

### FEATURES

- Double Side Cooling
- High Surge Capability

### APPLICATIONS

- High Power Drives
- High Voltage Power Supplies
- Static Switches

### VOLTAGE RATINGS

| Part and Ordering Number | Repetitive Peak Voltages $V_{DRM}$ and $V_{RRM}$ V | Conditions  |
|--------------------------|--|---|
| DCR2760V28               | 2800   | $T_{vj} = -40^{\circ}\text{C}$ to $125^{\circ}\text{C}$ ,<br>$I_{DRM} = I_{RRM} = 300\text{mA}$ ,<br>$V_{DRM}, V_{RRM} t_p = 10\text{ms}$ ,<br>$V_{DSM} \& V_{RSM} =$<br>$V_{DRM} \& V_{RRM} + 100\text{V}$<br>respectively |
| DCR2760V26               | 2600   |   |
| DCR2760V24               | 2400   |   |

Lower voltage grades available.

### ORDERING INFORMATION

When ordering, select the required part number shown in the Voltage Ratings selection table.

For example:

#### DCR2760V28

Note: Please use the complete part number when ordering and quote this number in any future correspondence relating to your order.

### KEY PARAMETERS

|             |  |
|-------------|--|
| $V_{DRM}$   | <b>2800 V</b>                          |
| $I_{T(AV)}$ | <b>2760 A</b>                          |
| $I_{TSM}$   | <b>43000 A</b>                         |
| $dV/dt^*$   | <b>1000 V/<math>\mu\text{s}</math></b> |
| $dI/dt$     | <b>200 A/<math>\mu\text{s}</math></b>  |

\* Higher  $dV/dt$  selections available

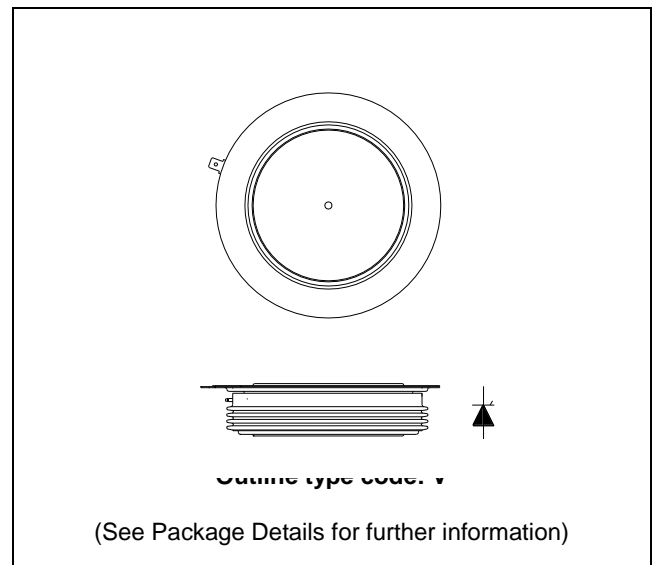


Fig. 1 Package outline

**CURRENT RATINGS**
 $T_{case} = 60^{\circ}C$  unless stated otherwise

| Symbol                    | Parameter                            | Test Conditions          | Max. | Units |
|---------------------------|--------------------------------------|--------------------------|------|-------|
| <b>Double Side Cooled</b> |                                      |                          |      |       |
| $I_{T(AV)}$               | Mean on-state current                | Half wave resistive load | 2760 | A     |
| $I_{T(RMS)}$              | RMS value                            | -                        | 4330 | A     |
| $I_T$                     | Continuous (direct) on-state current | -                        | 3900 | A     |

**SURGE RATINGS**

| Symbol    | Parameter                               | Test Conditions                           | Max. | Units             |
|-----------|---|---|------|-------------------|
| $I_{TSM}$ | Surge (non-repetitive) on-state current | 10ms half sine, $T_{case} = 125^{\circ}C$ | 43.0 | kA                |
| $I^2t$    | $I^2t$ for fusing                       | $V_R = 0$                                 | 9.25 | MA <sup>2</sup> s |

**THERMAL AND MECHANICAL RATINGS**

| Symbol        | Parameter                             | Test Conditions              | Min. | Max.  | Units         |
|---------------|---------------------------------------|------------------------------|------|-------|---------------|
| $R_{th(j-c)}$ | Thermal resistance – junction to case | Double side cooled      DC   | -    | 0.01  | $^{\circ}C/W$ |
| $R_{th(c-h)}$ | Thermal resistance – case to heatsink | Double side cooled      DC   | -    | 0.003 | $^{\circ}C/W$ |
| $T_{vj}$      | Virtual junction temperature          | Blocking $V_{DRM} / V_{RRM}$ | -    | 125   | $^{\circ}C$   |
| $T_{stg}$     | Storage temperature range             |                              | -40  | 140   | $^{\circ}C$   |
| $F_m$         | Clamping force                        |                              | 50   | 62    | kN            |

**DYNAMIC CHARACTERISTICS**

| Symbol            | Parameter                                     | Test Conditions  | Min.            | Max. | Units      |            |
|-------------------|---|--|-----------------|------|------------|------------|
| $I_{RRM}/I_{DRM}$ | Peak reverse and off-state current            | At $V_{RRM}/V_{DRM}$ , $T_{case} = 125^{\circ}C$   | -               | 300  | mA         |            |
| $dV/dt$           | Max. linear rate of rise of off-state voltage | To 67% $V_{DRM}$ , $T_j = 125^{\circ}C$ , gate open  | 1000            | -    | V/ $\mu$ s |            |
| $dI/dt$           | Rate of rise of on-state current              | From 67% $V_{DRM}$ to 3000A<br>Gate source 30V, 10 $\Omega$ ,<br>$t_r < 0.5\mu$ s, $T_j = 125^{\circ}C$        | Repetitive 50Hz | -    | 150        | A/ $\mu$ s |
|                   |   |  | Non-repetitive  | -    | 1000       | A/ $\mu$ s |
| $V_T$             | On-state voltage                              | $I_T = 3000A$ , $T_{case} = 125^{\circ}C$  |                 | 1.49 | V          |            |
| $V_{T(TO)}$       | Threshold voltage                             | $T_{case} = 125^{\circ}C$  | -               | 0.98 | V          |            |
| $r_T$             | On-state slope resistance                     | $T_{case} = 125^{\circ}C$  | -               | 0.17 | m $\Omega$ |            |
| $t_{gd}$          | Delay time                                    | $V_D = 67\% V_{DRM}$ , gate source 30V, 10 $\Omega$<br>$t_r = 0.5\mu$ s, $T_j = 25^{\circ}C$                   | -               | 3.0  | $\mu$ s    |            |
| $t_q$             | Turn-off time                                 | $T_j = 125^{\circ}C$ , $V_R = 100V$ , $dI/dt = 10A/\mu$ s,<br>$dV_{DR}/dt = 20V/\mu$ s linear to 67% $V_{DRM}$ | -               | 600  | $\mu$ s    |            |
| $Q_S$             | Stored charge                                 | $I_T = 4000A$ , $t_p = 1000\mu$ s, $T_j = 125^{\circ}C$ ,<br>$dI/dt = 10A/\mu$ s,                              | -               | 4500 | $\mu$ C    |            |
| $I_{RR}$          | Reverse recovery current                      |  | -               | 210  | A          |            |
| $I_L$             | Latching current                              | $T_j = 25^{\circ}C$ ,  | -               | 1    | A          |            |
| $I_H$             | Holding current                               | $T_j = 25^{\circ}C$ ,  | -               | 200  | mA         |            |

**GATE TRIGGER CHARACTERISTICS AND RATINGS**

| Symbol   | Parameter                | Test Conditions                              | Max. | Units |
|----------|--------------------------|--|------|-------|
| $V_{GT}$ | Gate trigger voltage     | $V_{DRM} = 5V$ , $T_{case} = 25^{\circ}C$    | 3    | V     |
| $V_{GD}$ | Gate non-trigger voltage | At 40% $V_{DRM}$ , $T_{case} = 125^{\circ}C$ | 0.3  | V     |
| $I_{GT}$ | Gate trigger current     | $V_{DRM} = 5V$ , $T_{case} = 25^{\circ}C$    | 300  | mA    |
| $I_{GD}$ | Gate non-trigger current | At 40% $V_{DRM}$ , $T_{case} = 125^{\circ}C$ | 20   | mA    |

CURVES

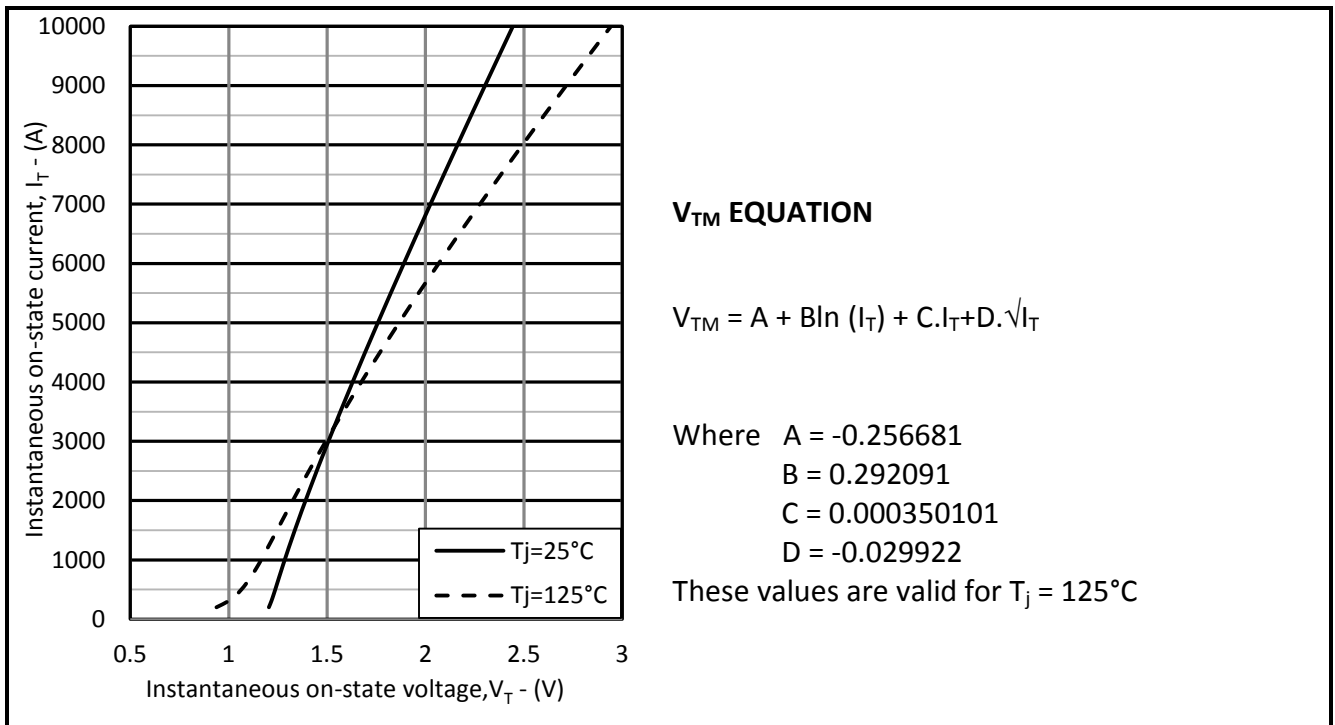


Fig.2 Maximum & minimum on-state characteristics

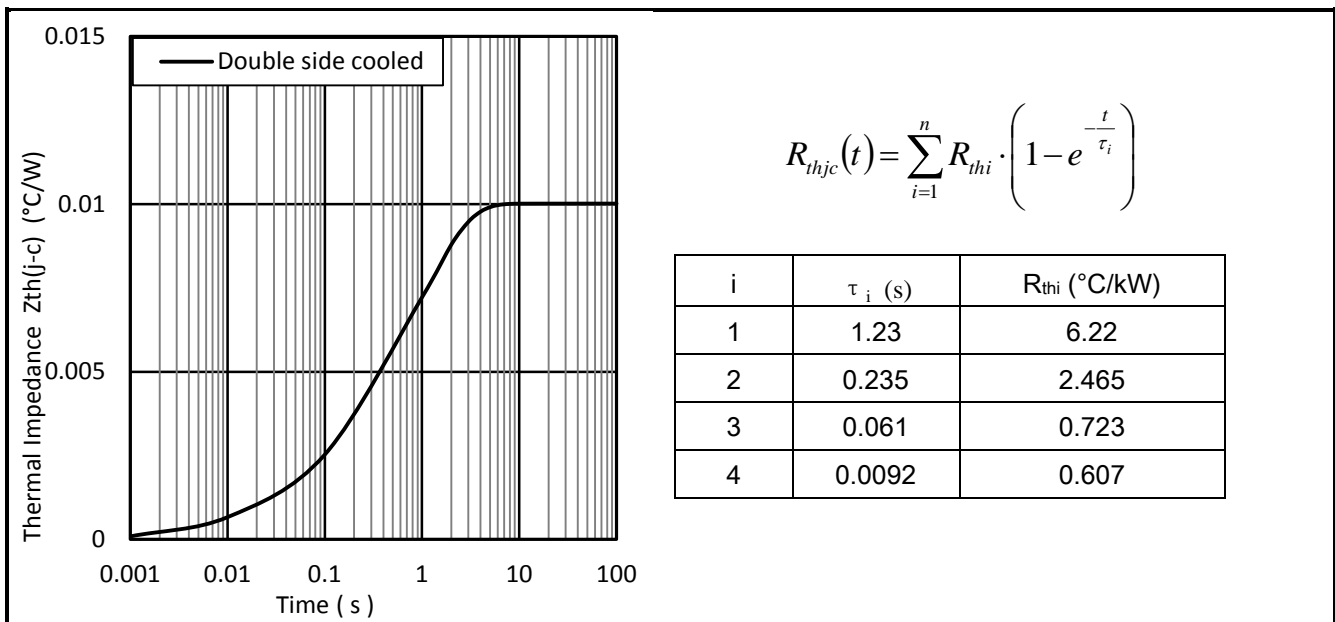
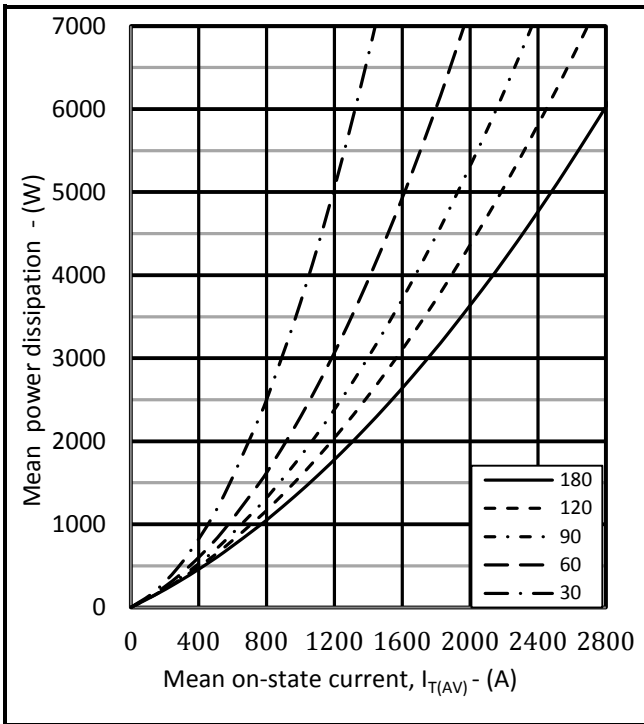
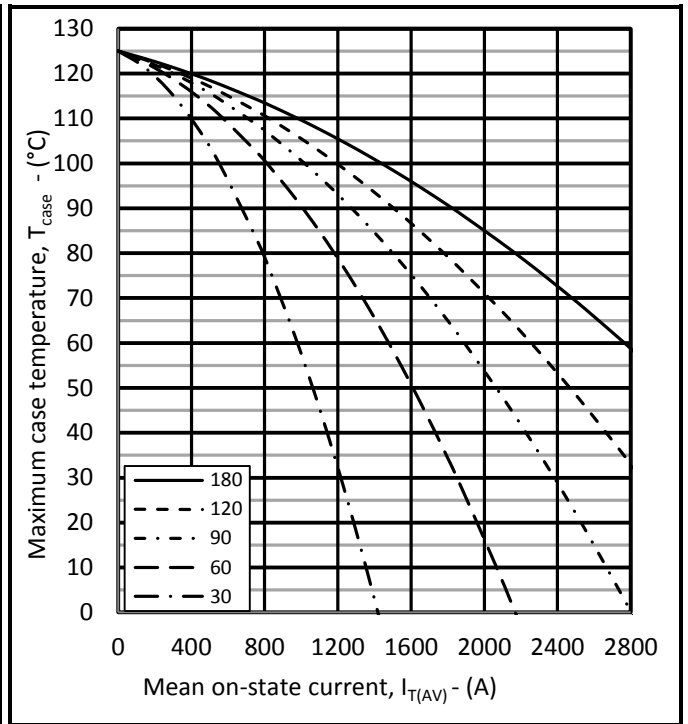


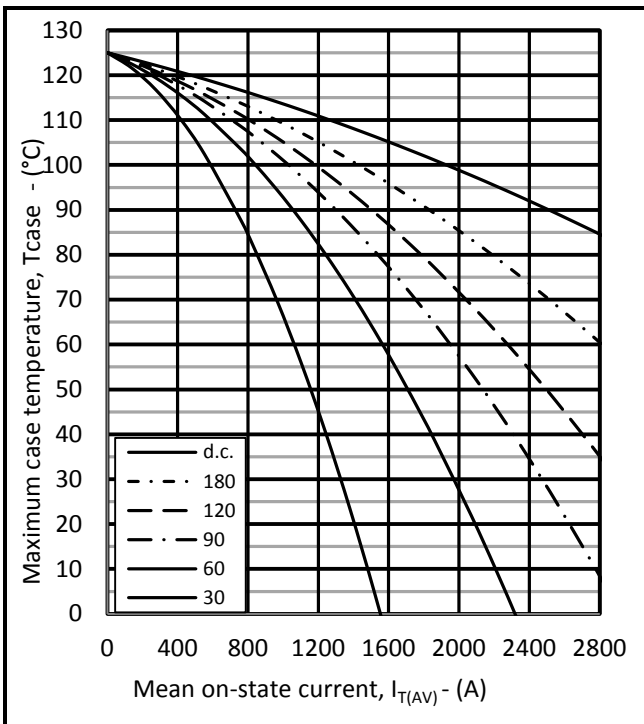
Fig.3 Maximum (limit) transient thermal impedance – junction to case (°C/W)



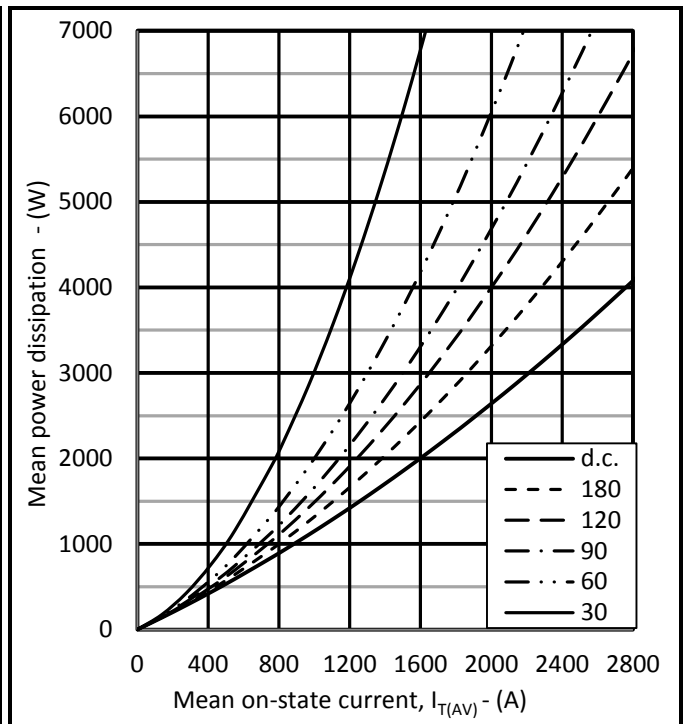
**Fig.4 On-state power dissipation – sine wave**



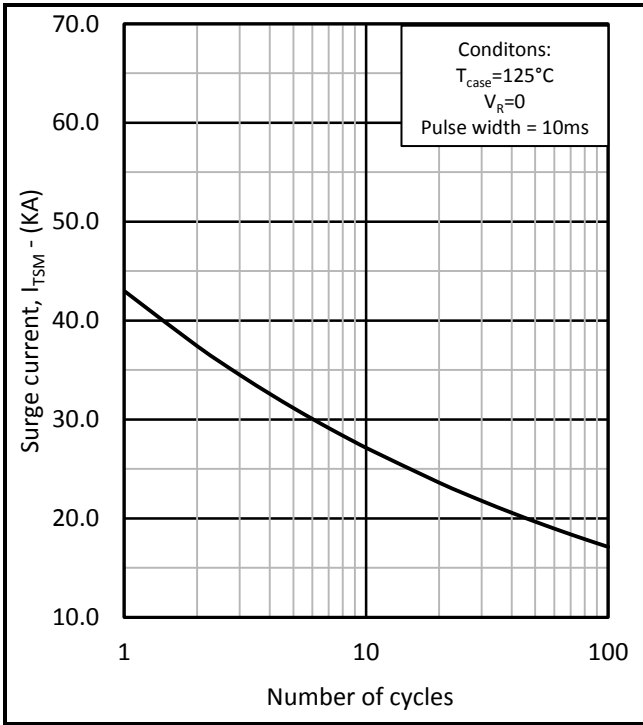
**Fig.5 Maximum permissible case temperature, double side cooled – sine wave**



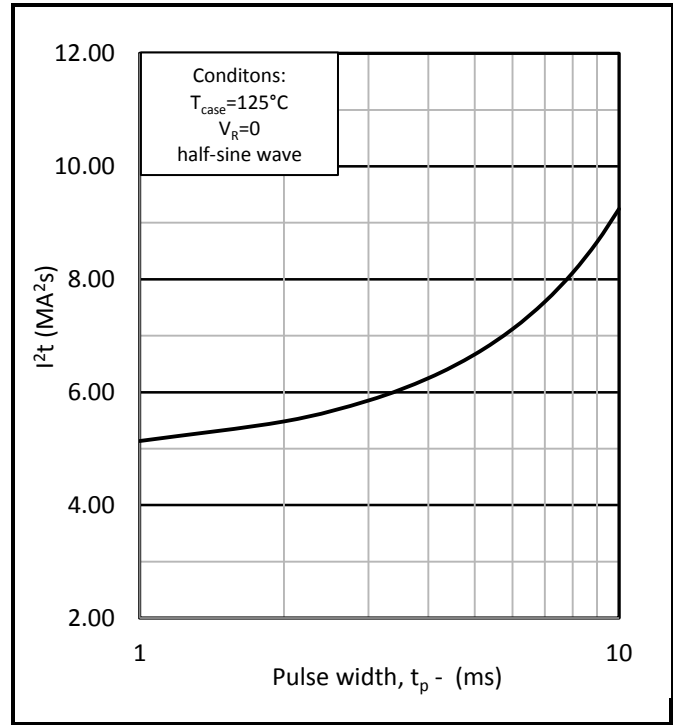
**Fig.6 Maximum permissible case temperature, double side cooled – rectangular wave**



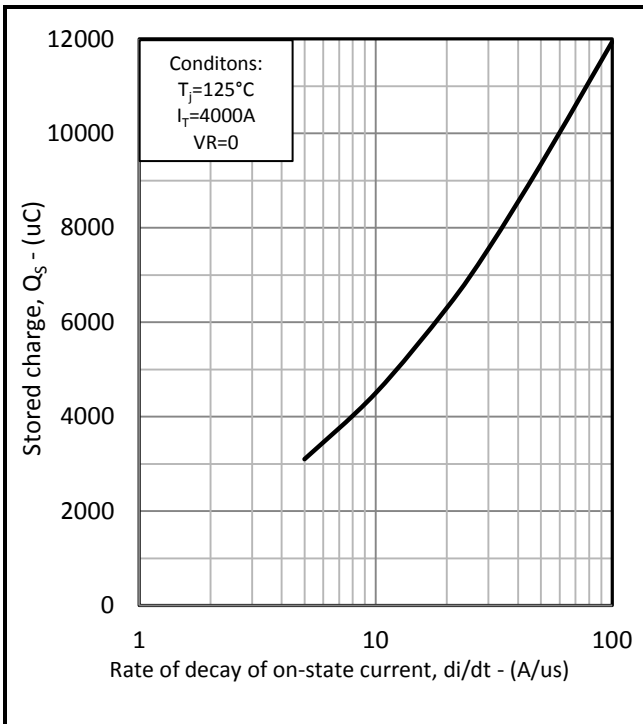
**Fig.7 On-state power dissipation – rectangular wave**



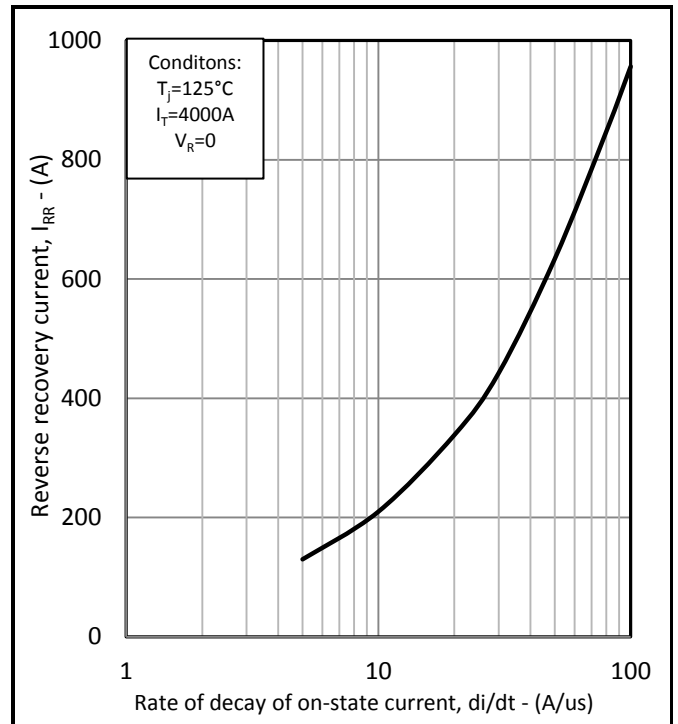
**Fig.8 Multi-cycle surge current**



**Fig.9 Single-cycle  $I^2t$**



**Fig.10 Stored charge vs di/dt**



**Fig.11 Reverse recovery current vs di/dt**

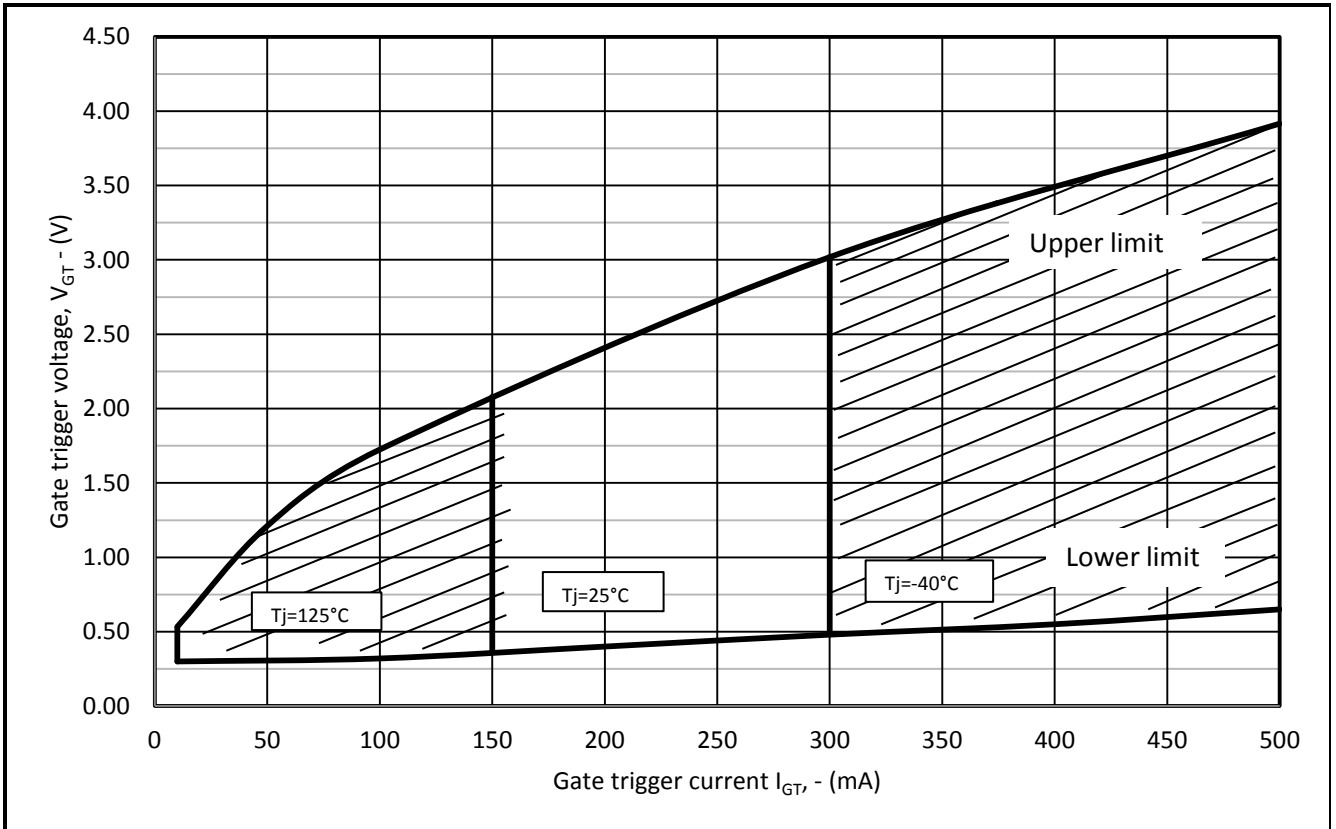
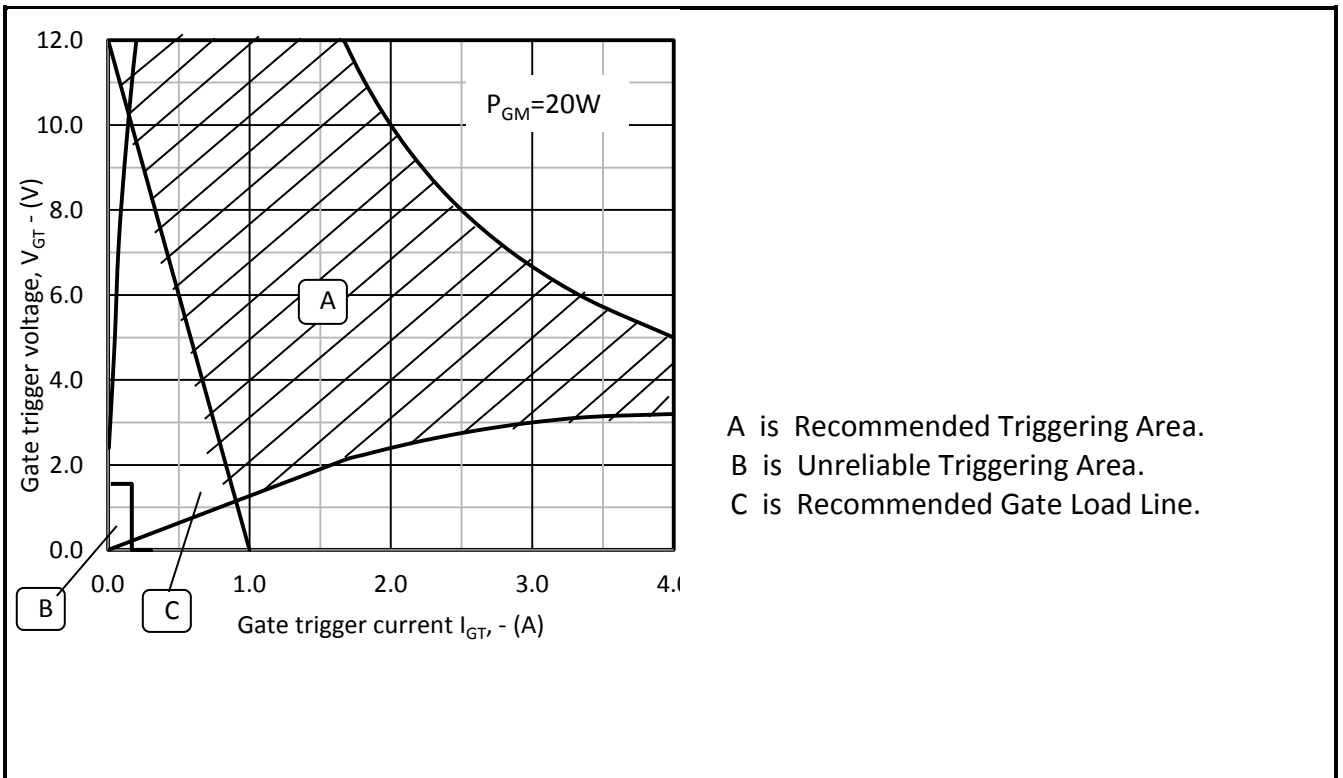


Fig.12 Gate characteristics

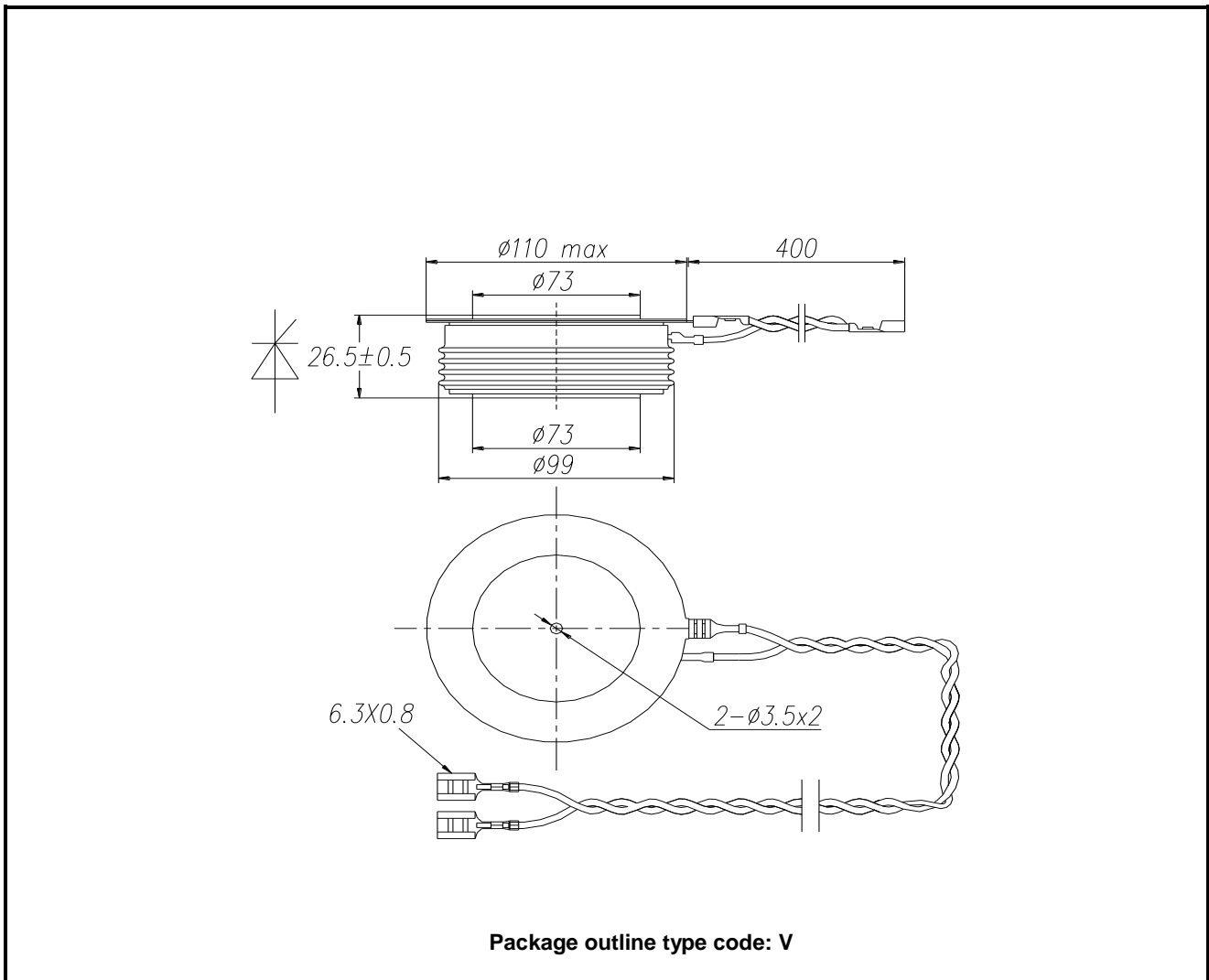


A is Recommended Triggering Area.  
 B is Unreliable Triggering Area.  
 C is Recommended Gate Load Line.

Fig.13 Gate characteristics

**PACKAGE DETAILS**

For further package information, please contact Customer Services. All dimensions in mm, unless stated otherwise. DO NOT SCALE.



**Fig.14 Package outline**



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