

## 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

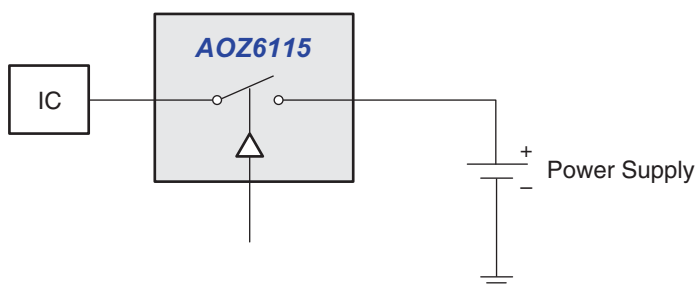
- SOT23 and SC70 5-Lead Package
- 1.65V to 5.5V  $V_{CC}$  operation
- Low  $C_{ON}$ : 18pF

## Applications

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



## Typical Application



## Ordering Information

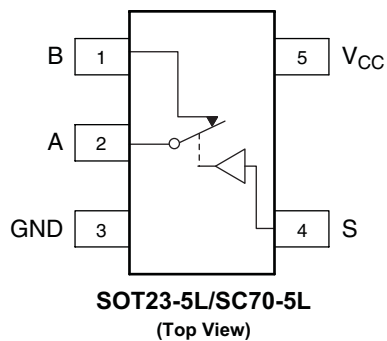
| Part Number            | Ambient Temperature Range | Package                     | Environmental                   |
|------------------------|---------------------------|-----------------------------|---------------------------------|
| AOZ6115CI<br>AOZ6115HI | -40°C to +85°C            | SOT23 5-Lead<br>SC70 5-Lead | RoHS Compliant<br>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](http://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 <sup>(1)</sup>                        | -0.5V to $V_{CC}$ |
| $V_{IN}$     | Input Voltage <sup>(1)</sup>                         | -0.5V to $V_{CC}$ |
| $I_{IK}$     | Minimum Input Diode Current <sup>(2)</sup>           | -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 <sup>(3)</sup>     | 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 <sup>(4)</sup> | 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. <sup>(1)</sup> | Max. | Units |    |
|-------------------------------|---------------------------------------|-----------------------------------------------------------------------------------------|--------------------------------|---------------------|------|-------|----|
| DC CHARACTERISTICS            |                                       |                                                                                         |                                |                     |      |       |    |
| V <sub>IH</sub>               | Input Voltage High                    | V <sub>CC</sub> = 2.7V to 3.6V                                                          | 1.5                            |                     |      | V     |    |
|                               |                                       | V <sub>CC</sub> = 4.5V to 5.5V                                                          | 2.0                            |                     |      |       |    |
| V <sub>IL</sub>               | Input Voltage Low                     | V <sub>CC</sub> = 2.7V to 3.6V                                                          |                                |                     | 0.6  | V     |    |
|                               |                                       | V <sub>CC</sub> = 4.5V to 5.5V                                                          |                                |                     | 0.8  |       |    |
| R <sub>ON</sub>               | On Resistance                         | V <sub>CC</sub> = 2.7V, I <sub>OUT</sub> = 100mA, B = 1.5V                              |                                | 3.0                 | 4.0  | Ω     |    |
|                               |                                       | V <sub>CC</sub> = 4.5V, I <sub>OUT</sub> = 100mA, B = 3.5V                              |                                | 2.0                 | 3.0  |       |    |
| R <sub>FLAT</sub>             | On Resistance Flatness                | V <sub>CC</sub> = 4.5V, I <sub>OUT</sub> = 100mA, B = 0V, 1V, 2V                        |                                | 0.8                 |      | Ω     |    |
| I <sub>IN</sub>               | Input Leakage Current                 | V <sub>IN</sub> = 0V or V <sub>CC</sub>                                                 | -1.0                           |                     | 1.0  | μA    |    |
| I <sub>B(off)</sub>           | Off Stage Switch Leakage              | V <sub>CC</sub> = 5.5V, A = 1V, 4.5V, B = 4.5V, 1V                                      | -100                           | 4                   | 100  | nA    |    |
| I <sub>A(on)</sub>            | On State Switch Leakage               | V <sub>CC</sub> = 5.5V, A = 1V, 4.5V, B = floating                                      | -20                            | 1                   | 20   | nA    |    |
| POWER SUPPLY                  |                                       |                                                                                         |                                |                     |      |       |    |
| V <sub>CC</sub>               | Power Supply Range                    |                                                                                         | 1.65                           |                     | 5.5  | V     |    |
| I <sub>CCQ</sub>              | Quiescent Supply Current              | V <sub>CC</sub> = 5.5V, V <sub>IN</sub> = 0V or V <sub>CC</sub> , I <sub>OUT</sub> = 0V |                                | 0.5                 | 1    | μA    |    |
| I <sub>CCT</sub>              | Increase in I <sub>CC</sub> per Input | V <sub>CC</sub> = 3.6V, V <sub>IN</sub> = 2.0V                                          |                                | 3.3                 | 10   | μA    |    |
|                               |                                       | V <sub>CC</sub> = 5.5V, V <sub>IN</sub> = 2.4V                                          |                                | 20                  | 30   |       |    |
| AC CHARACTERISTICS            |                                       |                                                                                         |                                |                     |      |       |    |
| t <sub>ON</sub>               | Turn-On Time                          | B = 1.5V, R <sub>L</sub> = 50Ω, C <sub>L</sub> = 35pF                                   | V <sub>CC</sub> = 2.7V to 3.6V |                     | 20   | 65    | ns |
|                               |                                       |                                                                                         | V <sub>CC</sub> = 4.5V to 5.5V |                     | 10   | 40    |    |
| t <sub>OFF</sub>              | Turn-Off Time                         | B = 1.5V, R <sub>L</sub> = 50Ω, C <sub>L</sub> = 35pF                                   | V <sub>CC</sub> = 2.7V to 3.6V |                     | 20   | 30    | ns |
|                               |                                       |                                                                                         | V <sub>CC</sub> = 4.5V to 5.5V |                     | 10   | 20    |    |
| Q                             | Charge Injection                      | C <sub>L</sub> = 1.0nF, V <sub>GE</sub> = 0V, R <sub>GEN</sub> = 0Ω                     | V <sub>CC</sub> = 2.7V to 3.6V |                     | 1    |       | pC |
|                               |                                       |                                                                                         | V <sub>CC</sub> = 4.5V to 5.5V |                     | 2    |       |    |
| ANALOG SWITCH CHARACTERISTICS |                                       |                                                                                         |                                |                     |      |       |    |
| OIRR                          | Off Isolation                         | R <sub>L</sub> = 50Ω, f = 1MHz                                                          |                                | -70                 |      | dB    |    |
| BW                            | -3dB Bandwidth                        | R <sub>L</sub> = 50Ω                                                                    |                                | 300                 |      | MHz   |    |
| THD                           | Total Harmonic Distortion             | V <sub>CC</sub> = 5V, R <sub>L</sub> = 600Ω, C <sub>L</sub> = 50pF, f = 20Hz to 20kHz   |                                | 0.005               |      | %     |    |
| CAPACITANCE                   |                                       |                                                                                         |                                |                     |      |       |    |
| C <sub>IN</sub>               | Control Pin Capacitance               | V <sub>CC</sub> = 0V, f = 1MHz                                                          |                                | 2                   |      | pF    |    |
| C <sub>OFF</sub>              | B Port Off Capacitance                | V <sub>CC</sub> = 4.5V, f = 1MHz                                                        |                                | 7.5                 |      | pF    |    |
| C <sub>ON</sub>               | A Port Capacitance When Switch Enable | V <sub>CC</sub> = 4.5V, f = 1MHz                                                        |                                | 18                  |      | pF    |    |

**Note:**

1. Typical values:

## AC Loading and Waveforms

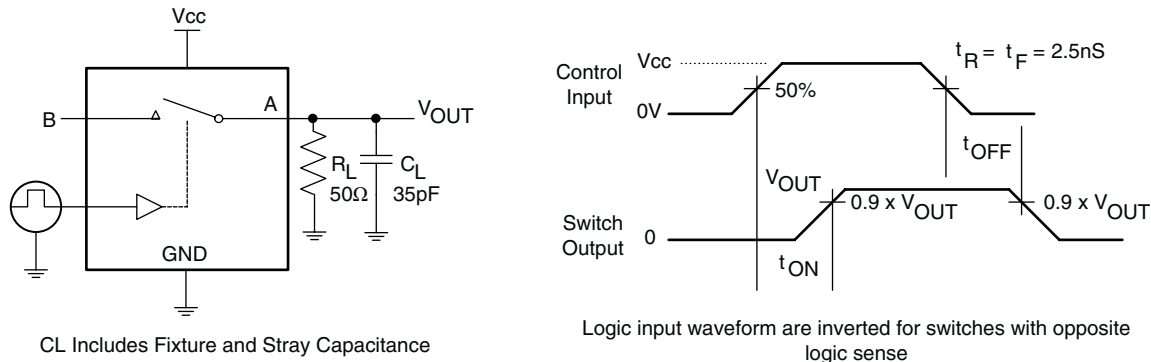


Figure 1. Turn-On/Turn-Off Timing

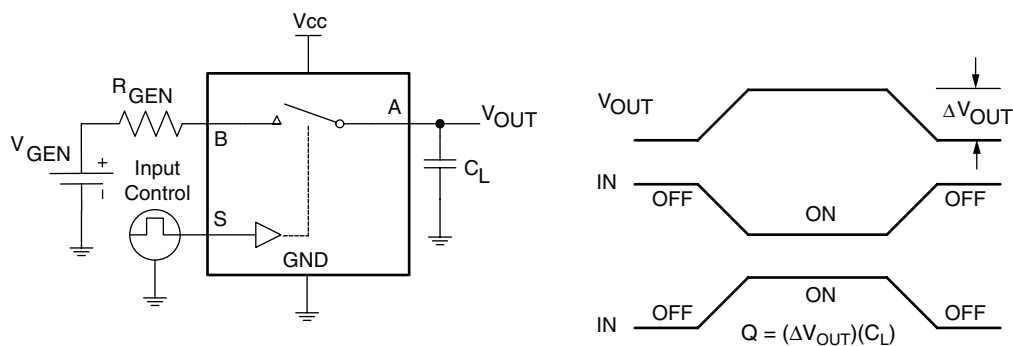


Figure 2. Charge Injection

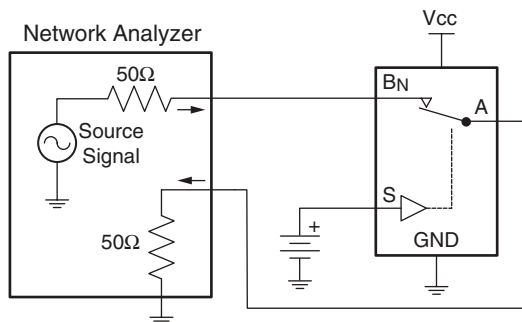


Figure 3. Bandwidth

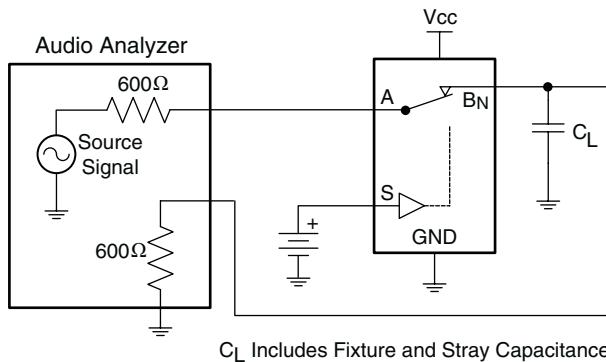
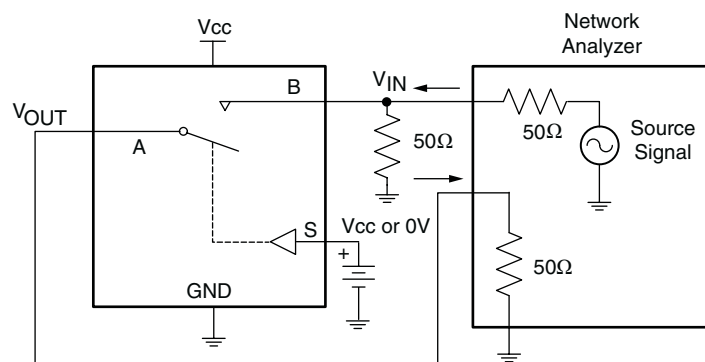
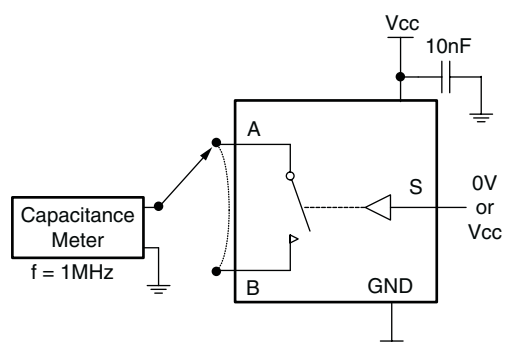


Figure 4. Harmonic Distortion

## AC Loading and Waveforms (Continued)

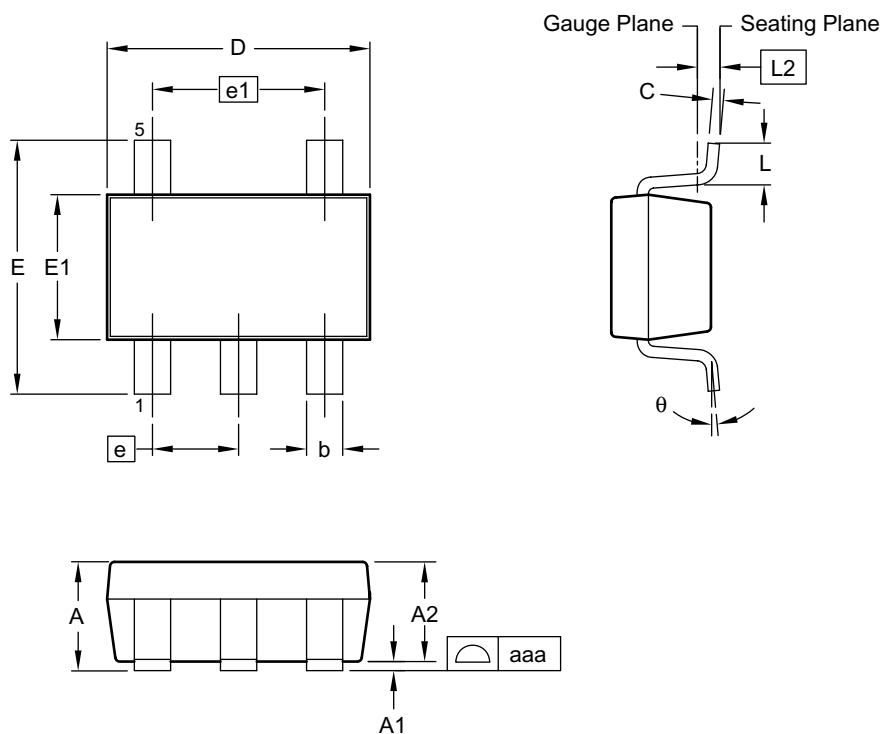


**Figure 5. Off Isolation**

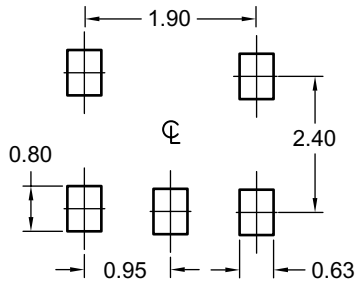


**Figure 6. ON/Off Capacitance Measurement**

## 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

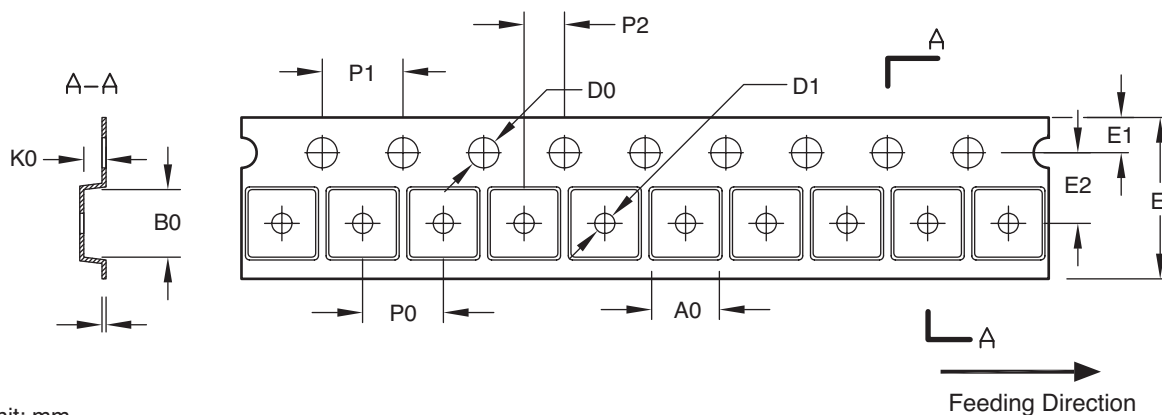
| Symbols | Min.      | Nom.  | Max.  |
|---------|-----------|-------|-------|
| A       | —         | —     | 0.039 |
| A1      | 0.00      | —     | 0.004 |
| A2      | 0.028     | 0.035 | 0.037 |
| b       | 0.014     | 0.016 | 0.020 |
| C       | 0.004     | 0.005 | 0.008 |
| D       | 0.110     | 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

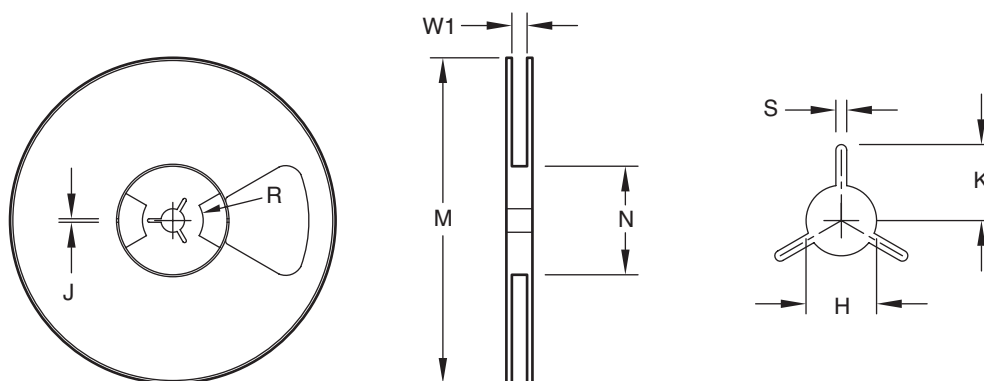
### Tape



Unit: mm

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

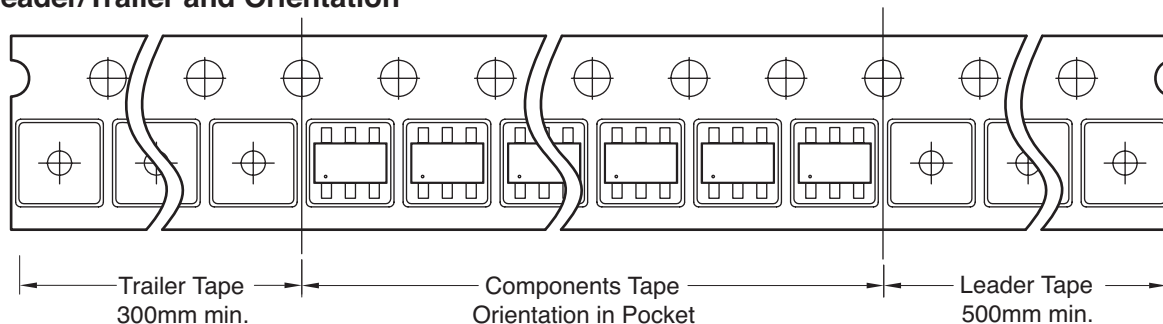
### Reel



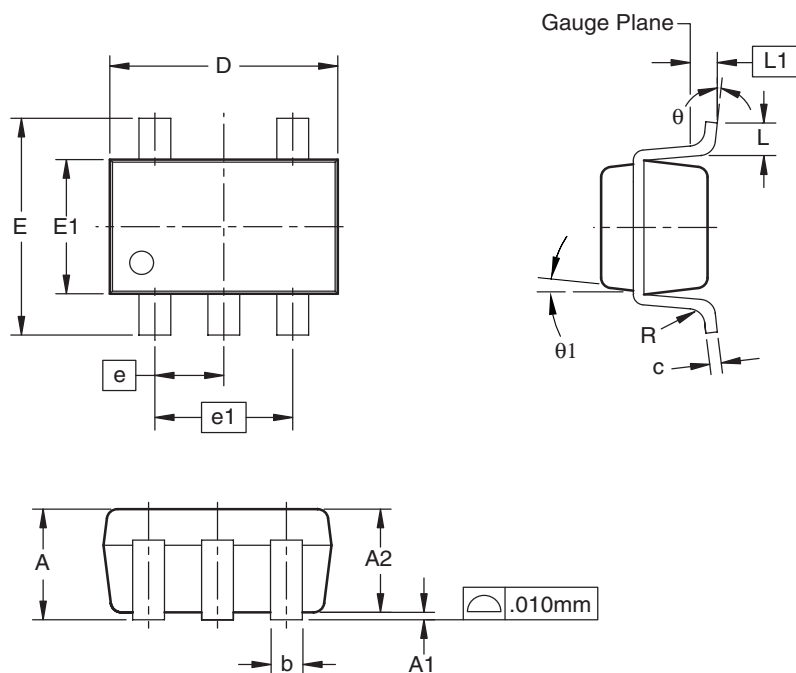
Unit: mm

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

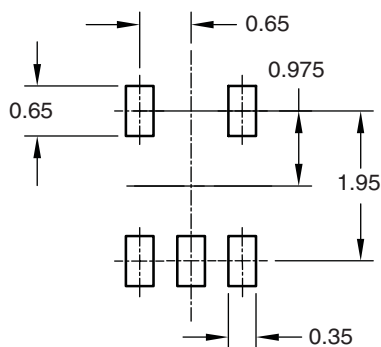
### Leader/Trailer and Orientation



## Package Dimensions, SC70-5L



### RECOMMENDED LAND PATTERN



#### 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.

### Dimensions in millimeters

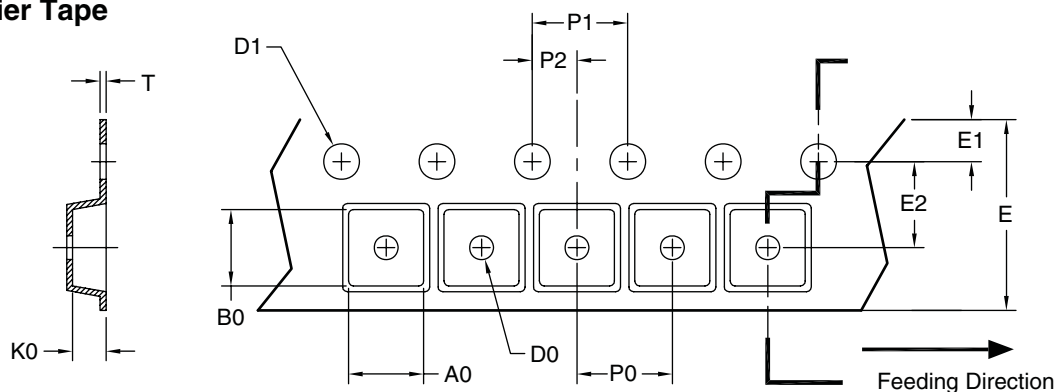
| Symbols | Min.     | Nom.  | Max. |
|---------|----------|-------|------|
| A       | 0.90     | 0.95  | 1.10 |
| A1      | 0.00     | —     | 0.10 |
| A2      | 0.7      | 0.9   | 1.00 |
| b       | 0.15     | 0.22  | 0.30 |
| c       | 0.08     | 0.127 | 0.20 |
| D       | 2.10 BSC |       |      |
| 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     |       |       |

## Tape and Reel Dimensions, SC70-5L

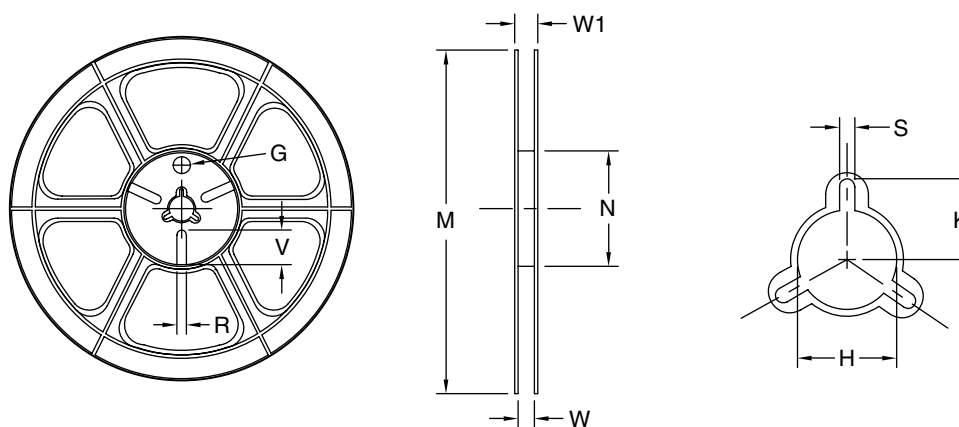
### Carrier Tape



UNIT: mm

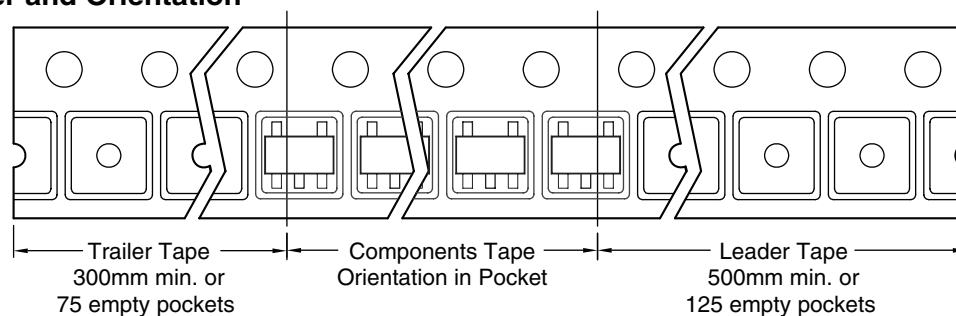
| Package            | A0            | B0            | K0            | D0           | D1            | E             | E1            | E2            | P0            | P1            | P2            | T             |
|--------------------|---------------|---------------|---------------|--------------|---------------|---------------|---------------|---------------|-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

### Reel

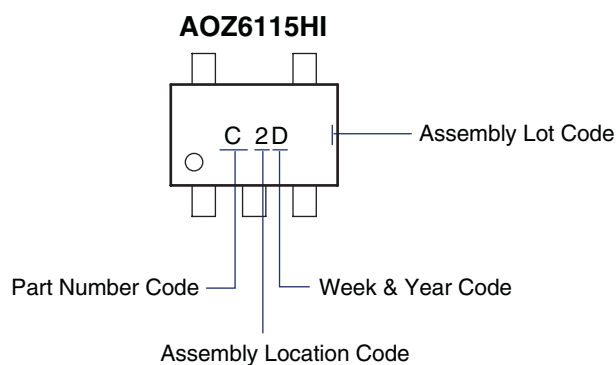
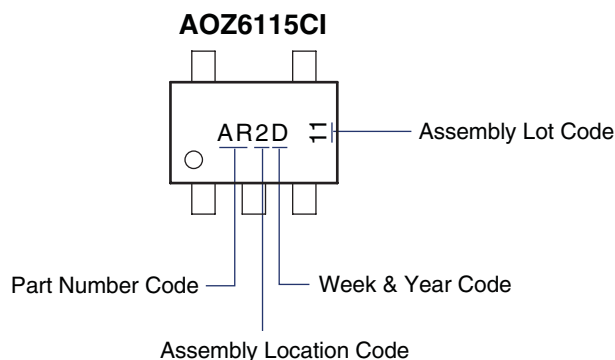


| Tape Size | Reel Size | M                | N      | W             | W1             | H                     | K     | S             | G     | R    | V     |
|-----------|-----------|------------------|--------|---------------|----------------|-----------------------|-------|---------------|-------|------|-------|
| 8mm       | ø180      | ø180.00<br>±0.50 | ø60.50 | 9.00<br>±0.30 | 11.40<br>±1.00 | ø13.00<br>+0.50/-0.20 | 10.60 | 2.00<br>±0.50 | ø9.00 | 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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As used herein:

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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.