

## Anti-parallel Module

### Description

- 1) A package consists of two inverse parallel SCR chips, which non-repetitive peak off-state voltage is up to 2000V
- 2) Welding by vacuum welding technology, which provide high reliability
- 3) Insulated by silicone gel, provide a insulation voltage of 3000V~



### Typical Application

Soft start, solid state relay, AC/DC switch, temperature control.

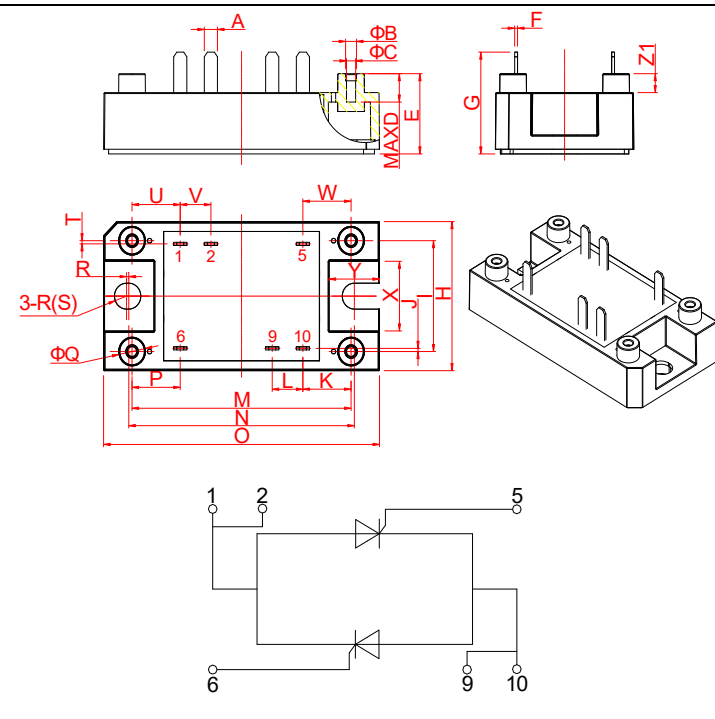
### Absolute Maximum Ratings (Packaged into V1-A-Pack, unless otherwise specified, $T_{CASE}=25^{\circ}C$ )

Parameter	Test Conditions	Symbol	Values			Unit
			12	16	18	
Operating junction temperature range		$T_j$	-40-125			$^{\circ}C$
Storage temperature range		$T_{stg}$	-40-125			$^{\circ}C$
Repetitive peak off-state voltage	$T_j=25^{\circ}C$	$V_{DRM}$	1200	1600	1800	V
Repetitive peak reverse voltage	$T_j=25^{\circ}C$	$V_{RRM}$	1200	1600	1800	V
Non-repetitive peak off-state voltage	$T_j=25^{\circ}C$	$V_{DSM}$	1300	1700	1900	V
Non-repetitive peak reverse voltage	$T_j=25^{\circ}C$	$V_{RSM}$	1300	1700	1900	V
RMS on-state current	$T_C=85^{\circ}C$	$I_{T(RMS)}$	150			A
Peak on-state surge current	$t_p=10ms V_R=0.6V_{RRM}$	$I_{TSM}$	2200			A
$I^2t$ value for fusing	$t_p=10ms V_R=0.6V_{RRM}$	$I^2t$	24200			$A^2s$
Critical rate of rise of on-state current	$I_G=2 \times I_{GT}$	$di/dt$	150			$A/\mu s$
Insulation voltage	A.C 50Hz(1s/1min)	$V_{ISO}$	3600/3000			V

**Electrical Characteristics** (Packaged into V1-A-Pack, unless otherwise specified,  $T_{CASE}=25^{\circ}C$ )

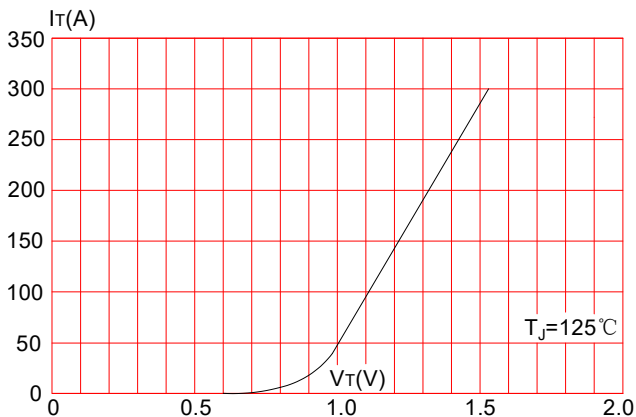
Parameter	Test Conditions	Symbol	Values	Unit
Peak on-state voltage	$I_T=300A$ $t_p=380\mu s$	$V_{TM}$	$\leq 1.8$	V
Threshold voltage	$T_j=125^{\circ}C$	$V_{TO}$	$\leq 0.9$	V
Dynamic resistance	$T_j=125^{\circ}C$	$R_d$	$\leq 2.1$	m $\Omega$
Repetitive peak off-state current	$V_D=V_{RRM}$ $T_C=25^{\circ}C$	$I_{DRM1}$	$\leq 100$	$\mu A$
	$T_C=125^{\circ}C$	$I_{DRM2}$	$\leq 30$	mA
Repetitive peak reverse current	$V_R=V_{RRM}$ $T_C=25^{\circ}C$	$I_{RRM1}$	$\leq 100$	$\mu A$
	$T_C=125^{\circ}C$	$I_{RRM2}$	$\leq 30$	mA
Triggering gate current	$V_D=12V$ $R_L=30\Omega$	$I_{GT}$	20-120	mA
Holding current	$I_T=1A$	$I_H$	$\leq 250$	mA
Latching current	$I_G=1.2 I_{GT}$	$I_L$	$\leq 300$	mA
Triggering gate voltage	$V_D=12V$ $R_L=30\Omega$	$V_{GT}$	$\leq 1.8$	V
Non triggering gate voltage	$V_D=V_{DRM}$ $T_j=125^{\circ}C$	$V_{GD}$	$\geq 0.25$	V
Critical rate of rise of voltage	$V_D=2/3V_{DRM}$ $T_j=125^{\circ}C$ Gate Open	dv/dt	$\geq 1000$	V/ $\mu s$
Thermal resistance	Junction to case	$R_{th(j-c)}$	0.35	$^{\circ}C/W$

**Mechanical Characteristics**

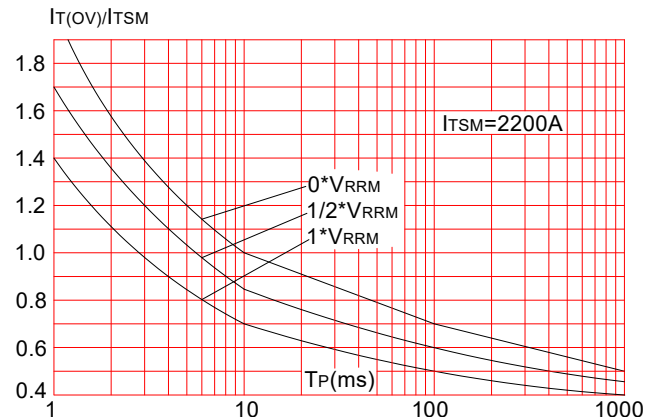
Module size	63x31.6mm																																																																																																																																																																																																									
Module height	21.6mm																																																																																																																																																																																																									
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<table border="1"> <thead> <tr> <th rowspan="3">Ref</th> <th colspan="6">Dimensions</th> </tr> <tr> <th colspan="3">Millimeters</th> <th colspan="3">Inches</th> </tr> <tr> <th>Min</th> <th>Typ</th> <th>Max</th> <th>Min</th> <th>Typ</th> <th>Max</th> </tr> </thead> <tbody> <tr><td>A</td><td>2.85</td><td>3</td><td>3.15</td><td>0.112</td><td>0.118</td><td>0.124</td></tr> <tr><td>B</td><td>2.3</td><td>2.5</td><td>2.7</td><td>0.091</td><td>0.098</td><td>0.106</td></tr> <tr><td>C</td><td>1.9</td><td>2.1</td><td>2.3</td><td>0.075</td><td>0.083</td><td>0.091</td></tr> <tr><td>D</td><td></td><td></td><td>6</td><td></td><td></td><td>0.236</td></tr> <tr><td>E</td><td>16.25</td><td>17</td><td>17.75</td><td>0.640</td><td>0.669</td><td>0.699</td></tr> <tr><td>F</td><td>0.55</td><td>0.65</td><td>0.75</td><td>0.022</td><td>0.026</td><td>0.030</td></tr> <tr><td>G</td><td>20.85</td><td>21.6</td><td>22.35</td><td>0.821</td><td>0.850</td><td>0.880</td></tr> <tr><td>H</td><td>30.85</td><td>31.6</td><td>32.35</td><td>1.215</td><td>1.244</td><td>1.274</td></tr> <tr><td>I</td><td>23</td><td>23.5</td><td>24</td><td>0.906</td><td>0.925</td><td>0.945</td></tr> <tr><td>J</td><td>0.17</td><td>0.67</td><td>1.17</td><td>0.007</td><td>0.026</td><td>0.046</td></tr> <tr><td>K</td><td>10.5</td><td>11</td><td>11.5</td><td>0.413</td><td>0.433</td><td>0.453</td></tr> <tr><td>L</td><td>6.5</td><td>7</td><td>7.5</td><td>0.256</td><td>0.276</td><td>0.295</td></tr> <tr><td>M</td><td>49.5</td><td>50</td><td>50.5</td><td>1.949</td><td>1.989</td><td>1.988</td></tr> <tr><td>N</td><td>51</td><td>51.5</td><td>52</td><td>2.008</td><td>2.028</td><td>2.047</td></tr> <tr><td>O</td><td>62.25</td><td>63</td><td>63.75</td><td>2.451</td><td>2.480</td><td>2.510</td></tr> <tr><td>P</td><td>10.5</td><td>11</td><td>11.5</td><td>0.413</td><td>0.433</td><td>0.453</td></tr> <tr><td>Q</td><td>5.6</td><td>6.1</td><td>6.6</td><td>0.220</td><td>0.240</td><td>0.260</td></tr> <tr><td>R</td><td>0.3</td><td>0.5</td><td>0.7</td><td>0.012</td><td>0.020</td><td>0.028</td></tr> <tr><td>S</td><td>2.55</td><td>2.</td><td>2.</td><td>0.100</td><td>0.108</td><td>0.116</td></tr> <tr><td>T</td><td>750.17</td><td>0</td><td>951.</td><td>0.007</td><td>0.026</td><td>0.046</td></tr> <tr><td>U</td><td>10.5</td><td>67</td><td>1175</td><td>0.413</td><td>0.433</td><td>0.453</td></tr> <tr><td>V</td><td>6.5</td><td>7</td><td>7.5</td><td>0.256</td><td>0.276</td><td>0.295</td></tr> <tr><td>W</td><td>10.5</td><td>11</td><td>11.5</td><td>0.413</td><td>0.433</td><td>0.453</td></tr> <tr><td>X</td><td>6.5</td><td>7</td><td>7.5</td><td>0.256</td><td>0.276</td><td>0.295</td></tr> <tr><td>Y</td><td>10.5</td><td>11</td><td>11.5</td><td>0.413</td><td>0.433</td><td>0.453</td></tr> <tr><td>Z1</td><td>5.6</td><td>6.1</td><td>6.6</td><td>0.220</td><td>0.240</td><td>0.260</td></tr> </tbody> </table>		Ref	Dimensions						Millimeters			Inches			Min	Typ	Max	Min	Typ	Max	A	2.85	3	3.15	0.112	0.118	0.124	B	2.3	2.5	2.7	0.091	0.098	0.106	C	1.9	2.1	2.3	0.075	0.083	0.091	D			6			0.236	E	16.25	17	17.75	0.640	0.669	0.699	F	0.55	0.65	0.75	0.022	0.026	0.030	G	20.85	21.6	22.35	0.821	0.850	0.880	H	30.85	31.6	32.35	1.215	1.244	1.274	I	23	23.5	24	0.906	0.925	0.945	J	0.17	0.67	1.17	0.007	0.026	0.046	K	10.5	11	11.5	0.413	0.433	0.453	L	6.5	7	7.5	0.256	0.276	0.295	M	49.5	50	50.5	1.949	1.989	1.988	N	51	51.5	52	2.008	2.028	2.047	O	62.25	63	63.75	2.451	2.480	2.510	P	10.5	11	11.5	0.413	0.433	0.453	Q	5.6	6.1	6.6	0.220	0.240	0.260	R	0.3	0.5	0.7	0.012	0.020	0.028	S	2.55	2.	2.	0.100	0.108	0.116	T	750.17	0	951.	0.007	0.026	0.046	U	10.5	67	1175	0.413	0.433	0.453	V	6.5	7	7.5	0.256	0.276	0.295	W	10.5	11	11.5	0.413	0.433	0.453	X	6.5	7	7.5	0.256	0.276	0.295	Y	10.5	11	11.5	0.413	0.433	0.453	Z1	5.6	6.1	6.6	0.220	0.240	0.260
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**Performance Curves**

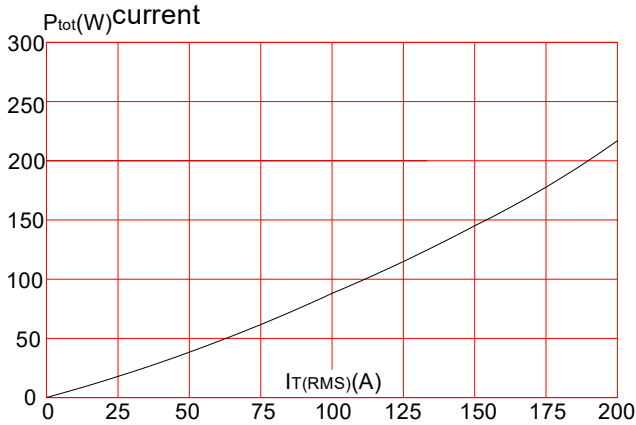
**FIG.1:** Forward characteristics(per thyristor)



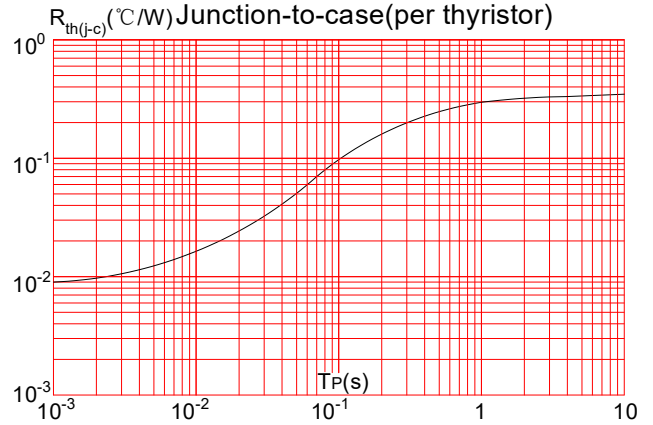
**FIG.2:** Surge overload current vs. time



**FIG.3:** Power dissipation per module vs. R.M.S. current



**FIG.4:** Maximum transient thermal impedance Junction-to-case(per thyristor)



**Ordering Information**

