

P6SMB series



TRANSIENT VOLTAGE SUPPRESSOR DIODES

Voltage: 6.8~600 Volts

Current: 600 W

Package: SMB

Features

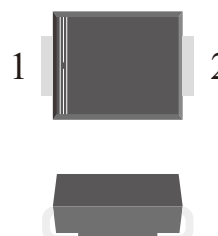
- NH'S Glass Passivated Chip Technology
- Wave And Reflow Solderable
- Low Reverse Leakage
- Very Fast Response Time
- Excellent Clamping Capability
- 10/1000 μ s Waveform, Repetition Rate(Duty Cycle):0.01 %
- ESD Immunity Acc. IEC 61000-4-2

Typical Applications

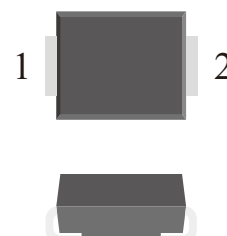
- Power Port
- Communication And Data Port
- ESD Protection And Automotive Electronics
- Industrial Control and Automation

Diagram:

UNI

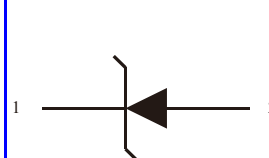


BI

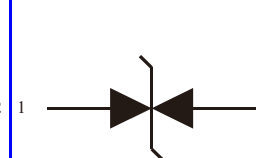


Polarity:

UNI



BI



Single Phase, Half Wave, 60Hz, Resistive Or Inductive Load. For Capacitive Load, Derate Current By 20%

Maximum Ratings (Ta=25°C Unless Otherwise Specified)

Parameter	Test Conditions	Symbol	Value	Unit
Non-Repetitive Peak Pulse Power Dissipation	10/1000 μ s Waveform	P_{PP}	600	W
Peak Pulse Current	10/1000 μ s Waveform	I_{PP}	See Table-1	A
Peak Forward Surge Current	8.3ms Single Half Sine-Wave Superimposed On Rate Load	I_{FSM}	100	A
Power Dissipation On Infinite Heatsink	$T_L = 75.0\text{ }^{\circ}\text{C}$	P_D	5.0	W
Maximum Instantaneous Forward Voltage	$I_F = 50.0\text{ A}, V_{BR} < 200\text{ V}$	V_F	3.5	V
	$I_F = 50.0\text{ A}, V_{BR} > 201\text{ V}$		6.5	

Thermal Characteristics (Ta=25°C Unless Otherwise Specified)

Parameter	Test Conditions	Symbol	Value	Unit
Operating Junction Temperature Range		T_J	-55 ~ 150	$^{\circ}\text{C}$
Storage Temperature Range		T_{STG}	-55 ~ 150	
Thermal Resistance Junction To Ambient With Steady-State	Device Mounted On 1 in2 FR-4 Board With 2oz. Copper	$R_{\theta JA}$	100	$^{\circ}\text{C/W}$

C-V Curve Chart

Symbol Instruction

UNI	BI	Symbol	Instruction
		I_{PP}	Maximum Reverse Peak Pulse Current
		V_C	Clamping Voltage @ I_{PP}
		P_{PP}	Peak Power Dissipation
		V_{RWM}	Working Peak Reverse Voltage
		I_R	Maximum Reverse Leakage Current @ V_{RWM}
		V_{BR}	Breakdown Reverse Voltage
		I_T	Test Current @ V_{RWM}
		I_F	Maximum Average Forward Rectified Current
		V_F	Maximum Instantaneous Forward Voltage
		C_J	Junction Capacitance @ $V_R = 0$ and $f = 1.0\text{ MHz}$

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TRANSIENT VOLTAGE SUPPRESSOR DIODES
Table-1.ELECTRICAL CHARACTERISTICS (TA=25°C unless otherwise noted)

Part Number		Device Marking Code		Reverse Stand-off Voltage	Breakdown Voltage VBR @ IT		Test Current	Max. Clamping Voltage @ IPP	Max. Peak Pulse Current	Max. Reverse Leakage @ VRWM
UNI-POLAR	BI-POLAR	UNI	BI	VRWM(V)	Min.(V)	Max.(V)	IT(mA)	VC Max.(V)	IPP(A)	IR(uA)
P6SMB6.8A	P6SMB6.8CA	6V8A	6V8C	5.8	6.45	7.14	10	10.5	57.14	1000
P6SMB7.5A	P6SMB7.5CA	7V5A	7V5C	6.4	7.13	7.88	10	11.3	53.10	500
P6SMB8.2A	P6SMB8.2CA	8V2A	8V2C	7.0	7.79	8.61	10	12.1	49.59	200
P6SMB9.1A	P6SMB9.1CA	9V1A	9V1C	7.8	8.65	9.55	1	13.4	44.78	50
P6SMB10A	P6SMB10CA	10A	10C	8.6	9.50	10.50	1	14.5	41.38	10
P6SMB11A	P6SMB11CA	11A	11C	9.4	10.50	11.60	1	15.6	38.46	5
P6SMB12A	P6SMB12CA	12A	12C	10.2	11.40	12.60	1	16.7	35.93	5
P6SMB13A	P6SMB13CA	13A	13C	11.1	12.40	13.70	1	18.2	32.97	1
P6SMB15A	P6SMB15CA	15A	15C	12.8	14.30	15.80	1	21.2	28.30	1
P6SMB16A	P6SMB16CA	16A	16C	13.6	15.20	16.80	1	22.5	26.67	1
P6SMB18A	P6SMB18CA	18A	18C	15.3	17.10	18.90	1	25.5	23.53	1
P6SMB20A	P6SMB20CA	20A	20C	17.1	19.00	21.00	1	27.7	21.66	1
P6SMB22A	P6SMB22CA	22A	22C	18.8	20.90	23.10	1	30.6	19.61	1
P6SMB24A	P6SMB24CA	24A	24C	20.5	22.80	25.20	1	33.2	18.07	1
P6SMB27A	P6SMB27CA	27A	27C	23.1	25.70	28.40	1	37.5	16.00	1
P6SMB30A	P6SMB30CA	30A	30C	25.6	28.50	31.50	1	41.4	14.49	1
P6SMB33A	P6SMB33CA	33A	33C	28.2	31.40	34.70	1	45.7	13.13	1
P6SMB36A	P6SMB36CA	36A	36C	30.8	34.20	37.80	1	49.9	12.02	1
P6SMB39A	P6SMB39CA	39A	39C	33.3	37.10	41.00	1	53.9	11.13	1
P6SMB43A	P6SMB43CA	43A	43C	36.8	40.90	45.20	1	59.3	10.12	1
P6SMB47A	P6SMB47CA	47A	47C	40.2	44.70	49.40	1	64.8	9.26	1
P6SMB51A	P6SMB51CA	51A	51C	43.6	48.50	53.60	1	70.1	8.56	1
P6SMB56A	P6SMB56CA	56A	56C	47.8	53.20	58.80	1	77.0	7.79	1
P6SMB62A	P6SMB62CA	62A	62C	53.0	58.90	65.10	1	85.0	7.06	1
P6SMB68A	P6SMB68CA	68A	68C	58.1	64.60	71.40	1	92.0	6.52	1
P6SMB75A	P6SMB75CA	75A	75C	64.1	71.30	78.80	1	103.0	5.83	1
P6SMB82A	P6SMB82CA	82A	82C	70.1	77.90	86.10	1	113.0	5.31	1
P6SMB91A	P6SMB91CA	91A	91C	77.8	86.50	95.50	1	125.0	4.80	1
P6SMB100A	P6SMB100CA	100A	100C	85.5	95.00	105.00	1	137.0	4.38	1
P6SMB110A	P6SMB110CA	110A	110C	94.0	105.00	116.00	1	152.0	3.95	1
P6SMB120A	P6SMB120CA	120A	120C	102.0	114.00	126.00	1	165.0	3.64	1
P6SMB130A	P6SMB130CA	130A	130C	111.0	124.00	137.00	1	179.0	3.35	1
P6SMB150A	P6SMB150CA	150A	150C	128.0	143.00	158.00	1	207.0	2.90	1
P6SMB160A	P6SMB160CA	160A	160C	136.0	152.00	168.00	1	219.0	2.74	1
P6SMB170A	P6SMB170CA	170A	170C	145.0	162.00	179.00	1	234.0	2.56	1
P6SMB180A	P6SMB180CA	180A	180C	154.0	171.00	189.00	1	246.0	2.44	1
P6SMB200A	P6SMB200CA	200A	200C	171.0	190.00	210.00	1	274.0	2.19	1
P6SMB220A	P6SMB220CA	220A	220C	185.0	209.00	231.00	1	328.0	1.83	1
P6SMB250A	P6SMB250CA	250A	250C	214.0	237.00	263.00	1	344.0	1.74	1
P6SMB300A	P6SMB300CA	300A	300C	256.0	285.00	315.00	1	414.0	1.45	1
P6SMB350A	P6SMB350CA	350A	350C	300.0	332.00	368.00	1	482.0	1.24	1

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UNI-POLAR	BI-POLAR	UNI	BI	VRWM(V)	Min.(V)	Max.(V)	IT(mA)	VC Max.(V)	IPP(A)	IR(uA)
P6SMB400A	P6SMB400CA	400A	400C	342.0	380.00	420.00	1	548.0	1.09	1
P6SMB440A	P6SMB440CA	440A	440C	376.0	418.00	462.00	1	602.0	1.00	1
P6SMB480A	P6SMB480CA	480A	480C	408.0	456.00	504.00	1	658.0	0.91	1
P6SMB510A	P6SMB510CA	510A	510C	434.0	485.00	535.00	1	698.0	0.86	1
P6SMB530A	P6SMB530CA	530A	530C	450.0	503.00	556.00	1	725.0	0.83	1
P6SMB540A	P6SMB540CA	540A	540C	459.0	513.00	567.00	1	740.0	0.81	1
P6SMB550A	P6SMB550CA	550A	550C	467.0	522.50	577.50	1	760.0	0.79	1
P6SMB600A	P6SMB600CA	600A	600C	509.0	570.00	630.00	1	820.0	0.73	1

TRANSIENT VOLTAGE SUPPRESSOR DIODES

Typical Characteristics Curves

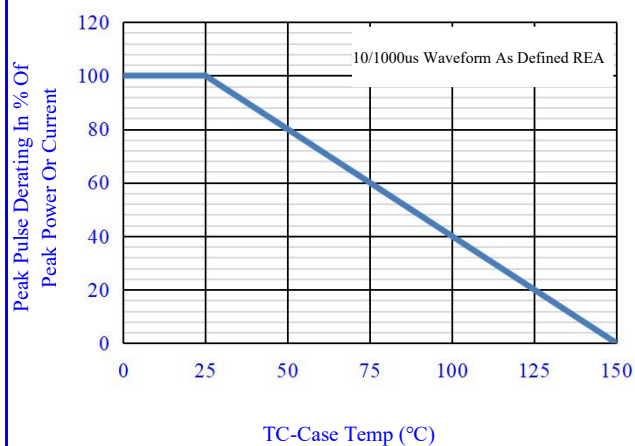


Fig.1-Peak Power Or Current vs.Tc

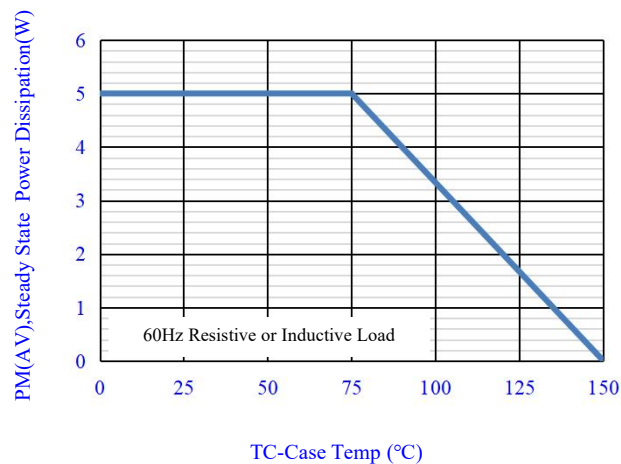


Fig.2-Steady State Power Derating Curve



Fig.3-Peak Pulse Power Rating Curve

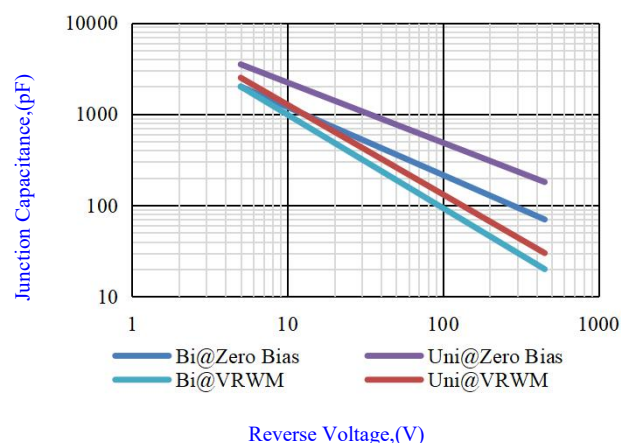


Fig.4-Typical Junction Capacitance

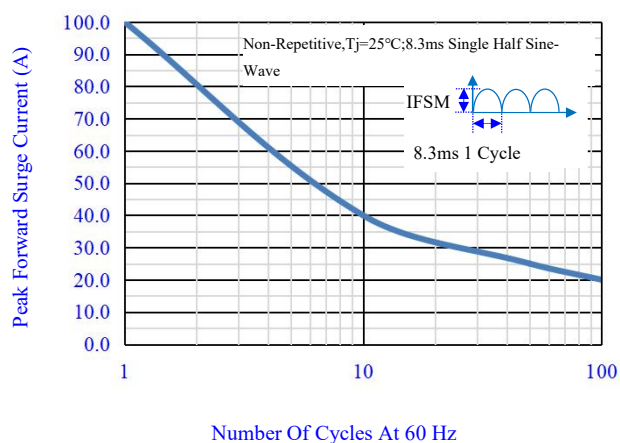


Fig.5-Max. Non-Repetitive Surge Current

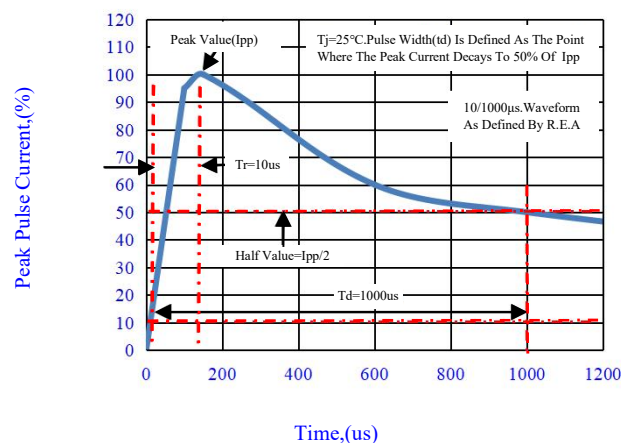
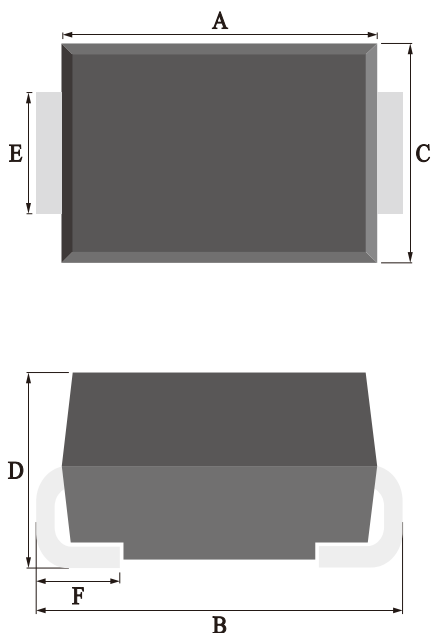


Fig.6-Pulse Waveform

TRANSIENT VOLTAGE SUPPRESSOR DIODES

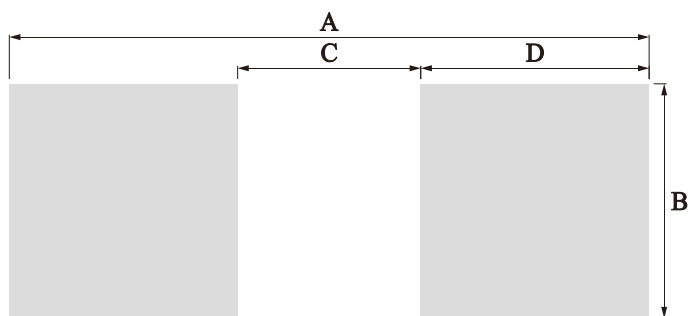
OUTLINE DRAWINGS



SMB

OUTLINE DIMENSIONS						
Dim.	Milimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.00	-	4.70	0.1575	-	1.8504
B	5.00	-	5.59	1.9685	-	2.2008
C	3.30	-	3.94	1.2992	-	1.5512
D	2.10	-	2.45	0.8268	-	0.9646
E	1.90	-	2.11	0.7480	-	0.8307
F	0.76	-	1.50	0.2992	-	0.5906

RECOMMENDED LAYOUT DRAWINGS



SMB

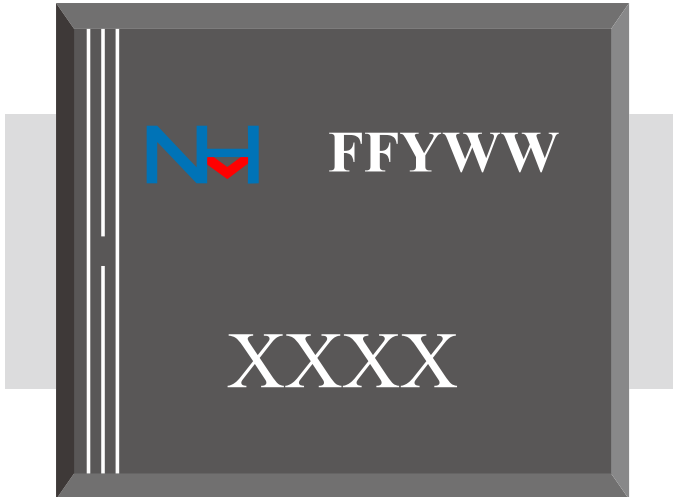
OUTLINE DIMENSIONS						
Dim.	Milimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	-	6.34	-	-	2.4961	-
B	-	2.72	-	-	1.0709	-
C	-	1.76	-	-	0.6929	-
D	-	2.29	-	-	0.9016	-

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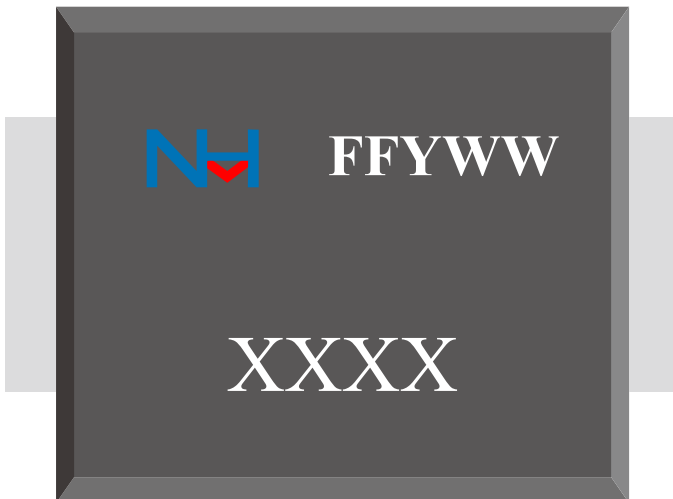
MARKING



MARKING INSTRUCTION

NH=Niuhan Trademark
FF=Product Line Code,According To Actual Changes
YWW=Date Code,According To Actual Changes
XXXX=Make,XXXX=See Table-1
White band denotes cathode

MARKING



MARKING INSTRUCTION

NH=Niuhan Trademark
FF=Product Line Code,According To Actual Changes
YWW=Date Code,According To Actual Changes
XXXX=Make,XXXX=See Table-1

PACKING INFORMATION

Package Type	Package Code	Product Weight Approx(g/Pcs)	Package Method	Quantity (Pcs/Min. Pack.)	Quantity (Pcs/Inner Box)	Quantity (Pcs/Carton)
SMB	P1	0.095	13" Reel	3000	6000	48000
SMB	P2	0.095	13" Reel	3000	6000	60000

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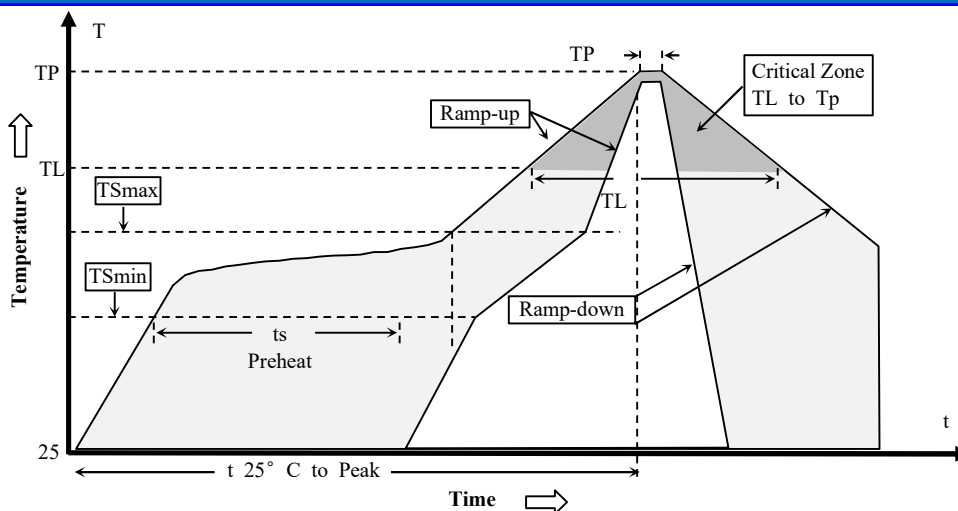


TRANSIENT VOLTAGE SUPPRESSOR DIODES

Recommended wave soldering condition

Product	Peak Temperature	Soldering Time
Pb-free devices	260 +0/-5 °C	5 +1/-1 seconds

Recommended temperature profile for IR reflow



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (T _{smax} to T _p)	3°C/second max.	3°C/second max.
Preheat -Temperature Min(TS min) -Temperature Max(TS max) -Time(ts min to ts max)	100°C 150°C 60-120 seconds	150°C 200°C 60-180 seconds
Time maintained above: -Temperature (TL) - Time (tL)	183°C 60-150 seconds	217°C 60-150 seconds
Peak Temperature(TP)	240 +0/-5 °C	260 +0/-5 °C
Time within 5°C of actual peak temperature(tp)	10-30 seconds	20-40 seconds
Ramp down rate	6°C/second max.	6°C/second max.
Time 25 °C to peak temperature	6 minutes max.	8 minutes max.

Note : All temperatures refer to topside of the package, measured on the package body surface.

TRANSIENT VOLTAGE SUPPRESSOR DIODES

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