SGM4806
Wide Power Supply Range, 2:1 MUX Input Audio Click-Pop Noise Eliminator

GENERAL DESCRIPTION

The SGM4806 is a 2:1 MUX input, audio click-pop eliminator which can operate from a 2.7V to 12V single power supply. It is designed for HiFi audio system or portable devices.

The SGM4806 allows $-V_{CC}$ to $+V_{CC}$ wide range audio signals passing with low distortion. An external processor can eliminate the click-pop noise.

The SGM4806 is available in Green TQFN-4×4-16L, WLCSP-1.27×2.13-15B and SOIC-16 packages. It operates over an ambient temperature range of -40℃ to +85℃.

FEATURES

- **Supply Voltage Range: 2.7V to 12V**
- **2:1 MUX Input**
- **Low On-Resistance: 0.8Ω (TYP)**
- **$-V_{CC}$ to $+V_{CC}$ Rail-to-Rail Low Distortion Audio Signals Passing**
- **High Off-Isolation**
- **Low Crosstalk**
- **Low THD+N**
- **1.8V Logic Control**
- **-40℃ to +85℃ Operating Temperature Range**
- **Available in Green WLCSP-1.27×2.13-15B, SOIC-16 and TQFN-4×4-16L Packages**

APPLICATIONS

HiFi Audio System

Portable Equipment

PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGM4806	WLCSP-1.27×2.13-15B	-40℃ to +85℃	SGM4806YG/TR	XXXXX 4806	Tape and Reel, 3000
	SOIC-16	-40℃ to +85℃	SGM4806YS16G/TR	SGM4806YS16 XXXXX	Tape and Reel, 2500
	TQFN-4×4-16L	-40℃ to +85℃	SGM4806YTQE16G/TR	SGM4806 YTQE16 XXXXX	Tape and Reel, 3000

NOTE: XXXXX = Date Code and Vendor Code.

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

V_{CC} to GND ..... 0V to 13.2V
CHSEL, $\overline{MUTECH1}$, $\overline{MUTECH2}$, EN to GND ..... 0V to 6V
Passing Audio Signals Range (1)
..... ($-V_{CC}$ - 0.3V) to (V_{CC} + 0.3V)
Continuous Current ..... ±350mA
Peak Current ..... ±400mA
I/O Clamp Current (V_I < 0) ..... -30mA
Junction Temperature ..... +150℃
Storage Temperature Range ..... -65℃ to +150℃
Lead Temperature (Soldering, 10s) ..... +260℃
ESD Susceptibility
HBM 8000V
MM 400V
CDM 1000V

NOTE:
1. Signals on RINx, LINx, ROUT, LOUT, exceeding V_{CC} will be clamped by internal diodes. Limit forward diode current to maximum current ratings.

RECOMMENDED OPERATING CONDITIONS

Operating Voltage Range ..... 2.7V to 12V
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

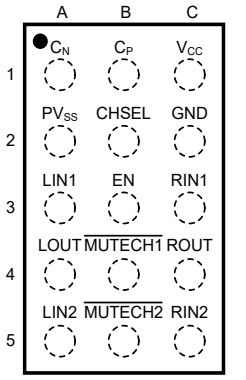
This integrated circuit can be damaged if ESD protections are not considered carefully. SGMICRO recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage. ESD damage can range from subtle performance 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.

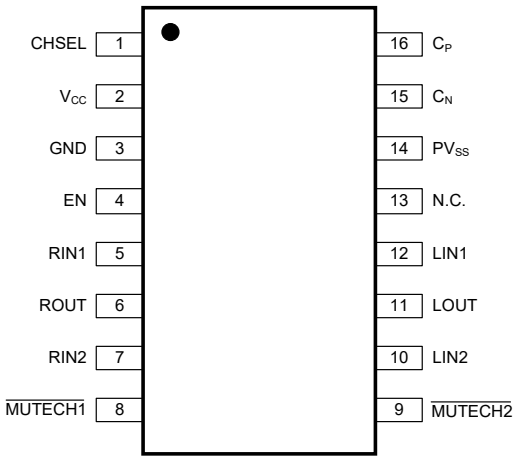
PIN CONFIGURATIONS

(TOP VIEW)



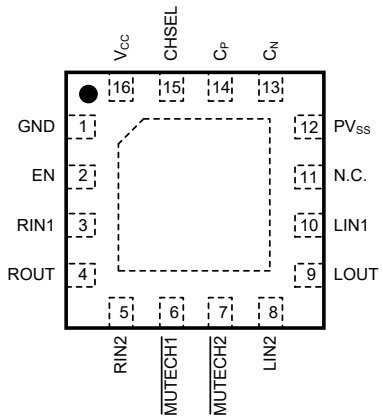
WLCSP-1.27×2.13-15B

(TOP VIEW)



SOIC-16

(TOP VIEW)



TQFN-4×4-16L

PIN DESCRIPTION

PIN			NAME	FUNCTION
WLCSP-1.27×2.13-15B	SOIC-16	TQFN-4×4-16L		
A1	15	13	C_N	Negative Terminal for Charge Pump Flying Capacitor.
A2	14	12	PV_{SS}	Negative Supply Voltage Output. Connect one 0.1μF ceramic capacitor from PV_{SS} to GND.
A3	12	10	LIN1	Left Audio Signal Input of Channel 1.
A4	11	9	LOUT	Left Audio Signal Output.
A5	10	8	LIN2	Left Audio Signal Input of Channel 2.
B1	16	14	C_P	Positive Terminal for Charge Pump Flying Capacitor.

PIN DESCRIPTION (continued)

PIN			NAME	FUNCTION
WLCSP-1.27×2.13-15B	SOIC-16	TQFN-4×4-16L		
B2	1	15	CHSEL	Channel Select Control. When CHSEL = “0”, Channel 1 (RIN1 and LIN1) is selected, RIN1 = ROUT, LIN1 = LOUT; When CHSEL = “1”, Channel 2 (RIN2 and LIN2) is selected, RIN2 = ROUT, LIN2 = LOUT.
B3	4	2	EN	Enable Control. When EN = “Low”, both RINx to ROUT and LINx to LOUT channels will be disconnected, negative charge pump doesn’t work, the SGM4806 will be in shutdown state. When EN = “High”, negative charge pump will work, and the SGM4806 will be in working state, and whether or not audio signals channel works depends on the logical state of $\overline{\text{MUTECH1}}$, $\overline{\text{MUTECH2}}$ and CHSEL.
B4	8	6	$\overline{\text{MUTECH1}}$	Digital Control Pin to Mute Channel 1 Audio Signals.
B5	9	7	$\overline{\text{MUTECH2}}$	Digital Control Pin to Mute Channel 2 Audio Signals.
C1	2	16	V_{CC}	Power Supply.
C2	3	1	GND	Ground.
C3	5	3	RIN1	Right Audio Signal Input of Channel 1.
C4	6	4	ROUT	Right Audio Signal Output.
C5	7	5	RIN2	Right Audio Signal Input of Channel 2.
–	13	11	N.C.	No Connection.

FUNCTION TABLE

Table 1. Function Table:

EN	$\overline{\text{MUTECH1}}$	CHSEL	CHANNEL1	CHARGE PUMP
0	X	X	Shutdown	Turn off
1	0	X	Mute	Turn on
1	1	0	Active	Turn on
1	1	1	Mute	Turn on

Table 2. Function Table:

EN	$\overline{\text{MUTECH2}}$	CHSEL	CHANNEL2	CHARGE PUMP
0	X	X	Shutdown	Turn off
1	0	X	Mute	Turn on
1	1	0	Mute	Turn on
1	1	1	Active	Turn on

ELECTRICAL CHARACTERISTICS

(V_{CC} = 3.3V, 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_{ROUT}, V_{LOUT}, V_{RIN}, V_{LIN}			Full	$-V_{CC}$		$+V_{CC}$	V
Resistance from Audio Signals Input to Output	R_{ON}	$-V_{CC} \le V_{RIN}$ or $V_{LIN} \le V_{CC}$, I_{ROUT} or I_{LOUT} = -50mA, Test Circuit 1	SOIC-16, TQFN-4×4-16L	+25℃		0.9	1.2	Ω
				Full			1.8	
			WLCSP-1.27×2.13-15B	+25℃		0.8	1.1	
				Full			1.7	
On-Resistance Match Between Channels	ΔR_{ON}	$-V_{CC} \le V_{RIN}$ or $V_{LIN} \le V_{CC}$, I_{ROUT} or I_{LOUT} = -50mA, Test Circuit 1		+25℃		0.01	0.15	Ω
				Full			0.25	
On-Resistance Flatness	$R_{FLAT(ON)}$	$-V_{CC} \le V_{RIN}$ or $V_{LIN} \le V_{CC}$, I_{ROUT} or I_{LOUT} = -50mA, Test Circuit 1		+25℃		0.05	0.15	Ω
				Full			0.2	
Mute Resistance	R_{MUTE}	V_{RIN} or V_{LIN} = ±1V		+25℃		900		Ω
Channel On Leakage Current	$I_{RIN(ON)}$, $I_{LIN(ON)}$, $I_{ROUT(ON)}$, $I_{LOUT(ON)}$	V_{RIN} or V_{LIN} = -2.8V, 2.8V, V_{ROUT} or V_{LOUT} = floating, or V_{RIN} or V_{LIN} = floating, V_{ROUT} or V_{LOUT} = -2.8V, 2.8V		+25℃	-0.5	0.01	0.5	μA
				Full			1	
Digital Inputs (EN, CHSEL, $\overline{\text{MUTECH1}}$, $\overline{\text{MUTECH2}}$)								
Input High Voltage	V_{INH}	V_{CC} = 2.7V to 12V		Full	1.5		5.5	V
Input Low Voltage	V_{INL}	V_{CC} = 2.7V to 12V		Full	0		0.5	V
Pull-Low Resistor for Digital Control Pins	$R_{PULL-LOW}$			+25℃		600		kΩ
Dynamic Characteristics								
Turn-On Time	t_{ON}	V_{RIN} or V_{LIN} = 1V, R_L = 50Ω, C_L = 35pF, Test Circuit 2		+25℃		820		μs
Turn-Off Time	t_{OFF}	V_{RIN} or V_{LIN} = 1V, R_L = 50Ω, C_L = 35pF, Test Circuit 2		+25℃		180		μs
Off Isolation	O_{ISO}	f = 1kHz, R_L = 32Ω, Signal = 0dBm, Test Circuit 3		+25℃		-130		dB
		f = 1MHz, R_L = 50Ω, Signal = 0dBm, C_L = 5pF, Test Circuit 3				-50		
Channel-to-Channel Crosstalk	X_{TALK}	f = 1kHz, R_L = 32Ω, Signal = 0dBm, Test Circuit 4		+25℃		-120		dB
		f = 1MHz, R_L = 50Ω, Signal = 0dBm, C_L = 5pF, Test Circuit 4				-60		
-3dB Bandwidth	BW	Signal = 0dBm, R_L = 50Ω, C_L = 5pF, Test Circuit 5		+25℃		100		MHz
Channel On Capacitance	C_{ON}			+25℃		60		pF
Charge Injection	Q	V_G = GND, R_G = 0Ω, C_L = 1nF, Test Circuit 6		+25℃		1000		pC
Total Harmonic Distortion	THD	A-Weighting, Test Circuit 7	V_{RIN} or V_{LIN} = $2V_{RMS}$, R_L = 600Ω	+25℃		-113		dB
			V_{RIN} or V_{LIN} = $2V_{PP}$, R_L = 600Ω			-115		
			V_{RIN} or V_{LIN} = $2V_{PP}$, R_L = 32Ω			-113		
			V_{RIN} or V_{LIN} = $1V_{PP}$, R_L = 600Ω			-112		
			V_{RIN} or V_{LIN} = $1V_{PP}$, R_L = 32Ω			-110		
			V_{RIN} or V_{LIN} = $0.5V_{PP}$, R_L = 600Ω			-108		
			V_{RIN} or V_{LIN} = $0.5V_{PP}$, R_L = 32Ω			-104		
Start-Up Time	t_{START}	V_{EN} = 0V to V_{EN} = 1.5V		+25℃		0.5		ms

ELECTRICAL CHARACTERISTICS (continued)

(V_{CC} = 5V, Full = -40℃ to +85℃. Typical values are at T_A = +25℃, unless otherwise noted.)

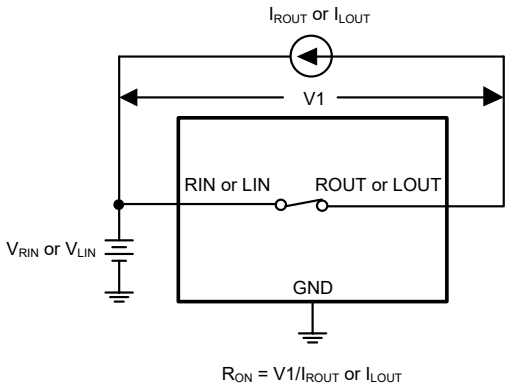
PARAMETER	SYMBOL	CONDITIONS		TEMP	MIN	TYP	MAX	UNITS
Analog Switch								
Analog Signal Range	V_{ROUT}, V_{LOUT}, V_{RIN}, V_{LIN}			Full	$-V_{CC}$		$+V_{CC}$	V
Resistance from Audio Signals Input to Output	R_{ON}	$-V_{CC} \le V_{RIN}$ or $V_{LIN} \le V_{CC}$, I_{ROUT} or I_{LOUT} = -50mA, Test Circuit 1	SOIC-16, TQFN-4×4-16L	+25℃		0.9	1.2	Ω
				Full			1.8	
			WLCSP-1.27×2.13-15B	+25℃		0.8	1.1	
				Full			1.7	
On-Resistance Match Between Channels	ΔR_{ON}	$-V_{CC} \le V_{RIN}$ or $V_{LIN} \le V_{CC}$, I_{ROUT} or I_{LOUT} = -50mA, Test Circuit 1		+25℃		0.01	0.15	Ω
				Full			0.25	
On-Resistance Flatness	$R_{FLAT(ON)}$	$-V_{CC} \le V_{RIN}$ or $V_{LIN} \le V_{CC}$, I_{ROUT} or I_{LOUT} = -50mA, Test Circuit 1		+25℃		0.01	0.15	Ω
				Full			0.2	
Mute Resistance	R_{MUTE}	V_{RIN} or V_{LIN} = ±1V		+25℃		900		Ω
Channel On Leakage Current	$I_{RIN(ON)}$, $I_{LIN(ON)}$, $I_{ROUT(ON)}$, $I_{LOUT(ON)}$	V_{RIN} or V_{LIN} = -4.5V, 4.5V, V_{ROUT} or V_{LOUT} = floating, or V_{RIN} or V_{LIN} = floating, V_{ROUT} or V_{LOUT} = -4.5V, 4.5V		+25℃	-0.5	0.01	0.5	μA
				Full			1	
Dynamic Characteristics								
Turn-On Time	t_{ON}	V_{RIN} or V_{LIN} = 1V, R_L = 50Ω, C_L = 35pF, Test Circuit 2		+25℃		880		μs
Turn-Off Time	t_{OFF}	V_{RIN} or V_{LIN} = 1V, R_L = 50Ω, C_L = 35pF, Test Circuit 2		+25℃		190		μs
Off Isolation	O_{ISO}	f = 1kHz, R_L = 32Ω, Signal = 0dBm, Test Circuit 3		+25℃		-130		dB
		f = 1MHz, R_L = 50Ω, Signal = 0dBm, C_L = 5pF, Test Circuit 3				-50		
Channel-to-Channel Crosstalk	X_{TALK}	f = 1kHz, R_L = 32Ω, Signal = 0dBm, Test Circuit 4		+25℃		-120		dB
		f = 1MHz, R_L = 50Ω, Signal = 0dBm, C_L = 5pF, Test Circuit 4				-60		
-3dB Bandwidth	BW	Signal = 0dBm, R_L = 50Ω, C_L = 5pF, Test Circuit 5		+25℃		100		MHz
Channel On Capacitance	C_{ON}			+25℃		60		pF
Charge Injection	Q	V_G = GND, R_G = 0Ω, C_L = 1nF, Test Circuit 6		+25℃		1000		pC
Total Harmonic Distortion	THD	A-Weighting, Test Circuit 7	V_{RIN} or V_{LIN} = $2V_{RMS}$, R_L = 600Ω	+25℃		-117		dB
			V_{RIN} or V_{LIN} = $2V_{PP}$, R_L = 600Ω			-115		
			V_{RIN} or V_{LIN} = $2V_{PP}$, R_L = 32Ω			-113		
			V_{RIN} or V_{LIN} = $1V_{PP}$, R_L = 600Ω			-112		
			V_{RIN} or V_{LIN} = $1V_{PP}$, R_L = 32Ω			-110		
			V_{RIN} or V_{LIN} = $0.5V_{PP}$, R_L = 600Ω			-108		
			V_{RIN} or V_{LIN} = $0.5V_{PP}$, R_L = 32Ω			-104		
Start-Up Time	t_{START}	V_{EN} = 0V to V_{EN} = 1.5V		+25℃		0.5		ms
Power Requirements								
Power Supply Current	I_{CC}	V_{EN} = 1.5V		+25℃		520	650	μA
				Full			680	
Power Supply Current in Shutdown State	I_{CC}	V_{EN} = 0V		+25℃		0.4	1	μA
				Full			1.5	

ELECTRICAL CHARACTERISTICS (continued)

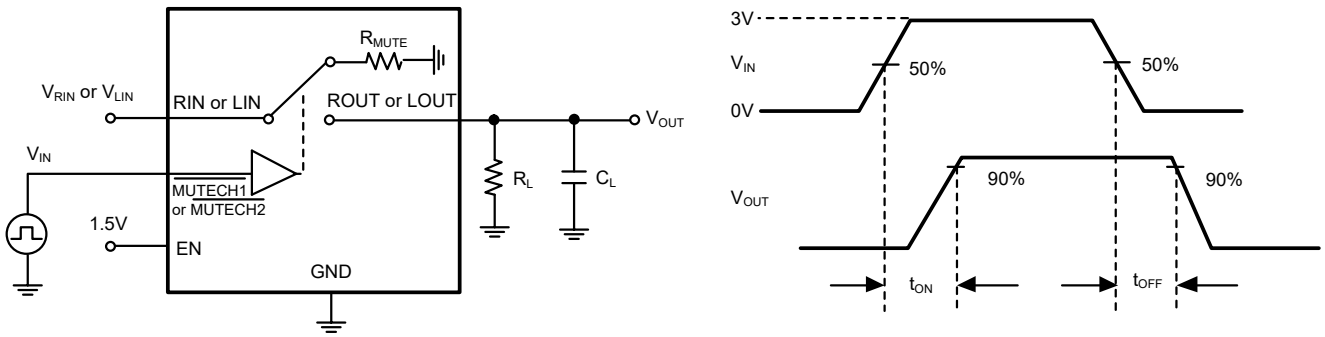
(V_{CC} = 12V, Full = -40℃ to +85℃. Typical values are at T_A = +25℃, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS		TEMP	MIN	TYP	MAX	UNITS
Analog Switch								
Analog Signal Range	V_{ROUT}, V_{LOUT}, V_{RIN}, V_{LIN}			Full	$-V_{CC}$		$+V_{CC}$	V
Resistance from Audio Signals Input to Output	R_{ON}	$-V_{CC} \le V_{RIN}$ or $V_{LIN} \le V_{CC}$, I_{ROUT} or I_{LOUT} = -50mA, Test Circuit 1	SOIC-16, TQFN-4×4-16L	+25℃		0.9	1.2	Ω
				Full			1.8	
			WLCSP-1.27×2.13-15B	+25℃		0.8	1.1	
				Full			1.7	
On-Resistance Match Between Channels	ΔR_{ON}	$-V_{CC} \le V_{RIN}$ or $V_{LIN} \le V_{CC}$, I_{ROUT} or I_{LOUT} = -50mA, Test Circuit 1		+25℃		0.01	0.15	Ω
				Full			0.2	
On-Resistance Flatness	$R_{FLAT(ON)}$	$-V_{CC} \le V_{RIN}$ or $V_{LIN} \le V_{CC}$, I_{ROUT} or I_{LOUT} = -50mA, Test Circuit 1		+25℃		0.01	0.15	Ω
				Full			0.2	
Mute Resistance	R_{MUTE}	V_{RIN} or V_{LIN} = ±1V		+25℃		900		Ω
Channel On Leakage Current	$I_{RIN(ON)}$, $I_{LIN(ON)}$, $I_{ROUT(ON)}$, $I_{LOUT(ON)}$	V_{RIN} or V_{LIN} = -11.5V, 11.5V, V_{ROUT} or V_{LOUT} = floating, or V_{RIN} or V_{LIN} = floating, V_{ROUT} or V_{LOUT} = -11.5V, 11.5V		+25℃	-1.5	0.05	1.5	μA
				Full			9	
Dynamic Characteristics								
Turn-On Time	t_{ON}	V_{RIN} or V_{LIN} = 1V, R_L = 50Ω, C_L = 35pF, Test Circuit 2		+25℃		1100		μs
Turn-Off Time	t_{OFF}	V_{RIN} or V_{LIN} = 1V, R_L = 50Ω, C_L = 35pF, Test Circuit 2		+25℃		200		μs
Off Isolation	O_{ISO}	f = 1kHz, R_L = 32Ω, Signal = 0dBm, Test Circuit 3		+25℃		-130		dB
		f = 1MHz, R_L = 50Ω, Signal = 0dBm, C_L = 5pF, Test Circuit 3				-50		
Channel-to-Channel Crosstalk	X_{TALK}	f = 1kHz, R_L = 32Ω, Signal = 0dBm, Test Circuit 4		+25℃		-120		dB
		f = 1MHz, R_L = 50Ω, Signal = 0dBm, C_L = 5pF, Test Circuit 4				-60		
-3dB Bandwidth	BW	Signal = 0dBm, R_L = 50Ω, C_L = 5pF, Test Circuit 5		+25℃		100		MHz
Channel On Capacitance	C_{ON}			+25℃		60		pF
Charge Injection	Q	V_G = GND, R_G = 0Ω, C_L = 1nF, Test Circuit 6		+25℃		1100		pC
Total Harmonic Distortion	THD	A-Weighting, Test Circuit 7	V_{RIN} or V_{LIN} = $2V_{RMS}$, R_L = 600Ω	+25℃		-117		dB
			V_{RIN} or V_{LIN} = $2V_{PP}$, R_L = 600Ω			-115		
			V_{RIN} or V_{LIN} = $2V_{PP}$, R_L = 32Ω			-113		
			V_{RIN} or V_{LIN} = $1V_{PP}$, R_L = 600Ω			-112		
			V_{RIN} or V_{LIN} = $1V_{PP}$, R_L = 32Ω			-110		
			V_{RIN} or V_{LIN} = $0.5V_{PP}$, R_L = 600Ω			-108		
			V_{RIN} or V_{LIN} = $0.5V_{PP}$, R_L = 32Ω			-104		
Start-Up Time	t_{START}	V_{EN} = 0V to V_{EN} = 1.5V		+25℃		0.5		ms
Power Requirements								
Power Supply Current	I_{CC}	V_{EN} = 1.5V		+25℃		620	780	μA
				Full			800	
Power Supply Current in Shutdown State	I_{CC}	V_{EN} = 0V		+25℃		0.5	1.5	μA
				Full			2	

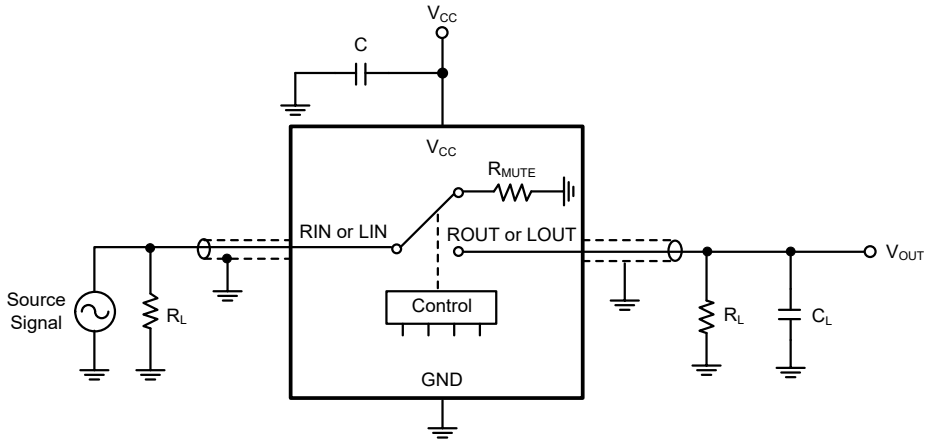
TEST CIRCUITS



Test Circuit 1. On-Resistance

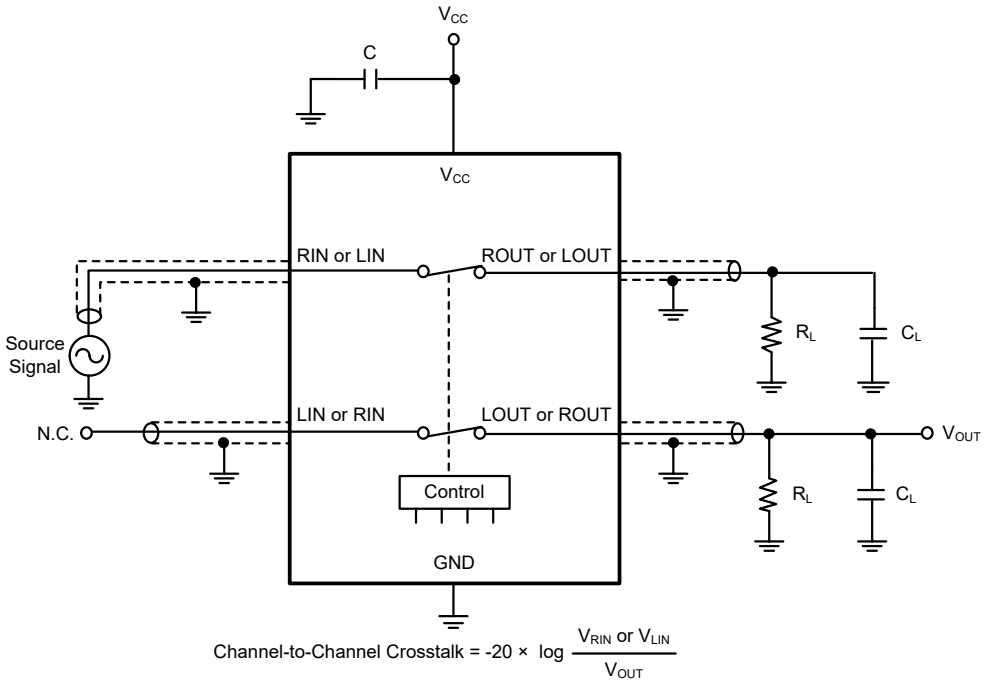


Test Circuit 2. Switching Times (t_{ON}, t_{OFF})

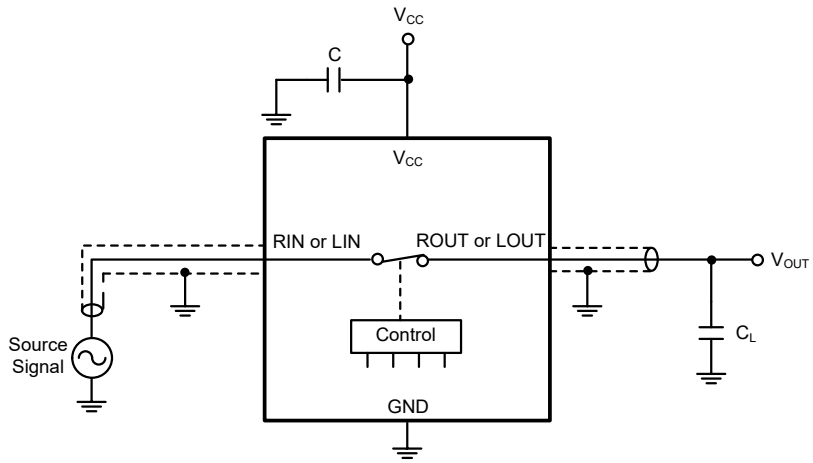


Test Circuit 3. Off Isolation

TEST CIRCUITS (continued)

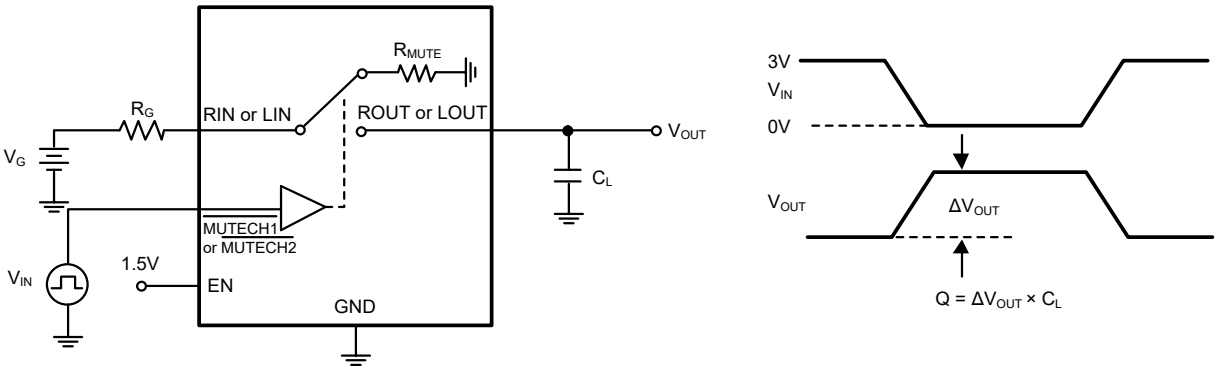


Test Circuit 4. Channel-to-Channel Crosstalk

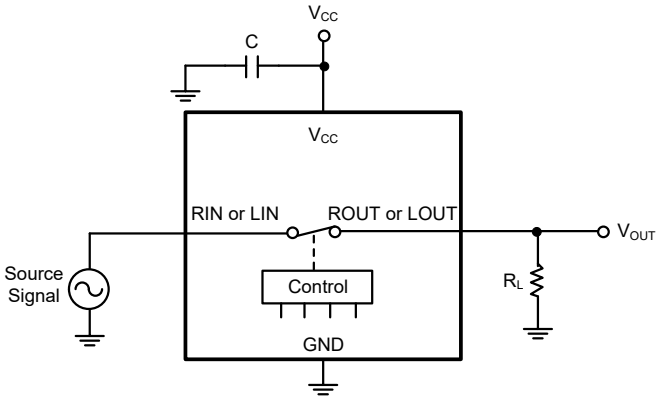


Test Circuit 5. -3dB Bandwidth

TEST CIRCUITS (continued)



Test Circuit 6. Charge Injection (Q)



Test Circuit 7. Total Harmonic Distortion + Noise (THD+N)

REVISION HISTORY

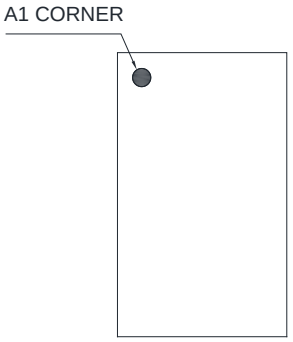
NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

Changes from Original (NOVEMBER 2017) to REV.A

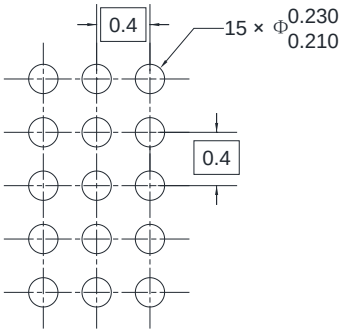
Changed from product preview to production data ..... All

PACKAGE OUTLINE DIMENSIONS

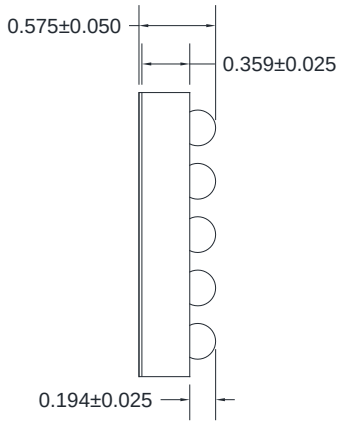
WLCSP-1.27×2.13-15B



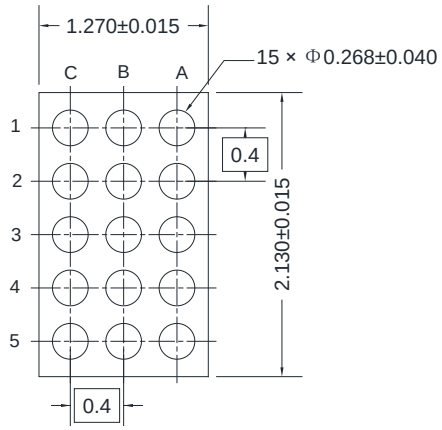
TOP VIEW



RECOMMENDED LAND PATTERN



SIDE VIEW

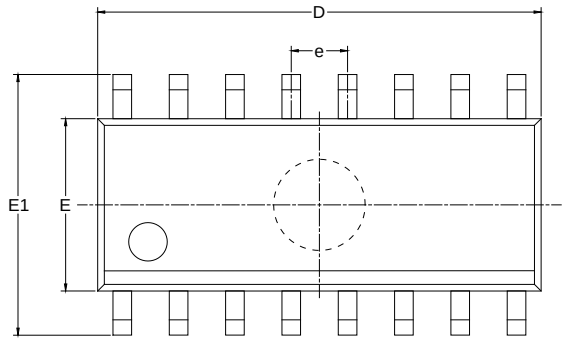


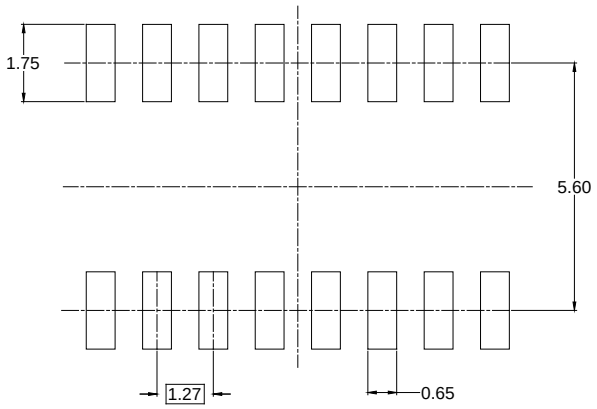
BOTTOM VIEW

NOTES:
1. All linear dimensions are in millimeters.
2. This drawing is subject to change without notice.

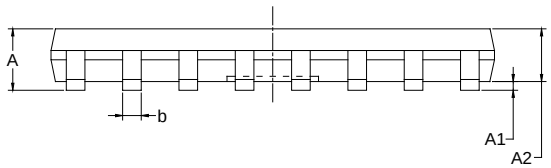
PACKAGE OUTLINE DIMENSIONS

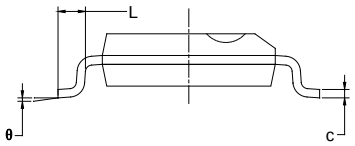
SOIC-16





RECOMMENDED LAND PATTERN (Unit: mm)



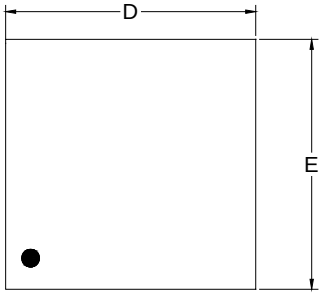


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	9.800	10.200	0.386	0.402
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.27 BSC		0.050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

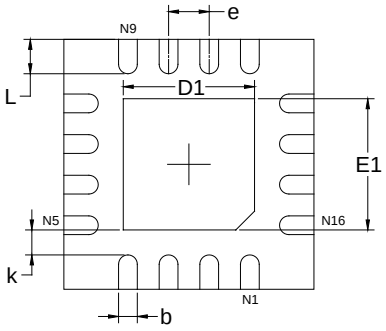
NOTES:
1. Body dimensions do not include mode flash or protrusion.
2. This drawing is subject to change without notice.

PACKAGE OUTLINE DIMENSIONS

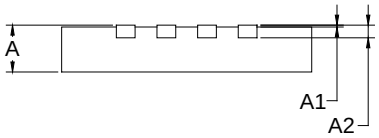
TQFN-4×4-16L



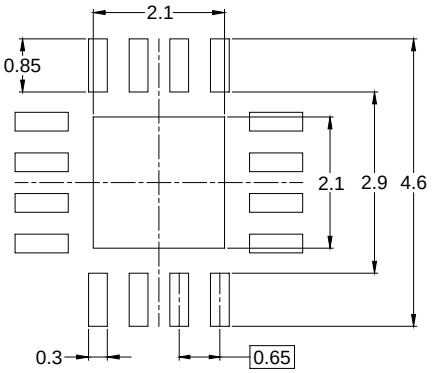
TOP VIEW



BOTTOM VIEW



SIDE VIEW



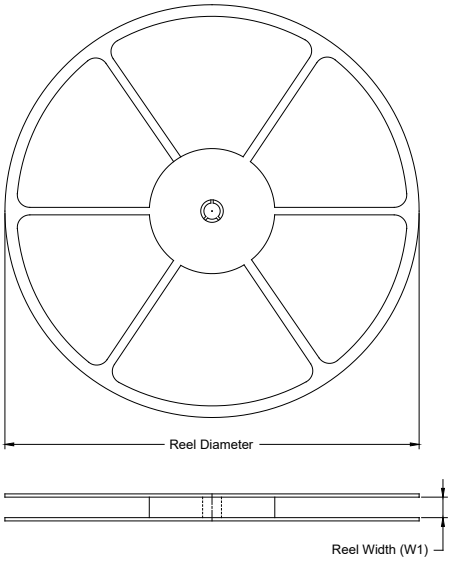
RECOMMENDED LAND PATTERN (Unit: mm)

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	3.900	4.100	0.154	0.161
D1	2.000	2.200	0.079	0.087
E	3.900	4.100	0.154	0.161
E1	2.000	2.200	0.079	0.087
k	0.200 MIN		0.008 MIN	
b	0.250	0.350	0.010	0.014
e	0.650 TYP		0.026 TYP	
L	0.450	0.650	0.018	0.026

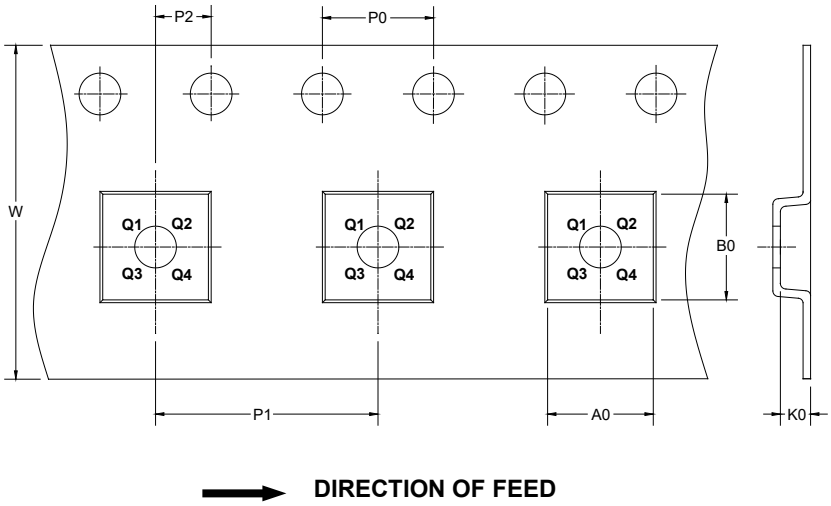
NOTE: This drawing is subject to change without notice.

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



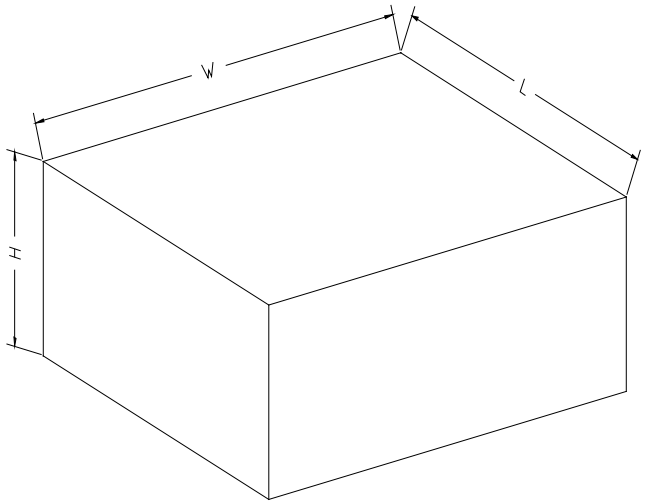
NOTE: The picture is only for reference. Please make the object as the standard.

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
WLCSP-1.27×2.13-15B	7″	9.5	1.47	2.37	0.78	4.0	4.0	2.0	8.0	Q1
SOIC-16	13″	16.4	6.50	10.30	2.10	4.0	8.0	2.0	16.0	Q1
TQFN-4×4-16L	13″	12.4	4.30	4.30	1.10	4.0	8.0	2.0	12.0	Q2

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
7″ (Option)	368	227	224	8
7″	442	410	224	18
13″	386	280	370	5

DD0002