SGM4583
High Voltage, CMOS Analog Switch

GENERAL DESCRIPTION

The SGM4583 is a TTL/CMOS compatible analog multiplexer which consists of three single-pole/double-throw (SPDT) switches. It operates from +3.6V to +11V single power supply or ±1.8V to ±5.5V dual power supplies.

TTL/CMOS logic compatibility can be guaranteed when using a single +5V or dual ±5V power supplies because the logic thresholds of all digital inputs are between 0.8V and 2.4V.

The SGM4583 features high voltage, low on-resistance and low distortion. The high performances make it very suitable for multiple applications, such as cellular phones, audio and video signal routing, etc.

The SGM4583 is available in Green SOIC-16, SSOP-16, TSSOP-16 and TQFN-3×3-16L packages. It operates over an ambient temperature range of -40℃ to +85℃.

FEATURES

- **Single Supply Voltage Range: +3.6V to +11V**
- **Dual-Supply Voltage Range: ±1.8V to ±5.5V**
- **High Off-Isolation: -62dB (R_L = 50Ω, f = 1MHz)**
- **On-Resistance:**
    51Ω (MAX) with ±5V Supplies
    84Ω (MAX) with Single +5V Supply
- **Low On-Resistance Flatness**
- **Low Off-Leakage Current: 10nA (TYP) at +25℃**
- **Low On-Leakage Current: 10nA (TYP) at +25℃**
- **Low Crosstalk: -85dB (R_L = 50Ω, f = 1MHz)**
- **Low Distortion: 0.02% (R_L = 600Ω, f = 20Hz to 20kHz)**
- **Rail-to-Rail Input and Output Operation**
- **TTL/CMOS-Logic Compatible**
- **-40℃ to +85℃ Operating Temperature Range**
- **Available in Green SOIC-16, SSOP-16, TSSOP-16 and TQFN-3×3-16L Packages**

APPLICATIONS

Automotive
Cellular Phones
Portable Equipment
Sample-and-Hold Circuits
Battery-Powered Systems
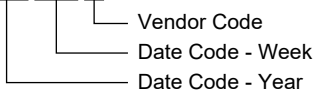Audio and Video Signal Routing

PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGM4583	SOIC-16	-40℃ to +85℃	SGM4583YS16G/TR	SGM4583YS16 XXXXX	Tape and Reel, 2500
	SSOP-16	-40℃ to +85℃	SGM4583YQS16G/TR	SGM4583 YQS16 XXXXX	Tape and Reel, 3000
	TSSOP-16	-40℃ to +85℃	SGM4583YTS16G/TR	SGM4583 YTS16 XXXXX	Tape and Reel, 3000
	TQFN-3×3-16L	-40℃ to +85℃	SGM4583YTQ16G/TR	4583TQ XXXXX	Tape and Reel, 3000

MARKING INFORMATION

NOTE: XXXXX = Date Code and Vendor Code.

SOIC-16/SSOP-16/TSSOP-16/TQFN-3×3-16L

<u>X X X X X</u>
- Vendor Code
- Date Code - Week
- Date Code - Year

Green (RoHS & HSF): SG Micro Corp defines "Green" to mean Pb-Free (RoHS compatible) and free of halogen substances. If you have additional comments or questions, please contact your SGMICRO representative directly.

ABSOLUTE MAXIMUM RATINGS

Voltages Referenced to V_{EE}

V_{CC} .... -0.3V to 13.2V

GND .... -0.3V to 6V

Voltage into Any Terminal [(1)]

.... (V_{EE} - 0.3V) to (V_{CC} + 0.3V)

Continuous Current into Any Terminal .... ±20mA

Peak Current, X_ (pulsed at 1ms, 10% duty cycle)

.... ±40mA

Junction Temperature .... +150℃

Storage Temperature Range .... -65℃ to +150℃

Lead Temperature (Soldering, 10s) .... +260℃

ESD Susceptibility

HBM 3000V

MM 150V

NOTE: 1. Voltages exceeding V_{CC} or V_{EE} on any signal terminal are clamped by internal diodes. Limit forward-diode current to maximum current rating.

RECOMMENDED OPERATING CONDITIONS

Operating Temperature Range .... -40℃ to +85℃

OVERSTRESS CAUTION

Stresses beyond those listed in Absolute Maximum Ratings may cause permanent damage to the device. Exposure to absolute maximum rating conditions for extended periods may affect reliability. Functional operation of the device at any conditions beyond those indicated in the Recommended Operating Conditions section is not implied.
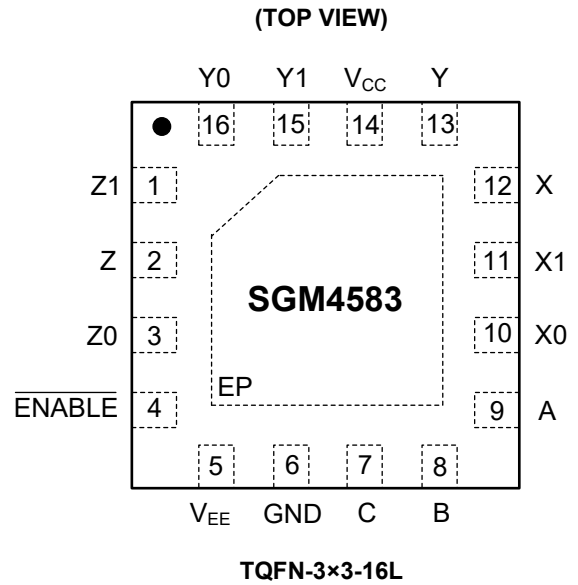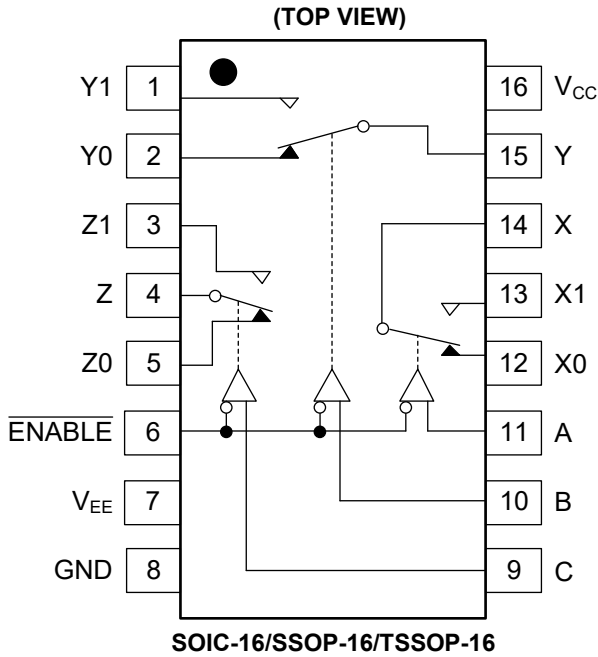
ESD SENSITIVITY CAUTION

This integrated circuit can be damaged if ESD protections are not considered carefully. SGMICRO recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage. ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because even small parametric changes could cause the device not to meet the published specifications.

DISCLAIMER

SG Micro Corp reserves the right to make any change in circuit design, or specifications without prior notice.

PIN CONFIGURATIONS

(TOP VIEW)

SOIC-16/SSOP-16/TSSOP-16

(TOP VIEW)

TQFN-3×3-16L

PIN DESCRIPTION

PIN		NAME	FUNCTION
SOIC-16, SSOP-16, TSSOP-16	TQFN-3×3-16L		
1	15	Y1	Analog Switch "Y" Normally Open Input Pin.
2	16	Y0	Analog Switch "Y" Normally Closed Input Pin.
3	1	Z1	Analog Switch "Z" Normally Open Input Pin.
4	2	Z	Analog Switch "Z" Output Pin.
5	3	Z0	Analog Switch "Z" Normally Closed Input Pin.
6	4	$\overline{\text{ENABLE}}$	Digital Enable Control Pin. Normally connected to GND.
7	5	V_{EE}	Negative Analog Supply Voltage Input Pin. Connect to GND for single-supply operation.
8	6	GND	Ground.
9	7	C	Digital Address "C" Input Pin.
10	8	B	Digital Address "B" Input Pin.
11	9	A	Digital Address "A" Input Pin.
12	10	X0	Analog Switch "X" Normally Closed Input Pin.
13	11	X1	Analog Switch "X" Normally Open Input Pin.
14	12	X	Analog Switch "X" Output Pin.
15	13	Y	Analog Switch "Y" Output Pin.
16	14	V_{CC}	Positive Analog and Digital Supply Voltage Input Pin.
—	Exposed Pad	EP	Exposed Pad. Connect exposed pad to V_{EE} Pin.

NOTE:
Any input terminal can be used as an output terminal, and any output terminal can also be used as an input terminal. Signal transmission in both directions is equally well.

FUNCTION TABLE

ENABLE INPUT	SELECT INPUTS			ON SWITCHES
	C	**B**	**A**	
H	*X*	*X*	*X*	All Switches Open
L	L	L	L	X-X0, Y-Y0, Z-Z0
L	L	L	H	X-X1, Y-Y0, Z-Z0
L	L	H	L	X-X0, Y-Y1, Z-Z0
L	L	H	H	X-X1, Y-Y1, Z-Z0
L	H	L	L	X-X0, Y-Y0, Z-Z1
L	H	L	H	X-X1, Y-Y0, Z-Z1
L	H	H	L	X-X0, Y-Y1, Z-Z1
L	H	H	H	X-X1, Y-Y1, Z-Z1

X = Don't care.

ELECTRICAL CHARACTERISTICS (Dual Supplies)

(V_{CC} = 4.5V to 5.5V, V_{EE} = -4.5V to -5.5V, Full = -40℃ to +85℃, typical values are at T_A = +25℃, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS	TEMP	MIN	TYP	MAX	UNITS
Analog Switch							
Analog Signal Range	$V_{X\_}$, $V_{Y\_}$, $V_{Z\_}$, V_X, V_Y, V_Z		Full	V_{EE}		V_{CC}	V
On-Resistance	R_{ON}	V_{CC} = 4.5V, V_{EE} = -4.5V, I_X, I_Y, I_Z = 1mA	+25℃		36	51	Ω
			Full			62	
On-Resistance Match Between Channels	ΔR_{ON}	V_{CC} = 4.5V, V_{EE} = -4.5V, I_X, I_Y, I_Z = 1mA	+25℃		3	11	Ω
			Full			12.7	
On-Resistance Flatness	$R_{FLAT(ON)}$	V_{CC} = 4.5V, V_{EE} = -4.5V, I_X, I_Y, I_Z = 1mA	+25℃		15	25	Ω
			Full			29	
X_, Y_, Z_ Off Leakage Current	$I_{X\_(OFF)}$, $I_{Y\_(OFF)}$, $I_{Z\_(OFF)}$	V_{CC} = 5.5V, V_{EE} = -5.5V, $V_{X\_}$, $V_{Y\_}$, $V_{Z\_}$ = ±4.5V, V_X, V_Y, V_Z = ∓4.5V	+25℃		10		nA
X, Y, Z Off Leakage Current	$I_{X(OFF)}$, $I_{Y(OFF)}$, $I_{Z(OFF)}$	V_{CC} = 5.5V, V_{EE} = -5.5V, $V_{X\_}$, $V_{Y\_}$, $V_{Z\_}$ = ±4.5V, V_X, V_Y, V_Z = ∓4.5V	+25℃		10		nA
X, Y, Z On Leakage Current	$I_{X(ON)}$, $I_{Y(ON)}$, $I_{Z(ON)}$	V_{CC} = 5.5V, V_{EE} = -5.5V, V_X, V_Y, V_Z = ±4.5V	+25℃		10		nA
Digital I/O							
Logic Input Logic Threshold High	V_{AH}, V_{BH}, V_{CH}, $V_{\overline{ENABLEH}}$		+25℃	2.4			V
Logic Input Logic Threshold Low	V_{AL}, V_{BL}, V_{CL}, $V_{\overline{ENABLEL}}$		+25℃			0.8	V
Input-Current High	I_{AH}, I_{BH}, I_{CH}, $I_{\overline{ENABLEH}}$	V_A, V_B, V_C, $V_{\overline{ENABLE}}$ = V_{CC}	+25℃		10		nA
Input-Current Low	I_{AL}, I_{BL}, I_{CL}, $I_{\overline{ENABLEL}}$	V_A, V_B, V_C, $V_{\overline{ENABLE}}$ = 0V	+25℃		10		nA
Dynamic Characteristics							
Address Transition Time	t_{TRANS}	$V_{X\_}$, $V_{Y\_}$, $V_{Z\_}$ = ±3V, R_L = 300Ω, C_L = 35pF, Test Circuit 1	+25℃		70		ns
$\overline{ENABLE}$ Turn-On Time	t_{ON}	$V_{X\_}$, $V_{Y\_}$, $V_{Z\_}$ = 3V, R_L = 300Ω, C_L = 35pF, Test Circuit 2	+25℃		60		ns
$\overline{ENABLE}$ Turn-Off Time	t_{OFF}	$V_{X\_}$, $V_{Y\_}$, $V_{Z\_}$ = 3V, R_L = 300Ω, C_L = 35pF, Test Circuit 2	+25℃		70		ns
Break-Before-Make Time Delay	t_D	$V_{X\_}$, $V_{Y\_}$, $V_{Z\_}$ = 3V, R_L = 300Ω, C_L = 35pF, Test Circuit 3	+25℃		15		ns
Charge Injection	Q	R_S = 0Ω, C = 1nF, V_S = 0V, Test Circuit 4	+25℃		10		pC
Off-Isolation	V_{ISO}	R_L = 50Ω, f = 1MHz, Test Circuit 5	+25℃		-62		dB
Channel-to-Channel Crosstalk	V_{CT}	R_L = 50Ω, f = 1MHz, Test Circuit 5	+25℃		-85		dB
Input Off-Capacitance	$C_{X\_(OFF)}$, $C_{Y\_(OFF)}$, $C_{Z\_(OFF)}$	$V_{X\_}$, $V_{Y\_}$, $V_{Z\_}$ = 0V, f = 1MHz, Test Circuit 6	+25℃		12		pF
Output Off-Capacitance	$C_{X(OFF)}$, $C_{Y(OFF)}$, $C_{Z(OFF)}$	$V_{X\_}$, $V_{Y\_}$, $V_{Z\_}$ = 0V, f = 1MHz, Test Circuit 6	+25℃		15		pF
Output On-Capacitance	$C_{X(ON)}$, $C_{Y(ON)}$, $C_{Z(ON)}$	$V_{X\_}$, $V_{Y\_}$, $V_{Z\_}$ = 0V, f = 1MHz, Test Circuit 6	+25℃		35		pF
-3dB Bandwidth	BW	R_L = 50Ω	+25℃		140		MHz
Total Harmonic Distortion	THD	R_L = 600Ω, 5V_{P-P}, f = 20Hz to 20kHz	+25℃		0.02		%
Power Supply							
Power Supply Range	V_{CC}, V_{EE}		Full	±1.8V		±5.5V	V
Power Supply Current	I_{CC}, I_{EE}	V_{CC} = 5.5V, V_{EE} = -5.5V, V_A, V_B, V_C, $V_{\overline{ENABLE}}$ = V_{CC} or 0	+25℃		0.01	20	µA

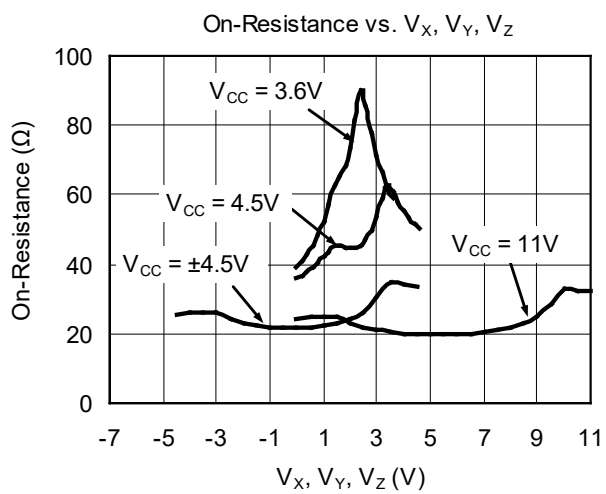## ELECTRICAL CHARACTERISTICS (Single Supply at +5V)

(V_{CC} = 4.5V to 5.5V, V_{EE} = 0V, Full = -40℃ to +85℃, typical values are at T_A = +25℃, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS	TEMP	MIN	TYP	MAX	UNITS
Analog Switch							
Analog Signal Range	$V_{X\_}$, $V_{Y\_}$, $V_{Z\_}$, V_X, V_Y, V_Z		Full	V_{EE}		V_{CC}	V
On-Resistance	R_{ON}	V_{CC} = 4.5V, I_X, I_Y, I_Z = 1mA	+25℃		66	84	Ω
			Full			97	
On-Resistance Match Between Channels	ΔR_{ON}	V_{CC} = 4.5V, I_X, I_Y, I_Z = 1mA	+25℃		3	11	Ω
			Full			14	
X_, Y_, Z_ Off Leakage Current	$I_{X\_(OFF)}$, $I_{Y\_(OFF)}$, $I_{Z\_(OFF)}$	V_{CC} = 5.5V, $V_{X\_}$, $V_{Y\_}$, $V_{Z\_}$ = 1V, 4.5V, V_X, V_Y, V_Z = 4.5V, 1V	+25℃		10		nA
X, Y, Z Off Leakage Current	$I_{X(OFF)}$, $I_{Y(OFF)}$, $I_{Z(OFF)}$	V_{CC} = 5.5V, $V_{X\_}$, $V_{Y\_}$, $V_{Z\_}$ = 1V, 4.5V, V_X, V_Y, V_Z = 4.5V, 1V	+25℃		10		nA
X, Y, Z On Leakage Current	$I_{X(ON)}$, $I_{Y(ON)}$, $I_{Z(ON)}$	V_{CC} = 5.5V, V_X, V_Y, V_Z = 4.5V, 1V	+25℃		10		nA
Digital I/O							
Logic Input Logic Threshold High	V_{AH}, V_{BH}, V_{CH}, $V_{\overline{ENABLEH}}$		+25℃	2.4			V
Logic Input Logic Threshold Low	V_{AL}, V_{BL}, V_{CL}, $V_{\overline{ENABLEL}}$		+25℃			0.8	V
Input-Current High	I_{AH}, I_{BH}, I_{CH}, $I_{\overline{ENABLEH}}$	V_A, V_B, V_C, $V_{\overline{ENABLE}}$ = V_{CC}	+25℃		10		nA
Input-Current Low	I_{AL}, I_{BL}, I_{CL}, $I_{\overline{ENABLEL}}$	V_A, V_B, V_C, $V_{\overline{ENABLE}}$ = 0V	+25℃		10		nA
Dynamic Characteristics							
Address Transition Time	t_{TRANS}	$V_{X\_}$, $V_{Y\_}$, $V_{Z\_}$ = 3V/0V, R_L = 300Ω, C_L = 35pF, Test Circuit 1	+25℃		100		ns
$\overline{ENABLE}$ Turn-On Time	t_{ON}	$V_{X\_}$, $V_{Y\_}$, $V_{Z\_}$ = 3V, R_L = 300Ω, C_L = 35pF, Test Circuit 2	+25℃		70		ns
$\overline{ENABLE}$ Turn-Off Time	t_{OFF}	$V_{X\_}$, $V_{Y\_}$, $V_{Z\_}$ = 3V, R_L = 300Ω, C_L = 35pF, Test Circuit 2	+25℃		80		ns
Break-Before-Make Time Delay	t_D	$V_{X\_}$, $V_{Y\_}$, $V_{Z\_}$ = 3V, R_L = 300Ω, C_L = 35pF, Test Circuit 3	+25℃		25		ns
Charge Injection	Q	R_S = 0Ω, C = 1nF, V_S = 2.5V, Test Circuit 4	+25℃		5		pC
-3dB Bandwidth	BW	R_L = 50Ω	+25℃		160		MHz
Power Supply							
Power Supply Range	V_{CC}, V_{EE}		+25℃	3.6		11	V
Power Supply Current	I_{CC}, I_{EE}	V_{CC} = 5.5V, V_A, V_B, V_C, $V_{\overline{ENABLE}}$ = V_{CC} or 0	+25℃		0.01	20	µA

ELECTRICAL CHARACTERISTICS (Single Supply at +3.6V)

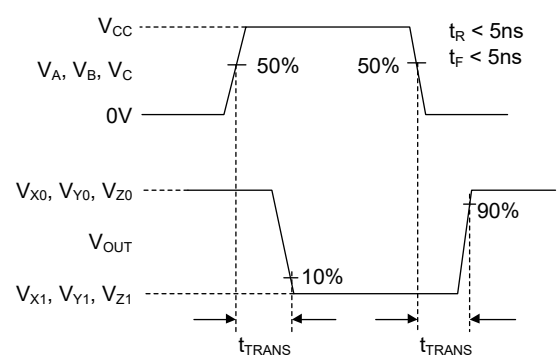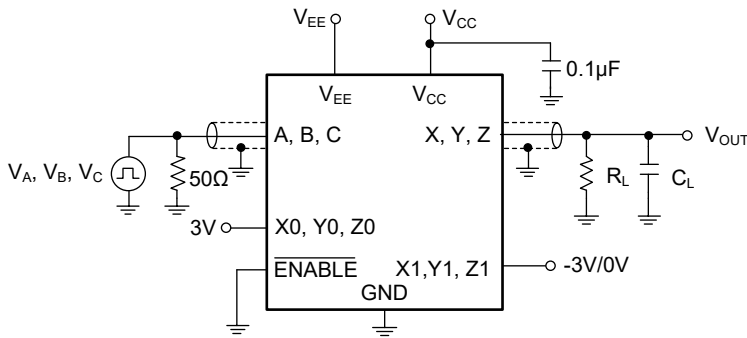(V_{CC} = 3.6V, V_{EE} = 0V, Full = -40℃ to +85℃, typical values are at T_A = +25℃, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS	TEMP	MIN	TYP	MAX	UNITS
Analog Switch							
Analog Signal Range	$V_{X\_}$, $V_{Y\_}$, $V_{Z\_}$, V_X, V_Y, V_Z		Full	V_{EE}		V_{CC}	V
On-Resistance	R_{ON}	I_X, I_Y, I_Z = 1mA	+25℃		100	128	Ω
			Full			138	
X_, Y_, Z_ Off Leakage Current	$I_{X\_(OFF)}$, $I_{Y\_(OFF)}$, $I_{Z\_(OFF)}$	$V_{X\_}$, $V_{Y\_}$, $V_{Z\_}$ = 1V, 3V, V_X, V_Y, V_Z = 3V, 1V	+25℃		10		nA
X, Y, Z Off Leakage Current	$I_{X(OFF)}$, $I_{Y(OFF)}$, $I_{Z(OFF)}$	$V_{X\_}$, $V_{Y\_}$, $V_{Z\_}$ = 1V, 3V, V_X, V_Y, V_Z = 3V, 1V	+25℃		10		nA
X, Y, Z On Leakage Current	$I_{X(ON)}$, $I_{Y(ON)}$, $I_{Z(ON)}$	V_X, V_Y, V_Z = 3V, 1V	+25℃		10		nA
Digital I/O							
Logic Input Logic Threshold High	V_{AH}, V_{BH}, V_{CH}, $V_{\overline{ENABLEH}}$		+25℃	2			V
Logic Input Logic Threshold Low	V_{AL}, V_{BL}, V_{CL}, $V_{\overline{ENABLEL}}$		+25℃			0.5	V
Input-Current High	I_{AH}, I_{BH}, I_{CH}, $I_{\overline{ENABLEH}}$	V_A, V_B, V_C, $V_{\overline{ENABLE}}$ = V_{CC}	+25℃		10		nA
Input-Current Low	I_{AL}, I_{BL}, I_{CL}, $I_{\overline{ENABLEL}}$	V_A, V_B, V_C, $V_{\overline{ENABLE}}$ = 0V	+25℃		10		nA
Dynamic Characteristics							
Address Transition Time	t_{TRANS}	$V_{X\_}$, $V_{Y\_}$, $V_{Z\_}$ = 3V/0V, R_L = 300Ω, C_L = 35pF, Test Circuit 1	+25℃		140		ns
$\overline{ENABLE}$ Turn-On Time	t_{ON}	$V_{X\_}$, $V_{Y\_}$, $V_{Z\_}$ = 3V, R_L = 300Ω, C_L = 35pF, Test Circuit 2	+25℃		100		ns
$\overline{ENABLE}$ Turn-Off Time	t_{OFF}	$V_{X\_}$, $V_{Y\_}$, $V_{Z\_}$ = 3V, R_L = 300Ω, C_L = 35pF, Test Circuit 2	+25℃		90		ns
Break-Before-Make Time Delay	t_D	$V_{X\_}$, $V_{Y\_}$, $V_{Z\_}$ = 3V, R_L = 300Ω, C_L = 35pF, Test Circuit 3	+25℃		35		ns
Charge Injection	Q	R_S = 0Ω, C = 1nF, V_S = 2.5V, Test Circuit 4	+25℃		3		pC
-3dB Bandwidth	BW	R_L = 50Ω	+25℃		160		MHz
Power Supply							
Power Supply Current	I_{CC}, I_{EE}	V_A, V_B, V_C, $V_{\overline{ENABLE}}$ = V_{CC} or 0	+25℃		0.01	20	μA

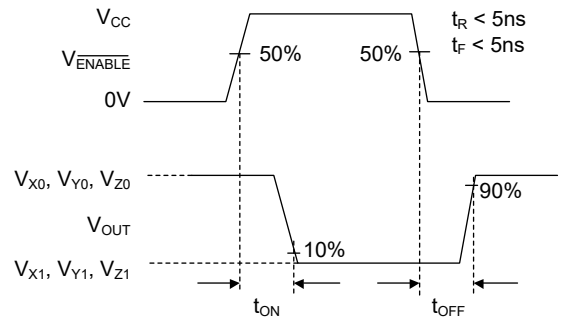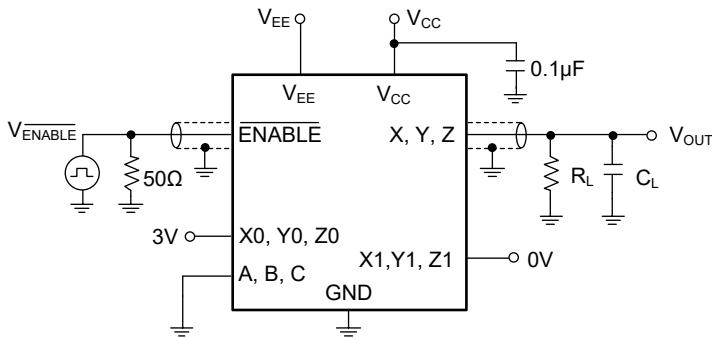## TYPICAL PERFORMANCE CHARACTERISTICS

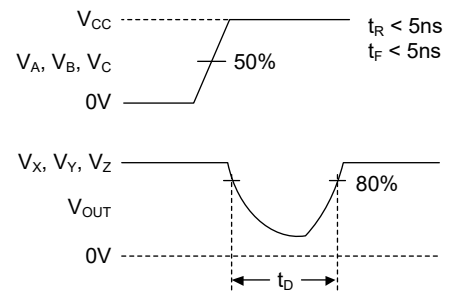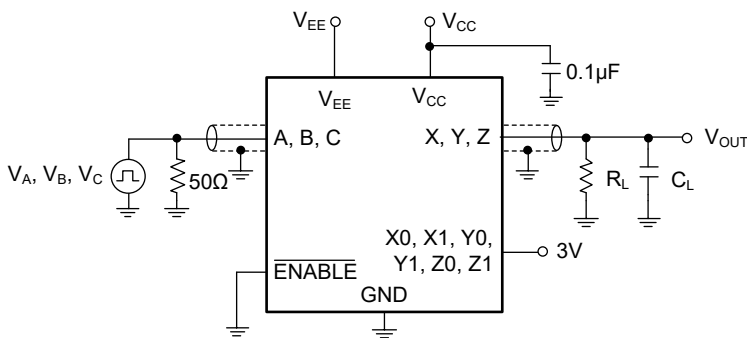On-Resistance vs. V_X, V_Y, V_Z

TEST CIRCUITS
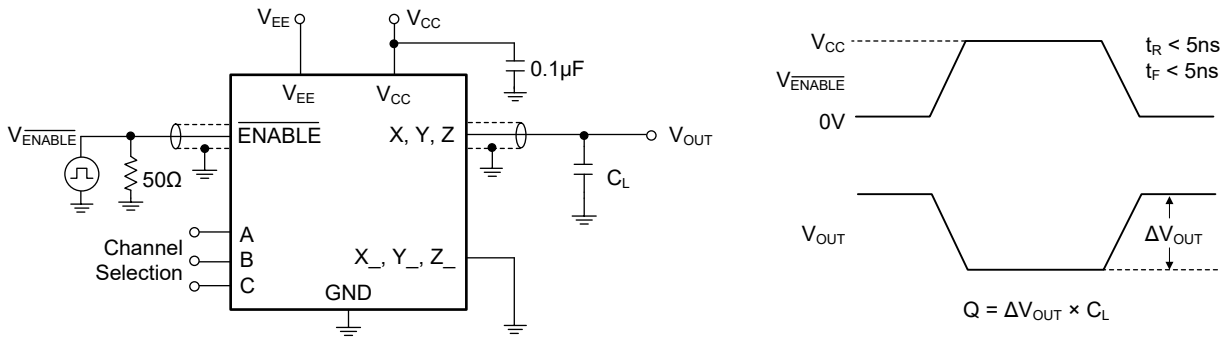

Test Circuit 1. Address Transition Times (t_{TRANS})
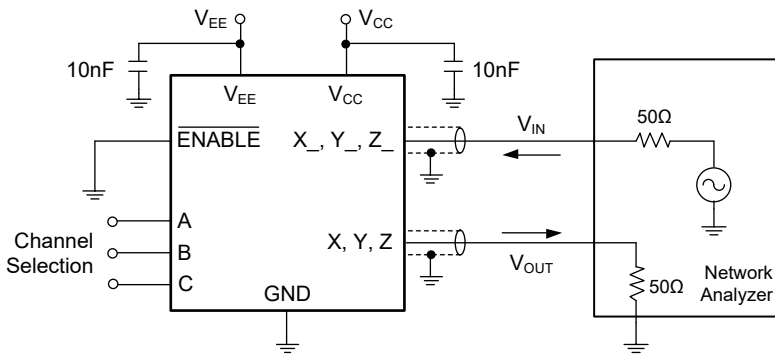

Test Circuit 2. Switching Times (t_{ON}, t_{OFF})

Test Circuit 3. Break-Before-Make Time Delay (t_D)
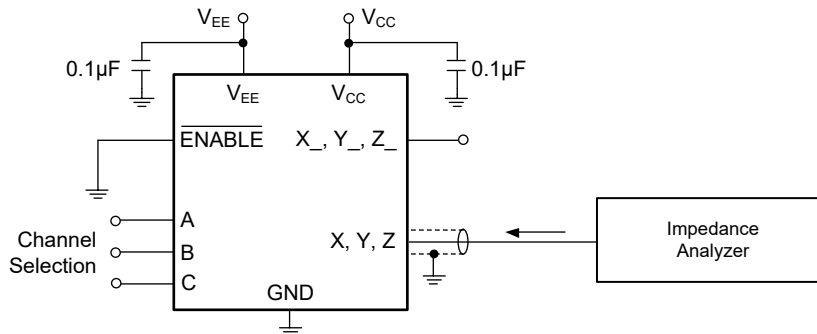
TEST CIRCUITS (continued)

Test Circuit 4. Charge Injection (Q)

$Q = \Delta V_{OUT} \times C_L$

Off-Isolation = 20log (V_{OUT}/V_{IN}) (Measured between X and "OFF" X_ Terminal on Each Switch)

On Loss = 20log (V_{OUT}/V_{IN}) (Measured between X and "ON" X_ Terminal on Each Switch)

Channel-to-Channel Crosstalk = 20log (V_{OUT}/V_{IN}) (Measured from One Channel (X, Y, Z) to All other Channels)

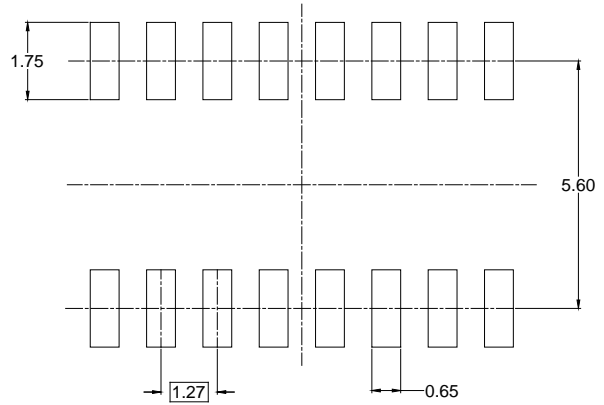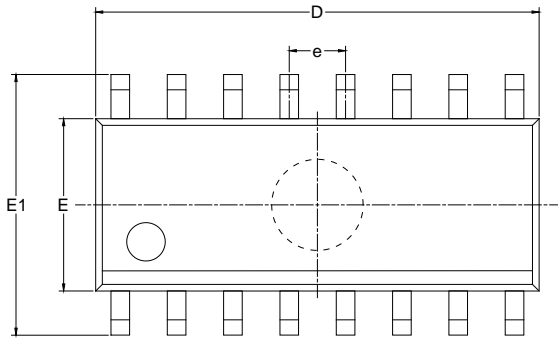**Test Circuit 5. Off-Isolation, On Loss and Crosstalk**

Test Circuit 6. Capacitance

REVISION HISTORY

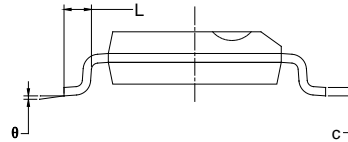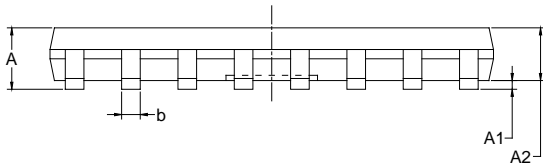NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

PACKAGE OUTLINE DIMENSIONS

SOIC-16

RECOMMENDED LAND PATTERN (Unit: mm)

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	**MAX**	**MIN**	**MAX**
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	9.800	10.200	0.386	0.402
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.27 BSC		0.050 BSC	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

NOTES:
1. Body dimensions do not include mode flash or protrusion.
2. This drawing is subject to change without notice.

SG Micro Corp
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TX00012.000

PACKAGE OUTLINE DIMENSIONS

SSOP-16

RECOMMENDED LAND PATTERN (Unit: mm)

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	**MAX**	**MIN**	**MAX**
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.200	0.300	0.008	0.012
c	0.170	0.250	0.007	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	0.635 BSC		0.025 BSC	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

NOTES:
1. Body dimensions do not include mode flash or protrusion.
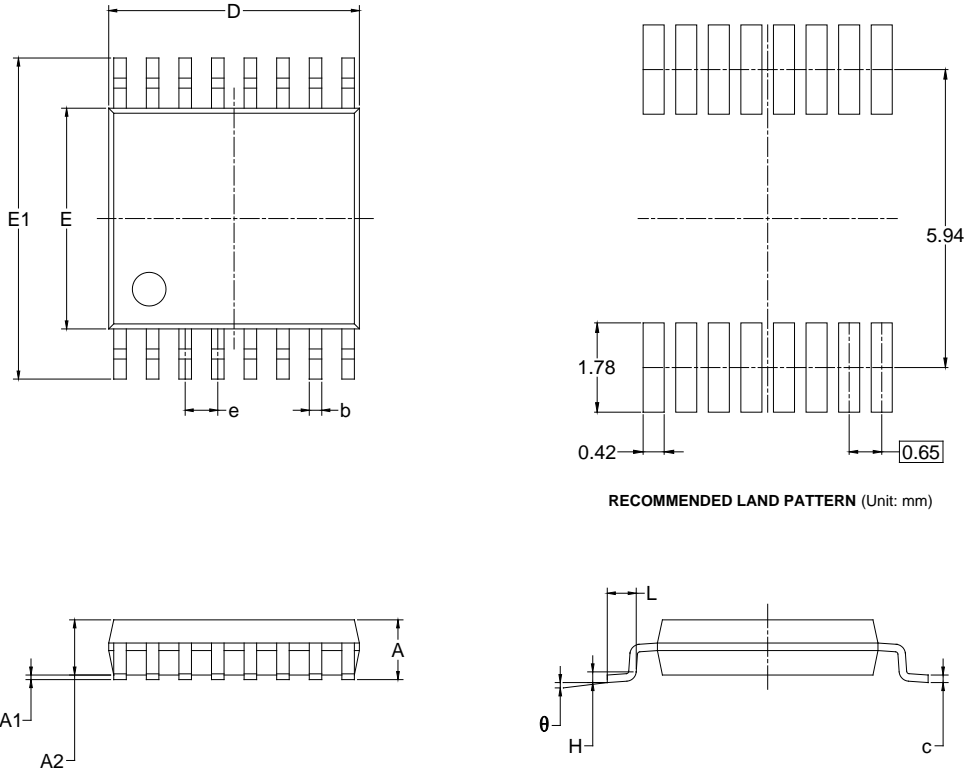2. This drawing is subject to change without notice.

SG Micro Corp
www.sg-micro.com

TX00026.000

PACKAGE OUTLINE DIMENSIONS

TSSOP-16

RECOMMENDED LAND PATTERN (Unit: mm)

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A		1.200		0.047
A1	0.050	0.150	0.002	0.006
A2	0.800	1.050	0.031	0.041
b	0.190	0.300	0.007	0.012
c	0.090	0.200	0.004	0.008
D	4.860	5.100	0.191	0.201
E	4.300	4.500	0.169	0.177
E1	6.200	6.600	0.244	0.260
e	0.650 BSC		0.026 BSC	
L	0.500	0.700	0.02	0.028
H	0.25 TYP		0.01 TYP	
θ	1°	7°	1°	7°

NOTES:
1. Body dimensions do not include mode flash or protrusion.
2. This drawing is subject to change without notice.
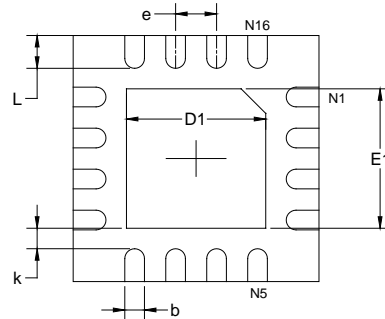
PACKAGE OUTLINE DIMENSIONS

TQFN-3×3-16L

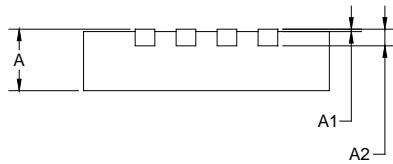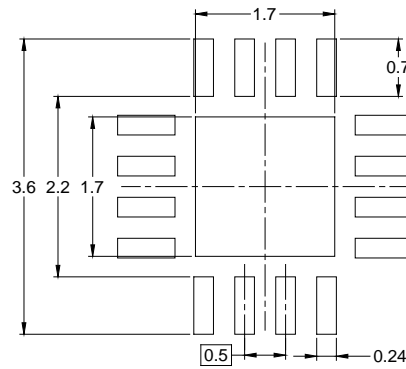**TOP VIEW**

BOTTOM VIEW

SIDE VIEW

RECOMMENDED LAND PATTERN (Unit: mm)

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
A2	0.203 REF		0.008 REF	
D	2.900	3.100	0.114	0.122
D1	1.600	1.800	0.063	0.071
E	2.900	3.100	0.114	0.122
E1	1.600	1.800	0.063	0.071
k	0.200 MIN		0.008 MIN	
b	0.180	0.300	0.007	0.012
e	0.500 TYP		0.020 TYP	
L	0.300	0.500	0.012	0.020

NOTE: This drawing is subject to change without notice.
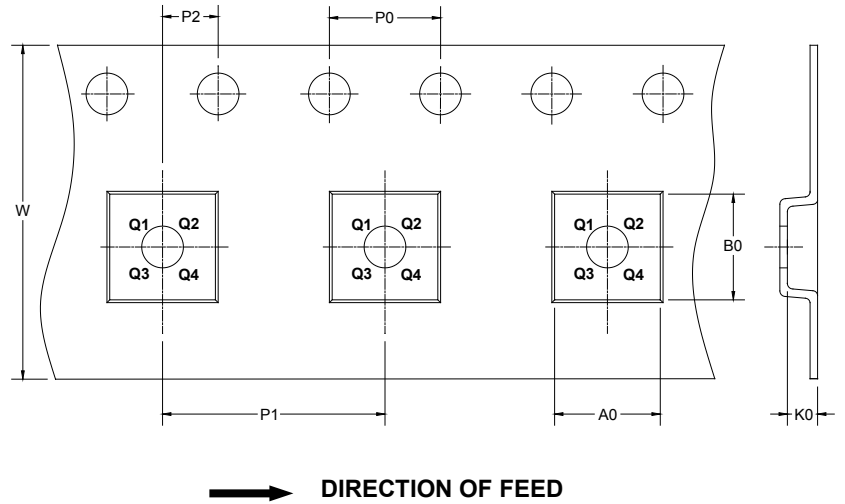
TAPE AND REEL INFORMATION

REEL DIMENSIONS

TAPE DIMENSIONS

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 W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
SOIC-16	13″	16.4	6.50	10.30	2.10	4.0	8.0	2.0	16.0	Q1
SSOP-16	13″	12.4	6.40	5.40	2.10	4.0	8.0	2.0	12.0	Q1
TSSOP-16	13″	12.4	6.90	5.60	1.50	4.0	8.0	2.0	12.0	Q1
TQFN-3×3-16L	13″	12.4	3.35	3.35	1.13	4.0	8.0	2.0	12.0	Q1

DD0001

CARTON BOX DIMENSIONS

NOTE: The picture is only for reference. Please make the object as the standard.

KEY PARAMETER LIST OF CARTON BOX

Reel Type	Length (mm)	Width (mm)	Height (mm)	Pizza/Carton
13″	386	280	370	5

DD0002