

General Description

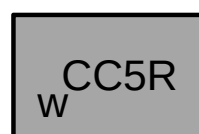
The SN74LVC1G3157DBVR is an single-pole double-throw(SPDT) analog switch fabricated with silicon gate CMOS technology. It achieves very low propagation delay while maintaining CMOS low power dissipation. that is designed to operate from 1.65V to 5.5V.

The SN74LVC1G3157DBVR device can handle both analog and digital signals.It features high-bandwidth (300MHz) and low on- resistance(2.2Ω @4.5V).

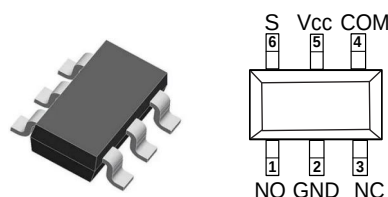
Applications: signal gating, chopping, modulation or demodulation (modem), and signal multiplexing for analog-to-digital and digital-to-analog conversion systems.

Features

- Low power dissipation
- High speed
- Standard CMOS logic levels
- High bandwidth 300MHz
- be used for Clock Switching, Data Mux'ing,etc.
- Low $R_{DS(on)}$ 2.2Ω @4.5V
- Supply range 1.65V to 5.5V
- Operating temperature $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$



SOT23-6



Applications

- Cell phones
- PADs
- Portable instrumentation
- Battery powered communications
- Computer peripherals

Pin Functions

Pin		Description
Name	SOT23-6	
NO	1	Data port
GND	2	Ground
NC	3	Data port (normally closed)
COM	4	Common output data port
V _{CC}	5	Power input
S	6	Logic control

Function Table

LOGIC	Function
0	NC connected to COM
1	NO connected to COM

Absolute Maximum Ratings

Parameters		Min.	Max.	Unit
V_{CC}	Supply voltage range	-0.3	6.0	V
V_{IN}	Input voltage	-0.3	6.0	V
	Analog,digital voltage range ⁽²⁾	-0.3	(V_{CC})+0.3	V
	Continuous current NO,NC or COM	-100	+100	mA
I_{PEAK}	Continuous channel current	-160	+160	mA
T_J	Junction temperature under bias	-65	150	°C
T_{stg}	Storage temperature range	-65	150	°C

(1) Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "Recommended Operating Conditions" is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

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

ESD RATINGS

ESD			Value	Unit
V(ESD)	Electrostatic discharge	Human-Body Model (HBM) ⁽¹⁾	2.5 K	V
		Charged-Device Model (CDM) ⁽²⁾	2 K	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.

Recommended Operating Conditions

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

Symbol	Parameter	Min	Max	Units
V_{CC}	Supply voltage	1.65	5.5	V
V_{IN}	Control input voltage	0	V_{CC}	V
	Switch input voltage	0	V_{CC}	V
V_{OUT}	Output voltage	0	V_{CC}	V
T_A	Ambient temperature	-40	85	°C

(1) All unused digital inputs of the device must be held at V_{CC} or GND to ensure proper device operation.

THERMAL INFORMATION

Package Type	θ_{JA}	θ_{JC}	Unit
SOT23-6	187.3	126.5	°C/W

Electrical Characteristics (T_J=25°C unless otherwise specified)

DC Electrical Characteristics

V_{CC}=1.65V to 5.5V, FULL=−40°C to +85°C. Typical values are at TA=+25°C (unless otherwise noted)

Parameter	Symbol	Conditions	V _{CC}	Temp	Min	Typ	Max	Units
Analog Signal Range	V _{NO} , V _{NC} , V _{COM}				0		V _{CC}	V
On-Resistance	R _{ON}	V _{NO} or V _{NC} =1.5V I _{COM} =−100mA	4.5V	+25°C		2.2	4.5	Ω
			3V	+25°C		3.8	7	
			2.3V	+25°C		6.9	12	
			1.65V	+25°C		12	20	
On-Resistance Match Between Channels	Δ R _{ON}	0≤V _{NO} or V _{NC} ≤V _{CC} , I _{COM} =−100mA	4.5V	+25°C		0.04		Ω
			3V	+25°C		0.08		
			2.3V	+25°C		0.01		
			1.65V	+25°C		0.02		
On-Resistance Flatness	R _{FLAT} (ON)	0≤V _{NO} or V _{NC} ≤V _{CC} , I _{COM} =−100mA	4.5V	+25°C		0.6	1	Ω
			3V	+25°C		1.7	3	
			2.3V	+25°C		4.5	7	
			1.65V	+25°C		8	15	
NC, NO Off Leakage Current	I _{NC(OFF)} , I _{NO(OFF)}	V _{NO} or V _{NC} =1V, 4.5V, V _{COM} =4.5V, 1V	5.5 V	Full			1	μA
NC, NO, COM On Leakage Current	I _{NC(ON)} , I _{NO(ON)} , I _{COM(ON)}	V _{COM} =1V, 4.5V, V _{NO} or V _{NC} =1V, 4.5V, or floating	5.5 V	Full			1	μA
Input High Voltage	V _{INH}		3V	Full	1.7			V
Input Low Voltage	V _{INL}		3V	Full			0.5	V
Input Leakage Current	I _{IN}	V _S =V _{CC} or 0	5.5 V	Full			1	μA
Power Supply Current	I _{CC}	V _S =GND or V _{CC}	5.5 V	Full			1	μA

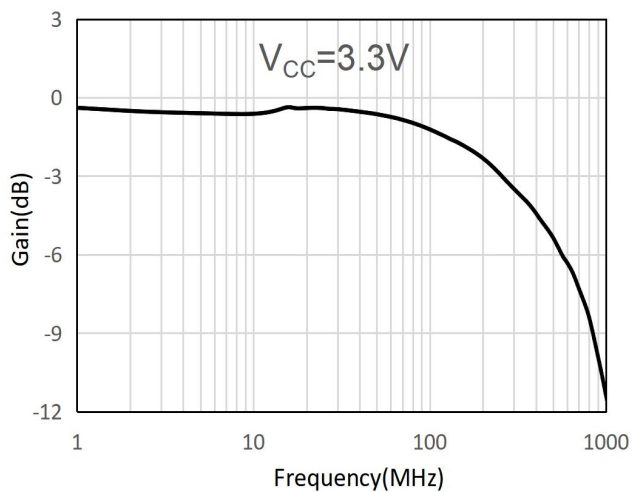
Switch And AC Characteristics

V_{CC}=1.65V to 5.5V, FULL=−40°C to +125°C. Typical values are at TA=+25°C (unless otherwise noted)

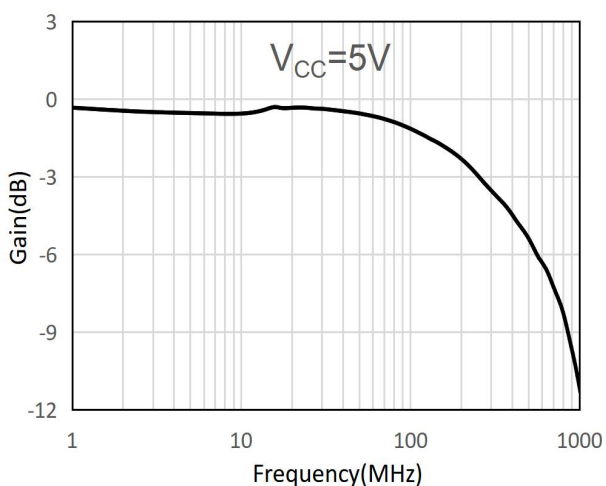
Parameter	Symbol	Conditions	V _{CC}	Temp	Min	Typ	Max	Units
Turn-On Time	t _{ON}	V _{COM} =V _{CC} , R _L =300Ω, C _L =35pF	5V	+25°C		6		ns
			3.3V			11		
Turn-Off Time	t _{OFF}	V _{COM} =V _{CC} , R _L =300Ω, C _L =35pF	5V	+25°C		7		ns
			3.3V			8		
Break-Before-Make Time Delay	t _{BBM}	V _{NO1} =V _{NC1} =V _{NO2} =V _{NC2} =3V R _L =300Ω, C _L =35pF	5V	+25°C		6		ns
			3.3V			9		
Off Isolation	O _{ISO}	R _L =50Ω, Switch OFF	5V	+25°C		-47		dB
						-66		
Crosstalk Isolation	X _{TALK}	R _L =50Ω, Switch OFF, f=10MHz	5V	+25°C		-53		dB
-3dB Bandwidth	BW	R _L =50Ω, Switch ON	5V	+25°C		300		MHz
Charge Injection	Q	C _L =1nF, V _{GEN} =0V, R _{GEN} =0Ω	5V	+25°C		10		pC
NC, NO Off Capacitance	C _{NC(OFF)} , C _{NO(OFF)}	f=1MHz	5V	+25°C		7		pF
NC, NO, COM On Capacitance	C _{NC(ON)} , C _{NO(ON)} , C _{COM(ON)}	f=1MHz	5V	+25°C		20		pF

RATING AND CHARACTERISTIC CURVES

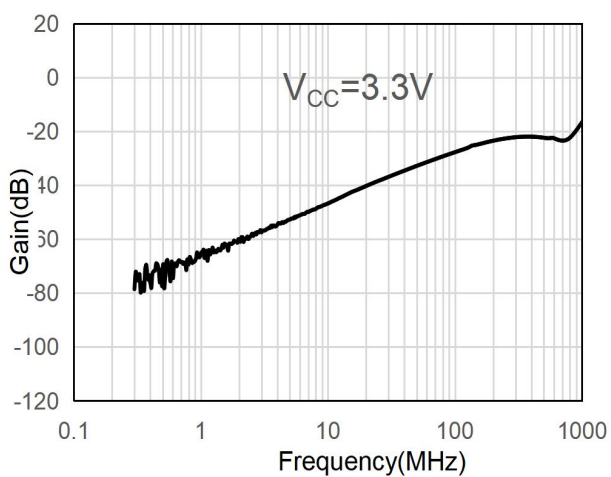
$V_{CC}=1.65V$ or $5.5V$, FULL= $-40^{\circ}C$ to $+125^{\circ}C$. Typical values are at $T_A=+25^{\circ}C$ (unless otherwise noted)



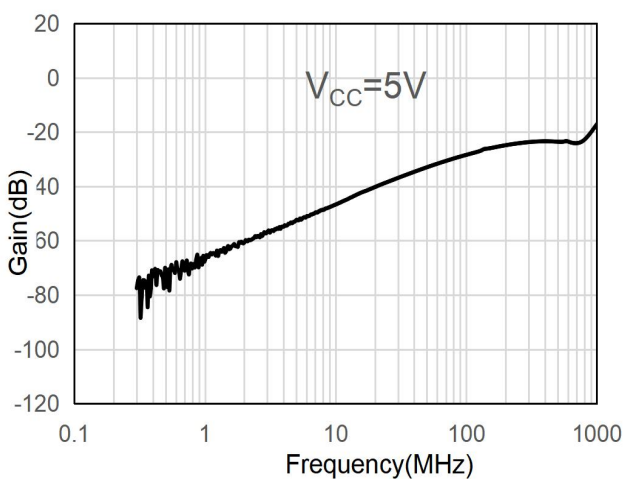
Bandwidth vs Frequency at 3.3V V_{CC}



Bandwidth vs Frequency at 5V V_{CC}

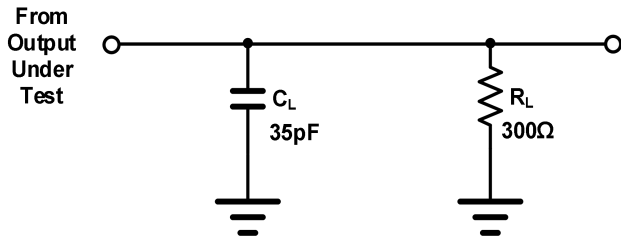


Off Isolation vs Frequency at 3.3V V_{CC}

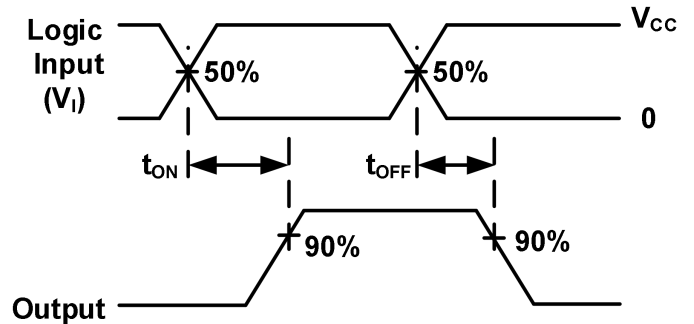


Off Isolation vs Frequency at 5V V_{CC}

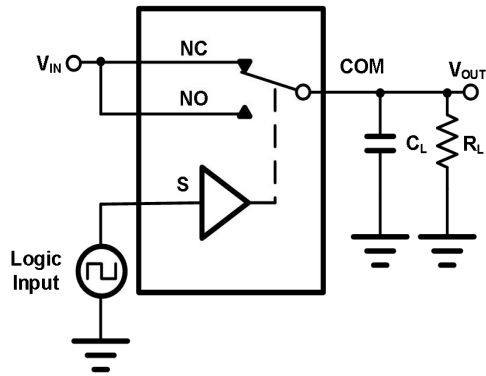
Measurement Information



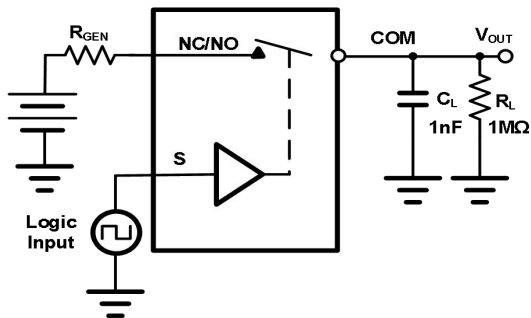
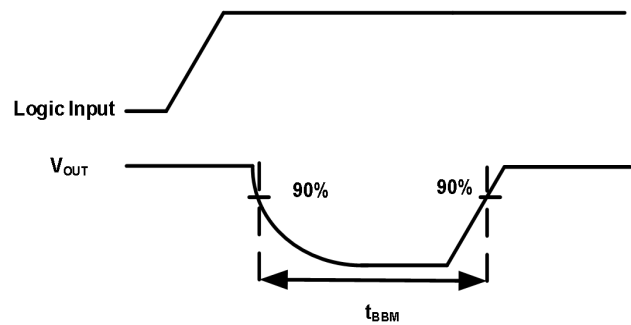
AC Test Circuit



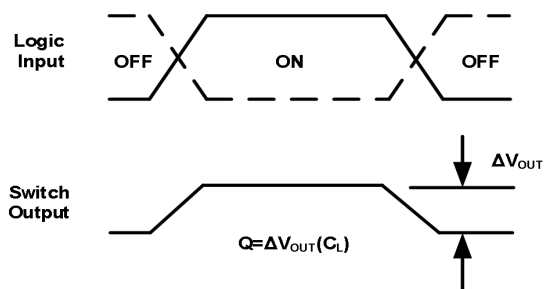
Switching Time



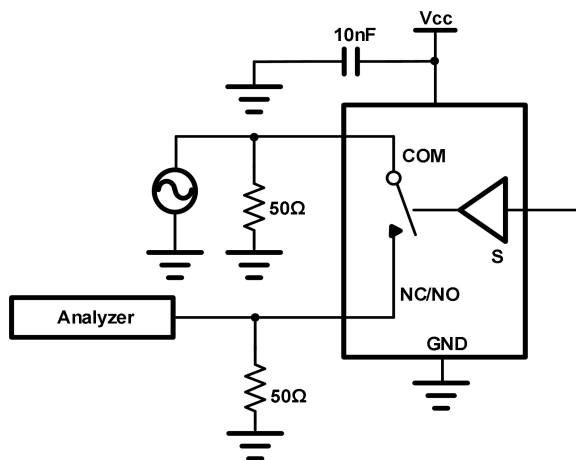
Break-Before-Make Time(t_{BBM})



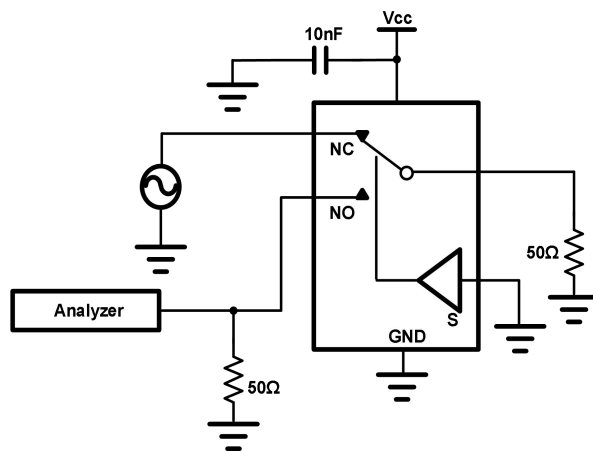
Charge Injection Test



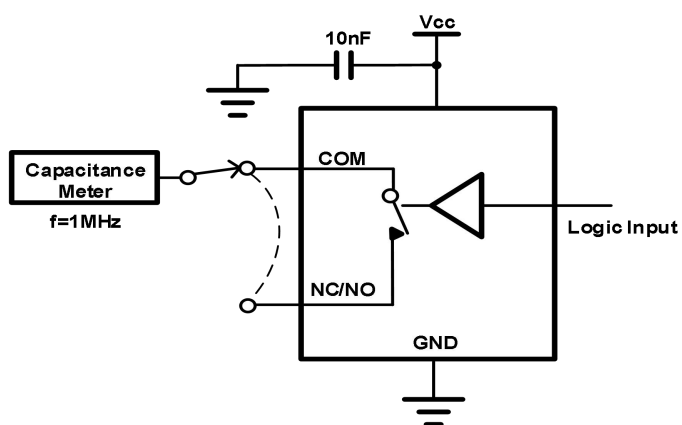
Measurement Information



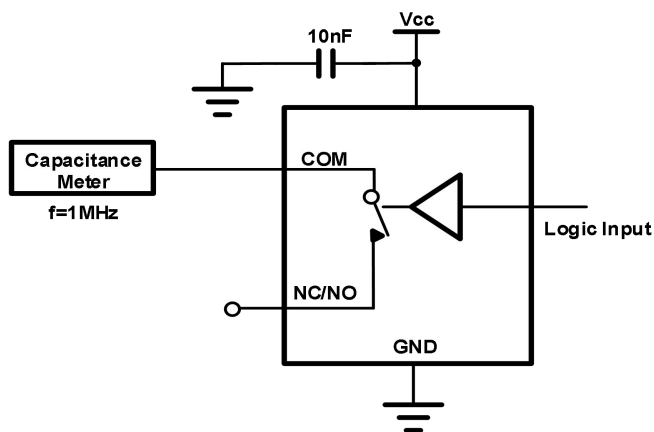
OFF Isolation (O_{iso})



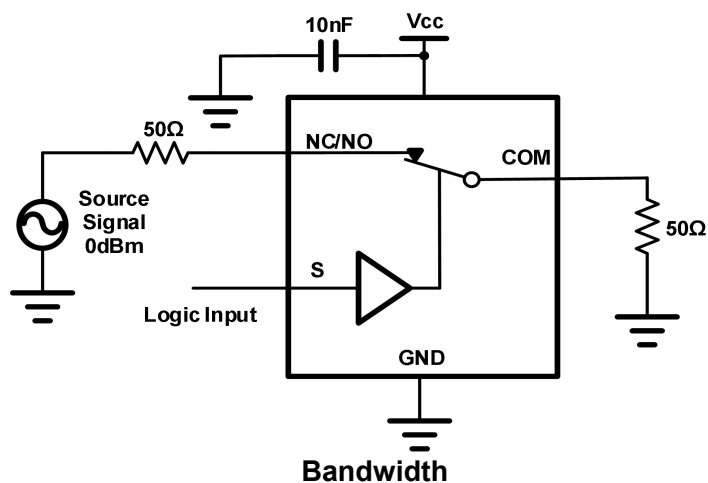
Crosstalk(X_{TALK})



Channel Off Capacitance



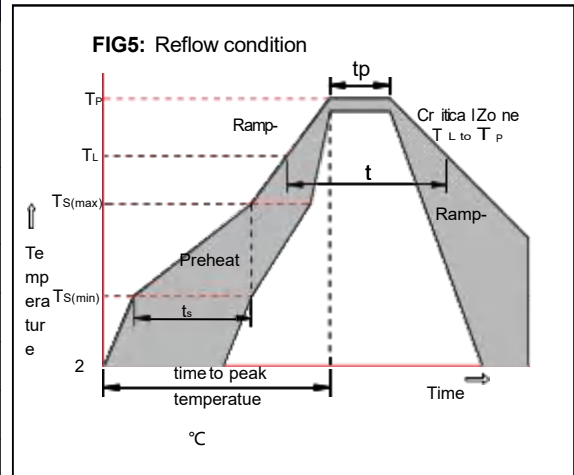
Channel On Capacitance



Bandwidth

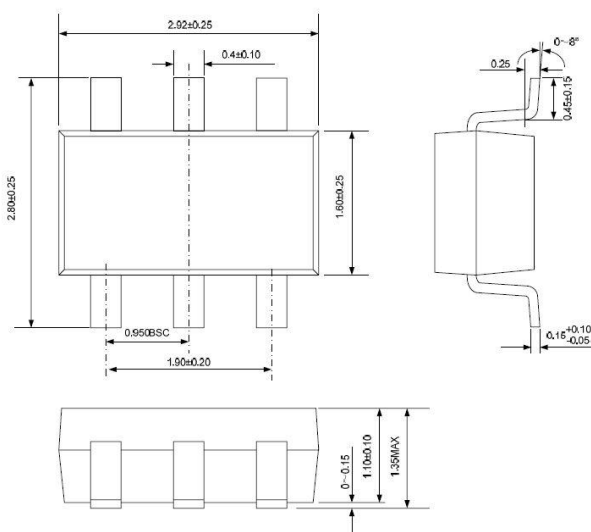
Soldering parameters

Reflow Condition		Pb-Free assembly (see as below)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150 °C
	-Temperature Max ($T_{s(max)}$)	+200 °C
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3 °C/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3 °C/sec. Max
Reflow	-Temperature(T_L)(Liquid us)	+217 °C
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_P)		+260(+0/-5) °C
Time within 5 °C of actual Peak Temp (t_P)		30 secs. Max
Ramp-down Rate		6 °C/sec. Max
Time 25 °C to Peak Temp (T_P)		8 min. Max
Do not exceed		+260 °C



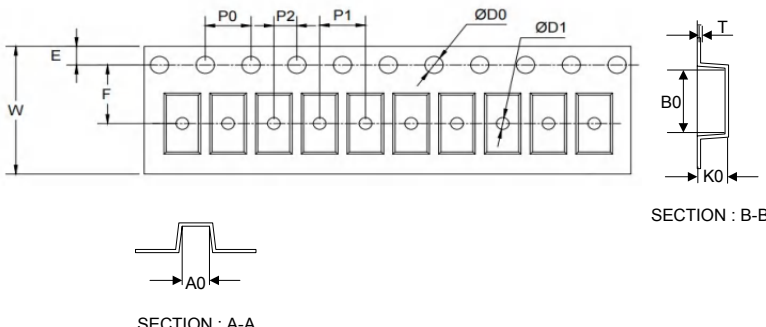
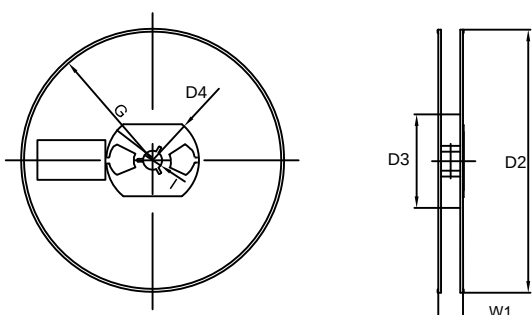
Package Dimensions & Suggested Pad Layout

SOT23-6L



Dimensions in millimeters

Tape & reel specification

Tape		Symbol	Dimension (mm)
		P0	4.00±0.20
		P1	4.00±0.20
		P2	2.00±0.20
		D0	1.55±0.20
		D1	1.20±0.20
		E	1.55±0.20
		F	3.60±0.20
		W	8.00±0.20
		A0	3.80±0.20
		B0	3.50±0.20
		K0	1.55±0.20
		T	0.25±0.15
		D2	178.0±5.0
		D3	55Min.
		D4	R24.0±3.0
7" Reel		G	R82.0±3.0
		I	13.0±2.0
		W1	11.0±3.0
		Quantity: 3000PCS	