

## Transient Voltage Suppressors (TVS) Data Sheet

### Features

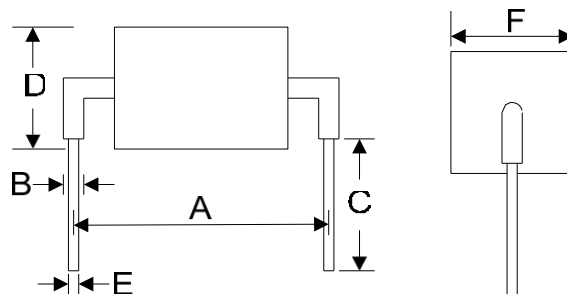
- Axial lead terminals
- High current transient suppressor
- Excellent clamping capability.
- Glass passivated junction.
- Bi-directional.
- Low slope resistance.
- Hazardous Substances Free.
- RoHS compliant
- High Temperature soldering: 265°C/10 seconds at terminals.
- Epoxy Encapsulated.
- Meets MSL level 1, per J-STD-020



### Maximum Ratings and thermal characteristics

Rating	Symbol	Value		Units
Current Rating	$I_{PP}$	HFA-L	3	KA
		HFB-L	6	
		HFC-L	10	
		HFD-L	16	
Operating junction and Storage Temperature Range.	$T_J, T_{STG}$	-40 to +125		°C

### Package Dimensions



HFA / HFB / HFC(020-190)-L Series			HFC(012/015/200/240)-L / HFD-L Series		
Symbol	Inches	Millimeters	Symbol	Inches	Millimeters
A	0.951±0.047	24.15±1.20	A	0.951±0.047	24.15±1.20
B	0.055min	1.40min	B	0.055min	1.40min
C	0.236±0.047	6.0±1.20	C	0.236±0.047	6.0±1.20
D	0.512max	13.0max	D	0.630max	16.0max
E	0.050±0.004	1.28±0.10	E	0.050±0.004	1.28±0.10
F	0.512max	13.0max	F	0.630max	16.0max

HFB-430L			HFC-430L		
Symbol	Inches	Millimeters	Symbol	Inches	Millimeters
A	1.063±0.047	27.00±1.20	A	1.024±0.047	26.00±1.20
B	0.055min	1.40min	B	0.055min	1.40min
C	0.079min	2.00min	C	0.079min	2.00min
D	0.512max	13.0max	D	0.630max	16.0max
E	0.050±0.004	1.28±0.10	E	0.050±0.004	1.28±0.10
F	0.512max	13.0max	F	0.630max	16.0max

**Electrical Characteristics( $T_A=25^{\circ}\text{C}$ )**

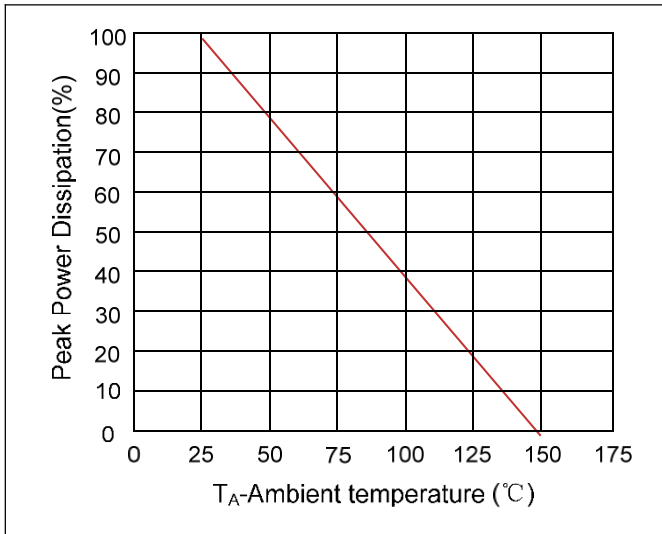
Part Number	Reverse Stand-Off Voltage		Breakdown Voltage	Test Current	Current Rating	Maximum Clamping Voltage	Reverse Leakage
	$V_{AC}(V)$	$V_{DC}(V)$	$V_{BR}(V)$ MIN. @ $I_T$	$I_T(mA)$	Rated $I_{PP}$ measured with 8/20 $\mu s$ pulse	$V_C(V)$ @ $I_{PP}$	$I_R(\mu A)$ @ $V_{DC}$
HFA-012L	8.5	12.8	14	1	3KA	80	20
HFA-015L	11	15	17	1	3KA	85	20
HFA-020L	14	20	22	1	3KA	90	20
HFA-025L	17	25	28	1	3KA	95	20
HFA-030L	21	30	33	1	3KA	100	20
HFA-042L	30	42	47	1	3KA	105	20
HFA-058L	40	58	64	1	3KA	110	20
HFA-066L	45	66	70	1	3KA	120	20
HFA-076L	54	76	85	1	3KA	140	20
HFA-100L	72	100	110	1	3KA	165	20
HFA-133L	100	133	147	1	3KA	220	20
HFA-170L	130	170	180	1	3KA	260	20
HFA-190L	145	190	200	1	3KA	290	20
HFA-200L	150	200	222	1	3KA	330	20
HFA-240L	180	240	250	1	3KA	340	20
HFA-275L	210	275	300	1	3KA	435	20
HFA-300L	230	300	330	1	3KA	470	20
HFA-380L	275	380	401	1	3KA	520	20
HFA-430L	310	430	440	1	3KA	625	20
HFA-460L	330	460	500	1	3KA	770	20
HFA-500L	385	500	558	1	3KA	868	20
HFA-650L	460	650	680	1	3KA	900	20
HFA-1100L	770	1100	1200	1	3KA	2000	20
HFB-012L	8.5	12.8	14	1	6KA	80	20
HFB-015L	11	15	17	1	6KA	85	20
HFB-020L	14	20	22	1	6KA	90	20
HFB-025L	17	25	28	1	6KA	95	20
HFB-030L	21	30	33	1	6KA	100	20
HFB-042L	30	42	47	1	6KA	105	20
HFB-058L	40	58	64	1	6KA	110	20
HFB-066L	45	66	70	1	6KA	120	20
HFB-076L	54	76	85	1	6KA	140	20
HFB-100L	72	100	110	1	6KA	165	20
HFB-133L	100	133	147	1	6KA	220	20
HFB-150L	105	150	165	1	6KA	240	20
HFB-170L	130	170	180	1	6KA	260	20
HFB-190L	145	190	200	1	6KA	290	20

Part Number	Reverse Stand-Off Voltage		Breakdown Voltage	Test Current	Current Rating	Maximum Clamping Voltage	Reverse Leakage
	V <sub>AC</sub> (V)	V <sub>DC</sub> (V)	V <sub>BR</sub> (V) MIN. @ I <sub>T</sub>	I <sub>T</sub> (mA)	Rated I <sub>PP</sub> measured with 8/20μs pulse	V <sub>C</sub> (V) @ I <sub>PP</sub>	I <sub>R</sub> (μA) @ V <sub>DC</sub>
HFB-200L	150	200	222	1	6KA	330	20
HFB-240L	180	240	250	1	6KA	340	20
HFB-275L	210	275	300	1	6KA	435	20
HFB-300L	230	300	330	1	6KA	470	20
HFB-380L	275	380	401	1	6KA	520	20
HFB-430L	310	430	440	1	6KA	625	20
HFC-012L	8.5	12.8	14	1	10KA	80	20
HFC-015L	11	15	17	1	10KA	85	20
HFC-020L	14	20	22	1	10KA	90	20
HFC-025L	17	25	28	1	10KA	95	20
HFC-030L	21	30	33	1	10KA	100	20
HFC-042L	30	42	47	1	10KA	105	20
HFC-058L	40	58	64	1	10KA	110	20
HFC-066L	45	66	70	1	10KA	120	20
HFC-076L	54	76	85	1	10KA	140	20
HFC-100L	72	100	110	1	10KA	165	20
HFC-133L	100	133	147	1	10KA	220	20
HFC-170L	130	170	180	1	10KA	260	20
HFC-190L	145	190	200	1	10KA	290	20
HFC-200L	150	200	222	1	10KA	330	20
HFC-240L	169	240	250	1	10KA	340	20
HFC-380L	275	380	401	1	10KA	520	20
HFC-430L	310	430	440	1	10KA	625	20
HFD-012L	8.5	12.8	14	1	16KA	80	20
HFD-015L	11	15	17	1	16KA	85	20
HFD-020L	14	20	22	1	16KA	90	20
HFD-025L	17	25	28	1	16KA	95	20
HFD-030L	21	30	33	1	16KA	100	20
HFD-042L	30	42	47	1	16KA	105	20
HFD-058L	40	58	64	1	16KA	110	20
HFD-066L	45	66	70	1	16KA	120	20
HFD-076L	54	76	85	1	16KA	140	20
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HFD-200L	150	200	222	1	16KA	330	20

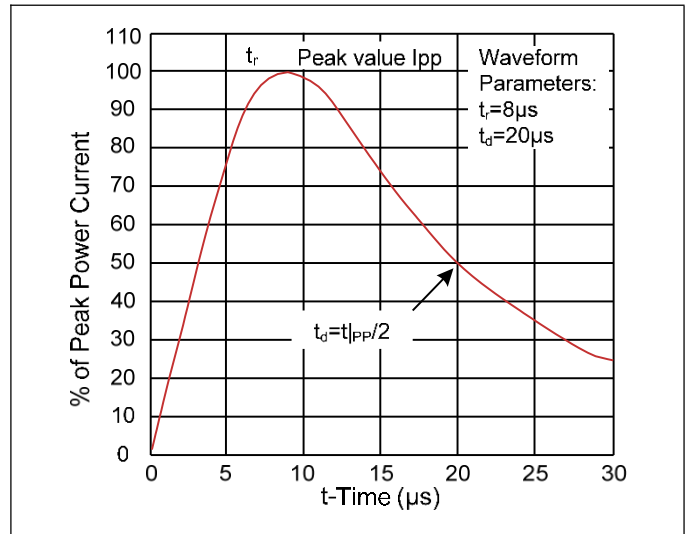
Notes: 1. TA=25°C unless otherwise specified  
 2. Using 8/20μs wave shape pulses as defined in IEC61000-4-5

**Ratings and Characteristic Curves ( $T_A=25^\circ\text{C}$  unless otherwise noted)**

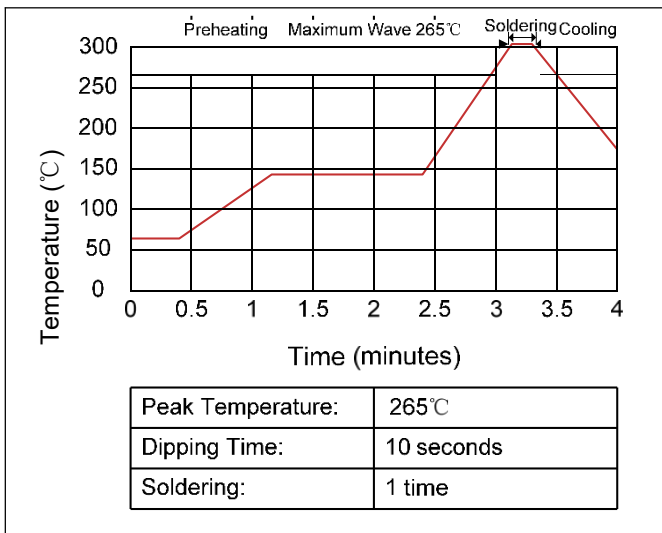
**Figure 1. Power Derating Curve**



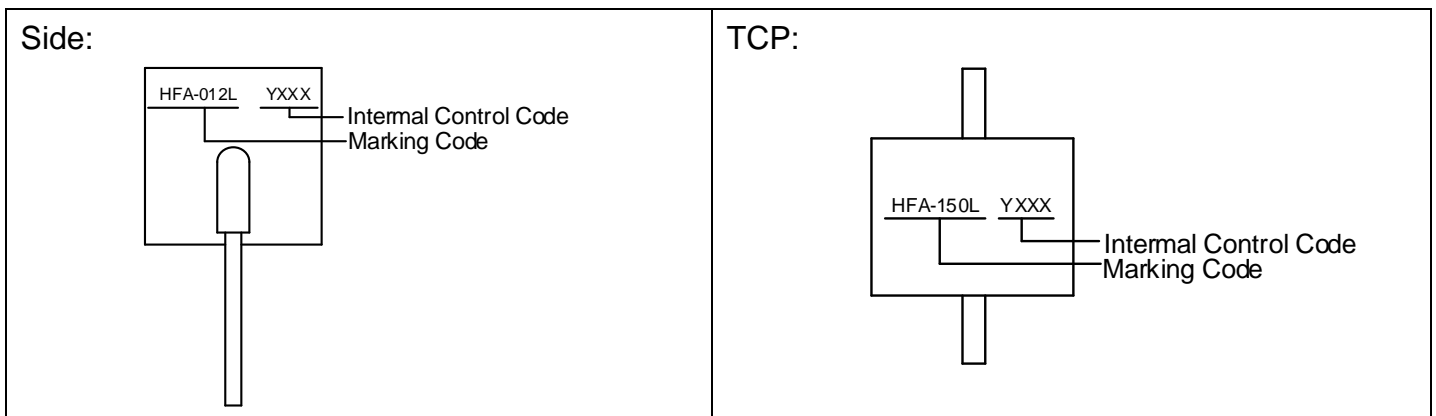
**Figure 2. Pulse Waveform**




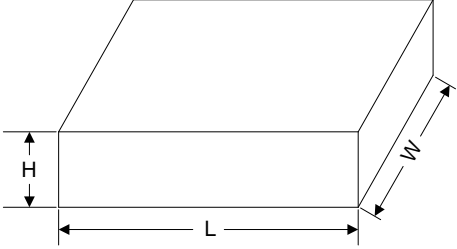
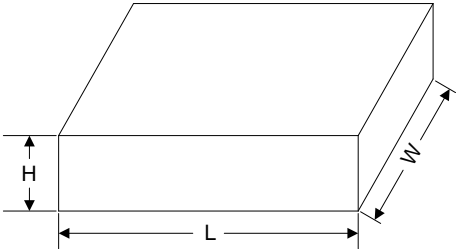
**Figure 3. Wave Soldering**



**Marking Code**



**Packaging**

<p>Skin packing</p> 	<p><b>Symbol</b></p>	<p><b>Dimension (mm)</b></p>
	<p>A</p>	<p>230.0</p>
	<p>B</p>	<p>150.0</p>
	<p>C</p>	<p>15.0</p>
	<p>Quantity: 20PCS</p>	
<p>HFA-012L~ HFA-200L; HFB-012L~HFB-076L; HFC-012L~HFC-042L; Inner Box</p> 	<p>L</p>	<p>250.0</p>
	<p>W</p>	<p>65.0</p>
	<p>H</p>	<p>165.0</p>
	<p>Quantity: 80PCS</p>	
<p>HFA-240L~HFA-650L; HFB-100L~HFB-430L; HFC-058L~HFC-430L; HFD-012L~HFD-200L; Inner Box</p> 	<p>L</p>	<p>250.0</p>
	<p>W</p>	<p>65.0</p>
	<p>H</p>	<p>165.0</p>
	<p>Quantity: 60PCS</p>	