

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

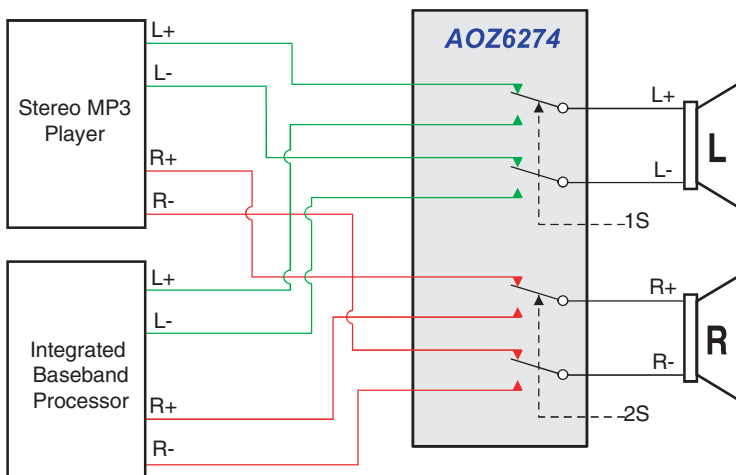
- Low On Resistance (R_{ON}) for +2.7V supply (0.3Ω)
- Low I_{CCT} current when nS input is lower than V_{CC}
- 0.25Ω maximum R_{ON} flatness for +2.7V supply
- Small 3 x 3mm 16-Lead QFN Package
- Broad 1.65V to 4.30V V_{CC} operating range
- Low THD (0.01% typical for 32Ω load)

Applications

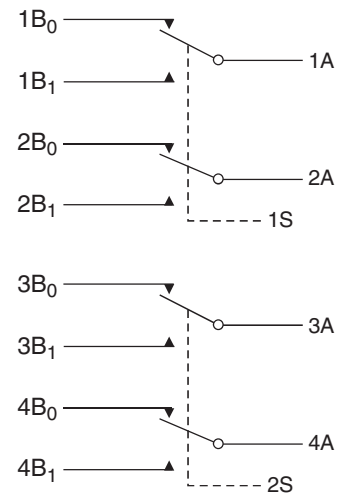
- Cell phone
- PDA
- Portable media player



Typical Application



Pin Configuration



Ordering Information

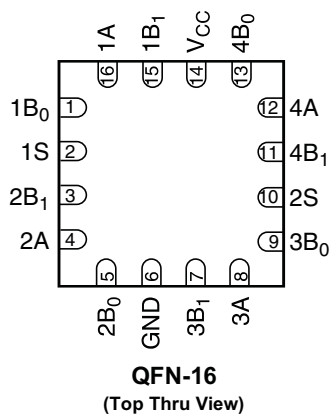
Part Number	Ambient Temperature Range	Package	Environmental
AOZ6274QI	-40°C to +85°C	3x3 16-Lead QFN	Green



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 _{CC(T)}	Increase in I _{CC} per Input Control 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

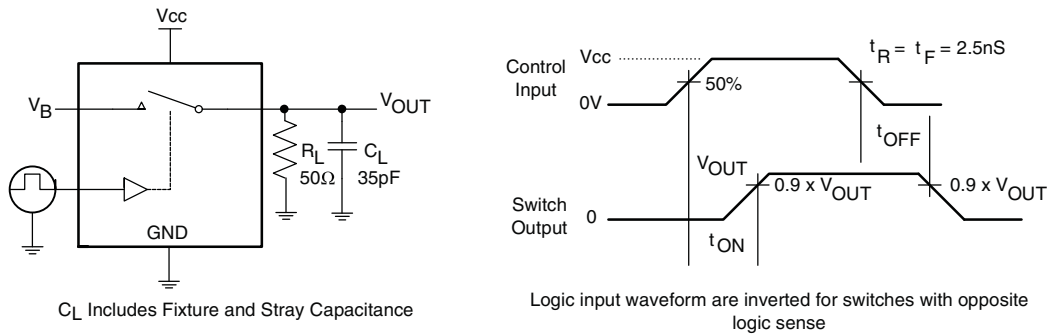


Figure 1. Turn-On/Turn-Off Timing

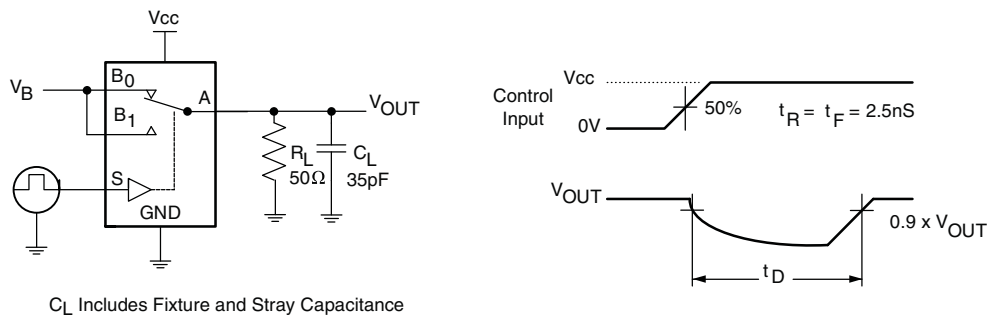


Figure 2. Break-Before-Make Timing

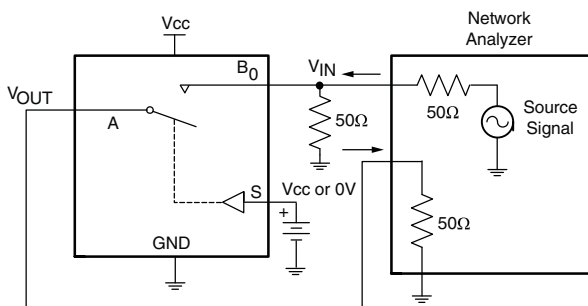


Figure 3. Off Isolation

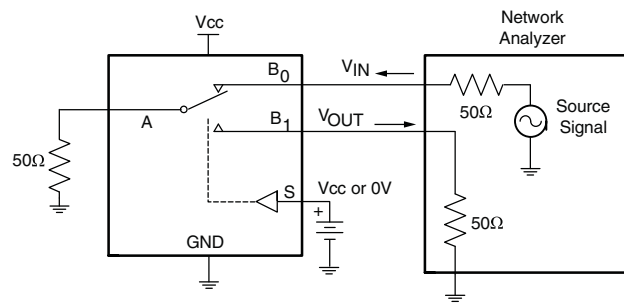


Figure 4. Crosstalk

AC Loading and Waveforms (continued)

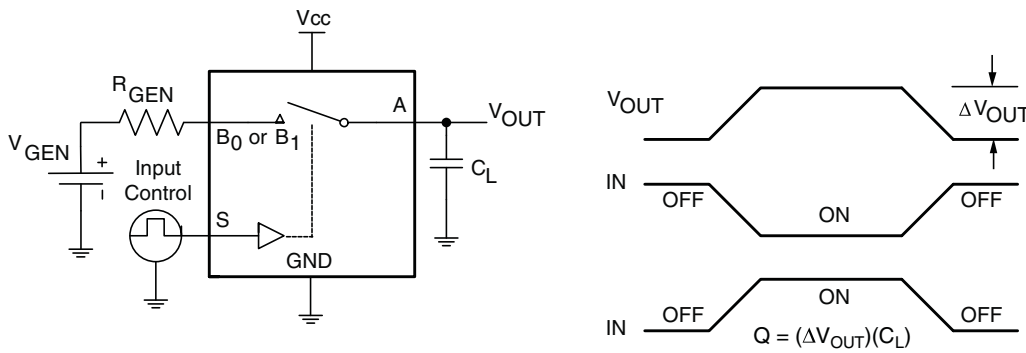


Figure 5. Charge Injection

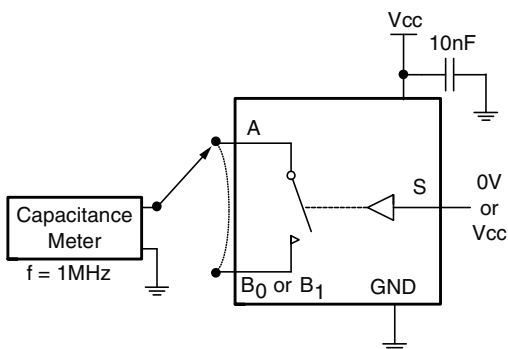


Figure 6. ON/Off Capacitance Measurement

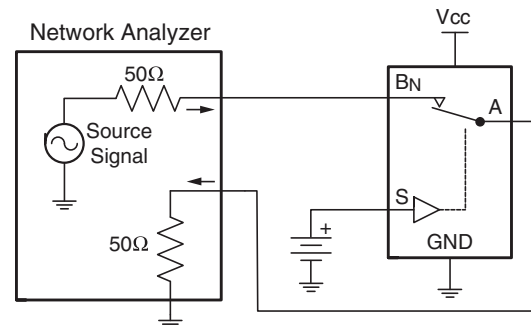


Figure 7. Bandwidth

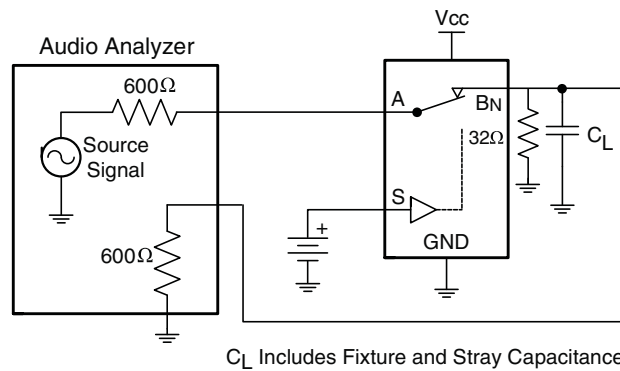
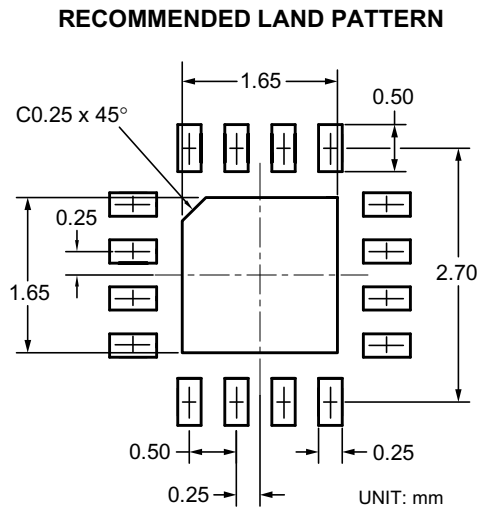
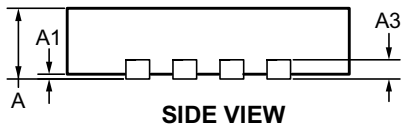
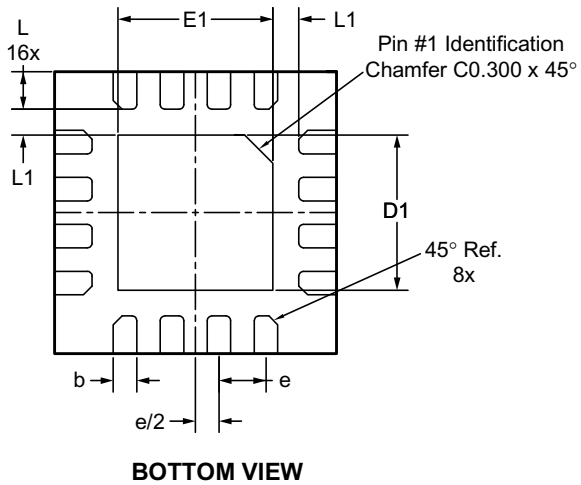
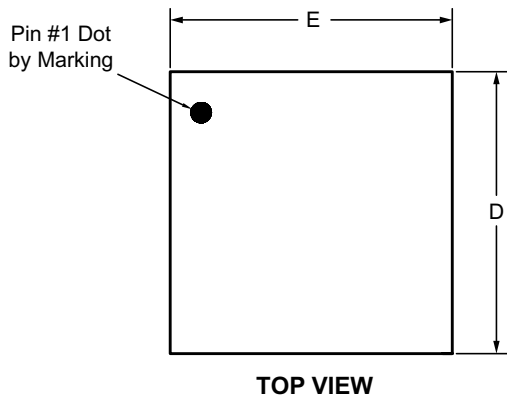


Figure 8. Harmonic Distortion

Package Dimensions, QFN 3 x 3



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

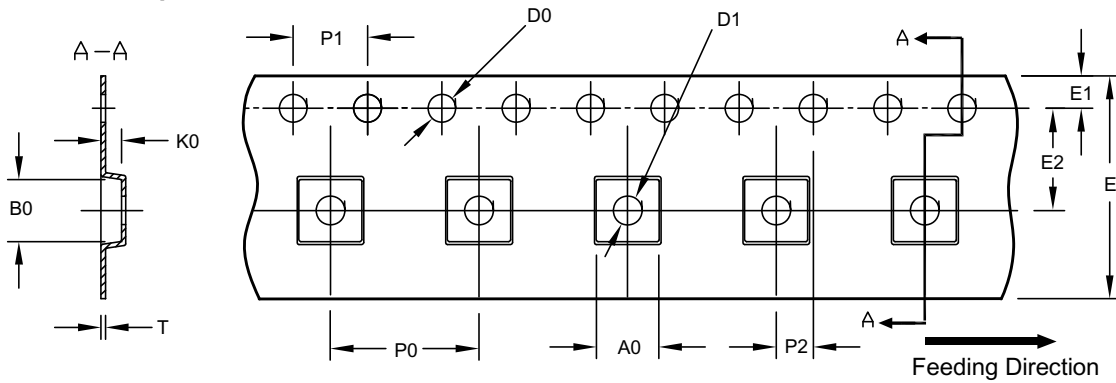
Symbols	Min.	Nom.	Max.
A	0.028	0.030	0.032
A1	0.000	—	0.002
b	0.008	0.010	0.012
A3	0.008 Ref.		
D	0.116	0.118	0.120
E	0.116	0.118	0.120
D1	0.063	0.065	0.067
E1	0.063	0.065	0.067
e	0.020 BSC		
L	0.014	0.016	0.018
L1	0.011 Ref.		

Note:

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

Tape and Reel Dimensions, QFN 3 x 3

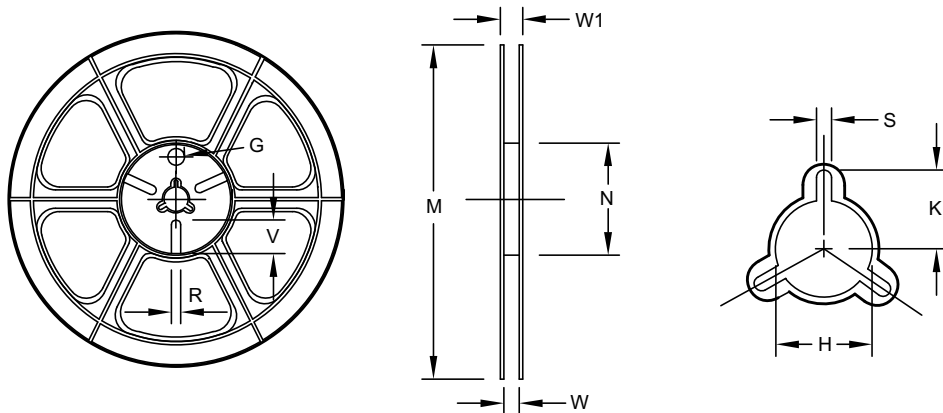
Carrier Tape



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

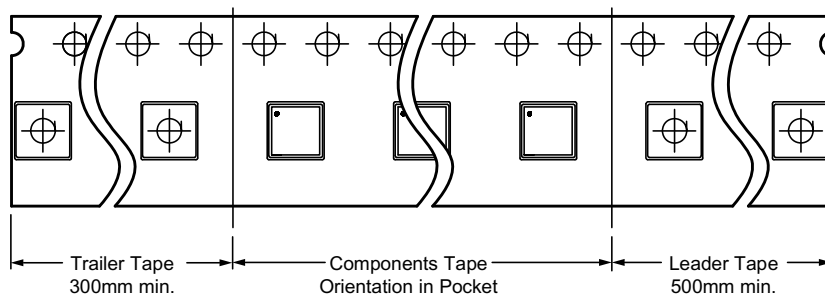
Reel



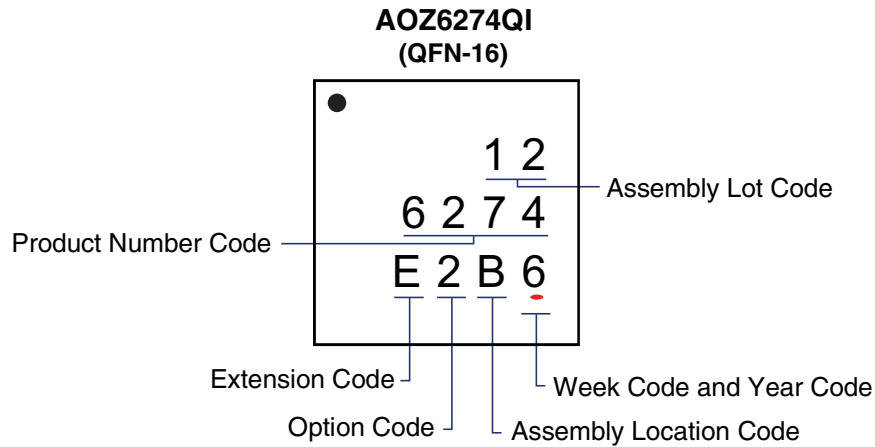
UNIT: mm

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.

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|---|---|