Bipolar TTL Logic – 7407

High Voltage Hex Buffer / Driver Logic IC in bare die form

Rev 1.0
29/07/20

Description

The 7407 comprises x6 buffer/drivers with high voltage open-collector outputs. The device finds use as high-level circuit interface or for driving high-current loads and is also characterised to drive TTL inputs as buffer. The device has a 30V minimum breakdown voltage and 40mA maximum sink current.

Features:

- High Sink-Current Capability: 40mA
- High Voltage Open-Collector Driver
- Minimum breakdown voltage: 30V
- Input Clamp Diodes minimize transmission-line effects
- TTL compatible inputs
- Direct drop-in replacement for obsolete components in long term programs.

Ordering Information

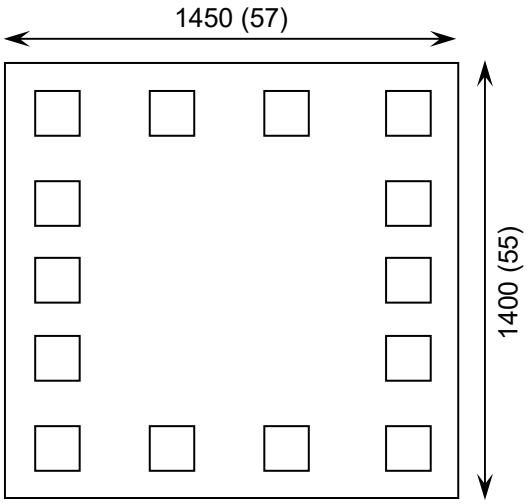
The following part suffixes apply:

- No suffix - MIL-STD-883 /2010B Visual Inspection

For High Reliability versions of this product please see

5407

Die Dimensions in µm (mils)



Supply Formats:

- Default – Die in Waffle Pack (400 per tray capacity)
- Sawn Wafer on Tape – On request
- Unsawn Wafer – On request
- Die Thickness <> 350µm(14 Mils) – On request
- Assembled into Ceramic Package – On request

Mechanical Specification

Die Size (Unsawn)	1450 x 1400 57 x 55	µm mils
Minimum Bond Pad Size	140 x 140 5.5 x 5.5	µm mils
Die Thickness	350 (±20) 13.78 (±0.79)	µm mils
Top Metal Composition	Al 1%Si 1.1µm	
Back Metal Composition	N/A – Bare Si	

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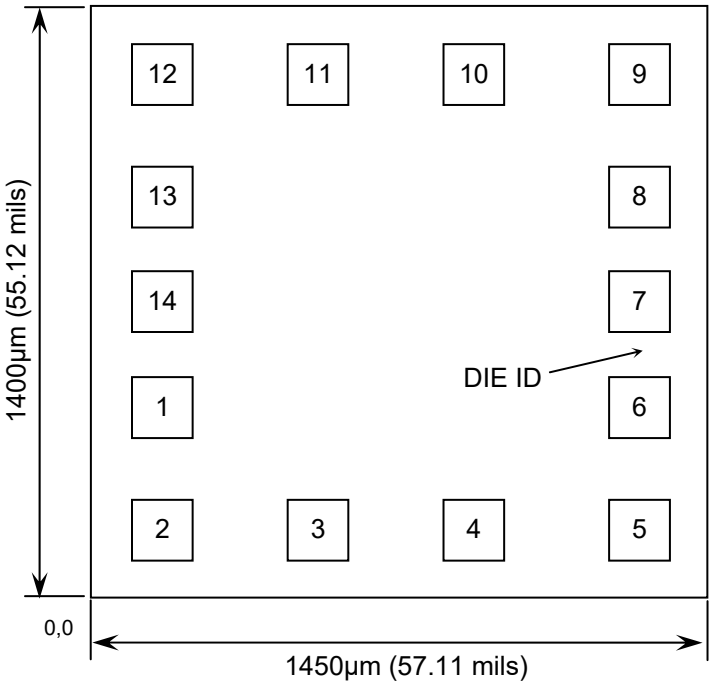
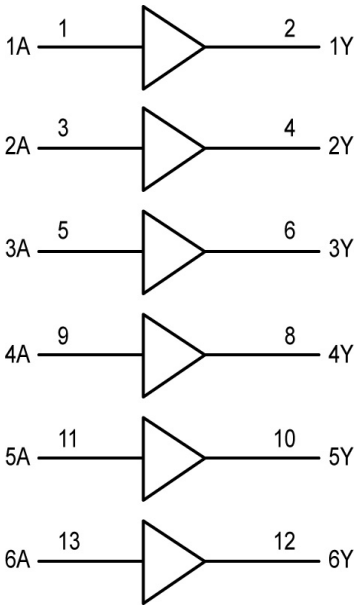
Pad Layout and Functions



PAD	FUNCTION	COORDINATES (mm)	
		X	Y
1	1A	0.090	0.380
2	1Y	0.090	0.090
3	2A	0.460	0.090
4	2Y	0.830	0.090
5	3A	1.220	0.090
6	3Y	1.220	0.380
7	GND	1.220	0.630
8	4Y	1.220	0.880
9	4A	1.220	1.170
10	5Y	0.830	1.170
11	5A	0.460	1.170
12	6Y	0.090	1.170
13	6A	0.090	0.880
14	V_{CC}	0.090	0.630
CONNECT CHIP BACK TO GND OR FLOAT			

Logic Diagram



Y = A

Pad 14 = V_{CC}
Pad 7 = GND

Truth Table

INPUTS A	OUTPUT Y
H	Z
L	L

H = High level (steady state)
L = Low level (steady state)
Z = High Impedance

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Absolute Maximum Ratings[1]

PARAMETER	SYMBOL	VALUE	UNIT
DC Supply Voltage	V_{CC}	7.0	V
DC Input Voltage	V_{IN}	5.5	V
DC Output Voltage	V_{OUT}	30	
Storage Temperature Range	T_{STG}	-65 to 150	°C

1. Operation above the absolute maximum rating may cause device failure. Operation at the absolute maximum ratings, for extended periods, may reduce device reliability.

Recommended Operating Conditions

PARAMETER	SYMBOL	MIN	MAX	UNITS
Supply Voltage	V_{CC}	4.75	5.25	V
High-Level Input Voltage	V_{IH}	2	-	V
Low-Level Input Voltage	V_{IL}	-	0.8	V
High-Level Output Voltage	V_{OH}	-	30	V
Low-Level Output Current	I_{OL}	-	40	mA
Operating Temperature Range	T_J	-40	+85	°C

DC Electrical Characteristics[2] T_J = -40°C to 85°C unless otherwise specified

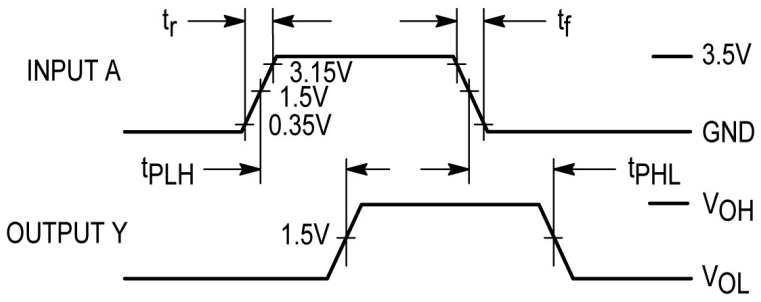
PARAMETER	SYMBOL	CONDITIONS	LIMITS			UNITS
			MIN	TYP	MAX	
Input Clamp Voltage	V_{IK}	V_{CC} = 4.75V, I_{IN} = -12mA	-	-	-1.5	V
High-Level Output Current	I_{OH}	V_{CC} = 4.75V, V_{IH} = 2V, V_{OH} = 30V	-	-	0.25	mA
Low-Level Output Voltage	V_{OL}	V_{CC} = 4.75V, V_{IL} = 0.8V, I_{OL} = 16mA	-	-	0.4	V
		V_{CC} = 4.75V, V_{IL} = 0.8V, I_{OL} = 40mA	-	-	0.7	
Input Current	I_{IN}	V_{CC} = 5.25V, V_{IN} = 5.25V	-	-	1	mA
High-Level Input Current	I_{IH}	V_{CC} = 5.25V, V_{IH} = 2.4V	-	-	0.04	mA
Low-Level Input Current	I_{IL}	V_{CC} = 5.25V, V_{IL} = 0.4V	-	-	-1.6	mA
Supply Current	I_{CC}	V_{CC} = 5.25V ,Output High	-	-	41	mA
		V_{CC} = 5.25V ,Output Low	-	-	30	

AC Electrical Characteristics[2]

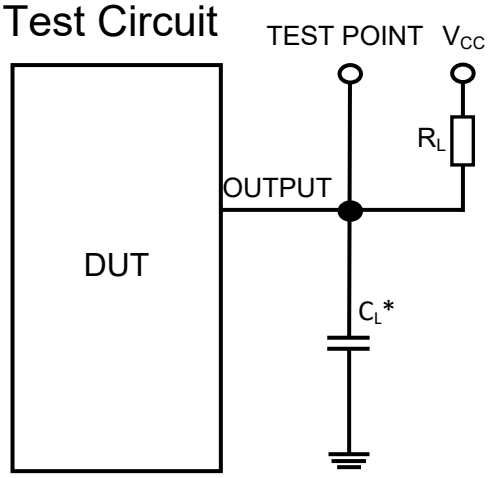
PARAMETER	SYMBOL	CONDITIONS	LIMITS			UNITS
			MIN	TYP	MAX	
Turn-Off Delay, Input to Output	t_{PLH}	T_A = 25°C, V_{CC} = 5V, R_L = 110Ω, C_L = 15pF, Input t_r = t_f = 10ns	-	-	10	ns
Turn-On Delay, Input to Output	t_{PHL}		-	-	35	

2. Not production tested in die form, characterized by chip design

Switching Waveform



Test Circuit



* Includes all probe and jig capacitance