

74LVC1G14 Single Schmitt-Trigger Inverter

1. General Description

1.1 Description

This single Schmitt-trigger inverter is designed for 1.65-V to 5.5-V VCC operation.

The 74LVC1G14 device contains one inverter and performs the Boolean function $Y = \bar{A}$. The device functions as an independent inverter with Schmitt-trigger inputs, so the device has different input threshold levels for positive-going (V_{T+}) and negative-going (V_{T-}) signals to provide hysteresis (ΔV_T) which makes the device tolerant to slow or noisy input signals.

1.2 Features

- Supports 5V VCC operation

- Inputs accept voltages to 5.5V
- Low power consumption, 10 μ A max I_{CC}
- ± 24 mA output drive at 3.3V
- I_{off} supports partial-power-down mode Operation

1.3 Device Information

PART NUMBER	PACKAGE
74LVC1G14	SOT23
	SC70
	SOT5X3
	DFN
	DSBGA

2. Connection Diagrams and Pin Description

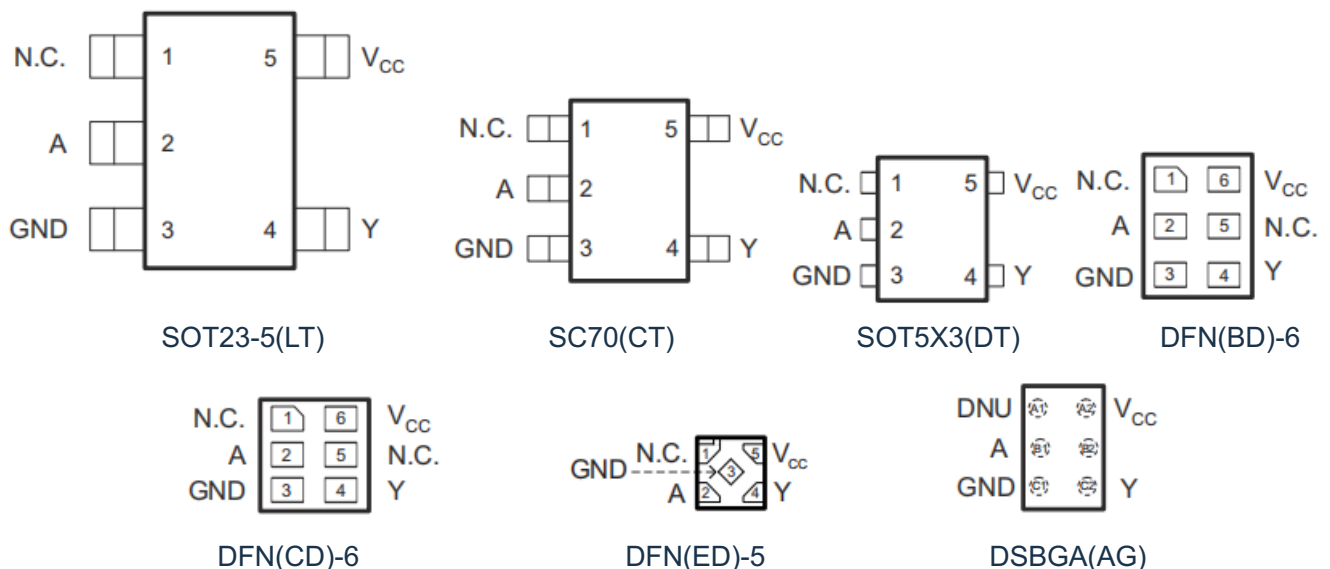


Figure 2.1: Top View

PIN No.				NAME	I/O	FUNCTION
LT/CT/DT	BD/CD	AG	ED			
1	1,5	A1,B2	1	NC		No Connected
2	2	B1	2	A	I	Input
3	3	C1	3	GND		Ground
4	4	C2	4	Y	O	Output
5	6	A2	5	VCC		Supply Voltage

3. System Diagram

3.1 Logic Diagram

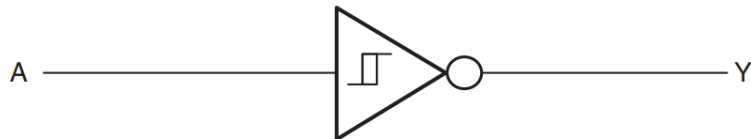


Figure 3.1: 74LVC1G14 Logic Diagram

3.2 Function Table

Input	Output
A	Y
1	0
0	1

1=High State, 0=Low State

4. Specifications

4.1 Absolute Maximum Ratings

Symbol	Parameter	MIN	MAX	Unit
V_{CC}	Supply Voltage	-0.5	6.5	V
V_I	Input Voltage Range	-0.5	6.5	V
V_O	Voltage Range(applied to any output in the high-impedance or power-off state) ⁽¹⁾	-0.5	6.5	V
	Voltage Range(applied to any output in the high or low state)	-0.5	$V_{CC} + 0.5$	V
I_O	Continuous Output Current		± 50	mA
T_J	Junction Temperature		125	°C
T_{OP}	Operating Temperature	0	70	°C

Absolute maximum ratings are those values beyond which the device could be permanently damaged, These are stress ratings only, which do not imply functional operation of the device at these or any other conditions beyond those indicated under normal operating conditions.

- (1) The input and output negative-voltage ratings may be exceeded if the input and output current ratings are observed.

4.2 Electrical Characteristics

4.2.1 DC Specifications

($T_a=25^{\circ}\text{C}$, voltages are referenced to GND (ground=0V), All typical values are at $V_{CC}=3.3\text{V}$, unless otherwise specified)

Symbol	Parameter	Test Condition	MIN	TYP	MAX	Unit
I_{OH}	High Level Output Current	$V_{CC}=1.65\text{V}$	--	--	-4	mA
		$V_{CC}=2.3\text{V}$	--	--	-8	mA
		$V_{CC}=3\text{V}$	--	--	-16	mA
			--	--	-24	mA
		$V_{CC}=4.5\text{V}$	--	--	-32	mA
I_{OL}	Low Level Output Current	$V_{CC}=1.65\text{V}$	--	--	4	mA
		$V_{CC}=2.3\text{V}$	--	--	8	mA
		$V_{CC}=3\text{V}$	--	--	16	mA
			--	--	24	mA
		$V_{CC}=4.5\text{V}$	--	--	32	mA



Symbol	Parameter	Test Condition	MIN	TYP	MAX	Unit
V_{T+}	Positive Switching Threshold	$V_{CC}=1.65V$	0.76	--	1.13	V
		$V_{CC}=2.3V$	1.08	--	1.56	V
		$V_{CC}=3V$	1.48	--	1.92	V
		$V_{CC}=4.5V$	2.19	--	2.74	V
		$V_{CC}=5.5V$	2.65	--	3.33	V
V_{T-}	Negative Switching Threshold	$V_{CC}=1.65V$	0.38	--	0.62	V
		$V_{CC}=2.3V$	0.59	--	0.91	V
		$V_{CC}=3V$	0.85	--	1.15	V
		$V_{CC}=4.5V$	1.35	--	1.85	V
		$V_{CC}=5.5V$	1.75	--	2.25	V
ΔV_T	Hysteresis($V_{T+}-V_{T-}$)	$V_{CC}=1.65V$	0.35	--	0.65	V
		$V_{CC}=2.3V$	0.45	--	0.8	V
		$V_{CC}=3V$	0.5	--	0.9	V
		$V_{CC}=4.5V$	0.65	--	1.05	V
		$V_{CC}=5.5V$	0.8	--	1.2	V
V_{OH}	High Level Output Voltage	$V_{CC}=1.65V$ to $5.5V, I_{OH}=-100\mu A$	$V_{CC}-0.1$	--	--	V
		$V_{CC}=1.65V, I_O=-4mA$	--	1.47	--	V
		$V_{CC}=2.3V, I_O=-8mA$	--	2.15	--	V
		$V_{CC}=3V, I_O=-16mA$	--	2.8	--	V
		$V_{CC}=3V, I_O=-24mA$	--	2.7	--	V
		$V_{CC}=4.5V, I_O=-32mA$	--	4.2	--	V
V_{OL}	Low Level Output Voltage	$V_{CC}=1.65V$ to $5.5V, I_{OH}=100\mu A$	--	--	0.1	V
		$V_{CC}=1.65V, I_O=4mA$	--	0.09	--	V
		$V_{CC}=2.3V, I_O=8mA$	--	0.1	--	V
		$V_{CC}=3V, I_O=16mA$	--	0.15	--	V
		$V_{CC}=3V, I_O=24mA$	--	0.25	--	V
		$V_{CC}=4.5V, I_O=32mA$	--	0.25	--	V
I_I	A Input Leakage Current	$V_{CC}=0$ to $5.5V, V_I=V_{CC}$ or GND	--	0	± 1	μA
I_{off}	Power Off Leakage Current	$V_{CC}=0V, V_I$ or $V_O=5.5V$	--	0	± 10	μA
I_{CC}	Quiescent Supply Current	$V_{CC}=1.65V$ to $5.5V, V_I=V_{CC}$ or GND, $I_O=0$	--	0	10	μA
ΔI_{CC}	Additional Quiescent Supply Current Per Input Pin	$V_{CC}=3V$ to $5.5V$, one input at $V_{CC}-0.6V$, other inputs at V_{CC} or GND	--	--	500	μA

5. Application Information

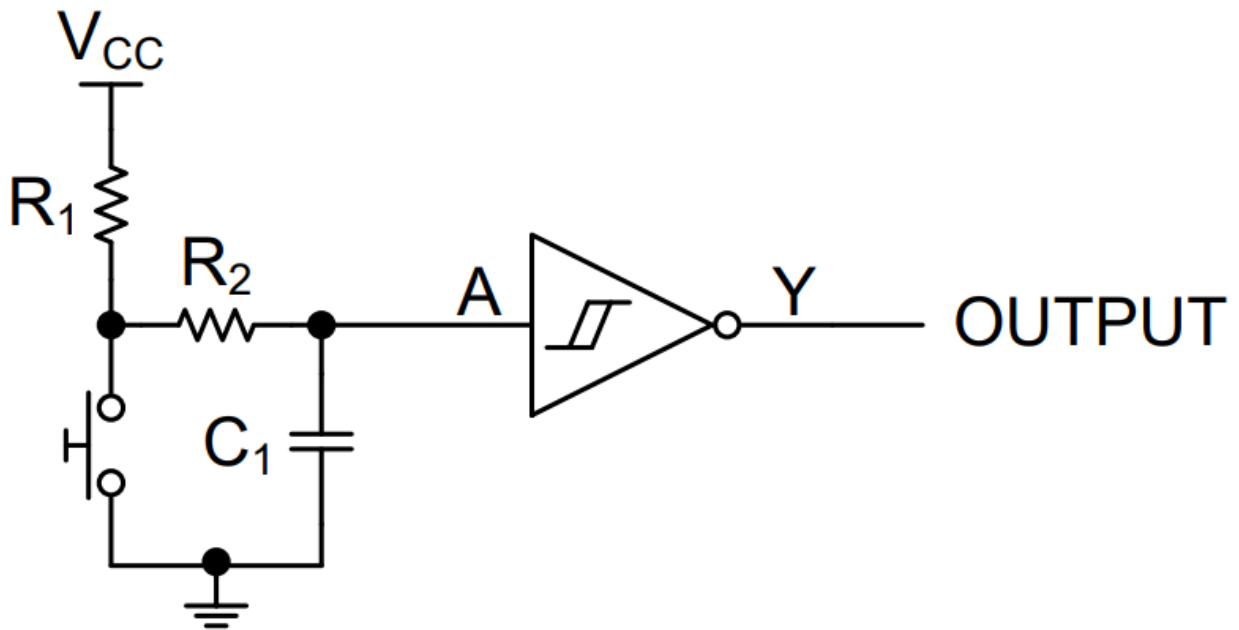


Figure 5.1: Application Schematic

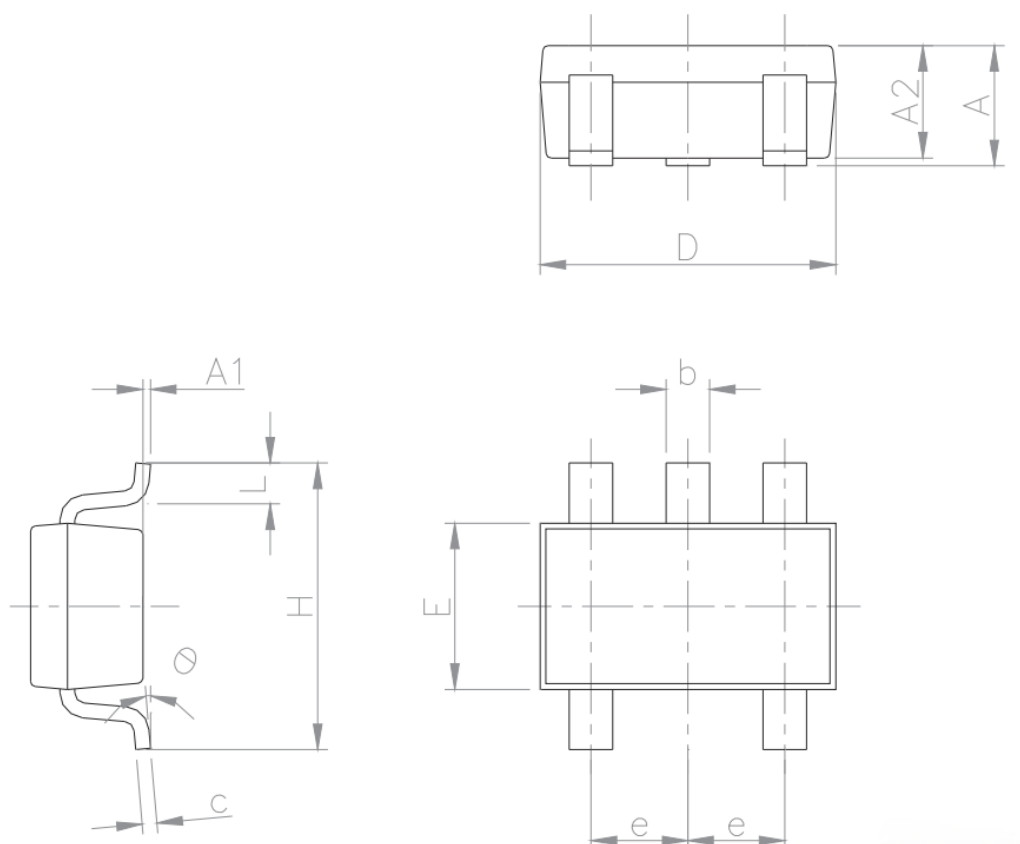


6. Ordering Information

Orderable Device	Package Type	Pins	Packing	Package Qty
74LVC1G14LT05ARCQ	SOT23	5	Tape & Reel	3000
74LVC1G14CT05ARCQ	SC70	5	Tape & Reel	3000
74LVC1G14DT05ARDQ	SOT5x3	5	Tape & Reel	4000
74LVC1G14BD06AREQ	DFN(BD)	6	Tape & Reel	5000
74LVC1G14CD06AREQ	DFN(CD)	6	Tape & Reel	5000
74LVC1G14ED05ARCQ	DFN	5	Tape & Reel	3000
74LVC1G14AG05ARCQ	DSBGA	5	Tape & Reel	3000

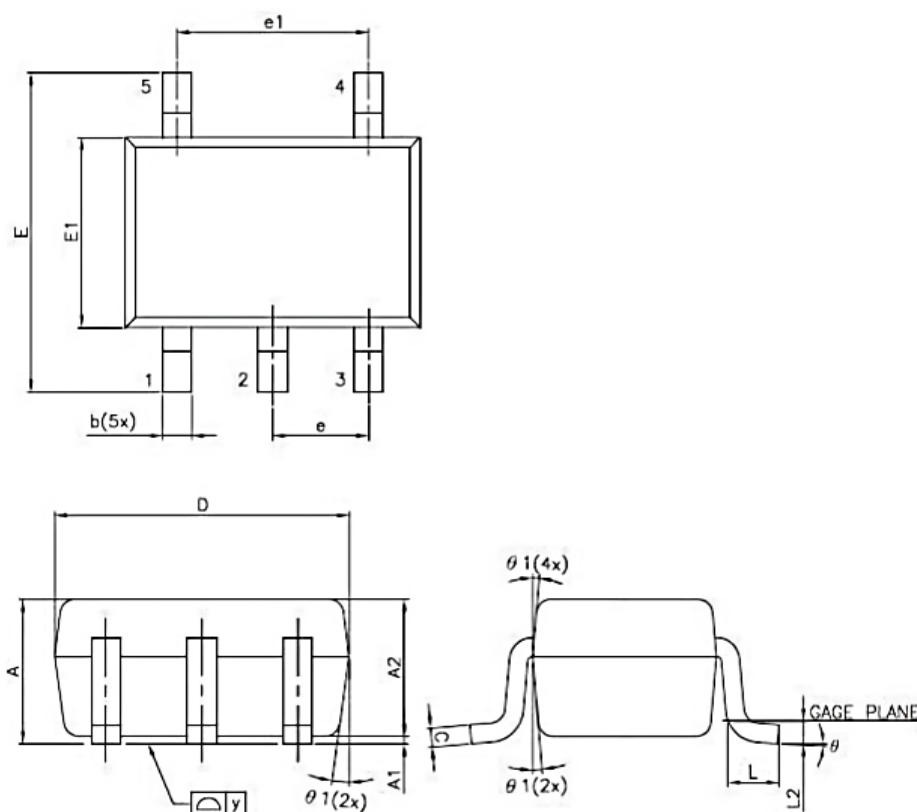
7. Package Information

7.1 SOT23-5



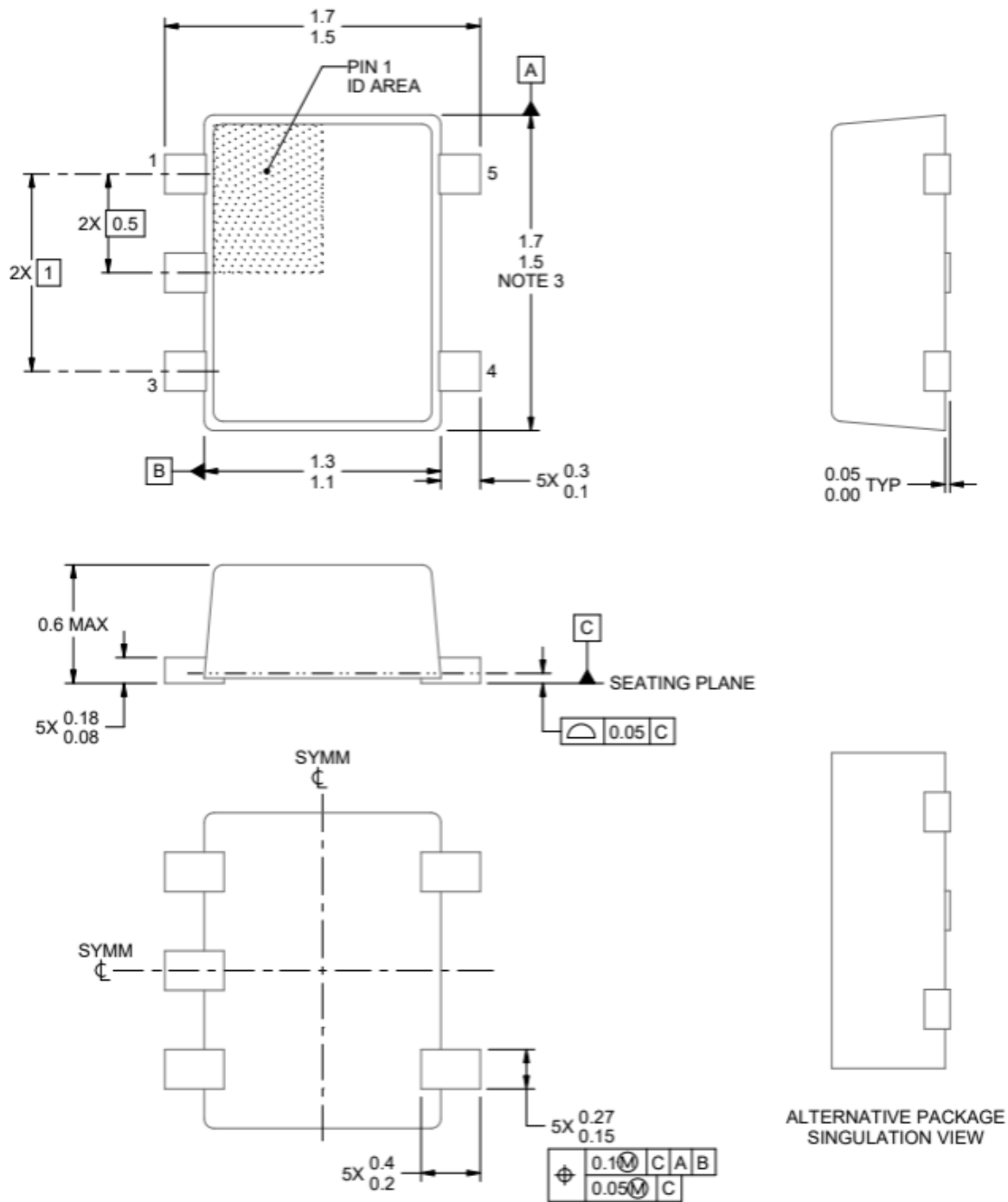
Symbol	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	0.90	-	1.45	0.035	-	0.057
A1	-	-	0.15	-	-	0.006
A2	0.90	-	1.30	0.035	-	0.051
b	0.35	-	0.50	0.014	-	0.020
c	0.09	-	0.20	0.004	-	0.008
D	2.80	-	3.05	0.110	-	0.120
E	1.50	-	1.75	0.059	-	0.069
e	-	0.95	-	-	0.037	-
H	2.60	-	3.00	0.102	-	0.118
L	0.10	-	0.60	0.004	-	0.024
θ	0 degrees	-	10 degrees	-	-	-

7.2 SC70

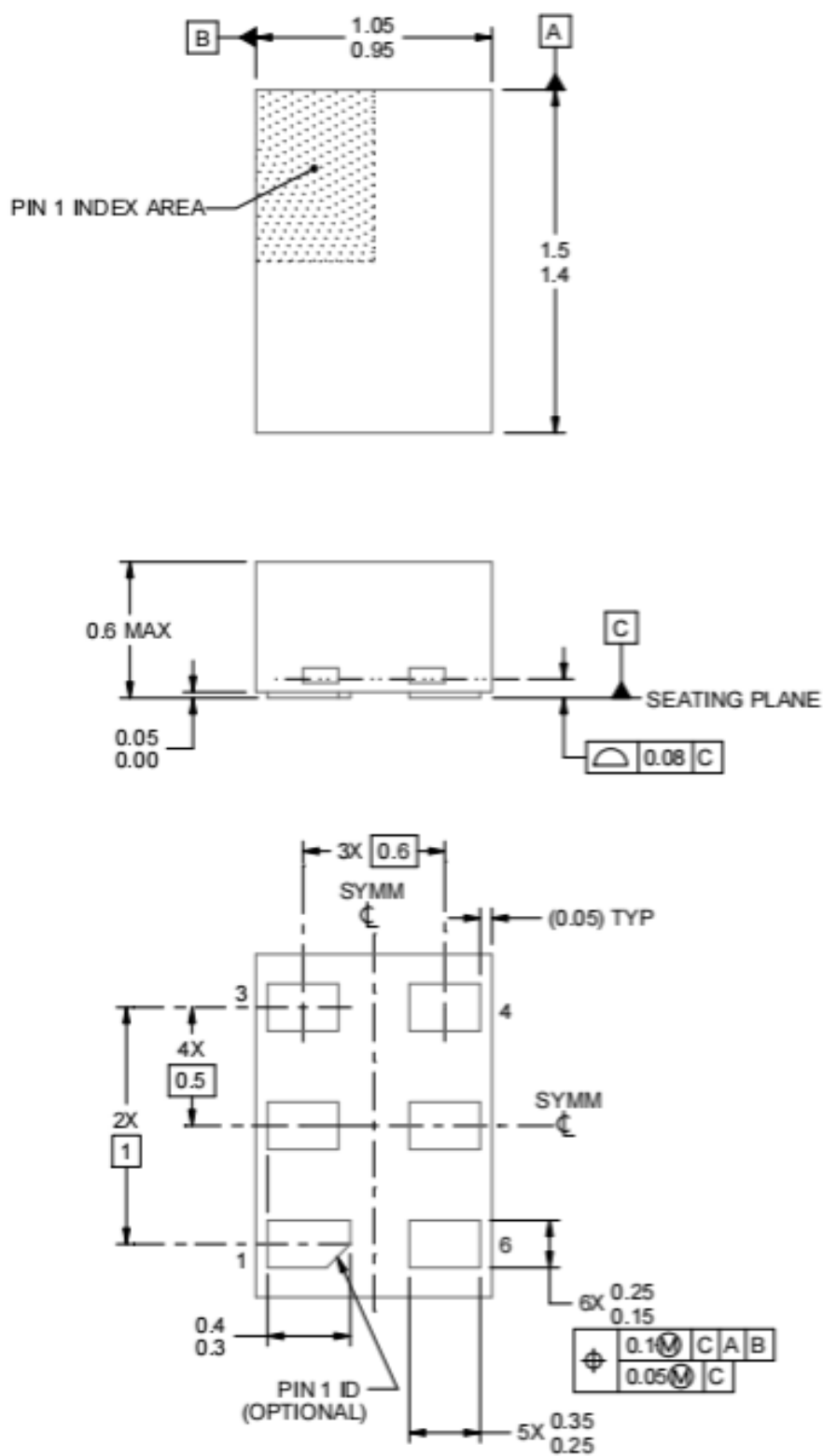


Symbol	Dim in mm		
	MIN	TYP	MAX
A	0.90	1.00	1.10
A1	0.00	0.05	0.10
A2	0.90	0.95	1.00
b	0.15	0.25	0.35
C	0.10	0.12	0.15
D	1.80	2.00	2.20
E	2.15	2.25	2.35
E1	1.15	1.25	1.35
e	0.650TYP.		
e1	1.20	1.30	1.40
L	0.25	0.30	0.40
L2	0.15TYP.		
Y	0.00	0.05	0.10
θ	4°	8°	12°

7.3 SOT5X3

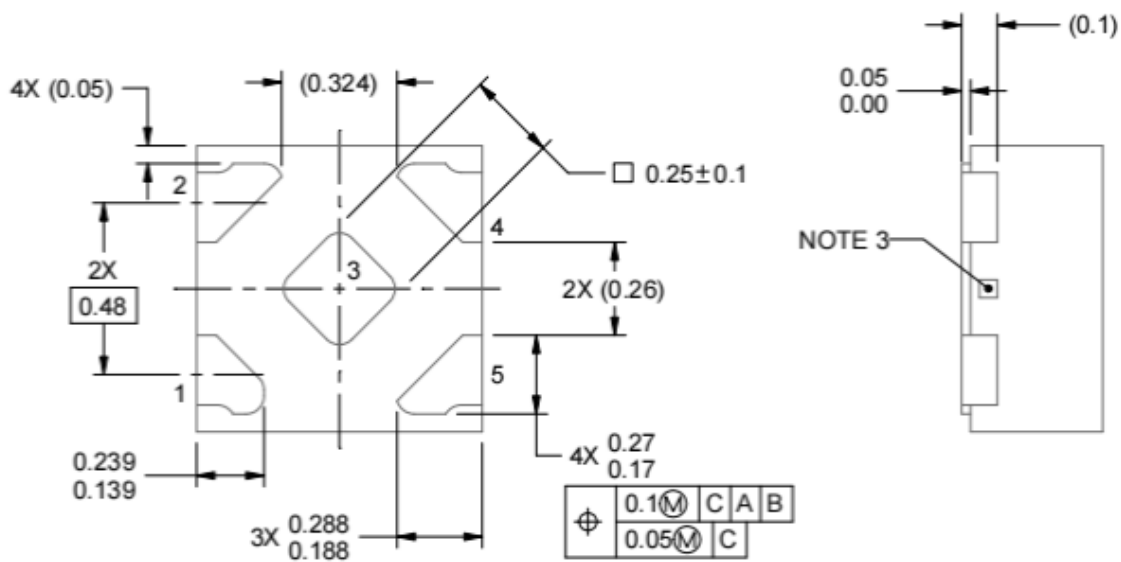
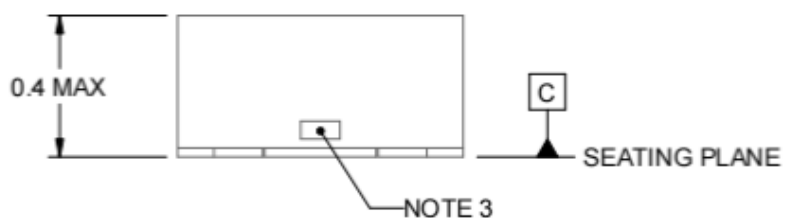
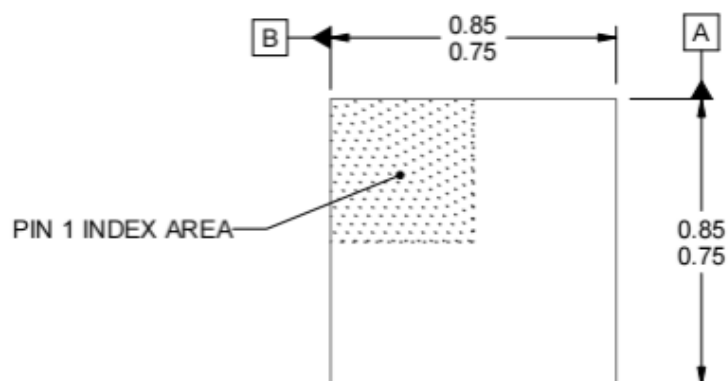


7.4 DFN(BD)-6



Rev.A1.0/2024.9

7.6 DFN5



7.7 DSBGA

