

1.5Ω, Low Voltage SPDT Analog Switch

1.Descriptions

The FSW3157 is a single, bidirectional, single-pole/ double-throw (SPDT) CMOS analog switch that is designed to operate from a single 1.5V to 5.5V supply. It features high-bandwidth (-3dB @600MHz) and low on-resistance (1.5Ω TYP), Targeted applications for audio switching.

The FSW3157 features guaranteed on-resistance matching between switches and guaranteed on-resistance flatness over the signal range. This ensures excellent linearity and low distortion when switching audio signals.

The FSW3157 is available in Green SOT23-6 and SOT363 package.

2.Features

- Supply Voltage Range: 1.5V to 5.5V
- On-Resistance: 1.5Ω (TYP) When A= 5V
- 1.8V Logic Compatible Control Pin
- A Overrides VCC to Achieve True Isolation
- Even When Supply Is Dead
- Low Quiescent Current (<2uA) With Very Wide Supply Range (1.5V ~ 5.5V)
- High Bandwidth: -3dB @600MHz
- ESD Tolerance: 2kV HBM
- Available in Green SOT23-6 and SOT363 Pack-age

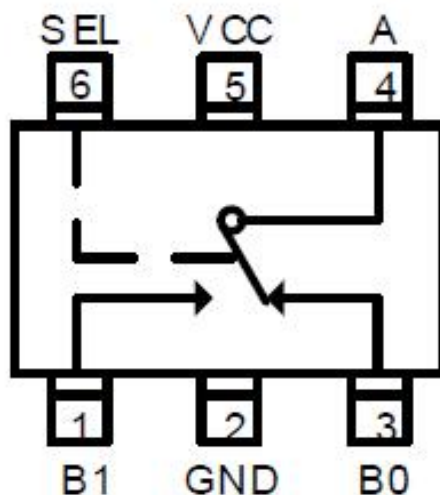
3.Applications

- Audio, Video, UART, USB2.0 Signal and
- Supply Routing
- Portable Instrumentation
- Battery-Operated Equipment
- Computer Peripherals
- Cell Phones
- PDAs
- MP3s

4.Order information

Mode	Package	Specified Temperature range	Ordering Number	Packing Option
FSW3157	SOT23-6	-40℃ to +85℃	FSW3157YSOT236G/TR	Tape and Reel,3000
	SOT363	-40℃ to +85℃	FSW3157YSOT363G/TR	Tape and Reel,3000

5.Pin Configuration



Pin	Pin Name	Description
1	B1	Analog/Digital Signal Port (Normally open)
2	GND	Ground
3	B0	Analog/Digital Signal Port (Normally closed)
4	A	Common Signal Port
5	VCC	Single Power Supply
6	SEL	Logic Input Control

6.Function Table

Logic Input	Function
SEL=0	B0=A
SEL=1	B1=A

7. Absolute Maximum Ratings⁽¹⁾

Parameter	Symbol	Value	Unit
Supply Voltage	V_{CC}	-0.3 ~ 6.5	V
Control Input Voltage	V_{SEL}	-0.3 ~ 6.5	V
Continuous Current Through A, B0, B1		±100	mA
Peak Current Through A, B0, B1 (pulsed at 1ms 50% duty cycle)		±200	mA
Storage Temperature Range	T_{STG}	-55 ~ 150	°C
Junction Temperature under Bias	T_J	150	°C
Lead Temperature (Soldering, 10 seconds)	T_L	260	°C
Thermal resistance	$R_{\theta JA}$	350	°C/W

Note:

1. "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions beyond those indicated in the operational sections of this specification is not implied.

8. Recommend operating ratings

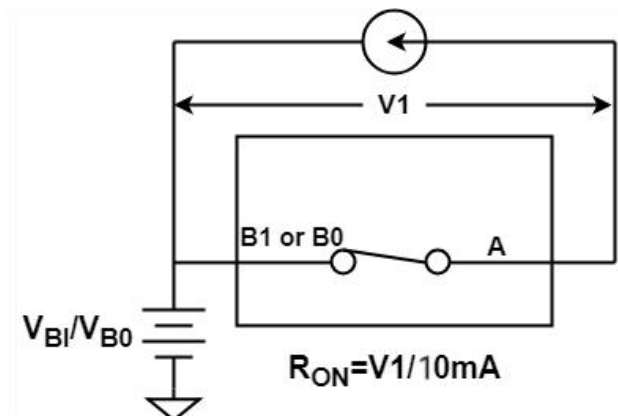
Parameter	Symbol	Value	Unit
Supply Voltage Operating	V_{CC}	1.5 ~ 5.5	V
Control Input Voltage	V_{SEL}	-0.3 ~ 5.5 V	V
Input Signal Voltage	V_A	-0.3 ~ 5.5	V
Operating Temperature	T_A	-40 ~ 85	°C

9. Electrical Characteristics

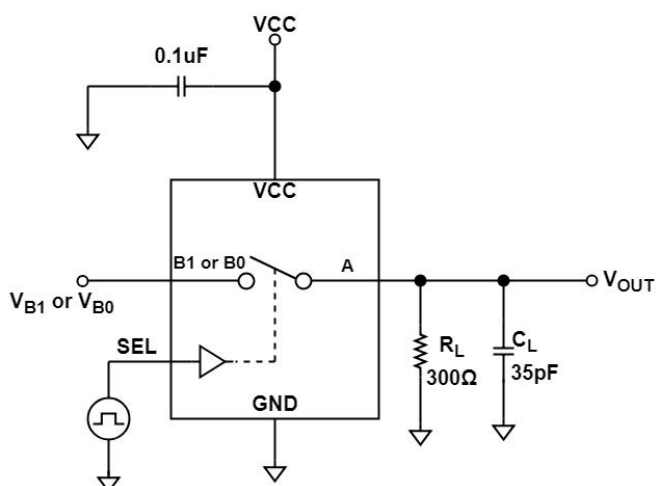
(T_A=25°C, VCC=3.3V, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max	Unit
DC CHARACTERISTICS						
Input logic high level	V _{IH}	VCC=3.3~5.5V	1.6			V
		VCC=1.5~3.3V	1.4			V
Input logic low level	V _{IL}	VCC=3.3~5.5V			0.6	V
		VCC=1.5~3.3V			0.4	V
Supply quiescent current	I _{CC}	I _A =0, V _{SEL} =0 or V _{SEL} =VCC			1.0	uA
Increase in I _{CC} per input	I _{CC} T	I _A =0, VCC=4.5V V _{SEL} >1.8 or V _{SEL} <0.5			1.0	uA
Off state leakage from A to B0 (or B1)	I _A	V _A = 5.5V , V _{B0(or B1)} = 0V			±3.5	uA
On-Resistance	R _{ON1}	V _A =0 ~ 1.5V,			7.5	Ω
	R _{ON2}	V _A =1.5 ~ 2.0V			3.5	Ω
	R _{ON3}	V _A =2.0 ~ 2.5V			3	Ω
	R _{ON4}	V _A =2.5 ~ 4.0V			2.5	Ω
On-Resistance Flatness	R _{FLAT1}	V _A =0 ~ 0.5V		0.7		Ω
	R _{FLAT2}	V _A =0.5 ~ 2.0V		0.5		Ω
	R _{FLAT3}	V _A =2.0 ~ 4.0V		1.6		Ω
	R _{FLAT4}	V _A =4.0 ~ 5.5V		0.3		Ω
On-Resistance Matching Between Channels	Δ R _{ON}	V _A =0~5.5V		0.1	0.2	Ω
AC CHARACTERISTICS						
Turn-On Time	T _{ON}	V _A =1.5V, C _L =35pF, R _L =50Ω		200		nS
Turn-Off Time	T _{OFF}	V _A =1.5V, C _L =35pF, R _L =50Ω		200		nS
Break-Before-Make time	T _{BBM}	V _A =1.5V, C _L =35pF, R _L =50Ω		500		nS
-3dB Bandwidth	BW	R _L =50Ω, C _L =0pF		600		MHZ
Off isolation	OIRR	F=1KHz, R _L =50Ω		-81		dB
		F=10KHz, R _L =50Ω		-80		dB
Crosstalk	Xtalk	F=1KHz, R _L =50Ω		-83		dB
		F=10KHz, R _L =50Ω		-82		dB
Total Harmonic Distortion	THD	F=20Hz to 20KHz V _A =600mVp-p @R _L =32Ω,		-80		dB
CAPACITANCE						
Off capacitance	C _{OFF}	F=100KHz, VCC=3.3		5		pF
On capacitance	C _{ON}	F=100KHz, VCC=3.3		7		pF

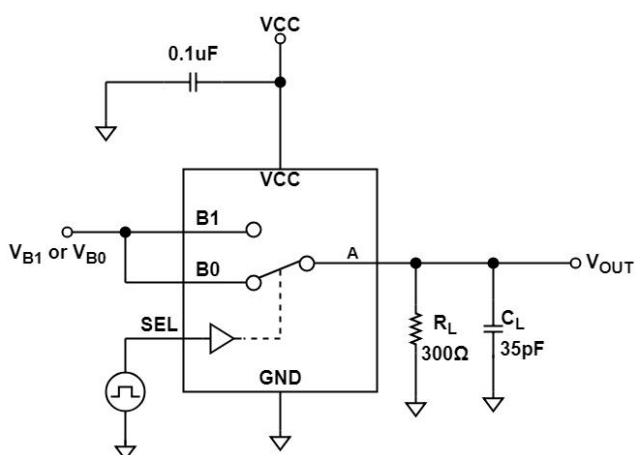
10. Test Circuits



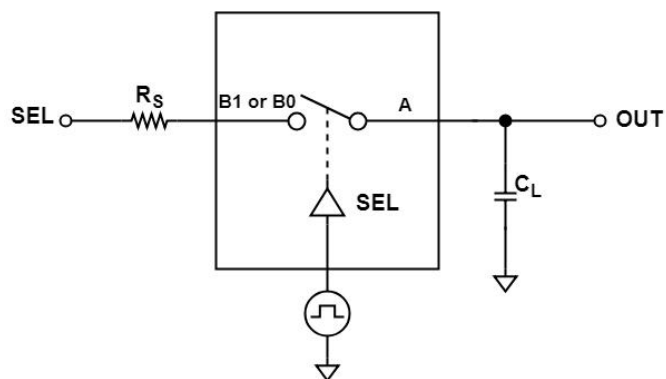
Test Circuit 1. On-Resistance



Test Circuit 2. Switching Times



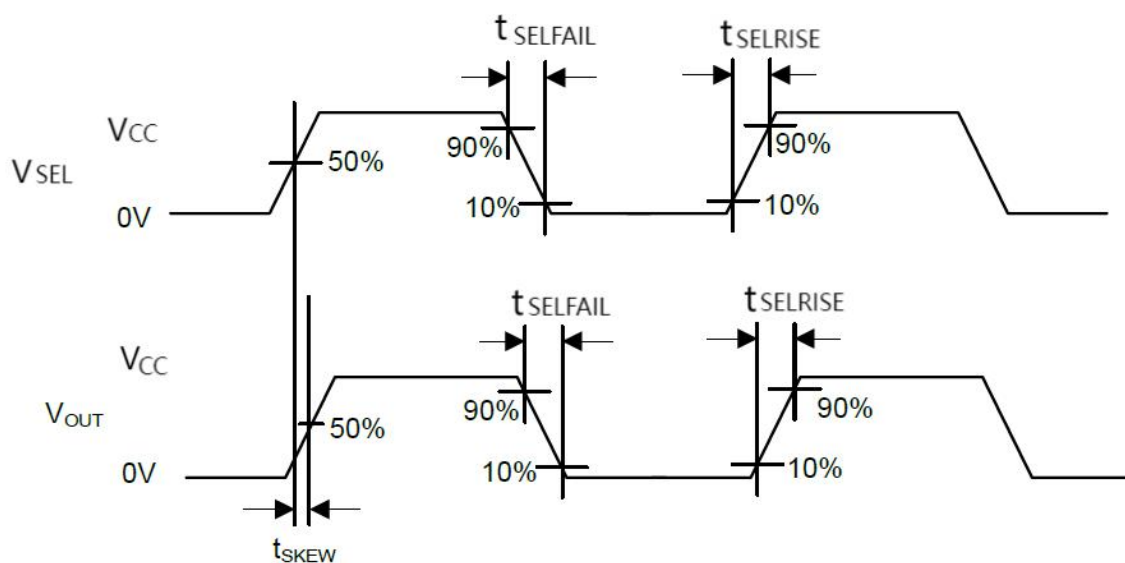
Test Circuit 3. Break-Before-Make Time Delay, t_D



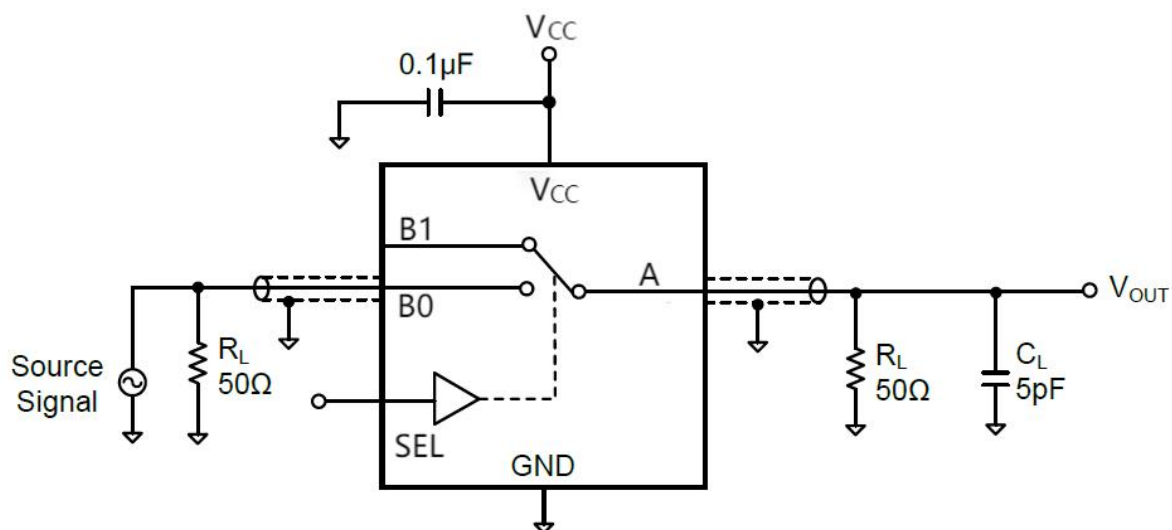
$$\text{Rise Time Delay} = |t_{SELRISE} - t_{OUTRISE}|$$

$$\text{Fall Time Delay} = |t_{SELFALL} - t_{OUTFALL}|$$

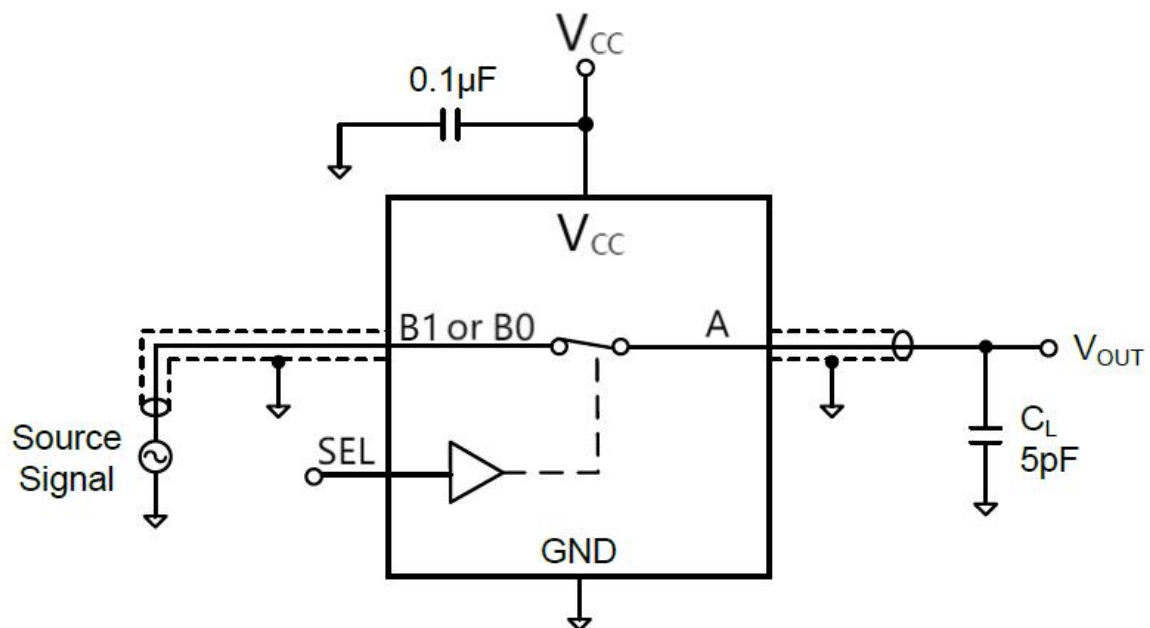
$$\text{Rise Time to Fall Time Mismatch} = |t_{OUTFALL} - t_{OUTRISE}|$$



Test Circuit 4. Output Signal Skew



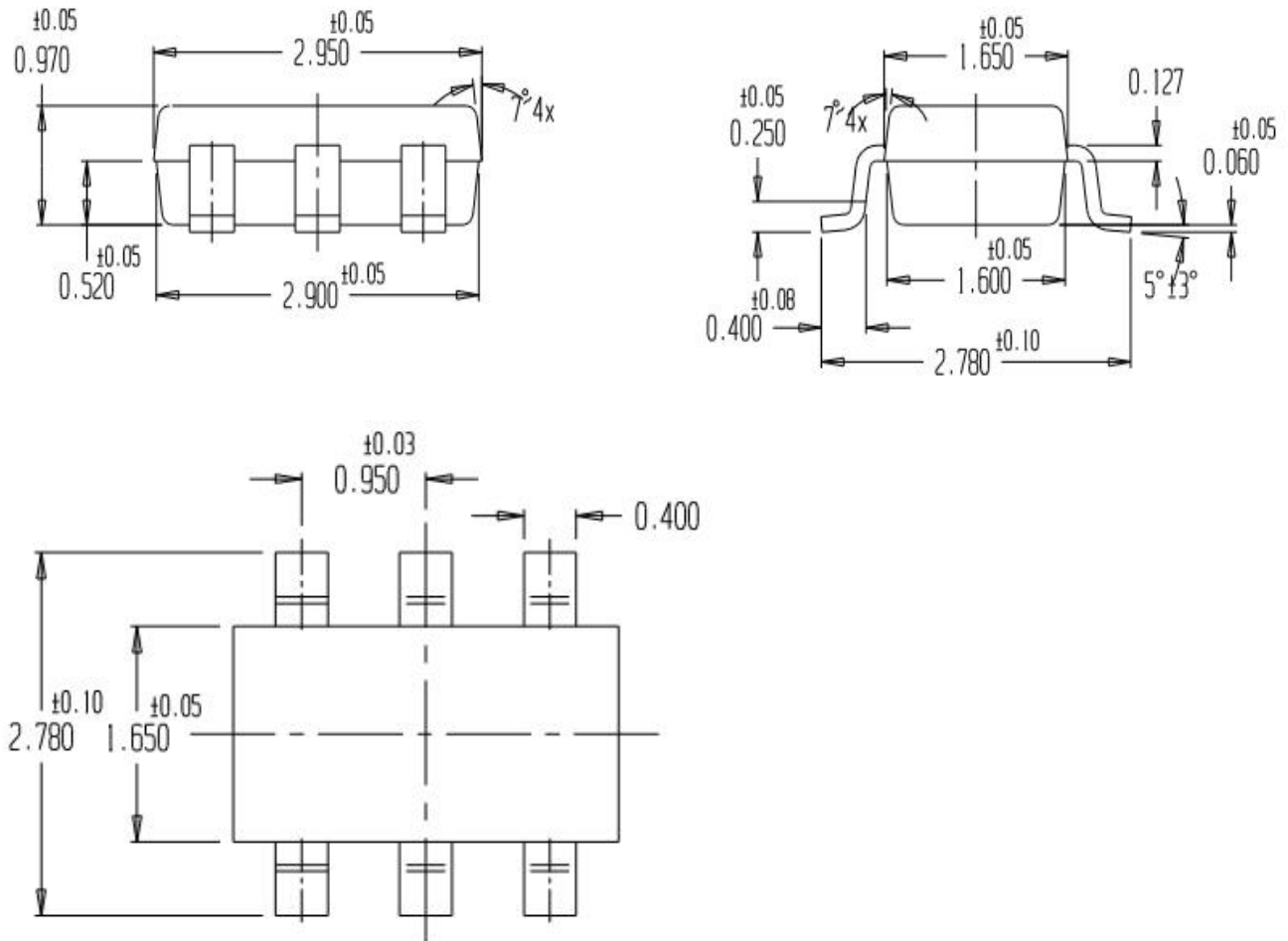
Test Circuit 5. Off Isolation



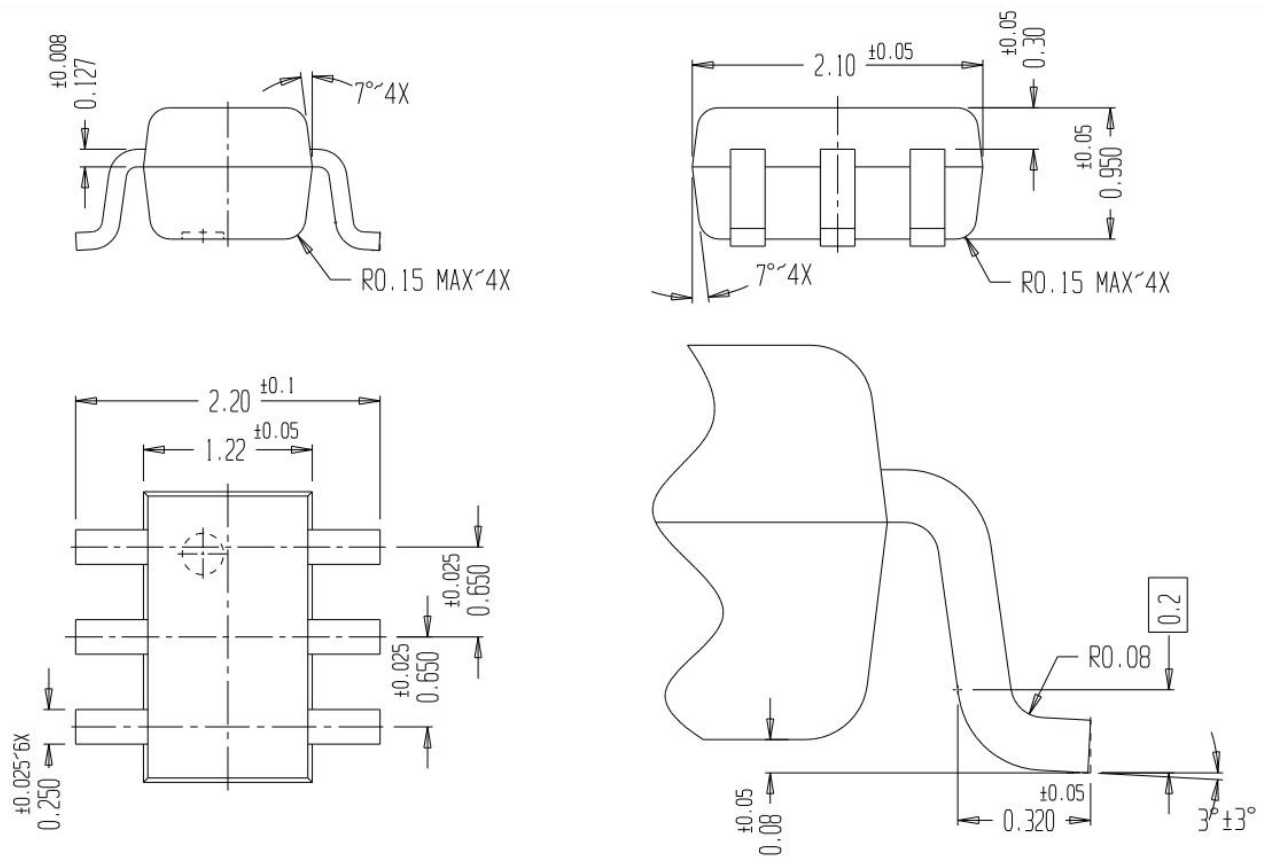
Test Circuit 6. -3dB Bandwidth

11.Package Outline Dimensions

(1) Package Type: SOT23-6(All dimensions in mm.)



(2) Package Type: SOT363(All dimensions in mm.)



12.Important Notice And Disclaimer

- We reserves the right to change the instruction manual without prior notice.
- Any semiconductor product has a certain possibility of failure or malfunction under specific conditions. The buyer is responsible for complying with safety standards and taking safety measures when using our products for system design and overall manufacturing to avoid potential failure risks that may cause personal injury or property damage.
- The improvement of product quality is endless, our company will be dedicated to provide customers with better products.

13.Version Modification Record

Version Number	Revision
first edition	
V1.0	1. Update the On-Resistance on page 3 2. Update the Test Circuit 1 on page 4 3. Update the Off state leakage from A to B0(or B1) on page 4
V2.0	1. Update the High Bandwidth on page 1&3 2. Update the Features and Descriptions on page 1.
V3.0	1. Update the Important Notice And Disclaimer on page 9.