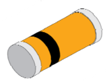
HIGH SPEED SILICON SWITCHING DIODES

LL4148
LL4448



SOD-80C
(Mini MELF)

SOD - 80C
Mini MELF (LL- 34)
SMD Glass Package
RoHS compliant

FEATURES:

1. Polarity: Cathode is indicated by a black band
2. Hermetically Sealed, Glass Silicon Diodes

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

Parameter		Symbol	Value	Unit
Peak Repetitive Reverse Voltage		V_{RRM}	100	V
Reverse Voltage (Continuous)		V_R	75	V
Average Rectified Forward Current		$I_{F(av)}$	200	mA
Repetitive Peak Forward Current		I_{FRM}	450	mA
Non Repetitive Peak Surge Current	t = 1µs	I_{FSM}	4	A
	t = 1ms		1	
	t = 1s		0.5	
Power Dissipation up to Tamb=25 ºC		P_{tot}	500	mW
Derating factor			2.85	mW/K
Operating and Storage Junction Temperature Range		T_j, T_{stg}	-65 to +175	°C

THERMAL RESISTANCES

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction Ambient [1]	$R_{th(j-a)}$	300	°C/W

Notes:

1. Valid provided that electrodes are kept at ambient temperature.

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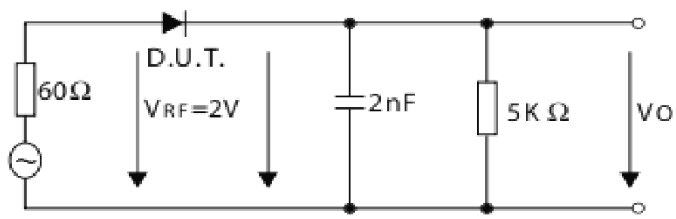
ELECTRICAL CHARACTERISTICS at (Ta = 25 ℃ Unless otherwise specified)

Parameter		Symbol	Test Conditions	Value			Unit
				Min.	Typ.	Max.	
Forward Voltage	LL4148	V_F	I_F=10mA	0.62	--	1.0	V
	LL4448		I_F=5mA		--	0.72	
			I_F=100mA		--	1.0	
Reverse Current	LL4148	I_R	V_R=20V	--	--	25	nA
			V_R=75V		--	5.0	µA
			V_R=20V, T_j=150º C		--	50	µA
	LL4448		V_R=20V, T_j=100º C		--	3.0	µA
Reverse Breakdown Voltage		V_{BR}	tested with 100 µA Pulses	100	--	--	V

DYNAMIC CHARACTERISTICS

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Diode Capacitance	C_d	V_R=0V, f=1MHz	--	--	4.0	pF
Forward Recovery Voltage	V_{fr}	Tested with 50 mA Forward Pulses tp=0.1s, Rise time < 30ns, fp= 5 to 100KHz	--	--	2.5	V
Reverse Recovery Time	t_{rr}	I_F=10mA to Irr=0.1X I_R, V_R = 6V, R_L=100Ω,	--	--	4.0	ns
Rectification Efficiency	ηv	f=100MHz, V_{REF} = 2V	0.45	--	--	



RECITIFICATION EFFICIENCY
MEASUREMENT CIRCUIT

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TYPICAL CHARACTERISTICS CURVES

Fig 1: Reverse Voltage vs Reverse Current
B_V - 1.0 to 100µA

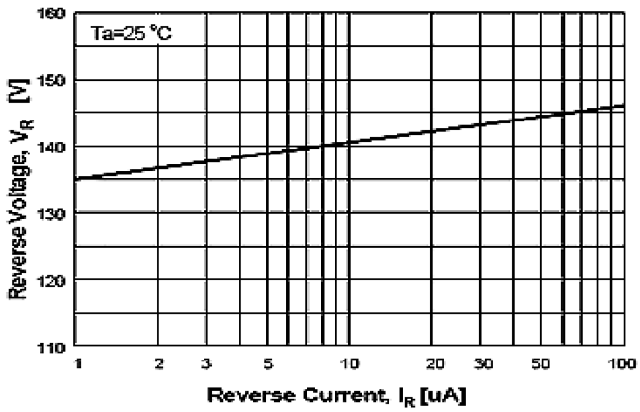


Fig 4: Reverse Voltage vs Reverse Current I_R - 10 to 100V

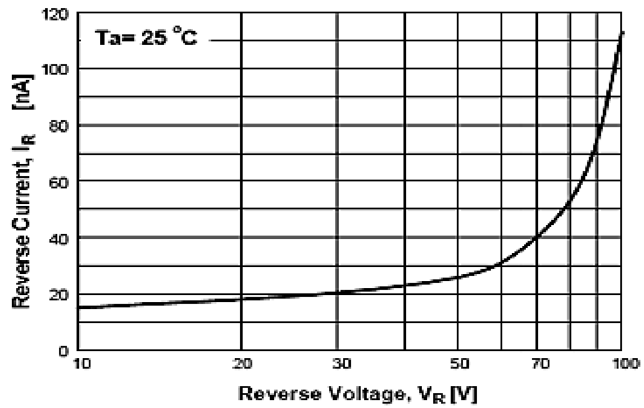


Fig 2: Forward Voltage vs Forward Current
V_F - 10 to 100µA

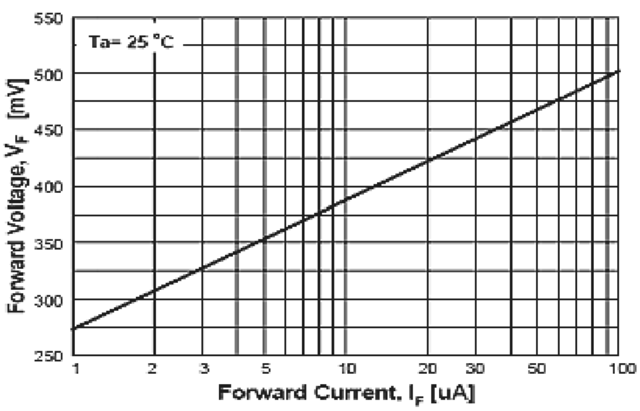


Fig 5: Forward Voltage vs Forward Current
V_F - 0.1 to 100mA

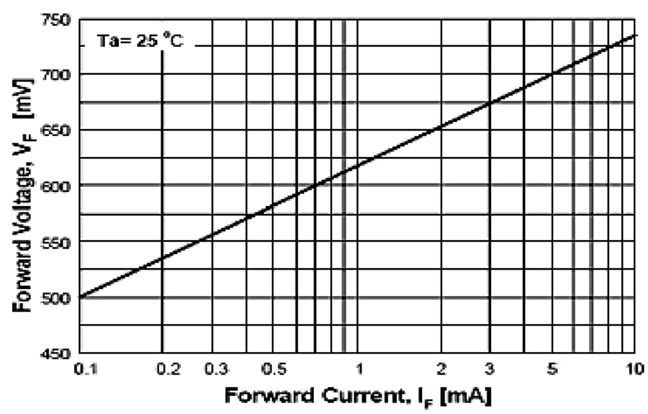


Fig 3: Forward Voltage vs Forward Current
V_F - 10 to 100µA

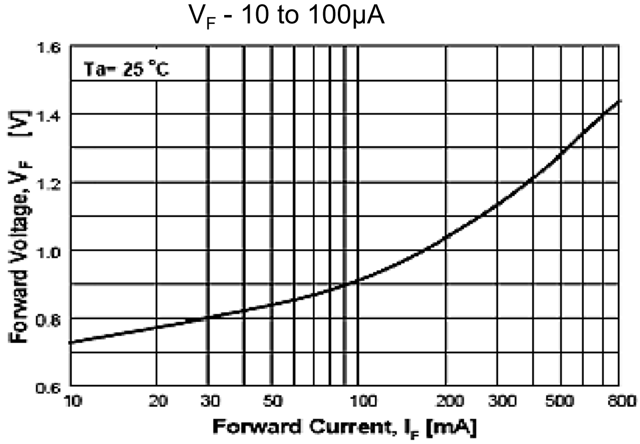
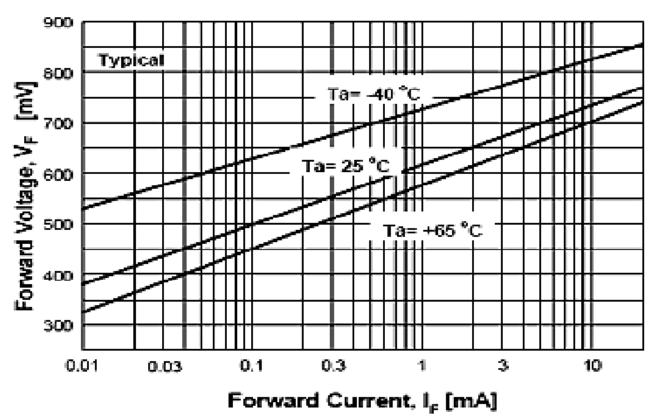


Fig 6: Forward Voltage vs Ambient Temp
V_F - 0.01 to 20mA -40 to +65 °C



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TYPICAL CHARACTERISTICS CURVES

Fig 7: Total Capacitance

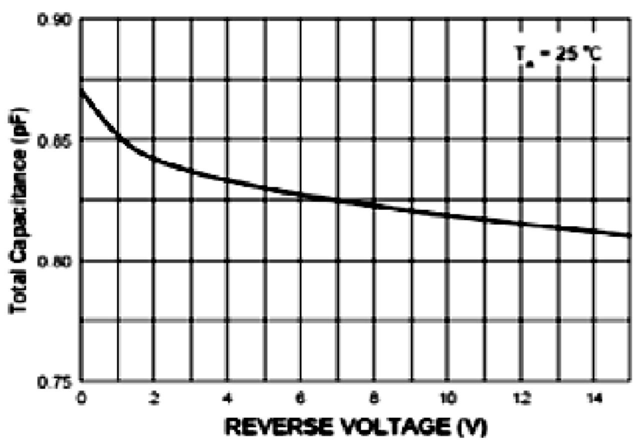


Fig 9: Reverse Recovery Time vs Reverse Recovery Current

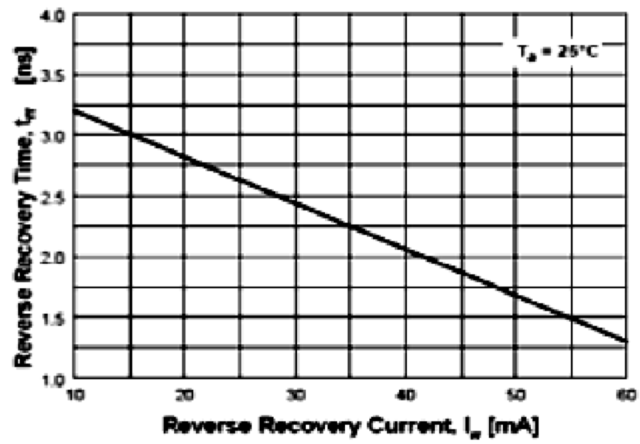


Fig 8: Average Rectified Current ($I_{F(AV)}$) Versus Ambient Temperature (T_A)

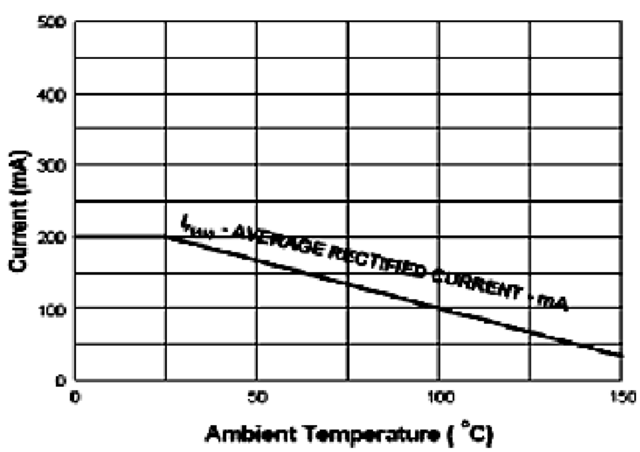
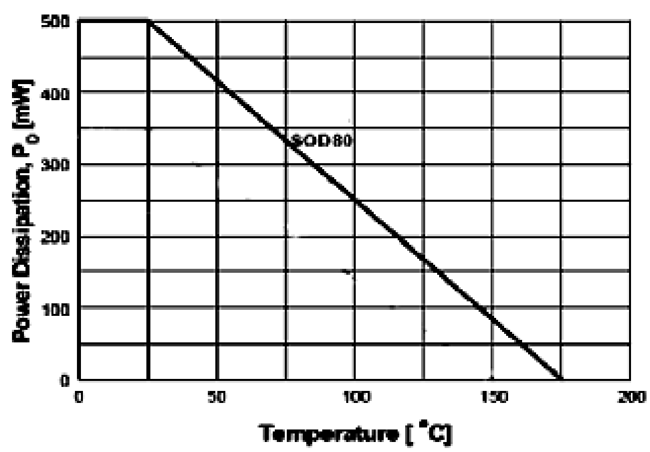
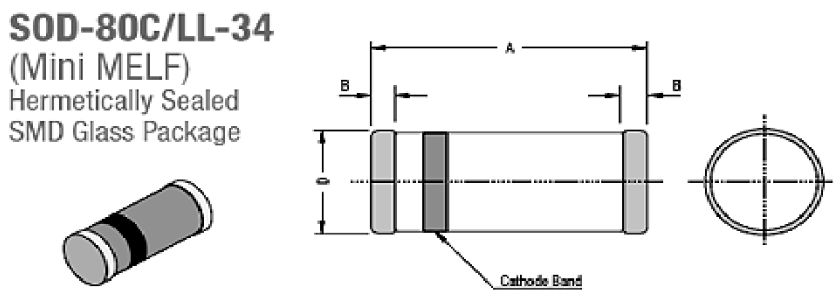


Fig 10: Power Derating Curve



Package Details

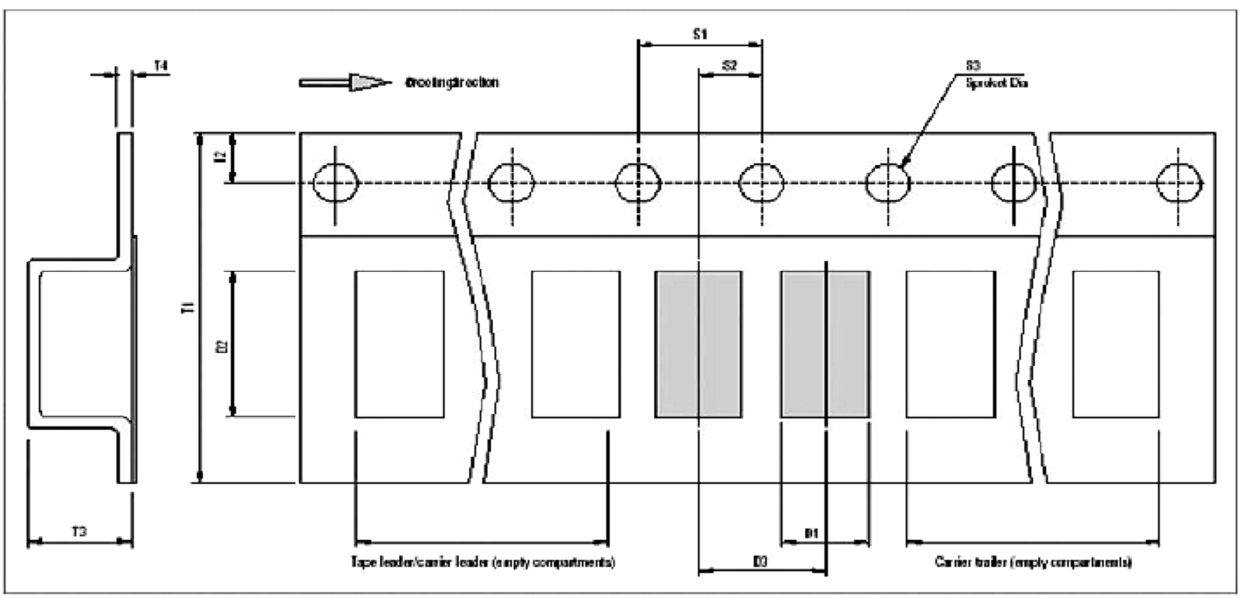
SOD - 80C Mini MELF (LL- 34)



DIM	MIN	Max.
A	3.30	3.70
B	0.20	0.40
D	1.40	1.60

All dimensions are in mm

Packaging Tape Specifications for SMD Packages



SMD Tape Specifications (8-12 mm)

Device	D1	D2	D3	T1	T2	T3	T4	S1	S2	S3
						Max	Max			Dia
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm

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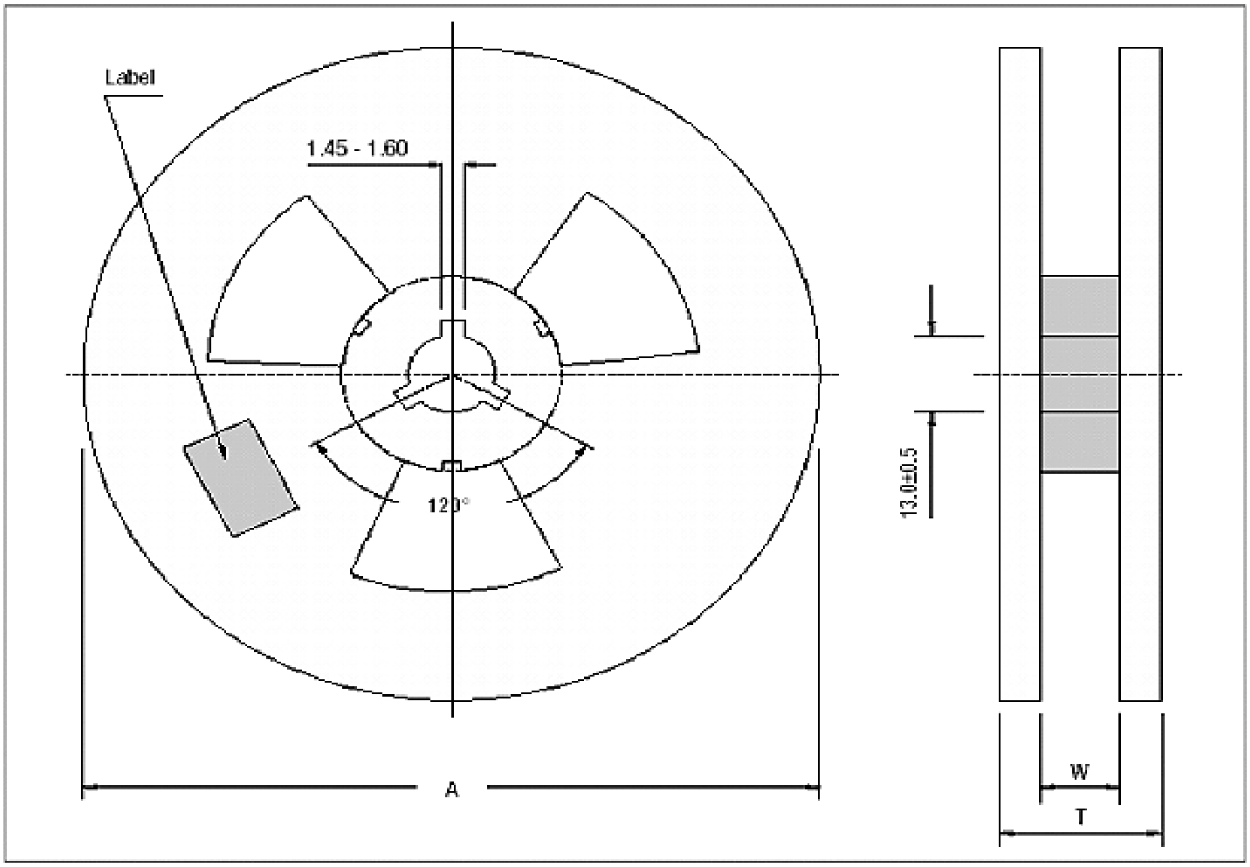
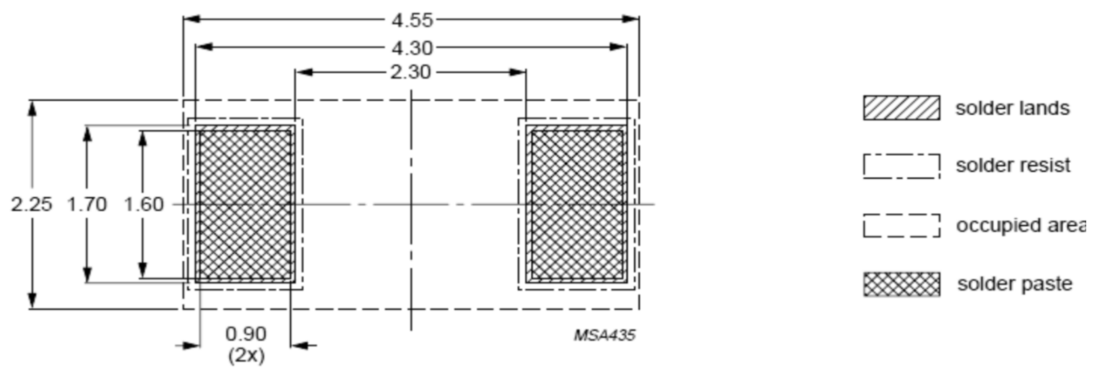
Reel Specifications for SMD Packages



Reel Specifications

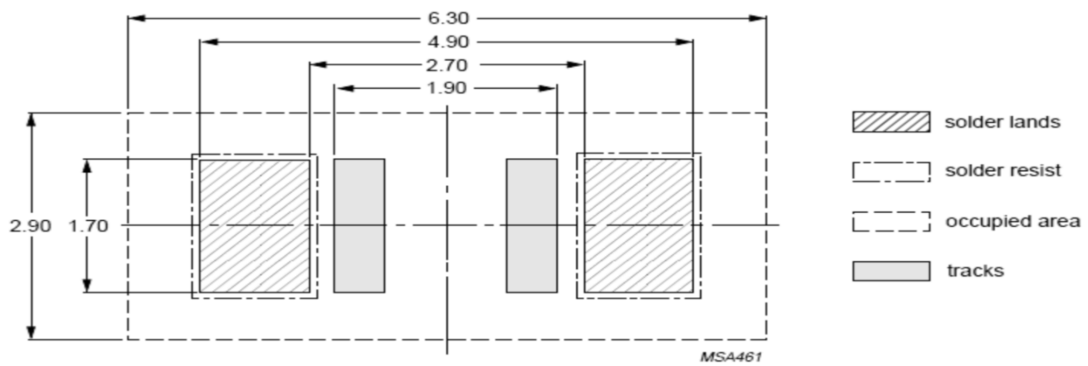
Package	Tape Width	Reel Dia. A – Max	Devices per Reel and MOQ	Inside Thickness W	Reel Thickness T – Max
SOD-80C (Mini MELF)	8	180	2,500	8.4±2	14.4
	8	330	10,000	8.4±2	14.4

SOLDER PAD LAYOUT (REFLOW SOLDERING)



Dimensions in mm.

SOLDER PAD LAYOUT (WAVE SOLDERING)



Dimensions in mm.

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

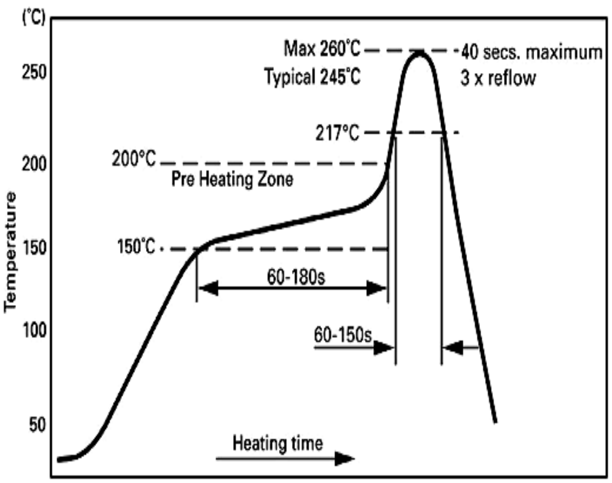
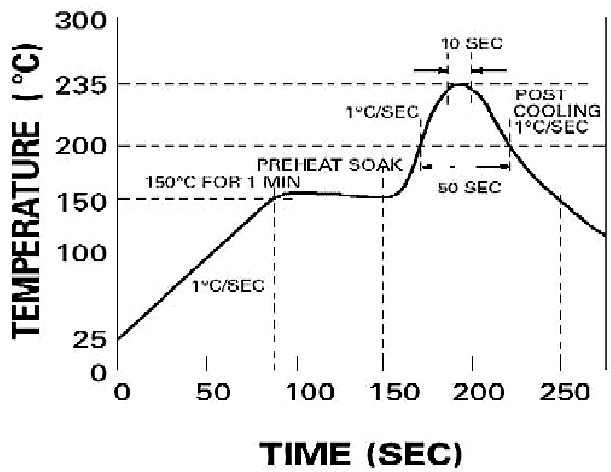


Figure 2



Reflow profiles in tabular form

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 – Tim	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.

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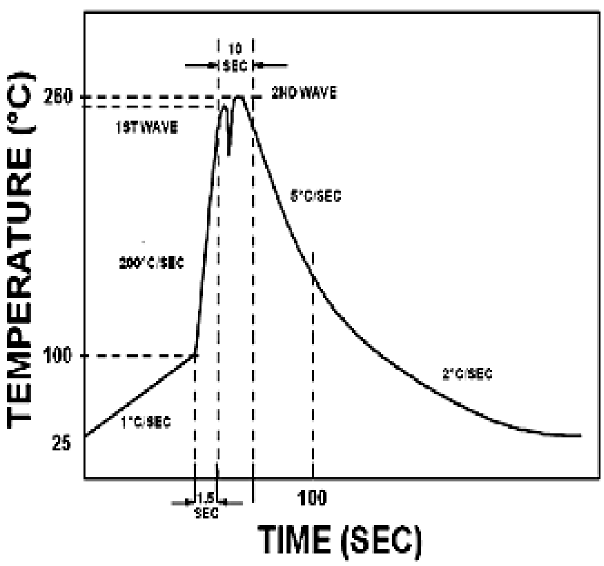
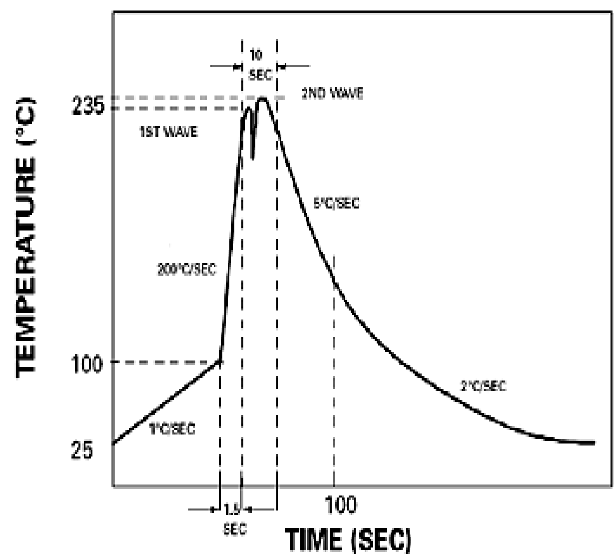
Recommended Wave Solder Profiles

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





Wave 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

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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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