Features

- **On-Resistance: 1.5Ω (TYP)**
- **-3dB Bandwidth: 100MHz**
- **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:**

GS3221 Available in SOT23-6 and SC70-6 Packages

General Description

The GS3221 is low on-resistance (1.5Ω), fast single-pole double-throw (SPDT) CMOS switch with operation range +1.8V ~ +5.5V. The GS3221 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℃ to +125℃.The GS3221 single is available in Green SC70-6 and SOT23-6 packages.

Applications

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

Pin Configuration

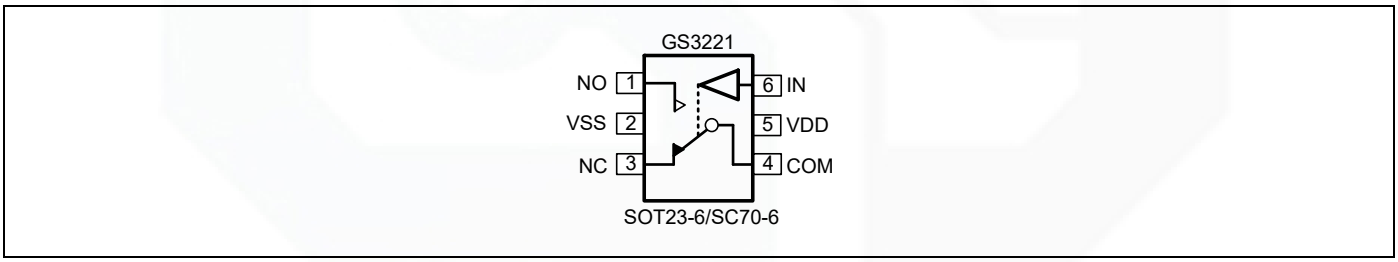


Figure 1. Pin Assignment Diagram

Absolute Maximum Ratings

Condition	Min	Max
Power Supply Voltage (V_{DD} to Vss)	-0.5V	+7.5V
Analog Input Voltage (NC NO or COM)	Vss-0.5V	V_{DD}+0.5V
PDB Input Voltage	Vss-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℃)		
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
GS3221	Single	GS3221-CR	SC70-6	Tape and Reel,3000	3221
		GS3221-TR	SOT23-6	Tape and Reel,3000	3221

Electrical Characteristics

(At V_S = +5V, and T_A = +25℃, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS	25℃	-40℃ ~85℃	-40℃ ~125℃	LIMIT	UNITS
ANALOG SWITCH							
Analog Signal Range	V_{NO} ,V_{NC} ,V_{COM}		V_S	V_S	V_S	MAX	V
On-Resistance	R_{ON}	V_S = 4.5V, V_{NO} or V_{NC} = 3.5V, I_{COM} = -10mA, Test Circuit 1	1.5			TYP	Ω
On-Resistance Match Between Channels	ΔR_{ON}	V_S = 4.5V, V_{NO} or V_{NC} = 3.5V, I_{COM} = -10mA, Test Circuit 1	1.0			TYP	Ω
		V_S = 4.5V, V_{NO} or V_{NC} = 3.5V, I_{COM} = -10mA, Test Circuit 1	3.0			MAX	Ω
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	0.2			TYP	Ω
		V_S = 4.5V, V_{NO} or V_{NC} = 1.0V, 2.0V, 3.5V, I_{COM} = -10mA, Test Circuit 1	0.45			MAX	Ω
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			MAX	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			MAX	μA
DIGITAL INPUTS							
Input High Voltage	V_{INH}	V_S = 5V	1.5			MIN	V
		V_S = 3V	0.9			MIN	V
Input Low Voltage	V_{INL}	V_S = 5V	0.55			MAX	V
		V_S = 3V	0.45			MAX	V
Input Leakage Current	I_{IN}	V_S = 5.5V, V_{IN} = 0V or 5.5V	±1			MAX	μA

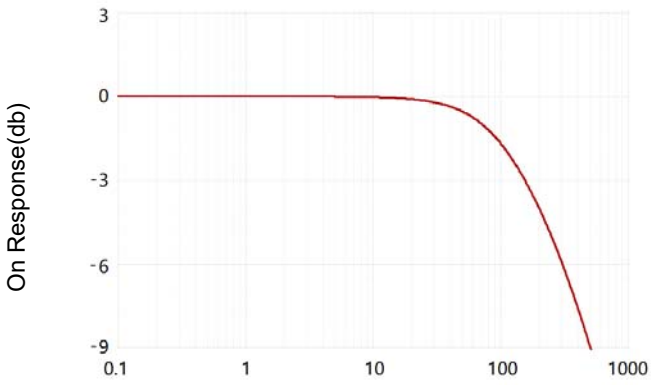
(At V_S = +5V, and T_A = +25℃, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS	25℃	-40℃ ~85℃	-40℃ ~125℃	LIMIT	UNITS
DYNAMIC CHARACTERISTICS							
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 = 300Ω, C_L = 35pF, Test Circuit 2	20			TYP	ns
		V_S = 3V, V_{NO} or V_{NC} = 1.5V, V_{IN_H} = 1.5V, V_{IN_L} = 0V, R_L = 300Ω, C_L = 35pF, Test Circuit 2	28			TYP	ns
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 = 300Ω, C_L = 35pF, Test Circuit 2	23			TYP	ns
		V_S = 3V, V_{NO} or V_{NC} = 1.5V, V_{IN_H} = 1.5V, V_{IN_L} = 0V, R_L = 300Ω, C_L = 35pF, Test Circuit 2	22			TYP	ns
Break-Before-Make Time Delay	T_{BBM}	V_S = 5V, V_{NO1} or V_{NC1} = V_{NO2} or V_{NC2} = 3V, R_L = 300Ω, C_L = 35pF, Test Circuit 3	23			TYP	ns
		V_S = 3V, V_{NO1} or V_{NC1} = V_{NO2} or V_{NC2} = 3V, R_L = 300Ω, C_L = 35pF, Test Circuit 3	27			TYP	ns
Skew	T_{SKEW}	V_S = 5V, R_S = 39Ω, C_L = 50pF, Test Circuit 4	9			TYP	ns
		V_S = 3V, R_S = 39Ω, C_L = 50pF, Test Circuit 4	9			TYP	ns
Off Isolation	O_{ISO}	R_L = 50Ω, Signal = 0dBm, C_L = 5pF, Test Circuit 5, f=10MHz	-40			TYP	db
		R_L = 50Ω, Signal = 0dBm, C_L = 5pF, Test Circuit 5, f=1MHz	-60			TYP	db
-3dB Bandwidth	BW	R_L = 50Ω, Signal = 0dBm, C_L = 5pF, Test Circuit 6	100			TYP	MHz
Source OFF Capacitance	$C_{NC(OFF)}$,$C_{NO(OFF)}$	f=1MHz	12			TYP	pF
Channel ON Capacitance	$C_{NC(ON)}$,$C_{NO(ON)}$,$C_{COM(ON)}$	f=1MHz	40			TYP	pF
POWER REQUIREMENTS							
Power Supply Range	V_S		1.8			MIN	V
Power Supply Range	V_S		5.5			MAX	V
Power Supply Current	I_S	V_{IN} = 0V or V_S	1			MAX	μA

Typical Performance characteristics

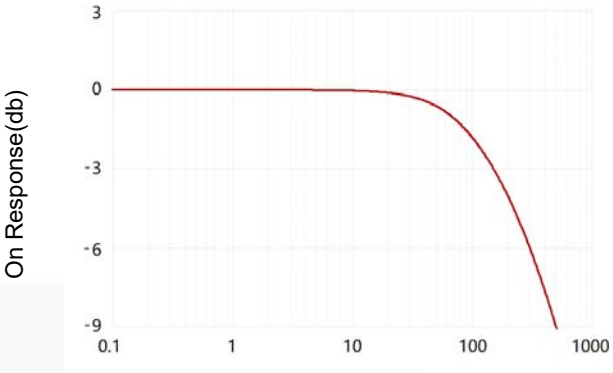
At T_A=+25°C, and V_S=+5V, unless otherwise noted.

BANDWIDTH



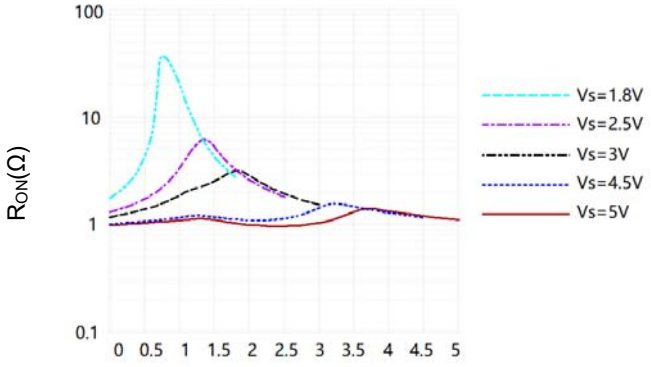
Frequency(MHz) V_S=+5V

BANDWIDTH



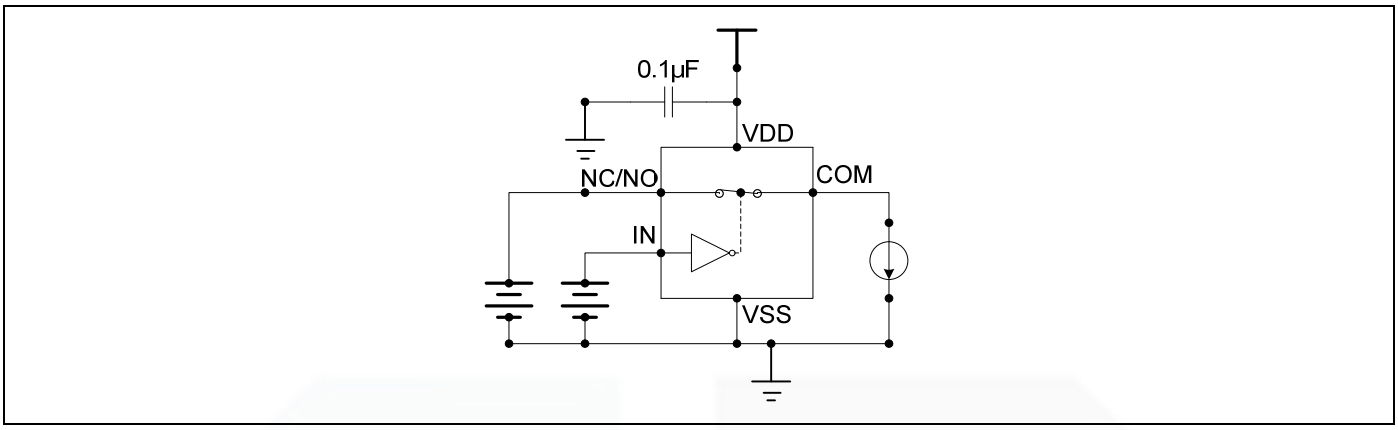
Frequency(MHz) V_S=+3V

Typical R_{ON} vs Input Voltage (VI)

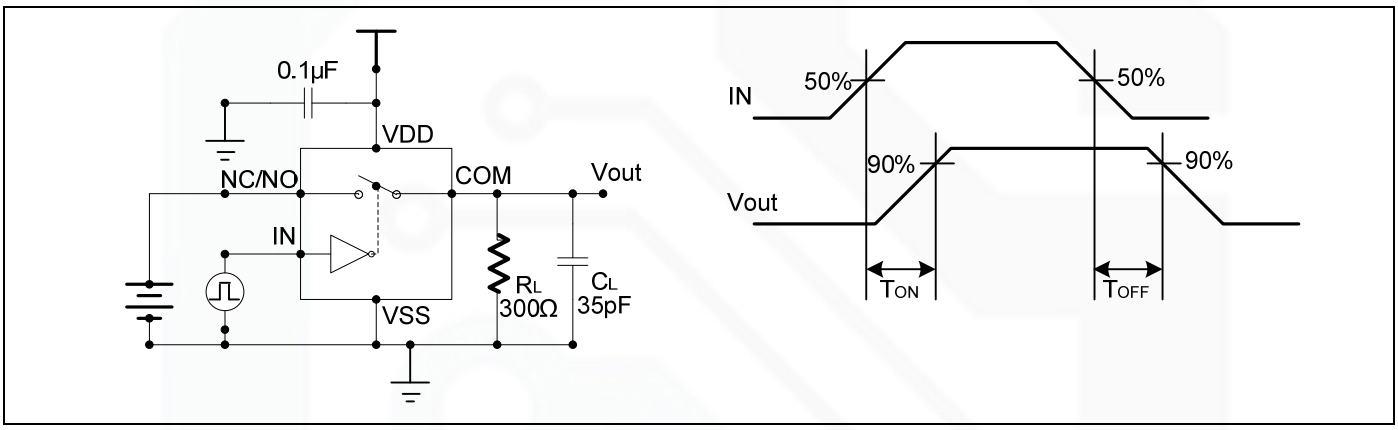


VI(V)

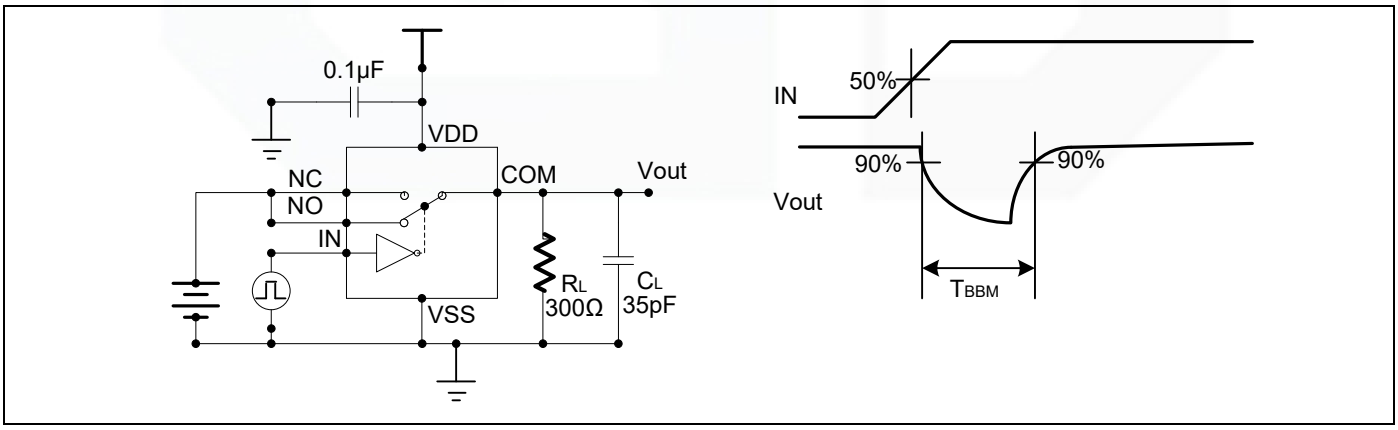
Parameter Measurement Information



Test Circuit 1. On-Resistance

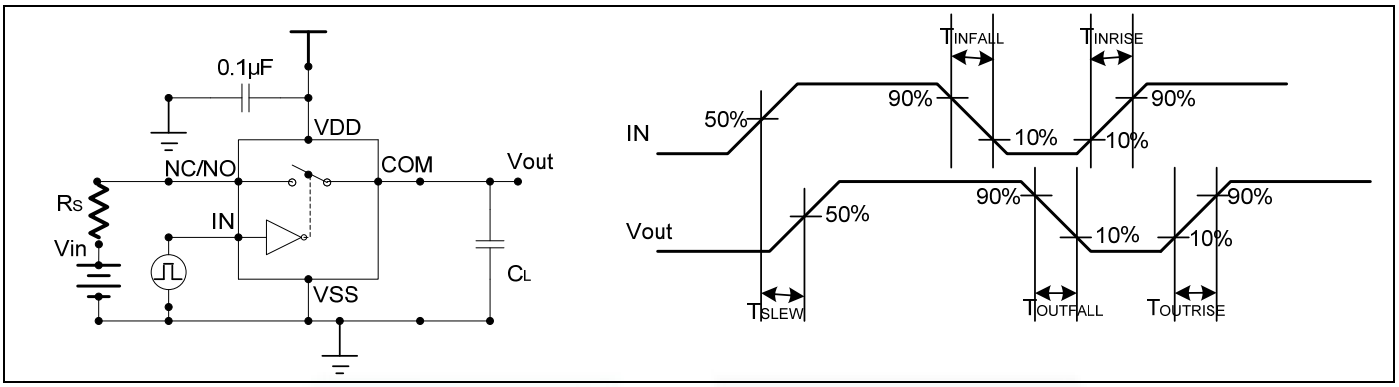


Test Circuit 2. Switching Times

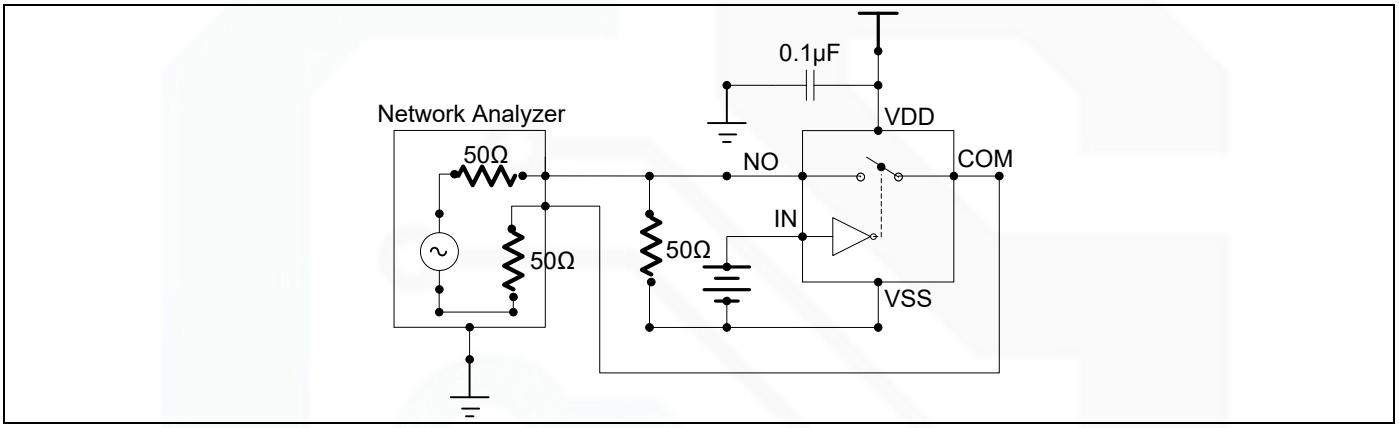


Test Circuit 3. Break-Before-Make Time Delay

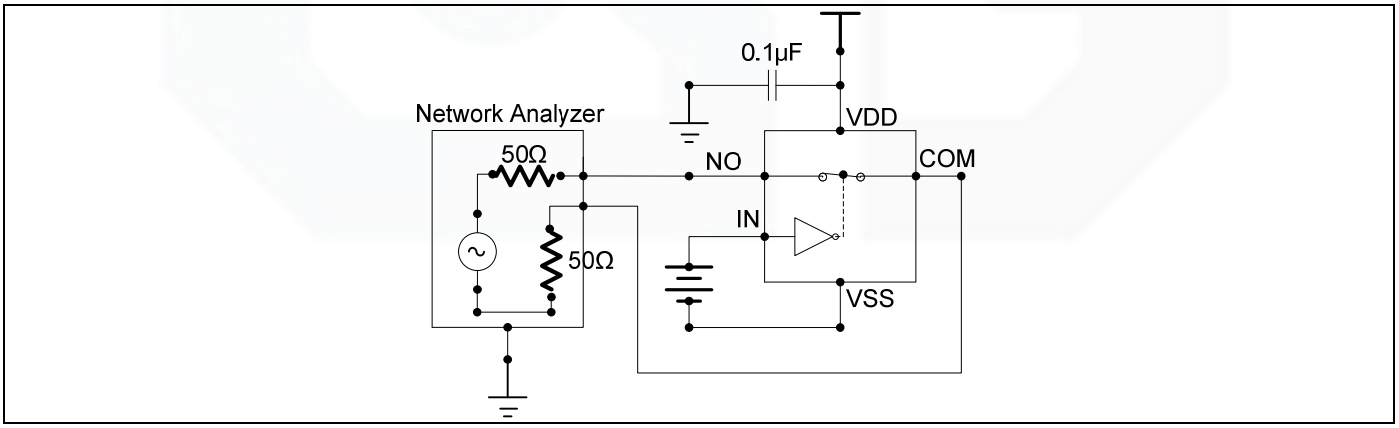
Parameter Measurement Information



Test Circuit 4. Output Signal Skew



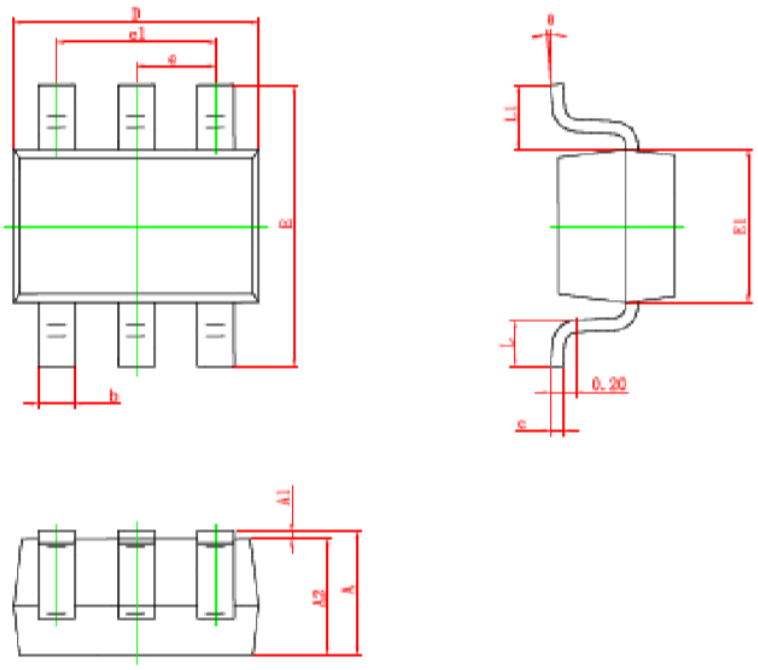
Test Circuit 5. Off Isolation



Test Circuit 6. -3dB Bandwidth

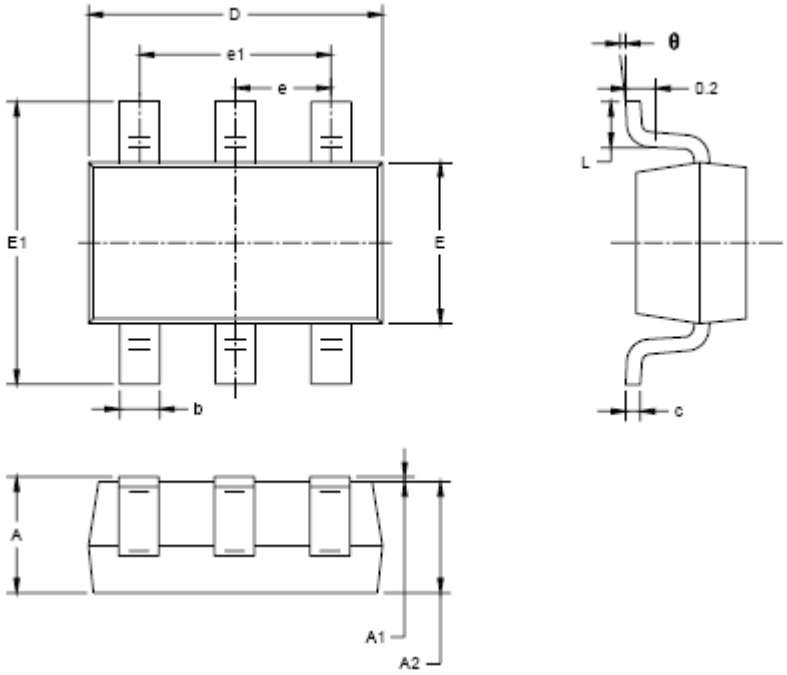
Package Information

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°