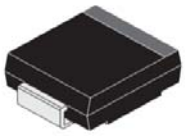
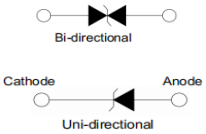
1500W SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSORS



DO-214AB (SMC)



SMCJXXX

DO-214AB(SMC)
Surface Mount
Plastic Package
RoHS compliant

FEATURES:

1.1500 W peak pulse power capability with a 10/1000 us waveform, repetitive rate (duty cycle):0.01 %
2. Low profile package.
3. Excellent clamping capability.
4. Very Fast response time.
5. IEC 61000-4-2 ESD 30KV(Air), 30KV(Contact)
6. ESD protection of data lines in accordance with IEC 61000-4-2
7. EFT protection of data lines in accordance with IEC 61000-4-4
8.Lead-free finish
9. Glass passivated chip
10. Low reverse leakage
11.This product is available in AEC-Q101 Compliant and PPAP Capable also.
Note: For AEC-Q101 compliant products, please use suffix -AQ in the part number while ordering.

APPLICATIONS:

Protection of I/O Interfaces, VCC bus and other vulnerable circuits used in telecom, computer, Industrial and consumer electronic applications.

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

PARAMETER	SYMBOL	VALUE	UNIT
Peak Pulse Power Dissipation on 10/1000 us Waveform [1 2] (Fig.1)	P_{PPM}	Min1500	W
Power Dissipation on Infinite Heat Sink at T_L=50°C	P_D	6.5	W
Peak Pulse Current of on 10/1000us Waveform [1] (Fig 2)	I_{PPM}	See Next Table	A
Peak Forward Surge Current, 8.3ms Single Half Sine-Wave Uni-directional only[2 3]	I_{FSM}	200	A
Typical junction resistance, Junction to Lead	$R_{\theta JL}$	15	°C/W
Typical junction resistance, Junction to Ambient	$R_{\theta JA}$	75	°C/W
Operating Junction Temperature Range	T_J	-55 to +150	°C
Storage Temperature Range	T_{stg}	-55 to +150	°C

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

Type Number		Marking Code		Reverse Stand-off Voltage	Breakdown Voltage Min. @I_T	Breakdown Voltage Max. @I_T	Test Current	Max. Clamping Voltage @I_{PP}	Peak Pulse Current	Reverse Leakage @ V_{RMW}
(Uni)	(Bi)	(Uni)	(Bi)	V_{RMW}(V)	$V_{BR\ MIN}$(V)	$V_{BR\ MAX}$(V)	I_T (mA)	V_C(V)	I_{pp}(A)	I_R(uA)
SMCJ5.0A	SMCJ5.0CA	GDE	BDE	5.0	6.40	7.00	10	9.2	163.0	500
SMCJ6.0A	SMCJ6.0CA	GDG	BDG	6.0	6.67	7.37	10	10.3	145.7	500
SMCJ6.5A	SMCJ6.5CA	GDK	BDK	6.5	7.22	7.98	10	11.2	134.0	300
SMCJ7.0A	SMCJ7.0CA	GDM	BDM	7.0	7.78	8.60	10	12.0	125.0	200
SMCJ7.5A	SMCJ7.5CA	GDP	BDP	7.5	8.33	9.21	1	12.9	116.3	100
SMCJ8.0A	SMCJ8.0CA	GDR	BDR	8.0	8.89	9.83	1	13.6	110.3	50
SMCJ8.5A	SMCJ8.5CA	GDT	BDT	8.5	9.44	10.40	1	14.4	104.2	30
SMCJ9.0A	SMCJ9.0CA	GDV	BDV	9.0	10.00	11.10	1	15.4	97.40	30
SMCJ10A	SMCJ10CA	GDX	BDX	10.0	11.10	12.30	1	17.0	88.30	5
SMCJ11A	SMCJ11CA	GDZ	BDZ	11.0	12.20	13.50	1	18.2	82.50	1
SMCJ12A	SMCJ12CA	GEE	BEE	12.0	13.30	14.70	1	19.9	75.40	1
SMCJ13A	SMCJ13CA	GEG	BEG	13.0	14.40	15.90	1	21.5	69.80	1
SMCJ14A	SMCJ14CA	GEK	BEK	14.0	15.60	17.20	1	23.2	64.70	1
SMCJ15A	SMCJ15CA	GEM	BEM	15.0	16.70	18.50	1	24.4	61.50	1
SMCJ16A	SMCJ16CA	GEP	BEP	16.0	17.80	19.70	1	26.0	57.70	1
SMCJ17A	SMCJ17CA	GER	BER	17.0	18.90	20.90	1	27.6	54.30	1
SMCJ18A	SMCJ18CA	GET	BET	18.0	20.00	22.10	1	29.2	51.40	1
SMCJ20A	SMCJ20CA	GEV	BEV	20.0	22.20	24.50	1	32.4	46.30	1
SMCJ22A	SMCJ22CA	GEX	BEX	22.0	24.40	26.90	1	35.5	42.30	1
SMCJ24A	SMCJ24CA	GEZ	BEZ	24.0	26.70	29.50	1	38.9	38.60	1
SMCJ26A	SMCJ26CA	GFE	BFE	26.0	28.90	31.90	1	42.1	35.70	1
SMCJ28A	SMCJ28CA	GFG	BFG	28.0	31.10	34.40	1	45.4	33.10	1
SMCJ30A	SMCJ30CA	GFK	BFK	30.0	33.30	36.80	1	48.4	31.00	1
SMCJ33A	SMCJ33CA	GFM	BFM	33.0	36.70	40.60	1	53.3	28.20	1
SMCJ36A	SMCJ36CA	GFP	BFP	36.0	40.00	44.20	1	58.1	25.90	1
SMCJ40A	SMCJ40CA	GFR	BFR	40.0	44.40	49.10	1	64.5	23.30	1
SMCJ43A	SMCJ43CA	GFT	BFT	43.0	47.80	52.80	1	69.4	21.70	1
SMCJ45A	SMCJ45CA	GFV	BFV	45.0	50.00	55.30	1	72.7	20.60	1
SMCJ48A	SMCJ48CA	GJT	BJT	48.0	53.30	58.90	1	77.4	19.40	1
SMCJ51A	SMCJ51CA	GJV	BJV	51.0	56.70	62.70	1	82.4	18.20	1
SMCJ54A	SMCJ54CA	GFX	BFX	54.0	60.00	66.30	1	87.1	17.3	1
SMCJ58A	SMCJ58CA	GFZ	BFZ	58.0	64.40	71.20	1	93.6	16.10	1
SMCJ60A	SMCJ60CA	GGE	BGE	60.0	66.70	73.70	1	96.8	15.50	1
SMCJ64A	SMCJ64CA	GGG	BGG	64.0	71.10	78.60	1	103.0	14.60	1
SMCJ70A	SMCJ70CA	GGK	BGK	70.0	77.80	86.00	1	113.0	13.30	1
SMCJ75A	SMCJ75CA	GGM	BGM	75.0	83.30	92.10	1	121.0	12.40	1
SMCJ78A	SMCJ78CA	GGP	BGP	78.0	86.70	95.80	1	126.0	11.90	1
SMCJ85A	SMCJ85CA	GGR	BGR	85.0	94.40	104.0	1	137.0	11.00	1
SMCJ90A	SMCJ90CA	GGT	BGT	90.0	100.0	111.0	1	146.0	10.30	1
SMCJ100A	SMCJ100CA	GGV	BGV	100.0	111.0	123.0	1	162.0	9.30	1
SMCJ110A	SMCJ110CA	GGX	BGX	110.0	122.0	135.0	1	177.0	8.50	1

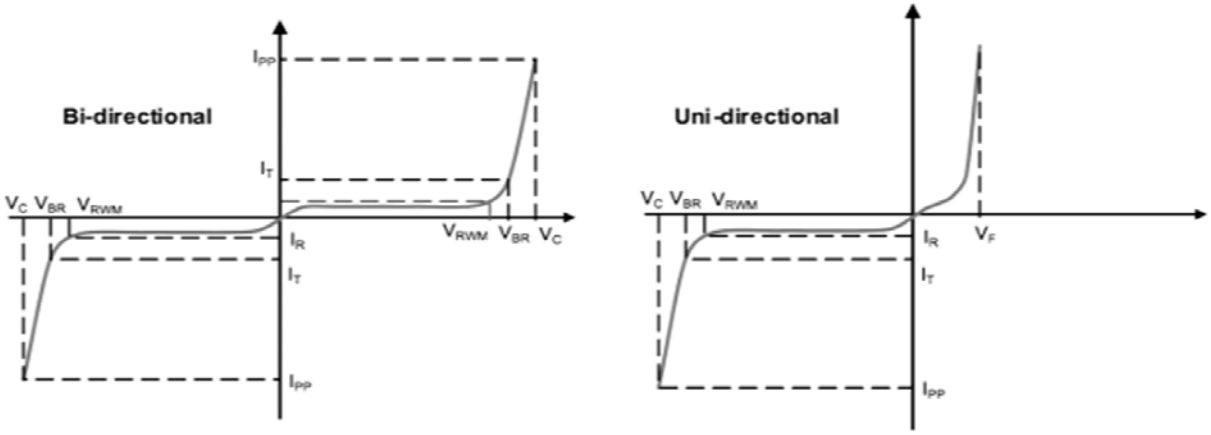
ELECTRICAL CHARACTERISTICS at (Ta = 25 ℃ Unless otherwise specified)

Type Number		Marking Code		Reverse Stand-off Voltage	Breakdown Voltage Min. @I_T	Breakdown Voltage Max. @I_T	Test Current	Maximum Clamping Voltage @I_{PP}	Peak Pulse Current	Reverse Leakage @ V_{RMW}
(Uni)	(Bi)	(Uni)	(Bi)	V_{RMW}(V)	$V_{BR\ MIN}$(V)	$V_{BR\ MAX}$(V)	I_T (mA)	V_C(V)	I_{pp}(A)	I_R(uA)
SMCJ120A	SMCJ120CA	GGZ	BGZ	120.0	133.0	147.0	1	193.0	7.80	1
SMCJ130A	SMCJ130CA	GHE	BHE	130.0	144.0	159.0	1	209.0	7.20	1
SMCJ150A	SMCJ150CA	GHG	BHG	150.0	167.0	185.0	1	243.0	6.20	1
SMCJ160A	SMCJ160CA	GHK	BHK	160.0	178.0	197.0	1	259.0	5.80	1
SMCJ170A	SMCJ170CA	GHM	BHM	170.0	189.0	209.0	1	275.0	5.50	1
SMCJ180A	SMCJ180CA	GHP	BHP	180.0	201.0	222.0	1	292.0	5.10	1
SMCJ190A	SMCJ190CA	GHR	BHR	190.0	209.0	231.0	1	308.0	4.90	1
SMCJ200A	SMCJ200CA	GHX	BHX	200.0	224.0	247.0	1	324.0	4.60	1
SMCJ210A	SMCJ210CA	GHZ	BHZ	210.0	237.0	263.0	1	340.0	4.40	1
SMCJ220A	SMCJ220CA	GJE	BJE	220.0	246.0	272.0	1	356.0	4.20	1
SMCJ250A	SMCJ250CA	GJG	BJG	250.0	279.0	309.0	1	405.0	3.70	1
SMCJ300A	SMCJ300CA	GJK	BJK	300.0	335.0	371.0	1	486.0	3.10	1
SMCJ350A	SMCJ350CA	GJM	BJM	350.0	391.0	432.0	1	567.0	2.60	1
SMCJ400A	SMCJ400CA	GJP	BJP	400.0	447.0	494.0	1	648.0	2.30	1
SMCJ440A	SMCJ440CA	GJR	BJR	440.0	492.0	543.0	1	713.0	2.10	1

Notes:

1. Non-repetitive current pulse, per Fig.5 and derated above T_A=25°C per Fig.4.
2. Mounted on 8.0x8.0mm^2 (0.03mm thick) Copper Pads to each terminal.
3. Measured on 8.3 ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum
4. V_F<3.5V for devices of V_{BR}<200V and V_F<6.5V for devices of V_{BR}>201V

CURVE CHARACTERISTICS



P_{PPM}: Peak Pulse Power Dissipation - Max power dissipation

V_{RWM}: Reverse Stand-off Voltage - Maximum voltage that can be applied to TVS without operation

V_{BR}: Breakdown Voltage – Maximum voltage that flows though the TVS at a specified current (IT)

V_C: Clamping Voltage – Peak voltage measured across the TVS at a specified IPPM (peak impulse current)

I_R: Reverse Leakage Current – Current measured at VR

V_F: Forward Voltage Drop for Uni-directional

TYPICAL CHARACTERISTICS CURVES

Fig 1: Maximum Non-repetitive Surge Current

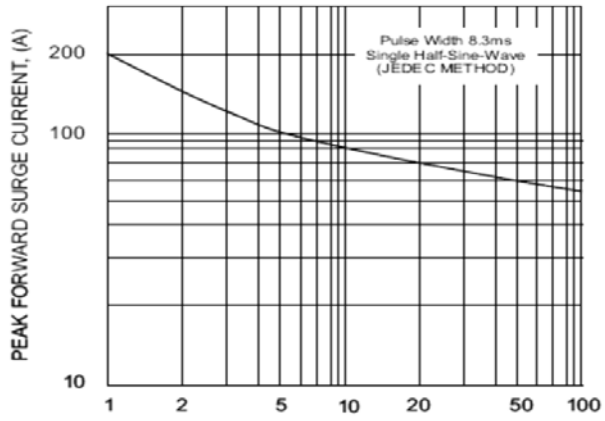


Fig 2: Steady state Power Derating Curve

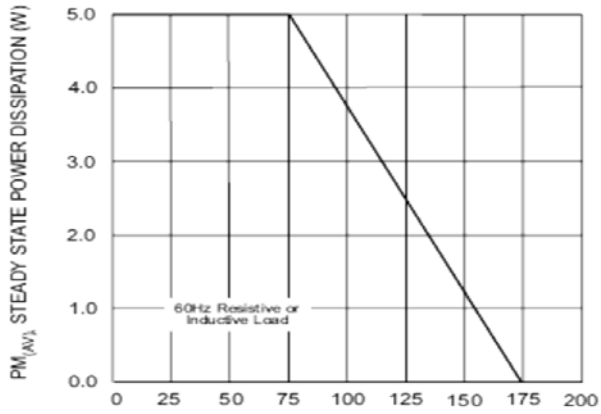


Fig 3: Peak Pulse Power Rating

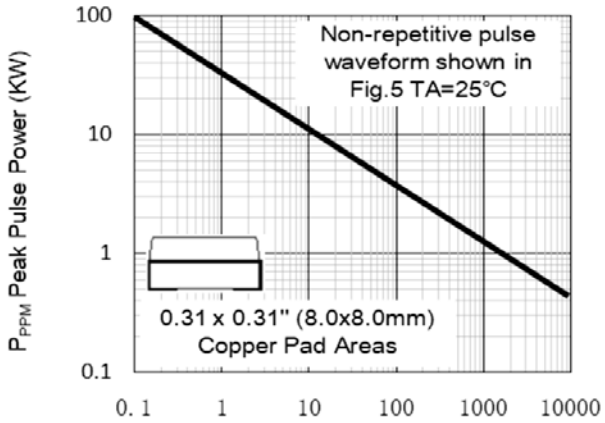


Fig 4: Pulse Derating Curves

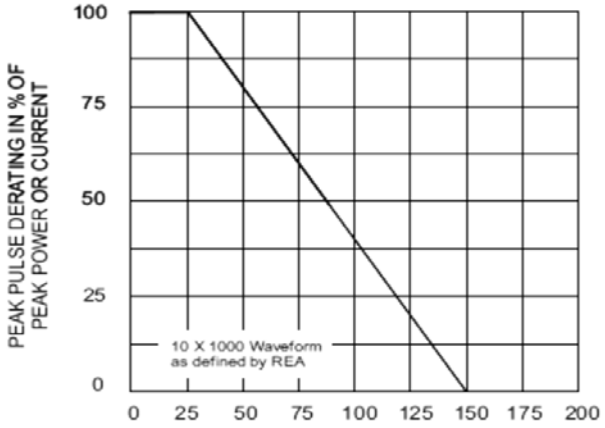


Fig 5: Pulse Waveform

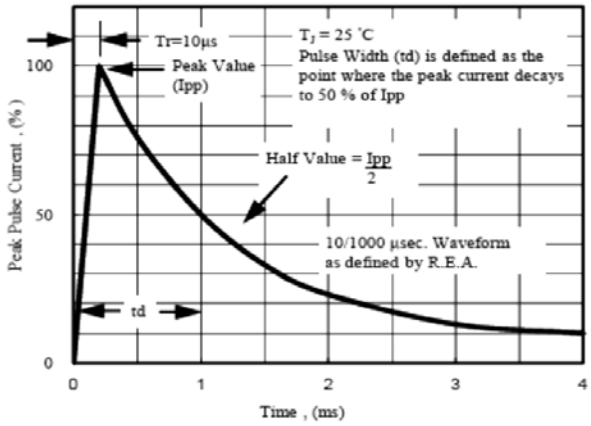
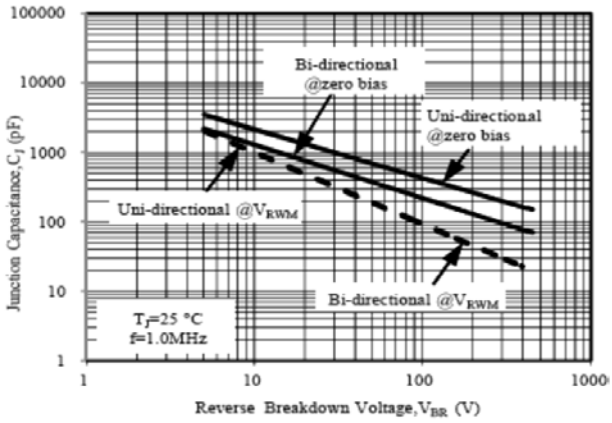
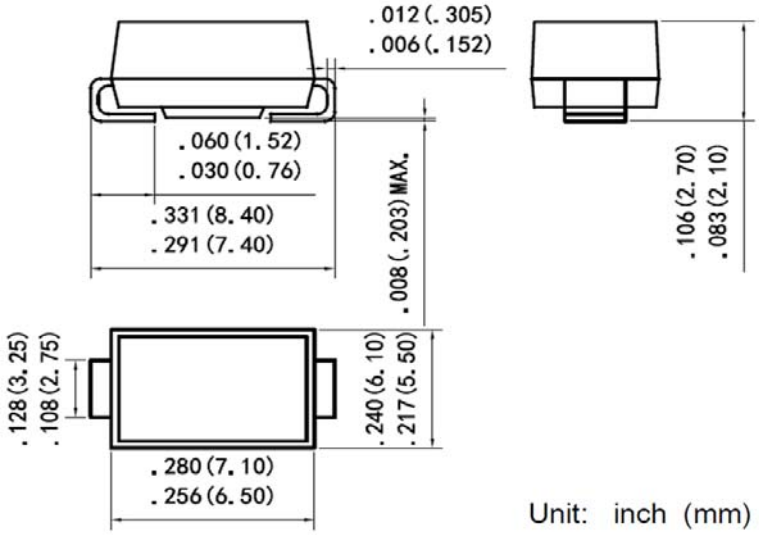


Fig 6: Typical Junction Capacitance



PACKAGE DETAIL

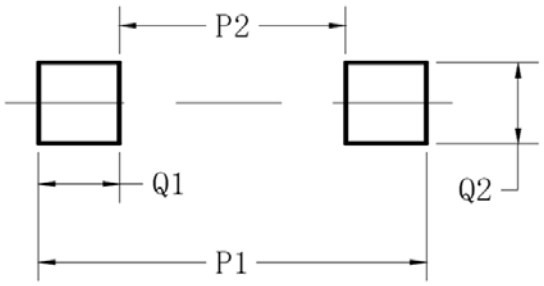
DO-214AB (SMC) Surface mount plastic package



Mechanical Data

1. **Case:** DO214AB/(SMC) Molded plastic
2. **Lead:** Solderable per MIL-STD-750, method 2026
3. **Epoxy:** UL 94V-0 rate flame retardant
3. **Polarity:** Color band denotes cathode end except Bipolar
4. **Mounting position:** Any

SUGGESTED PAD LAYOUT

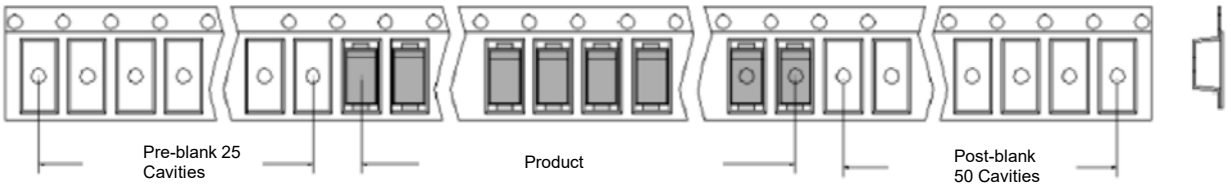


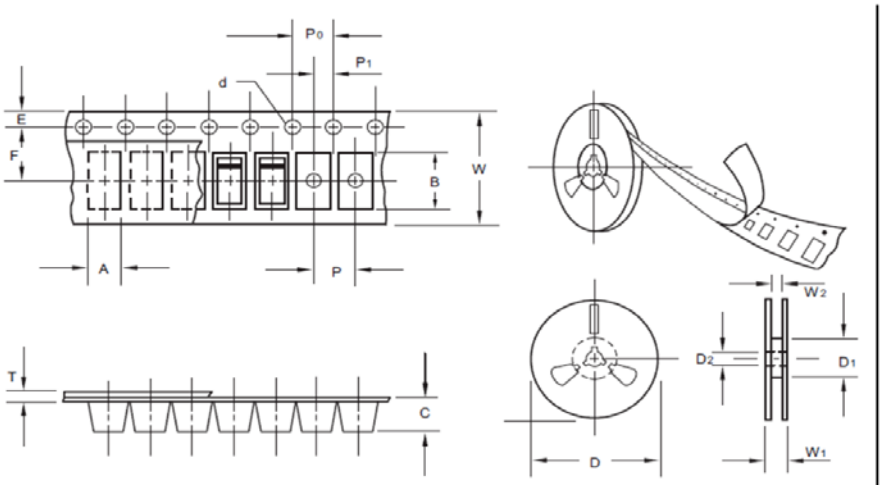
Dimensions in millimeters

Dim	DO-214AB(SMC)
P1	9.9
P2	3.84
Q1	3.03
Q2	3.82

PACKAGING SPECIFICATION OF SMC PRODUCT

1.Packing information



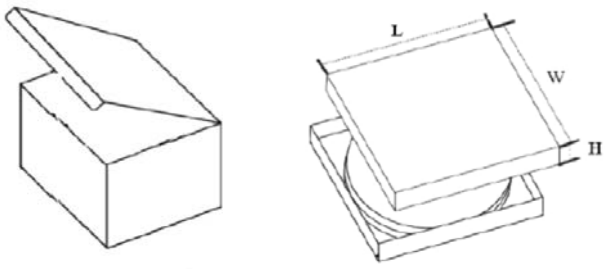


REF	mm
A	6.00±0.10
B	8.31±0.10
C	2.54±0.10
d	1.55±0.10
D	178/330.0±1.0
D1	54/75±1.0
D2	17±1.0
E	1.75±0.10
F	7.50±0.10
P	8.00±0.10
P0	4.00±0.10
P1	2.00±0.10
T	0.25±0.10
W	16.10±0.20
W1	22.7±1.5
W2	18.1±1.0

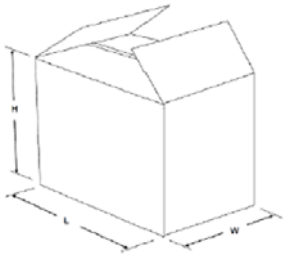
2. Reel packing

PACKAGE	REEL SIZE	REEL (Kpcs)	BOX (Kpcs)	INNER BOX (mm)	Shipping Box (Kpcs)	Shipping Box SIZE (mm)
SMC	7"	0.5	2	180*180*85	24	385*275*385
	13"	3	6	335*335*47	42	365*365*360

Inner Box for 7"(4 reels) & 13" (2 reels) diameter reel



Shipping Box for 7" & 13"



SMCJXXX
Rev03_100823SW

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

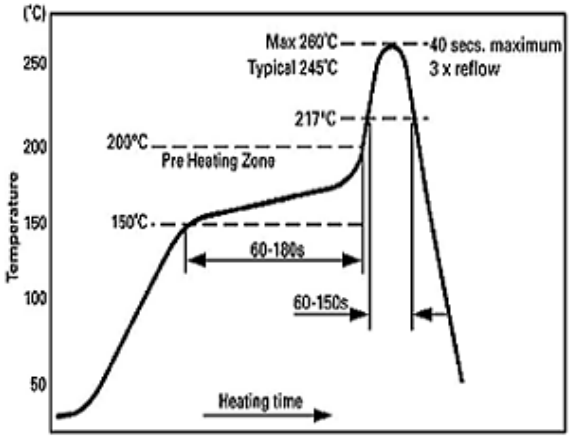
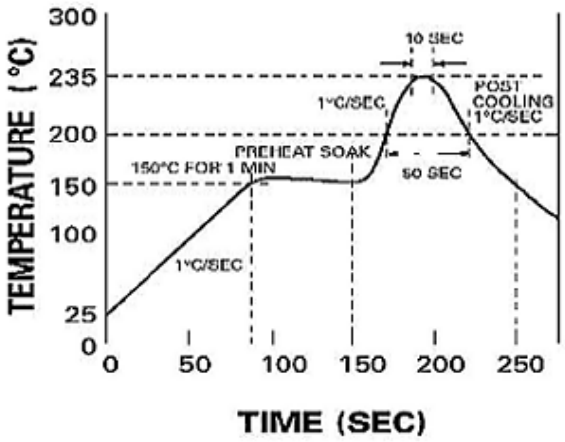


Figure 2

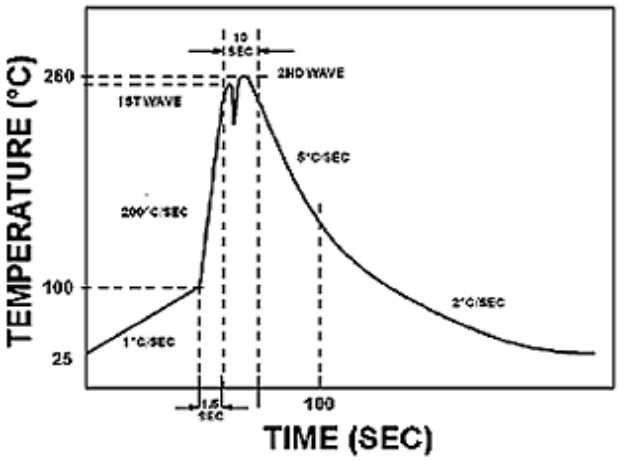


Reflow profiles in tabular form

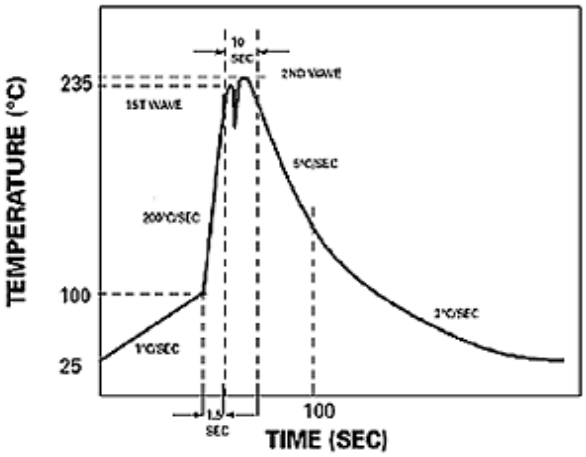
Profile Feature	Sn-Pb System	Pb-Free System
Average Ramp-Up Rate	~3°C/second	~3°C/second
Preheat – Temperature Range – Time	 150-170°C 60-180 seconds	 150-200°C 60-180 seconds
Time maintained above: – Temperature – Time	 200°C 30-50 seconds	 217°C 60-150 seconds
Peak Temperature	235°C	260°C max.
Time 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



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

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).
CDIL strives for continuous improvement and reserves the right to change the specifications of its products without prior notice.

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CIN No. U32109DL1964PTC004291

SMCJXXX
Rev03_100823SW