SEMICONDUCTOR

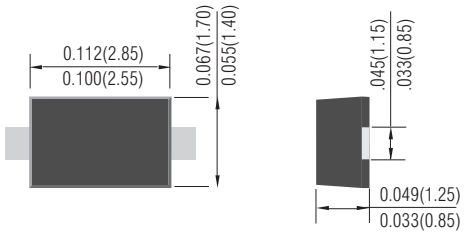
DATA SHEET

MBRL120S Thru MBRL140S

Features

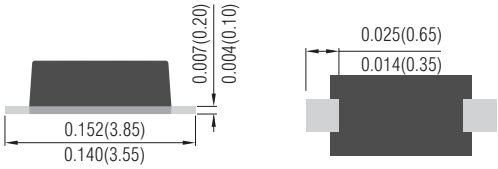
- Plastic package has Underwriters Laboratory Flammability Classification 94V-Outilizing Flame Retardant Epoxy Molding Compound.
- For surface mounted applications.
- Exceeds environmental standards of MIL-S-19500/228
- Low leakage current.
- ESD Range: Class 2B

SOD-123S Unit:inch(mm)



Mechanical data

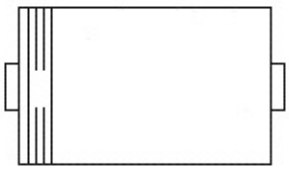
Case : Molded plastic,JEDEC SOD-123S
Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
Polarity : Indicated by cathode band
Mounting Position : Any



MAXIMUM RATINGS (AT T_A=25°C unless otherwise noted)

PARAMETER	CONDITIONS	Symbol	MIN.	TYP.	MAX.	UNIT
Forward rectified current	See Fig.1	I_O			1.0	A
Forward surge current	8.3ms single half sine-wave superimposed on rate load (JEDEC methode)	I_{FSM}			20	A
Reverse current	V_R = V_{RRM} T_A = 25°C	I_R			1.0	mA
	V_R = V_{RRM} T_A = 125°C				25	mA
Thermal resistance	Junction to ambient	R_{JA}		235		°C / W
Diode junction capacitance	f=1MHz and applied 4vDC reverse voltage	C_J		120		pF
Storage temperature		T_{STG}	-55		+150	°C
Power Dissipation		Pd		500		mW

SYMBOLS	V_{RRM} *1 (V)	V_{RMS} *2 (V)	V_R *3 (V)	V_F *4 (V)	Operating temperature (°C)
MBRL120S	20	14	20	0.38	-55 to +125
MBRL130S	30	21	30	0.38	
MBRL140S	40	28	40	0.40	





DEVICE MARKING

MBRL120S	L2 *5
MBRL130S	L3
MBRL140S	L4

*1 Repetitive peak reverse voltage
*2 RMS voltage
*3 Continuous reverse voltage
*4 Maximum forward voltage @ IF=1.0A
*5 DEVICE Marking

DEVICE CHARACTERISTICS

MBRL120S Thru MBRL140S

FIG.1-TYPICAL FORWARD CURRENT DERATING CURVE

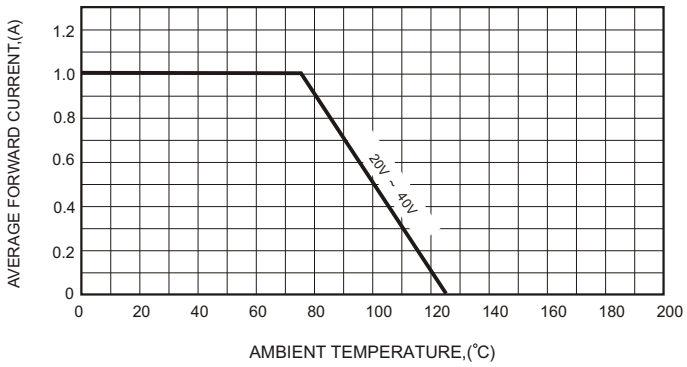


FIG.2-TYPICAL FORWARD CHARACTERISTICS

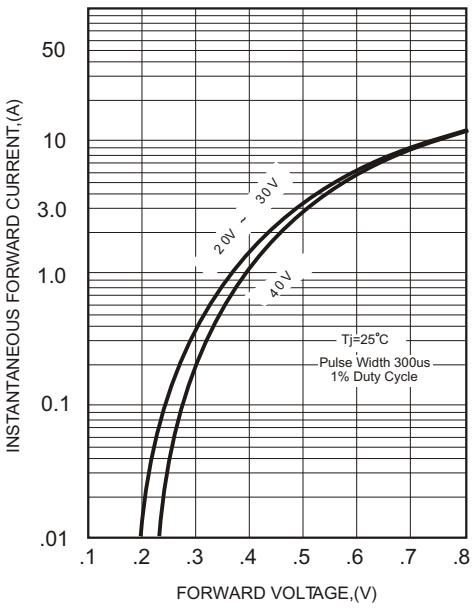


FIG.3-MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT

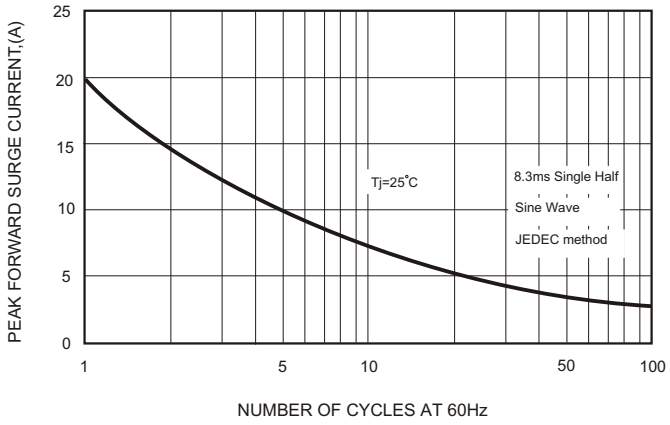


FIG.4-TYPICAL JUNCTION CAPACITANCE

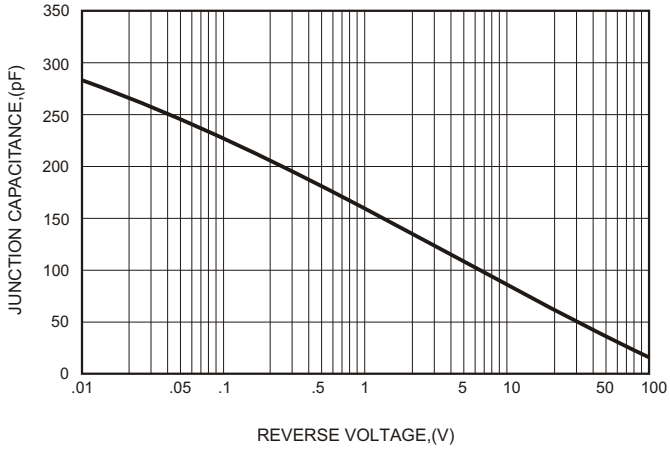
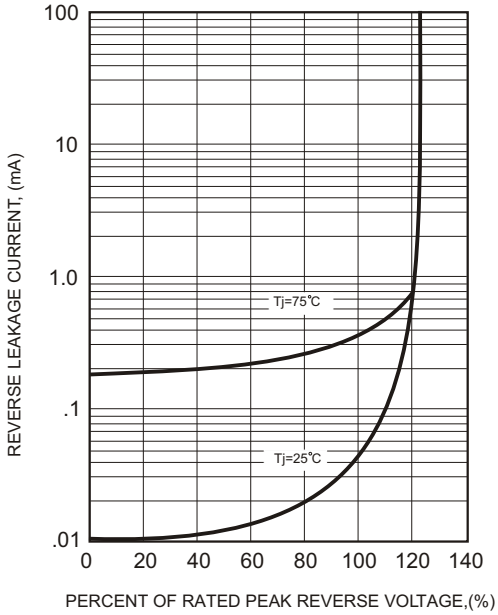
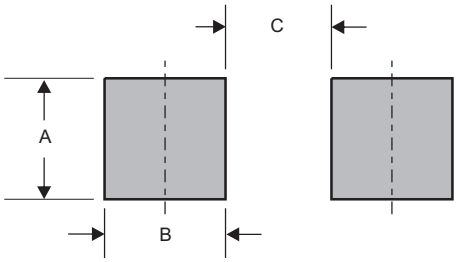


FIG.5 - TYPICAL REVERSE CHARACTERISTICS



Suggested solder pad layout

MBRL120S Thru MBRL140S



Dimensions in inches and (millimeters)

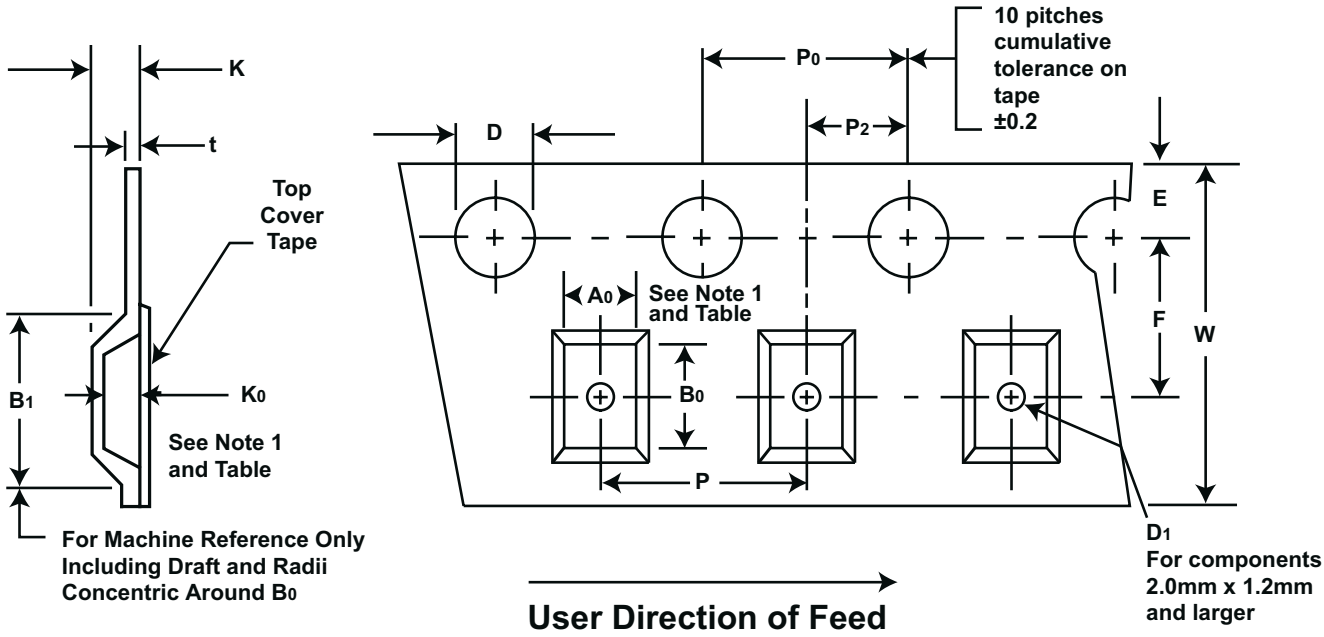
PACKAGE	A	B	C
SOD-123S	0.071 (1.80)	0.051 (1.30)	0.067 (1.70)

SOD-123S **Marking Information**



XX = Product Type Marking Code
XX : MBRL Low Forward Voltage Series.
XX : Repetitive peak reverse Voltage;
2-->20V
3-->30V
4-->40V
Ex:
L2:MBRL120S,Low Forward Voltage and Repetitive peak reverse Voltage, 20V.
L3:MBRL130S ,Low Forward Voltage and Repetitive peak reverse Voltage, 30V.
L4:MBRL140S,Low Forward Voltage and Repetitive peak reverse Voltage, 40V.

SURFACE MOUNT PACKAGING



EMBOSSED TAPE

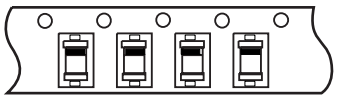
ALL DIMENSION IN MILLIMETERS

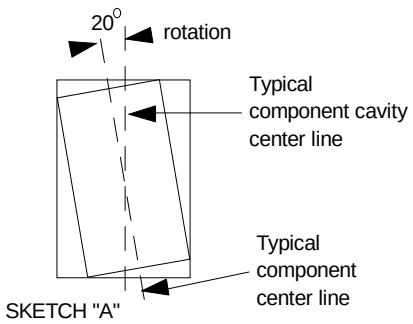
Tape Size	D	E	Po	t(Max)	Ao Bo Ko	Constant Dimensions
8, 12 , 16 mm	1.55+0.1 −0.0	1.75±0.10	4.0±0.10	0.400	See Note 1	

Product Type	Tape Size	B1 Max.	D1 Min.	F	K Max.	P2	R	W	P
SOT-23/323/363 SOD-123/323	8mm	4.5	1.0	3.5±0.05	2.4	2.0±0.05	25	8.0±0.3	4.0±0.1
SMA SMF	12mm	8.2	1.5	5.5±0.05	4.5	2.0±0.05	30	12.0±0.3	8.0±0.1
SMB MINI DIP									
SMC	16mm	12.1		7.5±0.1	3.29	2.0±0.1	40	16.0±0.3	8.0±0.1
DFS					3.70	4.0±0.1	50		12.0±0.1

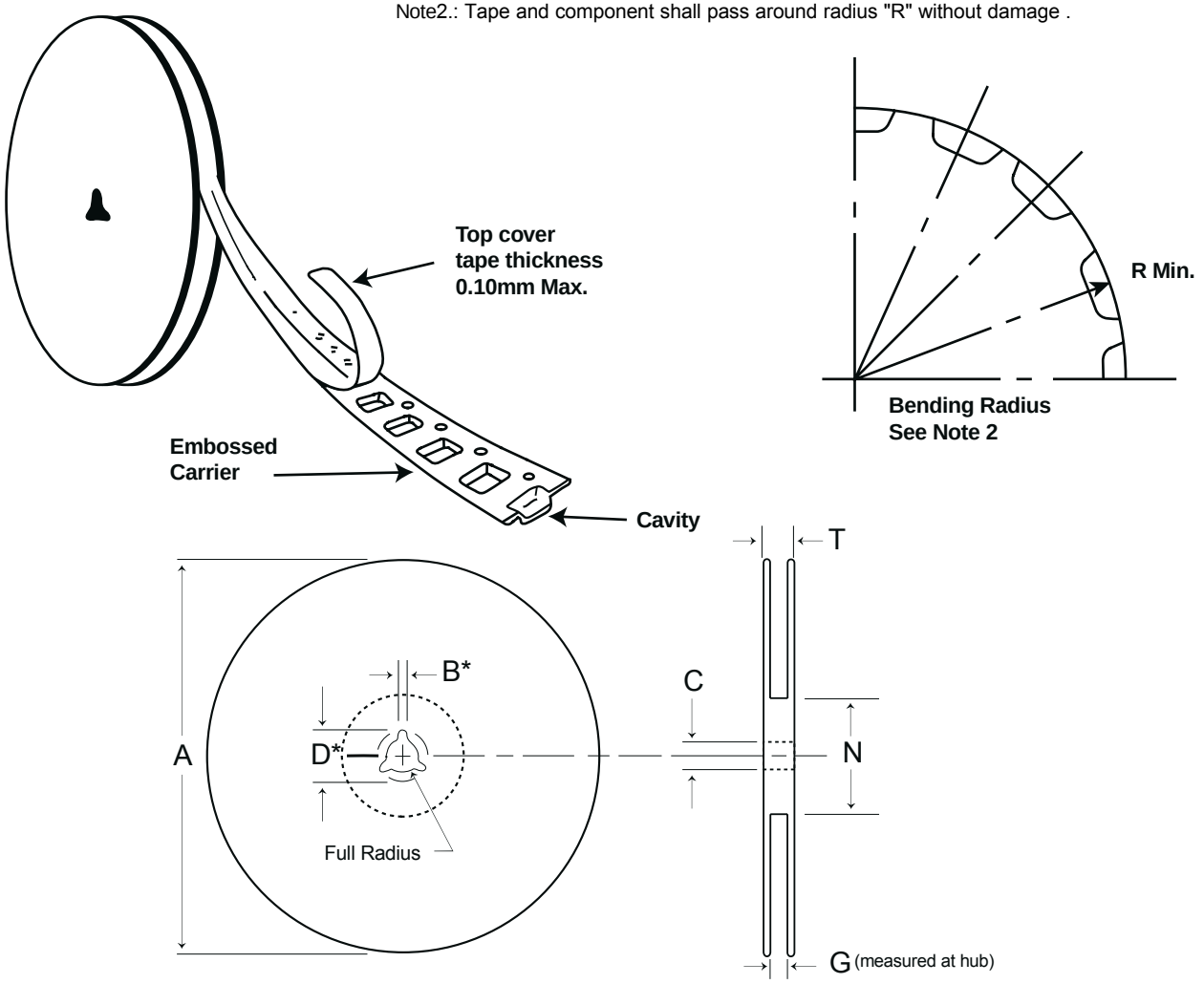
Note1.: A0B0K0 are determined by component size. The clearance between the component and the cavity must be within 0.05(.002) min. to 0.50 (.020) max. for 8 mm tape. 0.05(.002) min. to 0.65 (.025) max. for 12mm tape. 0.15 (0.006) min. to 0.90 (.035) max. for 16mm tape and 0.05(0.002) min. to 1.00 (.039) max. for 24 mm tape and larger. the component cannot rotate more than 20° within the determined cavity,see sketch "A" below

2. Comply with EIA-481-D specification.





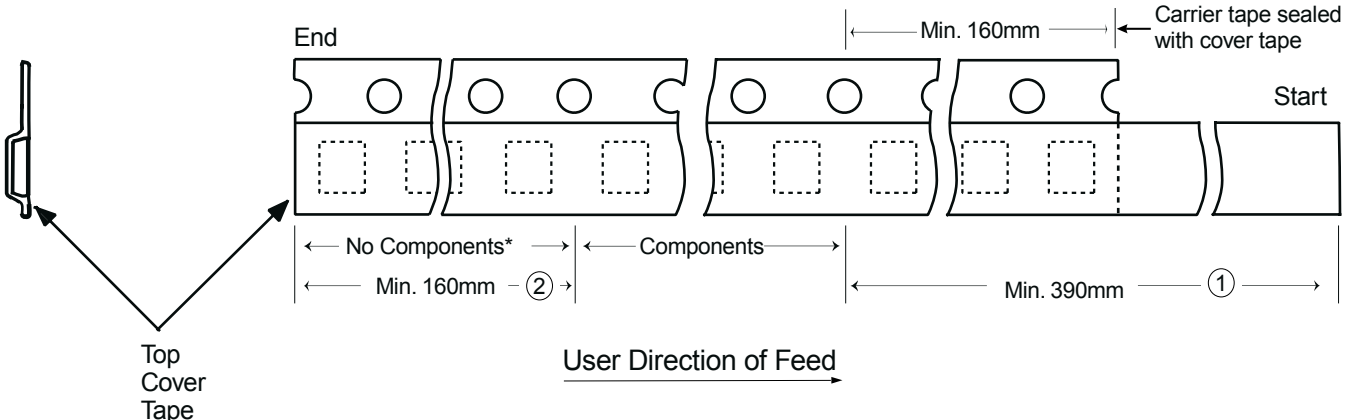
Note2.: Tape and component shall pass around radius "R" without damage .



* Drive spokes optional. If used, dimensions with asterisks apply.

ALL DIMENSION IN MILLMETERS

Tape Size	A Max.	B* Max.	C	D* Max.	N Min.	G	T Max.
8mm	178	1.5	13.0±0.2	20.2	50	8.4 +1.5 -0.0	14.4
12mm	330	1.5	13.0±0.2	20.2	50	12.4 +2.0 -0.0	18.4
16mm	330	1.5	13.0±0.2	20.2	50	16.4 +2.0 -0.1	22.4



Notes:
1. There shall be a leader of 230mm [9.05] minimum which may consist of carrier and/or cover tape or a start tape followed by a minimum of 160mm [6.30] of empty carrier tape sealed with cover tape.
2. There shall be a trailer of 160mm [6.30] minimum of empty carrier tape sealed with cover tape. The entire carrier tape must release from the reel hub as the last portion of the tape unwinds from the reel without damage to the carrier tape and the remaining components in the cavities.

PACKAGING

BOX SIZE:

PRODUCTS OUTLINE	DIMENSION (mm)			Q'TY PER BOX (PER REEL)
	A	B	C	
SOT-23/323/363 **SOD-123/323**	187	187	70	12000 (3000)
SMA/SMF	340	340	40	15000
SMB **MINI DIP** **SMC**				6000 (3000)
DFS				3000 (1500)

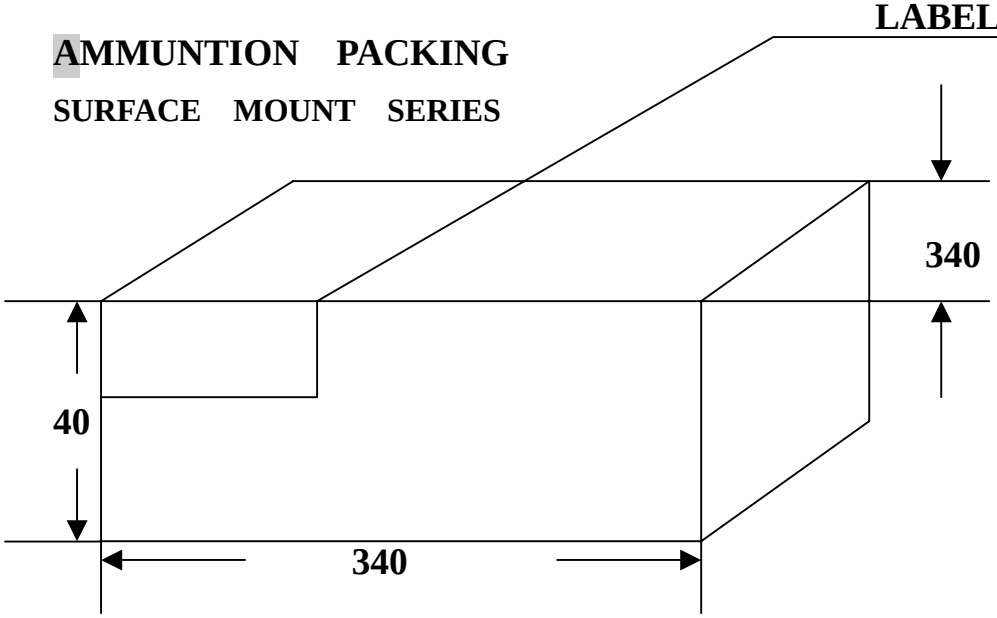
TUBE SIZE:

PRODUCTS OUTLINE	PACKAGEING SIZE (mm)		Q'TY PER BOX (PER TUBE)
	TUBE	BOX	
DFS	444*15*5.9	490*155*145	9000 (50)

AMMUNTION PACKING

SURFACE MOUNT SERIES

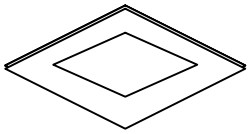
LABEL TYPE

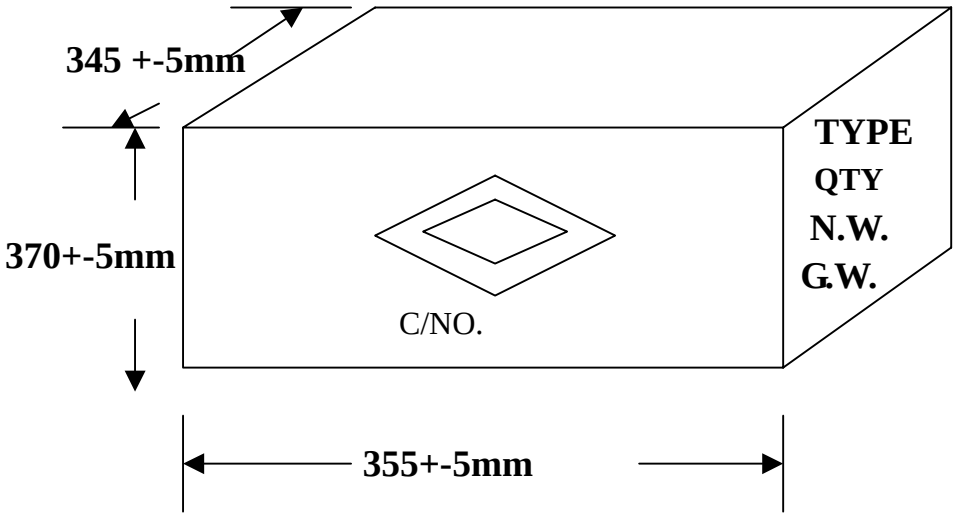


Box Dimensions :mm
Quantity per Box :7.5Kpcs/Roll,2Rolls/Box,15Kpcs/Box

CARTON

SHIPPING MARK

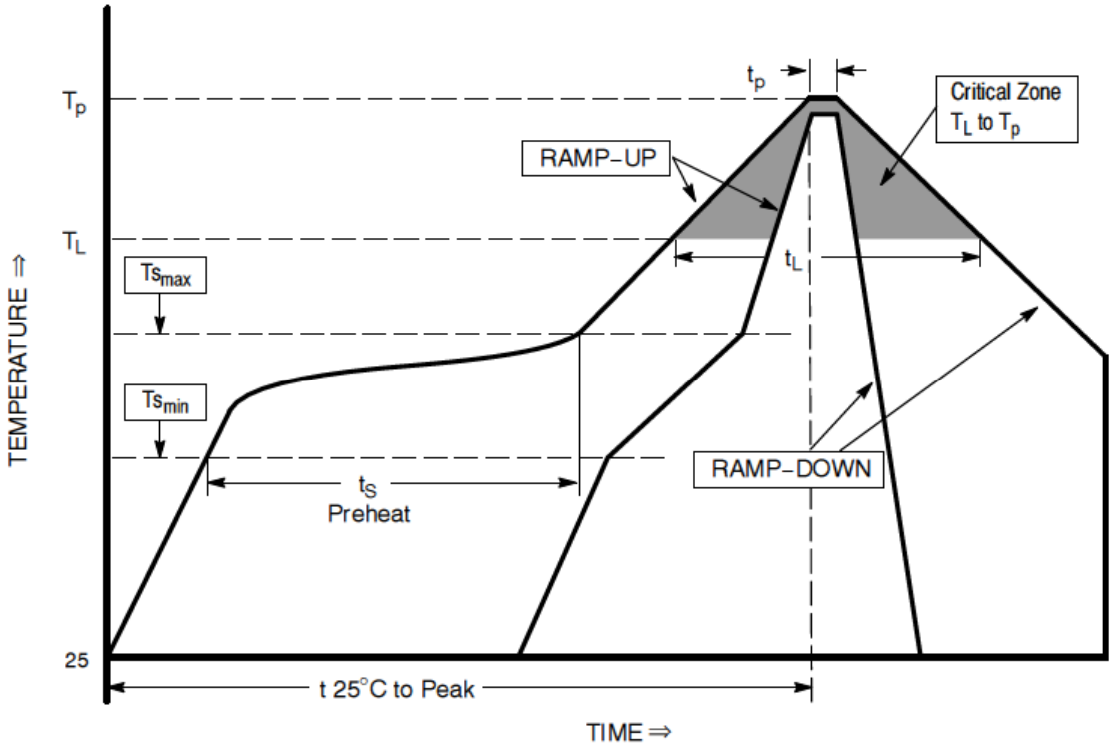




SIDEMARK

TYPE:
QTY:
N.W.:
G.W.:

Box dimensions: mm
Quantity per Box:15kpcs/Box. 8Box/carton,120kpcs/carton



Profile Feature	Pb-Free Assembly
Average Ramp-Up Rate (Ts_{max} to Tp)	3°C/second max
Preheat Temperature Min (Ts_{min}) Temperature Max (Ts_{max}) Time (ts_{min} to ts_{max})	 150°C 200°C 60–180 seconds
Time maintained above Temperature (T_T) Time (t_T)	 217°C 60–150 seconds
Peak Classification Temperature (Tp)	260°C +5/–0
Time within 5°C of actual Peak Temperature (tp)	20–40 seconds
Ramp-Down Rate	6°C/second max
Time 25°C to Peak Temperature	8 minutes max

Note : According to J-STD-020D.

1、Solder Composition：

Composition	Sn	Pb	Ag	Sb	Cu	Bi	Zn	Fe	Al	As	Cd
96.5Sn3.0Ag0.5Cu	rest	<0.1	3.0 ±0.2	<0.12	0.5 ±0.05	<0.1	<0.002	<0.02	<0.002	<0.03	<0.002

2、Solder Stick Parameter：

Liquid phase temp (℃)	221
Solid phase temp (℃)	216

Extension strength (kgf/mm^2)	3.7
Elongation	33

3、Solder Paste Parameter：

Item		Property		Testing Method
Liquid resistivity (Ω． m)		１×１0^{3}以上		JIS Z 3197 8.1.1 (1999)
Flux content (wt %)		10.5±0.03		JIS Z 3197 8.1.2(1999)
Halogen content (wt %)		0.07±0.02		JIS Z 3197 8.1.4.2.1(1999)
Copper mirror corrosion test		Accept		JIS Z 3197 8.1.4.2.3(1999)
Powder（u m）		GQ	G K	JIS Z 3284 Attach file 1
		Ball shape 10-38	Ball shape 20-45	
Melt point (℃)		216-221		DSC
Flux fluoride content		None		JIS Z 3284 Attach file 2
Insulate resistivity Ω	40℃ 90%	>1×10^{12}		JIS Z 3284 Attach file 3
	85℃ 85%	>5×10^8		
Flux residuum corrosion test		No corrosion		JIS Z 3284 Attach file 4
Printing test		GQ	GK	JIS Z 3284 Attach file 5
		0.4mm pitch	0.5mm pitch	
Visicosity (Pa.s)		180±20		JIS Z 3284 Attach file 6
Printing cave		None 0.2mm solder bridge		JIS Z 3284 Attach file 7
Heating cave		None 0.2mm solder bridge		JIS Z 3284 Attach file 8
Adhesive	Beginning	１． ＞０ Ｎ		JIS Z 3284 Attach file 9
	After 24 hrs.	１． ＞０ Ｎ		
Dewetting		2 grade（copper plate）		JIS Z 3284 Attach file 10
Solder ball test	Beginning	１－３ grade		JIS Z 3284 Attach file 11
	After 24 hrs.	１－３ grade		
Residuum adhesive after soldering		None		JIS Z 3284 Attach file 12
Transfer test		None		JIS Z 3284 Attach file 13