

Features

- On-Resistance: 4.0Ω (TYP)
 - -3dB Bandwidth: 300MHz
 - Single-Supply Operation: +1.8V ~ +5.5V
 - Break-Before-Make Switching
 - Rail-to-Rail Operation
 - Low Static Power
 - TTL/CMOS Compatible
 - Operating Temperature: -40°C ~ +125°C
 - Small Package:
- GS3157 Available in SOT23-6, SC70-6 and TDFN1.45x1-6 Packages

General Description

The GS3157 is low on-resistance (4.0Ω), fast single-pole double-throw (SPDT) CMOS switch with operation range +1.8V ~ +5.5V. The GS3157 is designed for low operating voltage, high current switching of signal gating, chopping, modulation or demodulation (modem), and speaker output for cell phone applications.

The device contains a break-before-make (BBM) feature. The control input, IN, tolerates input drive signals up to 5.5V, independent of supply voltage.

All devices are specified for the temperature range of -40°C to +125°C. The GS3157 single is available in Green SC70-6, SOT23-6 and TDFN1.45x1-6 packages.

Applications

- Battery-Operated Equipment
- Wearable Devices
- Computer Peripherals
- Portable Systems
- Cell Phones
- PDAs

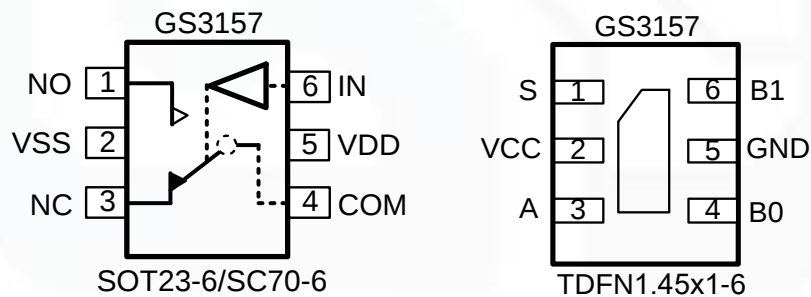


Figure 1. Pin Assignment Diagram

Logic Function Table

Logic Input (IN)	Function
0	NC Connected to COM
1	NO Connected to COM

Absolute Maximum Ratings

Condition	Min	Max
Power Supply Voltage (V _{DD} to V _{SS})	-0.5V	+7.5V
Analog Input Voltage (NC NO or COM)	V _{SS} -0.5V	V _{DD} +0.5V
PDB Input Voltage	V _{SS} -0.5V	+7V
Operating Temperature Range	-40°C	+125°C
Junction Temperature	+160°C	
Storage Temperature Range	-55°C	+150°C
Lead Temperature (soldering, 10sec)	+260°C	
Package Thermal Resistance (T _A =+25°C)		
SOT23-6, θ _{JA}	190°C/W	
SC70-6, θ _{JA}	333°C/W	
ESD Susceptibility		
HBM	3500V	
MM	300V	

Note: Stress greater than those listed under Absolute Maximum Ratings may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions outside those indicated in the operational sections of this specification are not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

Package/Ordering Information

Model	Channel	Order Number	Package Description	Package Option	Marking Information
GS3157	Single	GS3157-CR	SC70-6	Tape and Reel,3000	3157
		GS3157-TR	SOT23-6	Tape and Reel,3000	GS3157
		GS3157-FR	TDFN1.45x1-6	Tape and Reel,5000	57YW

Electrical Characteristics

(At $V_S = +5V$, and $T_A = +25^\circ C$, unless otherwise noted.)

Parameter	Symbol	Conditions	GS3157			
ANALOG SWITCH			TYP	MAX	MIN	UNIT
Analog Signal Range	V_{NO}, V_{NC}, V_{COM}		V_S	V_S	V_S	V
On-Resistance	R_{ON}	$V_S = 4.5V, V_{NO}$ or $V_{NC} = 4V,$ $I_{COM} = -10mA$, Test Circuit 1	4.0			Ω
On-Resistance Match Between Channels	ΔR_{ON}	$V_S = 4.5V, V_{NO}$ or $V_{NC} = 4V,$ $I_{COM} = -10mA$, Test Circuit 1	0.3			
		$V_S = 4.5V, V_{NO}$ or $V_{NC} = 4V,$ $I_{COM} = -10mA$, Test Circuit 1		0.8		
On-Resistance Flatness	$R_{FLAT(ON)}$	$V_S = 4.5V, V_{NO}$ or $V_{NC} = 1.0V, 2.0V,$ 3.5V, $I_{COM} = -10mA$, Test Circuit 1	1.7			
		$V_S = 4.5V, V_{NO}$ or $V_{NC} = 1.0V, 2.0V,$ 3.5V, $I_{COM} = -10mA$, Test Circuit 1		3.7		
Source OFF Leakage Current	$I_{NC(OFF)}, I_{NO(OFF)}$	$V_S = 5.5V, V_{NO}$ or $V_{NC} = 1.0V, 4.5V,$ $V_{COM} = 4.5V, 1.0V$		± 1		μA
Channel ON Leakage Current	$I_{NC(ON)}, I_{NO(ON)},$ $I_{COM(ON)}$	$V_S = 5.5V, V_{COM} = 1.0V, 4.5V$ V_{NO} or $V_{NC} = 1.0V, 4.5V$, or floating		± 1		
DIGITAL INPUTS						
Input High Voltage	V_{INH}	$V_S = 5V$			1.5	V
		$V_S = 3V$			0.9	
Input Low Voltage	V_{INL}	$V_S = 5V$		0.55		
		$V_S = 3V$		0.45		
Input Leakage Current	I_{IN}	$V_S = 5.5V, V_{IN} = 0V$ or 5.5V		± 1		μA

Electrical Characteristics

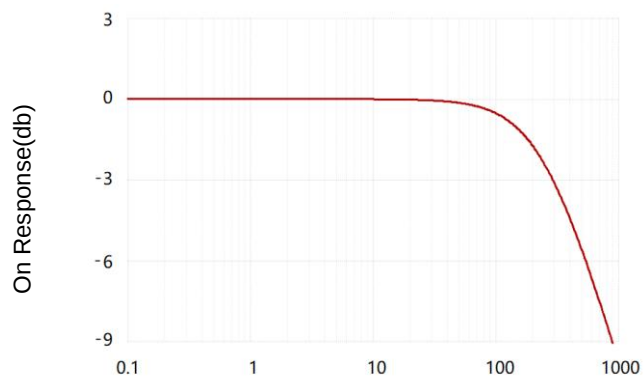
(At $V_S = +5V$, and $T_A = +25^\circ C$, unless otherwise noted.)

Parameter	Symbol	Conditions	GS3157			
DYNAMIC CHARACTERISTICS			TYP	MIN	MAX	UNIT
Turn-On Time	T_{ON}	$V_S = 5V$, V_{NO} or $V_{NC} = 3V$, $V_{IN_H} = 1.5V$, $V_{IN_L} = 0V$, $R_L = 300\Omega$, $C_L = 35pF$, Test Circuit 2	20			ns
		$V_S = 3V$, V_{NO} or $V_{NC} = 1.5V$, $V_{IN_H} = 1.5V$, $V_{IN_L} = 0V$, $R_L = 300\Omega$, $C_L = 35pF$, Test Circuit 2	30			
Turn-Off Time	T_{OFF}	$V_S = 5V$, V_{NO} or $V_{NC} = 3V$, $V_{IN_H} = 1.5V$, $V_{IN_L} = 0V$, $R_L = 300\Omega$, $C_L = 35pF$, Test Circuit 2	15			
		$V_S = 3V$, V_{NO} or $V_{NC} = 1.5V$, $V_{IN_H} = 1.5V$, $V_{IN_L} = 0V$, $R_L = 300\Omega$, $C_L = 35pF$, Test Circuit 2	25			
Break-Before-Make Time Delay	T_{BBM}	$V_S = 5V$, V_{NO1} or $V_{NC1} = V_{NO2}$ or $V_{NC2} = 3V$, $R_L = 300\Omega$, $C_L = 35pF$, Test Circuit 3	5.0			
		$V_S = 3V$, V_{NO1} or $V_{NC1} = V_{NO2}$ or $V_{NC2} = 3V$, $R_L = 300\Omega$, $C_L = 35pF$, Test Circuit 3	8			
Skew	T_{SKEW}	$V_S = 5V$, $R_S = 39\Omega$, $C_L = 50pF$, Test Circuit 4	5			
		$V_S = 3V$, $R_S = 39\Omega$, $C_L = 50pF$, Test Circuit 4	2			
Off Isolation	O_{ISO}	$R_L = 50\Omega$, Signal = 0dBm, $C_L = 5pF$, Test Circuit 5	$f=10MHz$	-51		dB
			$f=1MHz$	-72		
-3dB Bandwidth	GBW	$R_L = 50\Omega$, Signal = 0dBm, $C_L = 5pF$, Test Circuit 6	300			MHz
Source OFF Capacitance	$C_{NC(OFF)}$, $C_{NO(OFF)}$	$f=1MHz$	5.5			pF
Channel ON Capacitance	$C_{NC(ON)}$, $C_{NO(ON)}$, $C_{COM(ON)}$	$f=1MHz$	15.5			
POWER REQUIREMENTS						
Power Supply Range	V_S				1.8	V
Power Supply Range	V_S			5.5		
Power Supply Current	I_S	$V_{IN} = 0V$ or V_S		1		μA

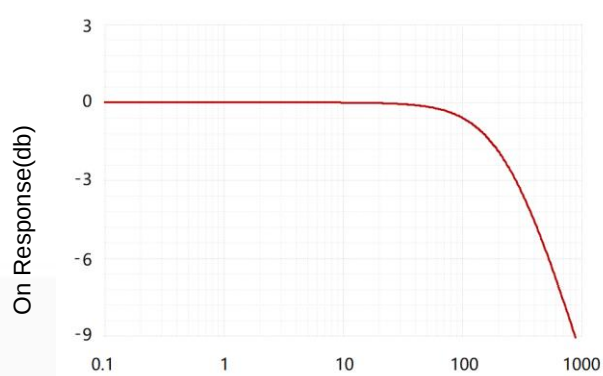
Typical Performance characteristics

At $T_A=+25^{\circ}\text{C}$, and $V_S=+5\text{V}$, unless otherwise noted.

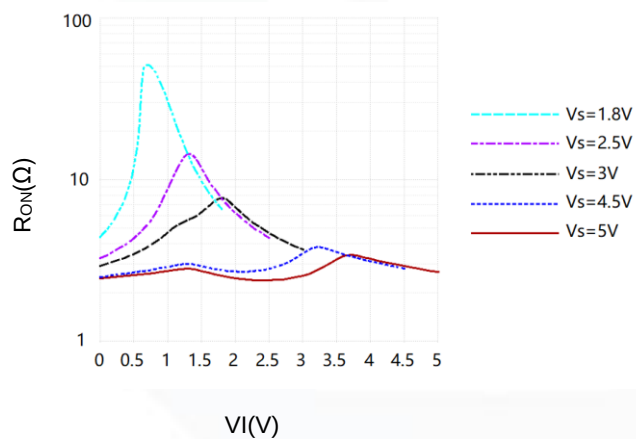
BANDWIDTH



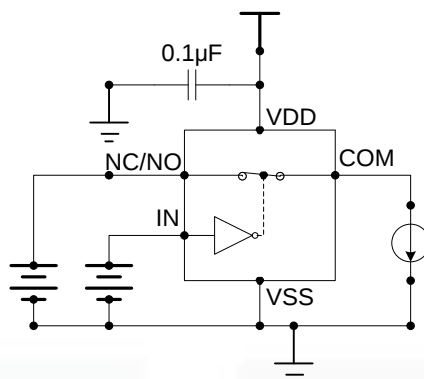
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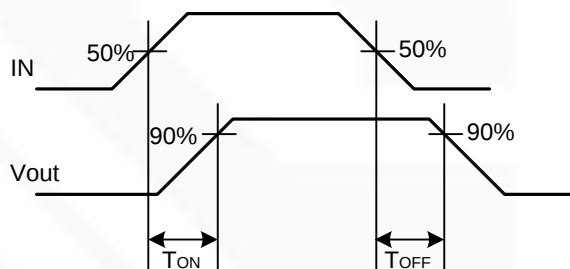
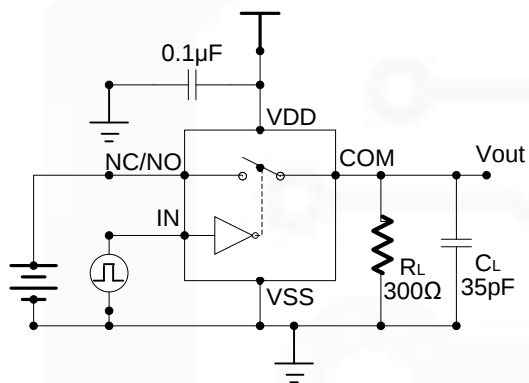
Typical R_{ON} vs Input Voltage (V_I)



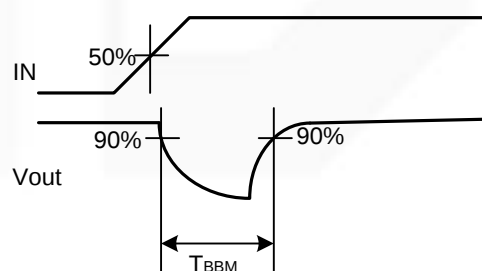
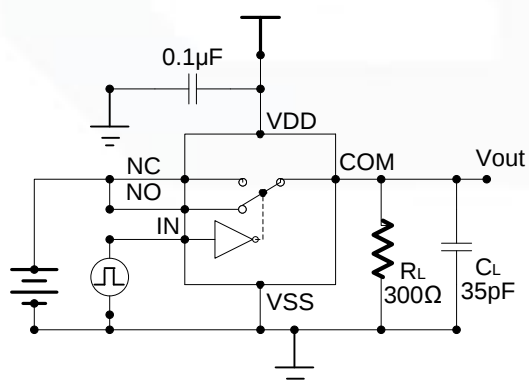
Parameter Measurement Information



Test Circuit 1. On-Resistance

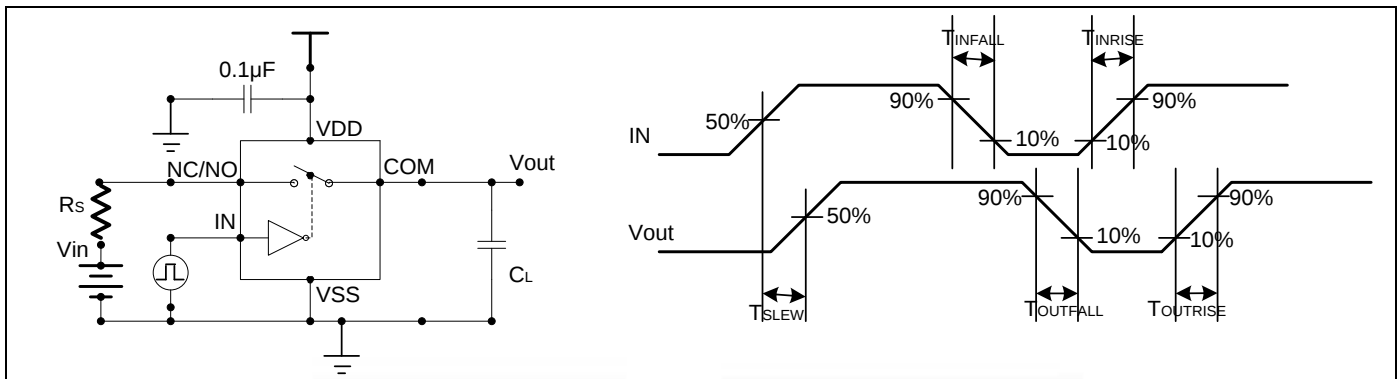


Test Circuit 2. Switching Times

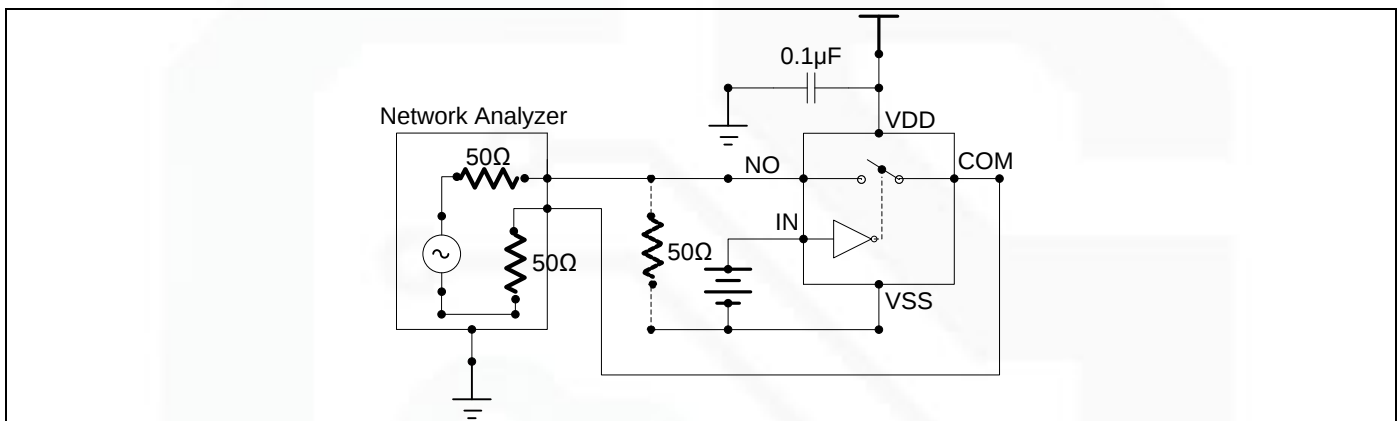


Test Circuit 3. Break-Before-Make Time Delay

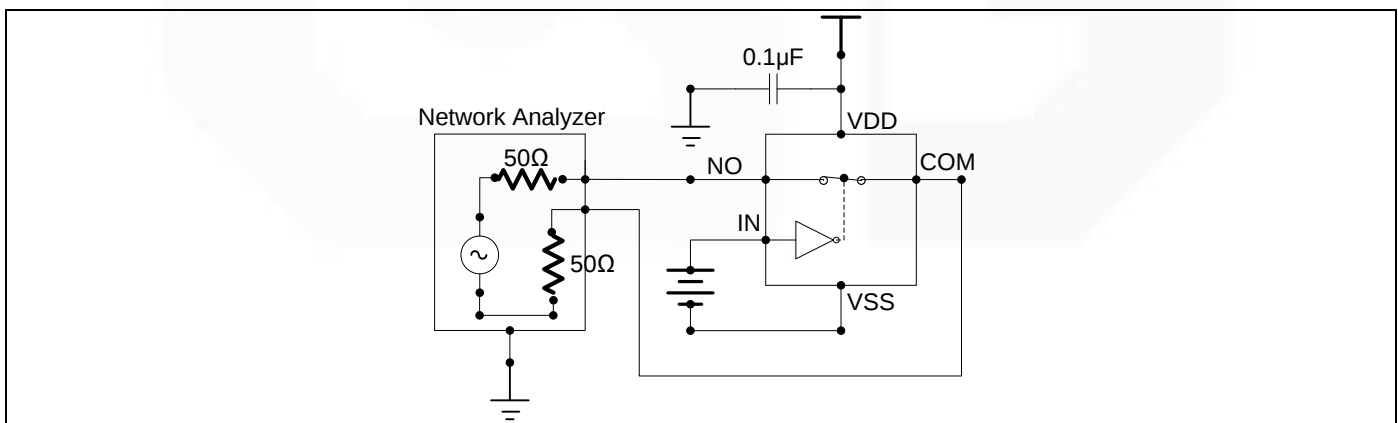
Parameter Measurement Information



Test Circuit 4. Output Signal Skew



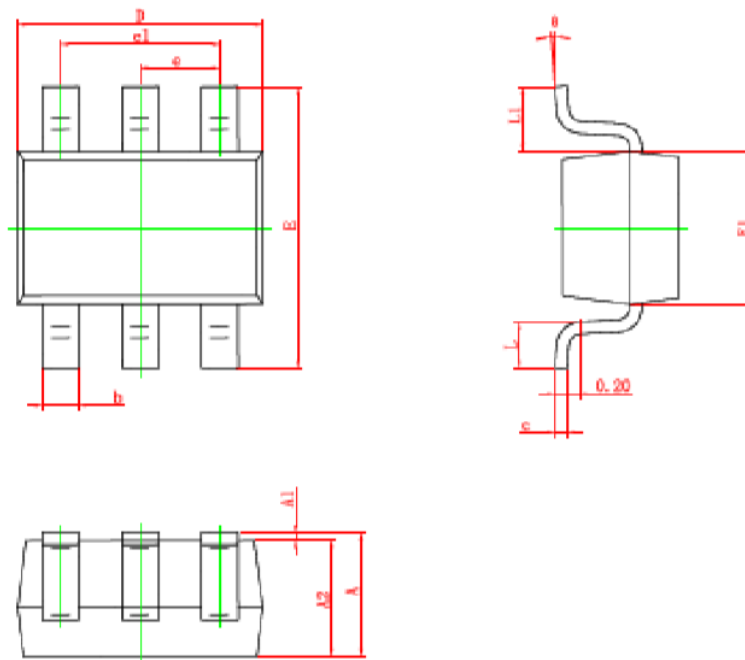
Test Circuit 5. Off Isolation



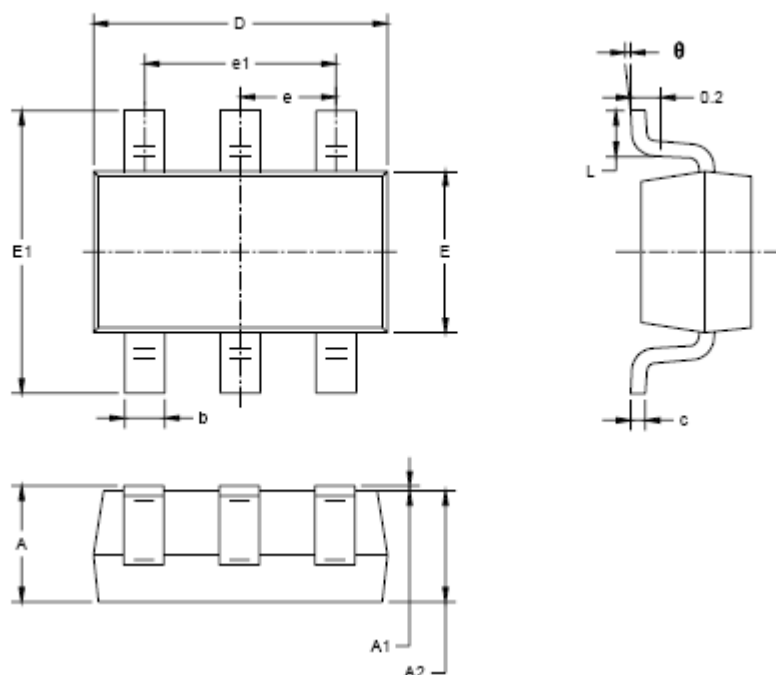
Test Circuit 6. -3dB Bandwidth

Package Information

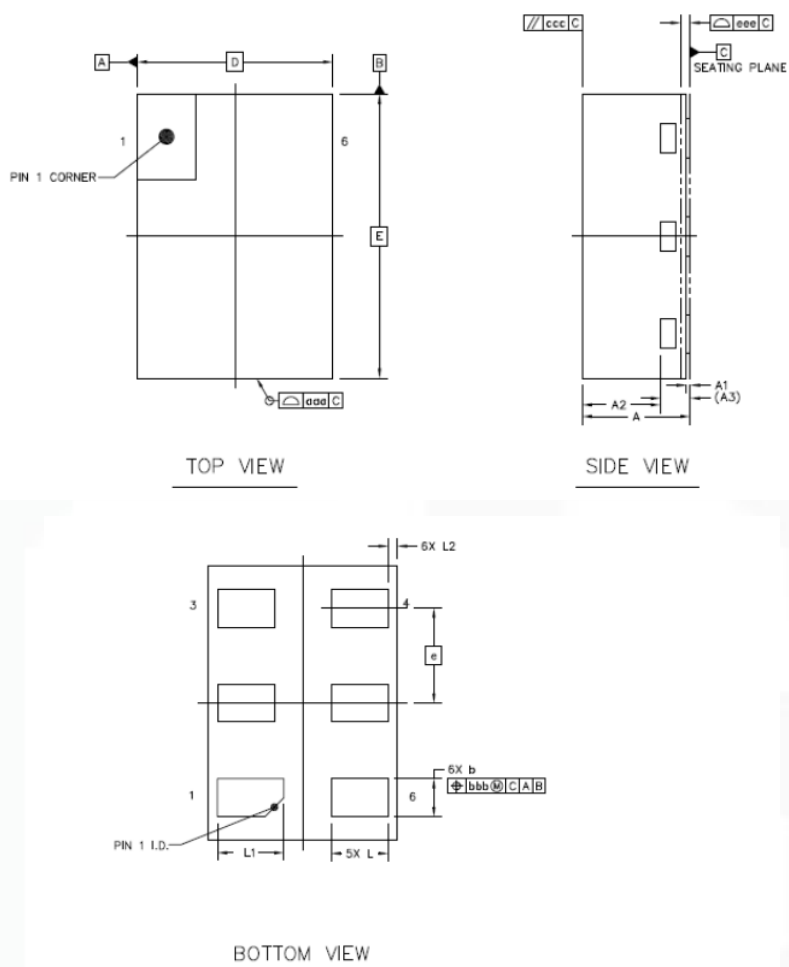
SC70-6



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.150	0.350	0.006	0.014
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	2.150	2.450	0.085	0.096
E1	1.150	1.350	0.045	0.053
e	0.650 TYP.		0.026 TYP.	
e1	1.200	1.400	0.047	0.055
L	0.260	0.460	0.010	0.018
L1	0.525 REF.		0.021 REF.	
θ	0°	8°	0°	8°

SOT23-6


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950 BSC		0.037 BSC	
e1	1.900 BSC		0.075 BSC	
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

TDFN1.45x1-6


		SYMBOL	MIN	NOM	MAX
TOTAL THICKNESS		A	0.5	0.55	0.6
STAND OFF		A1	0	0.02	0.05
MOLD THICKNESS		A2	---	0.4	---
L/F THICKNESS		A3	0.152 REF		
LEAD WIDTH		b	0.15	0.2	0.25
BODY SIZE	X	D	1 BSC		
	Y	E	1.45 BSC		
LEAD PITCH		e	0.5 BSC		
LEAD LENGTH		L	0.25	0.3	0.35
		L1	0.25	0.35	0.45
LEAD TO PKG		L2	0.05 REF		
PACKAGE EDGE TOLERANCE		aaa	0.1		
MOLD FLATNESS		ccc	0.1		
COPLANARITY		eee	0.05		
LEAD OFFSET		bbb	0.1		