

General Description

The AOZ6115 is a high performance single-pole single-throw (SPST), low power, TTL-compatible bus switch.

The AOZ6115 can handle analog and digital signals. Signals with voltages up to V_{CC} (1.65V to 5.5V) can be transmitted in either direction.

When the Select pin is HIGH, A is connected to the output B pin. The path that is open will have a high-impedance state with respect to the output.

Features

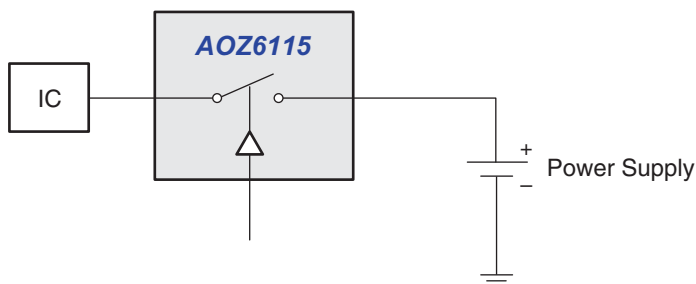
- SOT23 and SC70 5-Lead Package
- 1.65V to 5.5V V_{CC} operation
- Low C_{ON} : 18pF

Applications

- Audio and Video Signal Routing
- Battery Operated Equipment
- Communications Circuit
- Relay Replacement
- Power Routing



Typical Application



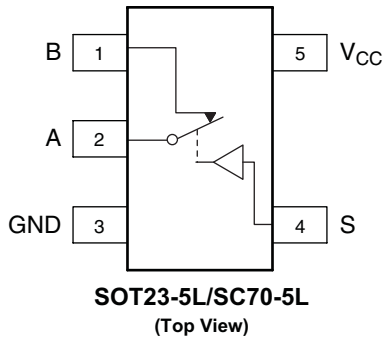
Ordering Information

Part Number	Ambient Temperature Range	Package	Environmental
AOZ6115CI AOZ6115HI	-40°C to +85°C	SOT23 5-Lead SC70 5-Lead	RoHS Compliant Green Product



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



Truth Table

Logic S Input	Function
0	No Connection
1	A Connected to B

Absolute Maximum Ratings

Exceeding the Absolute Maximum ratings may damage the device.

Symbol	Parameter	Rating
V _{CC}	Supply Voltage	-0.5V to +6V
V _{SW}	Switch Voltage ⁽¹⁾	-0.5V to V _{CC}
V _{IN}	Input Voltage ⁽¹⁾	-0.5V to V _{CC}
I _{IK}	Minimum Input Diode Current ⁽²⁾	-50mA
I _{SW}	Switch Current	130mA
I _{SWPEAK}	Peak Switch Current (Pulsed at 1ms, <10% Duty Cycle)	260mA
T _{STG}	Storage Temperature Range	-65°C to +150°C
T _J	Maximum Junction Temperature	+150°C
P _D	SOT23-5 Power Dissipation at 85°C ⁽³⁾	300mW
ESD	Human Body Model (JESD22A-114E)	8000V

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 +5.5V
V _{IN}	Control Input Voltage ⁽⁴⁾	0V to V _{CC}
V _{SW}	Switch Input Voltage	0V to V _{CC}
T _A	Operating Temperature	-40°C to +85°C

Notes:

1. The input and output negative voltage ratings may be exceeded if the input and output diode current ratings are observed.
2. Negative current should not exceed minimum negative value.
3. All leads welded or soldered to PC Board.
4. Unused inputs must be held HIGH or LOW. They may not float.

Electrical Characteristics (Continued)

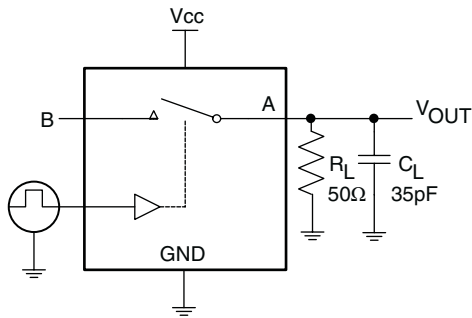
Unless otherwise indicated, specifications indicate a temperature range of -40°C to +85°C

Symbol	Parameter	Test Conditions	Min.	Typ. ⁽¹⁾	Max.	Units	
DC CHARACTERISTICS							
V _{IH}	Input Voltage High	V _{CC} = 2.7V to 3.6V	1.5			V	
		V _{CC} = 4.5V to 5.5V	2.0				
V _{IL}	Input Voltage Low	V _{CC} = 2.7V to 3.6V			0.6	V	
		V _{CC} = 4.5V to 5.5V			0.8		
R _{ON}	On Resistance	V _{CC} = 2.7V, I _{OUT} = 100mA, B = 1.5V		3.0	4.0	Ω	
		V _{CC} = 4.5V, I _{OUT} = 100mA, B = 3.5V		2.0	3.0		
R _{FLAT}	On Resistance Flatness	V _{CC} = 4.5V, I _{OUT} = 100mA, B = 0V, 1V, 2V		0.8		Ω	
I _{IN}	Input Leakage Current	V _{IN} = 0V or V _{CC}	-1.0		1.0	μA	
I _{B(off)}	Off Stage Switch Leakage	V _{CC} = 5.5V, A = 1V, 4.5V, B = 4.5V, 1V	-100	4	100	nA	
I _{A(on)}	On State Switch Leakage	V _{CC} = 5.5V, A = 1V, 4.5V, B = floating	-20	1	20	nA	
POWER SUPPLY							
V _{CC}	Power Supply Range		1.65		5.5	V	
I _{CCQ}	Quiescent Supply Current	V _{CC} = 5.5V, V _{IN} = 0V or V _{CC} , I _{OUT} = 0V		0.5	1	μA	
I _{CCT}	Increase in I _{CC} per Input	V _{CC} = 3.6V, V _{IN} = 2.0V		3.3	10	μA	
		V _{CC} = 5.5V, V _{IN} = 2.4V		20	30		
AC CHARACTERISTICS							
t _{ON}	Turn-On Time	B = 1.5V, R _L = 50Ω, C _L = 35pF	V _{CC} = 2.7V to 3.6V		20	65	ns
			V _{CC} = 4.5V to 5.5V		10	40	
t _{OFF}	Turn-Off Time	B = 1.5V, R _L = 50Ω, C _L = 35pF	V _{CC} = 2.7V to 3.6V		20	30	ns
			V _{CC} = 4.5V to 5.5V		10	20	
Q	Charge Injection	C _L = 1.0nF, V _{GE} = 0V, R _{GEN} = 0Ω	V _{CC} = 2.7V to 3.6V		1		pC
			V _{CC} = 4.5V to 5.5V		2		
ANALOG SWITCH CHARACTERISTICS							
OIRR	Off Isolation	R _L = 50Ω, f = 1MHz		-70		dB	
BW	-3dB Bandwidth	R _L = 50Ω		300		MHz	
THD	Total Harmonic Distortion	V _{CC} = 5V, R _L = 600Ω, C _L = 50pF, f = 20Hz to 20kHz		0.005		%	
CAPACITANCE							
C _{IN}	Control Pin Capacitance	V _{CC} = 0V, f = 1MHz		2		pF	
C _{OFF}	B Port Off Capacitance	V _{CC} = 4.5V, f = 1MHz		7.5		pF	
C _{ON}	A Port Capacitance When Switch Enable	V _{CC} = 4.5V, f = 1MHz		18		pF	

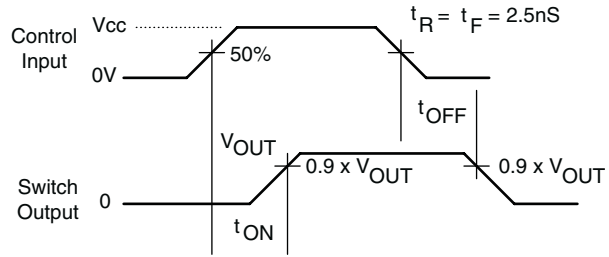
Note:

1. Typical values:

AC Loading and Waveforms



CL Includes Fixture and Stray Capacitance



Logic input waveform are inverted for switches with opposite logic sense

Figure 1. Turn-On/Turn-Off Timing

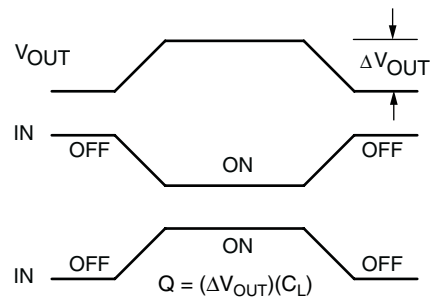
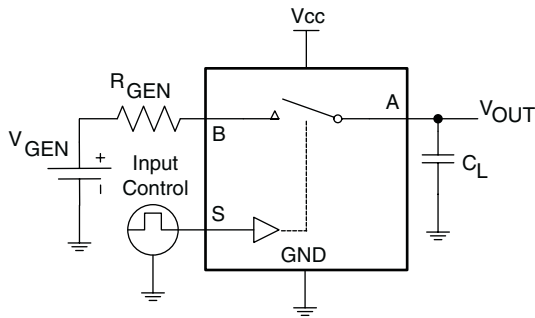


Figure 2. Charge Injection

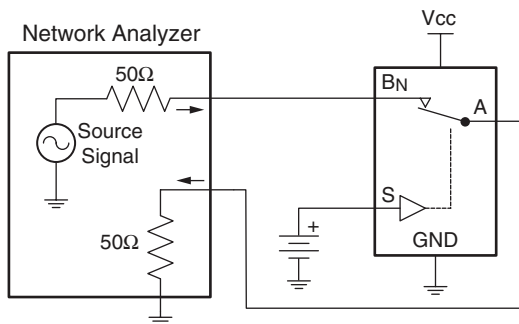
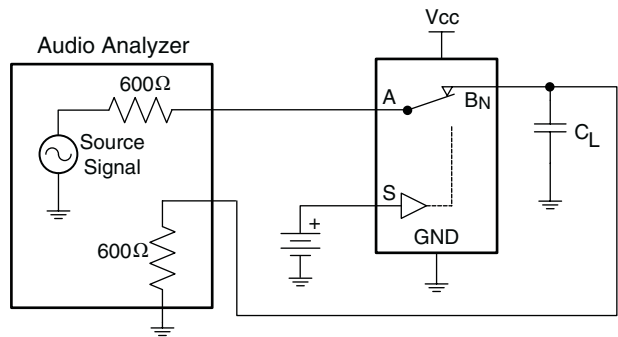


Figure 3. Bandwidth



CL Includes Fixture and Stray Capacitance

Figure 4. Harmonic Distortion

AC Loading and Waveforms (Continued)

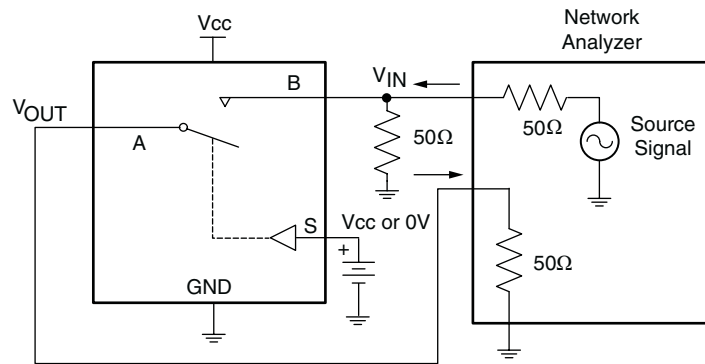


Figure 5. Off Isolation

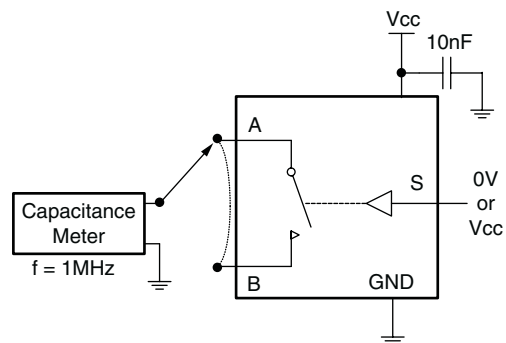
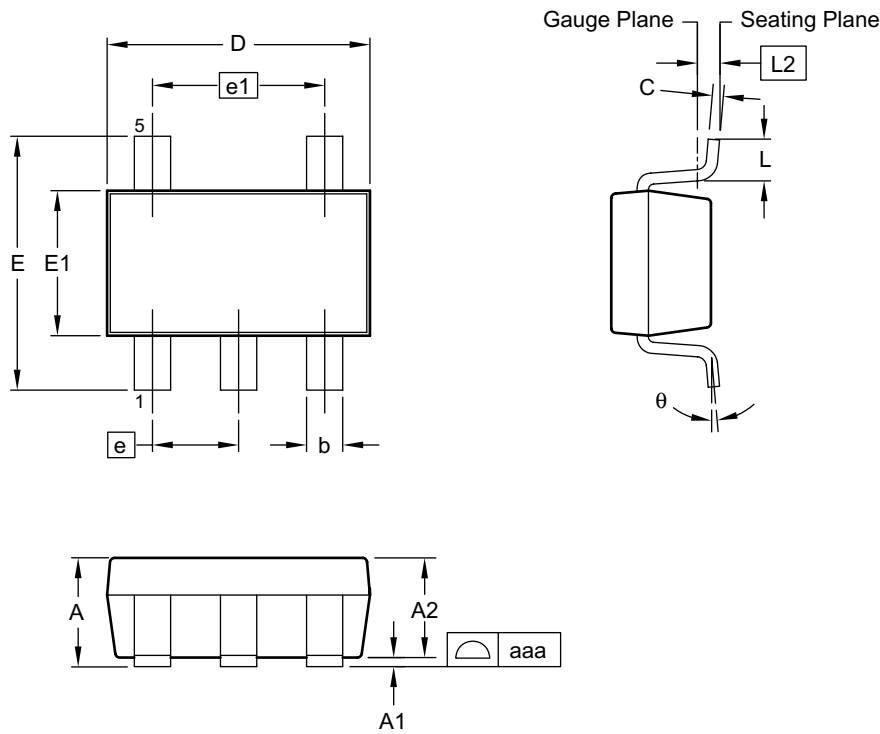
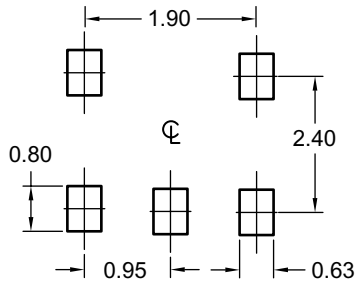


Figure 6. ON/Off Capacitance Measurement

Package Dimensions, SOT23-5L



RECOMMENDED LAND PATTERN



UNIT: mm

Dimensions in millimeters

Symbols	Min.	Nom.	Max.
A	—	—	1.00
A1	0.00	—	0.10
A2	0.70	0.88	0.95
b	0.35	0.40	0.50
C	0.10	0.13	0.20
D	2.80	2.90	3.00
E	2.60	2.80	3.00
E1	1.50	1.60	1.70
e	0.95 BSC		
e1	1.90 BSC		
L	0.30	0.40	0.60
L2	0.25 BSC		
aaa	0.10		
θ	0°	—	8°

Dimensions in inches

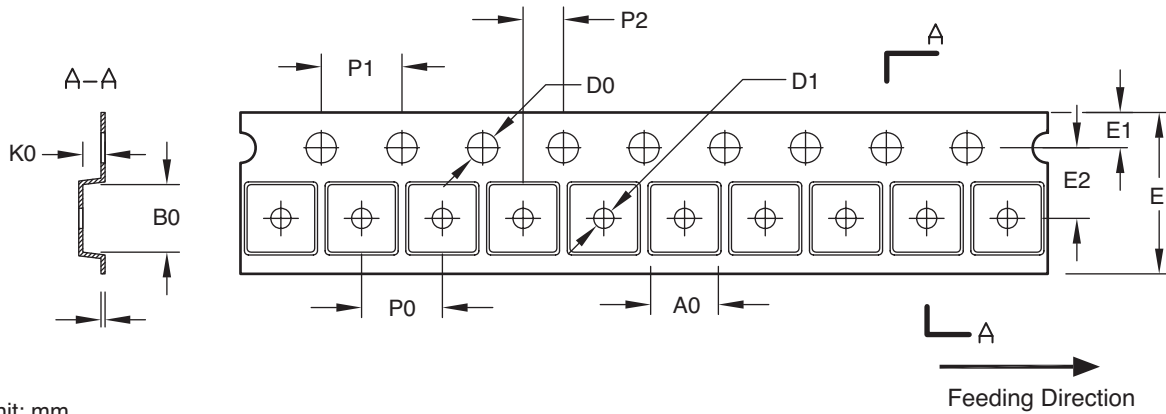
Symbols	Min.	Nom.	Max.
A	—	—	0.039
A1	0.00	—	0.004
A2	0.028	0.035	0.037
b	0.014	0.016	0.020
C	0.004	0.005	0.008
D	0.110	0.114	0.118
E	0.102	0.110	0.118
E1	0.059	0.063	0.067
e	0.037 BSC		
e1	0.075 BSC		
L	0.012	0.016	0.024
L2	0.010 BSC		
aaa	0.004		
θ	0°	—	8°

Notes:

1. Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 5 mils.
2. Dimension "L" is measured in gauge plane.
3. Tolerance $\pm 0.10\text{mm}$ (4 mil) unless otherwise specified
4. Refer to JEDEC MO-193C AB.
5. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

Tape and Reel Dimensions, SOT23-5L

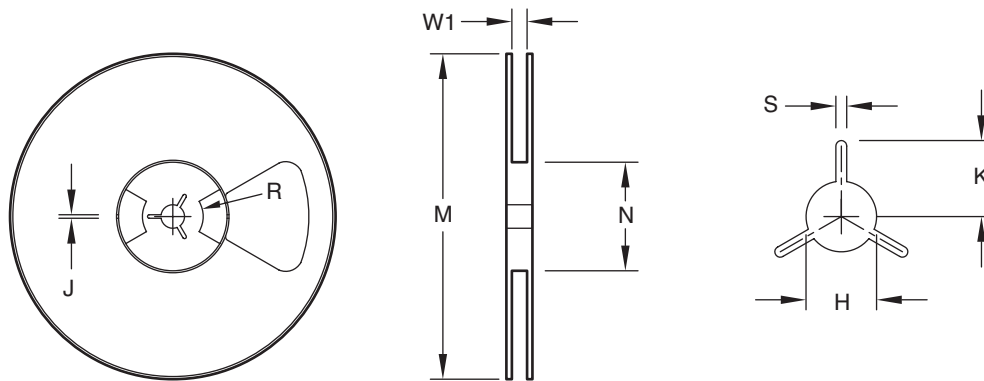
Tape



Unit: mm

Package	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
SOT23-5/6L LP	3.15 ±0.10	3.20 ±0.10	1.40 ±0.10	1.50 ±0.05	1.00 +0.10 / -0	8.00 ±0.30	1.75 ±0.10	3.50 ±0.05	4.00 ±0.10	4.00 ±0.10	2.00 ±0.05	0.23 ±0.03

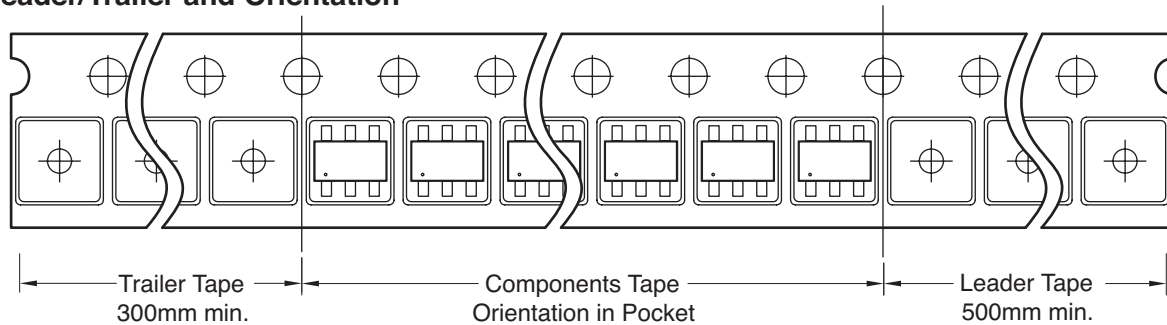
Reel



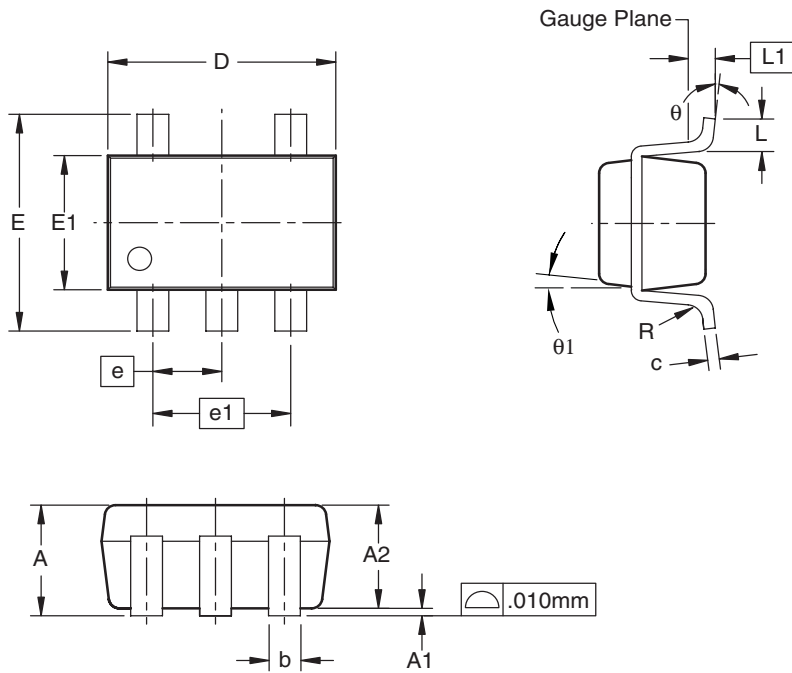
Unit: mm

Tape Size	Reel Size	M	N	W1	H	S	K	R	J
8mm	ø177.8	ø177.8 Max.	55.0 Min.	8.4 +1.50 / -0.0	13.0 +0.5 / -0.2	1.5 Min.	10.1 Min.	12.7	4.0 ±0.1

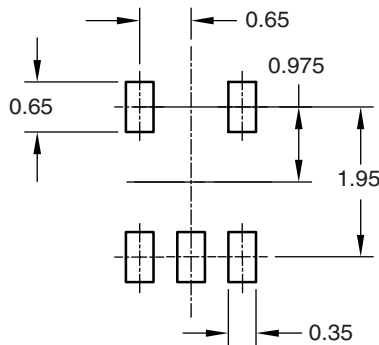
Leader/Trailer and Orientation



Package Dimensions, SC70-5L



RECOMMENDED LAND PATTERN



Dimensions in millimeters

Symbols	Min.	Nom.	Max.
A	0.90	0.95	1.10
A1	0.00	—	0.10
A2	0.7	0.9	1.00
b	0.15	0.22	0.30
c	0.08	0.127	0.20
D	2.10 BSC		
E	2.30 BSC		
e	0.65 BSC		
e1	1.30 BSC		
E1	1.30 BSC		
L	0.26	0.40	0.46
L1	2.54 BSC		
R	0.1	—	—
θ	0	4	8
θ1	7 NOM		

Dimensions in inches

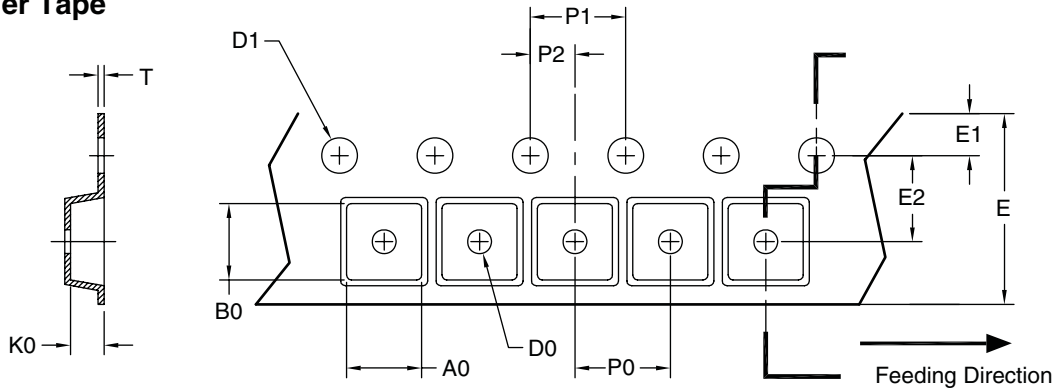
Symbols	Min.	Nom.	Max.
A	0.035	0.037	0.043
A1	0.00	—	0.004
A2	0.028	0.035	0.039
b	0.006	0.008	0.012
c	0.003	0.005	0.008
D	0.083 BSC		
E	0.091 BSC		
e	0.026 BSC		
e1	0.051 BSC		
E1	0.051 BSC		
L	0.010	0.015	0.018
L1	0.01 BSC		
R	0.004	—	—
θ	0	4	8
θ1	7 NOM		

Notes:

1. All dimensions are in millimeters.
2. Dimensions are inclusive of plating
3. Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 3 mils each.
4. Die is facing up for mold and facing down for trim/form; i.e., reverse trim/form.
5. Dimension L is measured in gauge plane.
6. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

Tape and Reel Dimensions, SC70-5L

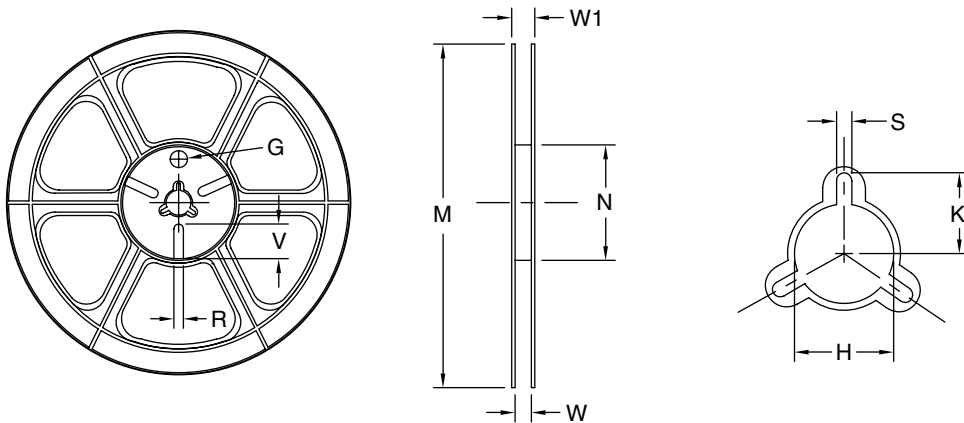
Carrier Tape



UNIT: mm

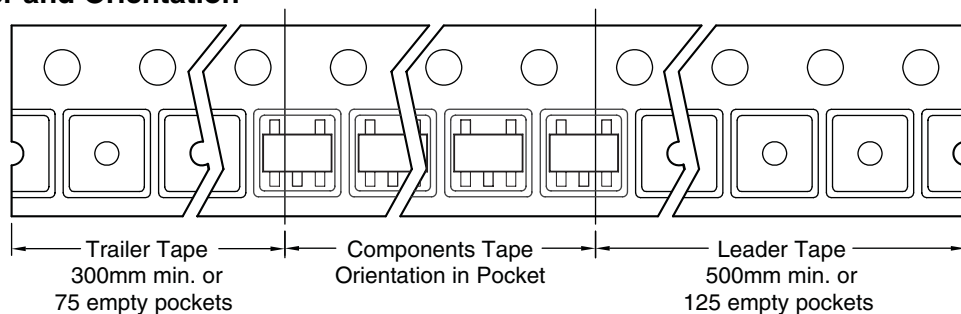
Package	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
SC-70, 6L (8mm)	2.40 ± 0.10	2.40 ± 0.10	1.19 ± 0.10	1.00 Min.	1.55 ± 0.05	8.00 ± 0.30	1.75 ± 0.10	3.50 ± 0.05	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	0.25 ± 0.05

Reel

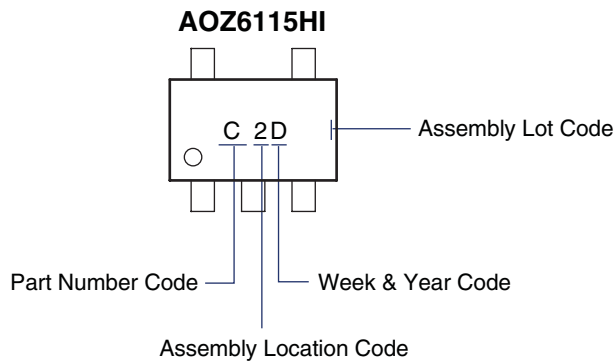
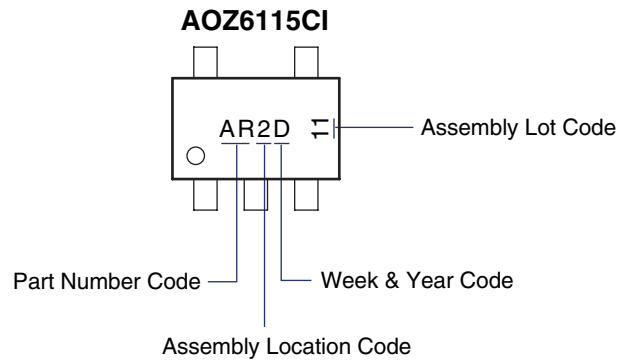


Tape Size	Reel Size	M	N	W	W1	H	K	S	G	R	V
8mm	$\phi 180$	$\phi 180.00$ ± 0.50	$\phi 60.50$	9.00 ± 0.30	11.40 ± 1.00	$\phi 13.00$ $+0.50/-0.20$	10.60	2.00 ± 0.50	$\phi 9.00$	5.00	18.00

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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- | | |
|---|---|
| <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> |
|---|---|