



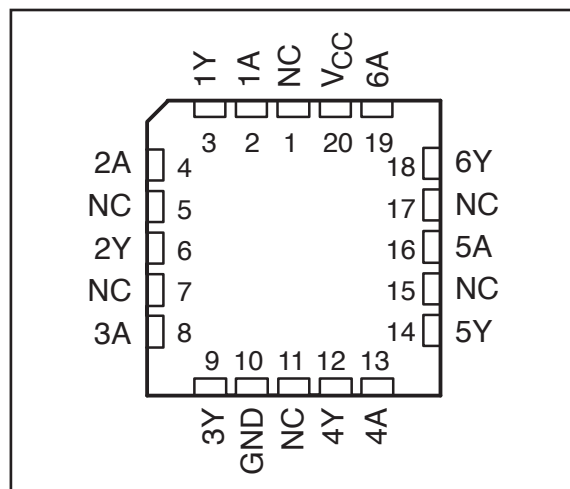
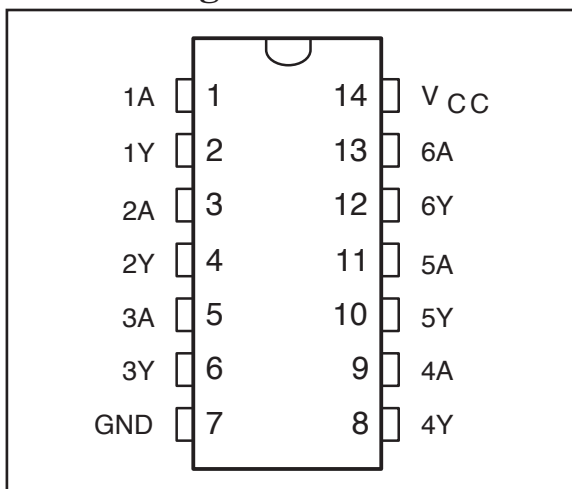
PO54G04A, PO74G04A

HEX INVERTER

54, 74 Series Noise Cancellation GHz Logic

FEATURES:	DESCRIPTION:
- Patented technology - Specified From -40°C to 85°C, -40°C to 125°C, and -55°C to 125°C - Operating frequency up to 1.125GHz with 2pf load - Operating frequency up to 700MHz with 5pf load - Operating frequency up to 270MHz with 15pf load - VCC Operates from 1.65V to 3.6V - Propagation delay $< 1.4\text{ns}$ max with 15pf load - Low input capacitance: 4pf typical - Latch-Up Performance Exceeds 250 mA Per JESD 17 - ESD Protection Exceeds JESD 22 5000-VHuman-BodyModel (A114-A) 200-VMachineModel (A115-A) - Available in 14pin 150mil wide SOIC package - Available in 14pin Ceramic Dual Flatpack - Available in 20pin Leadless Ceramic Chip Carrier	Potato Semiconductor's PO74G04A is designed for world top performance using submicron CMOS technology to achieve 1.125GHz TTL /CMOS output frequency with less than 1.4ns propagation delay. This hex inverter contains six independent inverters designed for 1.65-V to 3.6-V VCC operation. The PO74G04A performs the Boolean function $Y = \overline{A}$. Inputs can be driven from either 3.3V or 5V devices. This feature allows the use of these devices as translators in a mixed 3.3V/5V system environment.

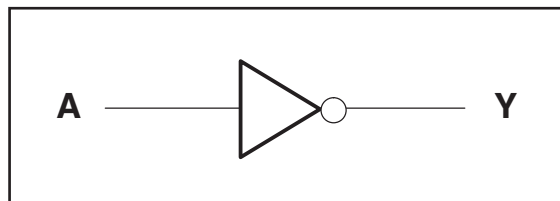
Pin Configuration



Pin Description

INPUT A	OUTPUT Y
H	L
L	H

Logic Block Diagram





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Maximum Ratings

Description	Max	Unit
Storage Temperature	-65 to 150	°C
Operation Temperature	-55 to 125	°C
Operation Voltage	-0.5 to +4.6	V
Input Voltage	-0.5 to +5.5	V
Output Voltage	-0.5 to Vcc+0.5	V

Note:

stresses greater than listed under Maximum Ratings may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability specification is not implied.

DC Electrical Characteristics

Symbol	Description	Test Conditions	Min	Typ	Max	Unit
VOH	Output High voltage	Vcc=3V Vin=VIH or VIL, IOH= -12mA	2.4	3	-	V
VOL	Output Low voltage	Vcc=3V Vin=VIH or VIL, IOH=12mA	-	0.3	0.5	V
VIH	Input High voltage	Guaranteed Logic HIGH Level (Input Pin)	2	-	5.5	V
VIL	Input Low voltage	Guaranteed Logic LOW Level (Input Pin)	-0.5	-	0.8	V
IiH	Input High current	Vcc = 3.6V and Vin = 5.5V	-	-	5	uA
IiL	Input Low current	Vcc = 3.6V and Vin = 0V	-	-	-5	uA
VIK	Clamp diode voltage	Vcc = Min. And IIN = -18mA	-	-0.7	-1.2	V

Notes:

1. For conditions shown as Max. or Min., use appropriate value specified under Electrical Characteristics for the applicable device type.
2. Typical values are at Vcc = 3.3V, 25 °C ambient.
3. This parameter is guaranteed but not tested.
4. Not more than one output should be shorted at one time. Duration of the test should not exceed one second.
5. VoH = Vcc – 0.6V at rated current

**54, 74 Series Noise Cancellation GHz Logic****Power Supply Characteristics**

Symbol	Description	Test Conditions (1)	Min	Typ	Max	Unit
IccQ	Quiescent Power Supply Current	Vcc=Max, Vin=Vcc or GND	-	0.1	40	uA

Notes:

1. For conditions shown as Max. or Min., use appropriate value specified under Electrical Characteristics for the applicable device type.
2. Typical values are at Vcc = 3.3V, 25°C ambient.
3. This parameter is guaranteed but not tested.
4. Not more than one output should be shorted at one time. Duration of the test should not exceed one second.

Capacitance

Parameters (1)	Description	Test Conditions	Typ	Unit
Cin	Input Capacitance	Vin = 0V	4	pF
Cout	Output Capacitance	Vout = 0V	6	pF

Notes:

- 1 This parameter is determined by device characterization but not production tested.

Switching Characteristics

Symbol	Description	Test Conditions (1)	Max	Unit
tPLH	Propagation Delay A, B to Y	CL = 15pF	1.4	ns
tPHL	Propagation Delay A, B to Y	CL = 15pF	1.4	ns
tr/tf	Rise/Fall Time	0.8V – 2.0V	0.8	ns
fmax	Input Frequency	CL = 15pF	270	MHz
fmax	Input Frequency	CL = 5pF	700	MHz
fmax	Input Frequency	CL = 2pF	1125	MHz

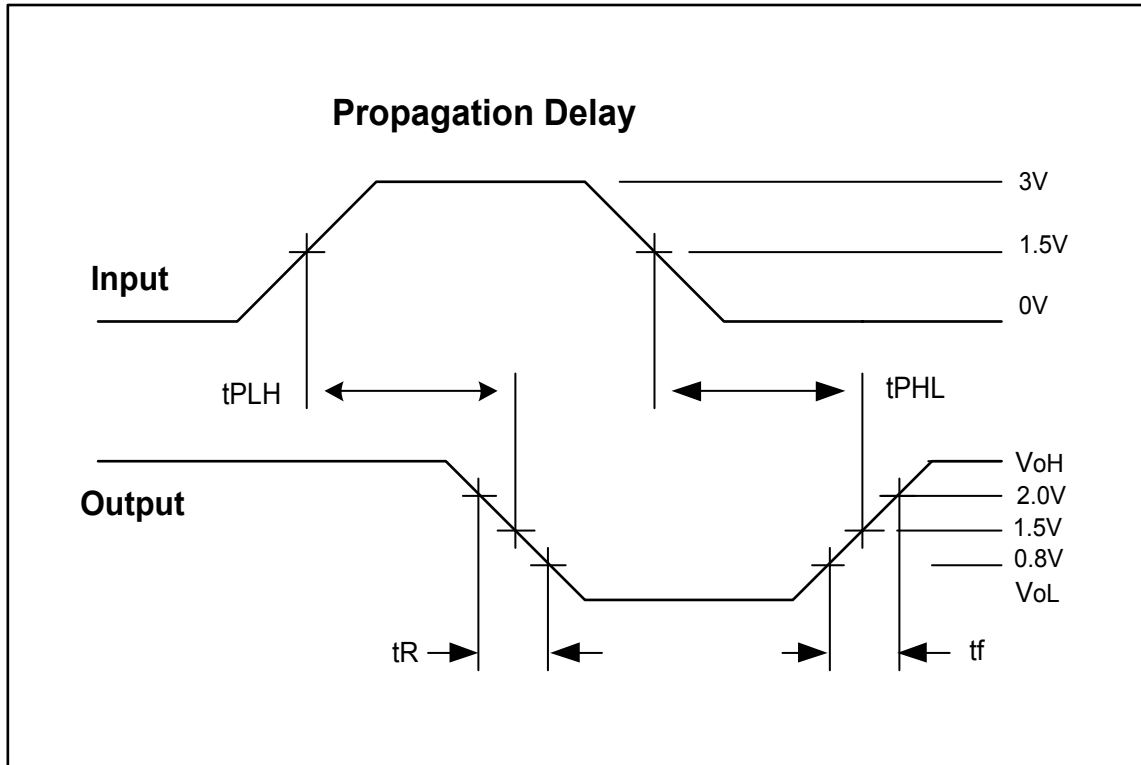
Notes:

1. See test circuits and waveforms.
2. tPLH, tPHL, tsk(p), and tsk(o) are production tested. All other parameters guaranteed but not production tested.
3. Airflow of 1m/s is recommended for frequencies above 133MHz

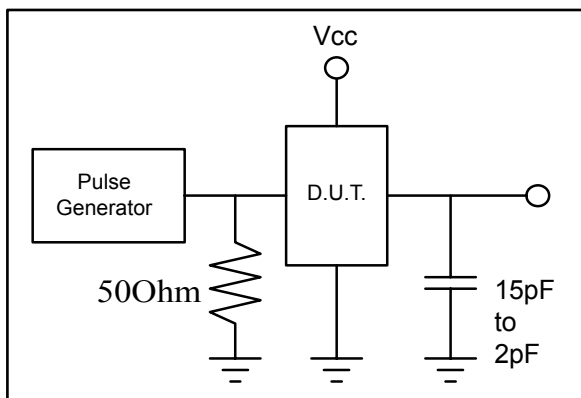


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Test Waveforms



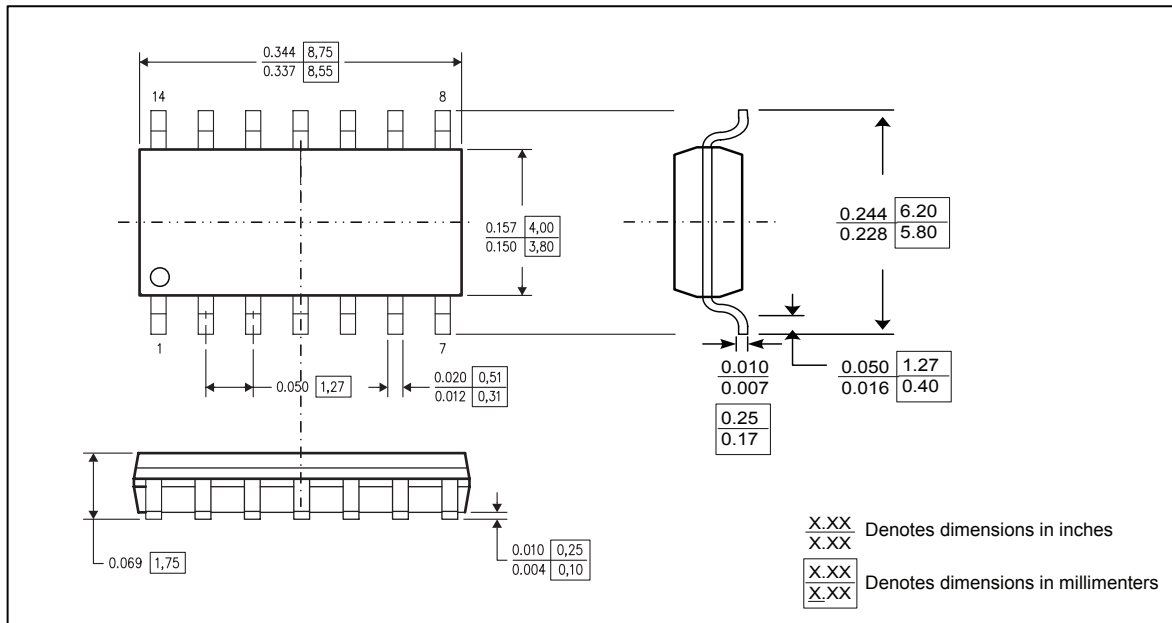
Test Circuit



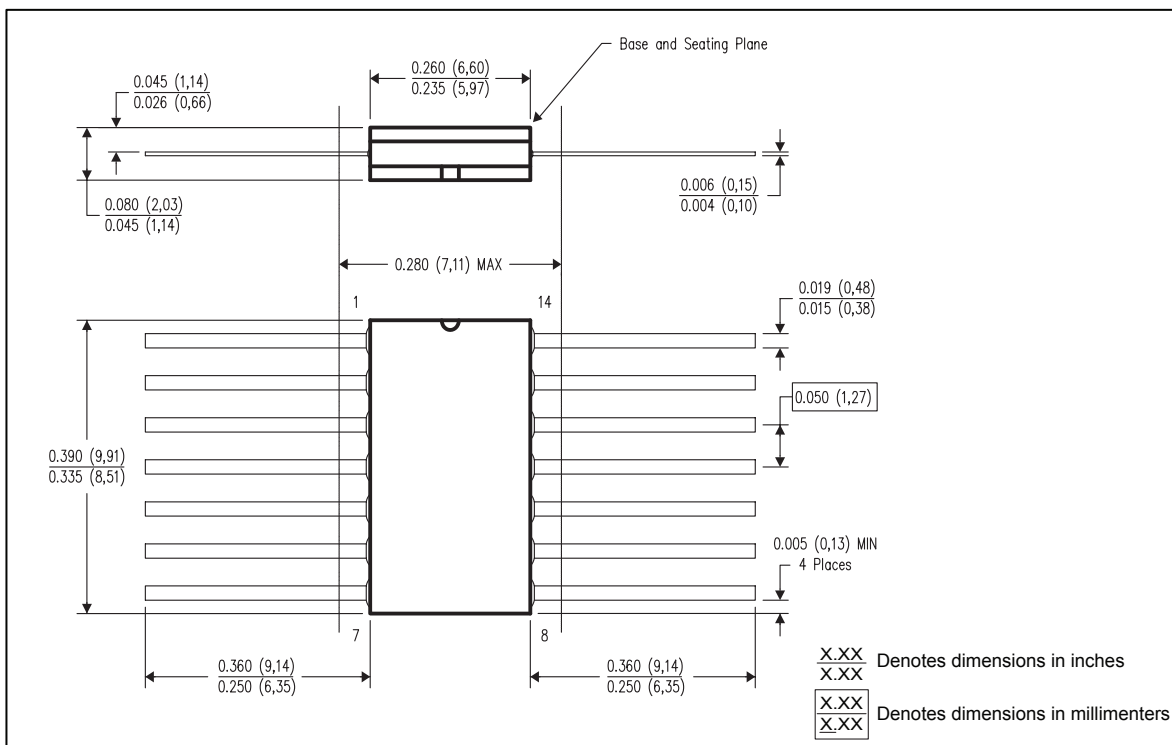


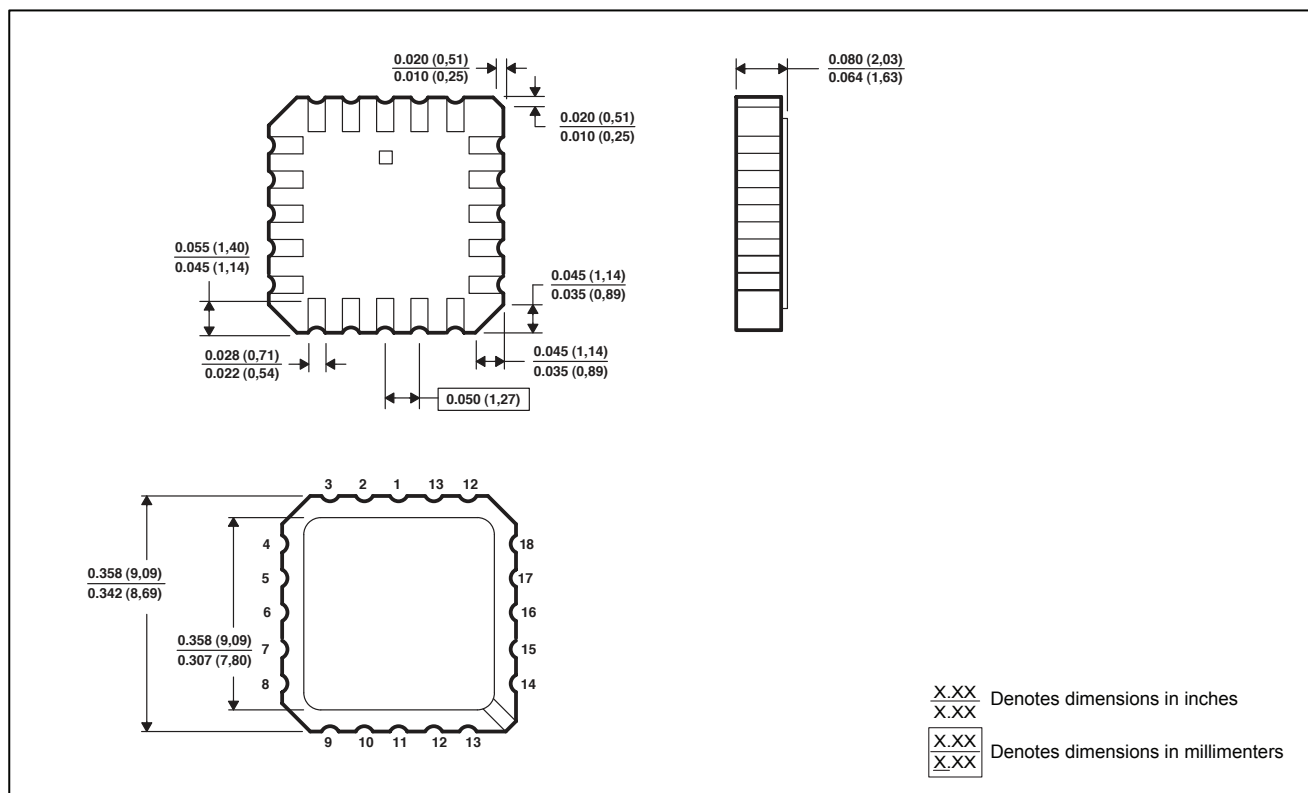
54, 74 Series Noise Cancellation GHz Logic

Packaging Mechanical Drawing: 14 pin 150mil SOIC



Packaging Mechanical Drawing: 14pin Leadless Ceramic Chip Carrier



**54, 74 Series Noise Cancellation GHz Logic****Packaging Mechanical Drawing: 20pin Ceramic Dual Flatpack****IC Ordering Information**

Ordering Code	Package		Top-Marking	T _A
PO74G04ASU for Tube	14pin SOIC	Pb-free & Green	POTATO74G04AS	-40°C to 125°C
PO74G04ASR for Tape & Reel	14pin SOIC	Pb-free & Green	POTATO74G04AS	-40°C to 125°C
PO54G04ALU for Tube	14pin Leadless Ceramic Chip Carrier	Pb-free & Green	POTATO54G04AL	-55°C to 125°C
PO54G04AFU for Tube	20pin Ceramic Dual Flatpack	Pb-free & Green	POTATO54G04AF	-55°C to 125°C

IC Package Information

PACKAGE CODE	PACKAGE TYPE	TAPE WIDTH (mm)	TAPE PITCH (mm)	PIN 1 LOCATION	TAPE TRAILER LENGTH	QTY PER REEL	TAPE LEADER LENGTH	QTY PER TUBE
S	SOIC 14	16	8	Top Left Corner	39 (12")	3000	64 (20")	55
L	LCCC 20	N/A	N/A	N/A	N/A	N/A	N/A	55
F	CFP 14	N/A	N/A	N/A	N/A	N/A	N/A	150