



SGMICRO Low Power Configurable Multiple Function Gate

74LVC1G58

GENERAL DESCRIPTION

The 74LVC1G58 is a low power configurable multiple function gate that is designed for 1.65V to 5.5V V_{CC} operation. All inputs support Schmitt-Trigger action and can be tied directly to V_{CC} or GND.

The use of 3-bit input allows the device to be configured for logic functions such as AND, NAND, OR, NOR, XOR, inverter and buffer. Both 3.3V and 5V devices can drive inputs, enabling this device to operate in a mixed 3.3V and 5V system environment.

This device is highly suitable for partial power-down applications by using power-off circuit. When the device is powered down, the output is disabled, and the current backflow can be prevented from passing through the device.

The 74LVC1G58 is available in Green SC70-6, SOT-23-6, UTDFN-1.45×1-6AL and XTDFN-1×1-6L packages. It operates over a temperature range of -40°C to +125°C.

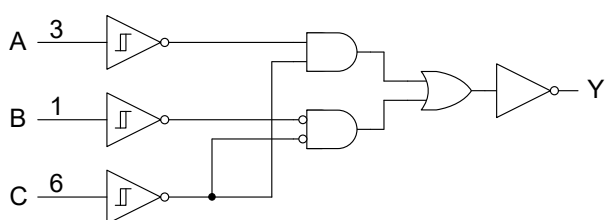
FEATURES

- Wide Operating Voltage Range: 1.65V to 5.5V
- Inputs Accept Voltages Higher than the Supply Voltage and up to 5.5V
- +24mA/-24mA Output Current at $V_{CC} = 3.0V$
- High Noise Immunity
- All Inputs with Schmitt-Trigger
- CMOS Low Power Dissipation
- Direct Interface with TTL Levels
- Support Partial Power-Down Mode
- Latch-Up Performance (> 250mA) Meets JESD 78, Class II Standard
- -40°C to +125°C Operating Temperature Range
- Available in Green SC70-6, SOT-23-6, UTDFN -1.45×1-6AL and XTDFN-1×1-6L Packages

APPLICATIONS

Industrial Equipment
Computing Platform
Medical System

LOGIC DIAGRAM



FUNCTION TABLE

INPUT			OUTPUT
A	B	C	Y
L	L	L	L
H	L	L	H
L	H	L	L
H	H	L	H
L	L	H	H
H	L	H	H
L	H	H	L
H	H	H	L

H = High Voltage Level

L = Low Voltage Level

PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
74LVC1G58	SC70-6	-40°C to +125°C	74LVC1G58XC6G/TR	1HLXX	Tape and Reel, 3000
	SOT-23-6	-40°C to +125°C	74LVC1G58XN6G/TR	1HO XXXXX	Tape and Reel, 3000
	UTDFN-1.45×1-6AL	-40°C to +125°C	74LVC1G58XUDL6G/TR	18X	Tape and Reel, 5000
	XTDFN-1×1-6L	-40°C to +125°C	74LVC1G58XXDM6G/TR	FX	Tape and Reel, 5000

MARKING INFORMATION

NOTE: X = Date Code. XX = Date Code. XXXXX = Date Code, Trace Code and Vendor Code.

SC70-6

YYY X X
 └───┘ └───┘
 Date Code - Week
 Date Code - Year
 Serial Number

UTDFN-1.45×1-6AL

YY X
 └───┘
 Date Code - Quarter
 Serial Number

SOT-23-6

XXXXX
 └───┘ └───┘
 Vendor Code
 Date Code - Week
 Date Code - Year

XTDFN-1×1-6L

Y X
 └───┘
 Date Code - Quarter
 Serial Number

Green (RoHS & HSF): SG Micro Corp defines "Green" to mean Pb-Free (RoHS compatible) and free of halogen substances. If you have additional comments or questions, please contact your SGMICRO representative directly.

OVERSTRESS CAUTION

Stresses beyond those listed in Absolute Maximum Ratings may cause permanent damage to the device. Exposure to absolute maximum rating conditions for extended periods may affect reliability. Functional operation of the device at any conditions beyond those indicated in the Recommended Operating Conditions section is not implied.

ESD SENSITIVITY CAUTION

This integrated circuit can be damaged if ESD protections are not considered carefully. SGMICRO recommends that all

integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage. ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because even small parametric changes could cause the device not to meet the published specifications.

DISCLAIMER

SG Micro Corp reserves the right to make any change in circuit design, or specifications without prior notice.

ABSOLUTE MAXIMUM RATINGS

Supply Voltage Range, V_{CC}	-0.5V to 6.5V
Input Voltage Range, V_I ⁽¹⁾	-0.5V to 6.5V
Output Voltage Range, V_O ⁽¹⁾	
Active Mode	-0.5V to MIN(6.5V, $V_{CC} + 0.5V$)
Power-Down Mode ($V_{CC} = 0V$)	-0.5V to 6.5V
Input Clamp Current, I_{IK} ($V_I < 0V$)	-50mA
Output Clamp Current, I_{OK} ($V_O < 0V$)	-50mA
Continuous Output Current, I_O ($V_O = 0V$ to V_{CC})	$\pm 50mA$
Continuous Current through V_{CC} or GND	$\pm 100mA$
Junction Temperature ⁽²⁾	+150°C
Storage Temperature Range	-65°C to +150°C
Lead Temperature (Soldering, 10s)	+260°C
ESD Susceptibility ^{(3) (4)}	
HBM	$\pm 5000V$
CDM	$\pm 1000V$

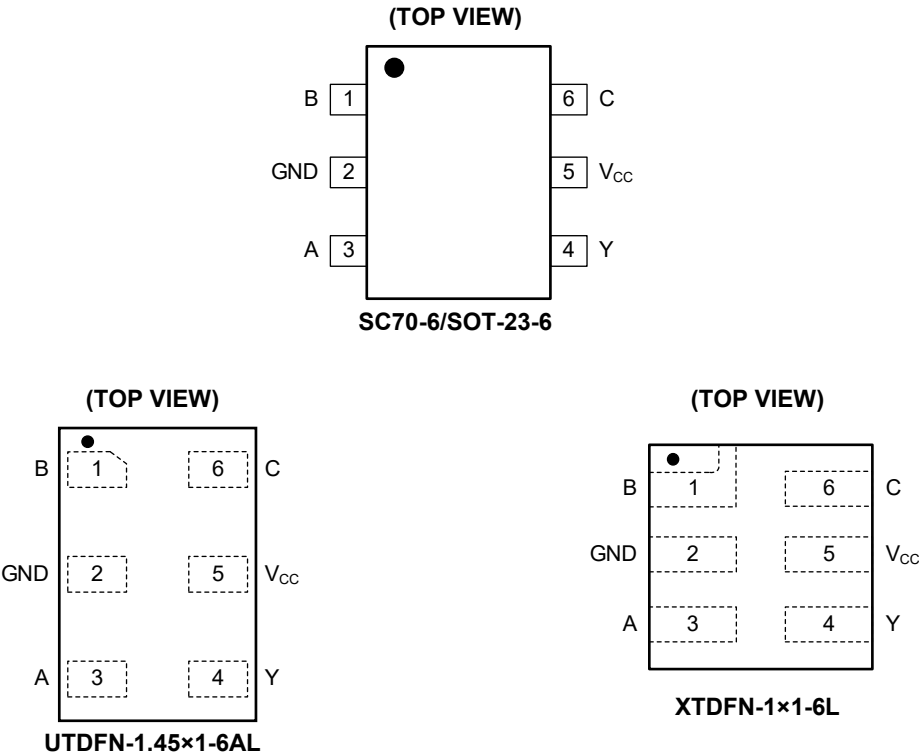
NOTES:

1. The input and output voltage ratings may be exceeded if the input and output clamp current ratings are observed.
2. The performance capability of a high-performance integrated circuit in conjunction with its thermal environment can create junction temperatures which are detrimental to reliability.
3. For human body model (HBM), all pins comply with ANSI/ESDA/JEDEC JS-001 specifications.
4. For charged device model (CDM), all pins comply with ANSI/ESDA/JEDEC JS-002 specifications.

RECOMMENDED OPERATING CONDITIONS

Supply Voltage Range, V_{CC}	1.65V to 5.5V
Input Voltage Range, V_I	0V to 5.5V
Output Voltage Range, V_O	
Active Mode	0V to V_{CC}
Power-Down Mode ($V_{CC} = 0V$)	0V to 5.5V
High-Level Output Current, I_{OH}	
$V_{CC} = 1.65V$	-4mA (MAX)
$V_{CC} = 2.3V$	-8mA (MAX)
$V_{CC} = 2.7V$	-12mA (MAX)
$V_{CC} = 3.0V$	-24mA (MAX)
$V_{CC} = 4.5V$	-32mA (MAX)
Low-Level Output Current, I_{OL}	
$V_{CC} = 1.65V$	4mA (MAX)
$V_{CC} = 2.3V$	8mA (MAX)
$V_{CC} = 2.7V$	12mA (MAX)
$V_{CC} = 3.0V$	24mA (MAX)
$V_{CC} = 4.5V$	32mA (MAX)
Operating Temperature Range	-40°C to +125°C

PIN CONFIGURATIONS



PIN DESCRIPTION

PIN	NAME	FUNCTION
1, 3, 6	B, A, C	Data Inputs.
2	GND	Ground.
4	Y	Data Output.
5	V _{CC}	Supply Voltage.

LOGIC CONFIGURATIONS

Table 1. Selection Table for Logic Function

Logic Function	Figure No.
2-Input NAND Gate	See Figure 1
2-Input OR Gate with Two Inverted Inputs	See Figure 1
2-Input AND Gate with One Inverted Input	See Figure 2 and Figure 3
2-Input NOR Gate with One Inverted Input	See Figure 2 and Figure 3
2-Input OR Gate	See Figure 4
2-Input NAND Gate with Two Inverted Inputs	See Figure 4
2-Input XOR Gate	See Figure 5
Inverter	See Figure 6
Buffer	See Figure 7

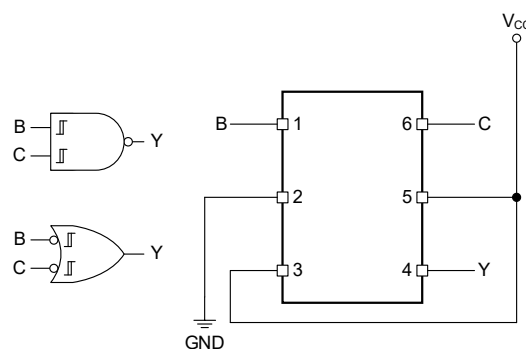


Figure 1. 2-Input NAND Gate or 2-Input OR Gate with Inverted Inputs B and C

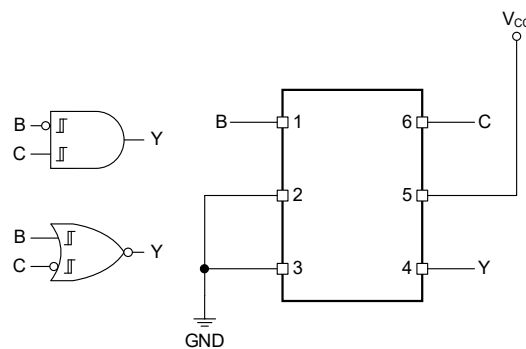


Figure 2. 2-Input AND Gate with Inverted Input B or 2-Input NOR Gate with Inverted Input C

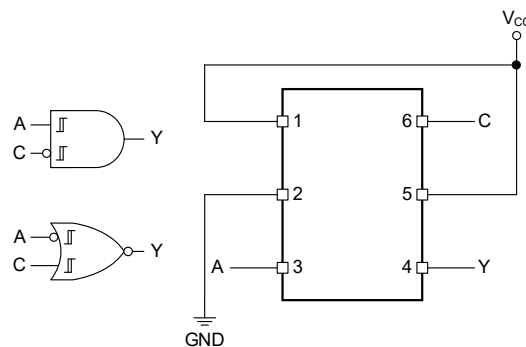


Figure 3. 2-Input AND Gate with Inverted Input C or 2-Input NOR Gate with Inverted Input A

LOGIC CONFIGURATIONS (continued)

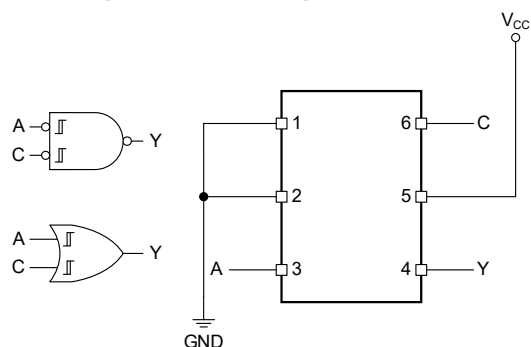


Figure 4. 2-Input OR Gate or 2-Input NAND Gate with Inverted Inputs A and C

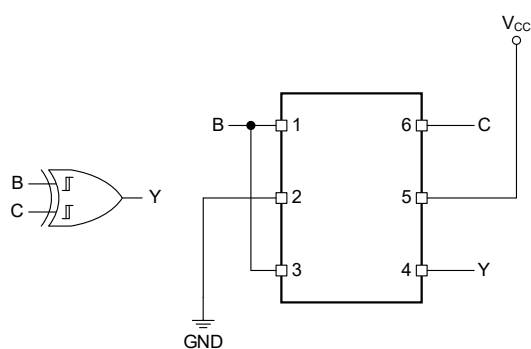


Figure 5. 2-Input XOR Gate

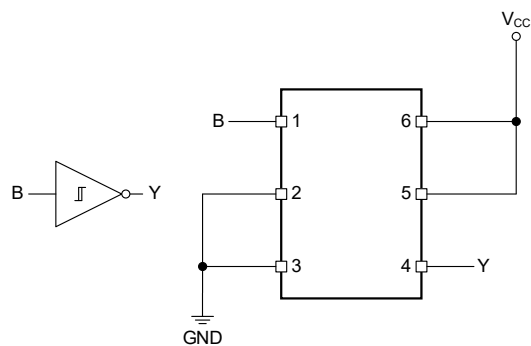


Figure 6. Inverter

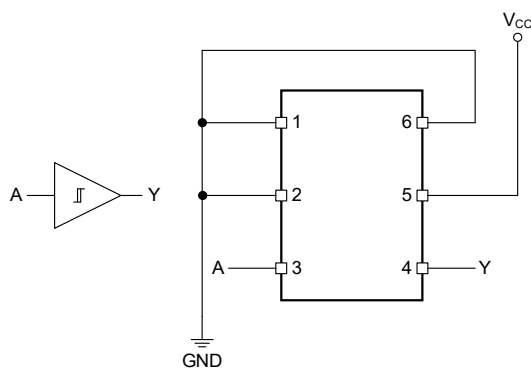
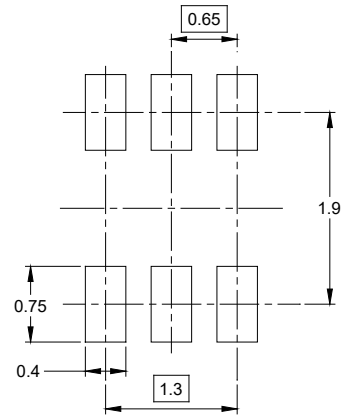
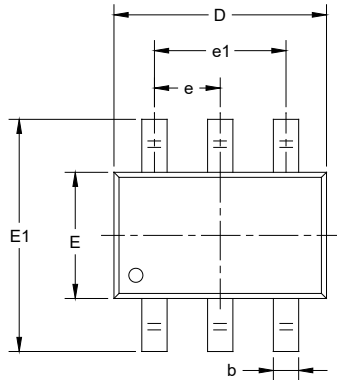


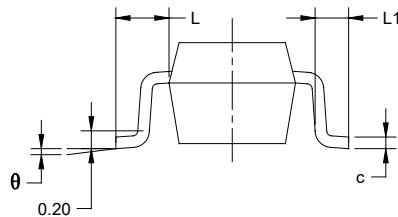
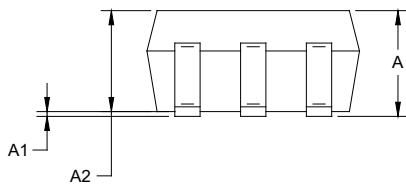
Figure 7. Buffer

PACKAGE OUTLINE DIMENSIONS

SC70-6



RECOMMENDED LAND PATTERN (Unit: mm)



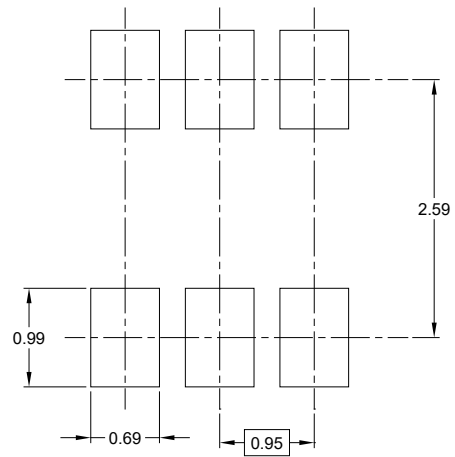
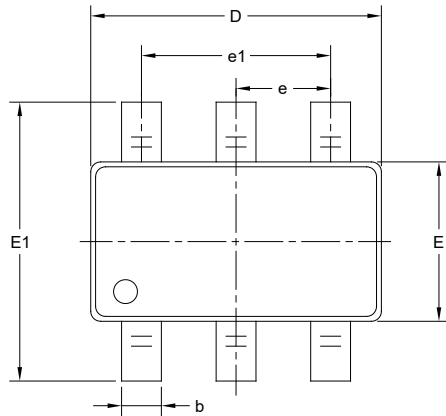
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	0.800	1.100	0.031	0.043
A1	0.000	0.100	0.000	0.004
A2	0.800	1.000	0.031	0.039
b	0.150	0.350	0.006	0.014
c	0.080	0.220	0.003	0.009
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.65 TYP		0.026 TYP	
e1	1.300 BSC		0.051 BSC	
L	0.525 REF		0.021 REF	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

NOTES:

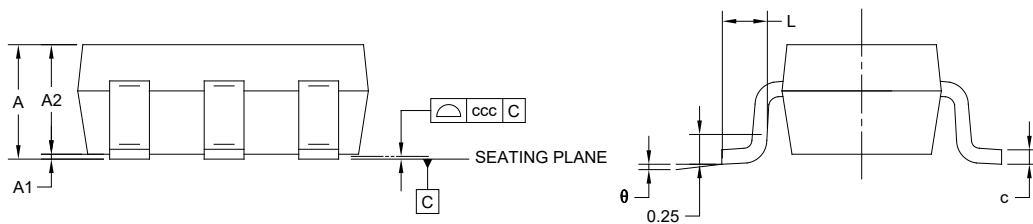
1. Body dimensions do not include mode flash or protrusion.
2. This drawing is subject to change without notice.

PACKAGE OUTLINE DIMENSIONS

SOT-23-6



RECOMMENDED LAND PATTERN (Unit: mm)



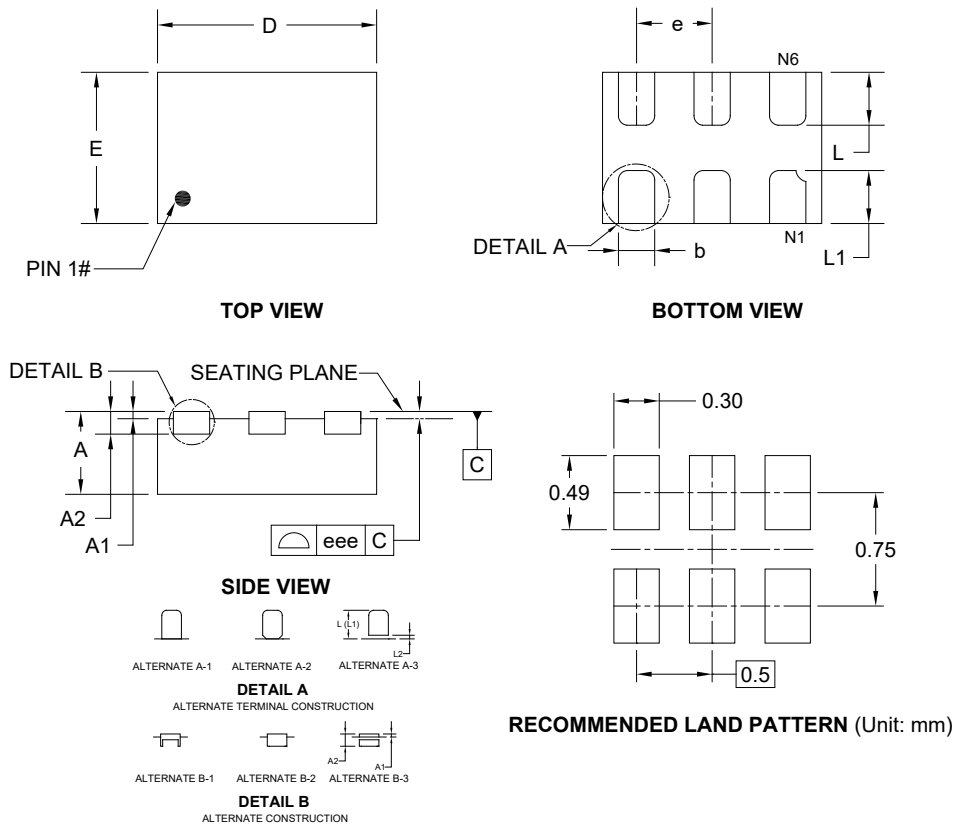
Symbol	Dimensions In Millimeters		
	MIN	NOM	MAX
A	-	-	1.450
A1	0.000	-	0.150
A2	0.900	-	1.300
b	0.300	-	0.500
c	0.080	-	0.220
D	2.750	-	3.050
E	1.450	-	1.750
E1	2.600	-	3.000
e	0.950 BSC		
e1	1.900 BSC		
L	0.300	-	0.600
θ	0°	-	8°
ccc	0.100		

NOTES:

1. This drawing is subject to change without notice.
2. The dimensions do not include mold flashes, protrusions or gate burrs.
3. Reference JEDEC MO-178.

PACKAGE OUTLINE DIMENSIONS

UTDFN-1.45×1-6AL

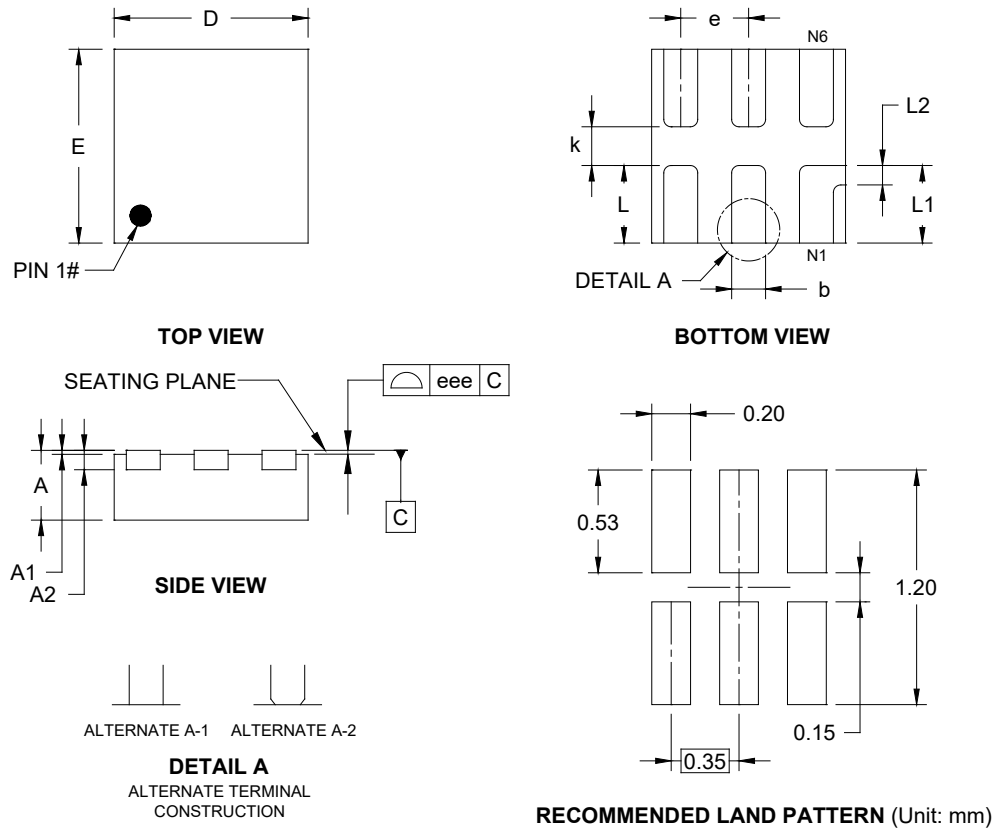


Symbol	Dimensions In Millimeters		
	MIN	NOM	MAX
A	0.450	-	0.600
A1	-0.004	-	0.050
A2	0.150 REF		
b	0.150	-	0.300
D	1.374	-	1.526
E	0.924	-	1.076
e	0.500 BSC		
L	0.250	-	0.450
L1	0.250	-	0.500
L2	0.000	-	0.100
eee	0.050		

NOTE: This drawing is subject to change without notice.

PACKAGE OUTLINE DIMENSIONS

XTDFN-1×1-6L



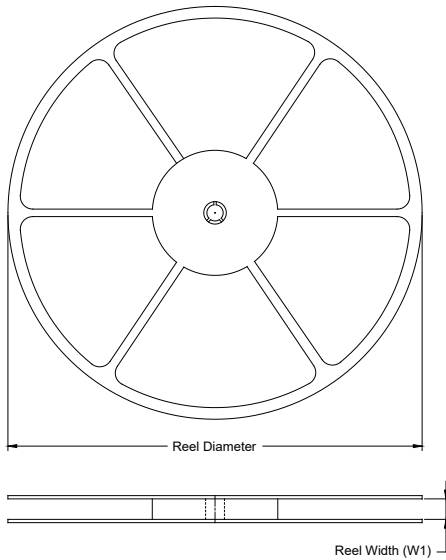
Symbol	Dimensions In Millimeters		
	MIN	NOM	MAX
A	0.320	-	0.400
A1	0.000	-	0.050
A2	0.100 REF		
b	0.120	-	0.230
D	0.950	-	1.050
E	0.950	-	1.050
e	0.350 BSC		
k	0.150 MIN		
L	0.350	-	0.450
L1	0.350	-	0.450
L2	0.100 REF		
eee	0.050		

NOTE: This drawing is subject to change without notice.

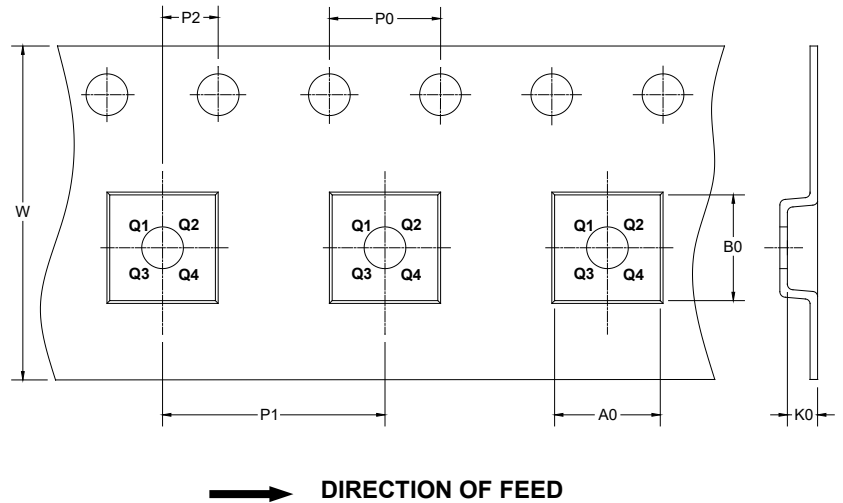
PACKAGE INFORMATION

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



NOTE: The picture is only for reference. Please make the object as the standard.

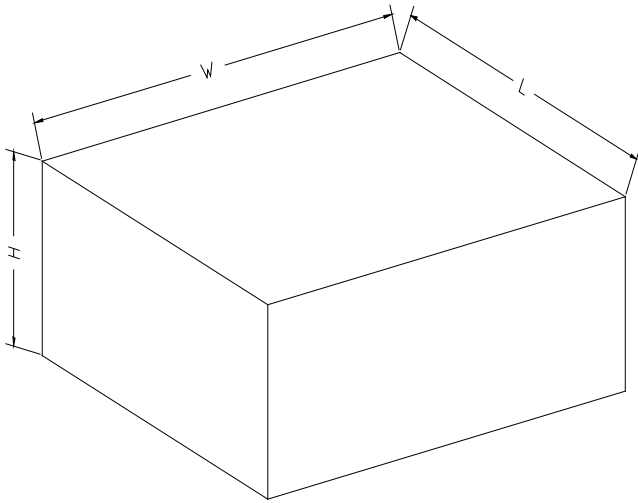
KEY PARAMETER LIST OF TAPE AND REEL

Package Type	Reel Diameter	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
SC70-6	7"	9.5	2.40	2.50	1.20	4.0	4.0	2.0	8.0	Q3
SOT-23-6	7"	9.5	3.23	3.17	1.37	4.0	4.0	2.0	8.0	Q3
UTDFN-1.45×1-6AL	7"	9.5	1.15	1.60	0.75	4.0	4.0	2.0	8.0	Q1
XTDFN-1×1-6L	7"	9.5	1.15	1.17	0.56	4.0	4.0	2.0	8.0	Q3

DD0001

PACKAGE INFORMATION

CARTON BOX DIMENSIONS



NOTE: The picture is only for reference. Please make the object as the standard.

KEY PARAMETER LIST OF CARTON BOX

Reel Type	Length (mm)	Width (mm)	Height (mm)	Pizza/Carton
7" (Option)	368	227	224	8
7"	442	410	224	18

DD0002