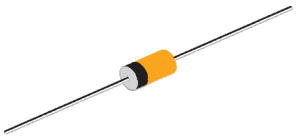
1 W Silicon Planar Power Zener Diodes

1N4727A ~ 1N4761A



DO-41

DO-41 Axial
Leaded Package
RoHS compliant

FEATURES:

1. This product is available in AEC-Q101 Qualified and PPAP Capable also. For AEC-Q101 qualified products, please use suffix -AQ in the part number while ordering.
2. Option for screening as per MIL-PRF-19500 for JAN, JANTX, JANTXV and JANS are available by adding CJ, CX, CV or CS suffix respectively after the part number while ordering.

General Description

Standard zener voltage tolerance is ±10% With suffix "A" zener voltage tolerance is ±5% and with suffix "B" zener voltage tolerance is ±2% . The Glass Passivated Chips are Hermetically Sealed with Double Studs, Providing Excellent Stability and reliability

ABSOLUTE MAXIMUM RATINGS (Ta = 25 ℃ Unless otherwise specified) [1]

PARAMETER	SYMBOL	VALUE	UNIT
Power Dissipation	P_{TOT} [1]	1.0	W
Junction Temperature	T_J	-65 to +200	°C
Storage Temperature Range	T_{STG}	-65 to +200	°C

THERMAL RESISTANCE

Thermal Resistance Junction to Ambient Air	$R_{\theta JA}$	170 [1]	K/mW
Forward Voltage at I_F = 200 mA	V_F	1.2	V

Note:

1. Valid provided that leads at a distance of 8 mm from case are kept at ambient temperature.

ELECTRICAL CHARACTERISTICS at (Ta = 25 ℃ Unless otherwise specified)

Part Number	Zener Voltage Range [4]			Dynamic resistance [2]			Reverse Current [3]		Maximum Surge Current [5]	Maximum Regulator Current [3]	Temp. coffined at I_{ZM}(mA)
	V_{Znom}	V_{ZT}	at I_{ZT}	Z_{ZT}	Z_{ZK}	at I_{ZK}	I_R	at V_R			
	(V)	(V)	(mA)	Max. (Ω)	Max. (Ω)	(mA)	Max. (μA)	Max (V)	I_{ZSM} (mA)	I_{ZM} (mA)	%/ °C
1N4727A	3	2.85-3.15	83	10	400	1	150	1	1375	275	-0.08~-0.05
1N4728A	3.3	3.13- 3.47	76	10	400	1	150	1	1375	275	-0.08~-0.05
1N4729A	3.6	3.42-3.78	69	10	400	1	100	1	1260	252	-0.08~-0.05
1N4730A	3.9	3.7-4.1	64	9	400	1	100	1	1190	234	-0.07~-0.02
1N4731A	4.3	4.08-4.52	58	9	400	1	50	1	1070	217	-0.07~-0.01
1N4732A	4.7	4.46-4.94	53	8	500	1	10	1	970	193	-0.03~+0.04
1N4733A	5.1	4.84-5.36	49	7	550	1	10	1	890	178	-0.01~+0.04
1N4734A	5.6	5.32-5.88	45	5	600	1	10	2	810	162	0.10~+0.045
1N4735A	6.2	5.89-6.5	41	2	700	1	10	3	730	146	+0.01~+0.05
1N4736A	6.8	6.46-7.14	37	3.5	700	1	10	4	660	133	+0.015~+0.0
1N4737A	7.5	7.12-7.88	34	4	700	0.5	10	5	605	121	+0.02~+0.06
1N4738A	8.2	7.79-8.61	31	4.5	700	0.5	10	6	550	110	0.03~0.07
1N4739A	9.1	8.64-9.56	28	5	700	0.5	10	7	500	100	0.035~0.075
1N4740A	10	9.5-10.5	25	7	700	0.25	10	7.6	454	91	0.04~0.08
1N4741A	11	10.45-11.55	23	8	700	0.25	5	8.4	414	83	0.045~0.08
1N4742A	12	11.4-12.6	21	9	700	0.25	5	9.1	380	76	0.045~0.085
1N4743A	13	12.35-13.65	19	10	700	0.25	5	9.9	344	69	0.05~0.085
1N4744A	15	14.25-15.75	17	14	700	0.25	5	11.4	304	61	0.055~0.09
1N4745A	16	15.2-16.8	15.5	16	700	0.25	5	12.2	285	57	0.055~0.09
1N4746A	18	17.1-18.9	14	20	750	0.25	5	13.7	250	50	0.06~0.09
1N4747A	20	19-21	12.5	22	750	0.25	5	15.2	225	45	0.06~0.09
1N4748A	22	20.9- 23.1	11.5	23	750	0.25	5	16.7	205	41	0.06~0.095
1N4749A	24	22.8- 25.2	10.5	25	750	0.25	5	18.2	190	38	0.06~0.095
1N4750A	27	25.65- 28.35	9.5	35	750	0.25	5	20.6	170	34	0.06~0.095
1N4751A	30	28.5- 31.5	8.5	40	1000	0.25	5	22.8	150	30	0.06~0.095
1N4752A	33	31.3- 34.65	7.5	45	1000	0.25	5	25.1	135	27	0.06~0.095
1N4753A	36	34.2- 37.8	7	50	1000	0.25	5	27.4	125	25	0.06~0.095
1N4754A	39	37.05- 40.95	6.5	60	1000	0.25	5	29.7	115	23	0.06~0.095
1N4755A	43	40.85- 45.15	6	70	1500	0.25	5	32.7	110	22	0.06~0.095
1N4756A	47	44.65- 49.35	5.5	80	1500	0.25	5	35.8	95	19	0.06~0.095
1N4757A	51	48.45- 53.55	5	95	1500	0.25	5	38.8	90	18	0.06~0.095
1N4758A	56	53.2- 58.8	4.5	110	2000	0.25	5	42.6	80	16	0.06~0.095
1N4759A	62	58.9- 65.1	4	125	2000	0.25	5	47.1	70	14	0.06~ 0.095
1N4760A	68	64.6- 71.4	3.7	150	2000	0.25	5	51.7	65	13	0.06~0.095
1N4761A	75	71.25- 78.75	3.3	175	2000	0.25	5	56	60	12	0.06~ 0.095

Note:

1. Valid provided that leads at a distance of 8 mm from case are kept at ambient temperature.

2. The dynamic resistance is derived from the 60 Hz AC voltage which results when an AC current having an RMS value equal to 10% of the Zener Current (I_{ZT} or I_{ZK}) is superimposed on I_{ZT} or I_{ZK}. Dynamic resistance is measured at two points to insure a sharp knee on the breakdown curve and to eliminate unstable units.

3. Valid provided that leads at a distance of 8 mm from case are kept at ambient temperature.
4. Tested with pulses tp = 20 ms.

5. The rating listed in the electrical characteristics table is maximum peak, non-repetitive, reverse surge current of 1/2 square wave or equivalent sine wave pulse of 1/120 second duration superimposed on the test current I_{ZT}

TYPICAL CHARACTERISTICS CURVES

Fig 1: Power Dissipation vs Ambient temperature

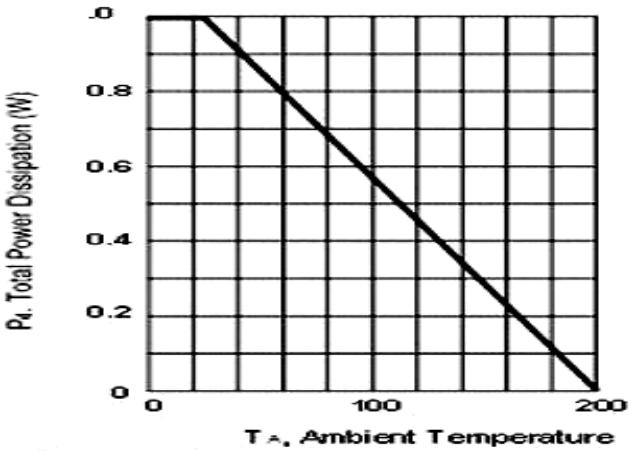


Fig 3: Typical Thermal Resistance vs Lead Length

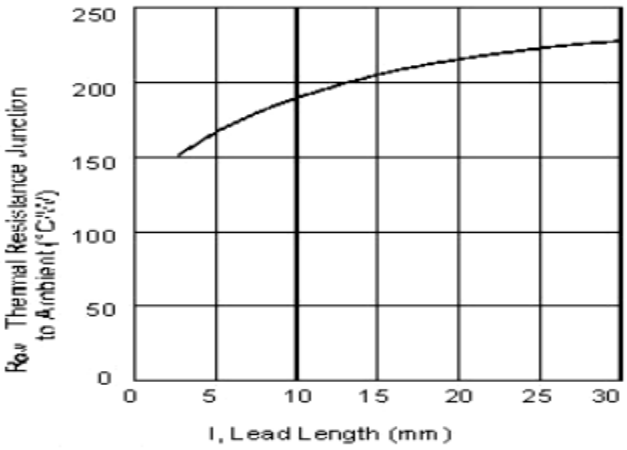


Fig 2: Junction Capacitance vs Zener Voltage

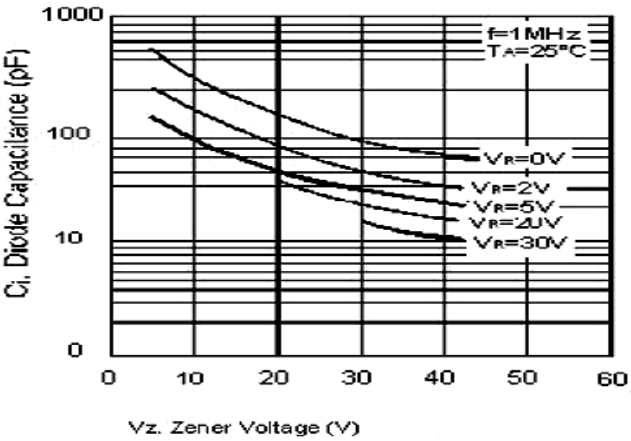
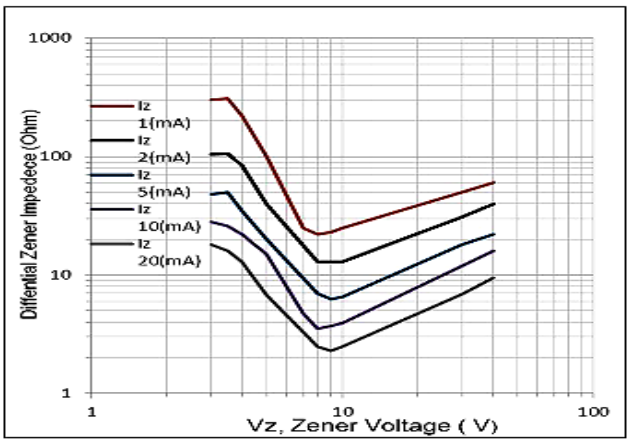
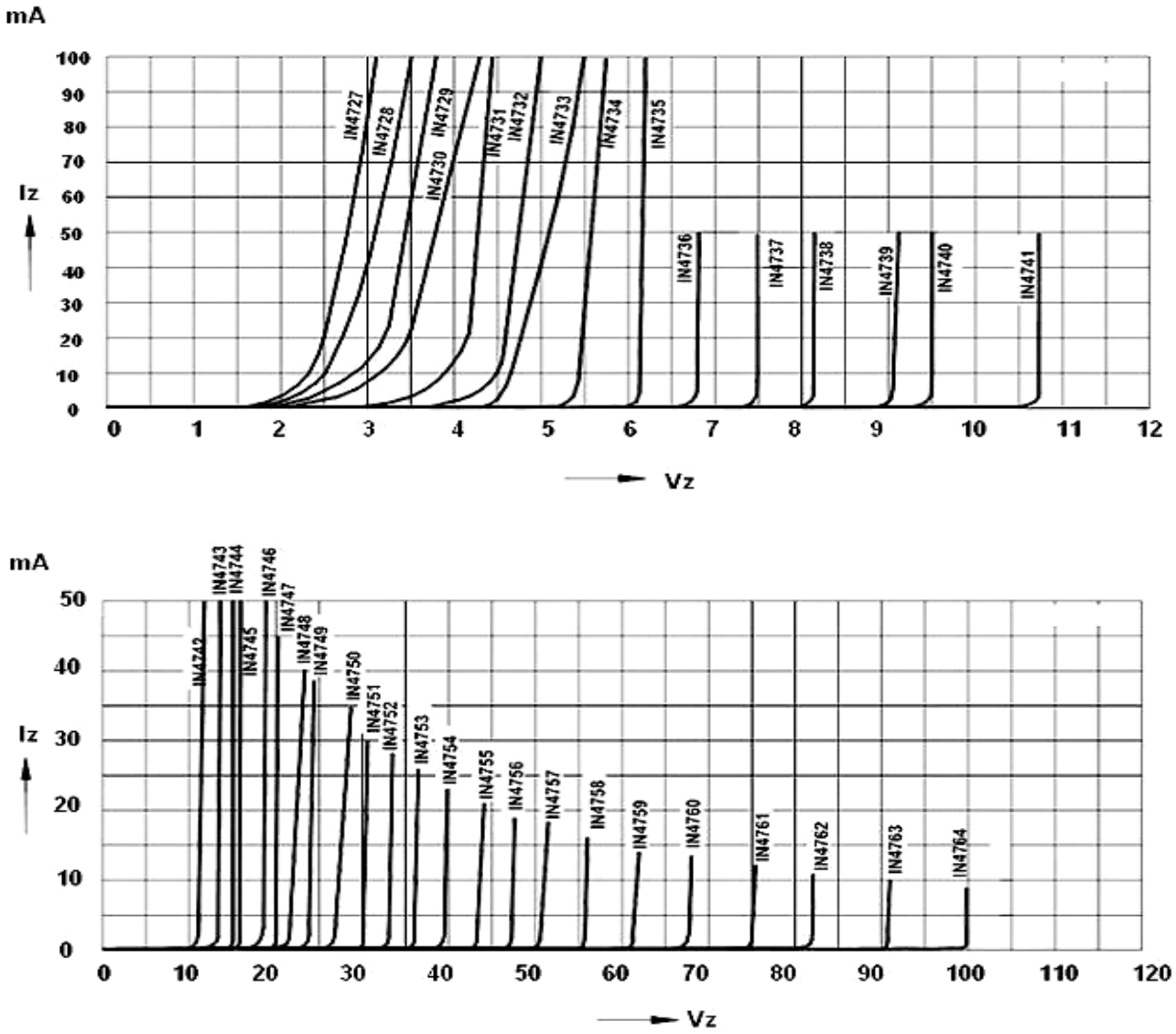


Fig 4: Typical Zener impedance vs Zener Voltage



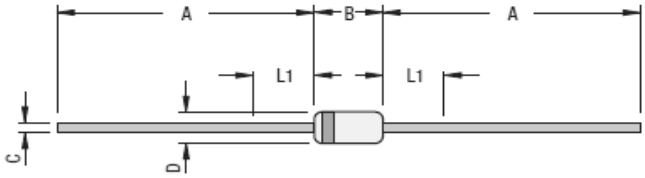
TYPICAL CHARACTERISTICS CURVES

Breakdown Characteristics, Tj = Constant (Pulsed)



PACKAGE DETAIL

DO-41 Hermetically Sealed Glass Axial Package



Dim	Min	Max
A	25.4	--
B	--	5.2
C	--	0.9
D	2.00	2.8
L1	--	1.27

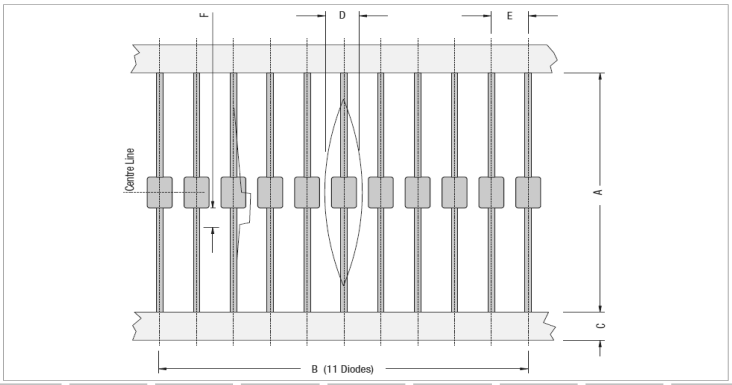
All dimensions are in mm

Packaging Specifications

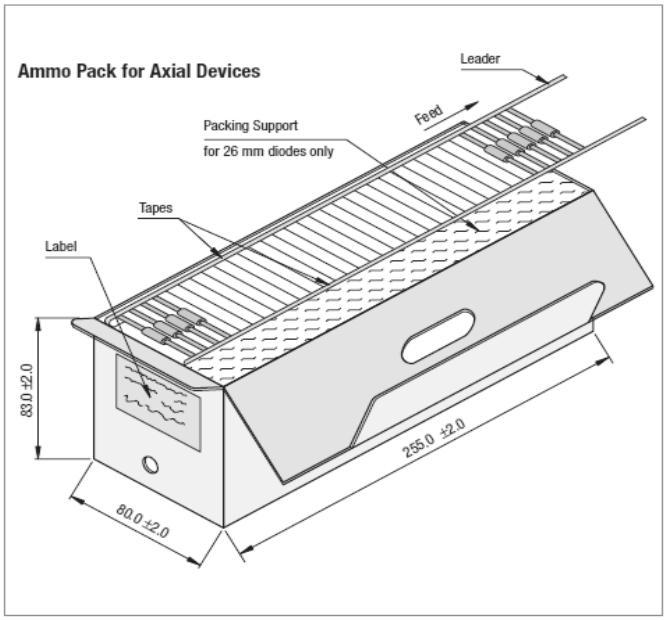
T & A: Tape and Ammo Pack; **T & R:** Tape and Reel; **Bulk:** Loose in Poly Bags; **Tube:** Tube and Carton; **K:** 1,000

Package / Case Type	Packaging Type	Std. Packing	Inner Carton			Outer Carton		
		Qty	Qty	Size L x W x H (cm)	Gross Weight (Kg)	Qty	Size L x W x H (cm)	Gross Weight (Kg)
DO-41	T & A	2,500	2.5K	25.5 x 8 x 8.5	0.9	62.5K	32 x 32 x 50	30.0

Axial Tape and Ammo Packaging



Device	Type	A		B		C		D		E		F	
	mm	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
DO-41	26 mm	26.0	26.4	48.0	52.0	5.0	6.0	—	1.5R	4.5	5.5	—	0.8



Taping Specification

- 300 mm (Min) leader tape on every roll.
- No. of empty places allowed 0.25% without consecutive empty places.
- Ends of leads shall normally not protrude beyond the tapes.
- Components shall be held sufficiently in the tape or tapes so that they can not come free in normal handling.

Recommended Reflow Solder Profiles

The recommended reflow solder profiles for Pb and Pb-free devices are shown below.

Figure 1 shows the recommended solder profile for devices that have Pb-free terminal plating, and where a Pb-free solder is used.

Figure 2 shows the recommended solder profile for devices with Pb-free terminal plating used with leaded solder, or for devices with leaded terminal plating used with a leaded solder.

Figure 1

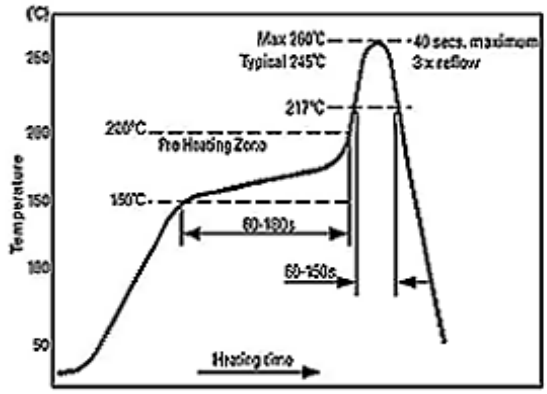
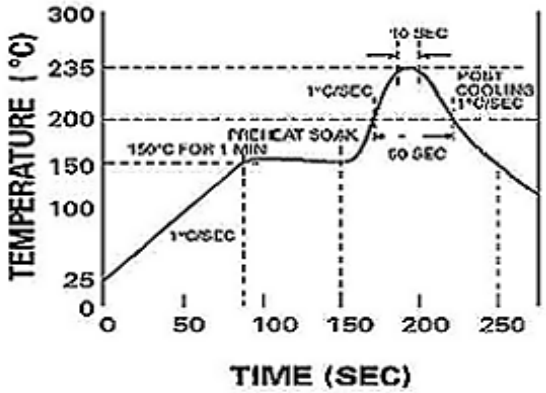


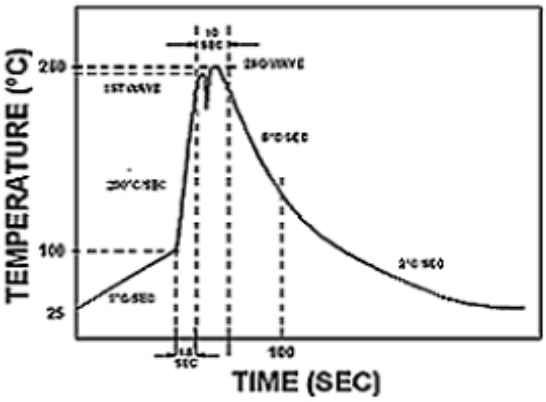
Figure 2



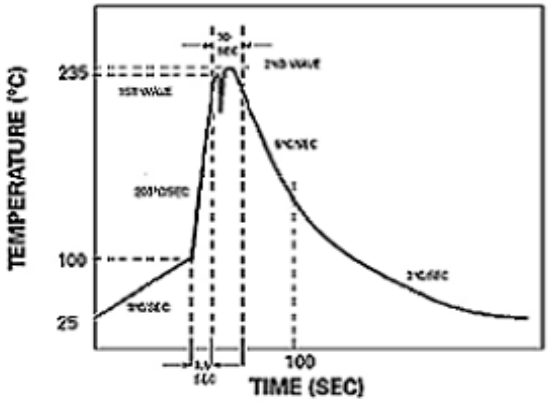
Profile Feature	Sn-Pb System	Pb-Free System
Average Ramp-Up Rate	~3°C/second	~3°C/second
Preheat – Temperature Range – Time	 150-170°C 60-180 seconds	 150-200°C 60-180 seconds
Time maintained above: – Temperature – Time	 200°C 30-50 seconds	 217°C 60-150 seconds
Peak Temperature	235°C	260°C max.
Time within +0 -5°C of actual Peak	10 seconds	40 seconds
Ramp-Down Rate	3°C/second max.	6°C/second max.

Recommended Wave Solder Profiles

The Recommended solder Profile For Devices with Pb-free terminal plating where a Pb-free solder is used



The Recommended solder Profile For Devices with Pb-free terminal plating used with leaded solder, or for devices with leaded terminal plating used with leaded solder



Reflow profiles in tabular form

Profile Feature	Sn-Pb System	Pb-Free System
Average Ramp-Up Rate	~200°C/second	~200°C/second
Heating rate during preheat	Typical 1-2, Max 4°C/sec	Typical 1-2, Max 4°C/Sec
Final preheat Temperature	Within 125°C of Solder Temp	Within 125°C of Solder Temp
Peak Temperature	235°C	260°C max.
Time within +0 -5°C of actual Peak	10 seconds	10 seconds
Ramp-Down Rate	5°C/second max.	5°C/second max

Recommended Product Storage Environment for Discrete Semiconductor Devices

This storage environment assumes that the Diodes and transistors are packed properly inside the original packing supplied by CDIL.

- Temperature 5 °C to 30 °C
- Humidity between 40 to 70 %RH
- Air should be clean.
- Avoid harmful gas or dust.
- Avoid outdoor exposure or storage in areas subject to rain or water spraying .
- Avoid storage in areas subject to corrosive gas or dust. Product shall not be stored in areas exposed to direct sunlight.
- Avoid rapid change of temperature.
- Avoid condensation.
- Mechanical stress such as vibration and impact shall be avoided.
- The product shall not be placed directly on the floor.
- The product shall be stored on a plane area. They should not be turned upside down. They should not be placed against the wall.

Shelf Life of CDIL Products

The shelf life of products is the period from product manufacture to shipment to customers. The product can be unconditionally shipped within this period. The period is defined as 2 years.
If products are stored longer than the shelf life of 2 years the products shall be subjected to quality check as per CDIL quality procedure.
The products are further warranted for another one year after the date of shipment subject to the above conditions in CDIL original packing.

Floor Life of CDIL Products and MSL Level

When the products are opened from the original packing, the floor life will start.
For this, the following JEDEC table may be referred:

JEDEC MSL Level		
Level	**Time**	**Condition**
1	Unlimited	≤30 °C / 85% RH
2	1 Year	≤30 °C / 60% RH
2a	4 Weeks	≤30 °C / 60% RH
3	168 Hours	≤30 °C / 60% RH
4	72 Hours	≤30 °C / 60% RH
5	48 Hours	≤30 °C / 60% RH
5a	24 Hours	≤30 °C / 60% RH
6	Time on Label(TOL)	≤30 °C / 60% RH

Customer Notes

Component Disposal Instructions

1. CDIL Semiconductor Devices are RoHS compliant, customers are requested to please dispose as per prevailing Environmental Legislation of their Country.
2. In Europe, please dispose as per EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE).

Disclaimer

The product information and the selection guides facilitate selection of the CDIL's Semiconductor Device(s) best suited for application in your product(s) as per your requirement. It is recommended that you completely review our Data Sheet(s) so as to confirm that the Device(s) meet functionality parameters for your application. The information furnished in the Data Sheet and on the CDIL Web Site/CD are believed to be accurate and reliable. CDIL however, does not assume responsibility for inaccuracies or incomplete information. Furthermore, CDIL does not assume liability whatsoever, arising out of the application or use of any CDIL product; neither does it convey any license under its patent rights nor rights of others. These products are not designed for use in life saving/support appliances or systems. CDIL customers selling these products (either as individual Semiconductor Devices or incorporated in their end products), in any life saving/support appliances or systems or applications do so at their own risk and CDIL will not be responsible for any damages resulting from such sale(s).
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