

General Description

The AOZ6275 is a dual Double-Pole, Double-Throw (DPDT) analog switch that is designed to operate from a single 1.65 V to 4.3 V supply. The AOZ6275 features an ultra-low on resistance, excellent Total Harmonic Distortion (THD) performance, and low power consumption.

The device also features fast switching and guaranteed Break-Before-Make (BBM) switching which interrupts one circuit before closing the other. This ensures the switches never shorts the driver.

Features

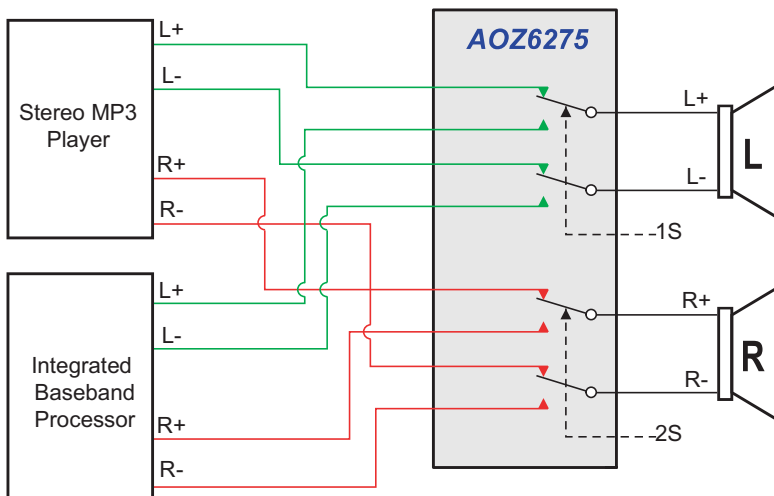
- Low On Resistance (R_{ON}) for +2.7 V supply (0.35 Ω)
- Low I_{CCT} current when nS input is lower than V_{CC}
- 0.25 Ω maximum R_{ON} flatness for +2.7 V supply
- Small 1.8 mm x 2.6 mm 16-Lead QFN Package
- Broad 1.65 V to 4.30 V V_{CC} operating range
- Low THD (0.01% typical for 32 Ω load)

Applications

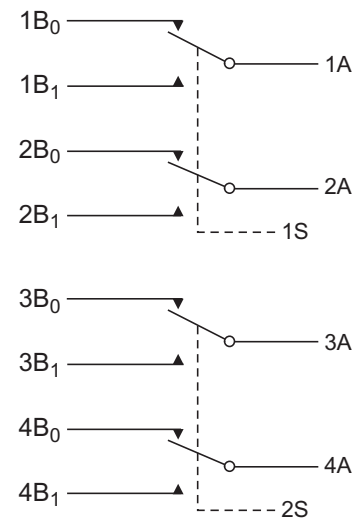
- Cell phone
- PDA
- Portable media player



Typical Application



Connection Diagram



Ordering Information

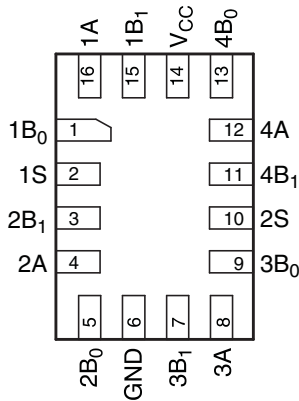
Part Number	Ambient Temperature Range	Package	Environmental
AOZ6275QI	-40 °C to +85 °C	1.8 mm x 2.6 mm 16-Lead QFN	Green



AOS Green Products use reduced levels of Halogens, and are also RoHS compliant.

Please visit www.aosmd.com/web/quality/rohs_compliant.jsp for additional information.

Pin Configuration



QFN-16
(Top Thru View)

Pin Description

Pin Name	Function
1A, 2A, 3A, 4A, 1B ₀ , 1B ₁ , 2B ₀ , 2B ₁ , 3B ₀ , 3B ₁ , 4B ₀ , 4B ₁	Data Ports
1S, 2S	Control Input

Truth Table

Logic Input	Function
0	nB ₀ Connected to nA
1	nB ₁ Connected to nA

Absolute Maximum Ratings

Exceeding the Absolute Maximum Ratings may damage the device.

Symbol	Parameter	Rating
V _{CC}	Supply Voltage	-0.5 V to +4.6 V
V _S	Switch Voltage	-0.5 to V _{CC} + 0.3 V
V _{IN}	Input Voltage	-0.5 V to +4.6 V
I _{IK}	Minimum Input Diode Current	-50 mA
I _{SW}	Switch Current	350 mA
I _{SWPEAK}	Peak Switch Current (Pulsed at 1 ms duration, <10 % Duty Cycle)	500 mA
T _{STG}	Storage Temperature Range	-65 °C to +150 °C
T _J	Maximum Junction Temperature	+150 °C
T _L	Lead Temperature (Soldering, 10 seconds)	+260 °C
ESD	Human Body Model	8000 V

Recommend Operating Ratings

The device is not guaranteed to operate beyond the Recommended Operating Ratings.

Symbol	Parameter	Rating
V _{CC}	Supply Voltage	1.65 V to 4.3 V
V _{IN}	Control Input Voltage ⁽¹⁾	0 V to V _{CC}
V _{SW}	Switch Input Voltage	0 V to V _{CC}
T _A	Operating Temperature	-40 °C to +85 °C

Note:

1. Unused inputs must be held HIGH or LOW. They may not float.

DC Electrical Characteristics

Unless otherwise indicated, specifications indicate a temperature range of -40 °C to +85 °C.

All typical values are at 25°C unless otherwise specified.

Symbol	Parameter	Conditions	V _{CC} (V)	Min.	Typ.	Max.	Units
V _{IH}	Input Voltage HIGH		4.3	1.4			V
			2.7 to 3.6	1.3			
			2.3 to 2.7	1.1			
			1.65 to 1.95	0.9			
V _{IL}	Input Voltage LOW		4.3			0.7	V
			2.7 to 3.6			0.5	
			2.3 to 2.7			0.4	
			1.65 to 1.95			0.4	
I _{IN}	Control Input Leakage	V _{IN} = 0 V to V _{CC}	1.65 to 4.30	-0.5		0.5	μA
I _{NO(OFF)} , I _{NC(OFF)}	Off-Leakage Current of Port nB ₀ and nB ₁	nA = 0.3 V, V _{CC} - 0.3 V, nB ₀ or nB ₁ = 0.3 V, V _{CC} - 0.3 V or floating	1.95 to 4.30	-50		50	nA
I _{A(ON)}	On Leakage Current of Port A	nA = 0.3 V, V _{CC} - 0.3V, nB ₀ or nB ₁ = 0.3 V, V _{CC} - 0.3 V or floating	1.95 to 4.30	-60		60	nA
R _{ON}	Switch On Resistance ⁽²⁾	I _{OUT} = 100 mA, nB ₀ or nB ₁ = 0 V, 0.7 V, 2.3 V, or 4.3 V	4.3		0.30	0.4	Ω
		I _{OUT} = 100 mA, nB ₀ or nB ₁ = 0 V, 0.7 V, 2.3 V, or 3.0 V	3.0		0.30	0.5	
		I _{OUT} = 100 mA, nB ₀ or nB ₁ = 0 V, 0.7 V, 2.0 V, or 2.7 V	2.7		0.35	0.5	
		I _{OUT} = 100 mA, nB ₀ or nB ₁ = 0 V, 0.7 V, 1.6 V, or 2.3 V	2.3		0.45	0.7	
		I _{OUT} = 100 mA, nB ₀ or nB ₁ = 0 V, 1.0 V, or 1.8 V	1.8		1.0	1.8	
ΔR _{ON}	On Resistance Matching Between Channels ⁽³⁾	I _{OUT} = 100 mA, nB ₀ or nB ₁ = 0.7 V	4.3		0.03	0.1	Ω
			3.0		0.03	0.1	
			2.7		0.03	0.1	
			2.3		0.03	0.1	
R _{FLAT(ON)}	On Resistance Flatness ⁽⁴⁾	I _{OUT} = 100 mA, nB ₀ or nB ₁ = 0 V to V _{CC}	4.3		0.07	0.2	Ω
			3.0		0.07	0.2	
			2.7		0.09	0.25	
			2.3		0.16	0.3	
I _{CC}	Quiescent Supply Current	V _{IN} = 0 V to V _{CC} , I _{OUT} = 0 A	4.3	-500		500	nA
I _{CCT}	Increase in I _{CC} per Input Control Voltage	V _{IN} = 1.8 V	4.3		26.0	40.0	μA
		V _{IN} = 2.6 V			9.0	12.0	

Notes:

- On resistance is determined by the voltage drop between A and B pins at the indicated current through the switch.
- ΔR_{ON} = R_{ONmax} - R_{ONmin} measured at identical V_{CC}, temperature, and voltage.
- Flatness is defined as the difference between the maximum and minimum value of R_{ON} over the specified range of conditions.

AC Electrical Characteristics

Unless otherwise indicated, specifications indicate a temperature range of -40 °C to +85 °C.

All typical values are at 25 °C unless otherwise specified.

Symbol	Parameter	Conditions	V _{CC} (V)	Min.	Typ.	Max.	Units
t _{ON}	Turn-On Time	nB ₀ or nB ₁ = 1.5 V, R _L = 50 Ω, C _L = 35 pF	3.6 to 4.3		35	70	ns
			2.7 to 3.6		50	95	
			2.3 to 2.7		75	105	
t _{OFF}	Turn-Off Time	nB ₀ or nB ₁ = 1.5 V, R _L = 50 Ω, C _L = 35 pF	3.6 to 4.3		25	55	ns
			2.7 to 3.6		30	60	
			2.3 to 2.7		40	75	
t _{BBM}	Break-Before-Make Time	nB ₀ or nB ₁ = 1.5 V, R _L = 50 Ω, C _L = 35 pF	3.6 to 4.3		10		ns
			2.7 to 3.6		20		
			2.3 to 2.7		35		
Q	Charge Injection	C _L = 100 pF, V _{GEN} = 0 V, R _{GEN} = 0 Ω	3.6 to 4.3		35		pC
			2.7 to 3.6		28		
			2.3 to 2.7		18		
OIRR	Off Isolation	f = 100 kHz, R _L = 50 Ω, C _L = 5 pF	3.6 to 4.3		-70		dB
			2.7 to 3.6		-70		
			2.3 to 2.7		-70		
Xtalk	Crosstalk	f = 100 kHz, R _L = 50 Ω, C _L = 5 pF	3.6 to 4.3		-70		dB
			2.7 to 3.6		-70		
			2.3 to 2.7		-70		
BW	-3dB Bandwidth	R _L = 50 Ω	2.3 to 4.3		70		MHz
THD	Total Harmonic Distortion	R _L = 32 Ω, V _{IN} = 2 V _{pp} , f = 20 Hz to 20 kHz	3.6 to 4.3		0.01		%
			2.7 to 3.6		0.01		
			2.3 to 2.7		0.01		

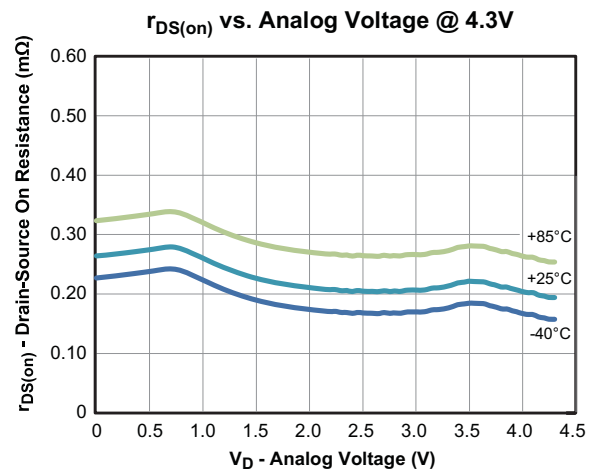
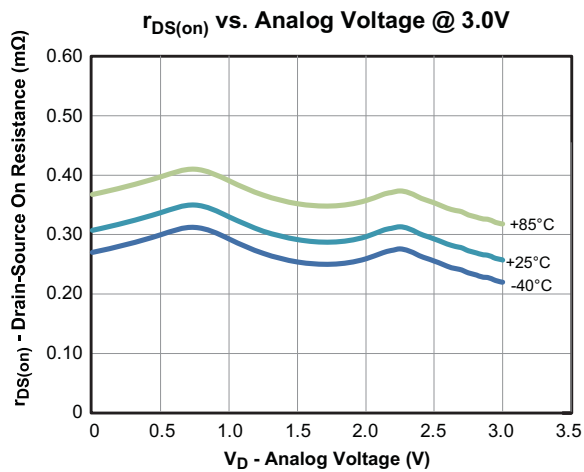
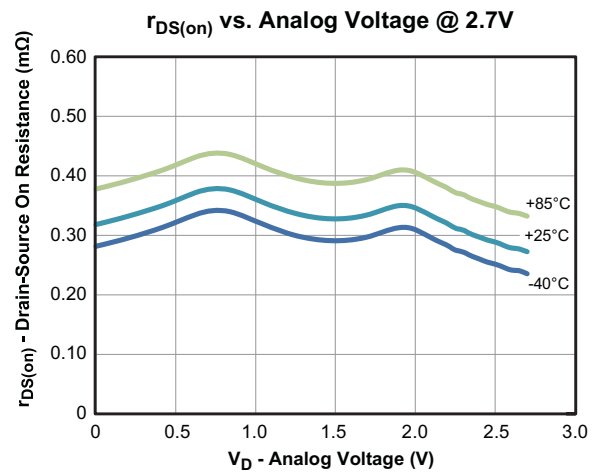
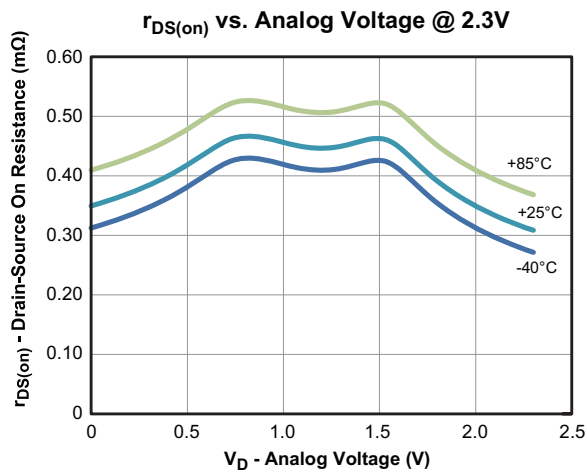
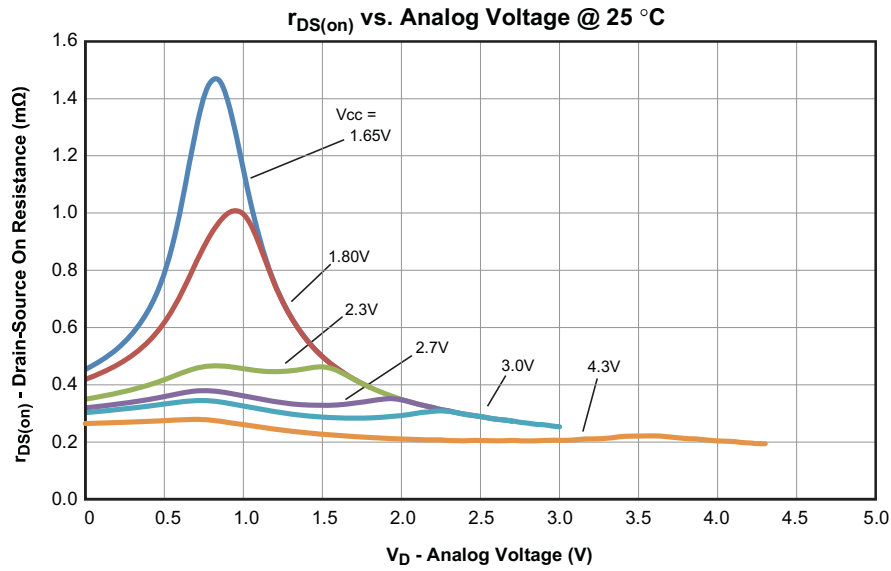
Capacitance

Unless otherwise indicated, specifications indicate a temperature range of -40 °C to +85 °C.

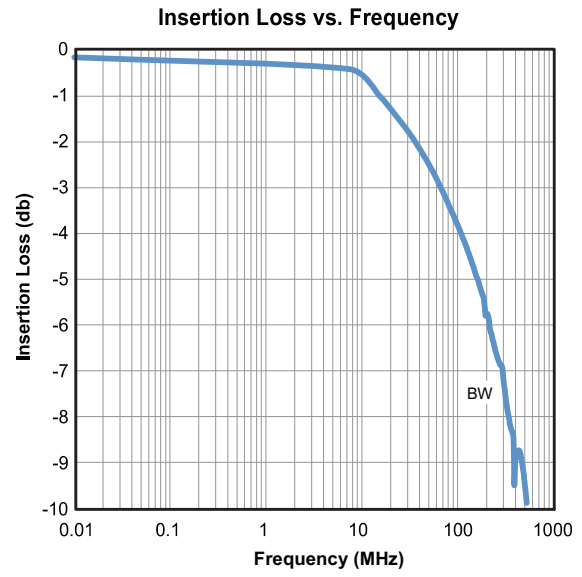
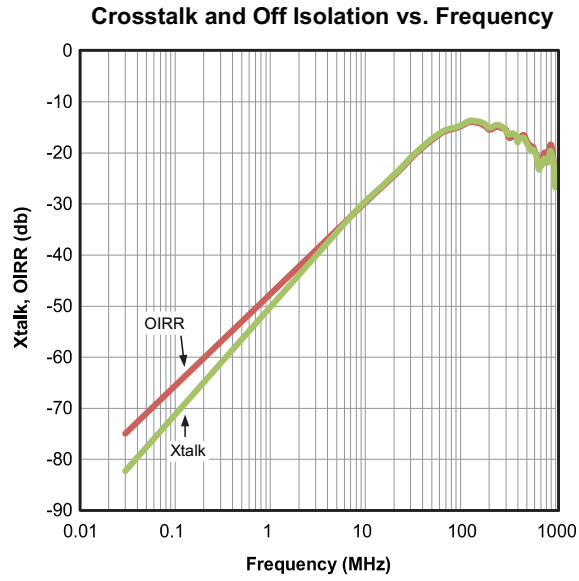
All typical values are at 25 °C unless otherwise specified.

Symbol	Parameter	Conditions	V _{CC} (V)	Min.	Typ.	Max.	Units
C _{IN}	Control Pin Input Capacitance	f = 1 MHz	3.3		2.0		pF
C _{OFF}	B Port Off Capacitance	f = 1 MHz	3.3		16		pF
C _{ON}	A Port On Capacitance	f = 1 MHz	3.3		116		pF

Typical Performance Characteristics



Typical Performance Characteristics (Continued)



AC Loading and Waveforms

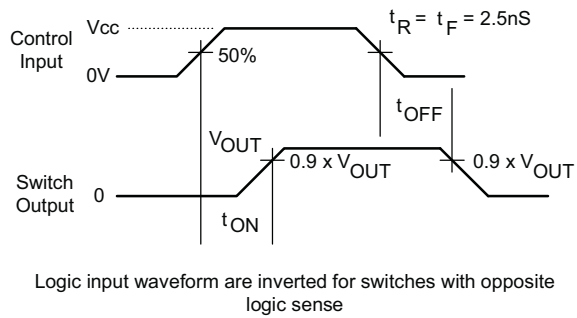
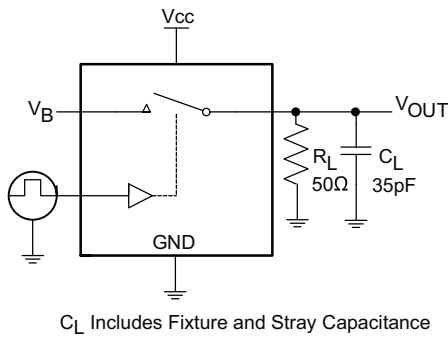


Figure 1. Turn-On/Turn-Off Timing

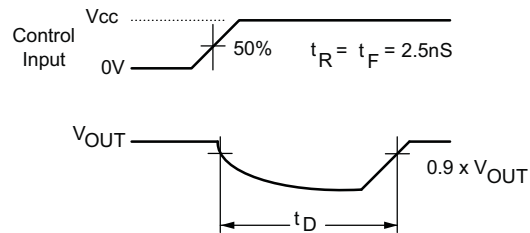
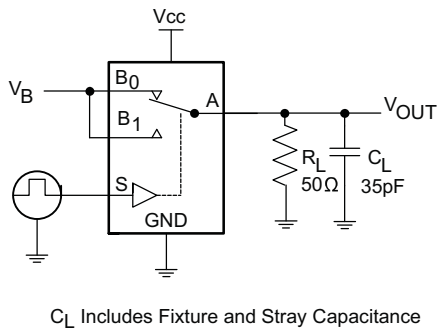


Figure 2. Break-Before-Make Timing

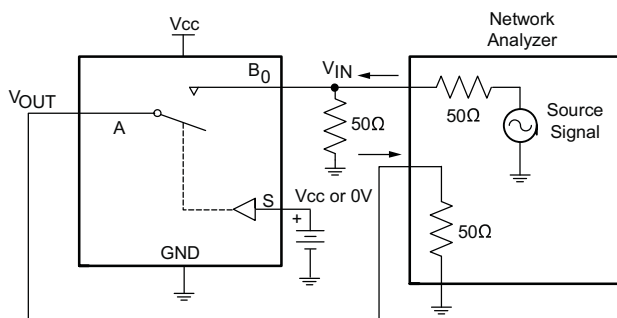


Figure 3. Off Isolation

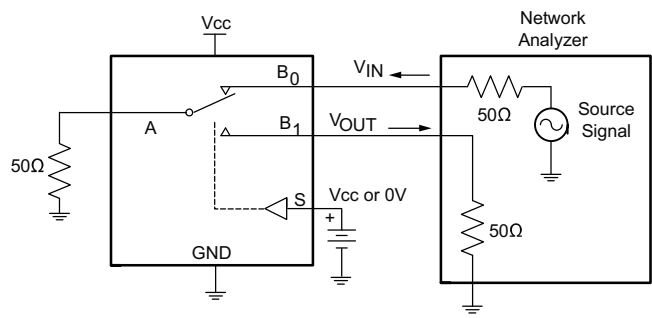


Figure 4. Crosstalk

AC Loading and Waveforms (continued)

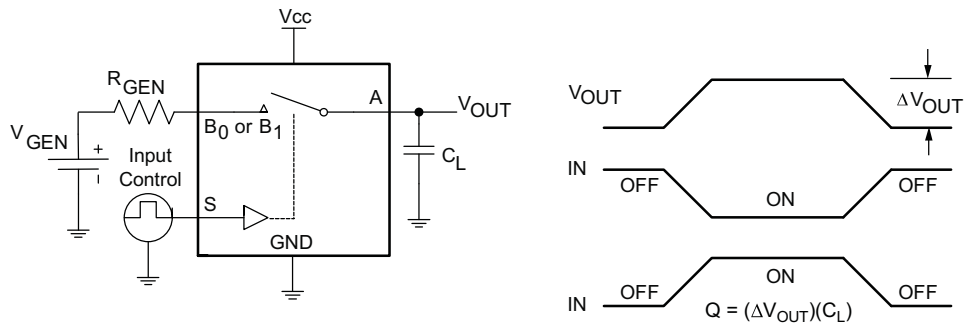


Figure 5. Charge Injection

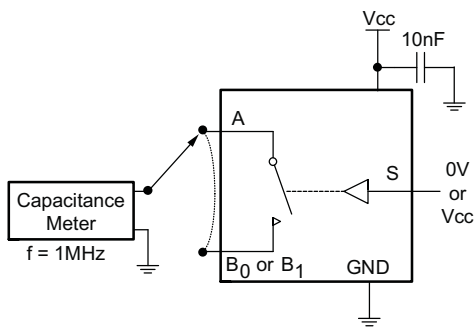


Figure 6. ON/Off Capacitance Measurement

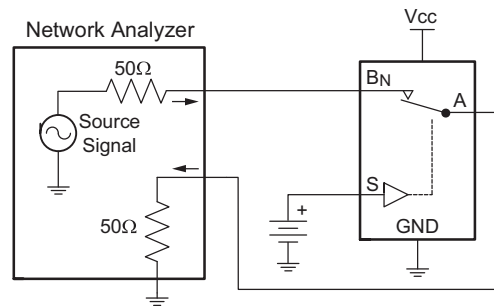


Figure 7. Bandwidth

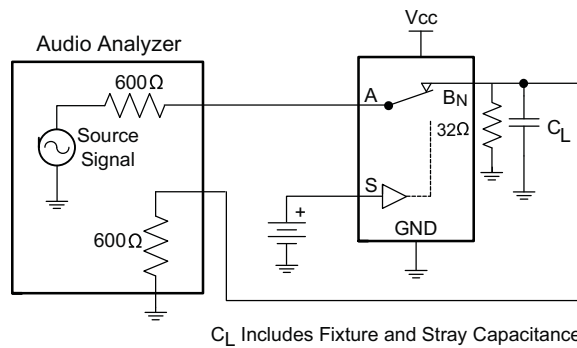
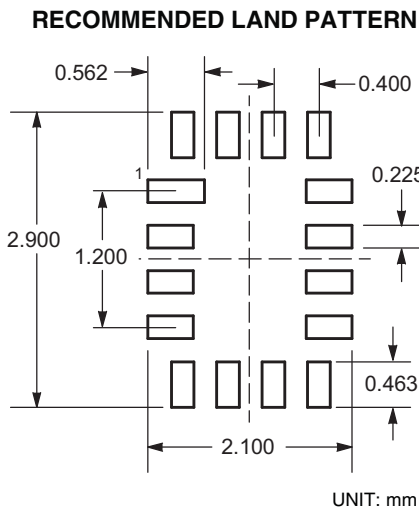
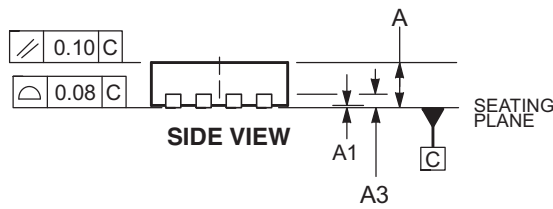
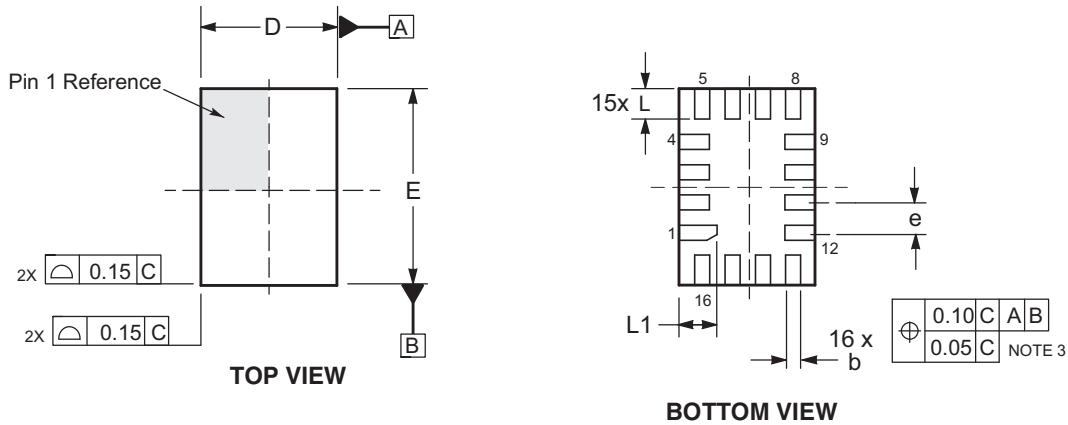


Figure 8. Harmonic Distortion

Package Dimensions, QFN 1.8 mm x 2.6 mm, 16L



Dimensions
in millimeters

Symbols	Min.	Min.
A	0.70	0.80
A1	0.00	0.050
A3	0.20 REF	
b	0.15	0.25
D	1.80 BSC	
E	2.60 BSC	
e	0.40 BSC	
L	0.30	0.50
L1	0.40	0.60

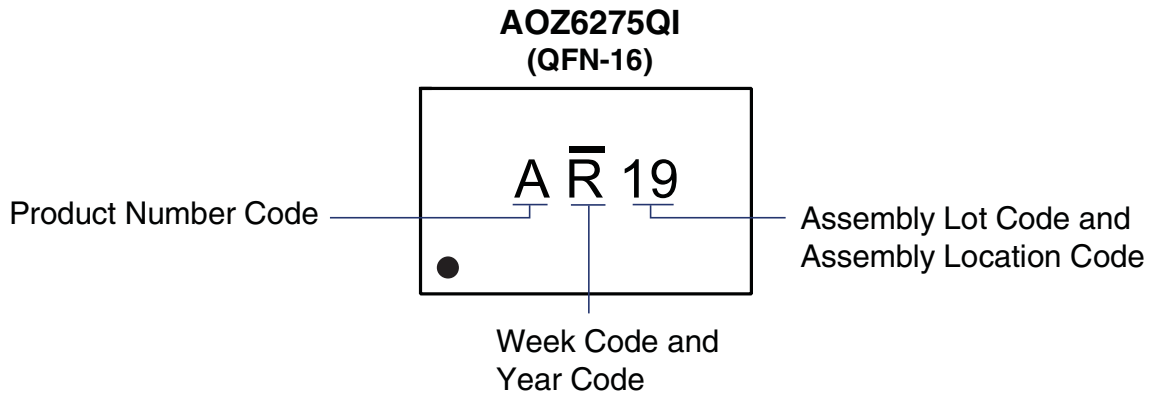
Dimensions
in inches

Symbols	Min.	Min.
A	0.028	0.031
A1	0.000	0.002
A3	0.008 REF	
b	0.006	0.010
D	0.071 BSC	
E	0.102 BSC	
e	0.016 BSC	
L	0.012	0.020
L1	0.016	0.024

Notes:

1. Dimensioning and tolerancing per ASME Y14.5m, 1994.
2. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.
3. Dimension b applies to plated terminal and is measured between 0.25 mm and 0.30 mm from terminal.
4. Coplanarity applies to the exposed pad as well as the terminals.
5. Exposed pads connected to die flag. Used as test contacts.

Part Marking



This datasheet contains preliminary data; supplementary data may be published at a later date. Alpha & Omega Semiconductor reserves the right to make changes at any time without notice.

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| <p>1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury of the user.</p> | <p>2. A critical component in any component of a life support, device, or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.</p> |
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