

General Description

The AOZ6274 is a dual Double-Pole, Double-Throw (DPDT) analog switch that is designed to operate from a single 1.65V to 4.3V supply. The AOZ6274 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, assuring the switches never shorts the driver.

Features

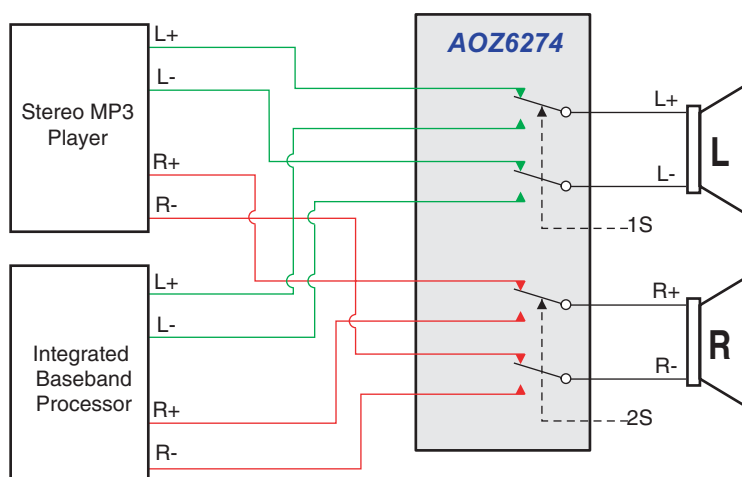
- Low On Resistance (R_{ON}) for +2.7V supply (0.3Ω)
- Low I_{CCT} current when nS input is lower than V_{CC}
- 0.25Ω maximum R_{ON} flatness for +2.7V supply
- Small 3 x 3mm 16-Lead QFN Package
- Broad 1.65V to 4.30V V_{CC} operating range
- Low THD (0.01% typical for 32Ω load)

Applications

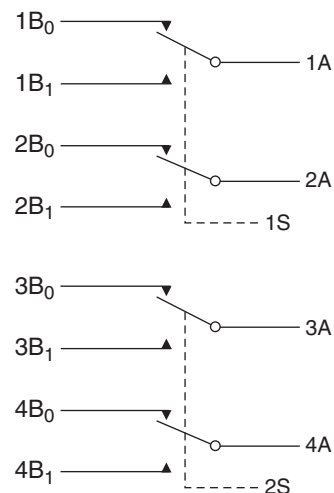
- Cell phone
- PDA
- Portable media player



Typical Application



Pin Configuration



Ordering Information

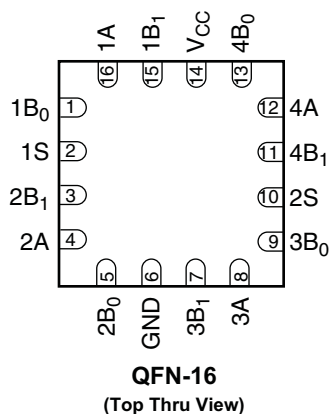
Part Number	Ambient Temperature Range	Package	Environmental
AOZ6274QI	-40°C to +85°C	3x3 16-Lead QFN	Green



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



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	-0.5V to +4.6V
V _S	Switch Voltage	-0.5 to V _{CC} + 0.3V
V _{IN}	Input Voltage	-0.5V to +4.6V
I _{IK}	Minimum Input Diode Current	-50mA
I _{SW}	Switch Current	350mA
I _{SWPEAK}	Peak Switch Current (Pulsed at 1ms duration, <10% Duty Cycle)	500mA
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	6000V

Recommend Operating Ratings

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

Symbol	Parameter	Rating
V _{CC}	Supply Voltage	1.65V to 4.3V
V _{IN}	Control Input Voltage ⁽¹⁾	0V to V _{CC}
V _{SW}	Switch Input Voltage	0V 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} = 0V 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 = 0.3V, V _{CC} -0.3V, nB ₀ or nB ₁ = 0.3V, V _{CC} -0.3V or floating	1.95 to 4.30	-50		50	nA
I _{A(ON)}	On Leakage Current of Port A	nA = 0.3V, V _{CC} -0.3V, nB ₀ or nB ₁ = 0.3V, V _{CC} -0.3V or floating	1.95 to 4.30	-60		60	nA
R _{ON}	Switch On Resistance ⁽²⁾	I _{OUT} = 100mA, nB ₀ or nB ₁ = 0V, 0.7V, 2.3V, 4.3V	4.3		0.25	0.4	Ω
		I _{OUT} = 100mA, nB ₀ or nB ₁ = 0V, 0.7V, 2.3V, 3.0V	3.0		0.27	0.4	
		I _{OUT} = 100mA, nB ₀ or nB ₁ = 0V, 0.7V, 2.0V, 2.7V	2.7		0.3	0.4	
		I _{OUT} = 100mA, nB ₀ or nB ₁ = 0V, 0.7V, 1.6V, 2.3V	2.3		0.4	0.7	
		I _{OUT} = 100mA, nB ₀ or nB ₁ = 0V, 1.0V, 1.8V	1.8		0.8	1.8	
ΔR _{ON}	On Resistance Matching Between Channels ⁽³⁾	I _{OUT} = 100mA, nB ₀ or nB ₁ = 0.7V	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} = 100mA, B ₀ or nB ₁ = 0V 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} = 0V to V _{CC} , I _{OUT} = 0A	4.3	-500		500	nA
I _{CCT}	Increase in I _{CC} per Input Con- trol Voltage	V _{IN} = 1.8V	4.3		26.0	32.0	μA
		V _{IN} = 2.6V			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 = 1.5V, R _L = 50Ω, C _L = 35pF	3.6 to 4.3		35	60	ns
			2.7 to 3.6		50	75	
			2.3 to 2.7		75	90	
t _{OFF}	Turn-Off Time	nB ₀ or nB ₁ = 1.5V, R _L = 50Ω, C _L = 35pF	3.6 to 4.3		25	40	ns
			2.7 to 3.6		30	50	
			2.3 to 2.7		40	60	
t _{BBM}	Break-Before-Make Time	nB ₀ or nB ₁ = 1.5V, R _L = 50Ω, C _L = 35pF	3.6 to 4.3		20		ns
			2.7 to 3.6		30		
			2.3 to 2.7		40		
Q	Charge Injection	C _L = 100pF, V _{GEN} = 0V, R _{GEN} = 0Ω	3.6 to 4.3		22		pC
			2.7 to 3.6		15		
			2.3 to 2.7		10		
OIRR	Off Isolation	f = 100kHz, R _L = 50Ω, C _L = 5pF	3.6 to 4.3		-70		dB
			2.7 to 3.6		-70		
			2.3 to 2.7		-70		
Xtalk	Crosstalk	f = 100kHz, R _L = 50Ω, C _L = 5pF	3.6 to 4.3		-70		dB
			2.7 to 3.6		-70		
			2.3 to 2.7		-70		
BW	-3dB Bandwidth	R _L = 50Ω	2.3 to 4.3		>55		MHz
THD	Total Harmonic Distortion	R _L = 32Ω, V _{IN} = 2V _{pp} , f = 20Hz to 20kHz	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 = 1MHz	0.0		2.0		pF
C _{OFF}	B Port Off Capacitance	f = 1MHz	3.3		16		pF
C _{ON}	A Port On Capacitance	f = 1MHz	3.3		116		pF

AC Loading and Waveforms

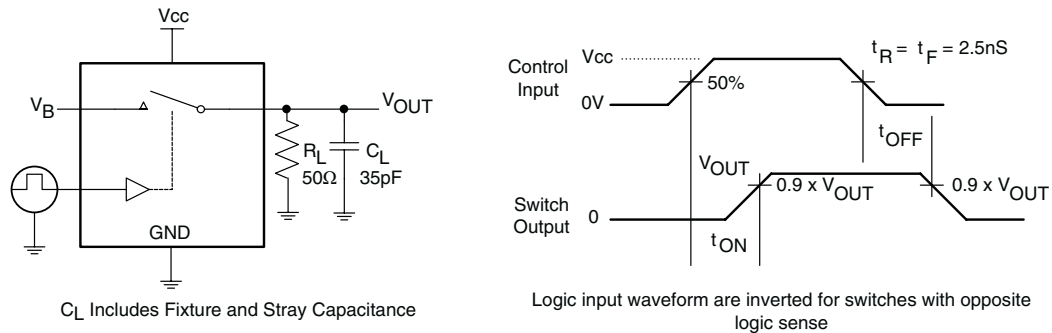


Figure 1. Turn-On/Turn-Off Timing

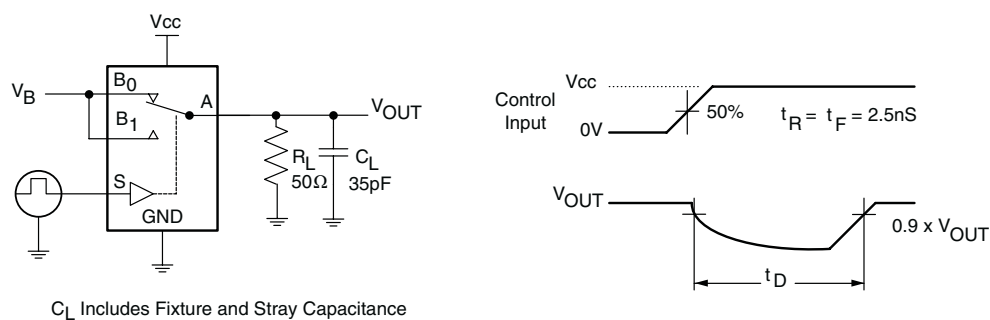


Figure 2. Break-Before-Make Timing

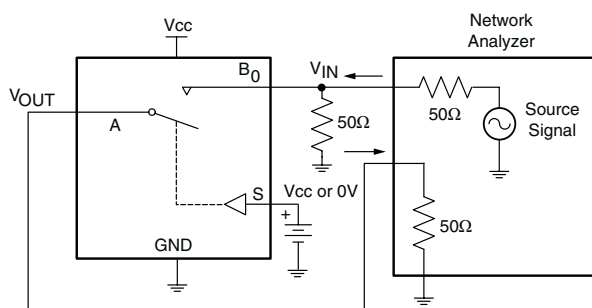


Figure 3. Off Isolation

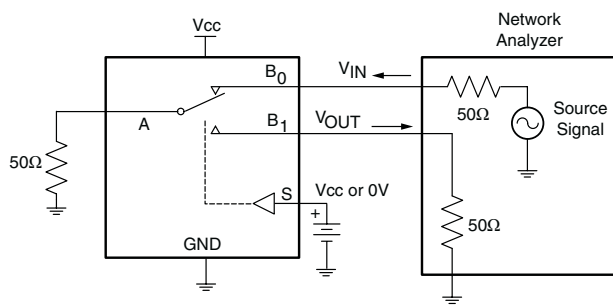


Figure 4. Crosstalk

AC Loading and Waveforms (continued)

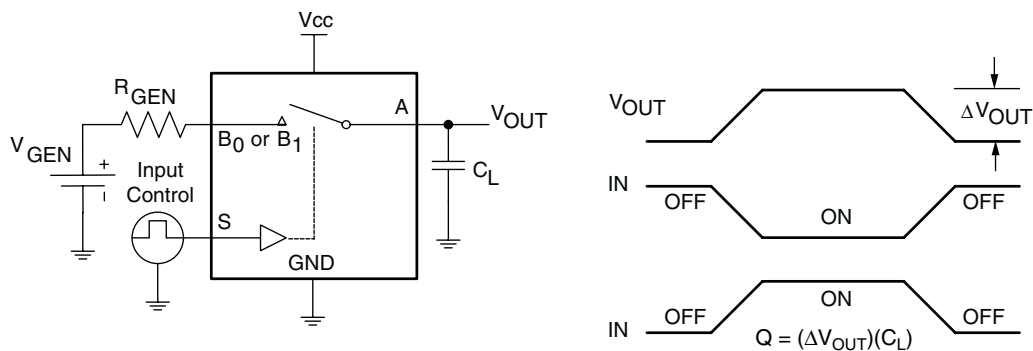


Figure 5. Charge Injection

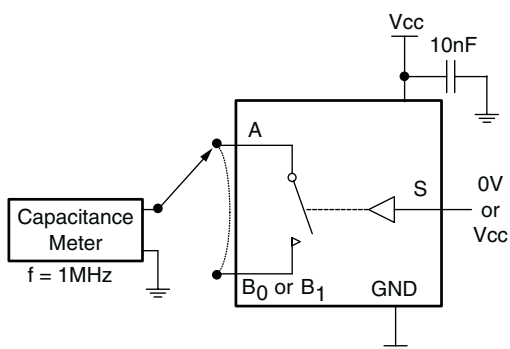


Figure 6. ON/Off Capacitance Measurement

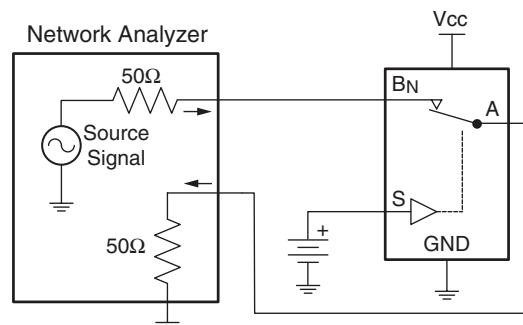


Figure 7. Bandwidth

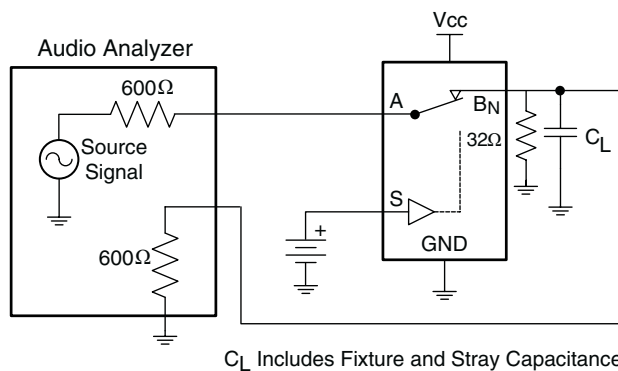
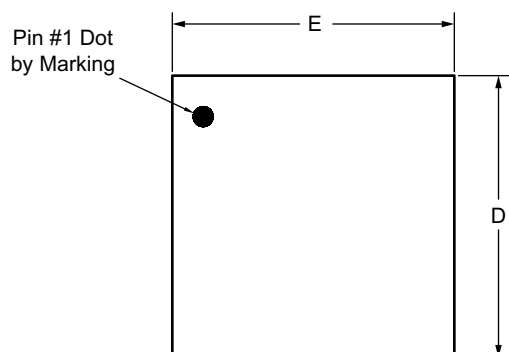
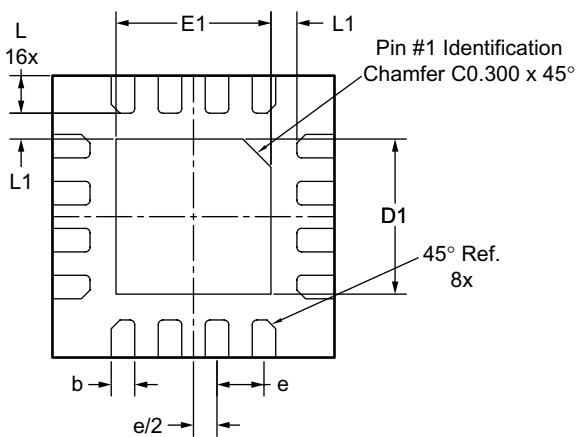


Figure 8. Harmonic Distortion

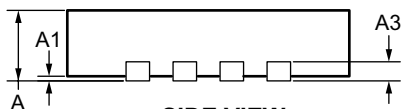
Package Dimensions, QFN 3 x 3



TOP VIEW

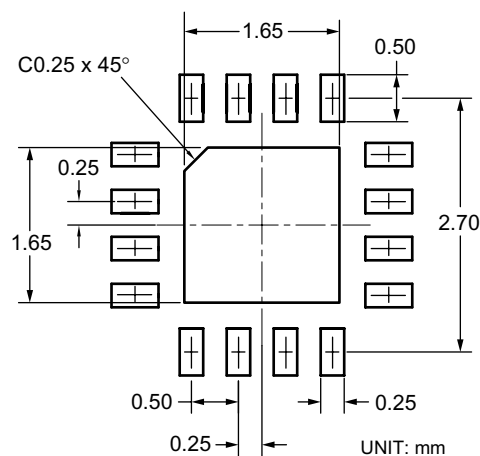


BOTTOM VIEW



SIDE VIEW

RECOMMENDED LAND PATTERN



Dimensions in millimeters

Symbols	Min.	Nom.	Max.
A	0.70	0.75	0.80
A1	0.00	—	0.05
b	0.20	0.25	0.30
A3	0.203 Ref.		
D	2.95	3.00	3.05
E	2.95	3.00	3.05
D1	1.60	1.65	1.70
E1	1.60	1.65	1.70
e	0.50 BSC		
L	0.35	0.40	0.45
L1	0.275 Ref.		

Dimensions in inches

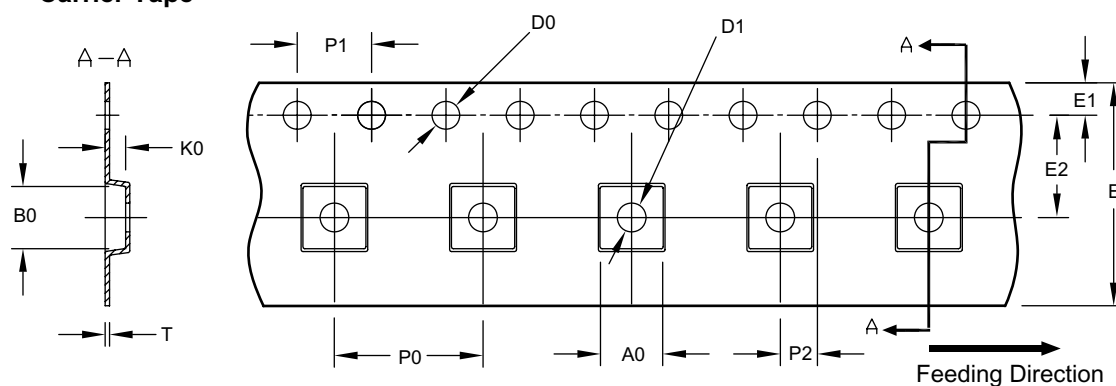
Symbols	Min.	Nom.	Max.
A	0.028	0.030	0.032
A1	0.000	—	0.002
b	0.008	0.010	0.012
A3	0.008 Ref.		
D	0.116	0.118	0.120
E	0.116	0.118	0.120
D1	0.063	0.065	0.067
E1	0.063	0.065	0.067
e	0.020 BSC		
L	0.014	0.016	0.018
L1	0.011 Ref.		

Note:

1. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

Tape and Reel Dimensions, QFN 3 x 3

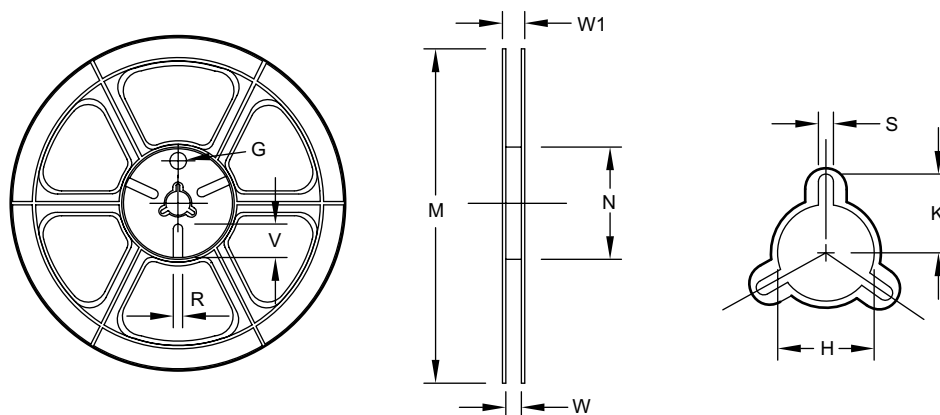
Carrier Tape



UNIT: mm

Package	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
DFN 3x3 EP	3.40 ±0.10	3.35 ±0.10	1.10 ±0.10	1.50 +0.10/-0	1.50 +0.10/-0	12.00 +0.30	1.75 ±0.10	5.50 ±0.05	8.00 ±0.10	4.00 ±0.10	2.00 ±0.05	0.30 ±0.05

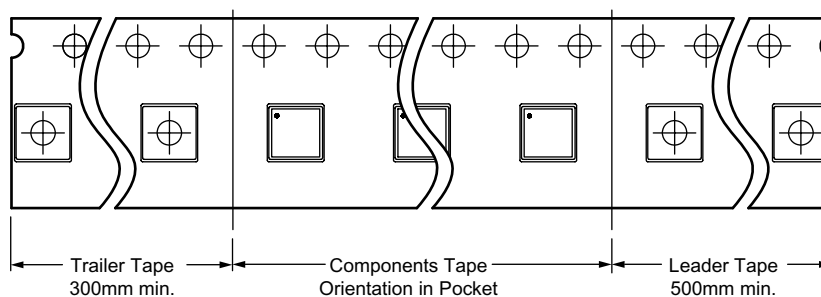
Reel



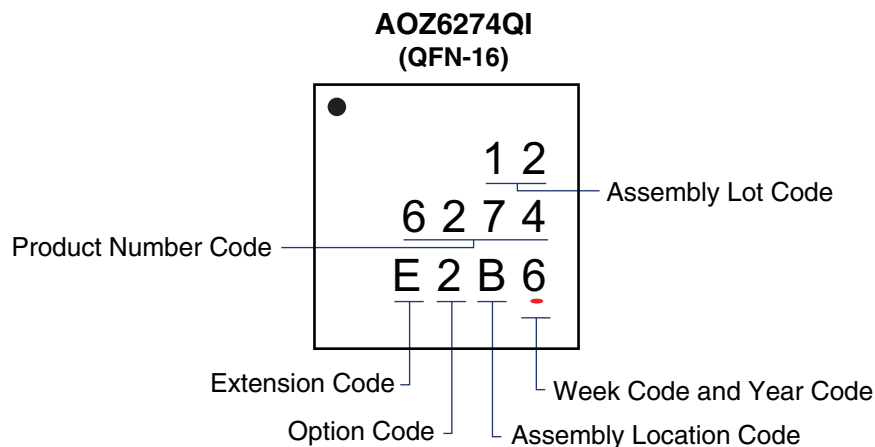
UNIT: mm

Tape Size	Reel Size	M	N	W	W1	H	K	S	G	R	V
12mm	ø330	ø330.0 ±0.50	ø97.00 ±0.10	13.00 ±0.30	17.40 ±1.00	ø13.0 +0.50/-0.20	10.60	2.00 ±0.50	—	—	—

Leader/Trailer and Orientation



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.

LIFE SUPPORT POLICY

ALPHA & OMEGA SEMICONDUCTOR PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS.

As used herein:

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.
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.