

# Option 11, 12, 21, 22, 31, 32, 1L, 1S, 2L, 2S Standard SMT and Through Hole Lead Bend Options for Subminiature LED Lamps



## Data Sheet

### Description

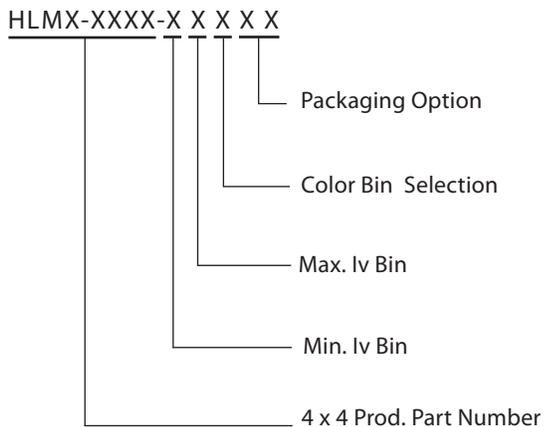
Subminiature lamps (HLMX-PXXX, HLMX-QXXX, HLMP-6XXX, HLMP-70XX) are available with the above standard options. Subminiature Lamps with Options 11, 12, 21, 22, 31, and 32 are suitable for surface mount applications and their leads are formed with gull wing, yoke bend and Z bend respectively. They are available in Tape and Reel (compatible to ANSI/EIA RS-481) or bulk. Options 1L, 1S, 2L, and 2S are right angle lead bends suitable for through hole applications.

### Features

- Surface mount lead configurations
- Right angle lead bend for through hole mounting
- Tape and reel in accordance with ANSI/EIA RS-481 specifications

### Ordering Information

To order Subminiature Lamps packaged with these standard options, include the appropriate option code along with the device catalog part number. Example: to order the HLMP-6300-F00xx with Option 11 gull wing leads in 12 mm embossed tape on 178mm (7 inch) diameter reels, with 1500 lamps per reel; order as follows: HLMP-6300-F0011. Order quantities must be placed in reel increments only. Orders for partial reels will not be accepted. For additional information, please contact your local Avago Technologies sales office or franchised distributor for assistance.



## Selection Guide

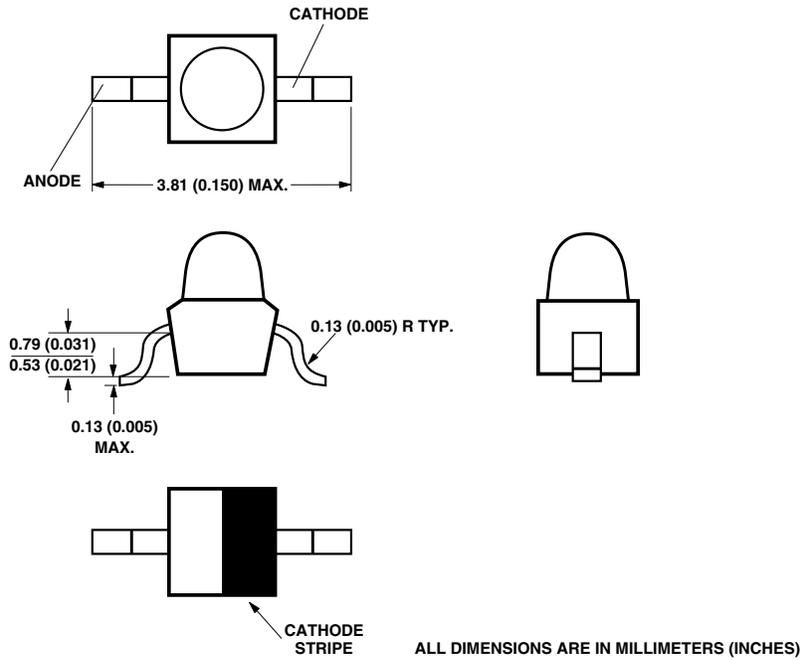
Option Code	Package Configuration		Package Outline Drawing	
11	Gull Wing Leads, 12 mm Tape on 7 in. Dia. Reel, 1500 Parts per Reel <sup>[1]</sup>	Surface Mount Lead Configurations	A, H, K, L	
12	Gull Wing Lead, Bulk Packaging, Quantity of 500 Parts <sup>[2]</sup>			
14	Gull Wing Leads, 12 mm Tape on 13 in. Dia. Reel, 6000 Parts per Reel <sup>[1]</sup>			
21	Yoke Leads, 12 mm Tape on 7 in. Dia. Reel 1500 Parts per Reel <sup>[1]</sup>		B, I, K, L	
22	Yoke Leads, Bulk Packaging, Quantity of 500 Parts <sup>[2]</sup>			
24	Yoke Leads, 12 mm Tape on 13 in. Dia. Reel, 6000 Parts per Reel <sup>[1]</sup>			
31	Z-Bend Leads, 12 mm Tape on 7 in. Dia. Reel 1500 Parts per Reel <sup>[1]</sup>		C, J, K, L	
32	Z-Bend Leads, Bulk Packaging, Quantity of 500 Parts <sup>[2]</sup>			
34	Z-Bend Leads, 12 mm Tape on 13 in. Dia. Reel, 6000 Parts per Reel <sup>[1]</sup>			
1L	2.54 mm (0.100 inch)	Long Leads; 10.4 mm (0.410 in.)	Right Angle Lead	D
1S	Center Lead Spacing	Short Leads; 3.7 mm (0.145 in.)	Bends for Through Hole Mounting	E
2L	5.08 mm (0.200 inch)	Long Leads; 9.2 mm (0.364 in.)		F
2S	Center Lead Spacing	Short Leads; 3.7 mm (0.145 in.)		G

### Notes:

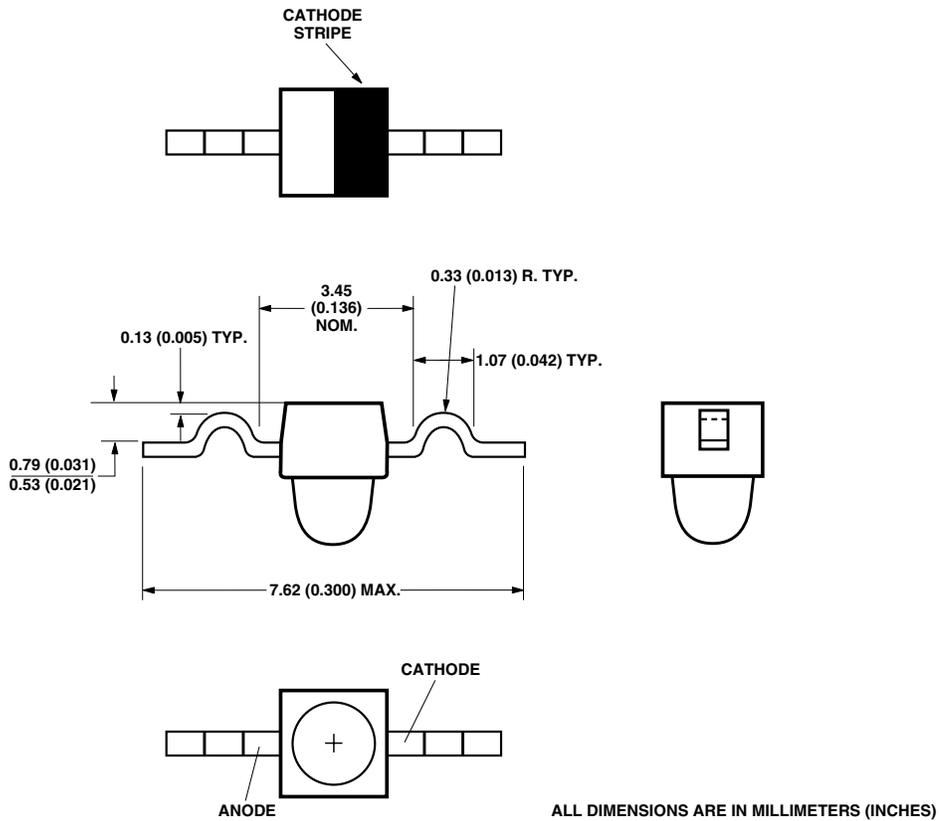
1. SMT lamps are supplied in 12 mm embossed carrier tape. Minimum order is for one full reel, either 7 inch or 13 inch. All other order quantities must be in reel increments only. Orders for partial reels are not accepted.
2. Vapor barrier bags are used for bulk packaging.

## Package Dimensions, Lead Bend Options

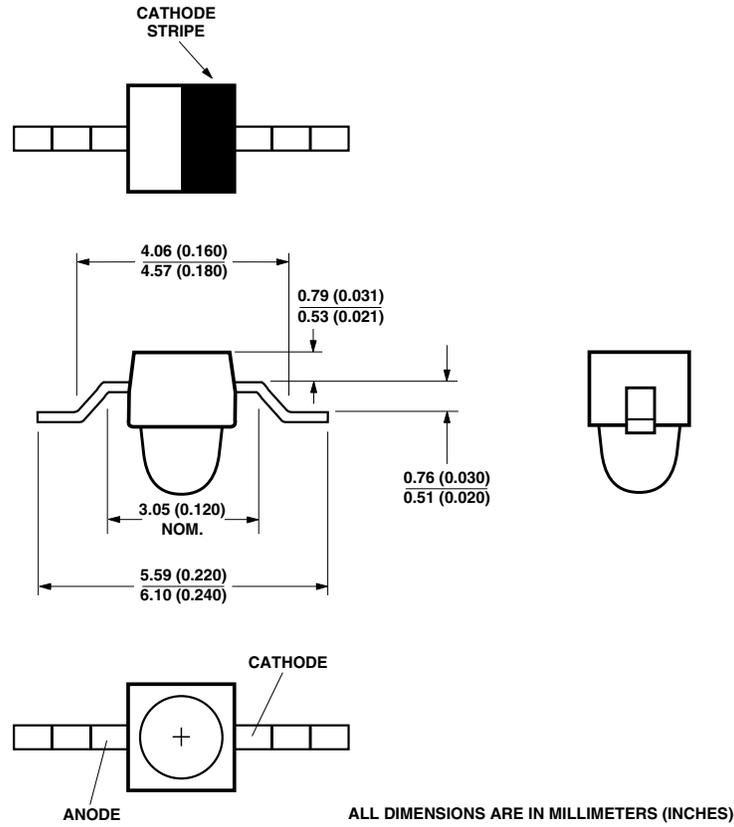
### (A) Gull Wing Lead, Option 11, 12, and 14



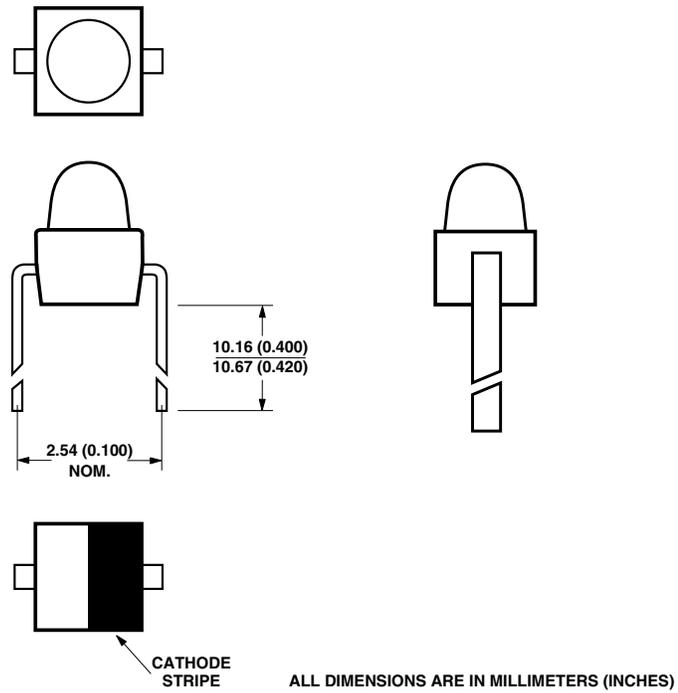
### (B) "Yoke" Lead, Options 21, 22, and 24



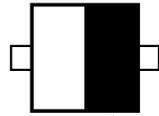
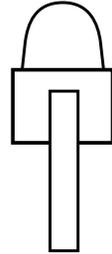
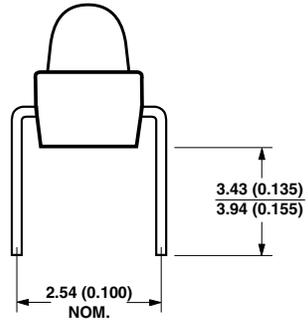
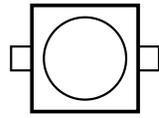
**(C) Z-Bend Lead, Option 31, 32, and 34**



**(D) Rt. Angle Bend Option 1L**



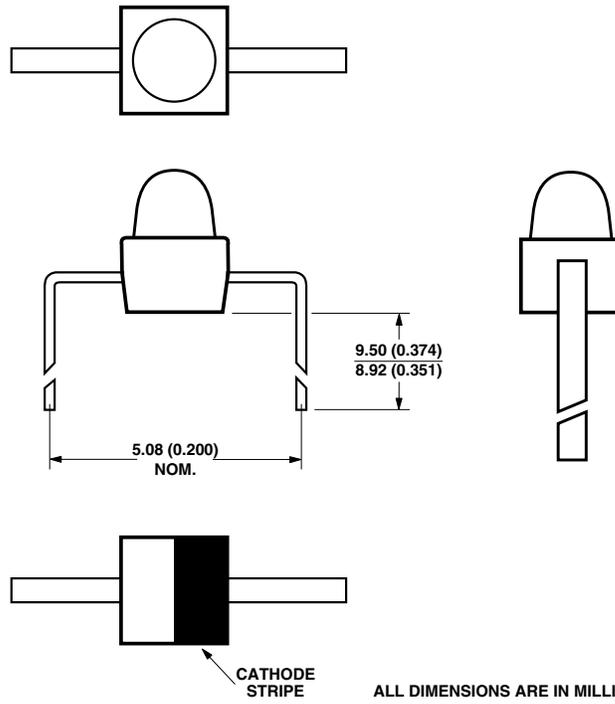
(E) Rt. Angle Bend Option 1S



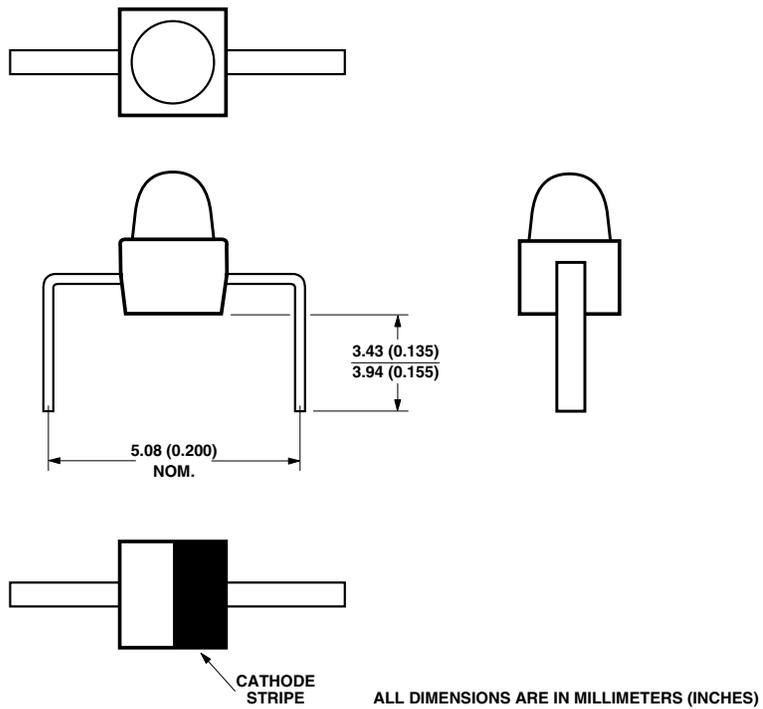
CATHODE  
STRIPE

ALL DIMENSIONS ARE IN MILLIMETERS (INCHES)

**(F) Rt. Angle Bend Option 2L**

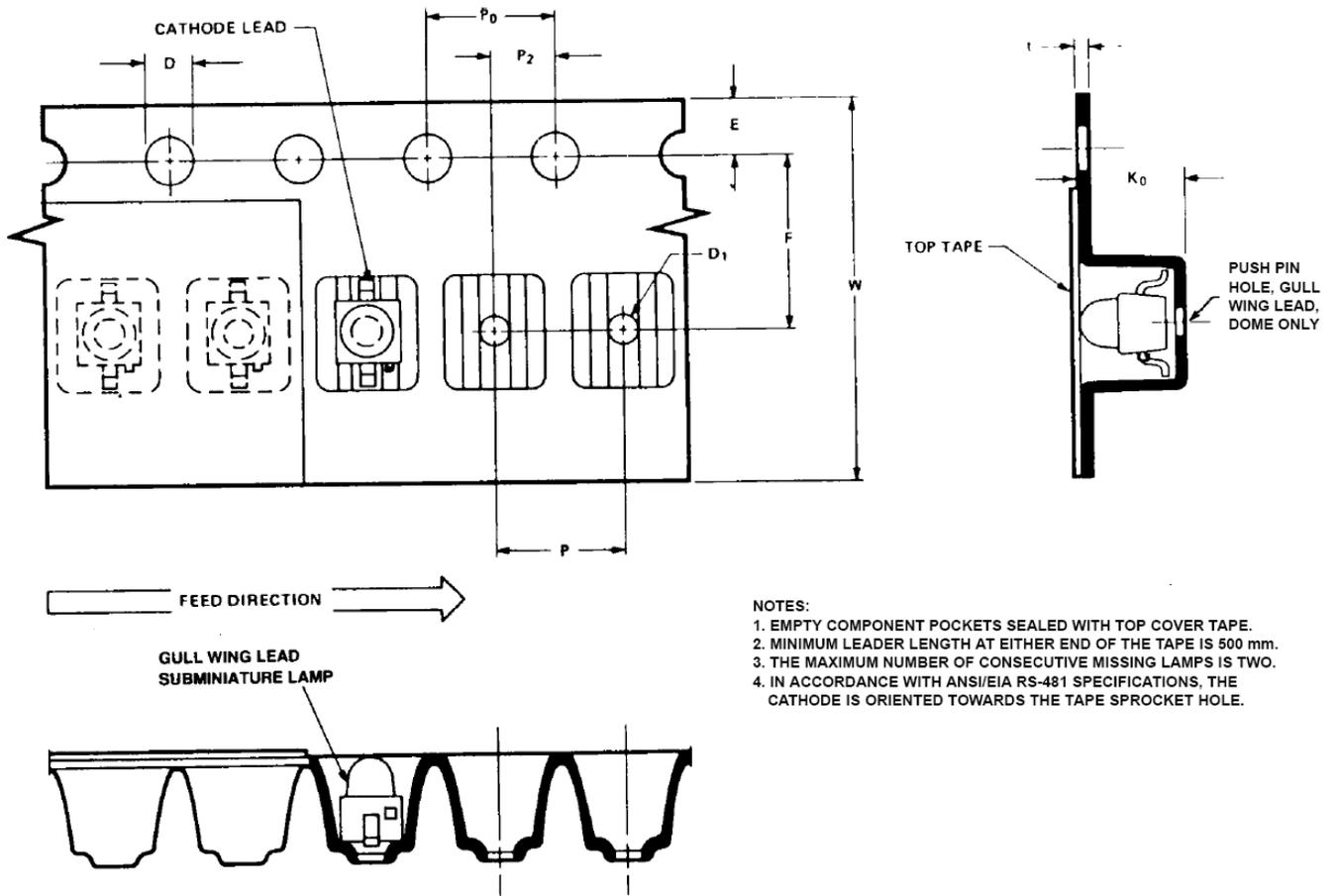


**(G) Rt. Angle Bend Option 2S**

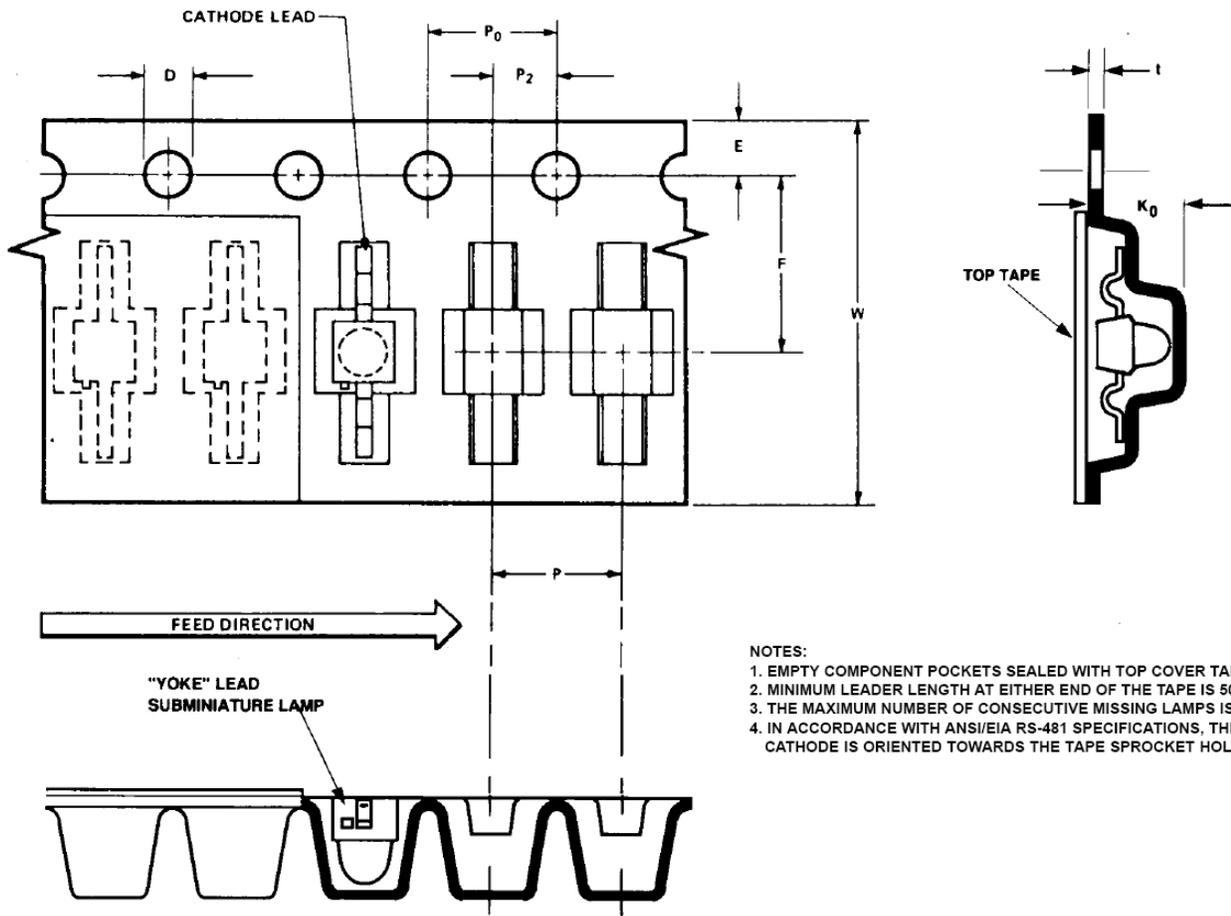


# Package Dimensions: Surface Mount Tape and Reel Options

(H) 12 mm Tape and Reel, Gull Wing Lead



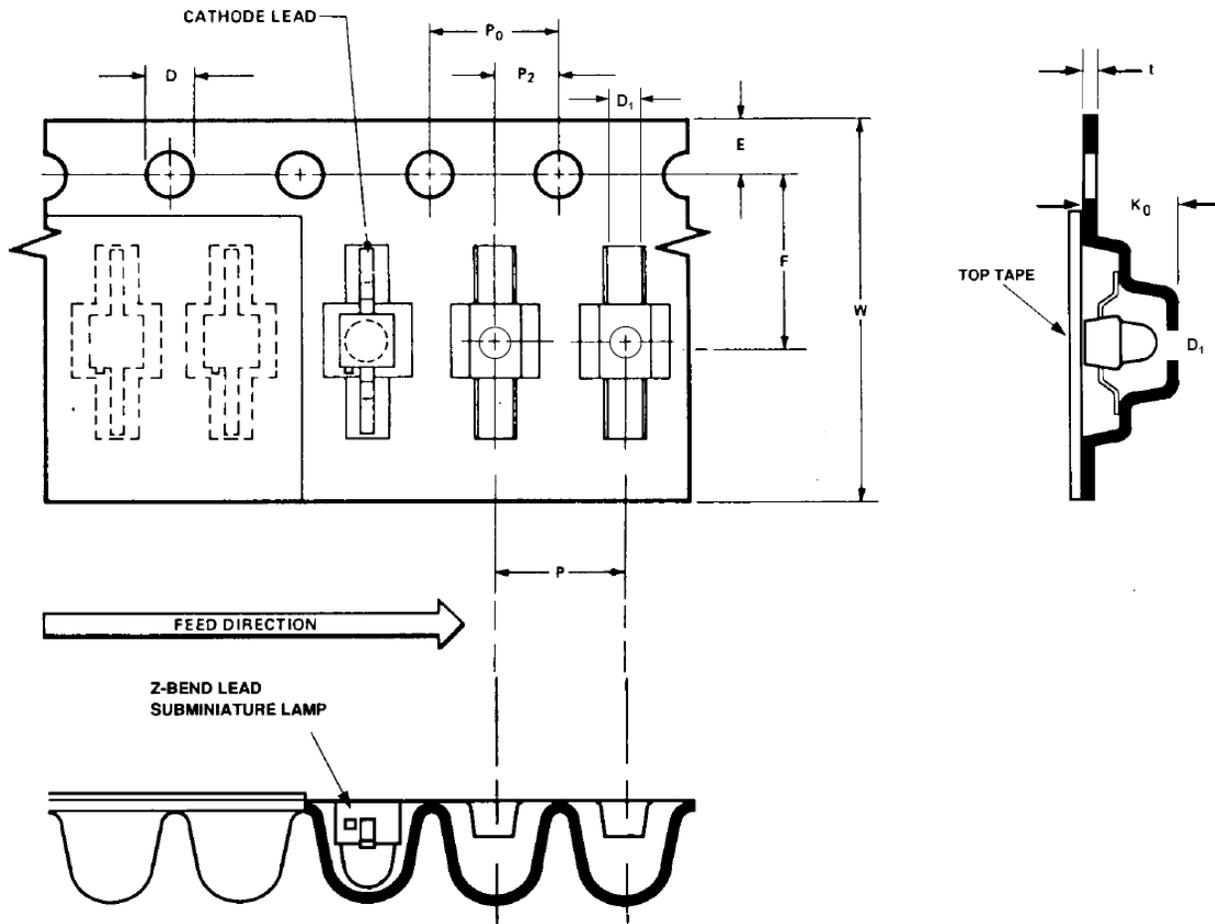
(I) 12 mm Tape and Reel, "Yoke" Lead



NOTES:

1. EMPTY COMPONENT POCKETS SEALED WITH TOP COVER TAPE.
2. MINIMUM LEADER LENGTH AT EITHER END OF THE TAPE IS 500 mm.
3. THE MAXIMUM NUMBER OF CONSECUTIVE MISSING LAMPS IS TWO.
4. IN ACCORDANCE WITH ANSI/EIA RS-481 SPECIFICATIONS, THE CATHODE IS ORIENTED TOWARDS THE TAPE SPROCKET HOLE.

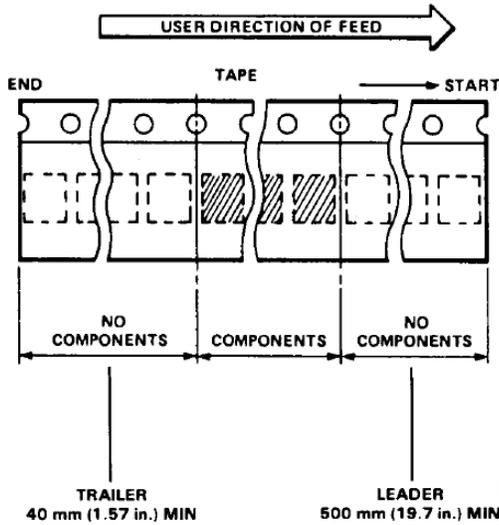
**(J) 12 mm Tape and Reel, Z-Bend Lead**



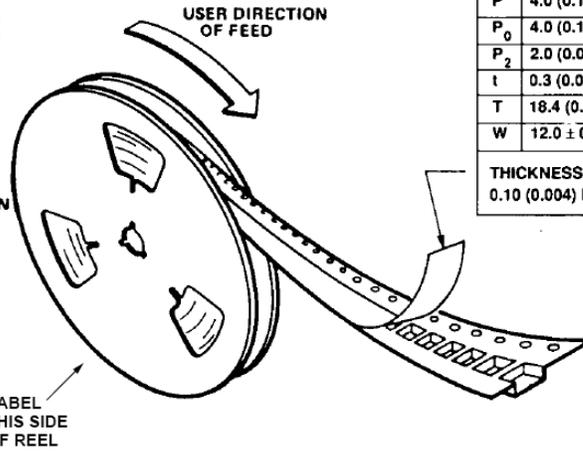
	Reel Dimensions Per ANSI/EIA Standard RS-481.	All Dimensions Are in Millimeters (Inches).
	7 inch Reel	13 Inch Reel
A	178.0 ± 2.0 (7.0 ± 0.08) Dia.	330 (12.9) Dia. Max.
C	13.0 (0.512) Dia. Typ.	13.0 (0.512) Dia. Typ.
N	50.0 (1.97) Min.	100.0 (3.93) Min.
T	18.4 (0.72) mMax.	18.4 (0.72) Max.

	Embossed Carrier Tape Dimensions Per ANSI/EIA Standard RS-481.	All Dimensions Are in Millimeters (Inches).			
	Gull Wing Dome	Gull Wing Flat Top	Yoke Dome	Z-Bend Dome	Yoke and Z-Bend Flat Top
D	1.55 (0.061 ± 0.002) Dia.	1.55 (0.061 ± 0.002) Dia.	1.55 (0.061 ± 0.002) Dia. (0.059 + 0.004) Dia.	1.50 + 0.10 (0.059 + 0.004) Dia.	1.50 + 0.10
D <sub>1</sub>	1.0 (0.039) Dia. Min.	N/A (No Push Pin Hole)	N/A (No Push Pin Hole)	1.50 + 0.25 (0.059 + 0.010)	N/A (No Push Pin Hole)
D <sub>2</sub>	20.2 (0.795) Dia. Min.	20.2 (0.795) Dia. Min.	20.2 (0.795) Dia. Min.	20.2 (0.795) Dia. Min.	20.2 (0.795) Dia. Min.
E	1.75 ± 0.1 (0.069)	1.75 ± 0.1 (0.069)	1.75 ± 0.1 (0.069)	1.75 ± 0.1 (0.069)	1.75 ± 0.1 (0.069)
F			5.50 ± 0.05 (0.217 ± 0.002)		
K <sub>0</sub>	3.05 ± 0.1 (0.120) Typ.	2.54 ± 0.1 (0.100) Typ.	3.05 ± 0.1 (0.120) Typ.	2.97 ± 0.1 (0.117) Typ.	3.05 ± 0.1 (0.120) Typ.
P	4.0 (0.157) Typ.	4.0 (0.157) Typ.	4.0 (0.157) Typ.	4.0 (0.157) Typ.	4.0 (0.157) Typ.
P <sub>0</sub>	4.0 (0.157) Typ.	4.0 (0.157) Typ.	4.0 (0.157) Typ.	4.0 (0.157) Typ.	4.0 (0.157) Typ.
P <sub>2</sub>	2.0 (0.079 ± 0.002)	2.0 (0.079 ± 0.002)	2.0 (0.079 ± 0.002)	2.0 (0.079 ± 0.002)	2.0 (0.079 ± 0.002)
t	0.3 (0.012) Typ.	0.3 (0.012) Typ.	0.3 (0.012) Typ.	0.305 ± 0.013 (0.0120 ± 0.0005)	0.305 ± 0.013 (0.0120 ± 0.0005)
W	12.0 ± 0.3 (0.472 ± 0.012)	12.0 ± 0.3 (0.472 ± 0.012)	12.0 ± 0.3 (0.472 ± 0.012)	12.0 ± 0.3 (0.472 ± 0.012)	12.0 ± 0.3 (0.472 ± 0.012)

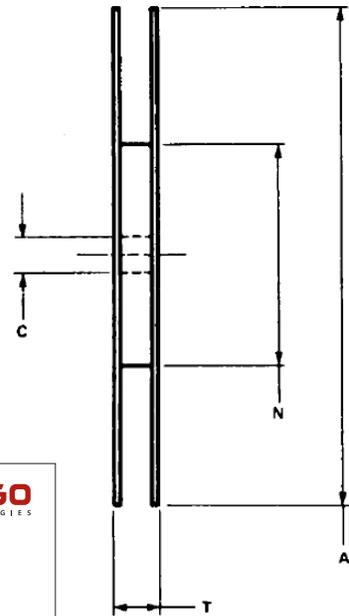
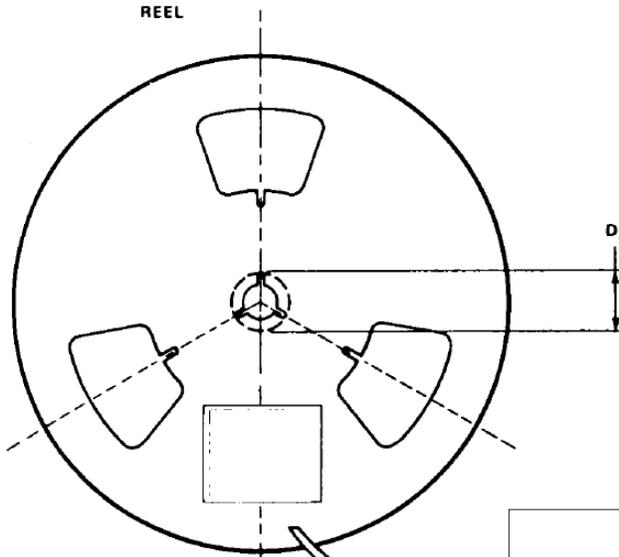
(K) 12 mm Tape and Reel



TOLERANCES (UNLESS OTHERWISE SPECIFIED):  
 .X ± .1; .XX ± .05 (.XXX ± .004)



DIMENSIONS PER ANSI/EIA STANDARD RS-481. ALL DIMENSIONS ARE IN MILLIMETRES (INCHES).	
A	178.0 ± 2.0 (7.0 ± 0.08) DIA.
C	13.0 (0.512) DIA. TYP.
D	1.55 (0.061 ± 0.002) DIA.
D <sub>1</sub>	1.0 (0.039) DIA. MIN.
D <sub>2</sub>	20.2 (0.795) DIA. MIN.
E	1.75 ± 0.1 (0.069)
F	5.50 (0.127 ± 0.002)
K <sub>0</sub>	3.05 ± 0.1 (0.120) TYP.
N	50.0 (1.970) MIN.
P	4.0 (0.157) TYP.
P <sub>0</sub>	4.0 (0.157) TYP.
P <sub>2</sub>	2.0 (0.079 ± 0.002) TYP.
t	0.3 (0.012) TYP.
T	18.4 (0.72) MAX.
W	12.0 ± 0.3 (0.472 ± 0.012)
THICKNESS OF TOP COVER TAPE 0.10 (0.004) MAX.	



**Avago**  
TECHNOLOGIES

PART: \_\_\_\_\_

LOT NO: \_\_\_\_\_

CUST PART: \_\_\_\_\_

QTY: \_\_\_\_\_

D/C: \_\_\_\_\_

TAPE DATE: \_\_\_\_\_

CAT: \_\_\_\_\_

BIN: \_\_\_\_\_

QA INSP: \_\_\_\_\_

C/O: \_\_\_\_\_

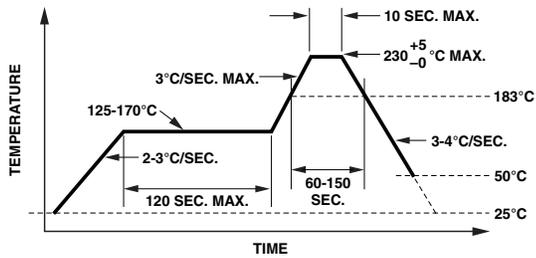
Storage Condition: 5 to 30°C @ 60% RH max.

Baking is required under the following conditions:

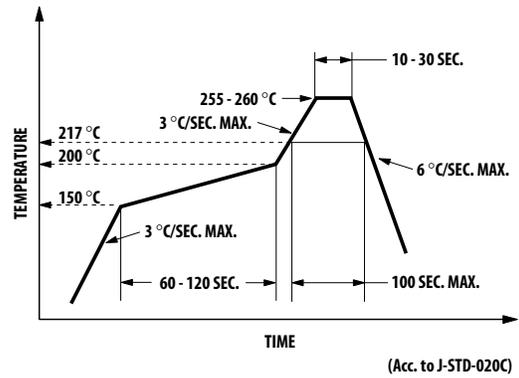
- a) Humidity Indicator Card is >10% when read at 23 ± 5°C.
- b) The pack has been opened for more than 1 week.

Baking recommended condition: 60 ± 5°C for 20 hours.

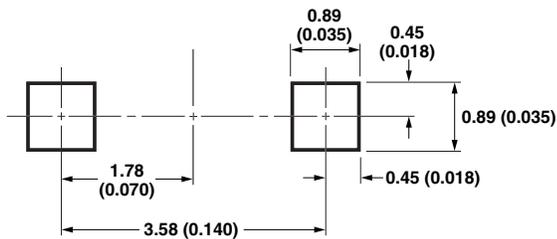
**(L) Recommended Reflow Soldering Profile and Soldering Pad Pattern for SMT Options**



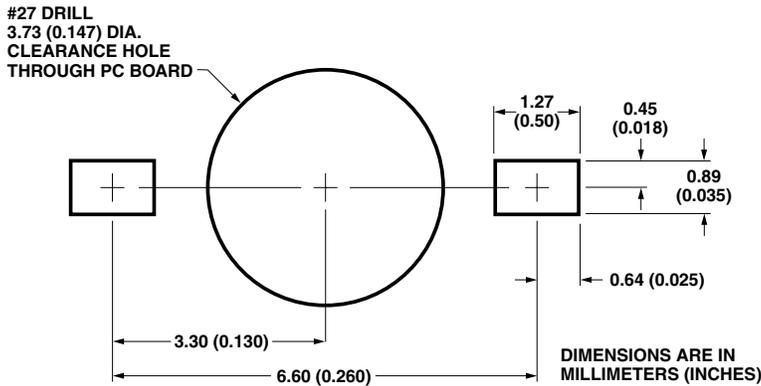
Recommended SnPb reflow soldering profile.  
Wait until device has cooled to room temperature before handling.



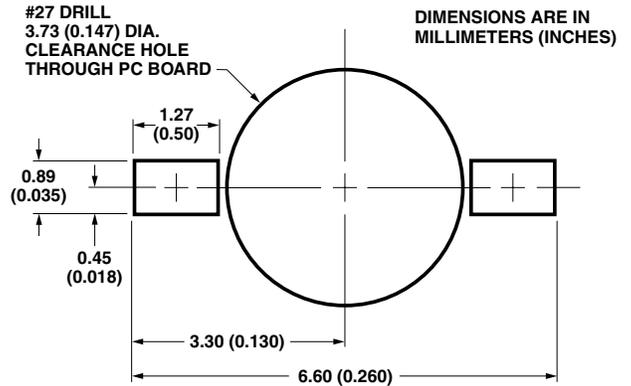
Recommended Pb-free reflow soldering profile.



Recommended soldering pad pattern for gull wing leads 11, 12, and 14.



Recommended soldering pad pattern for yoke leads 21, 22, and 24.



Recommended soldering pad pattern for Z-bend leads 31, 32, and 34.

For product information and a complete list of distributors, please go to our website: [www.avagotech.com](http://www.avagotech.com)

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