1.5KE series

TRANSIENT VOLTAGE SUPPRESSOR DIODES

Pb-Free RoHS COMPLIANT

Voltage:	6.8~600 Volts	Current:	1500 W	Package:	DO-27

Features

- NH'S Glass Passivated Chip Technology
- Wave And Reflow Solderable
- Low Reverse Leakage
- Very Fast Response Time
- Excellent Clamping Capability
- 10/1000μs 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

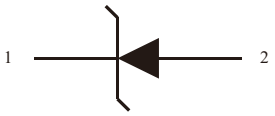
Diagram:

UNI

BI

Polarity:

UNI



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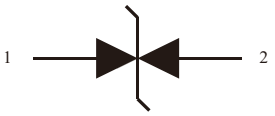


Single Phase,Half Wave,60Hz,Resistive Or Inductive Load.For Capacitive Load,Derate Current By 20%

Maximum Ratings (Ta=25℃ Unless Otherwise Specified)

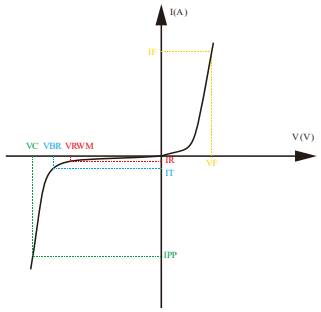
Parameter	Test Conditions	Symbol	Value	Unit
Non-Repetitive Peak Pulse Power Dissipation	10/1000μs Waveform	P_{PP}	1500	W
Peak Pulse Current	10/1000μs Wavefrom	I_{PP}	See Table-1	A
Peak Forward Surge Current	8.3ms Single Half Sine-Wave Superimposed On Rate Load	I_{FSM}	200	A
Power Dissipation On Infinite Heatsink	T_L= 75.0 ℃	P_D	6.5	W
Maximum Instantaneous Forward Voltage	I_F= 50.0 A,V_{BR}<200V I_F= 50.0 A,V_{BR}>201V	V_F	3.5 6.5	V

Thermal Characteristcs (Ta=25℃ Unless Otherwise Specified)

Parameter	Test Conditions	Symbol	Value	Unit
Operating Junction Temperature Range		T_J	-55 ~ 150	℃
Storage Temperature Range		T_{STG}	-55 ~ 150	
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	℃/W

C-V Curve Chart

UNI



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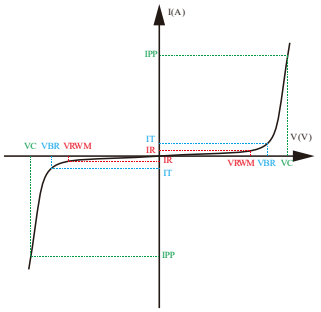


Symbol Instruction

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 Instaneous Forward Voltage
C_J	Junction Capacitance @ VR = 0 and f = 1.0 MHz

1.5KE series

TRANSIENT VOLTAGE SUPPRESSOR DIODES

Pb Pb-Free RoHS COMPLIANT

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)
1.5KE6.8A	1.5KE6.8CA	5.8	6.45	7.14	10	10.5	142.86	1000
1.5KE7.5A	1.5KE7.5CA	6.4	7.13	7.88	10	11.3	132.74	500
1.5KE8.2A	1.5KE8.2CA	7.0	7.79	8.61	10	12.1	123.97	200
1.5KE9.1A	1.5KE9.1CA	7.8	8.65	9.55	1	13.4	111.94	50
1.5KE10A	1.5KE10CA	8.6	9.50	10.50	1	14.5	103.45	10
1.5KE11A	1.5KE11CA	9.4	10.50	11.60	1	15.6	96.15	5
1.5KE12A	1.5KE12CA	10.2	11.40	12.60	1	16.7	89.82	5
1.5KE13A	1.5KE13CA	11.1	12.40	13.70	1	18.2	82.42	1
1.5KE15A	1.5KE15CA	12.8	14.30	15.80	1	21.2	70.75	1
1.5KE16A	1.5KE16CA	13.6	15.20	16.80	1	22.5	66.67	1
1.5KE18A	1.5KE18CA	15.3	17.10	18.90	1	25.5	58.82	1
1.5KE20A	1.5KE20CA	17.1	19.00	21.00	1	27.7	54.15	1
1.5KE22A	1.5KE22CA	18.8	20.90	23.10	1	30.6	49.02	1
1.5KE24A	1.5KE24CA	20.5	22.80	25.20	1	33.2	45.18	1
1.5KE27A	1.5KE27CA	23.1	25.70	28.40	1	37.5	40.00	1
1.5KE30A	1.5KE30CA	25.6	28.50	31.50	1	41.4	36.23	1
1.5KE33A	1.5KE33CA	28.2	31.40	34.70	1	45.7	32.82	1
1.5KE36A	1.5KE36CA	30.8	34.20	37.80	1	49.9	30.06	1
1.5KE39A	1.5KE39CA	33.3	37.10	41.00	1	53.9	27.83	1
1.5KE43A	1.5KE43CA	36.8	40.90	45.20	1	59.3	25.30	1
1.5KE47A	1.5KE47CA	40.2	44.70	49.40	1	64.8	23.15	1
1.5KE51A	1.5KE51CA	43.6	48.50	53.60	1	70.1	21.40	1
1.5KE56A	1.5KE56CA	47.8	53.20	58.80	1	77.0	19.48	1
1.5KE62A	1.5KE62CA	53.0	58.90	65.10	1	85.0	17.65	1
1.5KE68A	1.5KE68CA	58.1	64.60	71.40	1	92.0	16.30	1
1.5KE75A	1.5KE75CA	64.1	71.30	78.80	1	103.0	14.56	1
1.5KE82A	1.5KE82CA	70.1	77.90	86.10	1	113.0	13.27	1
1.5KE91A	1.5KE91CA	77.8	86.50	95.50	1	125.0	12.00	1
1.5KE100A	1.5KE100CA	85.5	95.00	105.00	1	137.0	10.95	1
1.5KE110A	1.5KE110CA	94.0	105.00	116.00	1	152.0	9.87	1
1.5KE120A	1.5KE120CA	102.0	114.00	126.00	1	165.0	9.09	1
1.5KE130A	1.5KE130CA	111.0	124.00	137.00	1	179.0	8.38	1
1.5KE150A	1.5KE150CA	128.0	143.00	158.00	1	207.0	7.25	1
1.5KE160A	1.5KE160CA	136.0	152.00	168.00	1	219.0	6.85	1
1.5KE170A	1.5KE170CA	145.0	162.00	179.00	1	234.0	6.41	1
1.5KE180A	1.5KE180CA	154.0	171.00	189.00	1	246.0	6.10	1
1.5KE200A	1.5KE200CA	171.0	190.00	210.00	1	274.0	5.47	1
1.5KE220A	1.5KE220CA	185.0	209.00	231.00	1	328.0	4.57	1
1.5KE250A	1.5KE250CA	214.0	237.00	263.00	1	344.0	4.36	1
1.5KE300A	1.5KE300CA	256.0	285.00	315.00	1	414.0	3.62	1
1.5KE350A	1.5KE350CA	300.0	332.00	368.00	1	482.0	3.11	1

1.5KE series

TRANSIENT VOLTAGE SUPPRESSOR DIODES

Pb Pb-Free RoHS COMPLIANT

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)
1.5KE400A	1.5KE400CA	342.0	380.00	420.00	1	548.0	2.74	1
1.5KE440A	1.5KE440CA	376.0	418.00	462.00	1	602.0	2.49	1
1.5KE480A	1.5KE480CA	408.0	456.00	504.00	1	658.0	2.28	1
1.5KE510A	1.5KE510CA	434.0	485.00	535.00	1	698.0	2.15	1
1.5KE530A	1.5KE530CA	450.0	503.00	556.00	1	725.0	2.07	1
1.5KE540A	1.5KE540CA	459.0	513.00	567.00	1	740.0	2.03	1
1.5KE550A	1.5KE550CA	467.0	522.50	577.50	1	760.0	1.97	1
1.5KE600A	1.5KE600CA	509.0	570.00	630.00	1	780.0	1.92	1

1.5KE series

TRANSIENT VOLTAGE SUPPRESSOR DIODES

Pb Pb-Free RoHS COMPLIANT

Typical Characteristics Curves

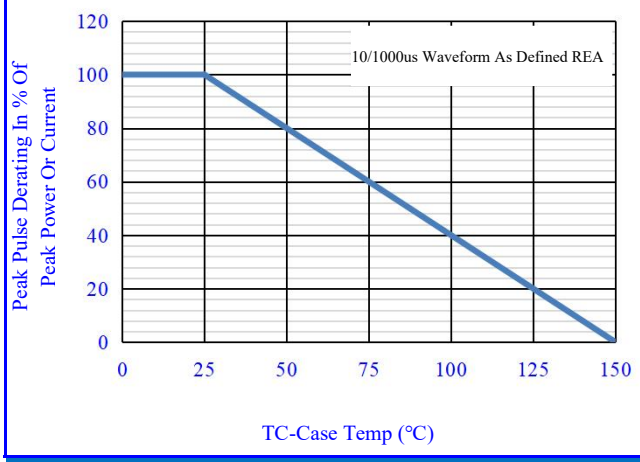


Fig.1-Peak Power Or Current vs.Tc

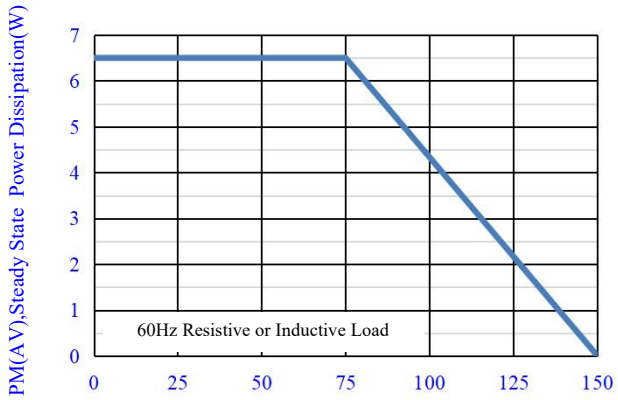


Fig.2-Steady State Power Derating Curve

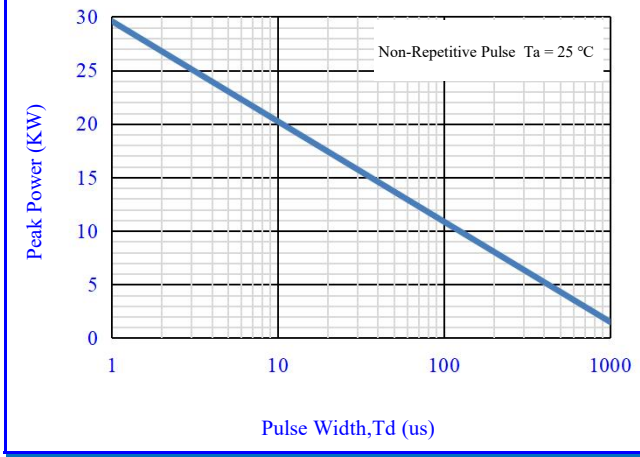


Fig.3-Peak Pulse Power Rating Curve

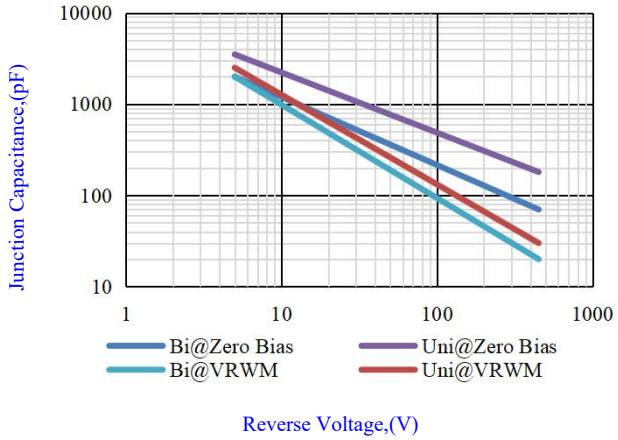


Fig.4-Typical Junction Capacitance

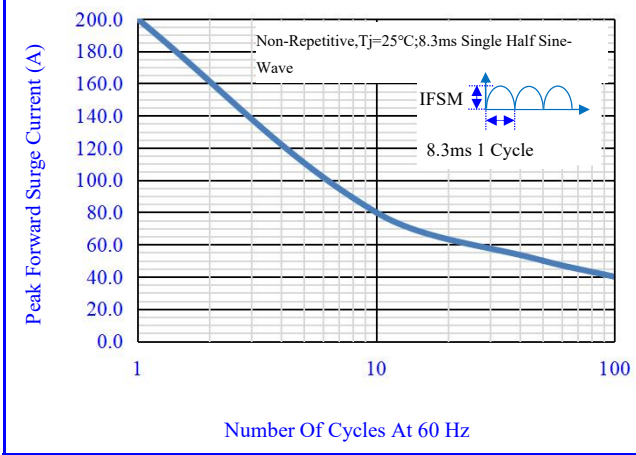


Fig.5-Max. Non-Repetitive Surge Current

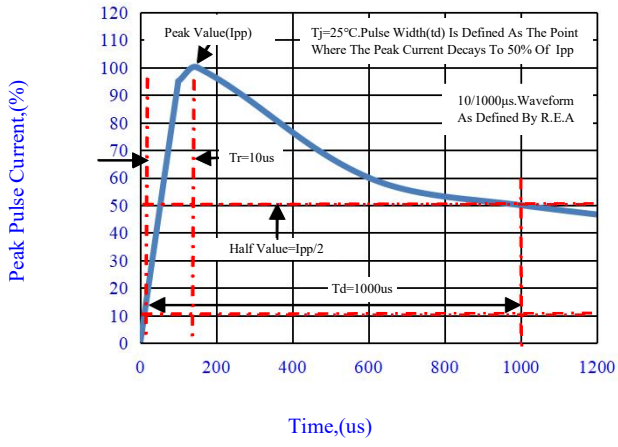


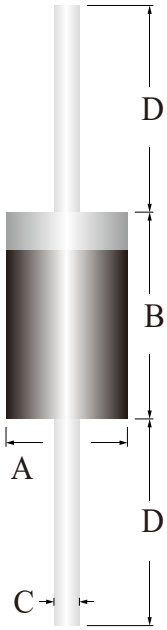
Fig.6-Pulse Waveform

1.5KE series

TRANSIENT VOLTAGE SUPPRESSOR DIODES

Pb-Free RoHS COMPLIANT

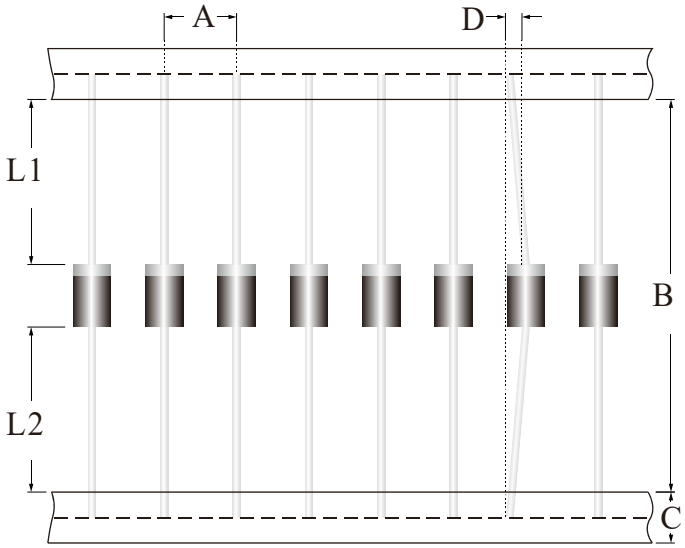
OUTLINE DRAWINGS



DO-27

OUTLINE DIMENSIONS						
Dim.	Milimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.90	-	5.60	0.1929	-	0.2205
B	8.00	-	10.00	0.3150	-	0.3937
C	1.00	-	1.40	0.0394	-	0.0551
D	24.50	-	26.50	0.9646	-	1.0433

COMPONENT PITCH DIMENSION DIAGRAM



DO-27

OUTLINE DIMENSIONS						
Dim.	Milimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	9.50	-	10.50	0.3740	-	0.4134
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

1.5KE series

TRANSIENT VOLTAGE SUPPRESSOR DIODES

Pb-Free RoHS COMPLIANT

MARKING	MARKING INSTRUCTION
	**NH=Niuhang Trademark** **FF=Product Line Code,According To Actual Changes** **LLWWF=Inernal Code,According To Actual Changes** **1.5KExxxxx=Make,XX=See Table-1** **White band denotes cathode**

MARKING	MARKING INSTRUCTION
	**NH=Niuhang Trademark** **FF=Product Line Code,According To Actual Changes** **LLWWF=Inernal Code,According To Actual Changes** **1.5KExxxxx=Make,XX=See Table-1**

PACKING INFORMATION

Package Type	Package Code	Productor Weight Approx(g/Pcs)	Package Method	Quantity (Pcs/Min. Pack.)	Quantity (Pcs/Inner Box)	Quantity (Pcs/Carton)
DO-27	P1	1	Tape	1000	1000	10000
DO-27	P2	1	Tape	1250	1250	12500

1.5KE series

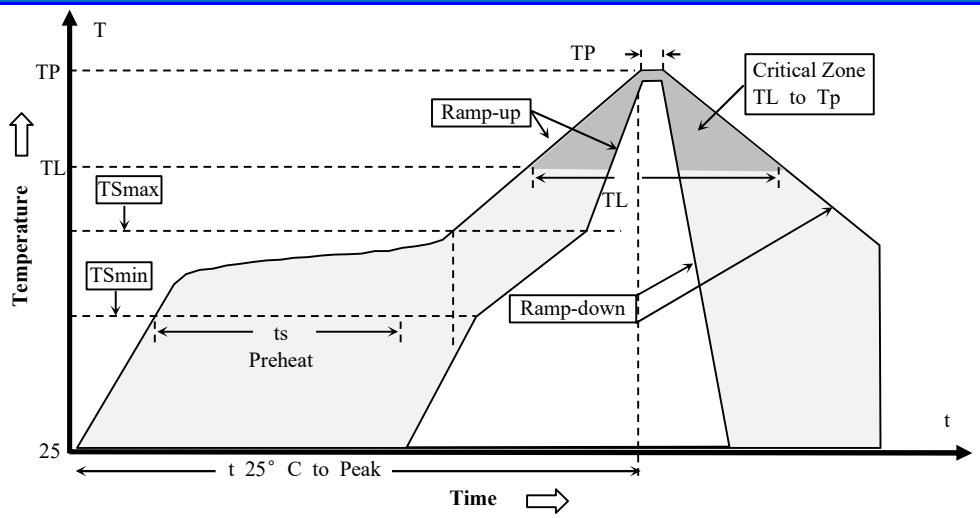
TRANSIENT VOLTAGE SUPPRESSOR DIODES

Pb Pb-Free RoHS COMPLIANT

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.

1.5KE series

TRANSIENT VOLTAGE SUPPRESSOR DIODES

Pb-Free RoHS COMPLIANT

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