GT3257
Quad 1-of-2 multiplexer/demultiplexer

1 Features

- Supply voltage range from 1.8 V to 5.5 V
- High noise immunity
4.5 Ω switch connection between two ports
- Rail to rail switching on data I/O ports
- CMOS low power consumption
- Latch-up performance exceeds 250 mA per JESD78B Class I level A
- I_{OFF} circuitry provides partial Power-down mode operation
- Multiple package options
- Specified from -40 °C to 125 °C

2 Application

- Game Consoles
- Audio and Video Switching
- DVD Players
- Personal Video Recorders
- Supports defense, aerospace and medical applications
- Desktop Video Editors
- Hard Disk Recorders

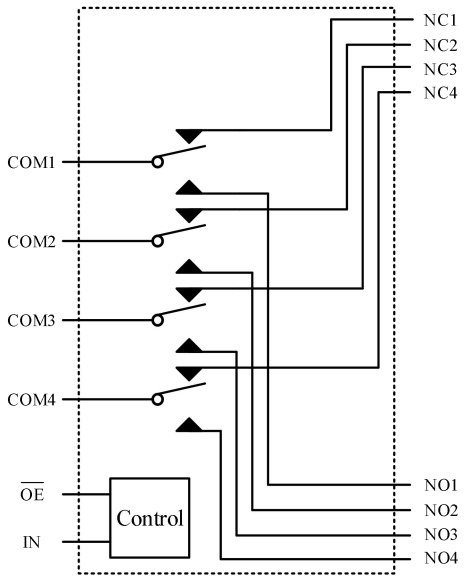
3 Description

The GT3257 provides a quad 1-of-2 high-speed multiplexer/demultiplexer with common select (IN) and output enable $\overline{EN}$ inputs. The low ON resistance of the switch allows inputs to be connected to outputs without adding propagation delay or generating additional ground bounce noise. When pin $\overline{EN}$ = LOW, one of the two switches is selected (low-impedance ON-state) with pin IN. When pin $\overline{EN}$ = HIGH, all switches are in the high-impedance OFF-state, independent of pin IN.

To ensure the high-impedance OFF-state during power-up or power-down, $\overline{EN}$ should be tied to the V_{CC} through a pull-up resistor. The minimum value of the resistor is determined by the current-sinking capability of the driver.

This device is fully specified for partial power-down applications using I_{OFF}. The I_{OFF} circuitry disables the output, preventing the damaging backflow current through the device when it is powered down.

Circuit Diagram



4 Device Summary, Pin and Packages

Table 4-1. Device Summary (1)

Serial Name	Part Name	Package	Body Size (Nom)	Marking(2)	MSL(3)	Package Qty
GT3257	GT3257PE	SOP16	9.90mm*3.90mm*1.75mm	GT3257 XXXXXXX	3	4000
	GT3257TE	TSSOP16	5.00mm*4.40mm*1.20mm	GT3257 XXXXXXX	3	4000
	GT3257UE	UTQFN2.6*1.8-16L	2.60mm*1.80mm*0.55mm	GT3257 XXXXX	3	4000

(1) For all available packages, please contact product sales

(2) There may be additional marking, which relates to the lot trace code information (data code and vendor code), the logo or the environmental category on the device.

(3) MSL, The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications.

(4) "XXXXX" in Marking will be appeared as the batch code.

4 Device Summary, Pin and Packages

Top View

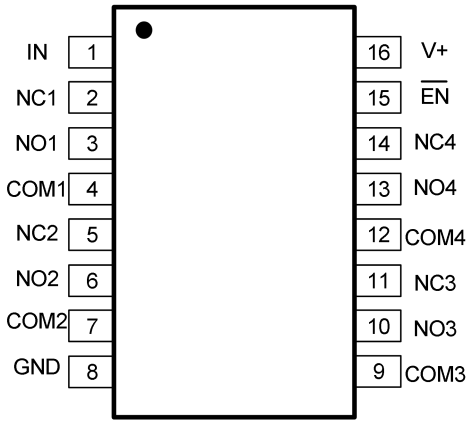


Fig.4-1. GT3257:TE(TSSOP16) Package
GT3257:PE(SOP16) Package

Top View

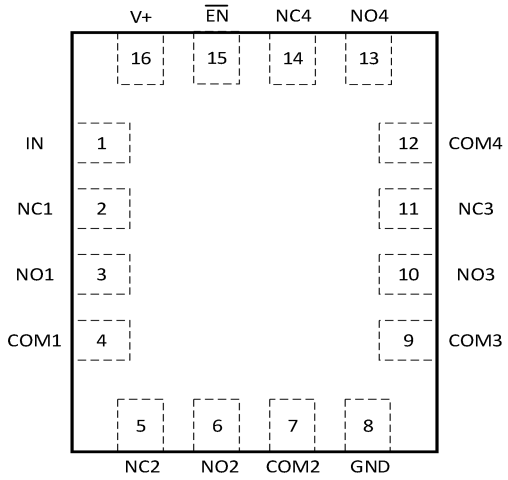


Fig.4-2. GT3257:UE(UTQFN2.6*1.8-16L) Package

Table 4-3 Pin Definition

Name	Pin	I/O	Description
IN	1	I	select input
NC1	2	I/O	NC1 input/output
NO1	3	I/O	NO1 input/output
COM1	4	I/O	COM1 input/output
NC2	5	I/O	NC2 input/output
NO2	6	I/O	NO2 input/output
COM2	7	I/O	COM2 input/output
GND	8	G	ground
COM3	9	I/O	COM3 input/output
NO3	10	I/O	NO3 input/output
NC3	11	I/O	NC3 input/output
COM4	12	I/O	COM4 input/output
NO4	13	I/O	NO4 input/output
NC4	14	I/O	NC4 input/output
$\overline{EN}$	15	I	output enable input (active LOW)
V_+	16	P	supply voltage

* It is suggested to leave the unconnected pins floating

Table 4-4 Truth Table

IN	$\overline{EN}$	NC_X	NO_X
0	0	ON	OFF
1	0	OFF	ON
X	1	OFF	OFF

5 Voltage, Temperature, ESD and Thermal Ratings

5.1 Absolute Maximum Ratings

Parameters	Min.	Max.	Unit
Supply Voltage (V_{CC})	-0.5	5.5	V
Control Input Voltage	-0.5	5.5	
Switch I/O Voltage	-0.5	V_{CC} +0.5	
Continuous Switch Current		1	uA
Storage Temperature	-65	150	°C

5.2 ESD Ratings

ESD			Value	Unit
V(ESD)[1][2]	Electrostatic Discharge	Human-Body Model (HBM)	7.5k	V

(1) JEDEC document JEP155 states that 500-V HBM allows safe manufacturing with a standard ESD control process.
(2) JEDEC document JEP157 states that 250-V CDM allows safe manufacturing with a standard ESD control process.

5.3 Recommended Operating Conditions

Over operating free-air temperature range (unless otherwise noted)

Symbol	Parameters	Min	Max	Unit
V_{CC}	supply voltage	1.8	5.5	V
V_I	input voltage	0	V_{CC}	
V_{SW}	switch voltage	0	V_{CC}	
T_{amb}	Operating Temperature	-40	125	°C

6 Electrical Specifications

V_{CC} = 2.3V or 3.6V, FULL= –40°C to +125°C, Typical values are at T_A = +25°C. (unless otherwise noted)

DC Electrical Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_{OFF}	power-off leakage current	V_{CC} =0V ,V_{SW} = 0 to 3.6V		1		μA
I_O	Channel OFF Leakage Current	Switch off, V_{SW} = 0 to 3.6V			1	μA
I_{IN}	Control Input Leakage	V_{IN} = GND or V_{CC}		1		μA
I_{CC}	Quiescent Supply Current	V_{CC} = 5.5V, V_I = GND or V_{CC}, V_{SW} = GND or V_{CC},		4		μA
V_{IH}	Input Voltage High	V_{CC} =2.3 V to 3.6V		1.6		V
V_{IL}	Input Voltage Low	V_{CC} =2.3 V to 3.6V		0.8		V
R_{ON}	On-Resistance	IN=$\overline{EN}$=GND,nA=GND,I=13mA		4.5		Ω
ΔR_{ON}	Delta R_{ON}	IN=$\overline{EN}$=GND,nA=GND,I=13mA		0.06	0.1	Ω
$R_{FLAT(ON)}$	On-Resistance Flatness	IN=$\overline{EN}$=GND,nA=GND,I=13mA		6.3		Ω

6 Electrical Specifications (Continued)

V_{CC} = 2.3V or 3.6V, FULL= –40°C to +125°C, Typical values are at T_A = +25°C. (unless otherwise noted)

AC Electrical Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
BW	-3 dB Bandwidth	V_{CC} = 3.3V,R_L=50Ω		320		MHz
T_{ON}	Turn-On Time	V_{SW}=GND，IN(↑50%），OUT(↑ 50%,C_L=20pF,R_L=75Ω		17.1		ns
T_{OFF}	Turn-Off Time	V_{SW}=GND，IN(↑50%），OUT(↑ 50%,C_L=20pF,R_L=75Ω		8.0		ns
X_{TALK}	Crosstalk	R_L=50Ω,f=250MHz		-73		dB
O_{IRR}	Off Isolation	R_L=150Ω, f=10MHz		-71		dB

Capacitance

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
C_{ON}	Switch ON Capacitance	f= 1MHz,R_L=50Ω		18		pF
C_{OFF}	Switch OFF Capacitance	f= 1MHz,R_L=50Ω		9		pF

7 Measurement Information

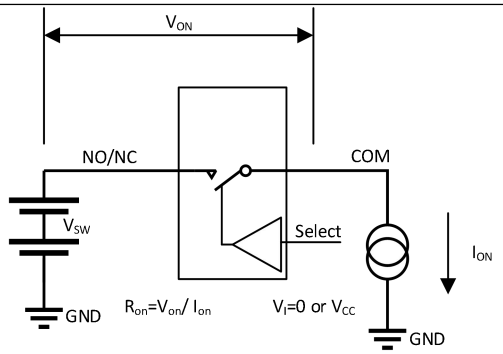


Fig. 7-1.On Resistance

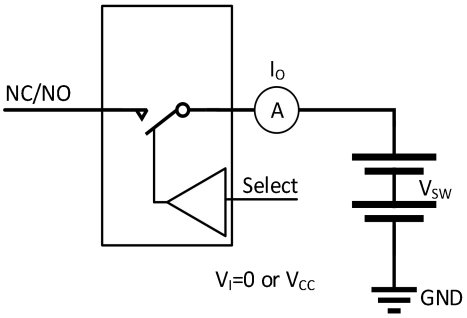


Fig. 7-2. Off Leakage

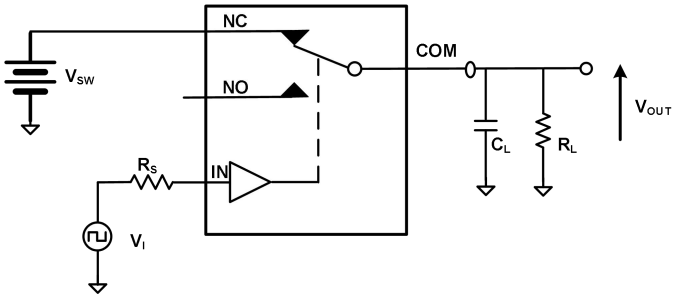


Fig. 7-3. AC Test Circuit Board

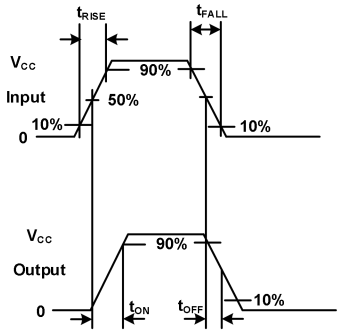


Fig. 7-4.Turn-On/Turn-Off waveform

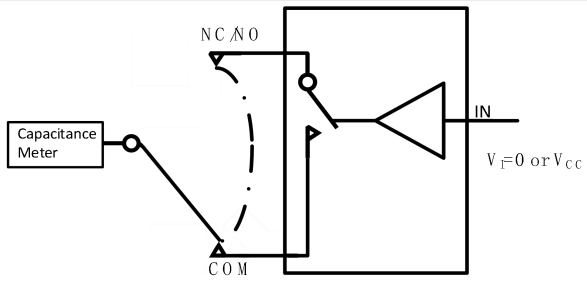


Fig. 7-5.Channel Off Capacitance

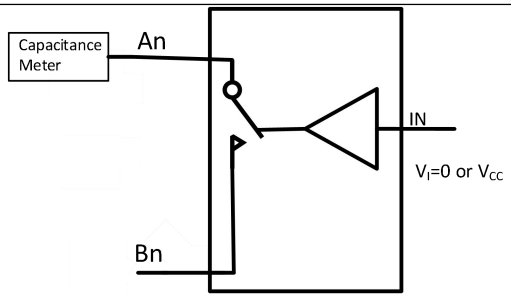
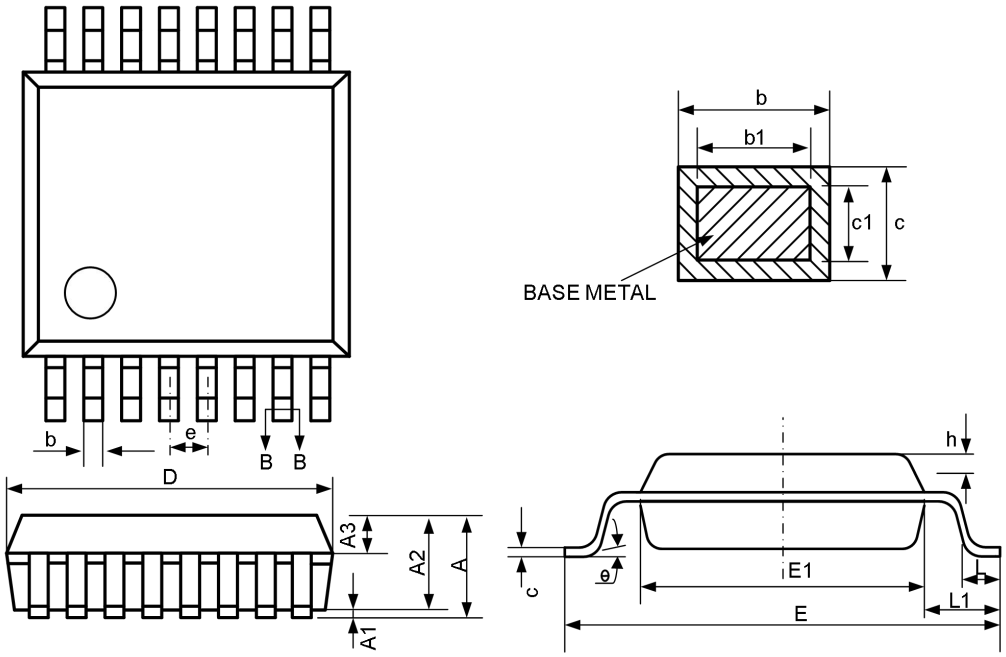


Fig. 7-6.Channel On Capacitance

8 Package Outline Dimension

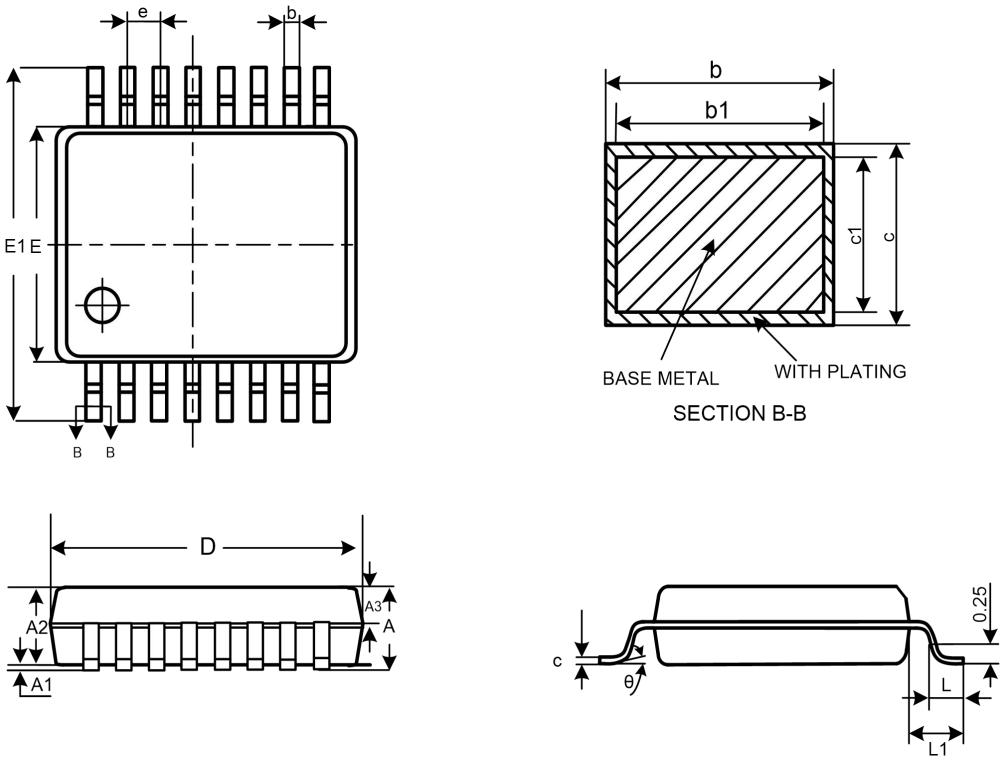
SOP16



symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min	Nom	Max	Min	Nom	Max
A	--	--	1.75	--	--	0.069
A1	0.10	--	0.225	0.004	--	0.009
A2	1.30	1.40	1.50	0.051	0.055	0.059
b	0.39	--	0.47	0.015	--	0.019
b1	0.38	0.41	0.44	0.015	0.016	0.017
c	0.20	--	0.24	0.008	--	0.009
c1	0.19	0.20	0.21	0.007	0.008	0.008
D	9.80	9.90	10.00	0.386	0.390	0.394
E	5.80	6.00	6.20	0.228	0.236	0.244
E1	3.80	3.90	4.00	0.150	0.154	0.157
e	1.27(BSC)			0.05(BSC)		
h	0.25	--	0.50	0.010	--	0.020
L	0.50	--	0.80	0.020	--	0.031
L1	1.05REF			0.041REF		
θ	0°	--	8°	0°	--	8°

8 Package Outline Dimension(Continued)

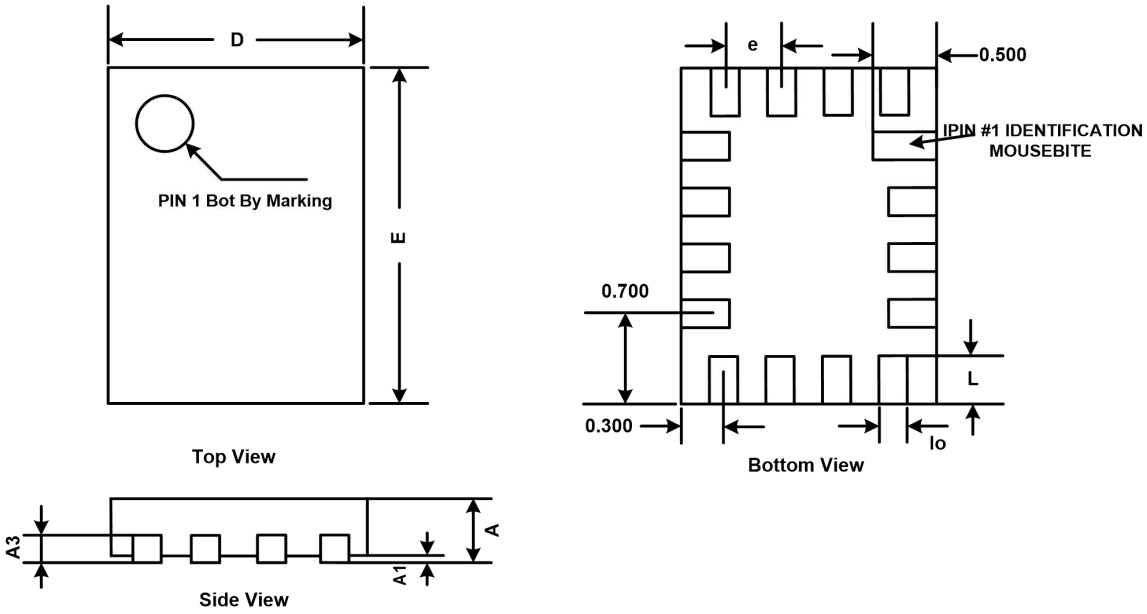
TSSOP16



Symbol	Dimensions in Millimeters			Dimensions in Inches		
	Min	Nom	Min	Nom	Min	Nom
A	—	—	1.20	—	—	0.047
A1	0.05	—	0.15	0.002	—	0.006
A2	0.80	1.00	1.05	0.031	0.039	0.041
A3	0.39	0.44	0.49	0.015	0.017	0.019
b	0.19	—	0.30	0.007	—	0.012
b1	0.19	0.22	0.25	0.007	0.009	0.010
c	0.13	—	0.18	0.005	—	0.007
c1	0.12	0.13	0.14	0.005	0.005	0.006
D	4.86	4.98	5.10	0.191	0.196	0.201
E	4.30	4.40	4.50	0.169	0.173	0.177
E1	6.20	6.40	6.60	0.244	0.252	0.260
e	0.65BSC			0.026BSC		
L	0.45	0.60	0.75	0.018	0.024	0.030
L1	1.00BSC			0.039BSC		
θ	0°	—	8°	0°	—	8°

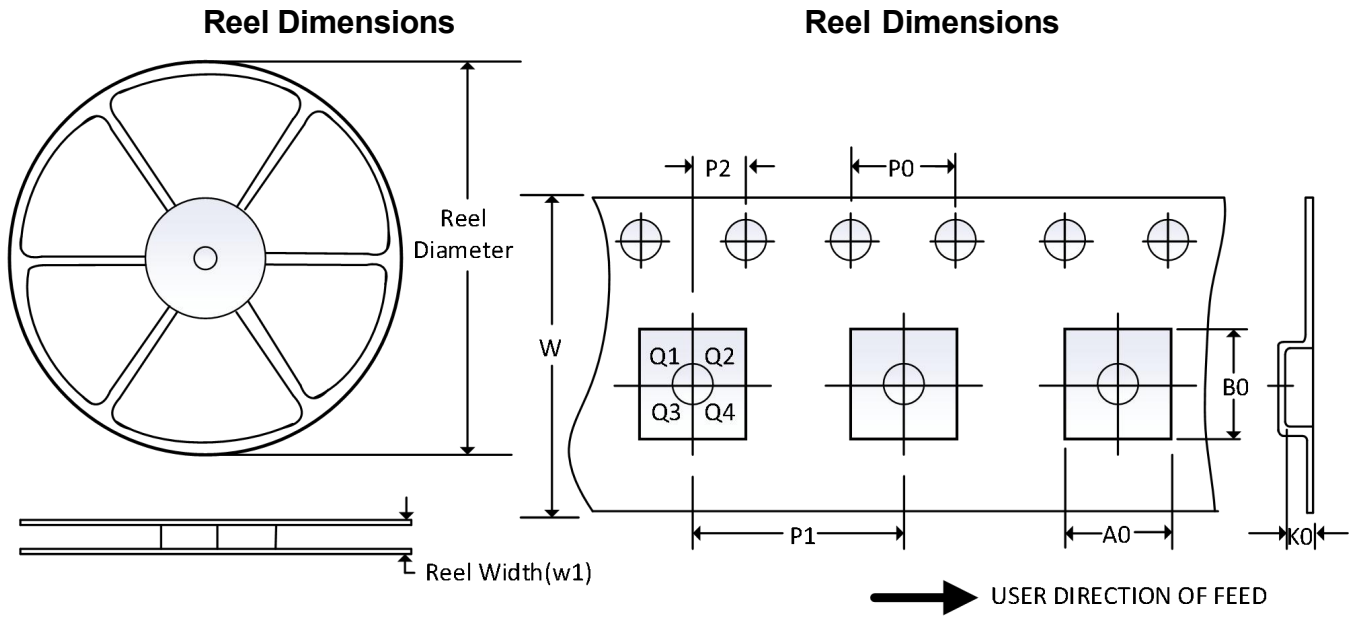
8 Package Outline Dimension(Continued)

TQFN2.6*1.8-16L



Symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min	Nom	Max	Min	Nom	Max
A	>0.50	0.55	0.60	>0.19	0.21	0.23
A1	0.00	-	0.05	0.00	-	0.02
A3	0.15REF			0.06REF		
D	1.75	1.80	1.85	0.68	0.70	0.72
E	2.55	2.60	2.65	0.99	1.01	1.03
L	0.30	0.40	0.50	0.12	0.16	0.19
lo	0.15	0.20	0.25	0.06	0.08	0.10
e	0.40BSC			0.16BSC		

9 Tape and Reel Information



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 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
SOP16	13''	16.4	6.5	10.3	2.1	4	8	2	16	Q1
TSSOP16	13''	12.4	6.9	5.6	1.2	4	8	2	12	Q1
UTQFN-2.6*1.8-16L	17.8''	9.04	2.1	2.9	0.75	4	4	2	8	Q1

NOTE:
1. All dimensions are nominal.
2. Plastic or metal protrusions of 0.15mm maximum per side are not included.