

# 500 mW LL-34 Hermetically Sealed Glass Zener Voltage Regulators



## Absolute Maximum Ratings $T_A = 25^\circ\text{C}$ unless otherwise noted

Parameter	Value	Units
Power Dissipation	500	mW
Storage Temperature Range	-65 to +200	$^\circ\text{C}$
Operating Junction Temperature	+200	$^\circ\text{C}$

These ratings are limiting values above which the serviceability of the diode may be impaired.

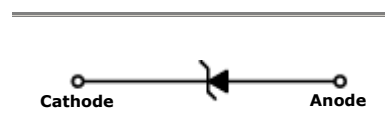
DEVICE MARKING DIAGRAM



Cathode Band Color : Blue

## Specification Features:

- Zener Voltage Range 2.0 to 56 Volts
- LL-34 (Mini-MELF) Package
- Surface Device Type Mounting
- Hermetically Sealed Glass
- Compression Bonded Construction
- All external surfaces are corrosion resistant and leads are readily solderable
- 1<sup>st</sup> band indicates negative polarity



ELECTRICAL SYMBOL

## Electrical Characteristics $T_A = 25^\circ\text{C}$ unless otherwise noted

Device Type	$V_Z @ I_{ZT}$ (Volts) Nominal	$I_{ZT}$ (mA)	$Z_{ZT} @ I_{ZT}$ ( $\Omega$ ) Max	$I_R @ V_R$ ( $\mu\text{A}$ ) Max	$V_R$ (Volts)
TCLLZ2V0	2.0	5	100	120	0.5
TCLLZ2V2	2.2	5	100	120	0.7
TCLLZ2V4	2.4	5	100	120	1
TCLLZ2V7	2.7	5	110	100	1
TCLLZ3V0	3.0	5	120	50	1
TCLLZ3V3	3.3	5	120	20	1
TCLLZ3V6	3.6	5	100	10	1
TCLLZ3V9	3.9	5	100	5	1
TCLLZ4V3	4.3	5	100	5	1
TCLLZ4V7	4.7	5	80	5	1
TCLLZ5V1	5.1	5	80	5	1.5
TCLLZ5V6	5.6	5	60	5	2.5
TCLLZ6V2	6.2	5	60	5	3
TCLLZ6V8	6.8	5	20	2	3.5
TCLLZ7V5	7.5	5	20	0.5	4
TCLLZ8V2	8.2	5	20	0.5	5
TCLLZ9V1	9.1	5	25	0.5	6
TCLLZ10V	10	5	30	0.2	7
TCLLZ11V	11	5	30	0.2	8
TCLLZ12V	12	5	30	0.2	9
TCLLZ13V	13	5	35	0.2	10
TCLLZ15V	15	5	40	0.2	11

**Electrical Characteristics**  $T_A = 25^\circ\text{C}$  unless otherwise noted

Device Type	$V_Z @ I_{ZT}$ (Volts) Nominal	$I_{ZT}$ (mA)	$Z_{ZT} @ I_{ZT}$ ( $\Omega$ ) Max	$I_R @ V_R$ ( $\mu\text{A}$ ) Max	$V_R$ (Volts)
TC16V	16	5	40	0.2	12
TC18V	18	5	45	0.2	13
TC20V	20	5	45	0.2	15
TC22V	22	5	30	0.2	17
TC24V	24	5	35	0.2	19
TC27V	27	5	45	0.2	21
TC30V	30	5	55	0.2	23
TC33V	33	5	65	0.2	25
TC36V	36	5	75	0.2	27
TC39V	39	5	85	0.2	30
TC43V	43	5	90	0.2	33
TC47V	47	5	90	0.2	36
TC51V	51	5	110	0.2	39
TC56V	56	5	110	0.2	43

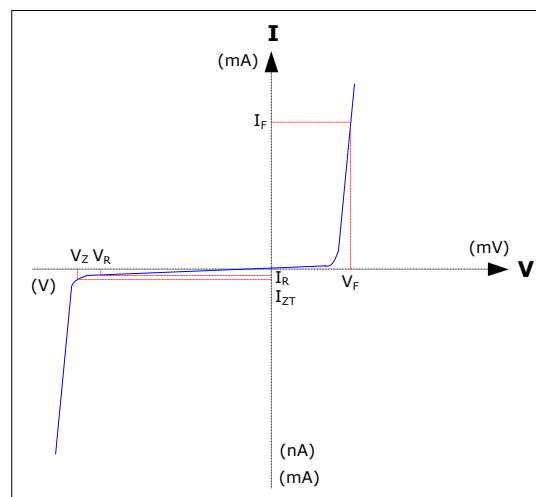
 $V_F$  Forward Voltage = 1.2 V Maximum @  $I_F = 200$  mA for all types

**Notes:**

- The type numbers listed have zener voltage as shown and have a standard tolerance on the nominal zener voltage of 5%.
- For detailed information on price, availability and delivery of nominal zener voltages between the voltages shown and tighter voltage tolerances, contact your nearest Tak Cheong Electronics representative.
- The zener impedance is derived from the 60-cycle ac voltage, which results when an ac current having an rms value equal to 10% of the dc zener current ( $I_{ZT}$  or  $I_{ZK}$ ) is superimposed to  $I_{ZT}$  or  $I_{ZK}$ .

**Electrical Symbol Definition**

Symbol	Parameter
$V_Z$	Reverse Zener Voltage @ $I_{ZT}$
$I_{ZT}$	Reverse Current
$Z_{ZT}$	Maximum Zener Impedance @ $I_{ZT}$
$I_{ZK}$	Reverse Current
$Z_{ZK}$	Maximum Zener Impedance @ $I_{ZK}$
$I_R$	Reverse Leakage Current @ $V_R$
$V_R$	Breakdown Voltage
$I_F$	Forward Current
$V_F$	Forward Voltage @ $I_F$

**Typical Characteristics**

**Ordering Information**

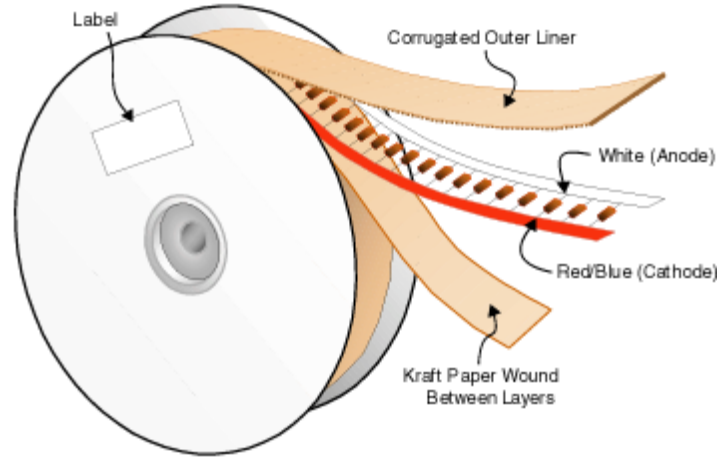
Device	Package	Quantity
TCxxx	Bulk	10,000
TCxxx.TB	Tape and Ammo	5,000
TCxxx.TR	Tape and Reel	10,000
TCxxx	Others (...contact Tak Cheong sales representatives)	

**Axial-Lead Tape Packaging Standards**

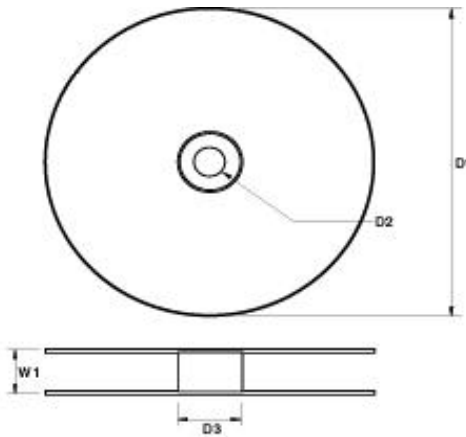
This axial-lead component's packaging requirements use in automatic testing and assembly equipment. And this standard practices for lead-tape packaging of axial-lead components meets the requirements of EIA Standard RS-296-D "Lead-taping of Components on Axial Lead Configuration for Automatic Insertion".

**Tape & Reel Packaging Information**

**Tape & Reel Outline**



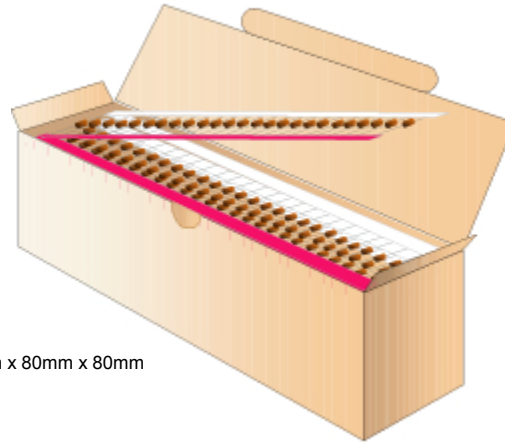
**Reel Dimensions**



DIM	Millimeters
D1	356
D2	30
D3	84
W1	77.5

**Quantity Per Reel**

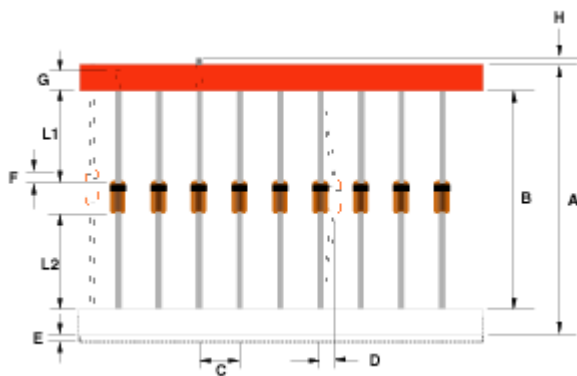
PKG Type	Quantity Per Reel
DO-35	10,000

**Tape & Ammo Packaging Information**
**Tape & Ammo Outline**


250mm x 80mm x 80mm

**Quantity Per Ammo Box**

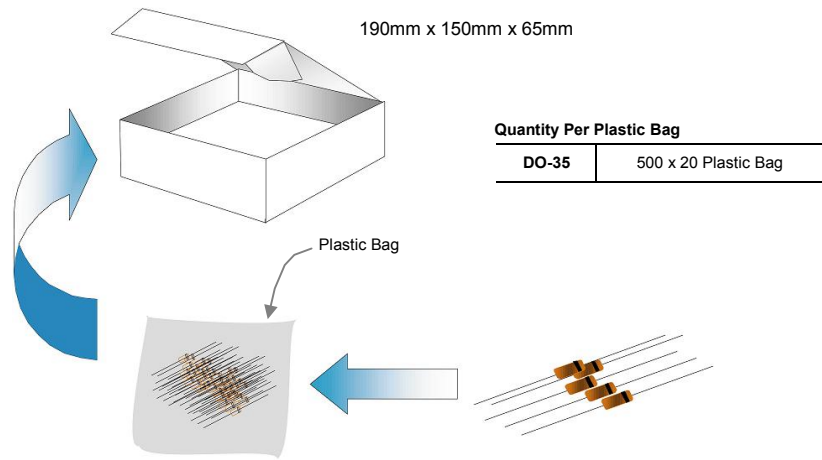
PKG Type	Quantity Per Box
DO-35	5,000

**Taping Dimensions**


Description	Millimeters	
	Standard Width	52
Tape Spacing (B)	52 ± 0.69	26 +0.5 / -0
Component Pitch (C)	5.08 ± 0.4	5.08 ± 0.4
Untaped Lead (L1 – L2)	± 0.69	± 0.69
Glass Offset (F)	± 0.69	± 0.69
Bent (D)	1.2 Max	1.2 Max
Tape Width (G)	6.138 ± 0.576	6.138 ± 0.576
Tape Mismatch (E)	0.55 Max	0.55 Max
Taped Lead (G)	3.2 Min	3.2 Min
Lead Beyond Tape (H)	0	0

**Bulk Packaging Information**

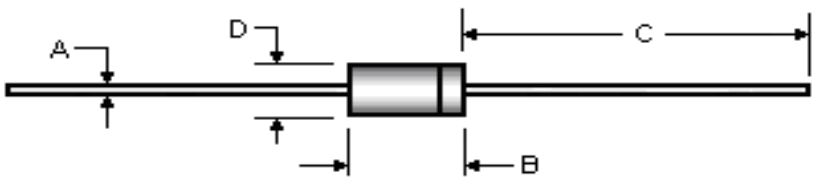
**Bulk Outline**



**Quantity Per Box**

PKG Type	Quantity Per Box
DO-35	10,000

**Package Outline**

Package	Case Outline				
DO-35					
	<b>DO-35</b>				
	<b>DIM</b>	<b>Millimeters</b>		<b>Inches</b>	
		Min	Max	Min	Max
	<b>A</b>	0.46	0.55	0.018	0.022
	<b>B</b>	3.05	5.08	0.120	0.200
<b>C</b>	25.40	38.10	1.000	1.500	
<b>D</b>	1.53	2.28	0.060	0.090	

**Notes:**

1. All dimensions are within JEDEC standard.
2. DO35 polarity denoted by cathode band.

**Electrical Characteristics**  $T_A = 25^\circ\text{C}$  unless otherwise noted

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TCLLZ22V	22	5	30	0.2	17
TCLLZ24V	24	5	35	0.2	19
TCLLZ27V	27	5	45	0.2	21
TCLLZ30V	30	5	55	0.2	23
TCLLZ33V	33	5	65	0.2	25
TCLLZ36V	36	5	75	0.2	27
TCLLZ39V	39	5	85	0.2	30
TCLLZ43V	43	5	90	0.2	33
TCLLZ47V	47	5	90	0.2	36
TCLLZ51V	51	5	110	0.2	39
TCLLZ56V	56	5	110	0.2	43

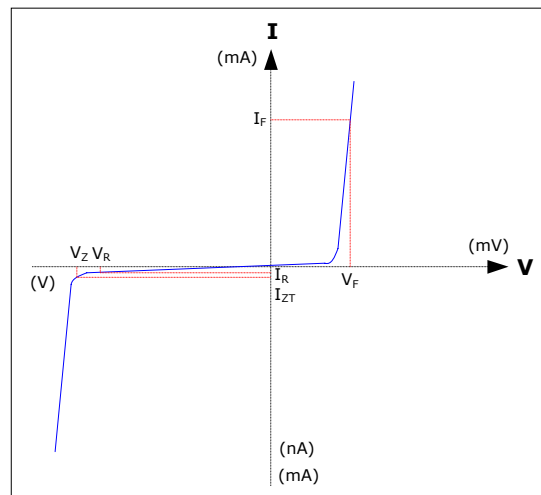
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$Z_{ZK}$	Maximum Zener Impedance @ $I_{ZK}$
$I_R$	Reverse Leakage Current @ $V_R$
$V_R$	Breakdown Voltage
$I_F$	Forward Current
$V_F$	Forward Voltage @ $I_F$

**Typical Characteristics**

**Ordering Information**

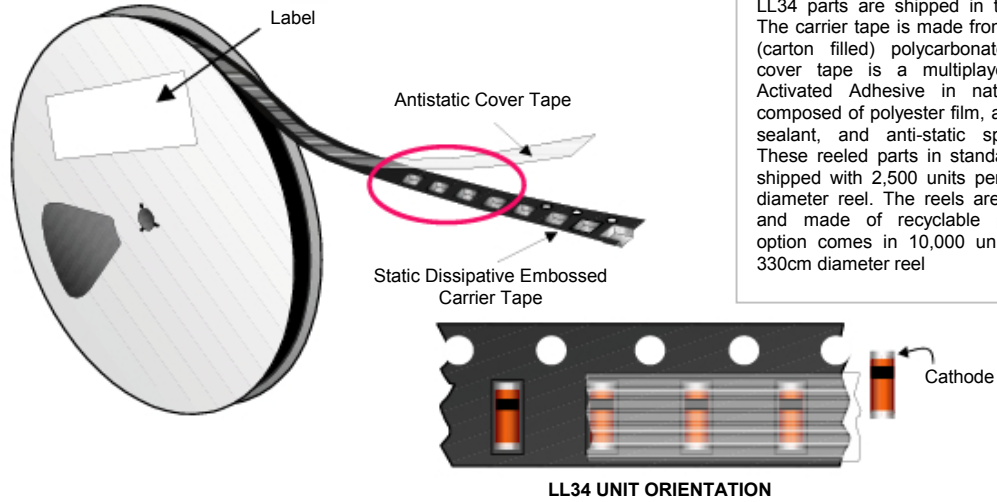
Pack Option	Package	Quantity
7" Reel	Tape and Reel	2500
13" Reel	Tape and Reel	10,000
Others	(...contact Tak Cheong sales representatives)	

**LL34 (Mini-MELF) Tape Packaging Standards**

This standard practices for surface-mount tape packaging of leadless (Mini-MELF) components meets the requirements of EIA Standard RS-481-A.

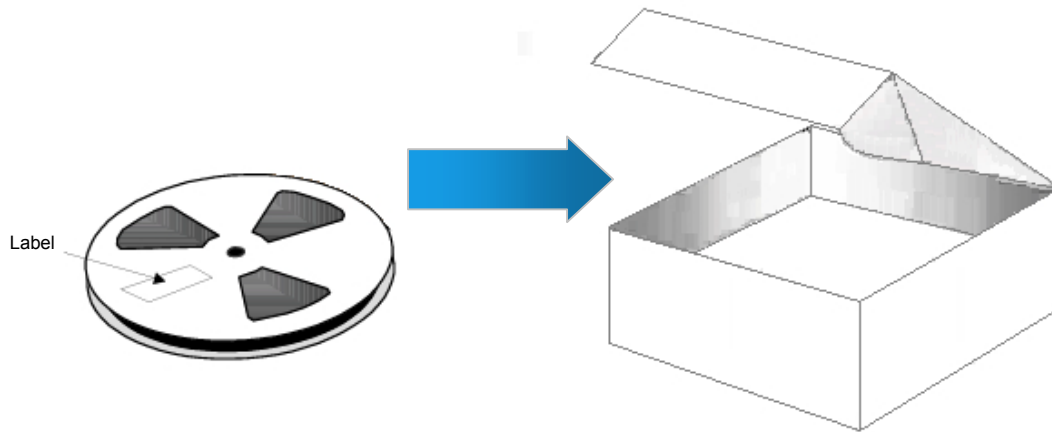
**LL-34 (Mini-MELF) Tape & Reel Packaging Information**

**LL-34 Packaging Outline**

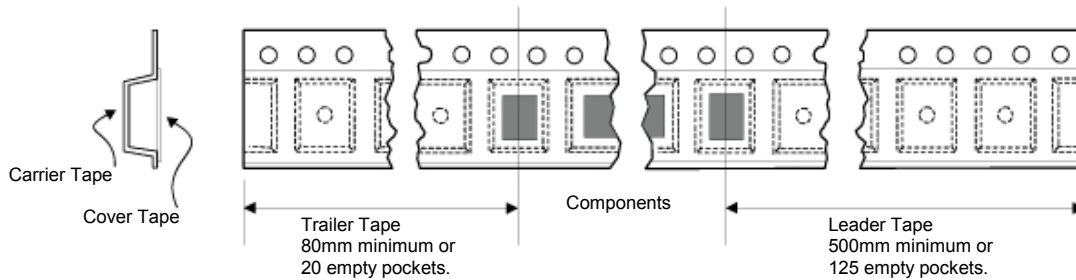


**Packaging Description:**

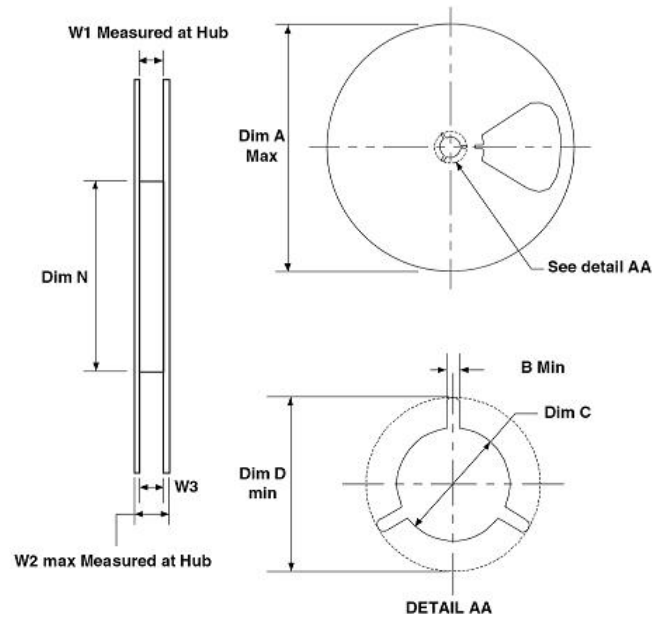
LL34 parts are shipped in tape and reel. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multiplayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 2,500 units per 7" or 178cm diameter reel. The reels are blue in color and made of recyclable plastic. Other option comes in 10,000 units per 13" or 330cm diameter reel



**LL-34 Leader and Trailer**





**LL-34 (Mini-MELF) Tape & Reel Packaging Information**
**LL-34 Reel Outline**


Dimensions are in millimeters

Tape Size	QTY Option	Dim A	Dim B	Dim C	Dim D	Dim N	W1	W2	W3
8mm	2,500	178	1.5	13	20.2	55	8.4	14.4	7.9 – 10.9
	10,000	330	1.5	13	20.2	100	8.4	14.4	7.9 – 10.9

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