

P6KE series



TRANSIENT VOLTAGE SUPPRESSOR DIODES

Voltage: 6.8~600 Volts

Current: 600 W

Package: DO-15

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

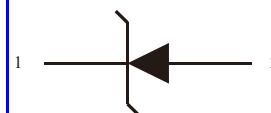


BI

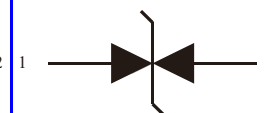


Polarity:

UNI



BI



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

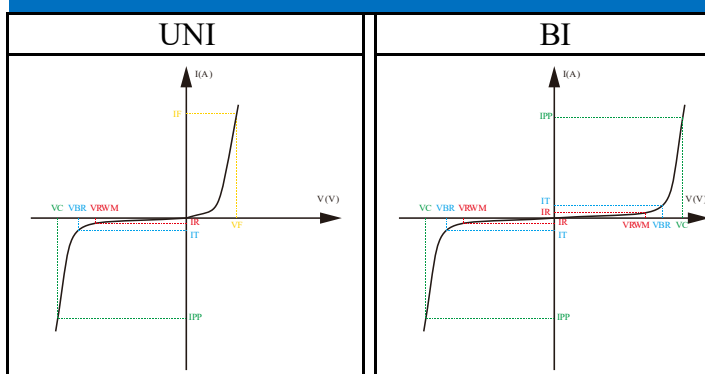
Maximum Ratings (Ta=25°C Unless Otherwise Specified)

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	$I_F = 25.0\text{ A}, V_{BR} < 200\text{ V}$	V_F	3.5	V
	$I_F = 25.0\text{ A}, V_{BR} > 201\text{ V}$		6.5	

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

Parameter	Test Conditions	Symbol	Value	Unit
Operating Junction Temperature Range		T_J	-55 ~ 175	$^{\circ}\text{C}$
Storage Temperature Range		T_{STG}	-55 ~ 175	
Thermal Resistance Junction To Ambient With Steady-State	At 0.375"(9.5mm) lead length Mounted On vertical P.C. Board	$R_{\theta JA}$	75	$^{\circ}\text{C/W}$

C-V Curve Chart



Symbol Instruction

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

Part Number And Code		Reverse Stand-off Voltage	Breakdown Voltage VBR @ I _T		Test Current	Max. Clamping Voltage @ I _{pp}	Max. Peak Pulse Current	Max. Reverse Leakage @ V _{RWM}
UNI-POLAR	BI-POLAR	V _{RWM} (V)	Min.(V)	Max.(V)	I _T (mA)	V _{C Max} (V)	IPP(A)	I _R (uA)
P6KE6.8A	P6KE6.8CA	5.8	6.45	7.14	10	10.5	57.14	1000
P6KE7.5A	P6KE7.5CA	6.4	7.13	7.88	10	11.3	53.10	500
P6KE8.2A	P6KE8.2CA	7.0	7.79	8.61	10	12.1	49.59	200
P6KE9.1A	P6KE9.1CA	7.8	8.65	9.55	1	13.4	44.78	50
P6KE10A	P6KE10CA	8.6	9.50	10.50	1	14.5	41.38	10
P6KE11A	P6KE11CA	9.4	10.50	11.60	1	15.6	38.46	5
P6KE12A	P6KE12CA	10.2	11.40	12.60	1	16.7	35.93	5
P6KE13A	P6KE13CA	11.1	12.40	13.70	1	18.2	32.97	1
P6KE15A	P6KE15CA	12.8	14.30	15.80	1	21.2	28.30	1
P6KE16A	P6KE16CA	13.6	15.20	16.80	1	22.5	26.67	1
P6KE18A	P6KE18CA	15.3	17.10	18.90	1	25.5	23.53	1
P6KE20A	P6KE20CA	17.1	19.00	21.00	1	27.7	21.66	1
P6KE22A	P6KE22CA	18.8	20.90	23.10	1	30.6	19.61	1
P6KE24A	P6KE24CA	20.5	22.80	25.20	1	33.2	18.07	1
P6KE27A	P6KE27CA	23.1	25.70	28.40	1	37.5	16.00	1
P6KE30A	P6KE30CA	25.6	28.50	31.50	1	41.4	14.49	1
P6KE33A	P6KE33CA	28.2	31.40	34.70	1	45.7	13.13	1
P6KE36A	P6KE36CA	30.8	34.20	37.80	1	49.9	12.02	1
P6KE39A	P6KE39CA	33.3	37.10	41.00	1	53.9	11.13	1
P6KE43A	P6KE43CA	36.8	40.90	45.20	1	59.3	10.12	1
P6KE47A	P6KE47CA	40.2	44.70	49.40	1	64.8	9.26	1
P6KE51A	P6KE51CA	43.6	48.50	53.60	1	70.1	8.56	1
P6KE56A	P6KE56CA	47.8	53.20	58.80	1	77.0	7.79	1
P6KE62A	P6KE62CA	53.0	58.90	65.10	1	85.0	7.06	1
P6KE68A	P6KE68CA	58.1	64.60	71.40	1	92.0	6.52	1
P6KE75A	P6KE75CA	64.1	71.30	78.80	1	103.0	5.83	1
P6KE82A	P6KE82CA	70.1	77.90	86.10	1	113.0	5.31	1
P6KE91A	P6KE91CA	77.8	86.50	95.50	1	125.0	4.80	1
P6KE100A	P6KE100CA	85.5	95.00	105.00	1	137.0	4.38	1
P6KE110A	P6KE110CA	94.0	105.00	116.00	1	152.0	3.95	1
P6KE120A	P6KE120CA	102.0	114.00	126.00	1	165.0	3.64	1
P6KE130A	P6KE130CA	111.0	124.00	137.00	1	179.0	3.35	1
P6KE150A	P6KE150CA	128.0	143.00	158.00	1	207.0	2.90	1
P6KE160A	P6KE160CA	136.0	152.00	168.00	1	219.0	2.74	1
P6KE170A	P6KE170CA	145.0	162.00	179.00	1	234.0	2.56	1
P6KE180A	P6KE180CA	154.0	171.00	189.00	1	246.0	2.44	1
P6KE200A	P6KE200CA	171.0	190.00	210.00	1	274.0	2.19	1
P6KE220A	P6KE220CA	185.0	209.00	231.00	1	328.0	1.83	1
P6KE250A	P6KE250CA	214.0	237.00	263.00	1	344.0	1.74	1
P6KE300A	P6KE300CA	256.0	285.00	315.00	1	414.0	1.45	1
P6KE350A	P6KE350CA	300.0	332.00	368.00	1	482.0	1.24	1

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UNI-POLAR	BI-POLAR	V _{RWM} (V)	Min.(V)	Max.(V)	I _T (mA)	V _{C Max.} (V)	IPP(A)	I _R (uA)
P6KE400A	P6KE400CA	342.0	380.00	420.00	1	548.0	1.09	1
P6KE440A	P6KE440CA	376.0	418.00	462.00	1	602.0	1.00	1
P6KE480A	P6KE480CA	408.0	456.00	504.00	1	658.0	0.91	1
P6KE510A	P6KE510CA	434.0	485.00	535.00	1	698.0	0.86	1
P6KE520A	P6KE520CA	442.0	494.00	546.00	1	698.0	0.86	1
P6KE530A	P6KE530CA	450.0	503.00	556.00	1	725.0	0.83	1
P6KE540A	P6KE540CA	459.0	513.00	567.00	1	740.0	0.81	1
P6KE550A	P6KE550CA	467.0	522.50	577.50	1	760.0	0.79	1
P6KE600A	P6KE600CA	512.0	570.00	630.00	1	828.0	0.72	1

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Typical Characteristics Curves

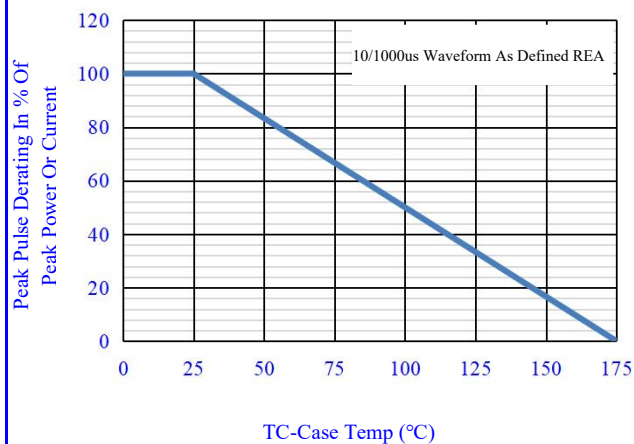


Fig.1-Peak Power Or Current vs.Tc

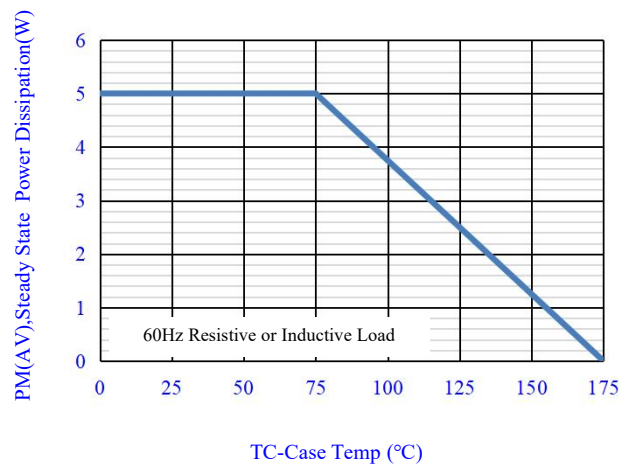


Fig.2-Steady State Power Derating Curve

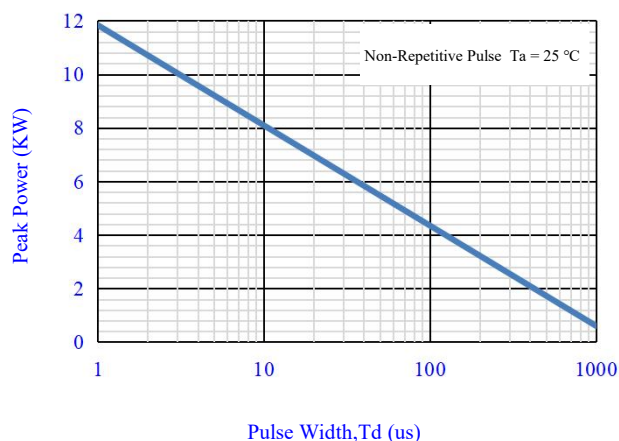


Fig.3-Peak Pulse Power Rating Curve

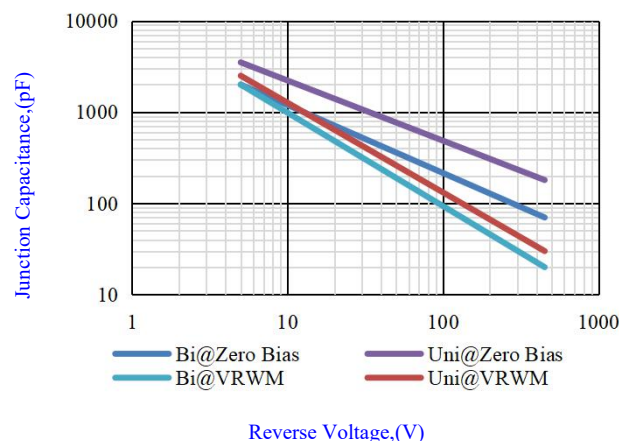


Fig.4-Typical Junction Capacitance

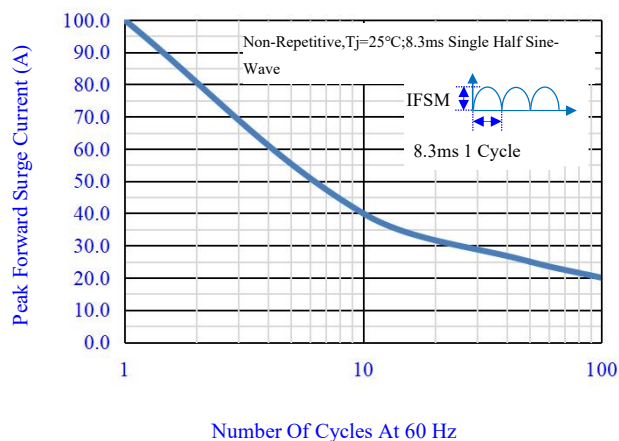


Fig.5-Max. Non-Repetitive Surge Current

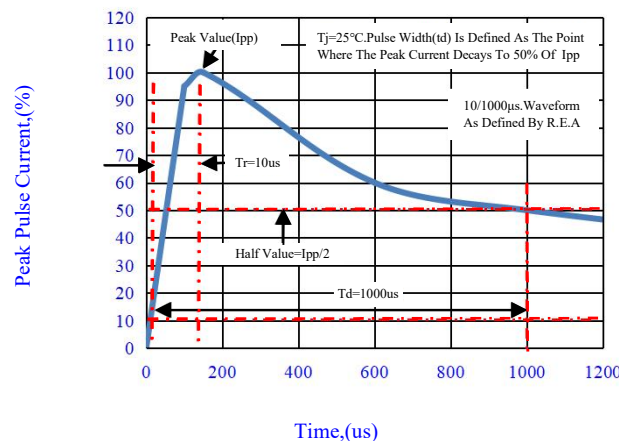


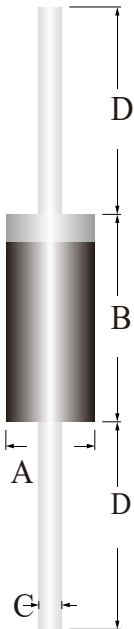
Fig.6-Pulse Waveform

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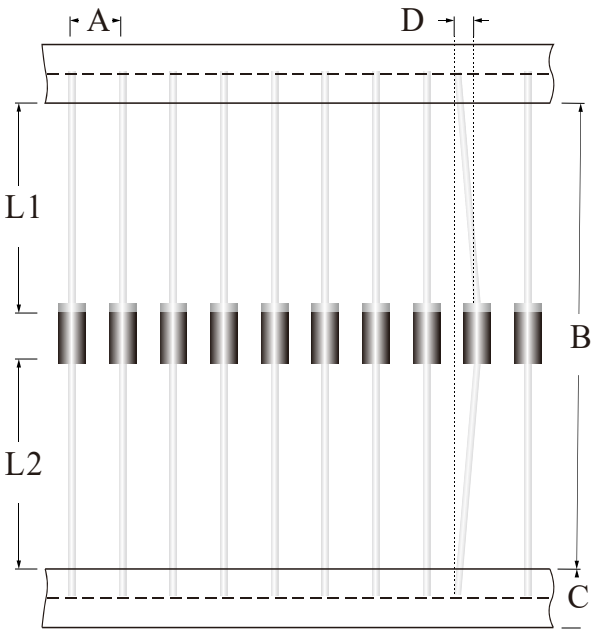
OUTLINE DRAWINGS



DO-15

OUTLINE DIMENSIONS						
Dim.	Milimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	3.10	-	3.90	0.1220	-	0.1400
B	5.60	-	7.60	0.2300	-	0.3000
C	0.55	-	0.85	0.0276	-	0.0350
D	24.00	-	27.00	0.9450	-	1.0630

COMPONENT PITCH DIMENSION DIAGRAM



DO-15

OUTLINE DIMENSIONS						
Dim.	Milimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.50	-	5.50	0.1772	-	0.2165
B	51.00	-	53.00	2.0079	-	2.0866
C	5.50	-	6.50	0.2165	-	0.2559
D	-	-	1.20	-	-	0.0472
[L2-L1]	-	-	1.00	-	-	0.0394

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MARKING



MARKING INSTRUCTION

NH=Niuhan Trademark
FF=Product Line Code,According To Actual Changes
P6KExxxx=Make,XX=See Table-1
White band denotes cathode

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NH=Niuhan Trademark
FF=Product Line Code,According To Actual Changes
P6KExxxx=Make,XX=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)
DO-15	P1	0.306	Tape	3000	3000	30000

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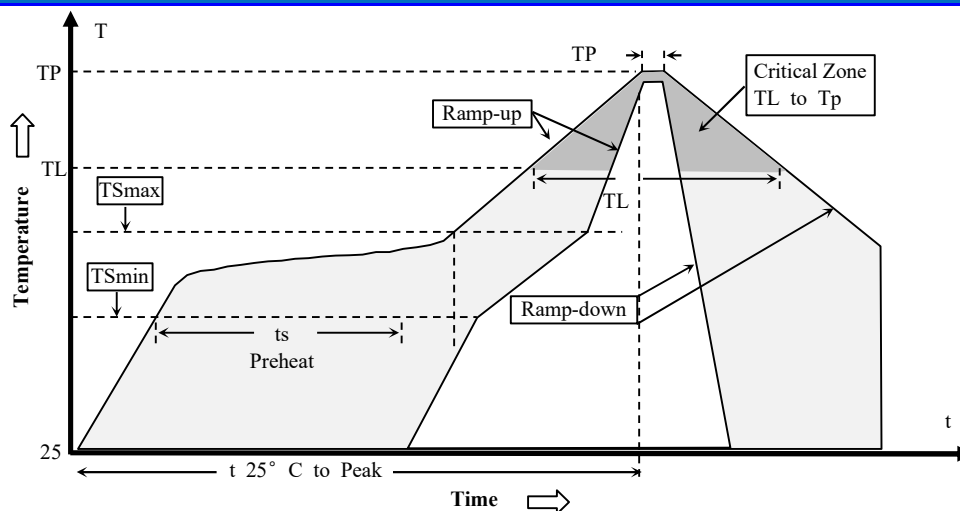


TRANSIENT VOLTAGE SUPPRESSOR DIODES

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 (TSmax to TP)	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.

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