

Transient Voltage Suppression Diodes: SMAJ Series

SMD Type 400 W



■ Features

1. For surface mounted applications
2. RoHS compliant and halogen-free
3. Reliable low cost construction utilizing molded plastic technique
4. Glass passivated chip junction
5. Both bi-directional and uni-directional devices are available
6. Typical IR less than 1μA above 11V
7. Fast response time
8. Excellent clamping capacity
9. 400W peak pulse power capability with a 10/1000 μs waveform, repetition rate (duty cycle): 0.01%



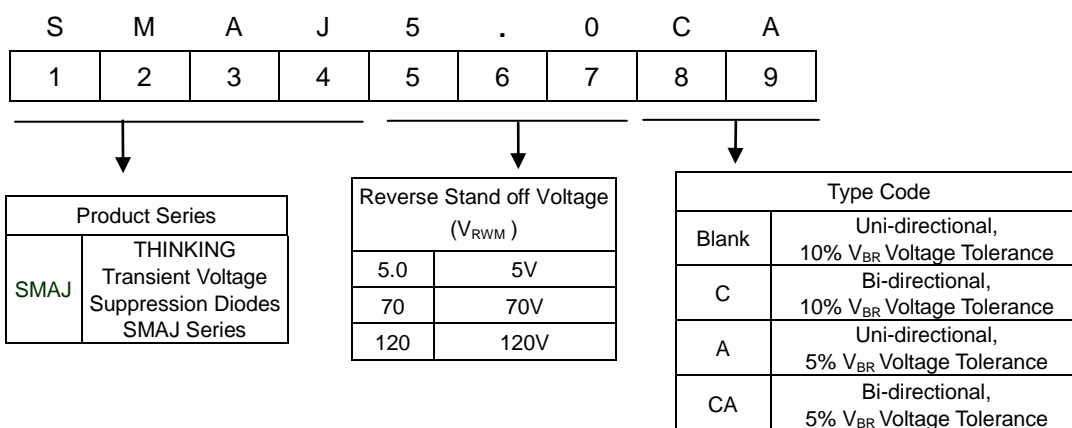
■ Recommended Applications

1. Telecommunication
2. Computer
3. Industrial device
4. Consumer electronic device

■ Mechanical Data

1. Case: DO-214AC (SMA), molded plastic meets UL flammability rating 94V-0
2. Terminal: Matte Tin-plated leads, solderable per MIL-STD-750, Method 2026.
3. Polarity: The band denotes cathode (Note: no polarity indicator for bi-directional devices)

■ Part Number Code



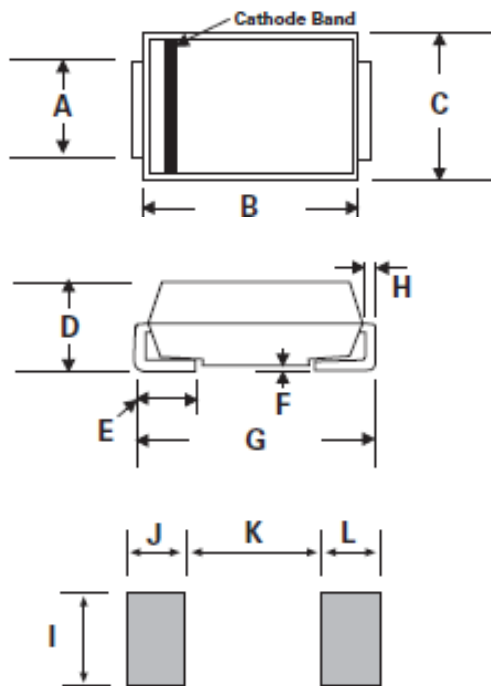
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Structures and Dimensions

SMA/DO-214AC



Item	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	1.25	1.65	0.049	0.065
B	3.99	4.60	0.157	0.181
C	2.40	2.80	0.094	0.110
D	1.90	2.30	0.074	0.090
E	0.76	1.52	0.030	0.060
F	-	0.203	-	0.008
G	4.80	5.28	0.188	0.208
H	0.152	0.305	0.006	0.012
I	1.80	-	0.070	-
J/L	2.10	-	0.082	-
K	-	2.30	-	0.090

Maximum Rating ($T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak pulse power dissipation at $T_A=25^\circ\text{C}$ by 10/1000 μs waveform (Note1, Fig.1)	P_{PPM}	400	W
Peak pulse current of on 10/1000 μs waveform.(Note1, Fig.3)	I_{PPM}	See Table	A
Peak forward surge current, 8.3ms single half sine wave on rated load (Note 2)	I_{FSM}	40	A
Steady state power dissipation at $T_A=50^\circ\text{C}$ (Fig.5).	$P_{M(AV)}$	3.3	W
Operating junction and storage temperature range	T_J, T_{STG}	-55~+150	$^\circ\text{C}$

Note: 1. Please refer to Fig. 3 for non-repetitive current pulse, and Fig. 2 for derated above $T_A = 25^\circ\text{C}$

2. 8.3ms single half sine-wave, or square wave that has a maximum of 4 pulses per minute.

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

Part No. (Uni)	Part No. (Bi)	Reverse Stand off Voltage	Breakage Voltage V_{BR} @ I_T		Test Current	Maximum Clamping Voltage V_C @ I_{pp}	Maximum Peak Pulse Current	Maximum Reverse Leakage I_R @ V_{RWM}	Marking Code	
		V_{RWM} (V)	Min(V)	Max(V)	I_T (mA)	V_C (V)	I_{pp} (A)	I_R (μ A)	UNI	BI
SMAJ5.0A	SMAJ5.0CA	5.0	6.40	7.00	10	9.2	43.5	800	AE	WE
SMAJ6.0A	SMAJ6.0CA	6.0	6.67	7.37	10	10.3	38.8	800	AG	WG
SMAJ6.5A	SMAJ6.5CA	6.5	7.22	7.98	10	11.2	35.7	500	AK	WK
SMAJ7.0A	SMAJ7.0CA	7.0	7.78	8.60	10	12.0	33.3	200	AM	WM
SMAJ7.5A	SMAJ7.5CA	7.5	8.33	9.21	1	12.9	31.0	100	AP	WP
SMAJ8.0A	SMAJ8.0CA	8.0	8.89	9.83	1	13.6	29.4	50	AR	WR
SMAJ8.5A	SMAJ8.5CA	8.5	9.44	10.4	1	14.4	27.8	20	AT	WT
SMAJ9.0A	SMAJ9.0CA	9.0	10.0	11.1	1	15.4	26.0	10	AV	WV
SMAJ10A	SMAJ10CA	10	11.1	12.3	1	17.0	23.5	5	AX	WX
SMAJ11A	SMAJ11CA	11	12.2	13.5	1	18.2	22.0	1	AZ	WZ
SMAJ12A	SMAJ12CA	12	13.3	14.7	1	19.9	20.1	1	BE	XE
SMAJ13A	SMAJ13CA	13	14.4	15.9	1	21.5	18.6	1	BG	XG
SMAJ14A	SMAJ14CA	14	15.6	17.2	1	23.2	17.2	1	BK	XK
SMAJ15A	SMAJ15CA	15	16.7	18.5	1	24.4	16.4	1	BM	XM
SMAJ16A	SMAJ16CA	16	17.8	19.7	1	26.0	15.4	1	BP	XP
SMAJ17A	SMAJ17CA	17	18.9	20.9	1	27.6	14.5	1	BR	XR
SMAJ18A	SMAJ18CA	18	20.0	22.1	1	29.2	13.7	1	BT	XT
SMAJ20A	SMAJ20CA	20	22.2	24.5	1	32.4	12.3	1	BV	XV
SMAJ22A	SMAJ22CA	22	24.4	26.9	1	35.5	11.3	1	BX	XX
SMAJ24A	SMAJ24CA	24	26.7	29.5	1	38.9	10.3	1	BZ	XZ
SMAJ26A	SMAJ26CA	26	28.9	31.9	1	42.1	9.5	1	CE	YE
SMAJ28A	SMAJ28CA	28	31.1	34.4	1	45.4	8.8	1	CG	YG
SMAJ30A	SMAJ30CA	30	33.3	36.8	1	48.4	8.3	1	CK	YK
SMAJ33A	SMAJ33CA	33	36.7	40.6	1	53.3	7.5	1	CM	YM
SMAJ36A	SMAJ36CA	36	40.0	44.2	1	58.1	6.9	1	CP	YP
SMAJ40A	SMAJ40CA	40	44.4	49.1	1	64.5	6.2	1	CR	YR
SMAJ43A	SMAJ43CA	43	47.8	52.8	1	69.4	5.8	1	CT	YT
SMAJ45A	SMAJ45CA	45	50.0	55.3	1	72.7	5.5	1	CV	YV
SMAJ48A	SMAJ48CA	48	53.3	58.9	1	77.4	5.2	1	CX	YX

Note: For bidirectional type having V_{RWM} of 10 volts and under, the I_R limit is doubled.

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Part No. (Uni)	Part No. (Bi)	Reverse Stand off Voltage	Breakage Voltage V_{BR} @ I_T		Test Current	Maximum Clamping Voltage V_C @ I_{pp}	Maximum Peak Pulse Current	Maximum Reverse Leakage I_R @ V_{RWM}	Marking Code	
			V_{RWM} (V)	Min(V)					Max(V)	I_T (mA)
SMAJ51A	SMAJ51CA	51	56.7	62.7	1	82.4	4.9	1	CZ	YZ
SMAJ54A	SMAJ54CA	54	60.0	66.3	1	87.1	4.6	1	RE	ZE
SMAJ58A	SMAJ58CA	58	64.4	71.2	1	93.6	4.3	1	RG	ZG
SMAJ60A	SMAJ60CA	60	66.7	73.7	1	96.8	4.1	1	RK	ZK
SMAJ64A	SMAJ64CA	64	71.1	78.6	1	103	3.9	1	RM	ZM
SMAJ70A	SMAJ70CA	70	77.8	86.0	1	113	3.5	1	RP	ZP
SMAJ75A	SMAJ75CA	75	83.3	92.1	1	121	3.3	1	RR	ZR
SMAJ78A	SMAJ78CA	78	86.7	95.8	1	126	3.2	1	RT	ZT
SMAJ85A	SMAJ85CA	85	94.4	104	1	137	2.9	1	RV	ZV
SMAJ90A	SMAJ90CA	90	100	111	1	146	2.7	1	RX	ZX
SMAJ100A	SMAJ100CA	100	111	123	1	162	2.5	1	RZ	ZZ
SMAJ110A	SMAJ110CA	110	122	135	1	177	2.3	1	SE	VE
SMAJ120A	SMAJ120CA	120	133	147	1	193	2.1	1	SG	VG
SMAJ130A	SMAJ130CA	130	144	159	1	209	1.9	1	SK	VK
SMAJ150A	SMAJ150CA	150	167	185	1	243	1.6	1	SM	VM
SMAJ160A	SMAJ160CA	160	178	197	1	259	1.5	1	SP	VP
SMAJ170A	SMAJ170CA	170	189	209	1	275	1.5	1	SR	VR
SMAJ180A	SMAJ180CA	180	201	222	1	292	1.4	1	ST	VT
SMAJ190A	SMAJ190CA	190	209	243	1	308	1.3	1	SV	VV
SMAJ200A	SMAJ200CA	200	224	247	1	324	1.2	1	SW	VW
SMAJ220A	SMAJ220CA	220	246	272	1	356	1.1	1	SX	VX
SMAJ250A	SMAJ250CA	250	279	309	1	405	1.0	1	SZ	VZ
SMAJ300A	SMAJ300CA	300	335	371	1	486	0.8	1	DE	HE
SMAJ350A	SMAJ350CA	350	391	432	1	567	0.7	1	DG	HG
SMAJ400A	SMAJ400CA	400	447	494	1	648	0.6	1	DK	HK
SMAJ440A	SMAJ440CA	440	492	543	1	713	0.6	1	DM	HM

Note: For bidirectional type having V_{RWM} of 10 volts and under, the I_R limit is doubled.

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■ Rate and Characteristic Curve ($T_A=25^\circ\text{C}$ unless otherwise noted)

FIG.1 - PULSE RATING CURVE

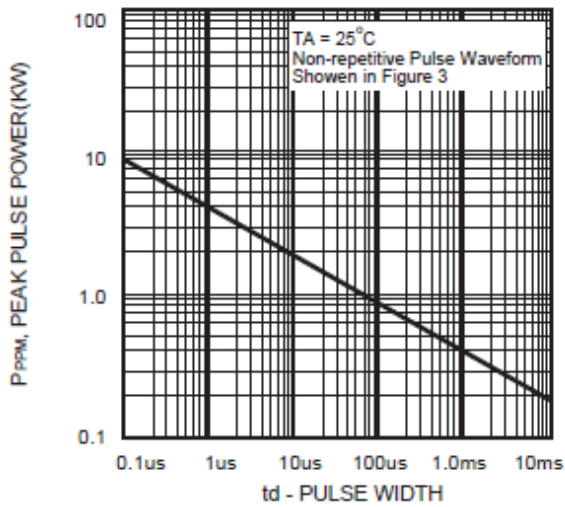


FIG.2 - PULSE DERATING CURVE

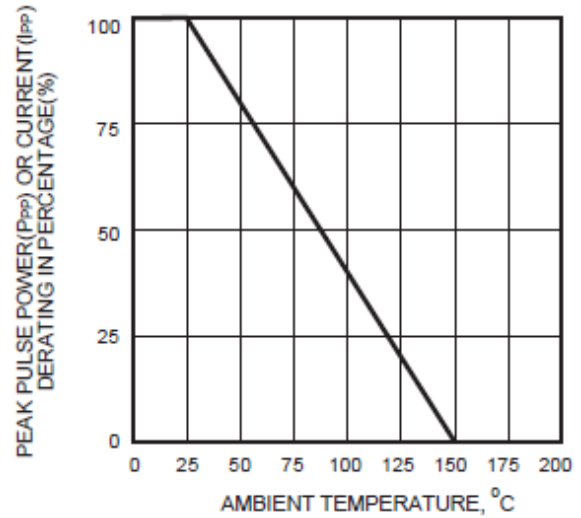


FIG.3 - PULSE WAVEFORM

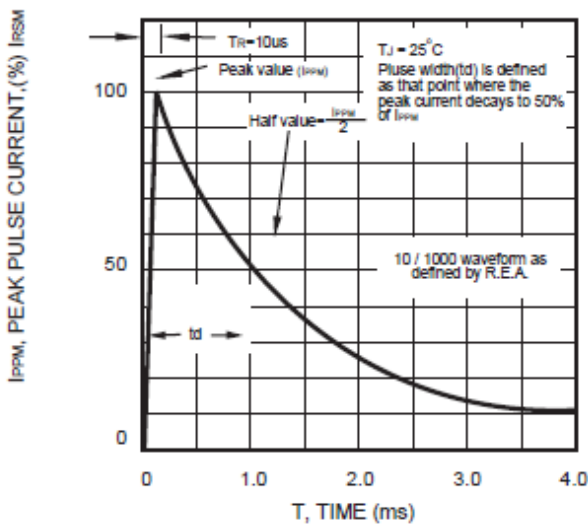


FIG.4 - TYPICAL JUNCTION CAPACITANCE

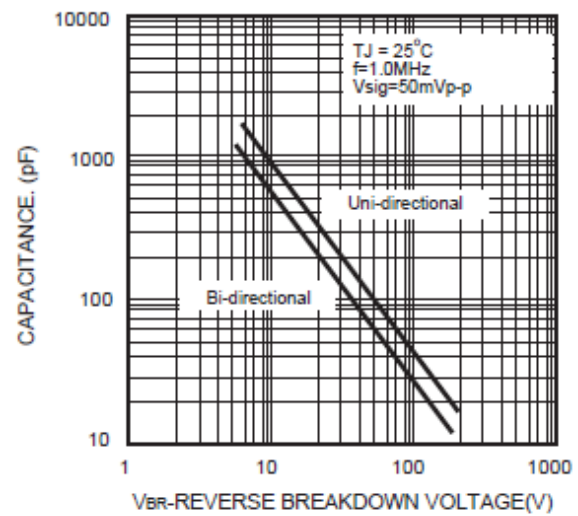
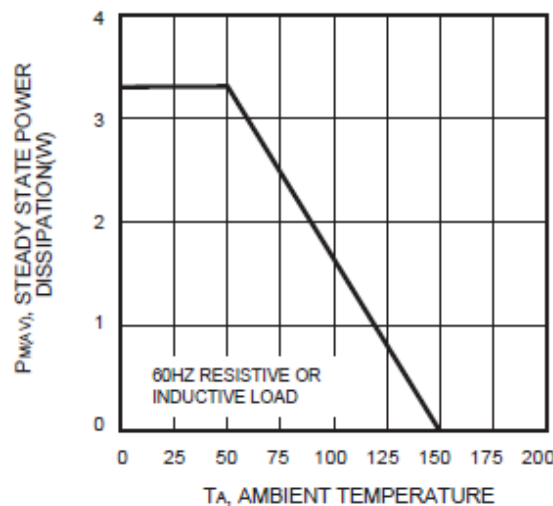


FIG.5 - STEADY STATE POWER DERATING CURVE

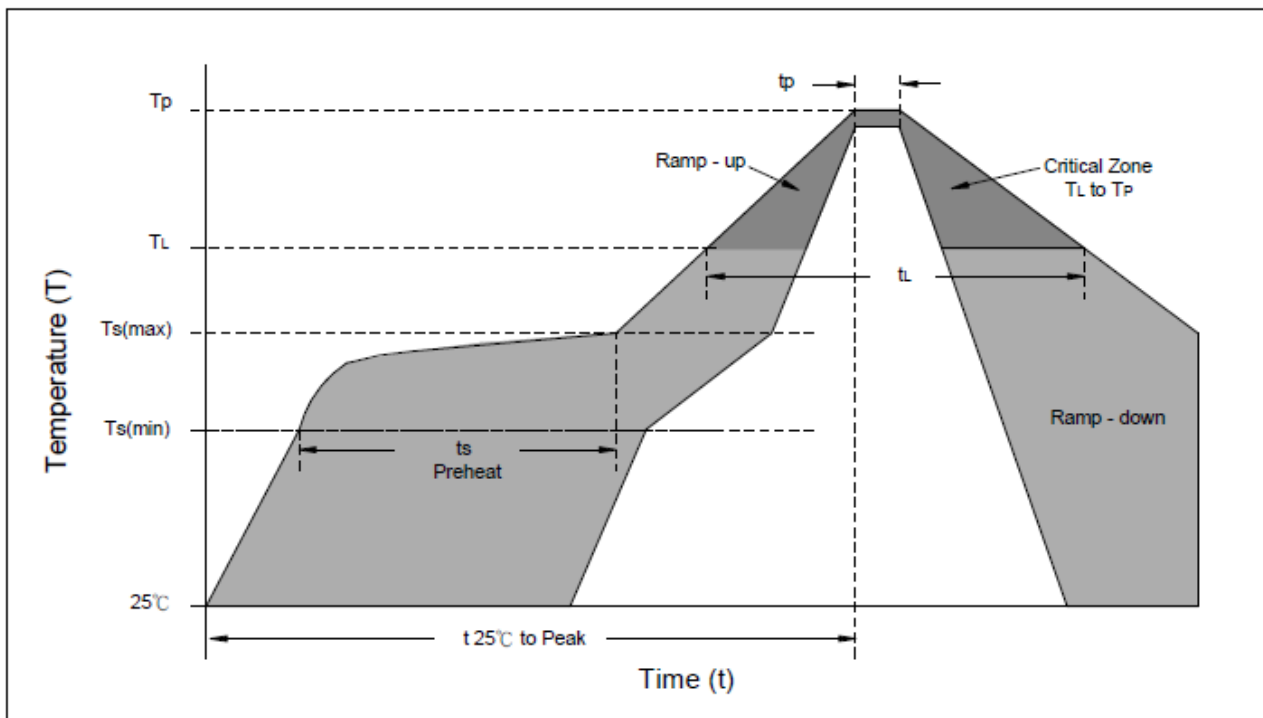


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■ Soldering Recommendation



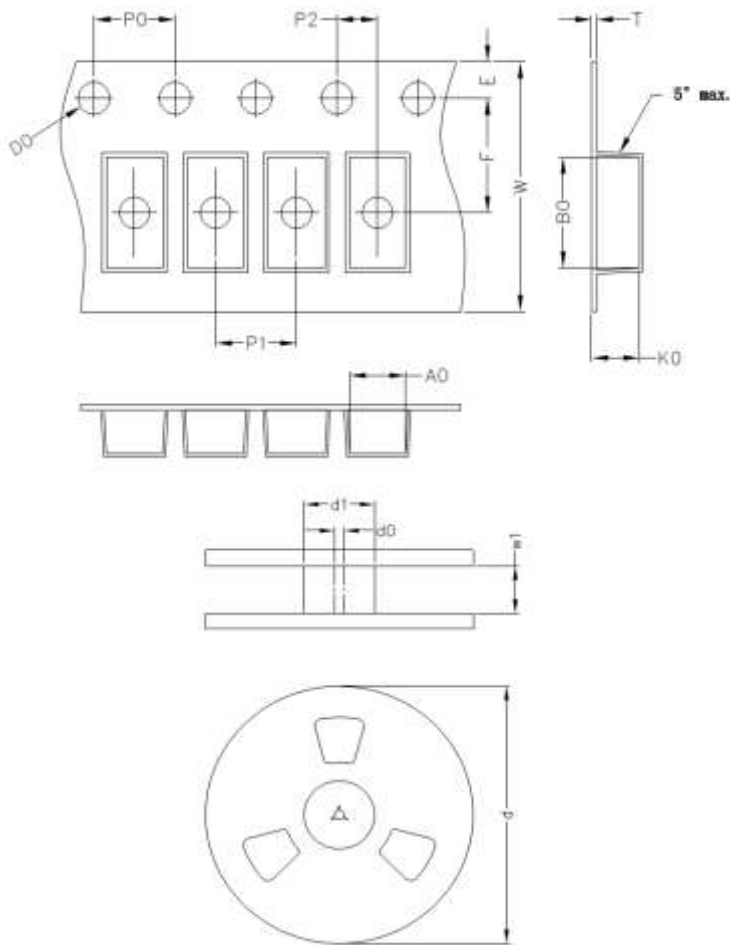
Reflow Condition	Lead-free assembly
Preheat -Temperature Min(Ts min) -Temperature Min(Ts max) -Time (min to max) (ts)	150°C 200°C 60 – 180 seconds
Average ramp up rate -Temperature Liquidus (TL) to peak	3°C/second max
Ts(max) to TL -Ramp-up Rate	3°C/second max.
Reflow -Temperature Liquidus (TL) -Time (tL)	217°C 60 – 150 seconds
Peak Temperature (TP)	260°C
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(TP)	8 minutes max.
Do not exceed	260°C

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■ Packaging



Item	Symbol	DO-214AC (SMA) Unit: mm
Carrier width	A0	2.80
Carrier length	B0	5.33
Carrier depth	K0	2.36
Sprocket hole	D0	1.55
Sprocket hole position	E	1.75
Punch hole position	F	5.50
Sprocket hole pitch	P0	4.00
Carrier pitch	P1	4.00
Embossment center	P2	2.00
Tape thickness	T	0.22±0.05
Tape width	W	12.00
Reel outside diameter	d (13")	330.0
Reel inner diameter	d1	75
Feed hole diameter	d0	13.50
Reel inner width	w1	13.50

Note: The tolerance of carrier tape and top cover is ± 0.1 mm, and the tolerance of reel is ± 2 mm

■ Quantity

Package Type	Reel Size	Reel	Inner Box
	inch	Kpcs	Kpcs
DO-214AC	13	5	10

■ Warehouse Storage Conditions of product

- Storage Condition:
 1. Storage Temperature: $-10^{\circ}\text{C} \sim +40^{\circ}\text{C}$
 2. Relative Humidity: $\leq 75\% \text{RH}$
 3. Keep away from corrosive atmosphere and sunlight.
- Period of Storage: 1 year.