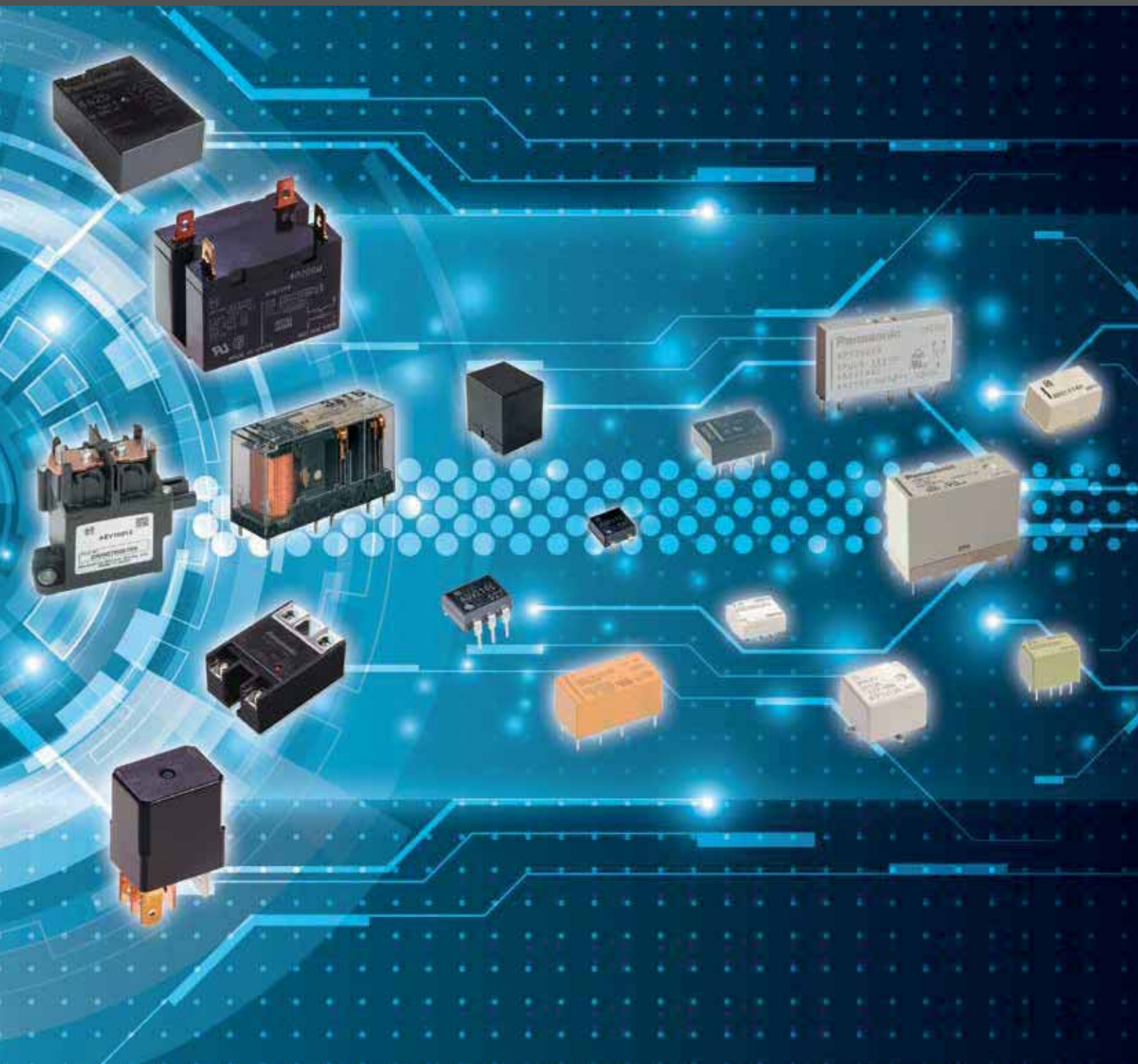
Panasonic

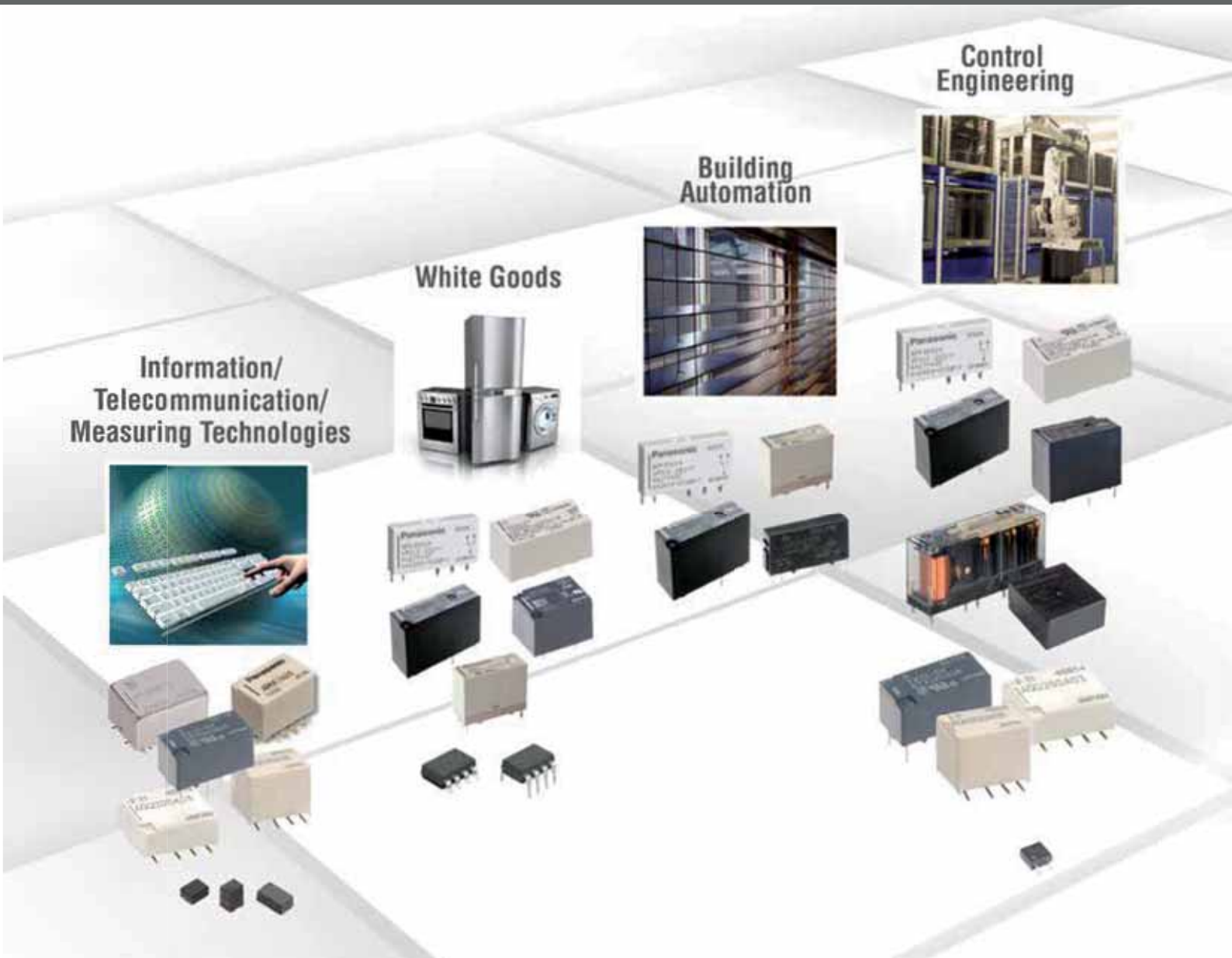
Short Form

RELAYS

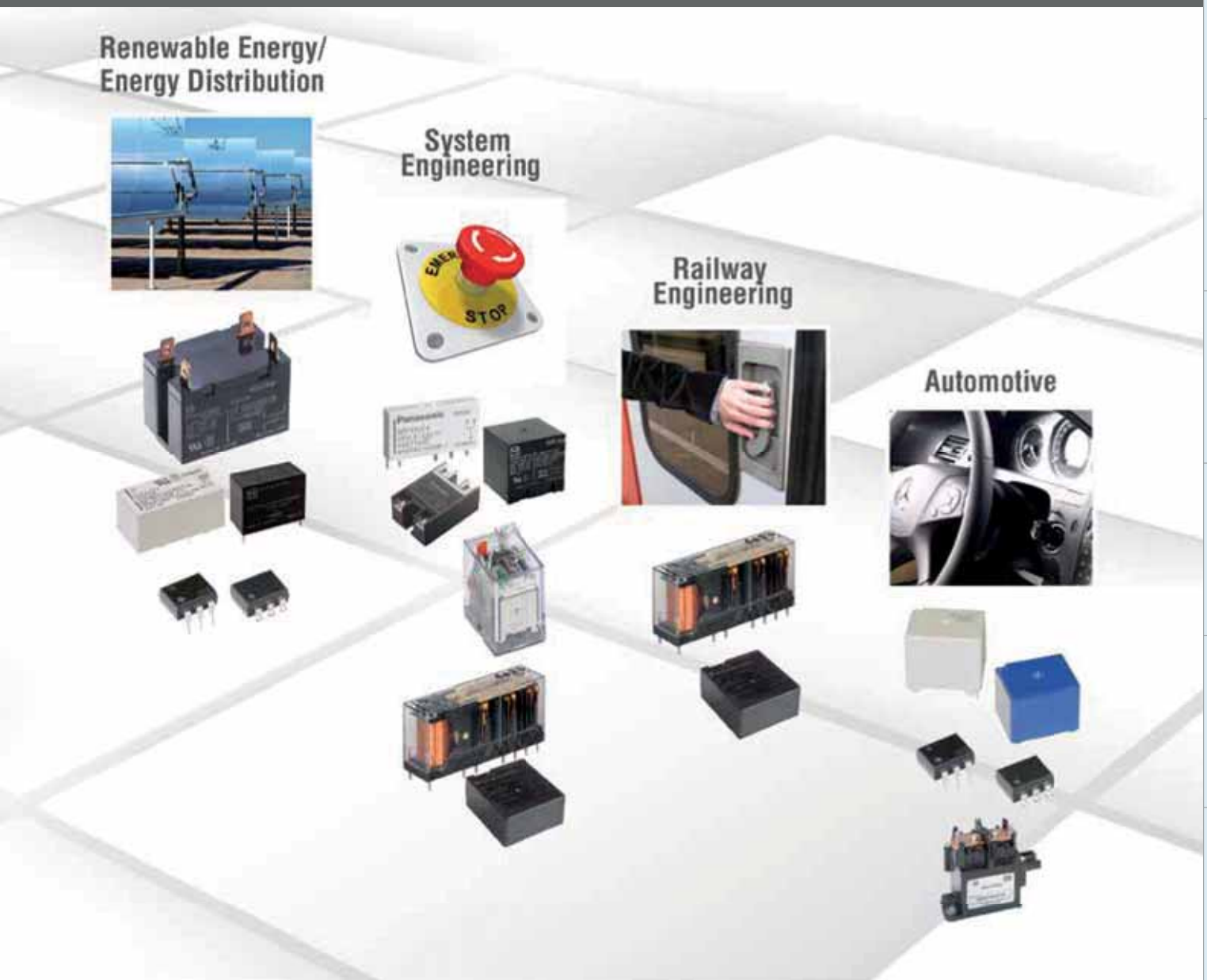


Panasonic Relay Technology – Innovations in 3,000 versions
Panasonic Relay Technology

Hardly any sector of the economy can exist without modern relay technology today. Panasonic Electric Works meets the sometimes highly specialized needs with a vast range of innovative and economical relays series. After more than 30 years experience at the forefront of relay innovation and development, Panasonic today offers a portfolio of 3,000 relay versions in the field of miniaturized relays, from ultra-miniature SMD semiconductor types to robust, compact industrial devices. Load switching capability ranges from low-level signals to double-digit ampere values. Various connection types such as circuit boards, plug-in or screw terminals offer a large variety of options that are tailored to the application. Signal relays of the T- and G-series, for example, contribute significantly to secure data transmission and perfect measurement applications. If a low profile is required, like measurement and medical applications, especially Panasonic's PhotoMOS relays can score points. They enable a fast, low noise and bounce-free switching in the smallest design and with an extremely long life. Panasonic power relays - especially the J-, L- and C-series - are used as network relays in a variety of durable household and consumer goods as well as in the automotive industry and in diverse OEM manufacturing industries.



In the field of safety of man and machine, the SF series relays with forcibly guided contacts, have set new standards. A wide range of electromechanical, semiconductor and PhotoMOS relays are also perfectly suited for SMD processing in automated manufacturing processes. Top quality and reliablity are guaranteed at Panasonic by strict production rules, advanced measuring and testing procedures as well as extensive testing before delivery, to comply with international standards. Of course, we sell RoHS compliant products and have ISO9001 certification. If you need more detailed information about Panasonic relays, please ask us to send you the complete relay catalog.



Relays: Characteristics at a Glance

	Coil insulation	Relays
UL coil insulation	UL-B	LE, LZ, JS, JW
	UL-F	LE, LZ, JT-V

	TV rated	Steady	Inrush (A)	Relays
TV rated	TV-3	4.5	71	ST
	TV-4	6.0	91	LA
	TV-5	7.5	111	LK-P, LK-Q, JS, JW
	TV-8	12.0	163	LK-T, LK-Q
	TV-10	15.0	191	HE (2a)
	TV-15	18.8	215	HE (1a)

	Surge voltage	Relays
Surge voltage between contact and coil	5000V	DS-P
	6000V	ST, PF, JT-V
	8000V	JK, PQ
	10000V	LF, LE, LZ, LA, LK-S, LK-P, LK-T, LK-Q, JW, HE, DJ, DK, DQ, DY

	Relays	Arrangement	Isolation	Insertion loss
High frequency characteristics	RD coaxial switch	SPDT, Transfer, SP6T	Min. 60dB (18GHz)	Max. 0.5dB (18GHz)
	RD coaxial switch	SPDT	Min. 60dB (18GHz)	Max. 0.7dB (18GHz)
	RJ	2 Form C	Min. 35dB (5GHz)	Max. 0.5dB (18GHz)
	RE	1 Form C	Min. 30dB (2.6GHz)	Max. 0.5dB (2.6GHz)
	RA	2 Form C	Min. 30dB (1GHz)	Max. 0.3dB (1GHz)
	RS	2 Form C	Min. 30dB (3GHz)	Max. 0.3dB (3GHz)

	Relays
Terminal socket	HN, SP, NC, HE, SFS
Socket	S, ST, SP, NC, PA, DK, DS-P, JW, Power PhotoMOS Relays, SFS, PF
LED operation indication type	HN, SFS, AQ-K

Please download CAD Data from our Website: **www.panasonic-electric-works.com**

Table of Contents

Panasonic Relay Technology 2
Relays: Characteristics at a Glance 4

Mechanical Relays Selector Chart 6
Signal Relays 6
Polarized Power Relays 12
Non Polarized Power Relays 18
High Capacity Power Relays 28
High Capacity DC Power Relays 30
High-Frequency Relays 32
Coaxial Switches 34
Automotive Relays 38
Safety Relays 52

PhotoMOS Relays Selector Chart 56
Examples of PhotoMOS Advantages 58
PhotoMOS Relays: Popular Type Selection Table 59
PhotoMOS Relay Dimensions 60
PhotoMOS Product Key 65
PhotoMOS 1 Form A Signal Relays 66
PhotoMOS 1 Form A Power Relays 74
PhotoMOS 1 Form A Voltage Sensitive Power Relays . . . 76
PhotoMOS 1 Form A Low CxR 78
PhotoMOS 1 Form B 82
PhotoMOS 2 Form A Signal Relays 86
PhotoMOS for Automotive Applications 88
PhotoMOS Other Types 90
Photovoltaic MOSFET drivers 94

Solid State Relays Selector Chart 96
Photo-Triac Couplers 96
Photo-Triac Couplers Wide Terminal 98
AQH Relays 100
Solid State SIL and DIL Types 102

Alphabetical List of Relays 106

Application of the EC Directives to All-or-Nothing Relays 107

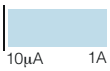
Variety of products 108

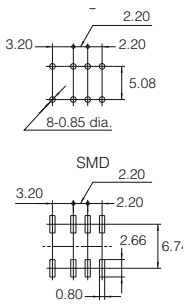
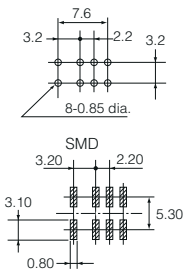
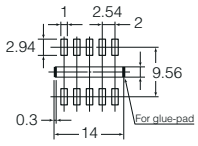
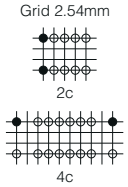
Service has Priority

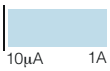
We respond quickly to customer needs. Just give us a call. Whether you have specific application requests or you simply want technical information, we are always ready to advise and assist you. Our current delivery program is assembled for you in this relay overview. Of course, data sheets are available on our homepage:
www.panasonic-electric-works.com

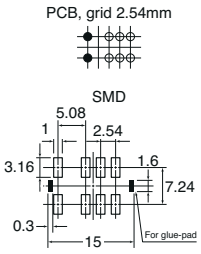
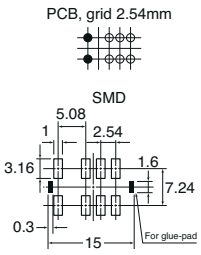
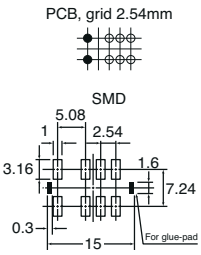
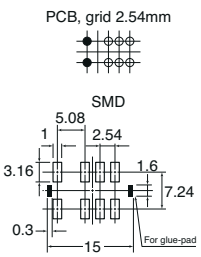
About the Selector Chart

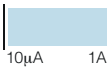
This selector chart is designed to help you quickly select a relay best suited for your needs. Please note: the values given for switching current and switching voltage do not necessarily indicate standard operating conditions. For the nominal switching capacity and other critical values, please refer to the respective data sheet or contact your Panasonic representative.

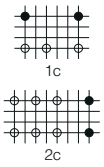
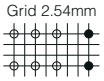
Type (Picture scale: DIN A4)	Features	Switching current	Max. switching voltage	Contact arrangement	Coil voltage
GQ (SMD) 1:1  10.6 x 7.2 x 5.2/5.4mm	» Compact flat body saves space » Outstanding surge resistance » The use of twin crossbar contacts ensures high contact reliability » High sensitivity 100mW type available » RTIII (IP67)	**Max.:** 2A **Min.:** 10µA  	» 110V DC » 125V AC	2c	(DC) 1.5, 3, 4.5, 6, 9, 12, 24V
GN (SMD) 1:1  10.6 x 5.7 x 9.0mm	» Compact slim body saves space » Outstanding surge resistance » The use of twin crossbar contacts ensures high contact reliability » High sensitivity 100mW type available » RTIII (IP67)	**Max.:** 2A **Min.:** 10µA10µA  	» 110V DC » 125V AC	2c	(DC) 1.5, 3, 4.5, 6, 9, 12, 24V
TQ (SMD) 1:1  14 x 9 x 5.6mm	» Ultra low profile 5.8mm » Surge withstand 2,500V » 3 types of surface-mount terminals available » RTIII (IP67)	**Max.:** 2A **Min.:** 10µA  	» 220V DC » 125V AC	2c	(DC) 1.5, 3, 4.5, 5, 6, 9, 12, 24, 48V
TQ (THT) 1:1  14 x 9 x 5mm	» 1,500V FCC » RTIII (IP67)	**Max.:** 1A **Min.:** 10µA  	» 110V DC » 125V AC	2c	(DC) 3, 4.5, 5, 6, 9, 12, 24, 48V

Coil power	Breakdown voltage			Surge withstand voltage	Mounting method (bottom view)	Approvals
	Between open contacts	Between contact sets	Contacts to coil			
Single side stable: 140mW (1.5 - 12V DC) 230mW (24V DC) **Sensitive type:** 100mW (1.5V - 12V DC) 120mW (24V DC) **1 coil latching:** 100mW (1.5V - 12V DC) 120mW (24V DC)	750Vrms	1000Vrms	1500Vrms	1,500V FCC Between open contacts 2,500V Telcordia Between contacts and coil	PCB, SMT 	BSI, CSA, UL
Single side stable: 140mW (1.5 - 12V DC) 230mW (24V DC) **Sensitive type:** 100mW (1.5V - 12V DC) 120mW (24V DC) **1 coil latching:** 100mW (1.5V - 12V DC) 120mW (24V DC)	750Vrms	1000Vrms	1500Vrms	1,500V FCC Between open contacts 2,500V Telcordia Between contacts and coil	PCB, SMT 	BSI, CSA, UL
Single side stable: 140mW (up to 12V DC) 200mW (24V DC) 300mW (48V DC) **1 coil latching:** 70mW (up to 12V DC) 100mW (24V DC) **2 coil latching:** 140mW (up to 12V DC) 200mW (24V DC)	1000Vrms	1500Vrms	1500Vrms	1,500V FCC Between open contacts 2,500V Telcordia Between contacts and coil	SMT 	CSA, UL
Single side stable: 140mW (3 - 12V DC) 200mW (24V DC) 300mW (48V DC) **1 coil latching:** 100mW (3 - 12V DC) 150mW (24V DC) **2 coil latching:** 200mW (3 - 12V DC) 300mW (24V DC)	750Vrms	1000Vrms	1000Vrms	1,500V FCC Between open contacts	PCB 	CSA, UL

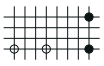
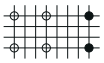
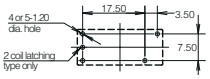
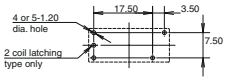
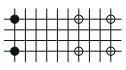
Type (Picture scale: DIN A4)	Features	Switching current	Max. switching voltage	Contact arrangement	Coil voltage
TX (SMD) 1:1  15 x 7.4 x 8.2mm	» Surge withstand 2,500V » Breakdown voltage between contacts and coil 2,000V » 3 types of surface-mount terminals available » Added new pin layout (LT type) in 2 coil latching type » RTIII (IP67)	**Max.:** 2A **Min.:** 10µA  	» 220V DC » 220V AC	2c	(DC) 1.5, 3, 4.5, 5, 6, 9, 12, 24, 48V
TX-TH (SMD) 1:1  15 x 7.4 x 8.2mm	» Controlled 7.5A inrush current » 2 types of pin layouts » 3 types of surface mount terminals available » RTIII (IP67)	**Max.:** 7.5A **Min.:** 10µA  	» 220V DC » 250V AC	2c	(DC) 1.5, 3, 4.5, 5, 6, 9, 12, 24, 48V
TX-D (SMD) 1:1  15 x 7.4 x 8.2/8.4mm	» High-insulation relay that conforms to the insulation level provided for in the EN41003 » 3 types of surface-mount terminals available » High-insulation relay that conforms to the insulation level provided for in the EN60950 » Surge breakdown voltage 6kV (contacts to coil) available » RTIII (IP67)	**Max.:** 2A **Min.:** 10µA  	Break Before Make: » 220V DC » 250V AC Make Before Break: » 125V DC » 125V AC	2c	(DC) 1.5, 3, 4.5, 5, 6, 9, 12, 24V
TX-S (SMD) 1:1  15 x 7.4 x 8.2/8.4mm	» Higher sensitivity » Nominal operating power, 50mW » 1,500V FCC » 3 types of surface-mount terminals available » Added new pin layout (LT type) in 2 coil latching type » RTIII (IP67)	**Max.:** 1A **Min.:** 10µA  	» 110V DC » 125V AC	2c	(DC) 1.5, 3, 4.5, 5, 6, 9, 12, 24V

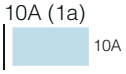
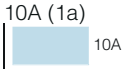
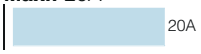
Coil power	Breakdown voltage			Surge withstand voltage	Mounting method (bottom view)	Approvals
	Between open contacts	Between contact sets	Contacts to coil			
Single side stable: 140mW (up to 24V DC) 270mW (48V DC) **1 coil latching:** 100mW **2 coil latching:** 200mW	1000Vrms	1000Vrms	2000Vrms	1,500V FCC Between open contacts 2,500V Telcordia Between contacts and coil	PCB, SMT 	BSI, CSA, UL
Single side stable: 140mW (up to 24V DC) 270mW (48V DC) **1 coil latching:** 100mW (up to 24V DC) **2 coil latching:** 140mW (up to 24V DC)	1000Vrms	1000Vrms	2000Vrms	1,500V FCC Between open contacts 2,500V Telcordia Between contacts and coil	PCB, SMT 	BSI, CSA, UL
Single side stable: 200mW (1.5 - 12V DC) 230mW (24V DC) **1 coil latching:** 150mW (1.5 - 12V DC) 170mW (24V DC)	1000Vrms	1000Vrms	3000Vrms	1,500V FCC Between open contacts 6,000V Between contacts and coil	PCB, SMT 	BSI, CSA, UL
Single side stable: 50mW (1.5 - 12V DC) 70mW (24V DC) **1 coil latching:** 35mW (1.5 - 12V DC) 50mW (24V DC) **2 coil latching:** 70mW (1.5 - 12V DC) 150mW (24V DC)	750Vrms	1000Vrms	1800Vrms	1,500V FCC Between open contacts 2,500V Telcordia Between contacts and coil	PCB, SMT 	BSI, CSA, UL

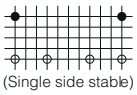
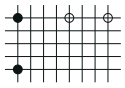
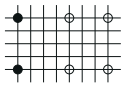
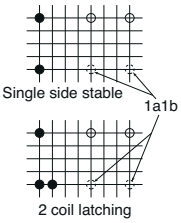
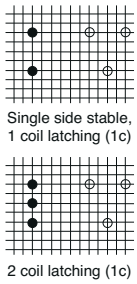
Type (Picture scale: DIN A4)	Features	Switching current	Max. switching voltage	Contact arrangement	Coil voltage
DS 1:1  15/20 x 9.9 x 9.9mm	» 1,500V FCC » High switching power » RTIII (IP67)	**Max.:** 2A **Min.:** 10µA  	» 220V DC » 250V AC	1c, 2c	(DC) 1.5, 3, 5, 6, 9, 12, 24, 48V
DS2Y 1:1  20 x 9.9 x 9.3mm	» High sensitivity » 2 Form C contact » 1,500V FCC » Sealed construction » RTIII (IP67)	**Max.:** 2A **Min.:** 10µA  	» 220V DC » 250V AC	2c	(DC) 1.5, 3, 5, 6, 9, 12, 24, 48V
HY 1:1  12 x 7.4 x 10.1mm	» High sensitivity 150mW / 200mW » RTIII (IP67)	**Max.:** 1A **Min.:** 10µA  	» 60V DC	1c	(DC) 1.5, 3, 4.5, 5, 6, 9, 12, 24V

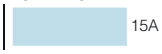
Coil power	Breakdown voltage			Surge withstand voltage	Mounting method (bottom view)	Approvals
	Between open contacts	Between contact sets	Contacts to coil			
Single side stable: 200mW **1 coil latching:** 90mW **2 coil latching:** 180mW	1000Vrms (DS1E-S: 500Vrms)	1000Vrms	1500Vrms (DS1E-S: 1000Vrms)	1,500V FCC Between open contacts	PCB Grid 2.54mm  1c 2c	CSA, UL
Single side stable: 200mW (up to 24V DC) 300mW (48V DC)	750Vrms	750Vrms	1000Vrms	1,500V FCC Between open contacts	PCB Grid 2.54mm 	CSA, UL
Standard: 200mW **High sensitivity:** 150mW	500Vrms	—	1000Vrms	—	PCB Grid 2.54mm 	CSA, UL

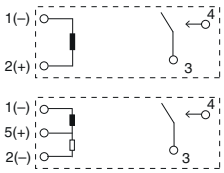
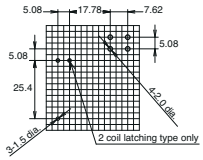
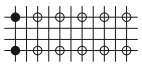
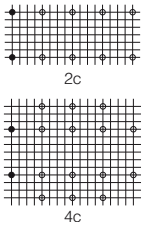
Type (Picture scale: DIN A4)	**Features**	**Switching current** (Min.: see data sheet)	**Max. switching voltage**	**Contact arrangement**	**Coil voltage**
DSP 1:2  20.2 x 11 x 10.5mm	» High switching capacity » High sensitivity » High breakdown voltage » Miniature high-power relay » Creepage and clearance distance min. 3.5mm » RTIII (IP67)	**Max.:** 8A (1a) 8A 5A (1a1b, 2a) 5A	» 220V DC » 400V AC	1a, 1a1b, 2	(DC) 3, 5, 6, 9, 12, 24V
DW 1:2  24 x 10 x 18.8mm	» Pin-in-Paste version available » Surge withstand voltage between coil and contact: 12,000V » Breakdown voltage between coil and contact: 5,000V rms » Conforms to EN 60335 » Creepage and clearance distance min. 6mm » RTII (IP54)	**Max.:** 8A/16A (1a) 8A 16A	» 8A 250V AC » 16A 277V AC	1a	(DC) 3, 5, 6, 9, 12, 24V
DW-HL 1:2  24 x 10 x 15.8mm	» Low profile type available (h = 15.8 mm) » Inrush type available (TV-8 UL/C-UL approved) » IEC60335-1* compliant type available (PTI 325V VDE approved) » Reflow possible (pin-in-paste) » Certified by UL/C-UL, VDE	**Max.:** 16A (1a) 16A	» 277V AC	1a	(DC) 3, 5, 6, 9, 12, 24V
DZ-S 1:2 	» IEC62055-31 UC3 compliant (short current 3,000 A) » High switching capacity » 120 A 250 VAC (Resistive load) » Twin contacts for low temperature rise » Low operating power	**Max.:** **90A (1a)** 90A	» 276 V AC	1a	(DC) 5, 12, 24V
DE 1:2  25 x 12.5 x 12.5mm	» Conforms to VDE0631 » Low coil power » Compact body saves space » High switching capacity: 16A = 25,000 10A = 100,000 switching cycles » Creepage and clearance distance min. 8mm » RTIII (IP67)	**Max.:** 10/16A (1a) 10A 16A 8A (1a1b, 2a) 8A	» 230V DC » 440V AC	1a, 1a1b, 2a	(DC) 1.5, 3, 4.5, 5, 6, 9, 12, 24, 48V

Coil power	Breakdown voltage			Surge withstand voltage	Mounting method (bottom view)	Approvals
	Between open contacts	Between contact sets	Contacts to coil			
Single side stable: 300mW **1 coil latching:** 150mW **2 coil latching:** 300mW	1000Vrms	2000Vrms	3000Vrms	5,000V	PCB Grid 2.54mm  1a  1a1b, 2a	CSA, SEV, TÜV, UL
1 coil latching: 200mW **2 coil latching:** 400mW	1000Vrms	—	5000Vrms	12,000V	PCB, PiP 	C-UL, VDE, UL
1 coil latching: 200mW **2 coil latching:** 400mW	1000Vrms	—	5000Vrms	12,000V	PCB 	C-UL, VDE, UL
1 coil latching: 1500mW **2 coil latching:** 3000mW	2000Vrms	—	4000Vrms	12,000V	Terminal mounting	VDE
Single side stable: 200mW **1 coil latching:** 100mW **2 coil latching:** 200mW	1000Vrms	4000Vrms (1a1b, 2a)	5000Vrms	12,000V	PCB Grid 2.54mm 	CSA, TÜV, UL, VDE

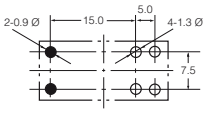
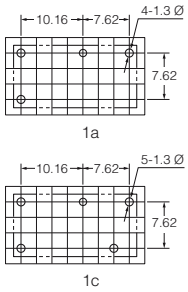
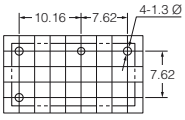
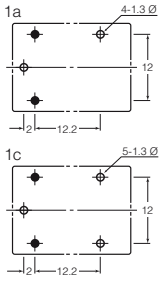
Type (Picture scale: DIN A4)	Features	Switching current (Min.: see data sheet)	Max. switching voltage	Contact arrangement	Coil voltage
ST 1:2  31 x 14 x 11.3mm	» High capacity in small size » High inrush capability » Latching type available » Frictionless pivoted rotating armature » High breakdown voltage » Socket available » Not for new applications » Creepage and clearance distance more than 3mm, approx. 4mm » RTIII (IP67)	**Max.:** 8A **Min.:** 1mA  1mA 8A	» 250V DC » 400V AC	1a1b, 2a	(DC) 3, 5, 6, 9, 12, 24, 48V
DK 1:2  20 x 12.5 x 9.7mm	» Dimensions for 1a = 12.5mm, for 2a, 1a1b = 15mm » Low coil power » Creepage and clearance distance min. 8mm: DK2A-L1/L2 min. 6.8mm DK1A1B-L1/L2 min. 6.8mm » RTIII (IP67)	**Max.:** 10A (1a)  10A 8A (1a1b, 2a)  8A	» 125V DC » 400V AC	1a, 1a1b, 2a	(DC) 3, 5, 6, 9, 12, 24V
DY 1:2  20 x 15 x 9.7mm	» Low cost, polarized power relay » 1a1b-contact arrangement is pin-compatible to DK1a1b » Latching type available » Creepage and clearance distance min. 6mm » RTIII (IP67)	**Max.:** 10A (1a)  10A 8A (1a1b)  8A	» 125V DC » 380V AC	1a, 1a1b	(DC) 3, 5, 6, 12, 24V
DJ 1:2  29 x 13 x 16/16.5mm	» Latching type available » Compact with high capacity » Low coil power » Optional available with manual test button » Creepage and clearance distance min. 8mm » RTII (IP54), RTIII (IP67)	**Max.:** 20A  20A	» 125V DC » 400V AC	1a, 1b, 1c, 1a1b, 2a, 2b, 2c	(DC) 5, 6, 12, 24, 48V

Coil power	Breakdown voltage			Surge withstand voltage	Mounting method (bottom view)	Approvals
	Between open contacts	Between contact sets	Contacts to coil			
Single side stable: 240mW **1 coil latching:** 130mW **2 coil latching:** 240mW	1200Vrms	2000Vrms	3750Vrms	6,000V	PCB Grid 2.54mm  (Single side stable)	CSA, TV rating, UL, VDE
Single side stable: 200mW **2 coil latching:** 200mW	1000Vrms	4000Vrms	4000Vrms	10,000V	PCB Grid 2.54mm  1a  1a1b, 2a	CSA, SEV, TÜV, UL, VDE
Single side stable: 200mW **2 coil latching:** 200mW	1000Vrms	4000Vrms	4000Vrms	10,000V	PCB Grid 2.54mm  Single side stable 1a1b 2 coil latching	CSA, TÜV, UL
Single side stable: 250mW **1 coil latching:** 150mW **2 coil latching:** 250mW	1000Vrms	—	4000Vrms	10,000V	PCB Grid 2.54mm  Single side stable, 1 coil latching (1c) 2 coil latching (1c)	CSA, SEV, TÜV, UL, VDE

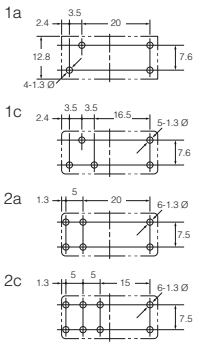
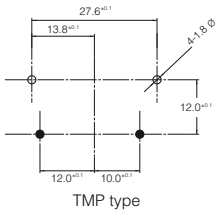
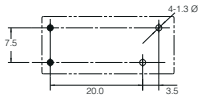
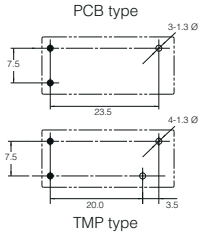
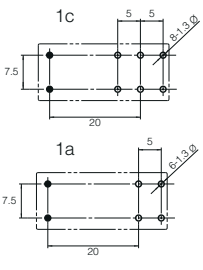
Type (Picture scale: DIN A4)	**Features**	**Switching current** (Min.: see data sheet)	**Max. switching voltage**	**Contact arrangement**	**Coil voltage**
DJ-H 1:2  39 x 15 x 33mm	» Manual Lever Type » Compact with high capacity » High insulation » Creepage and clearance distance min. 8mm » RTII » High inrush current capacity ~ 500A » EN 60669 compliant	**Max.:** 50A 	» 480V AC	1a	(DC) 5, 6, 9, 12, 24V
DQM 1:2  44 x 40.4 x 17.3mm	» Miniature 60A polarized power relay » Latching type available » High insulation » Creepage and clearance distance min. 8mm » RTIII (IP67)	**Max.:** 60A 	» 250V AC	1a	(DC) 4.5, 6, 9, 12, 24V
S 1:2  28 x 12 x 10.4mm	» High switching capacity range due to 5-layer contact » High sensitivity » High vibration and shock resistance » Low thermal electromotive force (approx. 3µV) » Latching type available Sockets available » RTIII (IP67)	**Max.:** 4A **Min.:** 100µA 	» 200V DC » 250V AC	2a2b, 3a1b, 4a	(DC) 3, 5, 6, 12, 24, 48V
SP 1:2  2c: 50 x 25.6 x 22mm 4c: 50 x 36.8 x 22mm	» Polarized power relay with rotating armature » High sensitivity » High vibration and shock resistance » Wide switching range » Latching type available » Socket available » RTI	**Max.:** 15A 	» 110V DC » 250V AC	2c, 4c	(DC) 3, 5, 6, 12, 24, 48V

Coil power	Breakdown voltage			Surge withstand voltage	Mounting method (bottom view)	Approvals
	Between open contacts	Between contact sets	Contacts to coil			
1 coil latching: 1000mW **2 coil latching:** 2000mW	1500Vrms	—	4000Vrms	12,000V	PCB 	CSA, UL
1 coil latching: 500mW **2 coil latching:** 1000mW	1500Vrms	—	4000Vrms	10,000V	PCB 	—
Single side stable: ~200mW (3V - 24V DC) 271mW (48V DC) **1 coil latching:** ~100mW (3V - 24V DC) 144mW (48V DC) **2 coil latching:** ~200mW (3V - 24V DC) 355mW (48V DC)	750Vrms	1000Vrms	1500Vrms	—	PCB Grid 2.54mm 	CSA, UL
Single side stable: 300mW **2 coil latching:** 300mW	1500Vrms	3000Vrms	3000Vrms	—	PCB, Plug-in Grid 2.54mm 	CSA, TÜV, UL

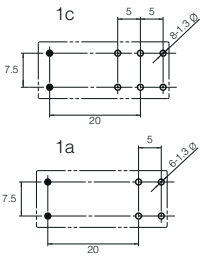
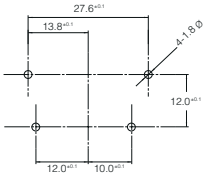
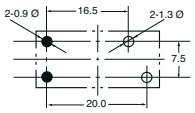
Type (Picture scale: DIN A4)	Features	Switching current (Min.: see data sheet)	Max. switching voltage	Contact arrangement	Coil voltage
Non polarized power relays					
LA 1:2  24 x 12 x 25mm	» Low cost slim power relay: 2 Form A » High insulation resistance between contact and coil » 3A-version with gold clad contacts available (ideal speaker switch) » Surge withstand voltage: 10kV » Creepage and clearance distance min. 6mm » RTIII (IP67)	**Standard:** **Max.:** 3 A (3A rated) 3A **Power type:** **Max.:** 5A (5A, TV-4 rated) 5A	» 30V DC » 277V AC	2a	(DC) 12, 24V
LQ 1:2  20 x 10 x 16mm	» High switching capacity in small size » High surge withstand voltage: 8,000V » Low power consumption » F-coil type for high ambient temperature (105°C) available » Extremely low cost » Creepage and clearance distance: 1a: min. 4.55mm 1c: min. 3.53mm » RTIII (IP67)	**Max.:** 10A (1a, 1c) 10A	» 277V AC	1a, 1c	(DC) 5, 6, 9, 12, 18, 24V
PQ 1:2  20 x 10 x 15.6mm	» High electrical noise immunity » High sensitivity: 200mW » High surge voltage: 8,000V » Pin-compatible to JQ1a » Gold-clad twin (bifurcated) contacts	**Max.:** 5A 5A	» 110V DC » 250V AC	1a	(DC) 3, 5, 6, 9, 12, 18, 24V
JS 1:2  22 x 16 x 16mm	» Ultra-miniature power relay with universal terminal footprint » F-coil type for high ambient temperature (105°C) available » Extremely low cost » High switching capacity: 10A » RTIII (IP67)	**Max.:** 10A 10A	» 100V DC » 277V AC	1a, 1c	(DC) 5, 6, 9, 12, 18, 24, 48V

Coil power	Breakdown voltage			Surge withstand voltage	Mounting method (bottom view)	Approvals
	Between open contacts	Between contact sets	Contacts to coil			
530mW	1000Vrms	1000Vrms	4000Vrms	10,000V	PCB 	CSA, SEV, SEMKO, TÜV, UL
200mW (1a) 400mW (1c)	1000Vrms (1a) 750Vrms (1c)	—	4000Vrms	8,000V	PCB 	C-UL, UL, VDE
200mW	1000Vrms	—	4000Vrms	8,000V	PCB 	CSA, SEMKO, TÜV, UL, VDE
360mW	750Vrms	—	1500Vrms	—	PCB 	CSA, TÜV, complies with TV-5, UL, VDE

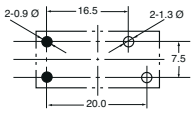
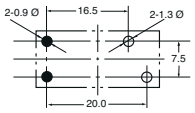
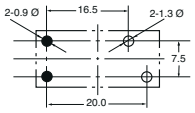
Type (Picture scale: DIN A4)	**Features**	**Switching current** (Min.: see data sheet)	**Max. switching voltage**	**Contact arrangement**	**Coil voltage**
JW 1:2  28.6 x 12.8 x 20mm	» Compact power relay » High surge withstand voltage: 10,000V » Class B coil insulation types available » Creepage and clearance distance min. 8mm between contacts and coil (for 2 changeover contacts min. 7.5mm) » RTIII (IP67)	**Standard:** **Max.:** 5A (2a, 2c) 5A **High capacity:** **Max.:** 10A (1a, 1c) 10A	» 100V DC 440V AC	1a, 1c, 2a, 2c	(DC) 5, 6, 9, 12, 18, 24, 48V
LF 1:2  30.1 x 15.7 x 23.3mm	» Ideal for compressor and inverter loads » High insulation resistance » Inrush current: 102A/200V AC 224A/100V AC » High surge withstand voltage » Creepage and clearance distance min. 8mm » RTII	**Max.:** 25A 25A	» 250V AC	1a	(DC) 5, 6, 9, 12, 18, 24V
LE 1:2  28.6 x 12.4 x 24.9mm	» Ideal for magnetron and heater loads » Excellent heat resistance » 4.8mm faston terminals » High sensitivity: 200mW » Creepage and clearance distance min. 8mm » RTI	**Max.:** 16A 16A	» 277/400V AC	1a	(DC) 5, 6, 9, 12, 18, 24, 48V
LZ 1:2  28.8 x 12.5 x 15.7mm	» Low profile relay (15.7mm) » Low operating power of 400mW » Ambient temperature up to 105°C » Creepage and clearance distance min. 10mm » RTIII (IP67)	**Max.:** 16A 16A	» 250V DC » 440V AC	1a, 1c	(DC) 5, 9, 12, 18, 24, 48V

Coil power	Breakdown voltage			Surge withstand voltage	Mounting method (bottom view)	Approvals
	Between open contacts	Between contact sets	Contacts to coil			
530mW	1000Vrms	3000Vrms (2a, 2c)	5000Vrms	10,000V	PCB 	CSA, SEMKO, SEV, TÜV, UL, VDE
900mW	1000Vrms	—	5000Vrms	10,000V	PCB Top mounting  TMP type	CSA, SEMKO, TÜV, UL, VDE
Standard: 400mW **High sensitivity:** 200mW	1000Vrms	—	4000Vrms	10,000V	PCB Top mounting  PCB type  TMP type	CSA, TÜV, UL, VDE
400mW	1000Vrms	—	5000Vrms	10,000V	PCB 	CSA, UL, VDE

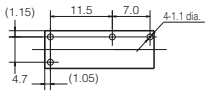
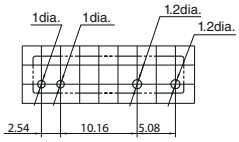
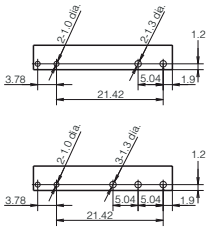
Type (Picture scale: DIN A4)	**Features**	**Switching current** (Min.: see data sheet)	**Max. switching voltage**	**Contact arrangement**	**Coil voltage**
LZ-N 1:2  28.8 x 12.5 x 15.7mm	» Low profile relay (15.7mm) » Low operating power of 400mW » Ambient temperature up to 105°C » Creepage and clearance distance min. 10mm » RTIII (IP67)	**Max.:** 16A 16A	» 250V DC » 440V AC	1a, 1c	(DC) 5, 9, 12, 18, 24
LF-G1/LF-G2 1:2  30.1 x 15.7 x 23.3mm	» Ideal for solar inverters » High insulation resistance » Inrush current: 102A/200V AC 224A/100V AC » High switching capacity 33A/277V AC » High surge withstand voltage, Creepage distance between contact and coil terminal: Min. 9.5 mm Clearance distance between contact and coil terminal: Min. 6.5 mm » RTI	**Standard:** **Max.:** 22A 22A **High capacity type,** 1.5mm contact gap: **Max.:** 31A 31A **High capacity type,** 1.8mm contact gap: **Max.:** 33A 33A	» 250V AC	1a	(DC) 9, 12, 18, 24V
LK-G 1:2  24 x 11 x 25mm	» Contact gap: 1mm » 3 different types available » High insulation resistance » Slim profile » High noise immunity » Creepage and clearance distance between contact and coil min. 6mm (IEC65 compliant) » RTI	**Max.:** 10A 10A **Max.**: 16A 16A	» 277V AC	1a	(DC) 5, 9, 12, 24V

Coil power	Breakdown voltage			Surge withstand voltage	Mounting method (bottom view)	Approvals
	Between open contacts	Between contact sets	Contacts to coil			
400mW	1000Vrms	—	5000Vrms	10,000V	PCB 	CSA, UL, VDE
1400mW	2500Vrms	—	4000Vrms	6,000V	PCB 	C-UL, UL, VDE
530mW	1000Vrms	—	4000Vrms	10,000V	PCB 	CSA, TÜV, UL

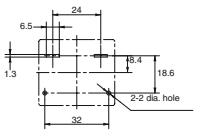
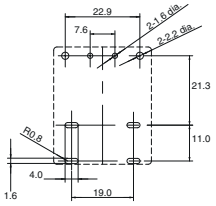
Type (Picture scale: DIN A4)	**Features**	**Switching current** (Min.: see data sheet)	**Max. switching voltage**	**Contact arrangement**	**Coil voltage**
LK-P 1:2  24 x 11 x 25mm	» High switching capacity 10A 277V AC » High inrush current capability: 111A » UL/CSA TV-5 rated type available » High insulation: Creepage and clearance distance between contact and coil min. 6mm » RTI	**Max.:** 10A 10A	» 30V DC » 277V AC	1a	(DC) 12, 24V
LK-Q 1:2  24 x 11 x 25mm	» Reduced noise » High sensitivity: nominal coil power 250mW » TV-5/TV-8 rated type available » Slim shape » Creepage and clearance distance min. 6mm » RTI	**Max.:** TV5: 5A (AC) 5A TV8: 8A (AC) 8A	» 30V DC » 277V AC	1a	(DC) 5, 9, 12, 24V
LK-T 1:2  24 x 11 x 25mm	» High inrush current capability: 118A » UL/CSA TV-8 rated type available » High noise immunity realized by the card separation structure between contact and coil » High insulation resistance: 1) Creepage and clearance distance between contact and coil min. 6mm 2) Surge withstand voltage between contact and coil > 10kV » RTI	**Max.:** 8A 8A	» 277V AC	1a	(DC) 5, 9, 12, 24V
HN 1:2  29 x 13 x 28mm	» Slim (13mm) and compact size relay: The size has been reduced 20% compared with the existing HC/HJ relays. » Plug-in solder type available » Slim screw terminal socket (17.5mm) » Also available with LED indication » High reliability » AC and DC coil available » RTII	**Max.:** 5A 5A **Max.:** 10A 10A **Max.:** 16A 16A	» 30V DC » 250V AC	1c, 2c	(DC) 5, 6, 12, 24, 48V (AC) 100, 120, 240V

Coil power	Breakdown voltage			Surge withstand voltage	Mounting method (bottom view)	Approvals
	Between open contacts	Between contact sets	Contacts to coil			
530mW	1000Vrms	—	4000Vrms	10,000V	PCB 	CSA, SEMKO, SEV, TÜV, TV-5 rating, UL, VDE
250mW	1000Vrms	—	4000Vrms	10,000V	PCB 	CSA, SEMKO, SEV, TÜV, complies with TV-5, TV-8, UL, VDE
250mW	1000Vrms	—	4000Vrms	10,000V	PCB 	CSA, SEMKO, SEV, TÜV, TV rating UL, VDE
(DC) 530mW (AC) 0.9VA	1000Vrms	3000Vrms	5000Vrms	—	Plug-in, Screw terminal —	UL, C-UL, (VDE)

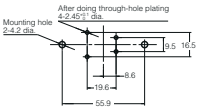
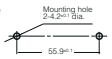
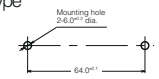
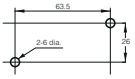
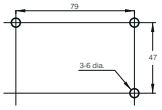
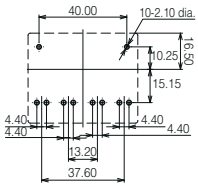
Type (Picture scale: DIN A4)	**Features**	**Switching current** (Min.: see data sheet)	**Max. switching voltage**	**Contact arrangement**	**Coil voltage**
Slim Power Relays					
LD-P 1:2  20.3 x 7 x 15mm	» Slim type: width 7mm » Coil power: 200mW » High switching capacity 5A/277V AC » Creepage and clearance distance min. 6mm » RTIII (IP67)	**Max.:** 5A 5A	» 30V DC » 277V AC	1a	(DC) 5, 6, 9, 12,18, 24V
PA-N 1:2  20 x 5 x 12.5mm	» High density mounting » Low operating power » Complies with IEC61010 reinforced insulation standards » Insulation distance: › 5.29mm clearance › 5.35mm creepage » Complies with Standard for Hazardous Location (ANSI/ ISA 12.12.01)	**Max.:** 5A 5A	» 110V DC » 250V AC	1a	(DC) 3, 4.5, 5, 6, 9, 2,18, 24V
PF 1:2  28 x 5 x 15mm	» Slim size permits high density mounting » Wide switching capacity » Slim relay for grid applications » Insulation construction conforms to VDE0700 » Contacts with gold flash plating or gold-clad contacts available » Clearance distance min. 6.0mm » Creepage distance min. 8mm » RTIII (IP67) » Bent pin type available	**Max.:** 6A 6A	» 300V DC » 400V AC	1a, 1c	(DC) 4.5, 5, 6,12, 18, 24, 48, 60V

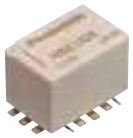
Coil power	Breakdown voltage			Surge withstand voltage	Mounting method (bottom view)	Approvals
	Between open contacts	Between contact sets	Contacts to coil			
200mW	750Vrms	—	4000Vrms	10,000V	PCB 	C-UL, UL, VDE
110mW (5 - 18V) 180mW (24V)	1000Vrms	—	3000Vrms	6,000V	PCB 	UL/C-UL, TÜV,
170mW (5 - 24V) 217mW (48V) 175mW (60V)	1000Vrms	—	4000Vrms	6,000V	PCB 	C-UL, UL, VDE

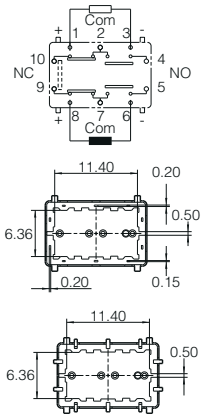
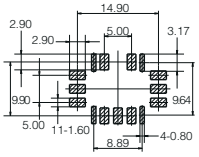
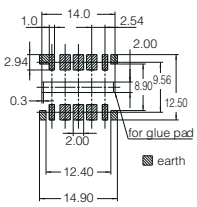
Type (Picture scale: DIN A4)	**Features**	**Switching current** (Min.: see data sheet)	**Max. switching voltage**	**Contact arrangement**	**Coil voltage**
HE/ HE PV 1:3  33 x 38 x 38,8mm	» High surge withstand voltage: 10,000V » High inrush resistance: TV-15: 1 form A TV-10: 2 form A » Compact power relays for AC and DC voltage » Contact gap: 3mm » Socket available » Creepage and clearance distance min. 8mm	**Max.:** 90A 	» 100V DC » 277V AC	1a, 2a	(DC) 6, 12, 24, 48, 110V (AC) 12, 24, 48, 120, 240V
HE-S 1:3  36 x 30 x 40mm	» High-capacity and long life 35A 277V AC » Reduced coil holding power 170mW contributes to saving energy of equipment » Contact gap: 3.2 mm » Safety: Mirror contact mechanisms according to IEC 60947-4-1	**Max.:** 35A 	» 220V DC » 480V AC	2a, 2a1b	(DC) 6, 9, 12, 24, 48

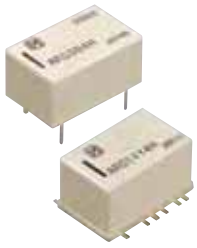
Coil power	Breakdown voltage			Surge withstand voltage	Mounting method (bottom view)	Approvals
	Between open contacts	Between contact sets	Contacts to coil			
(DC) 1920mW (AC) 1.7 - 2.7VA	2000Vrms	4000Vrms	5000Vrms	10,000V	Top mounting 	CSA, TÜV, TV rating, UL, VDE
(DC) 1880mW	2000Vrms	5000Vrms	5000Vrms between coil and Form-A contacts	10,000V	Recommended PC board pattern (Bottom view) 	UL/C-UL, CUL, VDE

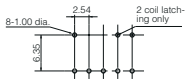
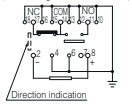
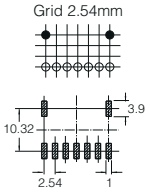
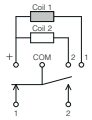
Type (Picture scale: DIN A4)	**Features**	**Switching current** (Min.: see data sheet)	**Max. switching voltage**	**Contact arrangement**	**Coil voltage**
EP 1:8   62.4 x 37.9 x 31.3mm 66.8 x 37.9 x 45mm  78 x 40 x 48.1mm   75.5 x 40 x 79mm 111 x 63 x 74.7mm	» High capacity to cut off DC voltage in a compact relay: max. cut-off current 2,500A/300V DC » Nominal switching capacity 300A 400V DC » Low operating noise » High contact reliability » DC type with sealed capsule » RTIII (IP67)	**Max.:** 10A 10A 20A 20A 80A 80A 300A 300A	» 1000V DC	1a	(DC) 12, 24, 48, 100V
HE-V 1:3  50 x 41 x 39.4mm	» Max. 1,000V DC, 20A cut-off possible in compact size relay » Coil holding power 210mW » High surge withstand voltage: 10,000V » Protective construction: Flux-resistant type » Contact gap: min. 3.0mm » Clearance distance min. 8mm » Creepage distance min. 9.6mm	**Max.:** 20A 20A	» 1000V DC	2a	(DC) 6, 9, 12, 15, 24

Coil power	Breakdown voltage			Surge withstand voltage	Mounting method (bottom view)	Approvals
	Between open contacts	Between contact sets	Contacts to coil			
Max.: 1.4W (10A) 3.9W (20A) 4.5W (80A) 4 - 40W (300A)	2500Vrms	—	2500Vrms	—	PCB 10A PC board type  10A TM type  20A type  80A type  300A type 	—
(DC) 1920mW	2000Vrms	4000Vrms	5000Vrms	10,000V	PCB 	UL, VDE

Type (Picture scale: DIN A4)	Features	Switching current	Max. switching voltage	Contact arrangement	Coil voltage
RJ 1:1  14 x 9 x 8.2mm	» Shielded HF relay » Up to 8GHz » Impedance 50Ω » Latching types available » SMD and PCB version available » RTIII (IP67) HF characteristics at 5GHz: » Isolation min. 35dB » Isolation min. 30dB between contact sets » Insertion loss max. 0.5dB » V.S.W.R. max.1.25	**DC:** 0.3A **HF:** 1W (5GHz)	» 30V DC	2c	(DC) 3, 4.5, 12, 24V
RN 1:1  14.6 x 9.6 x 10.0mm	» High hot switching capability up to 80W at 2GHz, contact rating up to 150W at 2GHz » High frequency capability up to 6GHz » 1 changeover contact, impedance 50Ω » Reversed contact type available » Single side stable or 2 coil latching types available » SMT version available » Very good HF characteristics » RTIII (IP67) HF characteristics at 2GHz: » Isolation min. 55dB » Insertion loss max. 0.12dB » V.S.W.R. max. 1.15	**DC:** 0.5A **HF:** 80W	» 30V DC	1c SPDT	(DC) 4.5, 12, 24V
RA 1:1  14.7 x 9.7 x 5.9mm	» HF relay in SMT version » Up to 1GHz » Impedance 50Ω Latching types available » RTIII (IP67) HF characteristics at 1GHz: » Isolation min. 20dB » Isolation min. 30dB between contact sets » Insertion loss max. 0.3dB » V.S.W.R. max. 1.2	**DC:** 1A **HF:** 3W (1GHz, carrying point to carrying current)	» 30V DC	2c	(DC) 1.5, 3, 4.5, 5, 6, 9, 12, 24, 48V

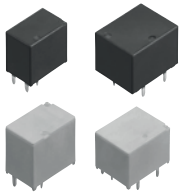
Coil power	Breakdown voltage				Life (min. operations)		Mounting method (bottom view)	Approvals
	Between open contacts	Between contact sets	Contacts to coil	Between live parts and ground	Electrical	Mechanical		
Single side stable: 200mW **2 coil latching:** 150mW	500Vrms	500Vrms	500Vrms	500Vrms	10^6	10^7	PCB, SMT 	—
Single side stable: 320mW **2 coil latching:** 400mW	500Vrms	—	500Vrms		10^5	10^6	SMT 	—
Single side stable: 140mW (1.5 - 12V) 200mW (24V) 300mW (48V) **1 coil latching:** 70mW (1.5 - 12V) 100mW (24V) **2 coil latching:** 140mW (1.5 - 12V) 200mW (24V)	750Vrms	1000Vrms	1000Vrms	1000Vrms	10^7	10^8	SMT 	—

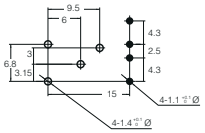
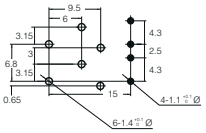
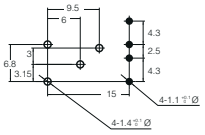
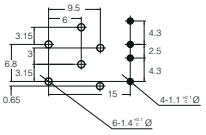
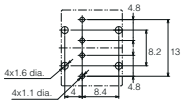
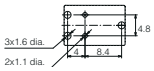
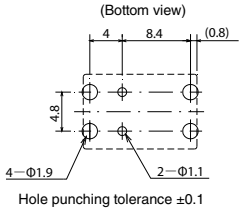
Type (Picture scale: DIN A4)	Features	Switching current	Max. switching voltage	Contact arrangement	Coil voltage
High-Frequency Relays					
RS 1:1  14 x 8.6 x 7/8mm	» HF relay » Up to 3GHz » Impedance 50/75Ω » Silent type available » Latching types available » SMT and PCB version available » 10W at 3GHz contact carrying power » RTIII (IP67) HF characteristics at 3GHz (50ΩPCB type): » Isolation min. 35dB » Insertion loss max. 0.35dB » V.S.W.R. max. 1.4	**DC:** 0.5A **HF:** 1W (3GHz)	» 30V DC	1c	(DC) 3, 4.5, 9, 12, 24V
RE 1:1  20.2 x 11.2 x 8.9/9.6mm	» HF relay » Up to 2.6GHz » Impedance 50/75Ω » SMT and PCB version available » RTIII (IP67) HF characteristics at 2.6GHz (75ΩPCB type): » Isolation min. 30dB » Insertion loss max. 0.5dB » V.S.W.R. max. 1.5	**DC:** 0.5A **HF:** 1W (2.6GHz)	» 30V DC	1c	(DC) 3, 4.5, 6, 9, 12, 24V
Coaxial Switches					
RV SPDT 1:1  15.9 x 15.9 x 11.2mm	» Ultra small coaxial switch » Up to 26.5 GHz » Impedance 50Ω » PIN and SMA terminals available » Latching types available » 2-coil latching type helps reduce power consumption » Failsafe type available » Reverse type available » Surge withstand voltage: 500Vrms HF characteristics at 18GHz/ SMA type: » Isolation min. 40dB » Insertion loss max. 0.7dB » V.S.W.R. max. 1.7	**HF:** 50W (3GHz)	—	SPDT	(DC) 4.5, 12, 24V

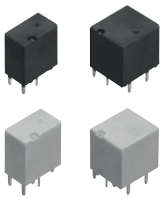
Coil power	Breakdown voltage				Life (min. operations)		Mounting method (bottom view)	Approvals
	Between open contacts	Between contact sets	Contacts to coil	Between live parts and ground	Electrical	Mechanical		
Single side stable: 200mW **1 coil latching:** 200mW **2 coil latching:** 400mW	500Vrms	—	1000Vrms	500Vrms	3×10^5	5×10^6	PCB, SMT  50Ω PCB type Single side stable type (Deenergized condition)  50Ω SMT type	—
Single side stable: 200mW	500Vrms	—	1000Vrms	500Vrms	3×10^5	10^6	PCB, SMT Grid 2.54mm  	—
700mW	500Vrms	500Vrms	500Vrms	500Vrms	3×10^5	10^6	PIN, SMA  	—

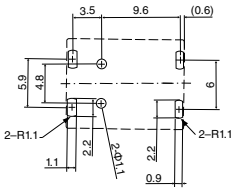
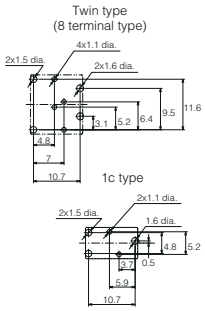
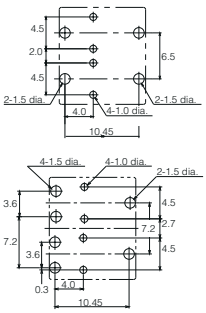
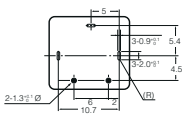
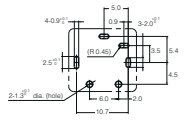
Type (Picture scale: DIN A4)	**Features**	**Switching current**	**Max. switching voltage**	**Contact arrangement**	**Coil voltage**
RD SPDT 1:2  34 x 13.2 x 40mm	» Coaxial relay » Up to 26.5GHz (18GHz) » Impedance 50Ω » Latching types available » TTL Version available » RTI HF characteristics at 18GHz: » Isolation min. 60dB » Insertion loss max. 0.5dB » V.S.W.R. max. 1.5	**DC:** 100mA (indicator) **HF:** 120W (3GHz)	» 30V DC (indicator)	SPDT	(DC) 4.5, 5, 12, 24V
RD TRANSFER 1:2  32 x 32 x 40mm	» Coaxial relay » Up to 26.5GHz (18GHz) » Impedance 50Ω » Latching types available » TTL Version available » RTI HF characteristics at 18GHz: » Isolation min. 60dB » Insertion loss max. 0.5dB » V.S.W.R. max. 1.5	**DC:** 100mA (indicator) **HF:** 120W (3GHz)	» 30V DC (indicator)	DPDT	(DC) 4.5, 5, 12, 24V
RD SP6T 1:4  80 x 80 x 40.5mm	» Coaxial relay » Up to 13GHz (18GHz) » Terminated type available » Impedance 50Ω » Latching types available » RTI HF characteristics at 13GHz: » Isolation min. 65dB » Insertion loss max. 0.4dB » V.S.W.R. max. 1.5	**DC:** 100mA (indicator) **HF:** 120W (3GHz)	» 30V DC (indicator)	SP6T	(DC) 4.5, 5, 12, 24V

Coil power	Breakdown voltage				Life (min. operations)		Mounting method (bottom view)	Approvals
	Between open contacts	Between contact sets	Contacts to coil	Between live parts and ground	Electrical	Mechanical		
Single side stable: 840-930mW (4.5, 12, 24V) **2 coil latching:** 600-620mW (4.5, 12, 24V) **Latching with TTL driver (self cut-off function):** 5, 12, 24V	500Vrms	500Vrms	500Vrms	500Vrms	5×10^6	5×10^6	Coax	—
Single side stable: 1540-1630mW (4.5, 12, 24V) **2 coil latching:** 700-1120mW (4.5, 12, 24V) **Latching with TTL driver (self cut-off function):** 5, 12, 24V	500Vrms	500Vrms	500Vrms	500Vrms	5×10^6	5×10^6	Coax	—
Single side stable: 840mW (4.5, 12V) 930mW (24V) **Latching:** 600mW (SET 4.5V) 600mW (SET 12V) 620mW (SET 24V)	500Vrms	500Vrms	500Vrms	500Vrms	5×10^6	5×10^6	Coax	—

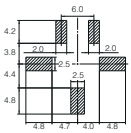
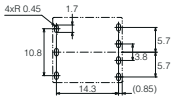
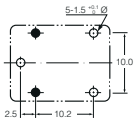
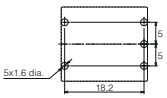
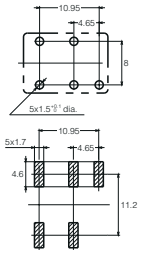
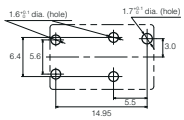
Type (Picture scale: DIN A4)	**Features**	**Switching current** (Min.: see data sheet)	**Max. switching voltage**	**Contact arrangement**	**Coil voltage**
PCB relays					
CT 1:2  Single: 17.4 x 7.2 x 13.5mm Twin: 17.4 x 14 x 13.5mm	» Super miniature size » Twin (1 Form C x 2) » ACT512 layout = layout of 2 x ACT112 » H-bridge type available (twin relay) » Quiet operation » Pin in Paste (with vent hole) available	**Max.:** 20A (N.O.) 20A 10A (N.C.) 10A	» 16V DC	1c, 1c x 2	(DC) 12V
CT POWER 1:2  Single: 17.4 x 7.2 x 13.5mm Twin: 17.4 x 14 x 13.5mm	» Super miniature size » Twin (1 Form C x 2) » Footprint same as CT standard type » 30A switching capacity (motor load) » H-bridge type available (twin relay) » Pin in Paste (with vent hole) available	**Max.:** 30A (N.O.) 30A 10A (N.C.) 10A	» 16V DC	1c, 1c x 2	(DC) 12V
TB 1:2  Single Print: 14 x 9.2 x 13.5mm PiP: 14 x 9.2 x 14.0mm Twin Print: 17.4 x 14 x 13.5mm PiP: 17.4 x 14 x 14.0mm	» Super miniature size » Single (1 Form A, 1 Form C) Twin (1 Form C x 2) » H-bridge type available (twin relay) » Pin in Paste (with vent hole) available » Lamp load type available	**Max.:** 20A (N.O.) 20A 10A (N.C.) 10A	» 16V DC	1a, 1c 1c x 2 (8 terminals) 1c x 2 (10 terminals)	(DC) 12V
TB1P 1:2  Size 14.0 x 9.2 x 14mm	» 1 form A contact arrangement » Low power consumption (typ. 480mW) » Small board space » Light weight	**Max.:** 30A (N.O.) 30A 10A (N.C.) 10A	» 16V DC	1a	(DC) 12V

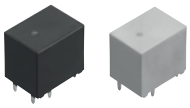
Coil power	Breakdown voltage			Surge withstand voltage	Mounting method	Approvals
	Between open contacts	Between contact sets	Contacts to coil			
800mW	500Vrms	—	500Vrms	—	PCB, PiP  8 terminals  10 terminals	—
1000mW	500Vrms	—	500Vrms	—	PCB, PiP  8 terminals  10 terminals	—
1,440mW (for pick-up voltage max. 5.5V DC) 900mW (for pick-up voltage max. 6.5V DC) 640mW (for pick-up voltage max. 7.7V DC)	500Vrms	—	500Vrms	—	PCB, PiP Twin type (8 terminal type)  1c type 	—
480mW	500Vrms	—	500Vrms	—	 Hole punching tolerance ±0.1	

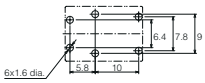
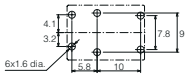
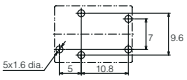
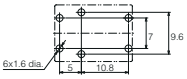
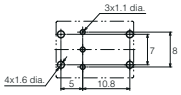
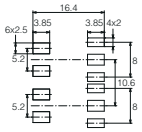
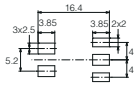
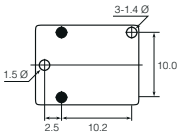
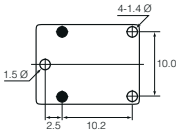
Type (Picture scale: DIN A4)	**Features**	**Switching current** (Min.: see data sheet)	**Max. switching voltage**	**Contact arrangement**	**Coil voltage**
TL 1:2  14.4 x 11.0 x 16.0mm	» 1 form U contact arrangement (Double make) » Small board space » Light weight	**Max.:** 40A (N.O.) 40A	» 16V DC	1u (double make contact)	(DC) 12V
TE 1:2  Single Print: 12 x 7.2 x 13.5mm PiP: 12 x 7.2 x 14.0mm Twin Print: 13.6 x 12 x 13.5mm PiP: 13.6 x 12 x 14.0mm	» Ultra small size » Smallest in its class » High capacity in a compact body » Single (1 Form C) » Twin (1 Form C x 2) » H-bridge type available (twin relay) » RTIII (IP67) » Pin in Paste (with vent hole) available	**Max.:** 20A (N.O.) 20A 10A (N.C.) 10A	» 16V DC	1c, 1c x 2 (8 terminals)	(DC) 12V
CJ 1:2  5 Pin Print: 7.2 x 12.2 x 13.5mm PiP: 7.2 x 12.2 x 13.8mm 8 Pin Print: 13.7 x 12.2 x 13.5mm PiP: 13.7 x 12.2 x 13.8mm 10 Pin Print: 14.4 x 12.2 x 13.5mm PiP: 14.4 x 12.2 x 13.8mm	» Ultra small size » Single (1 Form C) » Twin (1 Form C x 2) » High capacity in a compact body » H-bridge type available (twin relay) » Pin in Paste (with vent hole) available	**Max.:** 20A (N.O.) 20A 10A (N.C.) 10A	» 16V DC	1c, 1c x 2	(DC) 12V
CP 1:2  14 x 13 x 9.5mm	» Very low profile » High capacity » 24V DC type available on request	**Max.:** 20A (N.O.) 20A 10A (N.C.) 10A	» 16V DC	1a, 1c	(DC) 12V, 24V
CP POWER 1:2  14 x 13 x 9.5mm	» Very low profile » High capacity type: 45A maximum carrying current » Improved heat conduction thanks to additional pin » Layout is downward compatible to CP » Pin in Paste (with vent hole) available	**Max.:** 20A (N.O.) 20A 10A (N.C.) 10A	» 16V DC	1a, 1c	(DC) 12V

Coil power	Breakdown voltage			Surge withstand voltage	Mounting method	Approvals
	Between open contacts	Between contact sets	Contacts to coil			
640mW (for pick-up voltage max. 6.5V DC)	500Vrms	—	500Vrms	—		—
1,309mW (for pick-up voltage max. 5.5V DC) 900mW (for pick-up voltage max. 6.5V DC) 655mW (for pick-up voltage max. 7.7V DC)	500Vrms	—	500Vrms	—	PCB, PiP 	—
Standard: 800mW High sensitivity: 640mW	500Vrms	—	500Vrms	—	PCB, PiP 	—
640mW	500Vrms	—	500Vrms	—	PCB 	—
450mW 640mW	500Vrms	—	500Vrms	—	PCB 	—

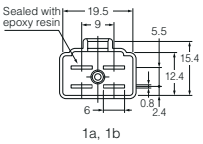
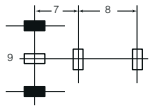
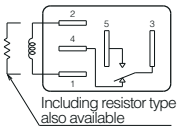
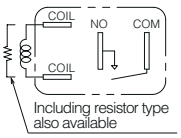
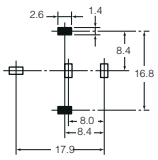
Type (Picture scale: DIN A4)	**Features**	**Switching current** (Min.: see data sheet)	**Max. switching voltage**	**Contact arrangement**	**Coil voltage**
CP (SMD) 1:2  14 x 13 x 10.5mm	» Very low profile » High capacity	**Max.:** 20A (N.O.) 20A 10A (N.C.) 10A	» 16V DC	1c	(DC) 12V
TJ 1:2  15 x 16 x 11.2mm	» Compact flat type (height: 11.2mm) » High capacity switching » Thermal resistant type	**Max.:** 30A (N.O.) 30A 15A (N.C.) 15A	» 16V DC	1c	(DC) 12V
CQ 1:2  17 x 13 x 16.6mm	» Very quiet operation » Terminal layout identical to JJM	**Max.:** 20A (N.O.) 20A 10A (N.C.) 10A	» 16V DC	1c	(DC) 12V
TA 1:2  19.8 x 17 x 14mm	» Very quiet operation » Flat type	**Max.:** 20A (N.O.) 20A 10A (N.C.) 10A	» 16V DC	1c	(DC) 12V
CN-M 1:2  15,5 x 11 x 14.4mm	» Space-saving design » High switching capacity (up to 30A) » SMD type available » Pin in Paste (with vent hole) available	**Max.:** 30A (N.O.) 30A 25A (N.C.) 25A	» 16V DC	1a, 1c	(DC) 12V
CN-H 1:2  17 x 10.6 x 18.3mm	» Best space savings in its class » Substitute for Micro-ISO relay » Low operating power type » High current-carrying capacity	**Max.:** 30A	» 16V DC	1a	(DC) 12V

Coil power	Breakdown voltage			Surge withstand voltage	Mounting method	Approvals
	Between open contacts	Between contact sets	Contacts to coil			
640mW	500Vrms	—	500Vrms	—	SMT 	—
450mW	500Vrms	—	500Vrms	—	PCB 	—
640mW	500Vrms	—	500Vrms	—	PCB 	—
640mW (for pick-up voltage max. 7.7V DC) 900mW (for pick-up voltage max. 6.5V DC)	500Vrms	—	500Vrms	—	PCB 	—
640mW	500Vrms	—	500Vrms	—	PCB, SMT 	—
450mW (for pick-up voltage max. 6.5V DC) 640mW (for pick-up voltage max. 5.5V DC)	500Vrms	—	500Vrms	—	PCB 	—

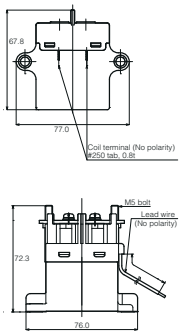
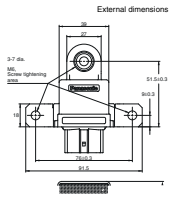
Type (Picture scale: DIN A4)	**Features**	**Switching current** (Min.: see data sheet)	**Max. switching voltage**	**Contact arrangement**	**Coil voltage**
TG 1:2  17.8 x 12.6 x 18mm	» Large capacity switching despite small size » Substitute for micro ISO relays » Low operating power type	**Max.:** 30A (N.O.) 30A 15A (N.C.) 15A	» 16V DC	1a, 1c	(DC) 12V
TC 1:2  Print: 17.8 x 13 x 16.0mm PiP: 17.8 x 13 x 16.4mm	» Large capacity switching despite small size » Substitute for micro ISO relays » Latching type available » High heat resistant type available » Pin in Paste (with vent hole) available	**Max.:** 30A (N.O.) 30A 15A (N.C.) 15A	» 16V DC	1a, 1c, 2a (2 coil latching	(DC) 12V
TH 1:2  Single: 11 x 12 x 8.8mm Twin: 21.6 x 12 x 8.8mm	» Ultra compact flat type » SMD mounting type: 8.8mm » High switching capacity (up to 25A) » Single (1 Form C) » Twin (1 Form C x 2)	**Max.:** 20A (N.O.) 20A 10A (N.C.) 10A	» 16V DC	1c 1c x 2 (10 terminals)	(DC) 12V
JJM 1:2  15.5 x 12 x 13.9mm	» Compact size » Bestselling, familiar blinker sound	**Max.:** 20A (N.O.) 20A 10A (N.C.) 10A	» 16V DC	1a, 1c	(DC) 12V
JJM-DM 1:2  15.5 x 12 x 13.9mm	» Small size » Double make contact arrangement » Terminal layout compatible to JJM	**Max.:** 2 x 6A 6A 6A	» 16V DC	1u (double make contact)	(DC) 12V

Coil power	Breakdown voltage			Surge withstand voltage	Mounting method	Approvals
	Between open contacts	Between contact sets	Contacts to coil			
640mW (for pick-up voltage max. 6.5V DC) 450mW (for pick-up voltage max. 7.0V DC)	500Vrms	—	500Vrms	—	PCB 1a type  1c type 	—
1,309mW (for pick-up voltage max. 6.5V DC) 900mW (for pick-up voltage max. 7.0V DC) 640mW (for pick-up voltage max. 7.5V DC) 1,920mW (2 coil latching type)	500Vrms	—	500Vrms	—	PCB, PiP 1a standard type  1c/2a standard type  2a latching type 	—
900mW (for pick-up voltage max. 6.5V DC) 655mW (for pick-up voltage max. 7.7V DC)	500Vrms	—	500Vrms	—	SMT Twin type (10 terminal type)  1c type 	—
640mW	500Vrms	—	500Vrms	—	PCB 	—
1000mW	500Vrms	—	500Vrms	—	PCB 	—

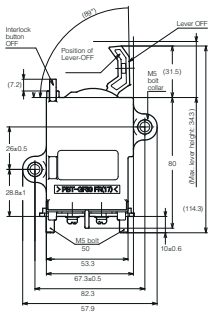
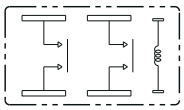
Type (Picture scale: DIN A4)	**Features**	**Switching current** (Min.: see data sheet)	**Max. switching voltage**	**Contact arrangement**	**Coil voltage**
Plug-in relays					
CA 1:2  21.5 x 14.4 x 37mm	» Small size » Direct plug-in	**Max.:** 20A (1a, 1.4W type) 20A 30A (1a, 1.8W type) 30A 20A (1b, 1c) 20A	» 15V DC (1c - 12V DC type) » 16V DC (1a, 1b - 12V DC type) » 30V DC (1c - 24V DC type)	1a, 1b, 1c	(DC) 12, 24V
CM 1:2  20 x 15 x 22mm	» Small substitute for Mini-ISO relay » Micro-ISO terminal type	**Max.:** 35A (N.O.) 35A 20A (N.C.) 20A	» 16V DC (12V DC type) » 32V DC (24V DC type)	1a, 1c	(DC) 12, 24V
CV 1:2  22.5 x 15 x 15.7mm	» Low profile » 20A Micro-ISO terminal type	**Max.:** 20A (N.O.) 20A 10A (N.C.) 10A	» 16V DC	1a, 1c	(DC) 12V
CV-N 1:2  22.5 x 15 x 15.7mm	» Low profile » Low temperature rise » Low sound pressure level » RTIII (IP67) available	**Max.:** 20A (N.O.) 20A 10A (N.C.) 10A	» 14V DC	1a, 1c	(DC) 12V
CB 1:2  26 x 22 x 25mm	» 40A switching current at 85°C » Mini-ISO type terminals » High shock resistance » High thermal resistance » 1 Form A available with 70A switching current » Broad lineup	**Max.:** 70A (N.O. H type) 70A 40A (1a, 1c N.O.) 40A 30A (1c N.C.) 30A	» 16V DC (12V DC type) » 32V DC (24V DC type)	1a, 1c	(DC) 12, 24V

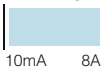
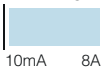
Coil power	Breakdown voltage			Surge withstand voltage	Mounting method	Approvals
	Between open contacts	Between contact sets	Contacts to coil			
1800mW 1400mW (type S)	500Vrms	—	500Vrms	—	Plug-in  1a, 1b	—
1500mW (12V DC type) 1800mW (24V DC type)	500Vrms	—	500Vrms	—	PCB (24V), Plug-in  	—
800mW	500Vrms	—	500Vrms	—	Plug-in  	—
800mW	500Vrms	—	500Vrms	—	Plug-in  	—
1400mW (12V DC type) 1800mW (24V DC type) 1800mW (12V DC, H type)	500Vrms	—	500Vrms	—	PCB, Plug-in  (PCB standard type)	—

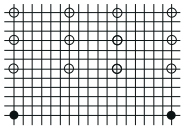
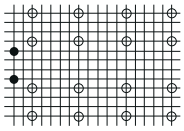
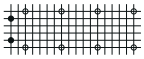
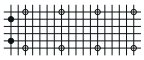
Type (Picture scale: DIN A4)	Features	Switching current (Min.: see data sheet)	Max. switching voltage	Contact arrangement	Coil voltage
High current/ High voltage relays					
EV 1:8  66.8 x 49.7 x 37.9mm  78 x 40 x 48.1mm  82.8 x 40 x 79mm  75.5 x 40 x 80mm  95 x 45 x 86.4mm  111 x 63 x 75mm	» 6 versions available: 10, 20, 80, 120, 200A, 300A » DC type with sealed capsule for electric and hybrid vehicles » Compact size » Small arcing space required thanks to blow-out magnets » Safety construction » High contact reliability	**Max.:** 10A (1a) 10A 20A (1a) 20A 60A (1a) 60A 80A (1a) 80A 120A (1a) 120A 200A (1a) 200A 300A (1a) 300A	» 400V DC	1a	(DC) 12, 24V
EV QUIET 1:4  76 x 36 x 72.3mm  77 x 67.8 x 37.7mm	» DC type with sealed capsule, mainly for hybrid vehicles » Very quiet operation » Small size and light weight » Small arcing space required thanks to blow-out magnets » Safety construction » High contact reliability » Standard type for horizontal mounting available	**Max.:** 60A (1a) 60A	» 400V DC	1a	(DC) 12V
CN-L 1:4  85.3 x 91.5 x 38.5mm	» Continuous carrying current of 150A@85°C » Continuous carrying current of 80A@125°C » Max. ambient temperature 125°C » Can be installed to engine compartment (IP54) » Version without fasten lug available » Overcurrent (> 2000A) trip function » No additional fuse needed	**Max.:** 150A (1a) 150A	» 14V DC	1a	(DC) 12V

Coil power	Breakdown voltage			Surge withstand voltage	Mounting method (bottom view)	Approvals
	Between open contacts	Between contact sets	Contacts to coil			
Stable: » 1240mW (10A, 12/24V) » 3900mW (20A, 12V) » 4200mW (80A/120A, 12/24V) » 6000mW (200A, 12/24V) » 3600mW (300A, 12V) » 3800mW (300A, 24V) Inrush: » 37.9W (300A, 12V) » 44.4W (300A, 24V)	2500Vrms	—	2500Vrms	—	Faston terminal (10A, 20A) Screw terminal (60A, 80A, 120A, 200A, 300A)	—
4500mW	Vertical: 2500Vrms Horizontal: 2000Vrms	—	Vertical: 2500Vrms Horizontal: 2000Vrms	—	Screw terminal 	—
30W	500Vrms	—	500Vrms	—	Screw terminal 	—

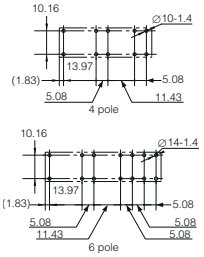
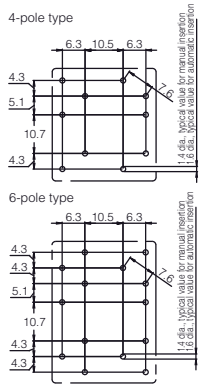
EV SWITCH 1:4  59.9 x 34.6 x 114.3mm	» High performance with capsule contact technology » High carrying current performance » Safety function	**Max.:** 80A (1a) 80A	» 400V DC	1a	—
CW 1:2  32 x 18 x 26mm	» Ideal relay for high output, 3-phase motors (Electric Power Steering) » High cut-off current capability and high carrying current	**Max.:** 120A	» 14V DC	2a	(DC) 12V

—	2500Vrms	—	2500Vrms	—	Screw terminal 	—
1400mW	500Vrms	—	500Vrms	—	Welding 	—

Type (Picture scale: DIN A4)	**Features**	**Switching current**	**Max. switching voltage**	**Contact arrangement**	**Coil voltage**
SFN4D 1:3  53.3 x 33 x 14.5mm	» Polarised relay with forcibly guided contacts according to EN 50205, Type B » Safety double contact » Coil power: 390mW » Relay height: 14.5mm » Reinforced insulation, creepage and clearance distance 5.5mm » RTIII (IP67)	**Max.:** 8A **Min.:** 10mA  	» 500V DC » 500V AC	4a2b	(DC) 5, 9, 12, 16, 18, 21, 24, 36, 48, 60V
SF4D 1:3  53.3 x 33 x 16.5mm	» Polarised relay with forcibly guided contacts according to EN 50205, Type B » Safety double contact » RTIII (IP67)	**Max.:** 8A **Min.:** 10mA  	» 400V DC » 400V AC	4a4b	(DC) 5, 9, 12, 18, 21, 24, 36, 48, 60V
SF2D 1:3  53.3 x 25 x 16.5mm	» Polarised relay with forcibly guided contacts according to EN 50205, Type A » Safety double contact » For applications according to EN 50155 » IEC/EN 60335-1 (GWT) compliant » RTIII (IP67)	**Max.:** 8A **Min.:** 10mA 	» 400V DC » 400V AC	2a2b	(DC) 5, 9, 12, 18, 21, 24, 36, 48, 60V
SF3 1:3  53.3 x 25 x 16.5mm	» Polarised relay with forcibly guided contacts according to EN 50205, Type A » For applications according to EN 50155 » IEC/EN 60335-1 (GWT) compliant » RTIII (IP67)	**Max.:** 8A **Min.:** 10mA 	» 400V DC » 400V AC	3a1b	(DC) 5, 9, 12, 18, 21, 24, 36, 48, 60V

Coil power	Breakdown voltage			Surge withstand voltage	Mounting method (bottom view)	Approvals
	Between open contacts	Between contact sets	Contacts to coil			
390mW (5 - 24V) 420mW (36 - 60V)	2500Vrms	4000Vrms	5000Vrms	—	PCB Grid 2.5mm  4a2b	CSA, TÜV, UL
500mW	2500Vrms	2500Vrms	2500Vrms	—	PCB Grid 2.54mm  4a4b	CSA, TÜV, UL
500mW	2500Vrms	2500Vrms	2500Vrms	—	PCB Grid 2.54mm  2a2b	CSA, TÜV, UL
500mW	2500Vrms	2500Vrms	2500Vrms	—	PCB Grid 2.54mm  3a1b	CSA, TÜV, UL

Type (Picture scale: DIN A4)	**Features**	**Switching current**	**Max. switching voltage**	**Contact arrangement**	**Coil voltage**
SFS 1:3  40 x 13 x 24mm  50 x 13 x 24mm	» Polarised relay with forcibly guided contacts according to EN 50205, Type A » 4-pole and 6-pole type with various contact arrangements » Slim profile reduces mounting area » PC board sockets and DIN-rail terminal socket available » RTII (IP54)	**Max.:** 6A **Min.:** 1mA 1mA 6A	» 30V DC » 250V AC	2a2b, 3a1b, 4a2b, 5a1b, 3a3b	(DC) 12, 16, 18, 21, 24, 48V
SF-Y 1:3  39 x 14.5 x 28.6mm  31 x 14.5 x 28.6mm	» Polarised relay with forcibly guided contacts according to EN 50205, Type A » 4-pole and 6-pole type with various contact arrangements » Gold clad contacts on request » Reinforced insulation according to EN 50178, creepage and clearance distance ≥5.5mm (V=230V overvoltage category III, 6 kV) » RTIII (IP67)	**Max.:** 8A **Min.:** 1mA 1mA 8A	» 400V DC » 250V AC	2a2b, 3a1b, 4a2b, 5a1b	(DC) 5, 12, 18, 21, 24V

Coil power	Breakdown voltage			Surge withstand voltage	Mounting method (bottom view)	Approvals
	Between open contacts	Between contact sets	Contacts to coil			
360mW (4 poles) 500mW (6 poles)	1500Vrms	2500Vrms/ 4000Vrms	4000Vrms	—	PCB 	CSA, TÜV, UL
670mW (4 poles, 6 poles)	1500Vrms	2500Vrms/ 4000Vrms	4000Vrms	—	PCB 	CSA, TÜV, UL

PHOTOMOS RELAYS

Panasonic

Lineup

Main Features

- Very compact housing (SON)
- Very low On resistance (HE-Type: Ron = typ. 8mΩ)
- Fast turn-on time (RF-Type: ton = 0,2ms)
- Very low leakage current (RF-Type: Leak = 10pA)
- High shock and vibration withstand capability (1000G)
- No arcing
- No abrasion → Endless lifetime

Highlights

- No threshold voltage
- Switching of lowest analog signals is possible
- Linear output characteristic
- Low control voltage / non inductive Input
- High I/O-Isolation (up to 5kV)
- High shock and vibration withstand capability (1000G)

Applications

- Automotive electronics
- Energy management
- Measurement equipment
- Telecommunication equipment
- Industrial automation
- Medical equipment
- Home and building security equipment

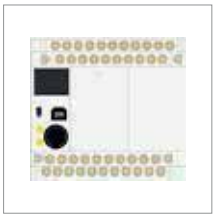
Applications

Automotive electronics

Energy management

Measurement equipment

Telecommunication equipment



Industrial Automation

Medical equipment

Home and building security equipment

What is PhotoMOS?

Panasonic Electric Works offers a wide range of PhotoMOS relays for use in telecommunication, measurement, security devices and industrial control. Obviously, the PhotoMOS relay differs from the conventional electromechanical relay, but it also distinguishes itself from other switching solutions that utilize optocouplers or semiconductors.

The construction of the PhotoMOS relay is illustrated below:

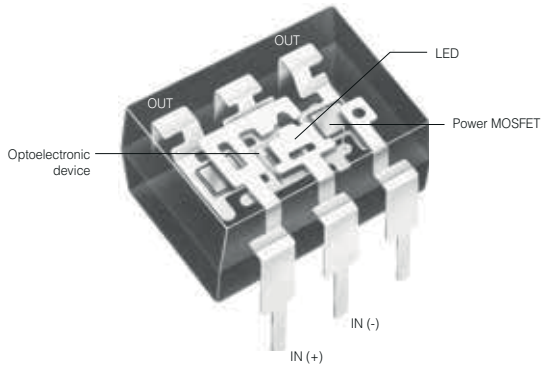


Figure 1 PhotoMOS internal construction

The input pins are connected to a light emitting diode. This LED is located on the upper part of the relay and as soon as a current flows through it, it starts emitting infrared light. Below the LED, there is an array of solar cells intergrated into an optoelectronic device, thus switching the output transistors.

The light emitter and detector are moulded in translucent resin that allows light to pass through but provides a dielectric barrier between the input and output side. By integrating an internal circuit in the optoelectronic device, it serves as a control circuit for switching the power MOSFETs and therefore the load circuit in an ON or OFF state.

A single power MOSFET is only capable of switching a DC voltage since its internal source-drain diode will become forward biased if the load polarity is reversed. Using a PhotoMOS relay for switching AC voltages therefore requires two source-coupled power MOSFETs in one PhotoMOS relay.

By connecting the two output transistors of an AC relay in parallel, the allowable DC current can also be increased (A, B or C connection) as illustrated below:

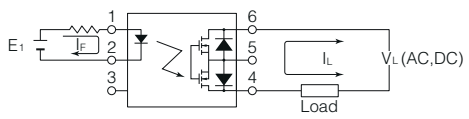


Figure 2 PhotoMOS in A connection

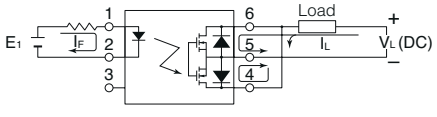
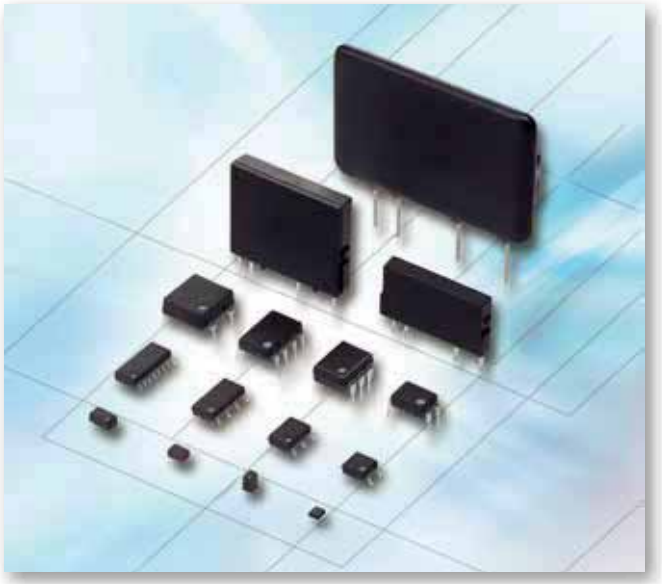


Figure 3 PhotoMOS in C connection

Basically, the power MOSFET's output acts as a pure ohmic resistance thus distinguishing the PhotoMOS from an optocoupler or triac solution, since no saturation voltage or offset voltage is required. However the aforementioned source-drain diode of the MOSFET may influence the linearity of the output, and the output capacitance may limit the usability for higher frequencies. This strongly depends on the type of PhotoMOS relay used and on the application's requirements.



Due to Panasonic's broad product range, we are able to offer PhotoMOS relays for numerous applications, enabling you to utilize

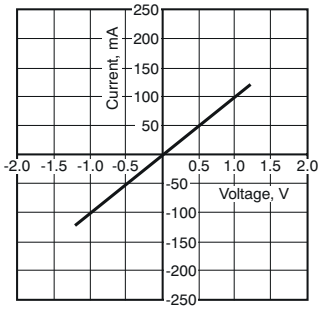
PhotoMOS advantages:

- Low control current
- Control of small analog signals
- Low leakage current
- Fast switching speed
- Stable ON-resistance over lifetime
- Extremely long product life
- Small size
- Flexible mounting position
- High vibration and shock resistance
- No contact bouncing
- No switching noise

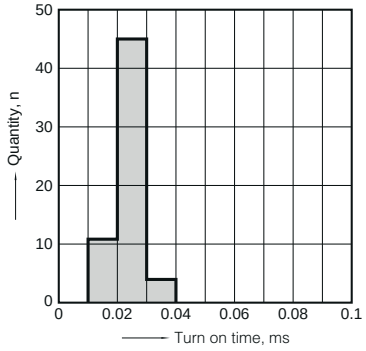
Due to the enormous variety of PhotoMOS relays, they are suitable for numerous applications (see figure 4). They can be used in telecommunications and for measurement equipment, for switching and controlling small motors or other power loads, and for controlling various signals out of microcontrollers.

Examples of PhotoMOS Advantages

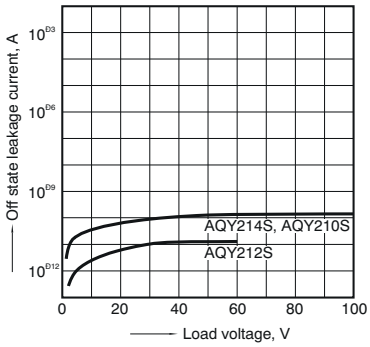
1. High output linearity without any saturation or offset voltage making PhotoMOS perfectly suitable for switching signals or loads (AQY225R2V).



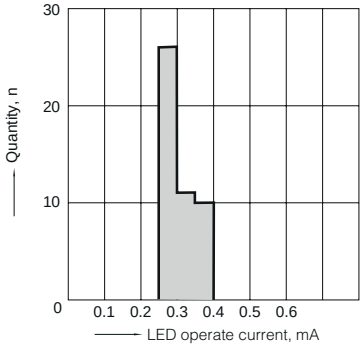
2. Fast switching times with stable behavior over lifetime and no contact bouncing due to semiconductor technology (AQY221N3V).

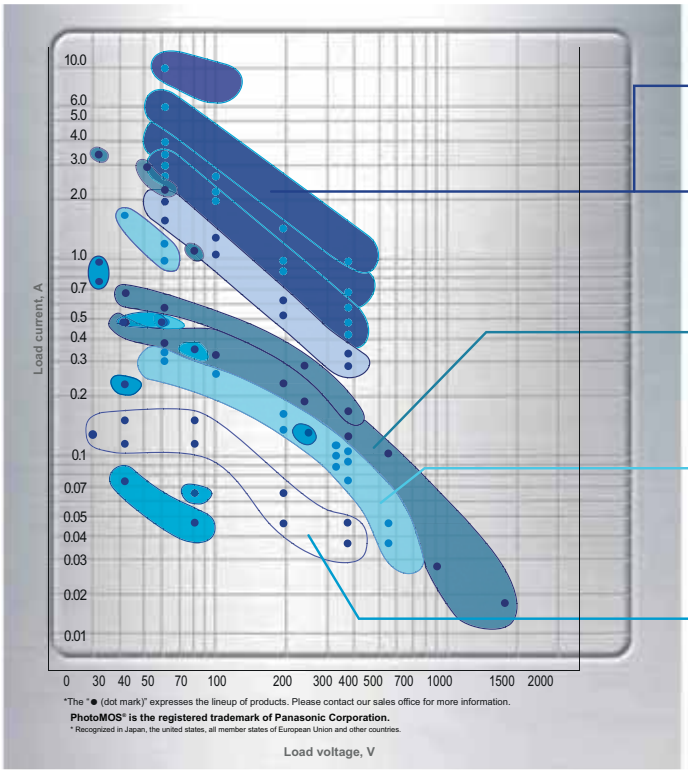


3. Perfectly suited for switching low level signals due to low off-state leakage current in the range of pA to nA (AQY21*S).



4. PhotoMOS relays require very low input control currents. Sensitive types are also available (AQV234). Take temperature and safety considerations into account.

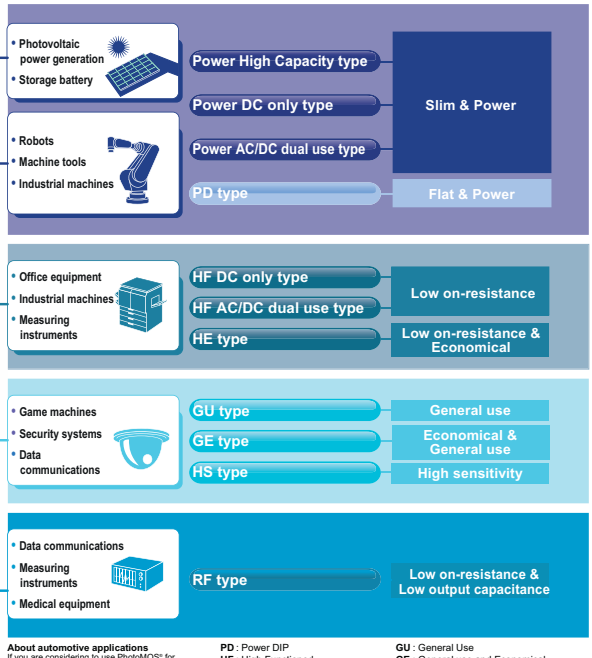




*The "● (dot mark)" expresses the lineup of products. Please contact our sales office for more information.

PhotoMOS® is the registered trademark of Panasonic Corporation.

* Recognized in Japan, the united states, all member states of European Union and other countries.



About automotive applications
If you are considering to use PhotoMOS® for automotive applications, please contact your local Panasonic Corporation technical representive.

PD : Power DIP
HF : High Functioned
HE : High functioned and Economical
RF : Radio Frequency

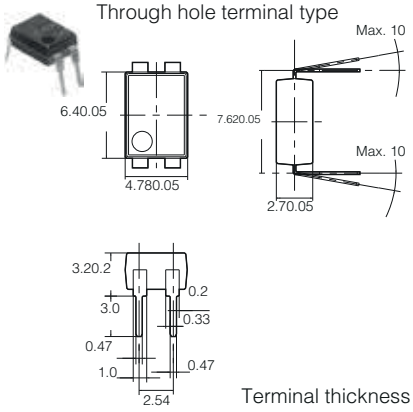
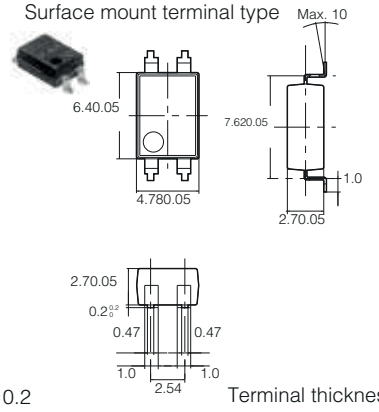
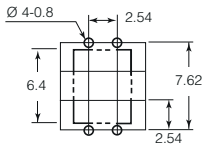
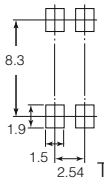
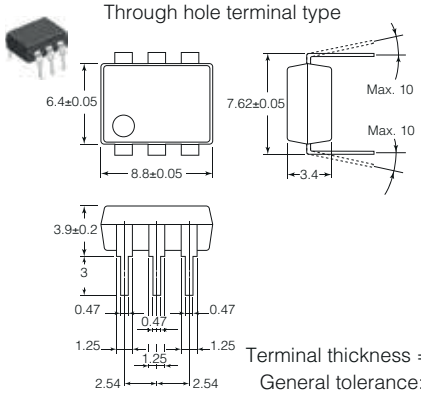
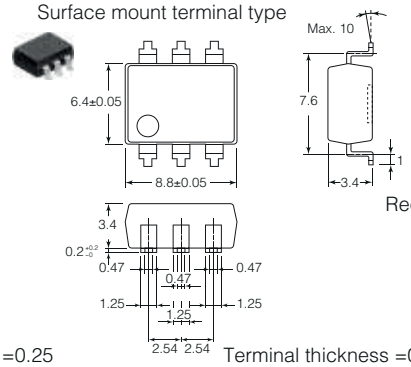
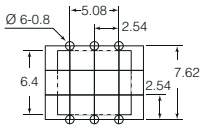
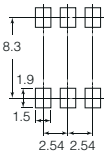
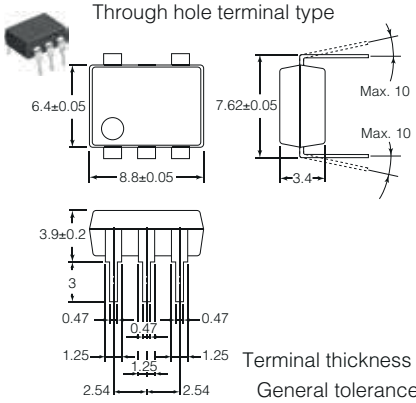
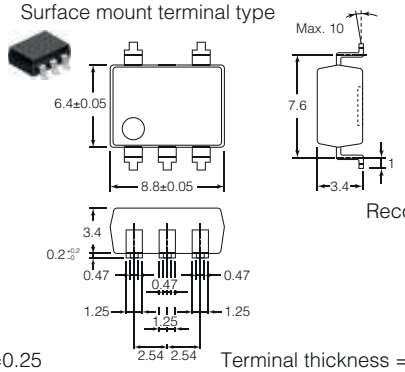
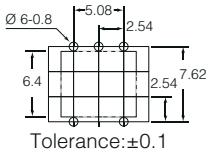
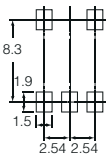
GU : General Use
GE : General use and Economical
HS : High Sensitivity

PhotoMOS Relays: Popular Type Selection Table

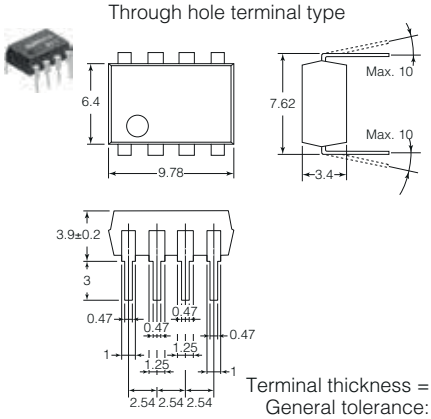
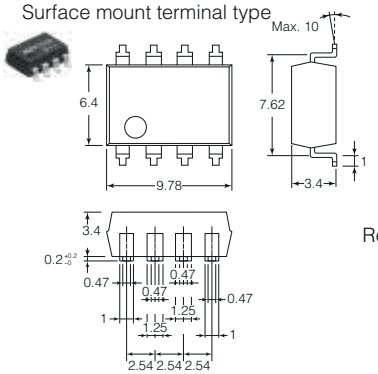
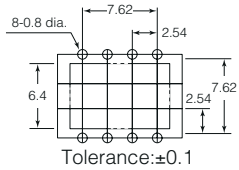
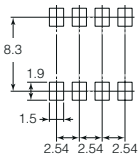
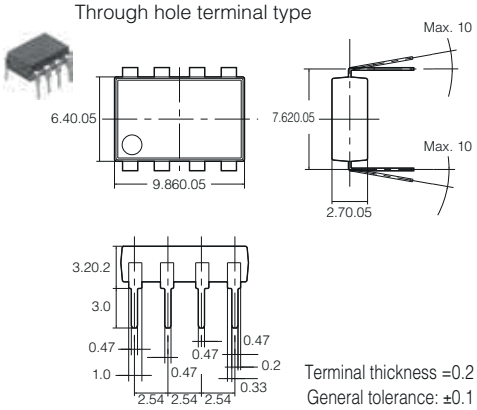
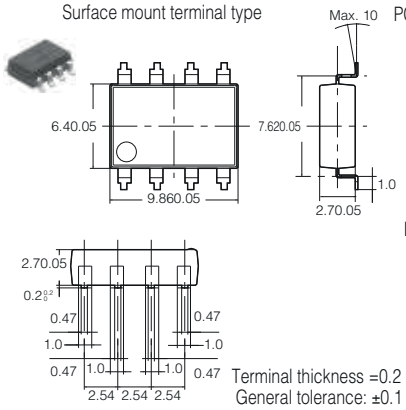
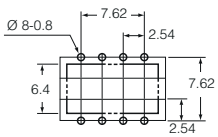
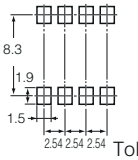
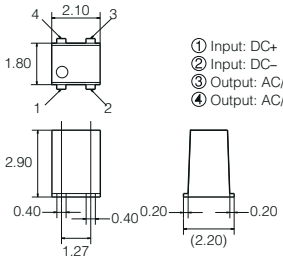
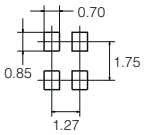
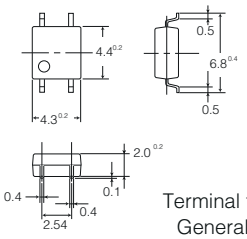
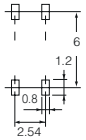
	Type[1]	Package	Contact	Voltage (V)[2]	Current (A)[2]	R_{on}[3] (Ω)	C_{out}[3] (pF)	Info.
	AQY211EH(A)	DIP4	1a	30	10	025	240	General use
	AQY212EH(A)			60	055	085	80	
	AQY212GH(A)			60	11	034	220	
	AQY210EH(A)			350	013	180	45	
	AQY214EH(A)			400	012	260	45	
	AQY216EH(A)			600	005	52	35	
	AQY212S	SOP4		60	05	083	80	
	AQY212GS			60	10	034	220	
	AQY212G2S			60	125	02	180	
	AQY210S			350	012	170	45	
	AQY214S			400	01	250	45	
	AQY412S		1b	60	05	10	450	
	AQY410S			350	012	180	110	
	AQY414S			400	01	260	100	
	AQY232S	SOP4	1a	60	05	085	80	Low operate current
	AQY230S			350	012	190	45	
	AQY234S			400	01	270	45	
	AQV112KL(A)	DIP6	1a	60	05	055	300	Short circuit protected
	AQY210KS	SOP4		350	012	23	42	
	AQV251G	DIP6	1a	30	35	0035	350	High power
	AQV252G2S	SOP6		50	30	004	360	
	AQV252G	DIP6		60	25	008	240	
	AQV255GS	SOP6		80	125	009	300	
	AQV259H(A)	DIP6		1,000	003	850	80	
	AQV258H(A)			1,500	002	3.450	80	
	AQY2C1R6P	TSON	1a	30	0.75	0.22	40	Low CxR for high frequencies
	AQY2C1R2P			40	0.3	0.9	14.5	
	AQY2C2R2P			60	0.3	1.0	27	
	AQY221N3T	VSSOP		25	015	55	11	
	AQY221N2T			40	012	95	11	
	AQY221R2T			60	04	08	27	
	AQY225R3T			100	012	88	58	
	AQY221N3M	SON		25	015	55	11	
	AQY221N2M			40	012	95	11	
	AQY221R2M			40	025	08	14	
	AQY221N2V	SSOP		40	012	95	1	
	AQY221R2V			40	025	075	125	
	AQY221R4V			40	05	055	24	
	AQY225R2V			80	012	105	45	
	AQY225R3V			100	012	88	58	
	AQY221N2S	SOP4		40	012	95	1	
	AQY221R2S			40	025	08	13	
	AQY225R2S			80	015	105	45	
	AQZ202		1a	60	30	011	1.400	AC and DC
	AQZ205			100	20	023	1.400	
	AQZ204			400	05	20	600	
	AQZ404		1b	400	05	28	2.000	

[1] A = SMD type, [2] Maximum value (DC or peak AC), [3] Typical value

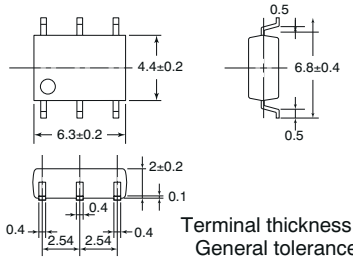
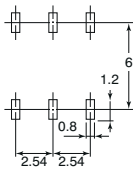
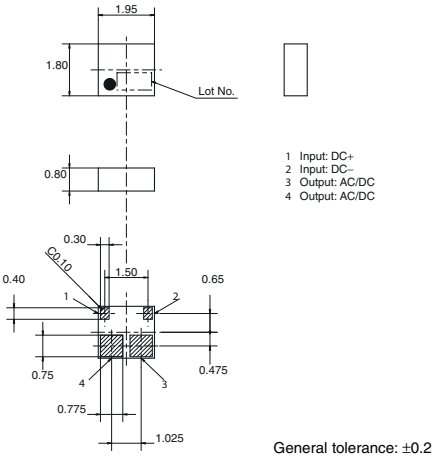
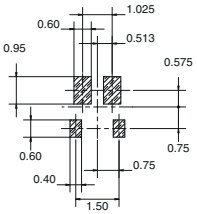
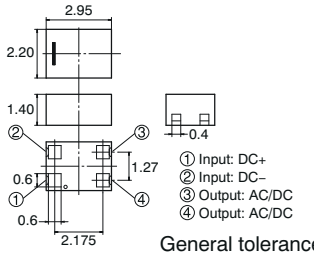
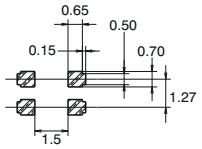
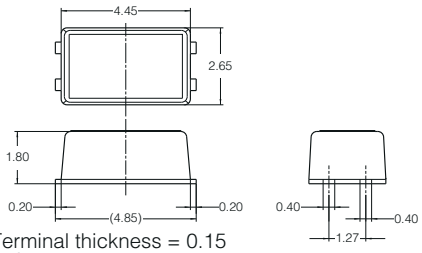
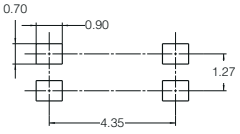
PhotoMOS Relay Dimensions

Type	Dimensions
AQY21 AQY41 Series	Through hole terminal type  Terminal thickness =0.2 General tolerance: ±0.1 Surface mount terminal type  Terminal thickness = 0.2 General tolerance: ±0.1 PC board pattern (Bottom view)  Tolerance: ±0.1 Mounting pad (Top view)  Tolerance: ,
AQV10 AQV11 AQV20 AQV21 AQV22 AQV23 AQV25 AQV41 AQV45 Series	Through hole terminal type  Terminal thickness =0.25 General tolerance: ±0.1 Surface mount terminal type  Terminal thickness =0.25 General tolerance: ±0.1 PC board pattern (Bottom view)  Tolerance:±0.1 Recommended mounting pad (Top view) 
APV1122 Series	Through hole terminal type  Terminal thickness =0.25 General tolerance: ±0.1 Surface mount terminal type  Terminal thickness =0.25 General tolerance: ±0.1 PC board pattern (Bottom view)  Tolerance:±0.1 Recommended mounting pad (Top view) 

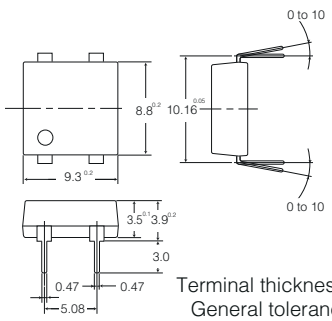
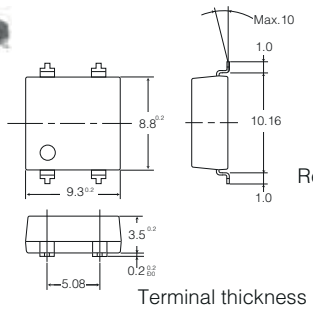
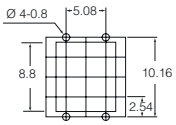
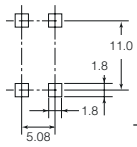
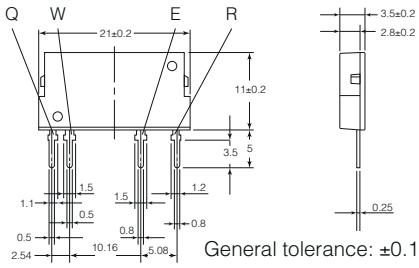
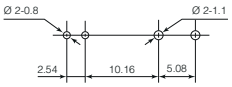
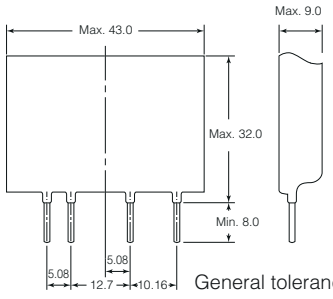
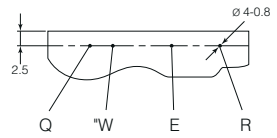
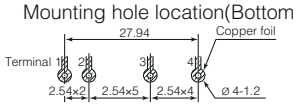
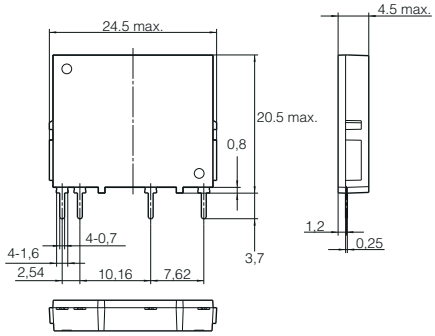
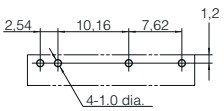
Please download CAD Data from our Web site: www.panasonic-electric-works.com

Type	Dimensions
AQW21 AQW22 AQW25 AQW41 AQW45 AQW61 AQW65 Series	Through hole terminal type  Terminal thickness = 0.25 General tolerance: ±0.1 Surface mount terminal type  Terminal thickness = 0.25 General tolerance: ±0.1 PC board pattern (Bottom view)  Tolerance:±0.1 Recommended mounting pad (Top view) 
AQW21ΩEH AQW21ΩHL AQW41ΩEH AQW61ΩEH Series	Through hole terminal type  Terminal thickness =0.2 General tolerance: ±0.1 Surface mount terminal type  Terminal thickness =0.2 General tolerance: ±0.1 PC board pattern (Bottom view)  Tolerance:±0.1 Mounting pad (Top view)  Tolerance:±0.1
AQY22 (VSSOP) Series AQW21ΩHL	  ① Input: DC+ ② Input: DC– ③ Output: AC/DC ④ Output: AC/DC General tolerance: ±0.2 Recommended mounting pad (Top view)  Tolerance : ±0.1
APV11(SOP) APV21(SOP) AQY21(SOP) AQY22(SOP) AQY23(SOP) AQY41(SOP) Series	  Terminal thickness =0.15 General tolerance: ±0.1 Recommended mounting pad (Top view)  Tolerance: ±0.1

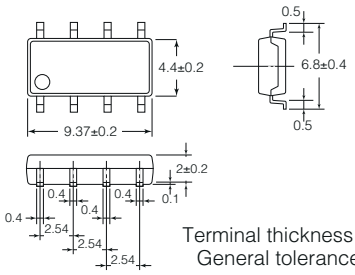
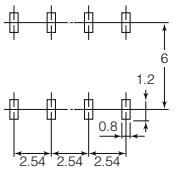
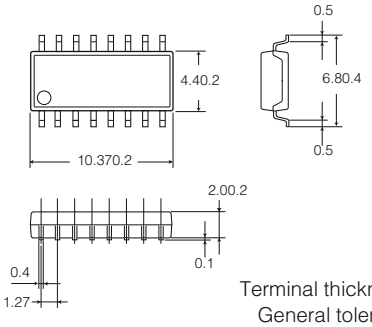
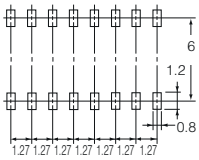
PhotoMOS Relay Dimensions

Type	Dimensions
AQV21(SOP) AQV22(SOP) AQV25(SOP) AQV41(SOP) Series	  Terminal thickness =0.15 General tolerance: ±0.1 Recommended mounting pad (Top view)  Tolerance: ±0.1
AQY2 (TSON) Series	 External dimensions  1 Input: DC+ 2 Input: DC– 3 Output: AC/DC 4 Output: AC/DC General tolerance: ±0.2 Recommended mounting pad (Top view)  Tolerance: ±0.1
AQY22 (SON) Series	  General tolerance: ±0.2 Recommended mounting pad (Top view)  Tolerance : ±0.1
APV21 (SSOP) AQY22 (SSOP) Series	  Terminal thickness = 0.15 General tolerance: ±0.5 Recommended mounting pad (Top view)  Tolerance: ±0.1

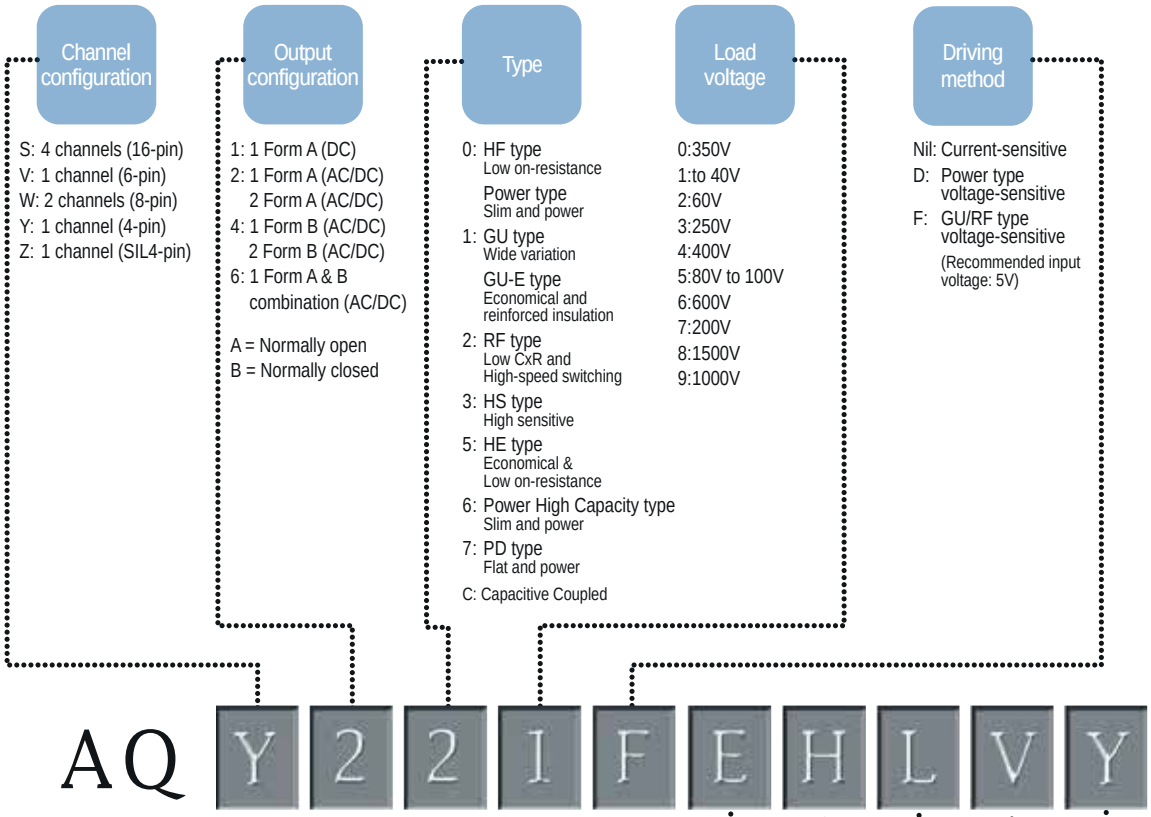
Please download CAD Data from our Web site: www.panasonic-electric-works.com

Type	Dimensions
AQY27 Series	Through hole terminal type   Terminal thickness =0.25 General tolerance: ±0.1 Surface mount terminal type   Terminal thickness =0.25 General tolerance: ±0.1 PC board pattern (Bottom view)  Tolerance: ±0.1 Recommended mounting pad (Top view)  Tolerance: ±0.1
AQZ10 AQZ20 AQZ40 Series	  General tolerance: ±0.1 PC board pattern (Bottom view)  Tolerance: ±0.1 AC/DC type Q Input: DC - W Input: DC+ E Output: DC or AC R Output: DC or AC DC type Q Input: DC - W Input: DC+ E Output: DC - R Output: DC+
AQZ26 Series	  General tolerance 0.5  Q Input: DC - "W Input: DC + E Output : AC or DC R Output : AC or DC Mounting hole location(Bottom view)  Pitch tolerance: 0.1
AQZ19 Series	  General tolerance: ±0,2 PC board pattern (Bottom view)  Tolerance: ±0,1 Schematic 

PhotoMOS Relay Dimensions

Type	Dimensions
AQW21(SOP) AQW22(SOP) AQW41(SOP) AQW61(SOP) Series	  Terminal thickness =0.15 General tolerance: ±0.1 Recommended mounting pad (Top view)  Tolerance: ±0.1
AQS22(SOP) Series	  Terminal thickness = 0.15 General tolerance: ±0.1 Recommended mounting pad (Top view)  Tolerance:±0.1

Product Key

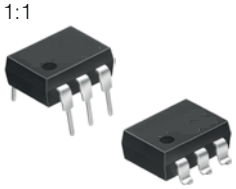


Note: Valid only for combinations of products listed in the catalog.
(Please inquire regarding combinations with products not listed in the catalog.)

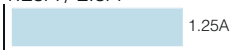
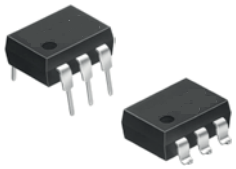
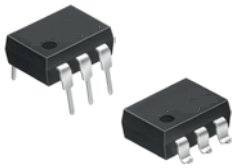
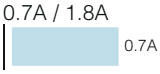
Product key may be followed by letter "J" or "T" for country of origin.

Type	Photo with dimensions (Picture scale: DIN A4)	Features	Output	
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)
AQY211G2S	1:1  4.3 x 4.4 x 2.1mm	High capacity type	40V	» 1.6A / 4.0A 1.6A
AQY212G2S		High capacity type	60V	» 1.25A / 3.0A 1.25A
AQY212GS		High capacity type	60V	» 1.0A / 3.0A 1A
AQY212S			60V	» 0.5A / 1.0A 0.5A
AQY210LS		Current limiting	350V	» 0.12A / - 0.18A (Output limit current [typ.]) 0.12A
AQY210S		PSpice	350V	» 0.12A / 0.3A 0.12A
AQY210KS		Short circuit protected	350V	» 0.12A / - 0.2A (Cut off current [typ.]) 0.12A
AQY214S		PSpice	400V	» 0.1A / 0.24A 0.1A
AQY232S	1:1  4.3 x 4.4 x 2.1mm	Sensitive type	60V	» 0.5A / 1.5A 0.5A
AQY230S		Sensitive type	350V	» 0.12A / 0.3A 0.12A
AQY234S		Sensitive type	400V	» 0.1A / 0.24A 0.1A

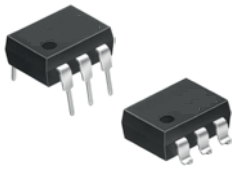
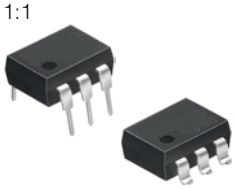
Output		**Input**		**Switching speed** (I LED = 5mA)		**I/O isolation voltage**	**Approvals**
ON resistance (typical/max.)	Output capacitance (typical)	LED operate current (max.)	LED turn-off current (min.)	Turn-on time (max.)	Turn-off time (max.)		
0.1/0.15Ω	180pF	3.0mA	0.2mA	3.0ms	0.5ms	1,500V AC	C-UL, UL, VDE
0.2/0.5Ω	180pF	3.0mA	0.3mA	5.0ms	0.5ms	1,500V AC	C-UL, UL, VDE
0.34/0.7Ω	220pF	3.0mA	0.3mA	5.0ms	0.5ms	1,500V AC	C-UL, UL, VDE
0.83/2.5Ω	80pF	3.0mA	0.4mA	2.0ms	0.2ms	1,500V AC	BSI, C-UL, UL
20/25Ω	45pF	3.0mA	0.4mA	2.0ms	1.0ms	1,500V AC	BSI, C-UL, UL
17/25Ω	45pF	3.0mA	0.4mA	0.5ms	0.2ms	1,500V AC	BSI, C-UL, UL
23.5/35Ω	42pF	3.0mA	0.3mA	2.0ms	1.0ms	1,500V AC	BSI, C-UL, UL
25/35Ω	45pF	3.0mA	0.4mA	0.5ms	0.2ms	1,500V AC	BSI, C-UL, UL
0.85/2.5Ω	0.8pF	0.5mA	0.1mA	5.0ms	2.0ms	1,500V AC	C-UL, UL, VDE
19/25Ω	0.8pF	0.5mA	0.1mA	5.0ms	2.0ms	1,500V AC	C-UL, UL, VDE
27/35Ω	0.8pF	0.5mA	0.1mA	5.0ms	2.0ms	1,500V AC	C-UL, UL, VDE

Type	Photo with dimensions (Picture scale: DIN A4)	Features	Output	
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)
AQY211EH	1:1  DIP : 4.78 x 6.4 x 3.2mm SMD: 4.78 x 6.4 x 2.9mm		30V	» 1.0A / 3.0A
AQY212EH			60V	» 0.55A / 1.5A
AQY212GH		High capacity type	60V	» 1.1A / 3.0A
AQY214EH			400V	» 0.12A / 0.3A
AQY210EH			350V	» 0.13A / 0.4A
AQY210HL		Current limiting	350V	» 0.12A / - 0.18A (Output limit current [typ.])
AQY216EH			600V	» 0.05A / 0.15A
AQV212S	1:1  6.3 x 4.4 x 2.1mm	PSpice	60V	» 0.5A / 1.0A
AQV215S		PSpice	100V	» 0.3A / 0.9A
AQV217S		PSpice	200V	» 0.16A / 0.48A
AQV210S		PSpice	350V	» 0.12A / 0.3A
AQV214S		PSpice	400V	» 0.1A / 0.3A
AQV216S		PSpice	600V	» 0.04A / 0.12A
AQV212	1:1  DIP: 8.8 x 6.4 x 3.9mm SMD: 8.8 x 6.4 x 3.6mm	PSpice	60V	» 0.55A / 1.2A
AQV252G		High capacity type	60V	» 2.5A / 6.0A
AQV251G		High capacity type	30V	» 3.5A / 6.0A

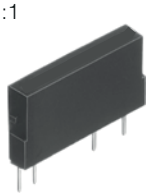
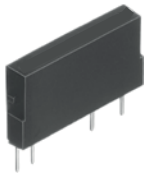
Output		**Input**		**Switching speed** (I LED = 5mA)		**I/O isolation voltage**	**Approvals**
ON resistance (typical/max.)	Output capacitance (typical)	LED operate current (max.)	LED turn-off current (min.)	Turn-on time (max.)	Turn-off time (max.)		
0.25/0.5Ω	240pF	3.0mA	0.4mA	5.0ms	1.0ms	5,000V AC	BSI, C-UL, UL
0.85/2.5Ω	80pF	3.0mA	0.4mA	4.0ms	1.0ms	5,000V AC	BSI, C-UL, UL
0.34/0.7Ω	220pF	3.0mA	0.3mA	5.0ms	0.5ms	5,000V AC	C-UL, UL, VDE
26/35Ω	45pF	3.0mA	0.4mA	2.0ms	1.0ms	5,000V AC	BSI, C-UL, UL
18/25Ω	45pF	3.0mA	0.4mA	2.0ms	1.0ms	5,000V AC	BSI, C-UL, UL
20/25Ω	45pF	3.0mA	0.4mA	2.0ms	1.0ms	5,000V AC	BSI, C-UL, UL
52/120Ω	35pF	3.0mA	0.4mA	2.0ms	1.0ms	5,000V AC	BSI, C-UL, UL
0.83/2.5Ω	150pF	3.0mA	0.4mA	2.0ms	0.2ms	1,500V AC	C-UL, UL
2.3/4.0Ω	110pF	3.0mA	0.4mA	2.0ms	0.2ms	1,500V AC	C-UL, UL
11/15Ω	70pF	3.0mA	0.4mA	1.0ms	0.2ms	1,500V AC	C-UL, UL
23/35Ω	45pF	3.0mA	0.4mA	0.5ms	0.2ms	1,500V AC	C-UL, UL
30/50Ω	45pF	3.0mA	0.4mA	0.5ms	0.2ms	1,500V AC	C-UL, UL
70/120Ω	45pF	3.0mA	0.4mA	0.5ms	0.2ms	1,500V AC	C-UL, UL
0.83/2.5Ω	150pF	3.0mA	0.4mA	2.0ms	0.2ms	1,500V AC	C-UL, UL
0.08/0.12Ω	240pF	3.0mA	0.2mA	5.0ms	0.5ms	1,500V AC	C-UL, UL, VDE
0.035/0.08Ω	350pF	3.0mA	0.2mA	5.0ms	0.5ms	1,500V AC	C-UL, UL, VDE

Type	Photo with dimensions (Picture scale: DIN A4)	Features	Output	
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)
AQV252G2S	1:1  6.3 x 4.4 x 2.0mm	High capacity type	50V	» 3.0A / 6.0A 
AQV252G3S		High capacity type	60V	» 3.3A / 10A 
AQV255GS		High capacity type	80V	» 1.25A / 2.5A 
AQV255G3S		High capacity type	100V	» 2.2A / 6.6A
AQV215	1:1  DIP: 8.8 x 6.4 x 3.9mm SMD: 8.8 x 6.4 x 3.6mm	PSpice	100V	» 0.32A / 0.96A
AQV217		PSpice	200V	» 0.18A / 0.54A
AQV210		PSpice	350V	» 0.13A / 0.4A
AQV210E	1:1  DIP: 8.8 x 6.4 x 3.9mm SMD: 8.8 x 6.4 x 3.6mm		350V	» 0.13A / 0.4A
AQV210EH			350V	» 0.13A / 0.4A
AQV214		PSpice	400V	» 0.12A / 0.3A
AQV214E			400V	» 0.12A / 0.3A
AQV214EH			400V	» 0.12A / 0.3A
AQV214H			400V	» 0.12A / 0.3A 
AQV216		PSpice	600V	» 0.05A / 0.15A 
AQV101			40V DC	» 0.7A / 1.8A 
AQV201			40V	» 0.5A / 1.8A 
AQV251			40V	» 0.5A / 1.8A 

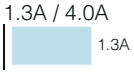
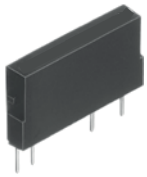
Output		**Input**		**Switching speed** (I LED = 5mA)		**I/O isolation voltage**	**Approvals**
ON resistance (typical/max.)	Output capacitance (typical)	LED operate current (max.)	LED turn-off current (min.)	Turn-on time (max.)	Turn-off time (max.)		
0.04/0.07Ω	360pF	3.0mA	0.2mA	5.0ms	0.5ms	1,500V AC	C-UL, UL, VDE
0.033/0.06Ω	500pF	3.0mA	0.2mA	5.0ms	0.5ms	1,500V AC	C-UL, UL, VDE
0.09/0.15Ω	300pF	3.0mA	0.2mA	5.0ms	0.5ms	1,500V AC	C-UL, UL, VDE
0.06/0.12Ω	300pF	3.0mA	0.2mA	5.0ms	0.5ms	1,500V AC	C-UL, UL, VDE
2.3/4.0Ω	110pF	3.0mA	0.4mA	2.0ms	0.2ms	1,500V AC	C-UL, UL
11/15Ω	70pF	3.0mA	0.4mA	1.0ms	0.2ms	1,500V AC	C-UL, UL
23/35Ω	45pF	3.0mA	0.4mA	0.5ms	0.2ms	1,500V AC	C-UL, UL
23/35Ω	45pF	3.0mA	1.0mA	2.0ms	1.0ms	1,500V AC	C-UL, UL
23/35Ω	45pF	3.0mA	0.4mA	2.0ms	1.0ms	5,000V AC	BSI, C-UL, UL
30/50Ω	45pF	3.0mA	0.4mA	0.5ms	0.2ms	1,500V AC	C-UL, UL
30/50Ω	45pF	3.0mA	0.3mA	2.0ms	1.0ms	1,500V AC	BSI, C-UL, UL
30/50Ω	45pF	3.0mA	0.4mA	2.0ms	1.0ms	5,000V AC	BSI, C-UL, UL
30/50Ω	45pF	3.0mA	0.4mA	0.8ms	0.2ms	5,000V AC	BSI. C-UL, UL
70/120Ω	45pF	3.0mA	0.4mA	0.5ms	0.2ms	1,500V AC	C-UL, UL
0.3/0.5Ω	600pF	5.0mA	0.8mA	1.0ms	1.0ms	1,500V AC	C-UL, UL
0.6/1Ω	350pF	5.0mA	0.8mA	1.0ms	1.0ms	1,500V AC	C-UL, UL
0.6/1.0Ω	350pF	3.0mA	0.4mA	3.0ms	0.2ms	1,500V AC	C-UL, UL

Type	Photo with dimensions (Picture scale: DIN A4)	Features	Output	
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)
AQV102			60V DC	» 0.6A / 1.5A
AQV202			60V	» 0.4A / 1.5A 
AQV252			60V	» 0.4A / 1.5A
AQV112KL		Short circuit protected	60V DC	» 0.5A / -
AQV255	1:1  DIP: 8.8 x 6.4 x 3.9mm SMD: 8.8 x 6.4 x 3.6mm		100V	» 0.35A / 1.0A
AQV257			200V	» 0.25A / 0.75A 
AQV103			250V DC	» 0.3A / 0.6A 
AQV203			250V	» 0.2A / 0.6A 
AQV253			250V	» 0.2A / 0.6A 
AQV253H			250V	» 0.2A / 0.6A 
AQV104			400V DC	» 0.18A / 0.5A 
AQV204			400V	» 0.15A / 0.5A 
AQV234	1:1  DIP: 8.8 x 6.4 x 3.9mm SMD: 8.8 x 6.4 x 3.6mm	Sensitive type	400V	» 0.12A / 0.3A 
AQV254			400V	» 0.15A / 0.5A 
AQV254H			400V	» 0.15A / 0.5A 
AQV256H			600V	» 0.13A / 0.4A 
AQV259			1,000V	» 0.03A / 0.09A 
AQV258			1,500V	» 0.02A / 0.06A 

Output		**Input**		**Switching speed** (I LED = 5mA)		**I/O isolation voltage**	**Approvals**
ON resistance (typical/max.)	Output capacitance (typical)	LED operate current (max.)	LED turn-off current (min.)	Turn-on time (max.)	Turn-off time (max.)		
0.37/0.7Ω	600pF	5.0mA	0.8mA	1.0ms	1.0ms	1,500V AC	C-UL, TÜV, UL
0.74/1.4Ω	350pF	5.0mA	0.8mA	1.0ms	1.0ms	1,500V AC	C-UL, TÜV, UL
0.74/1.4Ω	350pF	3.0mA	0.4mA	1.4ms	0.2ms	1,500V AC	C-UL, UL
0.55/2Ω	300pF	10mA	0.3mA	2.0ms	1.0ms	1,500V AC	C-UL, UL, VDE
1.8/2.5Ω	350pF	3.0mA	0.4mA	2.0ms	0.2ms	1,500V AC	C-UL, UL
2.6/4.0Ω	170pF	3.0mA	0.4mA	3.0ms	0.2ms	1,500V AC	C-UL, UL
2.7/4Ω	300pF	5.0mA	0.8mA	1.0ms	1.0ms	1,500V AC	C-UL, UL
5.5/8Ω	170pF	5.0mA	0.8mA	1.0ms	1.0ms	1,500V AC	C-UL, UL
5.5/8.0Ω	170pF	3.0mA	0.4mA	2.0ms	0.2ms	1,500V AC	C-UL, UL
5.5/8Ω	170pF	3.0mA	0.4mA	4.0ms	0.2ms	5,000V AC	BSI, C-UL, UL
6.3/8Ω	300pF	5.0mA	0.8mA	1.0ms	1.0ms	1,500V AC	C-UL, TÜV, UL
12.4/16Ω	170pF	5.0mA	0.8mA	1.0ms	1.0ms	1,500V AC	C-UL, TÜV, UL
30/50Ω	45pF	0.31mA	0.1mA	2.0ms	1.0ms	1,500V AC	CSA, C-UL, TÜV, UL
12.4/16Ω	170pF	3.0mA	0.4mA	2.0ms	0.2ms	1,500V AC	C-UL, UL
12.4/16Ω	170pF	3.0mA	0.4mA	3.0ms	0.2ms	5,000V AC	BSI, C-UL, UL
20/30Ω	70pF	3.0mA	0.4mA	3.0ms	0.2ms	5,000V AC	C-UL, UL, VDE
80/200Ω	80pF	3.0mA	0.4mA	1.0ms	0.2ms	1,500V AC	C-UL, UL
345/500Ω	80pF	3.0mA	0.4mA	1.0ms	0.2ms	1,500V AC	C-UL, UL, VDE

Type	Photo with dimensions (Picture scale: DIN A4)	Features	Output	
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)
AQZ102	1:1  21 x 3.5 x 12.5mm		60V DC	» 4.0A / 9.0A
AQZ105			100V DC	» 2.6A / 6.0A
AQZ107			200V DC	» 1.3A / 3.0A
AQZ104			400V DC	» 0.7A / 1.5A
AQZ192	1:1  24.5 x 4.5 x 20.5mm	DC high capacity	60V	» 10.0A / 30.0A
AQZ197		DC high capacity	200V	» 5.0A / 15.0A
AQZ202	1:1  21 x 3.5 x 12.5mm		60V	» 3.0A / 9.0A
AQZ202G		High Capacity	60V	» 6.0A / 12.0A
AQZ205			100V	» 2.0A / 6.0A
AQZ207			200V	» 1.0A / 3.0A
AQZ207G		High Capacity	200V	» 2.0A / 6.0A
AQZ204			400V	» 0.5A / 1.5A
AQZ264	1:1  43 x 9 x 32mm		400V	» 1.0A / 3.0A

Output		Input		Switching speed		I/O isolation voltage	Approvals
ON resistance (typical/max.)	Output capacitance (typical)	LED operate current (max.)	LED turn-off current (min.)	Turn-on time (max.)	Turn-off time (max.)		
0.05/0.09Ω	1700pF	3.0mA	0.4mA	5.0ms	3.0ms	2,500V AC	C-UL, UL, VDE
0.081/0.17Ω	1700pF	3.0mA	0.4mA	5.0ms	3.0ms	2,500V AC	C-UL, UL, VDE
0.34/0.55Ω	900pF	3.0mA	0.4mA	5.0ms	3.0ms	2,500V AC	C-UL, UL, VDE
1.06/1.6Ω	900pF	3.0mA	0.4mA	5.0ms	3.0ms	2,500V AC	C-UL, UL, VDE
0.008/0.015Ω	1800pF	3.0mA	0.2mA	3.0ms	1.0ms	3,000V AC	C-UL, UL, VDE
0.031/0.05Ω	2600pF	3.0mA	0.2mA	3.0ms	1.0ms	3,000V AC	C-UL, UL, VDE
0.11/0.18Ω	1400pF	3.0mA	0.4mA	5.0ms	3.0ms	2,500V AC	C-UL, UL, VDE
0.03/0.35Ω	1500pF	3.0mA	0.9mA	10ms	3.0ms	2,500Vrms	C-UL, UL, VDE
0.23/0.34Ω	1400pF	3.0mA	0.4mA	5.0ms	3.0ms	2,500V AC	C-UL, UL, VDE
0.7/1.1Ω	600pF	3.0mA	0.4mA	5.0ms	3.0ms	2,500V AC	C-UL, UL, VDE
0.03/0.35Ω	700pF	3.0mA	0.2mA	10ms	3.0ms	2,500Vrms	C-UL, UL, VDE
2.1/3.2Ω	600pF	3.0mA	0.4mA	5.0ms	3.0ms	2,500V AC	C-UL, UL, VDE
1.0/1.4Ω	600pF	3.0mA	0.4mA	10.0ms	3.0ms	1,500V AC	C-UL, UL, VDE

Type	Photo with dimensions (Picture scale: DIN A4)	Features	Output	
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)
PhotoMOS 1 Form A Power Relays				
AQY272	1:1  DIP : 9.3 x 8.8 x 3.9mm SMD: 9.3 x 8.8 x 3.7mm		60V	» 2.0A / 6.0A 
AQY275			100V	» 1.3A / 4.0A 
AQY277			200V	» 0.65A / 2.0A
AQY274			400V	» 0.35A / 1.0A
PhotoMOS 1 Form A Voltage Sensitive Power Relays				
AQZ102D	1:1  21 x 3.5 x 12.5mm	Input voltage sensitive	60V DC	» 3.6A / 9.0A 
AQZ105D		Input voltage sensitive	100V DC	» 2.3A / 6.0A 
AQZ107D		Input voltage sensitive	200V DC	» 1.1A / 3.0A
AQZ104D		Input voltage sensitive	400V DC	» 0.6A / 1.5A
AQZ202D		Input voltage sensitive	60V	» 2.7A / 9.0A
AQZ205D		Input voltage sensitive	100V	» 1.8A / 6.0A
AQZ207D		Input voltage sensitive	200V	» 0.9A / 3.0A 
AQZ204D		Input voltage sensitive	400V	» 0.45A / 1.5A 
AQY2C1R6P	1:1  1.8 x 1.95 x 2.9mm	Low CxR Capacitive Coupled	30V	» 0.75A 
AQY2C1R2P		Low CxR Capacitive Coupled	40V	» 0.3A 

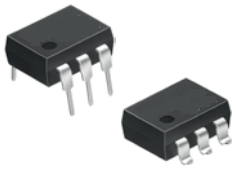
Output		Input		Switching speed		I/O isolation voltage	Approvals
ON resistance (typical/max.)	Output capacitance (typical)	LED operate current (max.)	LED turn-off current (min.)	Turn-on time (max.)	Turn-off time (max.)		
0.11/0.18Ω	1400pF	3.0mA	0.4mA	5.0ms	3.0ms	2,500V AC	C-UL, UL, VDE
0.23/0.34Ω	1400pF	3.0mA	0.4mA	5.0ms	3.0ms	2,500V AC	C-UL, UL, VDE
0.7/1.1Ω	600pF	3.0mA	0.4mA	5.0ms	3.0ms	2,500V AC	C-UL, UL, VDE
2.1/3.2Ω	600pF	3.0mA	0.4mA	5.0ms	3.0ms	2,500V AC	C-UL, UL, VDE
0.033/0.09Ω	1700pF	4V	0.8V	10.0ms	3.0ms	2,500V AC	C-UL, UL, VDE
0.090/0.17Ω	1700pF	4V	0.8V	10.0ms	3.0ms	2,500V AC	C-UL, UL, VDE
0.33/0.55Ω	900pF	4V	0.8V	10.0ms	3.0ms	2,500V AC	C-UL, UL, VDE
1.23/1.6Ω	900pF	4V	0.8V	10.0ms	3.0ms	2,500V AC	C-UL, UL, VDE
0.066/0.18Ω	1400pF	4V	0.8V	10.0ms	3.0ms	2,500V AC	C-UL, UL, VDE
0.18/0.34Ω	1400pF	4V	0.8V	10.0ms	3.0ms	2,500V AC	C-UL, UL, VDE
0.64/1.1Ω	600pF	4V	0.8V	10.0ms	3.0ms	2,500V AC	C-UL, UL, VDE
2.4/3.2Ω	600pF	4V	0.8V	10.0ms	3.0ms	2,500V AC	C-UL, UL, VDE
0.2/0.4Ω	40pF	0.2mA	0.1mA	0.5ms	0.5ms	200V AC	—
0.8/1.5Ω	14.5pF	0.2mA	0.1mA	0.5ms	0.5ms	200V AC	—

Type	Photo with dimensions (Picture scale: DIN A4)	Features	Output	
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)
AQY221R6T	1:1  1.8 x 2.1 x 2.9mm	Low CxR	30V	» 0.8A 0.8A
AQY221R2T		Low CxR	40V	» 0.25A 0.25A
AQY221N2T		Low CxR	40V	» 0.12A 0.12A
AQY221N3T		Low CxR	25V	» 0.15A 0.15A
AQY221N5T		Low CxR	20V	» 0.18A 0.18A
AQY222R2T		Low CxR	60V	» 0.4A / 1.2A 0.4A
AQY225R3T		Low CxR	100V	» 0.12A / -0.3A 0.12A
AQY221N3M	1:1  2.2 x 2.95 x 1.4mm	Low CxR	25V	» 0.15 A / 0.15A
AQY221R2M		Low CxR	40V	» 0.25A / 0.75A 0.25A
AQY221N2M		Low CxR	40V	» 0.12A / - 0.12A

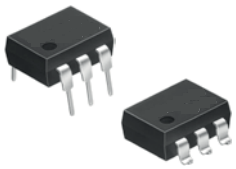
Output		Input		Switching speed		I/O isolation voltage	Approvals
ON resistance (typical/max.)	Output capacitance (typical)	LED operate current (max.)	LED turn-off current (min.)	Turn-on time (max.)	Turn-off time (max.)		
0.18/1.35Ω	37.5pF	3.0mA	0.1mA	0.5ms	0.2ms	200V AC	
0.8/1.25Ω	14pF	3.0mA	0.1mA	0.5ms	0.2ms	200V AC	—
9.5/12.5Ω	1.1pF	3.0mA	0.2mA	0.2ms	0.2ms	200V AC	—
5.5/7.5Ω	1.1pF	3.0mA	0.2mA	0.2ms	0.2ms	200V AC	—
2.8/4.5Ω	1.5pF	3.0mA	0.6mA	0.2ms	0.2ms	200V AC	—
0.8/1.25Ω	27pF	3.0mA	0.1mA	0.5ms	0.2ms	200V AC	—
8.8/14Ω	5.8pF	3.0mA	0.1mA	0.5ms	0.2ms	200V AC	—
5.5/7.5Ω	1.1pF	3.0mA	0.2mA	0.2ms	0.2ms	200V AC	—
0.8/1.25Ω	14pF	3.0mA	0.2mA	0.5ms	0.2ms	200V AC	—
9.5/12.5Ω	1.1pF	3.0mA	0.2mA	0.2ms	0.2ms	200V AC	—

Type	Photo with dimensions (Picture scale: DIN A4)	Features	Output	
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)
AQY221N3V	1:1  2.65 x 4.45 x 1.8mm	Low CxR	25V	» 0.15A / 0.4A 0.15A
AQY221N5V		Low CxR	20V	» 1.0A / 1.5A 1A
AQY221R6V		Low CxR	30V	» 1.0A / 1.5A 1A
AQY221R4V		Low CxR	40V	» 0.5A / 1.0A 0.5A
AQY221N2V		Low CxR PSpice	40V	» 0.12A / 0.3A 0.12A
AQY221R2V		Low CxR PSpice	40V	» 0.25A / 0.75A 0.25A
AQY222R2V		Low CxR	60V	» 0.4A / 1.2A 0.4A
AQY225R2V		Low CxR	80V	» 0.12A / 0.3A 0.12A
AQY221N2S	1:1  4.3 x 4.4 x 2.1mm	Low CxR	40V	» 0.12A / 0.3A 0.12A
AQY221R2S		Low CxR	40V	» 0.25A / 0.75A 0.25A
AQY222R1S		Low CxR	60V	» 0.5A / 1.0A 0.5A
AQY225R1S		Low CxR	80V	» 0.35A / 0.7A 0.35A
AQY225R2S		Low CxR	80V	» 0.15A / 0.45A 0.15A
AQY225R3V		Low CxR	100V	» 0.12A / 0.3A 0.12A
AQY225R3T		Low CxR	100V	» 0.12A / 0.3A 0.12A
AQV227NS	1:1  6.3 x 4.4 x 2.1mm	Low CxR	200V	» 0.05A / 0.15A 0.05A
AQV224NS		Low CxR	400V	» 0.04A / 0.12A 0.04A

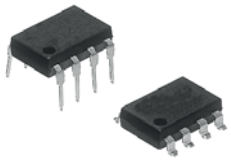
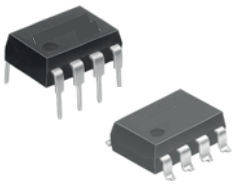
Output		Input		Switching speed		I/O isolation voltage	Approvals
ON resistance (typical/max.)	Output capacitance (typical)	LED operate current (max.)	LED turn-off current (min.)	Turn-on time (max.)	Turn-off time (max.)		
5.5/7.5Ω	1.0pF	3.0mA	0.2mA	0.2ms	0.2ms	1,500V AC	—
2.8/4.5Ω	1.5pF	3.0mA	0.7mA	0.2ms	0.2ms	500V AC	
0.18/0.35Ω	37.5pF	3.0mA	0.1mA	0.75ms	0.2ms	1,500V AC	—
0.55/1.0Ω	24pF	3.0mA	0.1mA	0.75ms	0.2ms	1,500V AC	—
9.5/12.5Ω	1.0pF	3.0mA	0.2mA	0.5ms	0.2ms	1,500V AC	—
0.75/1.25Ω	12.5pF	3.0mA	0.1mA	0.5ms	0.2ms	1,500V AC	—
0.8/1.25Ω	27pF	3.0mA	0.1mA	0.5ms	0.2ms	1,500V AC	—
10.5/15Ω	4.5pF	3.0mA	0.1mA	0.5ms	0.2ms	1,500V AC	—
9.5/12.5Ω	1.0pF	3.0mA	0.2mA	0.5ms	0.2ms	1,500V AC	—
0.8/1.25Ω	13pF	3.0mA	0.1mA	0.5ms	0.2ms	500V AC	—
0.8/1.2Ω	27.5pF	3.0mA	0.1mA	0.5ms	0.2ms	1,500V AC	—
0.8/1.2Ω	37.5pF	3.0mA	0.1mA	0.75ms	0.2ms	1,500V AC	C-UL, UL
10.5/15Ω	4.5pF	3.0mA	0.1mA	0.5ms	0.2ms	1,500V AC	—
8.8/14Ω	5.8pF	3.0mA	0.1mA	0.5ms	0.05ms	1,500V AC	
8.8/14Ω	5.8pF	3.0mA	0.1mA	0.5ms	0.2ms	200V AC	
30/50Ω	10pF	3.0mA	0.4mA	0.5ms	0.2ms	1,500V AC	C-UL, UL
70/100Ω	10pF	3.0mA	0.4mA	0.5ms	0.2ms	1,500V AC	C-UL, UL

Type	Photo with dimensions (Picture scale: DIN A4)	Features	Output	
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)
PhotoMOS 1 Form A Low CxR				
AQV227N	1:1  DIP : 8.8 x 6.4 x 3.9mm SMD: 8.8 x 6.4 x 3.6mm		200V	» 0.07A / 0.21A 0.07A
AQV224N			400V	» 0.05A / 0.15A 0.05A
1 Form B Signal Relays				
AQY412S	1:1  4.3 x 4.4 x 2.1mm		60V	» 0.5A / 1.5A  0.5A
AQY410S			350V	» 0.12A / 0.3A 0.12A
AQY414S			400V	» 0.1A / 0.24A 0.1A
AQY412EH	1:1  DIP : 4.78 x 6.4 x 3.2mm SMD: 4.78 x 6.4 x 2.9mm		60V	» 0.55A / 1.5A  0.55A
AQY410EH			350V	» 0.13A / 0.4A 0.13A
AQY414EH			400V	» 0.12A / 0.3A 0.12A
AQV414S	1:1  6.3 x 4.4 x 2.1mm		400V	» 0.1A / 0.3A 0.1A

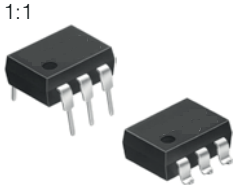
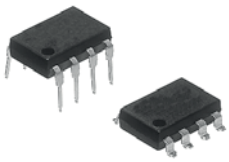
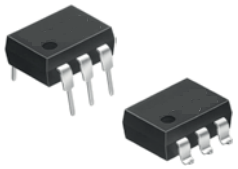
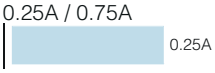
Output		Input		Switching speed		I/O isolation voltage	Approvals
ON resistance (typical/max.)	Output capacitance (typical)	LED operate current (max.)	LED turn-off current (min.)	Turn-on time (max.)	Turn-off time (max.)		
30/50Ω	10pF	3.0mA	0.4mA	0.5ms	0.2ms	1,500V AC	C-UL, UL
70/100Ω	10pF	3.0mA	0.4mA	0.5ms	0.2ms	1,500V AC	C-UL, UL
1/2.5Ω	450pF	3.0mA	0.4mA	3.0ms	1.0ms	1,500V AC	C-UL, UL, VDE
18/25Ω	110pF	3.0mA	0.4mA	1.0ms	1.0ms	1,500V AC	BSI, C-UL, UL
26/35Ω	100pF	3.0mA	0.4mA	1.0ms	1.0ms	1,500V AC	BSI, C-UL, UL
1/2.5Ω	480pF	3.0mA	0.4mA	10.0ms	1.0ms	5,000V AC	C-UL, UL, VDE
18/25Ω	110pF	3.0mA	0.4mA	3.0ms	1.0ms	5,000V AC	BSI, C-UL, UL
26/35Ω	100pF	3.0mA	0.4mA	3.0ms	1.0ms	5,000V AC	BSI, C-UL, UL
26/50Ω	100pF	3.0mA	0.4mA	1.0ms	1.0ms	1,500V AC	C-UL, UL

Type	Photo with dimensions (Picture scale: DIN A4)	Features	Output	
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)
AQV410EH	1:1  DIP : 8.8 x 6.4 x 3.9mm SMD: 8.8 x 6.4 x 3.6mm		350V	» 0.13A / 0.4A 0.13A
AQV412EH			60V	» 0.55A / 1.5A 0.55A
AQV414E			400V	» 0.12A / 0.3A 0.12A
AQV414EH			400V	» 0.12A / 0.3A 0.12A
AQV453			250V	» 0.2A / 0.6A 0.2A
AQV414			400V	» 0.12A / 0.3A 0.12A
AQV454			400V	» 0.15A / 0.5A 0.15A
			400V	» 0.15A / 0.5A 0.15A
1 Form B Power Relays				
AQZ404	1:1  21 x 3.5 x 12.5mm		400V	» 0.5A / 1.5A 0.5A

Output		Input		Switching speed		I/O isolation voltage	Approvals
ON resistance (typical/max.)	Output capacitance (typical)	LED operate current (max.)	LED turn-off current (min.)	Turn-on time (max.)	Turn-off time (max.)		
18/35Ω	110pF	3.0mA	0.4mA	3.0ms	1.5ms	5,000V AC	BSI, C-UL, UL
1/2.5Ω	480pF	3.0mA	0.4mA	10.0ms	1.5ms	5,000V AC	C-UL, UL, VDE
26/50Ω	100pF	3.0mA	0.3mA	2.0ms	1.0ms	1,500V AC	C-UL, UL
26/50Ω	100pF	3.0mA	0.4mA	3.0ms	1.5ms	5,000V AC	BSI, C-UL, UL
5.5/8.0Ω	350pF	3.0mA	0.4mA	3.0ms	1.0ms	1,500V AC	C-UL, UL
26/50Ω	100pF	3.0mA	0.4mA	1.0ms	1.0ms	1,500V AC	C-UL, UL
10.5/16Ω	170pF	3.0mA	0.4mA	2.0ms	1.0ms	1,500V AC	C-UL, UL
10.5/16Ω	170pF	3.0mA	0.4mA	3.0ms	1.0ms	5,000V AC	BSI, C-UL, UL
2.8/4.0Ω	2000pF	3.0mA	0.4mA	7.5ms	3.0ms	2,500V AC	C-UL, UL, VDE

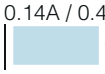
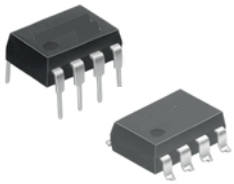
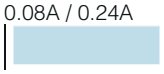
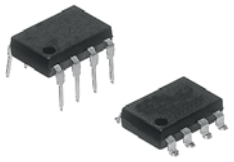
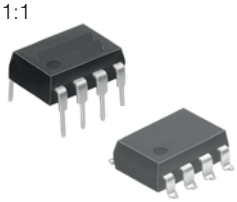
Type	Photo with dimensions (Picture scale: DIN A4)	Features	Output	
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)
AQW210S	1:1  9.37 x 4.4 x 2.1mm		350V	» 0.1A / 0.3A 0.1A
AQW212S			60V	» 0.4A / 1.5A 0.4A
AQW214S			400V	» 0.08A / 0.24A 0.08A
AQW212EH	1:1  DIP : 9.86 x 6.4 x 3.2mm SMD: 9.86 x 6.4 x 2.9mm		60V	» 0.5A / 1.5A 0.5A
AQW210EH			350V	» 0.12A / 0.36A 0.12A
AQW210HL		Current limiting	350V	» 0.1A / - 0.18A (Output limit current [typ.]) 0.1A
AQW214EH			400V	» 0.1A / 0.3A 0.1A
AQW216EH			600V	» 0.04A / 0.12A 0.04A
AQW212	1:1  DIP : 9.78 x 6.4 x 3.9mm SMD: 9.78 x 6.4 x 3.6mm		60V	» 0.6A / 1.0A » 0.6A
AQW215			100V	» 0.3A / 0.9A 0.3A
AQW217			200V	» 0.16A / 0.48A 0.16A
AQW210			350V	» 0.12A / 0.36A 0.12A
AQW214			400V	» 0.1A / 0.3A 0.1A
AQW254			400V	» 0.12A / 0.36A 0.12A
AQW216			600V	» 0.04A / 0.12A 0.04A

Output		Input		Switching speed		I/O isolation voltage	Approvals
ON resistance (typical/max.)	Output capacitance (typical)	LED operate current (max.)	LED turn-off current (min.)	Turn-on time (max.)	Turn-off time (max.)		
16/35Ω	45pF	3.0mA	0.4mA	0.5ms	0.2ms	1,500V AC	BSI, C-UL, UL
0.83/2.5Ω	-	3.0mA	0.4mA	2.0ms	0.2ms	1,500V AC	BSI, C-UL, UL
30/50Ω	45pF	3.0mA	0.4mA	0.5ms	0.2ms	1,500V AC	BSI, C-UL, UL
0.83/2.5Ω	80pF	3.0mA	0.4mA	4.0ms	1.0ms	5,000V AC	BSI, C-UL, UL
18/25Ω	45pF	3.0mA	0.4mA	2.0ms	1.0ms	5,000V AC	BSI, C-UL, UL
20/25Ω	45pF	3.0mA	0.4mA	2.0ms	1.0ms	5,000V AC	BSI, C-UL, UL
26/35Ω	45pF	3.0mA	0.4mA	2.0ms	1.0ms	5,000V AC	BSI, C-UL, UL
52/120Ω	45pF	3.0mA	0.4mA	2.0ms	1.0ms	5,000V AC	BSI, C-UL, UL
0.83/2.5Ω	150pF	3.0mA	0.4mA	2.0ms	0.2ms	1,500V AC	C-UL, UL
2.3/4.0Ω	110pF	3.0mA	0.4mA	2.0ms	0.2ms	1,500V AC	C-UL, UL
11/15Ω	70pF	3.0mA	0.4mA	2.0ms	0.2ms	1,500V AC	C-UL, UL
23/35Ω	45pF	3.0mA	0.4mA	0.5ms	0.05ms	1,500V AC	C-UL, UL
30/50Ω	45pF	3.0mA	0.4mA	0.5ms	0.05ms	1,500V AC	C-UL, UL
12.4/16Ω	170pF	3.0mA	0.4mA	2.0ms	0.2ms	1,500V AC	C-UL, UL
70/120Ω	45pF	3.0mA	0.4mA	0.5ms	0.2ms	1,500V AC	C-UL, UL

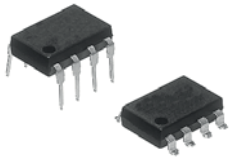
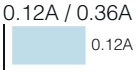
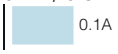
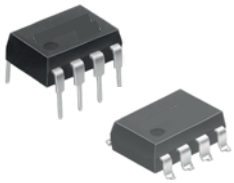
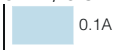
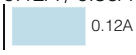
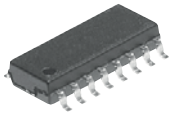
Type	Photo with dimensions (Picture scale: DIN A4)	Application	Output	
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)
AQV258HAXC**	1:1  DIP: 8.8 x 6.4 x 3.9mm SMD: 8.8 x 6.4 x 3.6mm	Isolation monitoring	1500V	» 0.02A / 0.06A 
AQV219HAXC**		Isolation monitoring	900V	» 0.015A / 0.045A 
AQW212HAXC**	1:1  DIP : 9.86 x 6.4 x 3.2mm SMD: 9.86 x 6.4 x 2.9mm	Cell Balancing	60V	» 0.6A / 1.5A 
AQW216HAXC**		Battery monitoring	600V	» 0.05A / 0.12A
AQV216HAXC**	1:1  DIP: 8.8 x 6.4 x 3.9mm SMD: 8.8 x 6.4 x 3.6mm	Battery monitoring	600V	» 0.04A / 0.12A 
AQY215HAXC**	1:1  DIP : 4.78 x 6.4 x 3.2mm SMD: 4.78 x 6.4 x 2.9mm	Wake up switch	100V	» 0.25A / 0.75A 

**Project based number

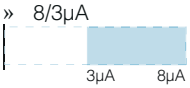
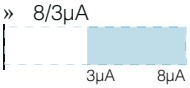
Output		Input		Switching speed		I/O isolation voltage	Approvals
ON resistance (typical/max.)	Output capacitance (typical)	LED operate current (max.)	LED turn-off current (min.)	Turn-on time (max.)	Turn-off time (max.)		
305/500Ω	on request	3.0mA	0.4mA	1ms	0.5ms	5,000V AC	–
310/500Ω	on request	3.0mA	0.8mA	0.5ms	0.2ms	3,000V AC	–
0,85/2,50Ω	on request	3.0mA	0.8mA	2ms	0.5ms	1,500V AC	–
70/150Ω	on request	3.0mA	0.8mA	0.5ms	0.4ms	5,000V AC	–
70/120Ω	on request	3.0mA	0.8mA	0.5ms	0.2ms	2,500V AC	–
2,3/4Ω	on request	3.0mA	0.4mA	2ms	0.7ms	2,500V AC	–

Type	Photo with dimensions (Picture scale: DIN A4)	Features	Output	
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)
2 Form A Low CxR				
AQW227NS	1:1  9.37 x 4.4 x 2.1mm		200V	» 0.04A / 0.15A 0.04A
AQW223R2S		Low CxR	250V	» 0.14A / 0.42A  0.14A
AQW227N	1:1  DIP : 9.78 x 6.4 x 3.9mm SMD: 9.78 x 6.4 x 3.6mm		200V	» 0.05A / 0.15A  0.05A
AQW224N			400V	» 0.04A / 0.12A  0.04A
2 Form B				
AQW414S	1:1  9.37 x 4.4 x 2.1mm		400V	» 0.08A / 0.24A  0.24A
AQW414EH	1:1  DIP : 9.86 x 6.4 x 3.2mm SMD: 9.86 x 6.4 x 2.9mm		400V	» 0.1A / 0.3A  0.1A
AQW414	1:1  DIP : 9.78 x 6.4 x 3.9mm SMD: 9.78 x 6.4 x 3.6mm		400V	» 0.1A / 0.3A  0.1A
AQW454			400V	» 0.12A / 0.36A  0.12A
1 Form A / 1 Form B				

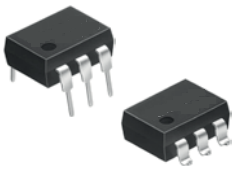
Output		Input		Switching speed		I/O isolation voltage	Approvals
ON resistance (typical/max.)	Output capacitance (typical)	LED operate current (max.)	LED turn-off current (min.)	Turn-on time (max.)	Turn-off time (max.)		
30/50Ω	10pF	3.0mA	0.4mA	0.5ms	0.2ms	1,500V AC	C-UL, UL
10/15Ω	33pF	3.0mA	0.1mA	0.5ms	0.2ms	1,500V AC	C-UL, UL
30/50Ω	10pF	3.0mA	0.4mA	0.5ms	0.2ms	1,500V AC	C-UL, UL
70/100Ω	10pF	3.0mA	0.4mA	0.5ms	0.2ms	1,500V AC	C-UL, UL
26/50Ω	100pF	3.0mA	0.4mA	1.0ms	1.0ms	1,500V AC	BSI, C-UL, UL
26/35Ω	100pF	3.0mA	0.4mA	3.0ms	1.0ms	5,000V AC	BSI, C-UL, UL
26/50Ω	100pF	3.0mA	0.4mA	1.0ms	1.0ms	1,500V AC	C-UL, UL
11/16Ω	170pF	3.0mA	0.4mA	2.0ms	1.0ms	1,500V AC	C-UL, UL

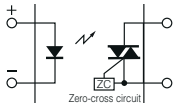
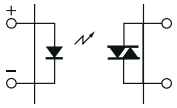
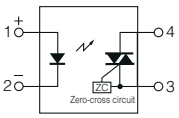
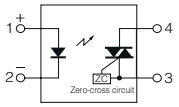
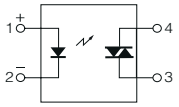
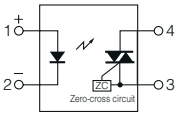
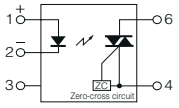
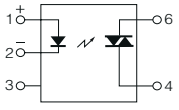
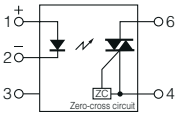
Type	Photo with dimensions (Picture scale: DIN A4)	Features	Output	
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)
AQW612S	1:1  9.37 x 4.4 x 2.1mm		60V	» 0.45A / 1.5A 
AQW610S			350V	» 0.1A / 0.3A 
AQW612EH	1:1  DIP : 9.86 x 6.4 x 3.2mm SMD: 9.86 x 6.4 x 2.9mm		60V	» 0.5A / 1.5A 
AQW610EH			350V	» 0.12A / 0.36A 
AQW614EH			400V	» 0.1A / 0.3A 
AQW614	1:1  DIP : 9.78 x 6.4 x 3.9mm SMD: 9.78 x 6.4 x 3.6mm		400V	» 0.1A / 0.3A 
AQW654			400V	» 0.12A / 0.36A 
Multichannel				
AQS221R2S	1:1  10.37 x 4.4 x 2.1mm	Low CxR	40V	» 0.16A / 0.2A 
AQS221N2S		Low CxR	40V	» 0.06A / 0.12A 
AQS225R2S		Low CxR	80V	» 0.07A / 0.2A
AQS221FR2S		Built-in resistor	40V	» 0.16A / 0.2A 
AQS221FN2S		Built-in resistor	40V	» 0.06A / 0.12A 

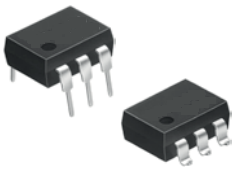
Output		Input		Switching speed		I/O isolation voltage	Approvals
ON resistance (typical/max.)	Output capacitance (typical)	LED operate current (max.)	LED turn-off current (min.)	Turn-on time (max.)	Turn-off time (max.)		
1/2.5Ω	80pF (N.O.) 450pF (N.C.)	3.0mA	0.4mA	3.0ms	1.0m	1,500V AC	C-UL, UL, VDE
18/25Ω	45pF (N.O) 100pF (N.C.)	3.0mA	0.4mA	1.0ms	1.0ms	1,500V AC	BSI, C-UL, UL
1/2.5Ω	80pF (N.O.) 480pF (N.C.)	3.0mA	0.4mA	4.0ms (N.O.) 10.0ms (N.C.)	1.0ms	5,000V AC	C-UL, UL, VDE
18/25Ω	45pF (N.O.) 100pF (N.C.)	3.0mA	0.4mA	3.0ms	1.0ms	5,000V AC	BSI, C-UL, UL
26/35Ω	45pF (N.O.) 100pF (N.C.)	3.0mA	0.4mA	3.0ms	1.0ms	5,000V AC	BSI, C-UL, UL
27/50Ω	45pF (N.O.) 100pF (N.C.)	3.0mA	0.4mA	1.0ms	1.0ms	1,500V AC	C-UL, UL
N.O.: 10/16Ω N.C.: 11/16Ω	170pF	3.0mA	0.4mA	3.0ms	1.0ms	1,500V AC	C-UL, UL
0.8/1.25Ω	13pF	3.0mA	0.1mA	0.5ms	0.2ms	500V AC	—
9.5/12.5Ω	1pF	3.0mA	0.1mA	0.2ms	0.2ms	500V AC	—
10.5/15.0Ω	4.5pF	3.0mA	0.3mA	0.3ms	0.2ms	1,500V AC	—
0.5/1.5Ω	12.5pF	Operate voltage V_{Fon} (max.) 4.0V	Turn off voltage V_{Foff} (min.) 0.8V	0.5ms	0.2ms	500V AC	—
9.5/12.5Ω	1pF	Operate voltage V_{Fon} (max.) 4.0V	Turn off voltage V_{Foff} (min.) 0.8V	0.5ms	0.2ms	500V AC	—

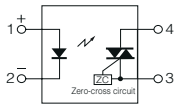
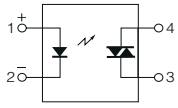
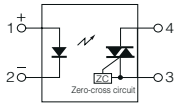
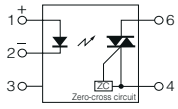
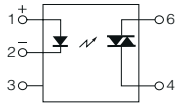
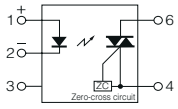
Type	Photo with dimensions (Picture scale: DIN A4)	Features	Output	
			Drop-out voltage (typical/min.)	Short circuit current (typical/min.)
APV2111V	1:1  2.65 x 4.45 x 1.8mm	Ultra small SSOP housing	8.2/5.0V	» 8/3µA 
APV1121S	1:1  4.3 x 4.4 x 2mm	Ultra small SMD (SOP) housing	8.7/6.0V	» 14/5µA 
APV2121S		Ultra small SMD (SOP) housing	8.2/5.0V	» 8/3µA 
APV1122	1:1  DIP : 8.8 x 6.4 x 3.6mm SMD: 8.8 x 6.4 x 3.9mm	5000V breakdown voltage	8.7/6.0V	» 14/5µA 

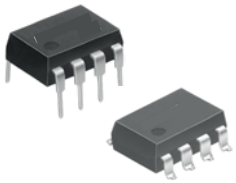
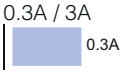
Input		Switching speed		I/O isolation voltage	Approvals
LED operate current (max.)	LED turn-off current (min.)	Turn-on time (typical)	Turn-off time (typical)		
3.0mA	0.2mA	0.8ms	0.1ms	1,500V AC	C-UL, UL
3.0mA	0.2mA	0.4ms	0.1ms	2,500V AC	C-UL, UL
3.0mA	0.2mA	0.8ms	0.1ms	2,500V AC	C-UL, UL
3.0mA	0.2mA	0.4ms	0.1ms	5,000V AC	C-UL, UL

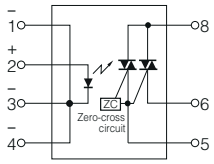
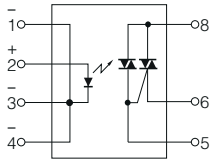
Type	Photo with dimensions (Picture scale: DIN A4)	Features	Output			
			Repetitive peak OFF-state voltage	Max. load current/ Non-repetitive surge current (1 cycle, 60Hz)	Peak ON-state voltage (max.)	Peak OFF-state current (max.)
APT1211S	1:1  4.3 x 4.4 x 2.1mm	» Zero-cross » SOP 4 pin	600V	» 0.05A / 0.6A	2.5V	1µA
APT1221S		» Random » SOP 4 pin				
APT1231S		» Low zero-cross » SOP 4 pin			2.0V	
APT1211	1:1  DIP : 4.78 x 6.4 x 3.2mm SMD: 4.78 x 6.4 x 2.9mm	» Zero-cross » DIP 4 pin	600V	» 0.1A / 1.2A	2.5V	1µA
APT1221		» Random » DIP 4 pin				
APT1231		» Low zero-cross » DIP 4 pin			2.0V	
APT1212	1:1  DIP: 8.8 x 6.4 x 3.9mm SMD: 8.8 x 6.4 x 3.6mm	» Zero-cross » DIP 6 pin	600V	» 0.1A / 1.2A	2.5V	1µA
APT1222		» Random » DIP 6 pin				
APT1232		» Low zero-cross » DIP 6 pin			2.0V	

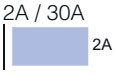
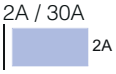
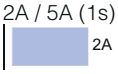
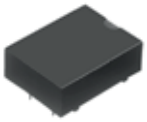
Input			Zero-cross voltage (max.)	I/O isolation voltage	Connection type Switching diagram	Approvals
LED trigger current (max.)	LED drop-out voltage (max.)	Turn-on time (max.)				
10mA	1.3V	0.1ms	50V	3,750V AC	SMT (SOP) 	C-UL, UL, VDE
			—		SMT (SOP) 	
			15V		SMT (SOP) 	
10mA	1.3V	0.1ms	50V	5,000V AC	PCB, SMT 	C-UL, UL, VDE
			—		PCB, SMT 	
			15V		PCB, SMT 	
10mA	1.3V	0.1ms	50V	5,000V AC	PCB, SMT 	C-UL, UL, VDE
			—		PCB, SMT 	
			15V		PCB, SMT 	

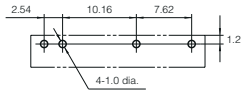
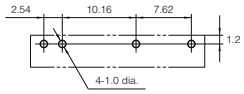
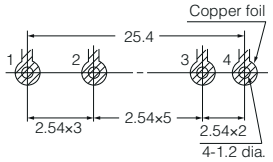
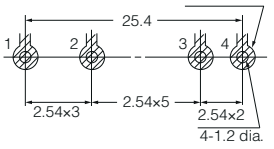
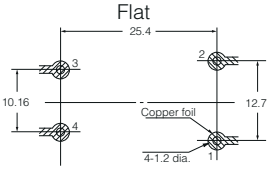
Type	Photo with dimensions (Picture scale: DIN A4)	Features	Output			
			Repetitive peak OFF-state voltage	Max. load current/ Non-repetitive surge current (1 cycle, 60Hz)	Peak ON-state voltage (max.)	Peak OFF-state current (max.)
APT1211W	1:1  DIP : 4.78 x 6.4 x 3.0mm SMD: 4.78 x 6.4 x 2.7mm	» Zero-cross » DIP 4 pin wide terminal	600V	» 0.1A / 1.2A 0.1A	2.5V	1µA
APT1221W		» Random » DIP 4 pin wide terminal				
APT1231W		» Low zero-cross » DIP 4 pin wide terminal			2.0V	
APT1212W	1:1  DIP: 8.8 x 6.4 x 3.9mm SMD: 8.8 x 6.4 x 3.6mm	» Zero-cross » DIP 6 pin wide terminal	600V	» 0.1A / 1.2A 0.1A	2.5V	1µA
APT1222W		» Random » DIP 6 pin wide terminal				
APT1232W		» Low zero-cross » DIP 6 pin wide terminal			2.0V	

Input			Zero-cross voltage (max.)	I/O isolation voltage	Connection type Switching diagram	Approvals
LED trigger current (max.)	LED drop-out voltage (max.)	Turn-on time (max.)				
10mA	1.3V	0.1ms	50V	5,000V AC	PCB, SMT 	C-UL, UL, VDE
			—		PCB, SMT 	
			15V		PCB, SMT 	
10mA	1.3V	0.1ms	50V	5,000V AC	PCB, SMT 	C-UL, UL, VDE
			—		PCB, SMT 	
			15V		PCB, SMT 	

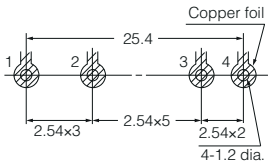
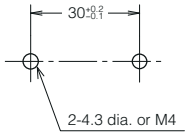
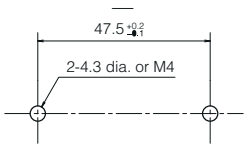
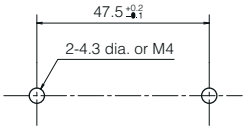
Type	Photo with dimensions (Picture scale: DIN A4)	Features	Output			
			Repetitive peak OFF-state voltage	Max. load current/ Non-repetitive surge current (1 cycle, 60Hz)	Peak ON-state voltage (max.)	Peak OFF-state current (max.)
AQH0213	1:1  DIP : 9.78 x 6.4 x 3.9mm SMD: 9.78 x 6.4 x 3.6mm	» Photo-Triac » Zero-cross	600V	» 0.3A / 3A 	2.5V	100µA
AQH0223		» Photo-Triac » Random				
AQH1213		» Photo-Triac » Zero-cross	600V	» 0.6A / 6A 	2.5V	100µA
AQH1223		» Photo-Triac » Random				
AQH2213		» Photo-Triac » Zero-cross	600V	» 0.9A / 9A 	2.5V	100µA
AQH2223		» Photo-Triac » Random				
AQH3213		» Photo-Triac » Zero-cross	600V	» 1.2A / 12A 	2.5V	100µA
AQH3223		» Photo-Triac » Random				

Input			Zero-cross voltage (max.)	I/O isolation voltage	Connection type Switching diagram	Approvals
LED trigger current (max.)	LED drop-out voltage (max.)	Turn-on time (max.)				
10mA	1.3V	0.1ms	50V	5,000V	PCB, SMT With zero-cross switch:  Without zero-cross switch: 	C-UL, UL, VDE
			—			
10mA	1.3V	0.1ms	50V	5,000V		
			—			
10mA	1.3V	0.1ms	50V	5,000V		
			—			
10mA	1.3V	0.1ms	50V	5,000V		
			—			

Type	Features	Output		
		Load voltage	Max. load current/ Non-repetitive surge current (1 cycle, 60Hz)	OFF-state leakage current (max.)
AQG 1A 1:2  24.5 x 4.5 x 13.5mm	» Photo-Triac » Zero-cross » Integrated snubber circuit	» 75 - 264V AC	» 1A / 8A 	1.5mA
	» Photo-Triac » Random » Integrated snubber circuit	» 75 - 264V AC	» 1A / 8A 	1.5mA
AQG 2A 1:2  24.5 x 4.5 x 20.5mm	» Photo-Triac » Zero-cross » Integrated snubber circuit	» 75 - 264V AC	» 2A / 30A 	1.5mA
	» Photo-Triac » Random » Integrated snubber circuit	» 75 - 264V AC	» 2A / 30A 	1.5mA
AQ1 1A (DC output) 1:2  33 x 10 x 25.1mm	» Photo-Transistor	» 10 - 200V DC	» 1A / 5A (1s) 	1mA
AQ1 2A (DC output) 1:2  33 x 10 x 25.1mm	» Photo-Transistor	» 3 - 60V DC	» 2A / 5A (1s) 	1mA
AQ1 3A (AC output) 1:2  33 x 10 x 25.1mm  33 x 25 x 12mm	» Photo-Triac » Zero-cross and random type available	» 75 - 250V AC	» 3A / 100A 	5mA

Input					Breakdown voltage	Connection type Terminal layout	Approvals
Input voltage	Input impedance	Drop-out voltage (min.)	Operate time	Release time			
4 - 6V DC	0.3kΩ	1V	½ cycle of voltage sine wave + 1ms	½ cycle of voltage sine wave + 1ms	3,000V AC	PCB 	C-UL, UL, VDE
9.6 - 14.4V DC	0.8kΩ						
19.2 - 28.8V DC	1.6kΩ						
4 - 6V DC	0.3kΩ	1V	1ms	½ cycle of voltage sine wave + 1ms	3,000V AC		
9.6 - 14.4V DC	0.8kΩ						
19.2 - 28.8V DC	1.6kΩ						
4 - 6V DC	0.3kΩ	1V	½ cycle of voltage sine wave + 1ms	½ cycle of voltage sine wave + 1ms	3,000V AC	PCB 	
9.6 - 14.4V DC	0.8kΩ						
19.2 - 28.8V DC	1.6kΩ						
4 - 6V DC	0.3kΩ	1V	1ms	½ cycle of voltage sine wave + 1ms	3,000V AC		
9.6 - 14.4V DC	0.8kΩ						
19.2 - 28.8V DC	1.6kΩ						
3 - 28V DC	1.6kΩ	0.8V	0.5ms	2ms	3,000V AC	PCB Slim 	CSA, TÜV, UL
3 - 28V DC	1.6kΩ	0.8V	0.5ms	2ms	3,000V AC		
4 - 32V DC	— (Input current, max. 20mA)	1.0V	½ cycle of voltage sine wave + 1ms	½ cycle of voltage sine wave + 1ms	» 4,000V AC (between input and output) » 2,500V AC (between input, output and case)	PCB Slim  Flat 	C-UL, UL, VDE

Type	Features	Output		
		Load voltage	Max. load current/ Non-repetitive surge current (1 cycle, 60Hz)	OFF-state leakage current (max.)
AQ1 10A (AC output) 1:2  54 x 26mm	» Photo-Triac » Zero-cross and random type available	» 75 - 250V AC	» 10A (5A without heat sink) / 100A 10A	5mA
Solid State Hockey Puck Types				
AQ-J 1:2  38 x 28 x 17mm	» Photo-Triac » Zero-cross and random type available » Ultra-compact size » Built-in varistor » Wide range input	» 75 - 264V AC	» 10A / 100A 10A » 15A / 150A 15A » 25A / 250A 25A	5mA
AQ-A 1:2  58 x 40 x 25.5mm	» Photo-Triac » Zero-cross and random type available » Built-in varistor and LED indication » Wide range input	» 75 - 250V AC	» 15A / 150A 15A » 25A / 250A 25A » 40A / 400A 40A	10mA
AQ-AD 1:2  58 x 40 x 25.5mm	» DC high power LED indication » Internal diode » Terminal cover » Wide range input	» 100 / 600V DC	» 10A 10A » 30A 30A	100µA

Input					Breakdown voltage	Connection type Terminal layout	Approvals
Input voltage	Input impedance	Drop-out voltage (min.)	Operate time	Release time			
4 - 32V DC	— (Input current, max. 20mA)	1,0V	½ cycle of voltage sine wave + 1ms	½ cycle of voltage sine wave + 1ms	» 4,000V AC (between input and output) » 2,500V AC (between input, output and case)	PCB 	C-UL, UL, TÜV
4 - 32V DC	— (Input current, max. 20mA)	1V	½ cycle of voltage sine wave + 1ms	½ cycle of voltage sine wave + 1ms	» 3,000V AC (between input and output) » 2,500V AC (between input, output and case)	— 	C-UL, UL, TÜV
4 - 32V DC	— (Input current, max. 20mA)	1V	½ cycle of voltage sine wave + 1ms	½ cycle of voltage sine wave + 1ms	» 4,000V AC (between input and output) » 2,500V AC (between input, output and case)	— 	C-UL, UL, VDE
4 - 32V DC	— (Input current, max. 20mA)	1V	5ms 10ms	1ms 3ms	» 4,000V AC (between input and output) » 2,500V AC (between input, output and case)	— 	C-UL, UL, VDE

Mechanical Relays

CA. 46
CB. 46
CJ 40
CM 46
CN-H. 42
CN-L 48
CN-M 42
CP. 40
CP (SMD) 42
CP POWER. 40
CQ 42
CT. 38
CT POWER 38
CV. 46
CV-N 46
CW 50
DE. 12
DJ 14
DJ-H 16
DK. 14
DQM 16
DS. 10
DS2Y. 10
DSP. 12
DW 12
DW-HL 12
DY. 15
DZ-S 12
EP. 30
EV. 48
EV QUIET 48
EV SWITCH 50
GN (SMD). 6
GQ (SMD). 6
HE-S 28
HE-V 30
HE/ HE PV 28
HN 24
HY. 10
JJM. 44
JJM-DM 44
JS 18
JW. 20
LA 18
LD-P 26
LE 20
LF 20
LF-G1/LF-G2. 22
LK-G 22
LK-P 24
LK-Q 24
LK-T 24
LQ. 18
LZ 20
LZ-N 22
PA-N 26
PF 26
PQ. 18
RA. 32
RD SP6T. 36
RD SPDT 36
RD TRANSFER 36
RE. 34
RJ 32
RN. 32
RS. 34
RV SPDT. 34
S 16
SF-Y 54
SF2D. 52
SF3 52
SF4D. 52
SFN4D 52
SFS. 54
SP. 16
ST 14
TA 42
TB 38
TB1P. 38
TC. 44
TE 40
TG. 44
TH. 44
TJ 42
TL 40
TQ (SMD) 6
TQ (THT). 6
TX (SMD) 8
TX-D (SMD) 8
TX-S (SMD). 8
TX-TH (SMD) 8

Semiconductor Relays

APT1211. 96
APT1211S. 96
APT1211W 98
APT1212. 96
APT1212W 99
APT1221. 96
APT1221S. 96
APT1221W 98
APT1222. 96
APT1222W 98
APT1231. 96
APT1231S. 96
APT1231W 98
APT1232. 96
APT1232W 99
APV1121S. 94
APV1122. 94
APV2111V. 94
APV2121S. 94
AQ-A. 104
AQ-AD 104
AQ-J 104
AQ1 102
AQ1 102
AQ1 102
AQ1 104
AQG 102
AQG 102
AQH0213 99
AQH0223 99
AQH1213 99
AQH1223 99
AQH2213 99
AQH2223 99
AQH3213 99
AQH3223 99
AQS221FN2S 92
AQS221FR2S 92
AQS221N2S 92
AQS221R2S 92
AQS225R2S 92
AQV101 70
AQV102 72
AQV103 72
AQV104 72
AQV112KL 72
AQV201 70
AQV202 72
AQV203 72
AQV204 72
AQV210 70
AQV210E 70
AQV210EH 70
AQV210S 68
AQV212 68
AQV212S 68
AQV214 70
AQV214E 70
AQV214EH 70
AQV214H 70
AQV214S 68
AQV215 70
AQV215S 68
AQV216 70
AQV216HAXC** 88
AQV216S 68
AQV217 70
AQV217S 68
AQV219HAXC** 88
AQV224N 82
AQV224NS 80
AQV227N 82
AQV227NS 80
AQV234 72
AQV251 70
AQV251G 68
AQV252 72
AQV252G 68
AQV252G2S 70
AQV252G3S 70
AQV253 72
AQV253H 72
AQV254 72
AQV254H 72
AQV255 72
AQV255G3S 70
AQV255GS 70
AQV256H 72
AQV257 72
AQV258 72
AQV258HAXC** 88
AQV259 73
AQV410EH 84
AQV412EH 84
AQV414 84
AQV414E 84
AQV414EH 84
AQV414S 82
AQV453 84
AQV454 84
AQV454H 84
AQW210 86
AQW210EH 86
AQW210HL. 86
AQW210S. 86
AQW212. 86
AQW212EH 86
AQW212HAXC** 88
AQW212S. 86
AQW214. 86
AQW214EH 86
AQW214S. 86
AQW215. 86
AQW216. 86
AQW216EH 86
AQW216HAXC** 88
AQW217. 86
AQW223R2S. 90
AQW224N. 90
AQW227N. 90
AQW227NS 90
AQW254. 86
AQW414. 90
AQW414EH 90
AQW414S. 90
AQW454. 90
AQW610EH 92
AQW610S. 92
AQW612EH 92
AQW612S. 92
AQW614. 92
AQW614EH 92
AQW654. 92
AQY210EH 68
AQY210HL 68
AQY210KS 66
AQY210LS 66
AQY210S 66
AQY211EH 68
AQY211G2S 66
AQY212EH 68
AQY212G2S 66
AQY212GH. 68
AQY212GS 66
AQY212S 66
AQY214EH 68
AQY214S 66
AQY215HAXC** 88
AQY216EH 68
AQY221N2M. 78
AQY221N2S 80
AQY221N2T 78
AQY221N2V 80
AQY221N3M. 78
AQY221N3T 78
AQY221N3V 80
AQY221N5T 78
AQY221N5V 80
AQY221R2M. 78
AQY221R2S 80
AQY221R2T 78
AQY221R2V 80
AQY221R4V 80
AQY221R6T 78
AQY221R6V 80
AQY222R1S 80
AQY222R2T 78
AQY222R2V 80
AQY225R1S 80
AQY225R2S 80
AQY225R2V 80
AQY225R3T 78
AQY225R3T 80
AQY225R3V 80
AQY230S 66
AQY232S 66
AQY234S 66
AQY272 76
AQY274 76
AQY275 76
AQY277 76
AQY2C1R2P. 78
AQY2C1R6P. 78
AQY410EH 82
AQY410S 82
AQY412EH 82
AQY412S 82
AQY414EH 82
AQY414S 82
AQZ102 74
AQZ102D 76
AQZ104 74
AQZ104D 76
AQZ105 74
AQZ105D 76
AQZ107 74
AQZ107D 76
AQZ192 74
AQZ197 74
AQZ202 74
AQZ202D 76
AQZ202G 74
AQZ204 74
AQZ204D 76
AQZ205 74
AQZ205D 76
AQZ207 74
AQZ207D 76
AQZ207G 74
AQZ264 74
AQZ404 84

1 EMC Directive

The EMC Directive concerns primarily the finished products. In applying the Directive to components, the Guidelines[1] should be consulted to determine whether the component in question has a "direct function". Electric motors, power supply units or temperature controls represent examples of such components with "direct function". These types of components must be provided with a CE marking.

Components which are integrated into a device, such as relays, do not have an independent function of their own. A given relay may perform differing functions in different devices. Consequently, all-or-nothing relays must be considered components without "direct function" which are not subject to the EMC Directive.

All-or-nothing - be they electro-mechanical relays or solid state relays - shall not be labeled with a CE marking nor shall a declaration of conformity be issued within the scope of the EMC Directive.

2 Low Voltage Directive

Relays with terminals for printed boards/plug-and-socket connections do not come within the purview of the Low Voltage Directive.

The Low Voltage Directive concerns electrical equipment intended for incorporation into a device as well as equipment intended for direct use. In the case of electrical equipment which is considered a basic component intended for incorporation into other electrical equipment, the properties and safety of the final product will be largely dependent on how it is integrated: as such, these components do not fall within the Low Voltage Directive and shall not be CE marked. The Guidelines[2] specifically cite electro-mechanical basic components such as connectors, relays with terminals for printed circuit boards and micro switches. They are therefore not subject to the scope of the Low Voltage Directive.

Except for larger relays which may, for example, find application in switching cabinets, the same considerations apply to common-place relays with plug-in connections available also with printed board terminals. Here again, safety is a function of the individual application. In evaluating these relays' performance from the perspective of the Low Voltage Directive, the same conclusion is reached as with the printed board relay. As such, CE marking is not mandatory for this type of relay.

3 Machinery Directive

The Machinery Directive differentiates between machines, machine parts and safety components. Relays are not part of any of these categories. The listing of safety components in Appendix IV is conclusive and does not include relays.

Consequently, a CE marking shall not be affixed nor shall a declaration of conformity or manufacturer's declaration be issued under the Machinery Directive.

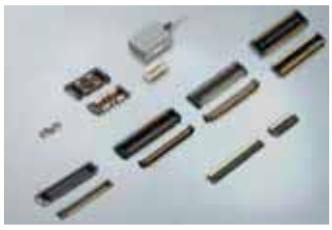
As of this moment, none of the aforementioned directives require CE marking for all-or-nothing relays[3].

4 RoHS Directive

The substances prohibited by the RoHS Directive (Pb, Hg, Cd, Cr+6, PBB, PBDE) concern 10 categories of devices that are mostly, but not entirely, intended for private use. Components such as relays are not listed in these categories. Therefore they do not directly fall within the scope of this directive. However, if the user employs relays in devices that fall within the scope of this directive, the user must also acknowledge the substances prevented. In order to adapt to this situation in good time, all Panasonic relays are generally RoHS compliant.

1 Guidelines (version dated March 22, 2007) for the Application of the Council Directive 2004/108/EC.
2 Guidelines (version dated August 2007) for the Application of the Council Directive 2006/95/EC.
3 This writing deals exclusively with "non-specified-time all-or-nothing relays". The abbreviated term "all-or nothing relay" has been introduced merely for purposes of convenience. The term includes solid state all-or nothing relays.

Panasonic Electric Works offers a wide product range from one source, from individual components to complete systems. Technology support for advice, design-in, installation and commissioning by our qualified application engineers round off the Panasonic service profile.



Connectors

Today's electronic components are expected to meet stringent demands: They have to be as compact as possible and provide maximum reliability. To fulfill these requirements, Panasonic engineers have developed narrow-pitch connectors that utilize TOUGH CONTACT technology. In addition to their excellent shock and vibration resistance, these connectors feature an ultra-slim profile, which makes them ideally suited to applications where space is at a premium. Our versatile board-to-board and board-to-FPC connector product range offers the appropriate solution for practically any scenario.

Switches

The immense portfolio includes switches in all common sizes and with various IP degrees of protection, and are guaranteed to cover all standard requirements. Our switches are characterized by a large switching capacity range, long lifetime and exceptional reliability. A wide selection of supplemental actuators coupled with various terminal styles, e.g. solder, quick connect, PC board terminal and cable connections, maximize flexibility and ease application design.

PaPIRs motion sensors

Intelligent automation solutions help increase energy efficiency, cost effectiveness and comfort significantly. With a power consumption as low as 1µA and a height of just 6mm, PaPIRS open up a diverse range of possibilities to the lighting and building technology as well as battery-driven applications.

NaPiOn motion Sensors

NaPiOn motion sensors are ideal for efficient lighting and energy management.

» Small size: Ø10x13.5mm (thimble size)
» Integrated amplifier
» 2 lens colors: white and black

Pressure sensors

Panasonic's pressure sensors contain built-in amplification and temperature compensation circuits. Users need not be concerned with circuit design or customization.
State-of-the-art technology allows us to achieve high-level precision and reliability, yet without compromising compactness.

» Footprint 7.0mm (W) x 7.2mm (D)
» 10.4mm (W) x 10.4mm (D) (low pressure type)

Global Network

North America | Europe | Asia Pacific | China | Japan

Panasonic Electric Works

Please contact our Global Sales Companies in:

Europe

▸ **Headquarters**	**Panasonic Electric Works Europe AG**	Robert-Koch-Straße 100, 85521 Ottobrunn, Tel. +49 89 45354-1000, Fax +49 89 45354-2111, www.panasonic-electric-works.com
▸ **Austria**	**Panasonic Electric Works Austria GmbH**	Josef Madersperger Str. 2, 2362 Biedermannsdorf, Tel. +43 (0) 2236-26846, Fax +43 (0) 2236-46133 www.panasonic-electric-works.at
	Panasonic Industrial Devices Materials Europe GmbH	Ennshafenstraße 30, 4470 Enns, Tel. +43 (0) 7223 883, Fax +43 (0) 7223 88333, www.panasonic-electronic-materials.com
▸ **Benelux**	**Panasonic Electric Works Sales Western Europe B.V.**	De Rijn 4, (Postbus 211), 5684 PJ Best, (5680 AE Best), Netherlands, Tel. +31 (0) 499 372727, Fax +31 (0) 499 372185, www.panasonic-electric-works.nl
▸ **Czech Republic**	**Panasonic Electric Works Europe AG, organizační složka**	Administrative centre PLATINIUM, Veveří 3163/111, 616 00 Brno, Tel. +420 541 217 001, Fax +420 541 217 101, www.panasonic-electric-works.cz
▸ **France**	**Panasonic Electric Works Sales Western Europe B.V.**	Succursale française, 10, rue des petits ruisseaux, 91370 Verrières Le Buisson, Tél. +33 (0) 1 6013 5757, Fax +33 (0) 1 6013 5758, www.panasonic-electric-works.fr
▸ **Germany**	**Panasonic Electric Works Europe AG**	Robert-Koch-Straße 100, 85521 Ottobrunn, Tel. +49 89 45354-1000, Fax +49 89 45354-2111, www.panasonic-electric-works.de
▸ **Hungary**	**Panasonic Electric Works Europe AG**	Magyarországi Közvetlen Kereskedelmi Képviselet, 1117 Budapest, Neumann János u. 1., Tel. +43 2236 26846-25, Mobile: +36 20 264 9896, Fax +43 2236 46133, www.panasonic-electric-works.hu
▸ **Ireland**	**Panasonic Electric Works UK Ltd.**	Irish Branch Office, Dublin, Tel. +353 (0) 14600969, Fax +353 (0) 14601131, www.panasonic-electric-works.co.uk
▸ **Italy**	**Panasonic Electric Works Italia srl**	Via del Commercio 3-5 (Z.I. Ferlina), 37012 Bussolengo (VR), Tel. +39 0456752711, Fax +39 0456700444, www.panasonic-electric-works.it
▸ **Nordic Countries**	**Panasonic Electric Works Europe AG**	Filial Nordic, Knarrarnäsgatan 15, 164 40 Kista, Sweden, Tel. +46 859476680, Fax +46 859476690, www.panasonic-electric-works.se
	Panasonic Eco Solutions Nordic AB	Jungmansgatan 12, 21119 Malmö, Tel. +46 40 697 7000, Fax +46 40 697 7099, www.panasonic-fire-security.com
▸ **Poland**	**Panasonic Electric Works Polska sp. z o.o**	ul. Wołoska 9A, 02-583 Warszawa, Tel. +48 22 338-11-33, Fax +48 22 338-12-00, www.panasonic-electric-works.pl
▸ **Spain**	**Panasonic Electric Works España S.A.**	Barajas Park, San Severo 20, 28042 Madrid, Tel. +34 913293875, Fax +34 913292976, www.panasonic-electric-works.es
▸ **Switzerland**	**Panasonic Electric Works Schweiz AG**	Grundstrasse 8, 6343 Rotkreuz, Tel. +41 (0) 41 7997050, Fax +41 (0) 41 7997055, www.panasonic-electric-works.ch
▸ **United Kingdom**	**Panasonic Electric Works UK Ltd.**	Sunrise Parkway, Linford Wood, Milton Keynes, MK14 6LF, Tel. +44 (0) 1908 231555, Fax +44 (0) 1908 231599, www.panasonic-electric-works.co.uk

North & South America

▸ **USA**	**Panasonic Industrial Devices Sales Company of America**	Two Riverfront Plaza, 7th Floor, Newark, NJ 07102-5490, Tel. 1-8003-442-112, www.pewa.panasonic.com

Asia Pacific / China / Japan

▸ **China**	**Panasonic Electric Works Sales (China) Co. Ltd.**	Tower C 3rd Floor, Office Park, NO.5 Jinghua South Street, Chaoyang District, Beijing 100020, Tel. +86-10-5925-5988, Fax +86-10-5925-5980
▸ **Hong Kong**	**Panasonic Industrial Devices Sales (HK) Co., Ltd.**	Suite 301, 3/F, Chinachem Golden Plaza, 77 Mody Road, TST East, Kowloon, Hong Kong, Tel. +852-2529-3956, Fax +852-2528-6991
▸ **Japan**	**Panasonic Corporation**	1006, Oaza Kadoma, Kadoma-shi, Osaka 571-8501, Japan, Tel. +81-6-6908-1121, www.panasonic.net
▸ **Singapore**	**Panasonic Industrial Devices Automation Controls Sales Asia Pacific**	No.3 Bedok South Road, Singapore 469269, Tel. +65-6299-9181, Fax +65-6390-3953

Panasonic®

Copyright © 2017 • Printed in Germany
1060 euen 11/17