




# **Tape and Reel Packaging and Handling Requirements**

Rev C 2/3/09

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## 1.0 SCOPE


This drawing defines requirements for Tape and Reel Packaging of Aeroflex Metelics Semiconductor devices in surface mount packages by external subcontractors.

## 2.0 APPLICABLE DOCUMENTS

EIA-481-B	8 mm through 200 mm Embossed Carrier Taping and 8 mm and 12 mm Punched Carrier Taping of Surface Mount Components for Automatic Handling
JESD-625	Requirements for Electrostatic Discharge Sensitive (ESDS) Devices
MIL-STD-883	Test Methods and Procedures for Microelectronics, Method 3015: Electrostatic Discharge Sensitivity Classification
J-STD-020	Moisture/Reflow Sensitivity Classification for Nonhermetic Solid State Surface Mount Devices
J-STD-033	Standard for Handling, Packing, Shipping, and use of Moisture/Reflow Sensitive Surface Mount Devices
JEP-113	Symbol and Labels for Moisture Sensitive Devices
EIA-541	Packaging material Standards for ESD Sensitive Items
EIA-583	Packaging material Standards for Moisture Sensitive Items

## 3.0 MATERIALS

- Carrier tape shall be black conductive type, having a surface resistivity of no greater than  $10^6$  ohms/square.
- Cover tape shall be anti-static, transparent, pressure-seal or heat-seal, having a surface resistivity (component side) between  $10^8$  and  $10^{11}$  ohms/square.
- Reels shall comply with the requirements of EIA-481.
- Aeroflex Metelics packages parts on both 7" and 13" reels as called out in the purchase order.


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## 4.0 REQUIREMENTS

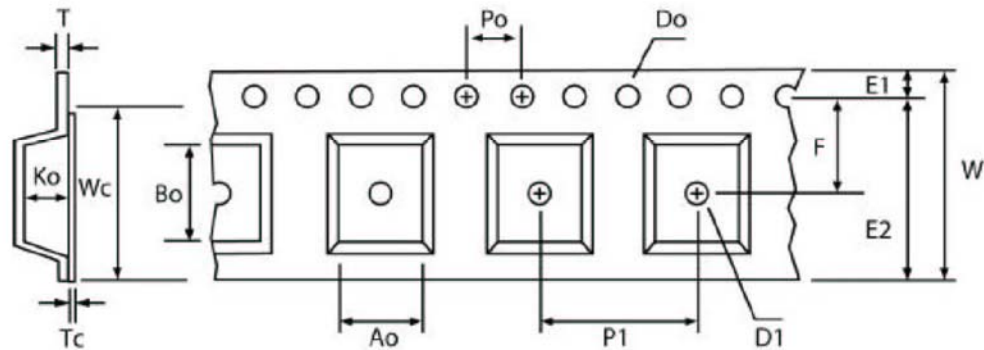
### 4.1 Approved Package Tapes

Device orientation in tape and specific tape size requirements are listed by package type in the figures in section 4.1 according to EIA-481. Only the tape part numbers referenced for each package are approved for use on Aeroflex Metelics products.

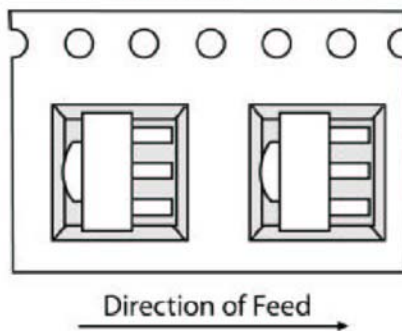
Drawing dimensions are in mm. Tolerances for Ao, Bo, and Ko are 0.1 mm.

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# SOT-89



SOT-89 - Part Orientation

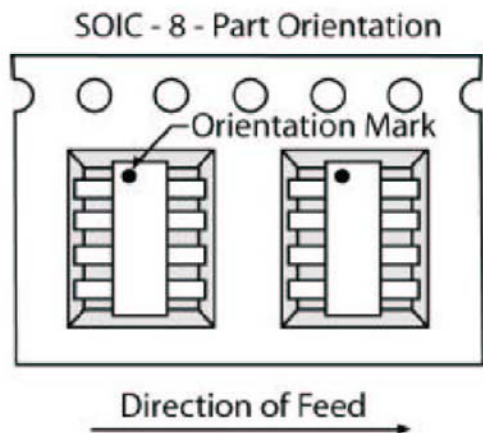
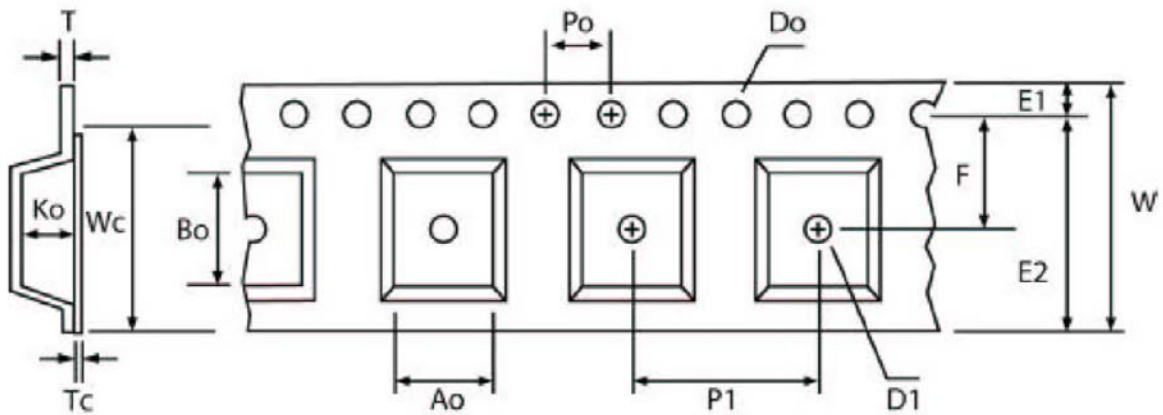


Vendor / Tape Part #	Ao	Bo	Do	D1	E1	F	Ko	Po	P1	T	W
Avantek SOT-89-AV	5.0	4.8	1.5	1.5	1.75	5.5	1.8	4.0	8.0	.21	12.0

\* Note: All dimensions in millimeters

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# SOIC 8

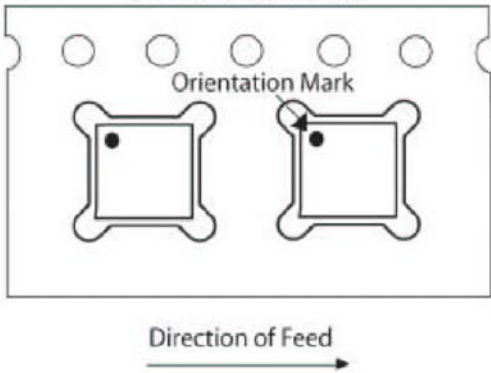
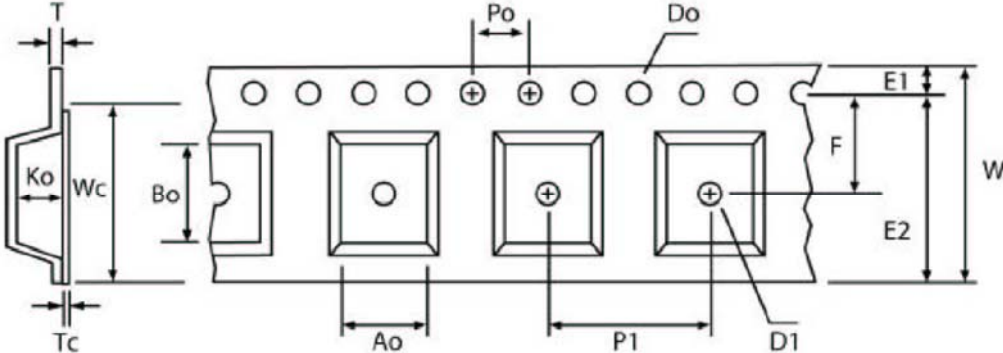


Vendor / Tape Part #	Ao	Bo	Do	D1	E1	F	Ko	Po	P1	T	W
Advantek SOIC8-A	6.40	5.20	1.5	1.5	1.75	5.5	2.10	4.0	8.0	.30	12.0

\* Note: All dimensions in millimeters

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# 6060 & 3030

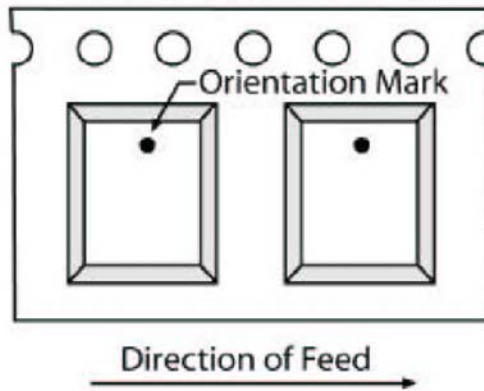
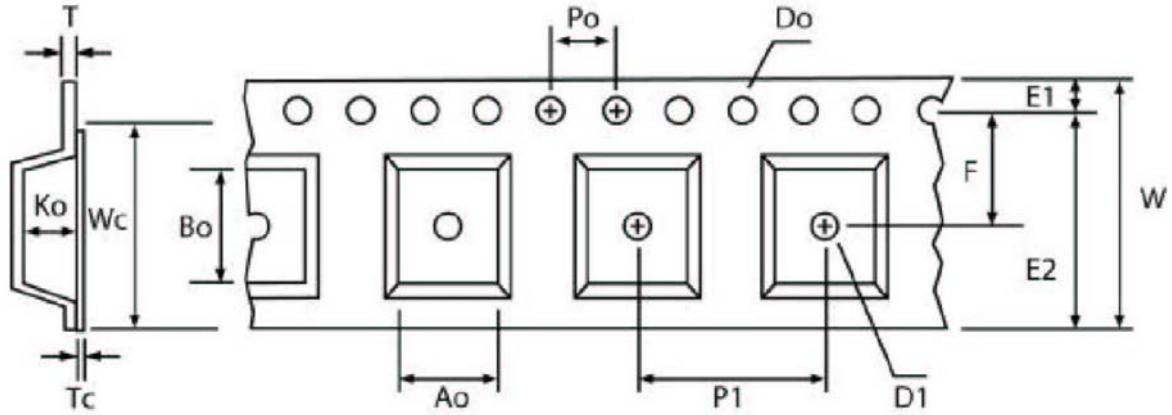


Vendor / Tape Part #	Ao	Bo	Do	D1	E1	F	Ko	Po	P1	T	W
Advantek ML0606-A	6.3	6.3	1.5	1.5	1.75	7.5	1.10	4.0	12.0	.30	16.0
Advantek ML3030-A	3.3	3.3	1.5	1.5	1.75	5.5	1.10	4.0	8.0	.30	12.0

\*Note: All dimensions in millimeters

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# 2012

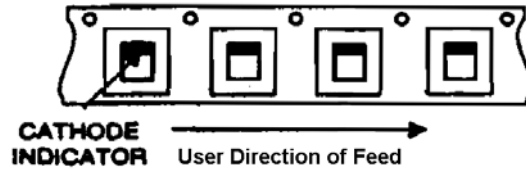
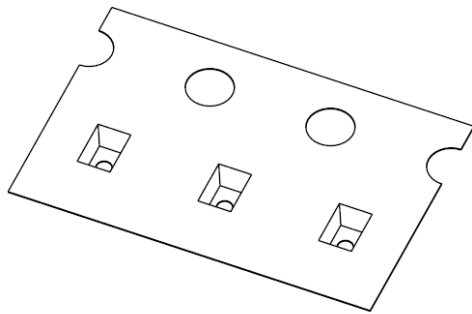
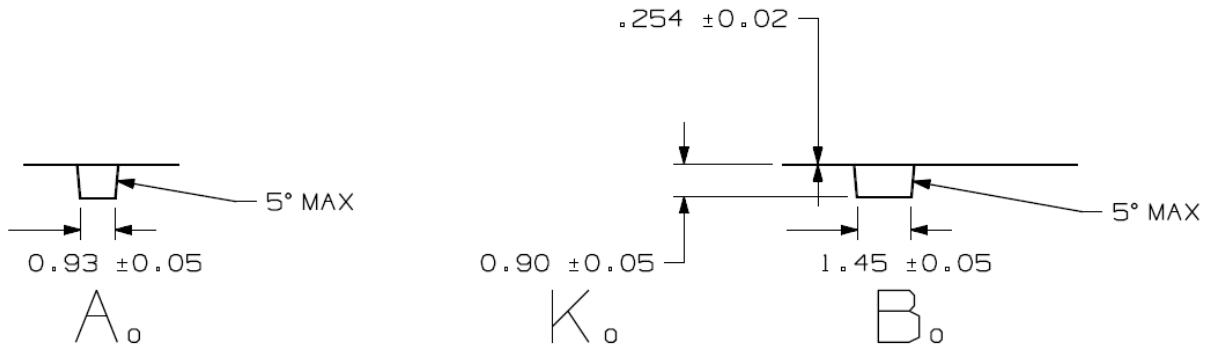
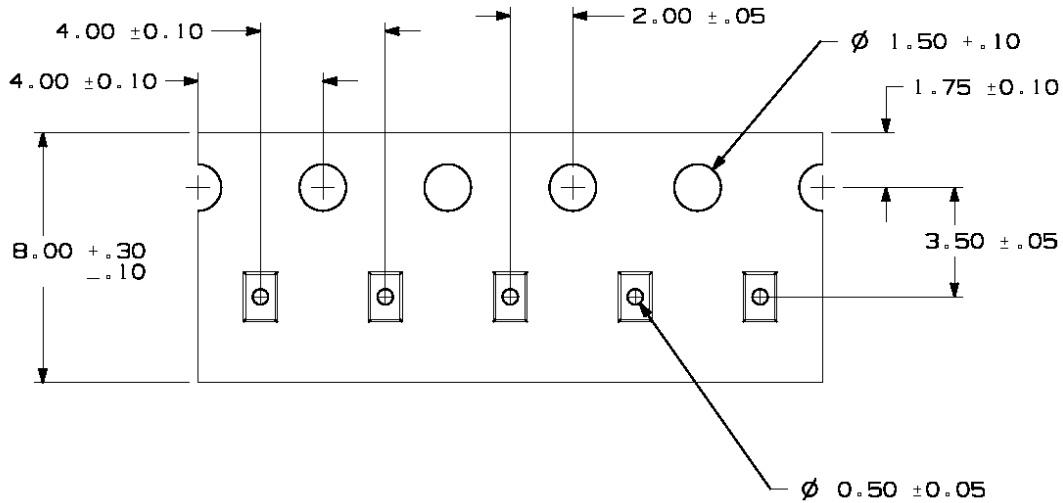


Vendor / Tape Part #	Ao	Bo	Do	D1	E1	F	Ko	Po	P1	T	W
3M US020011	1.27	2.03	1.5	.50	1.75	3.5	1.09	4.0	4.0	.254	8.0

\*Note: All dimensions in millimeters

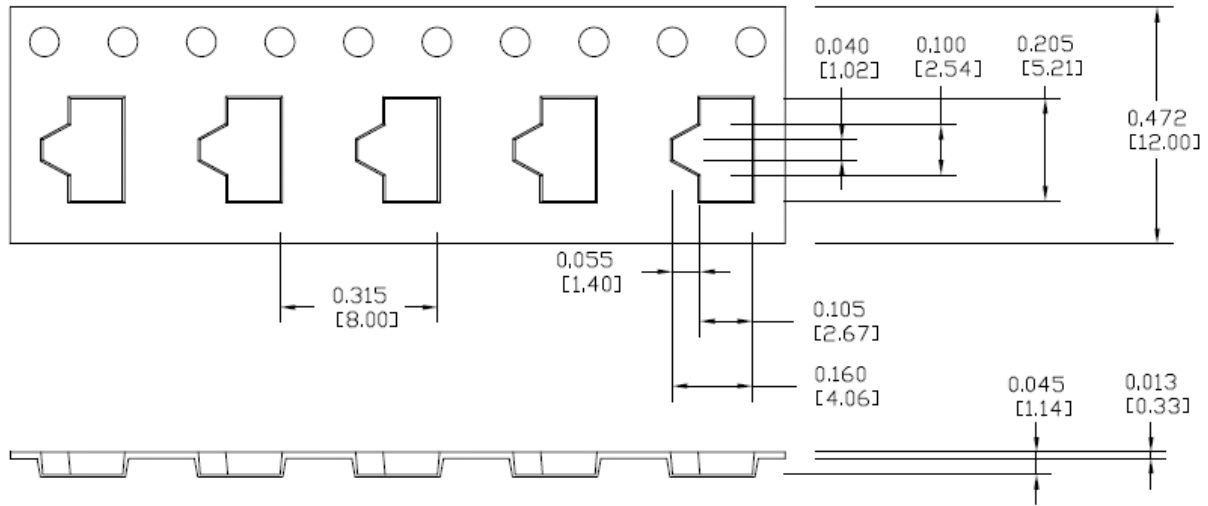
Size <b>A</b>	Dwg. No. XA20053B	Rev C	DO NOT SCALE DRAWING	Sheet 8 of 18	
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# 0503



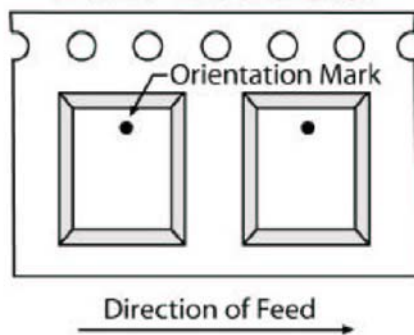
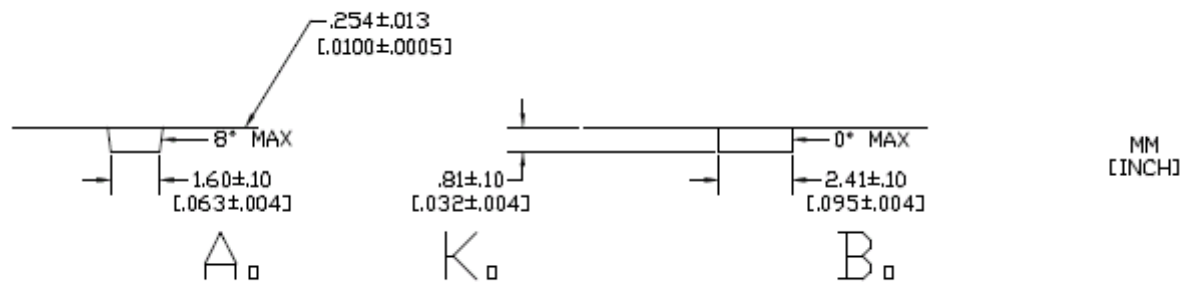
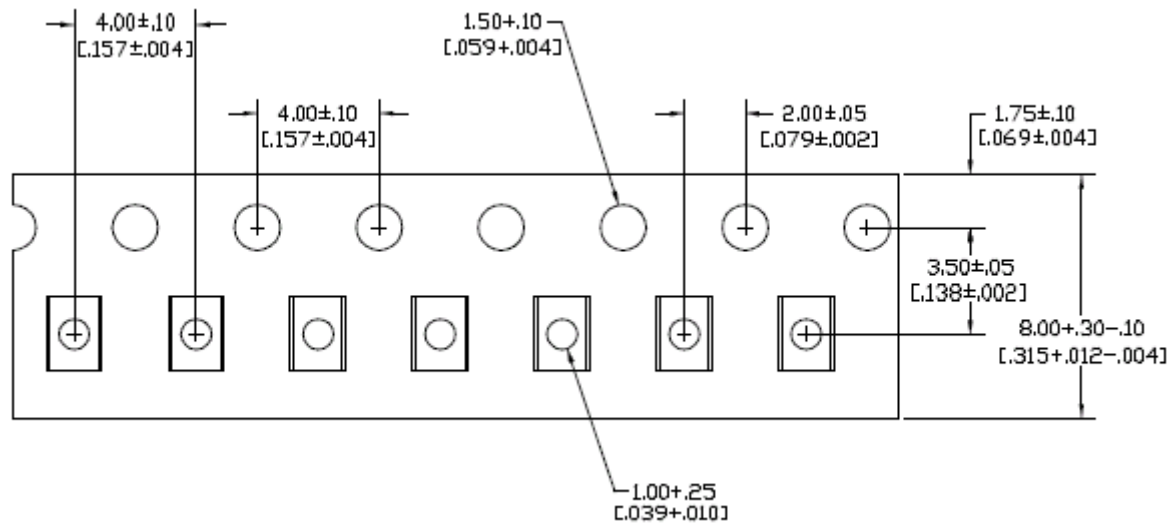
Size <b>A</b>	Dwg. No. XA20053B	Rev C	DO NOT SCALE DRAWING	Sheet 9 of 18	<b>AEROFLEX</b> METELICS
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# E50



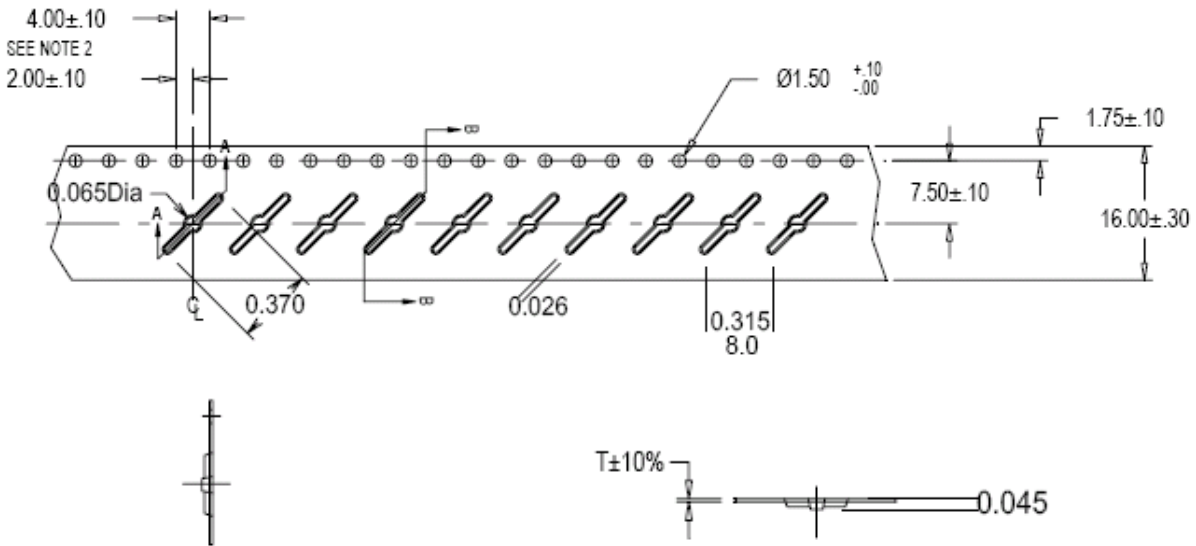
Size <b>A</b>	Dwg. No. XA20053B	Rev C	DO NOT SCALE DRAWING	Sheet 10 of 18	<b>AEROFLEX</b> METELICS
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# 0805(P)



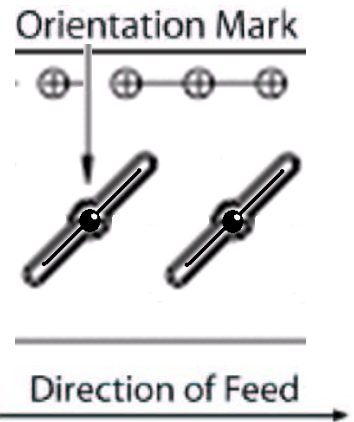
Size <b>A</b>	Dwg. No. XA20053B	Rev C	DO NOT SCALE DRAWING	Sheet 11 of 18	<b>AEROFLEX</b> METELICS
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# E25R



SECTION B-B

SECTION A-A

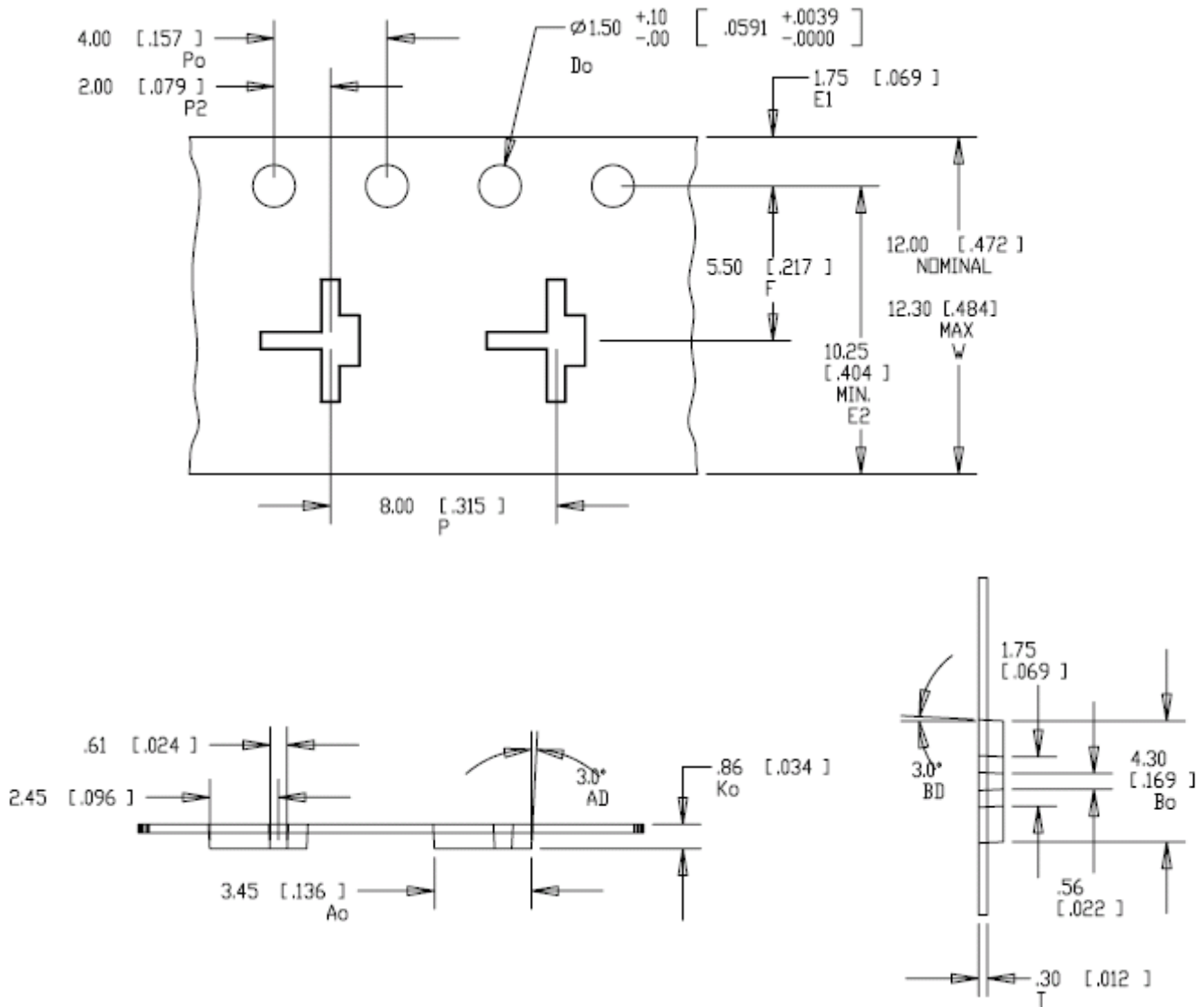


**NOTES:**

1. 10 SPROCKET HOLE PITCH CUMULATIVE TOLERANCE  $\pm 0.2\text{mm}$ .
2. CAMBER IN COMPLIANCE WITH EIA 481.
3. POCKET POSITION RELATIVE TO SPROCKET HOLE MEASURED AS TRUE POSITION OF POCKET, NOT POCKET HOLE.

Size <b>A</b>	Dwg. No. XA20053B	Rev C	DO NOT SCALE DRAWING	Sheet 12 of 18	<b>AEROFLEX</b> METELICS
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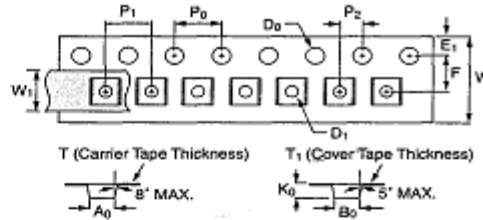
# E35SM



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### Tape Dimensions



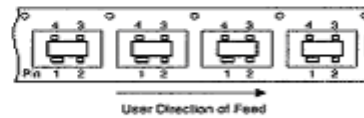
Description	Symbol	SOD-323	SOT-23	SOT-143
<b>Cavity</b>				
Length	$A_0$	1.45±0.10	3.02±0.10	3.20±0.10
Width	$B_0$	3.20±0.10	2.18±0.10	2.70±0.10
Depth	$K_0$	1.35±0.10	1.27±0.10	1.35±0.10
Pitch	$P_1$	4.00±0.10	4.00±0.10	4.00±0.10
Bottom Hole Diameter	$D_1$	1.00±0.10	1.00±0.10	1.00±0.10
<b>Perforation</b>				
Diameter	$D_0$	1.50±0.10	1.55±0.05	1.50±0.10
Pitch	$P_0$	4.00±0.10	4.00±0.10	4.00±0.10
Position	$E_1$	1.75±0.10	1.75±0.10	1.75±0.10
<b>Carrier Tape</b>				
Width	$W$	8.00±0.20	8.00±0.30	8.00±0.30
Thickness	$T$	0.254±0.013	0.255±0.013	0.210±0.03
<b>Cover Tape</b>				
Width	$W_1$	5.40±0.10	5.40±0.10	5.40±0.10
Tape Thickness	$T_1$	0.062±0.01	0.062±0.01	0.062±0.01
<b>Distance</b>				
Cavity to Perforation (Width Direction)	$F$	3.50±0.05	3.50±0.05	3.50±0.05
Cavity to Perforation (Length Direction)	$P_2$	2.00±0.05	2.00±0.05	2.00±0.05

Note: All dimensions are in mm.

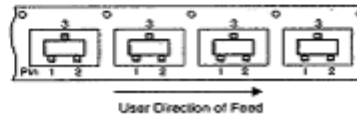
### SOD-323



### SOT-143



### SOT-23



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4.2 ESD Handling

Devices shall be treated as Class 0 ESD sensitive devices rated in accordance with MIL-STD-883, Method 3015 and handled in accordance with JESD-625.


4.3 Taping

Devices shall be taped in accordance with EIA-481. Different manufacturing lots shall not be mixed on one reel unless specifically called out in the purchase order. Specific quantities of devices per reel will be called out in the purchase order. Table 1 indicates the maximum quantity of each device package that can fit on a reel. All devices from a manufacturing lot in excess of the designated reel quantity are to be returned to Aeroflex Metelics in a separate ESD/MSL protective package.

**Table 1**

Package Type	Reel Size (inches)	Max Quantity per Reel*
SOT-89	7	1,000
	13	3,000
SOIC-8	7	1,000
	13	2,500
3030	7	1,000
	13	4,000
6060	7	1,000
	13	2,000
2012	7	3,000
	13	10,000
0503 SOD-323 SOT-143 SOT-23	7	3,000
	13	12,000
E50	13	7,000

\* Specific quantities will be called out on purchase order.

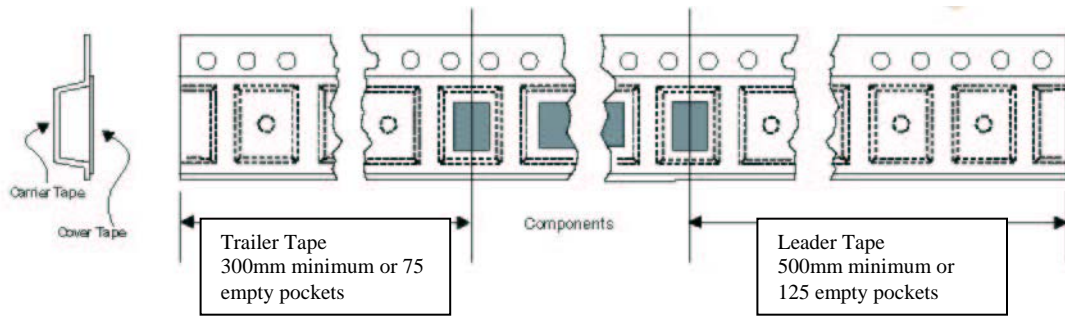
Size <b>A</b>	Dwg. No. XA20053B	Rev C	DO NOT SCALE DRAWING	Sheet 15 of 18	
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4.4

Packaging

Tape Leader and Trailer Configuration:

**Figure 8**



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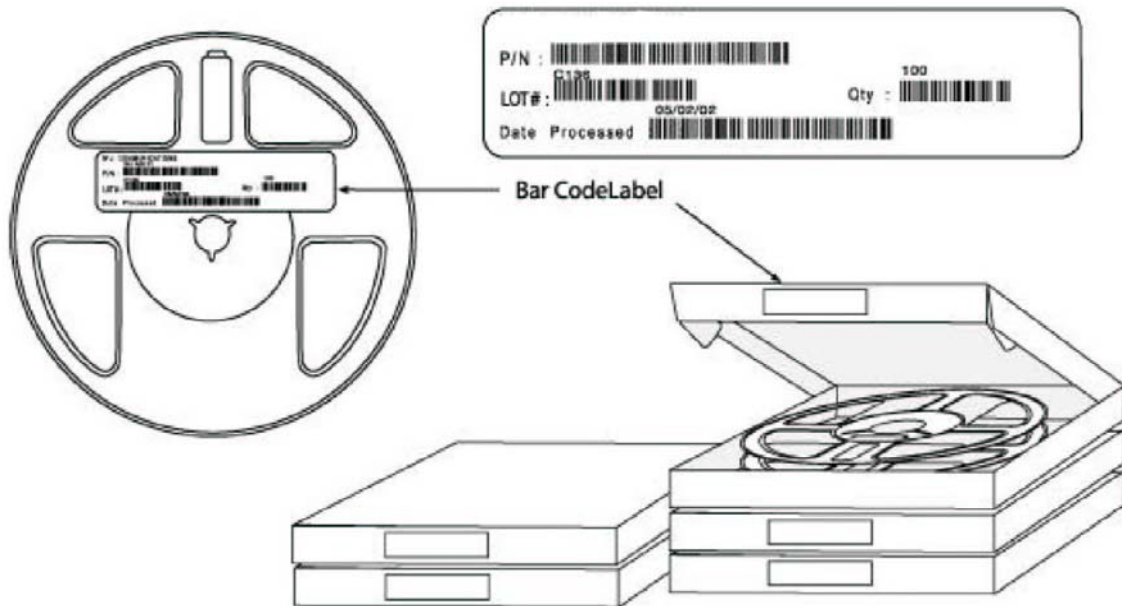
4.5 Package Labeling

4.5.1 Each reel, bag, and reel box shall be barcode labeled in accordance with EIA-481, as appropriate to the device, with the following information, unless otherwise specified:

- Aeroflex Metelics part number
- Aeroflex Metelics manufacturing lot number
- Date for taping
- Quantity per reel

The placement for each barcode label is shown in the Figure 3. An additional barcode label is to be included in each reel box. The required labeling information is obtained from a label affixed to each container (bag, canister, tube, etc.) used to provide the devices to the supplier and also from the purchase order. For the excess taped, non-reeled parts, the barcode label should be placed only on the ESD/MSL protective bag.

**Figure 3**



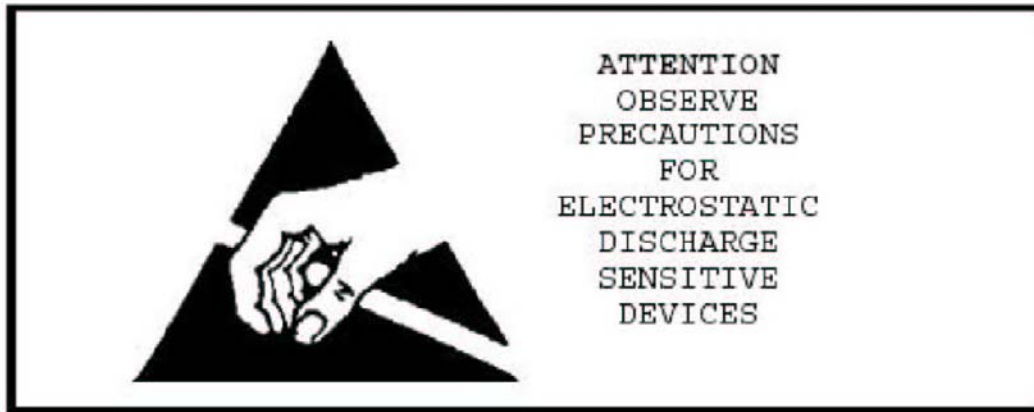
Note: ESD bag for reel in box was omitted for clarity of the labeling instructions.

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4.5.2 “ESD Sensitive” warnings shall be clearly marked on each reel bag and reel box. Either attaching a separate label or marking of the bag and box is acceptable. When using a label, place on the bag or box in such a way as to not interfere with the ability to open the bag or box. Do not use the label to fold over the reel bag or seal the box.

An example of an ESD Sensitive label is shown in Figure 4.

**Figure 4**



Size <b>A</b>	Dwg. No. XA20053B	Rev C	DO NOT SCALE DRAWING	Sheet 18 of 18	The logo for Aeroflex Metelics, featuring the word "AEROFLEX" in a large, bold, sans-serif font above the word "METELICS" in a smaller, blue, sans-serif font.
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