

### APPLICATIONS

- Rectification
- Freewheel Diode
- DC Motor Control
- Power Supplies
- Welding
- Battery Chargers

### KEY PARAMETERS

|             |       |
|-------------|-------|
| $V_{RRM}$   | 1400V |
| $I_{F(AV)}$ | 505A  |
| $I_{FSM}$   | 5600A |

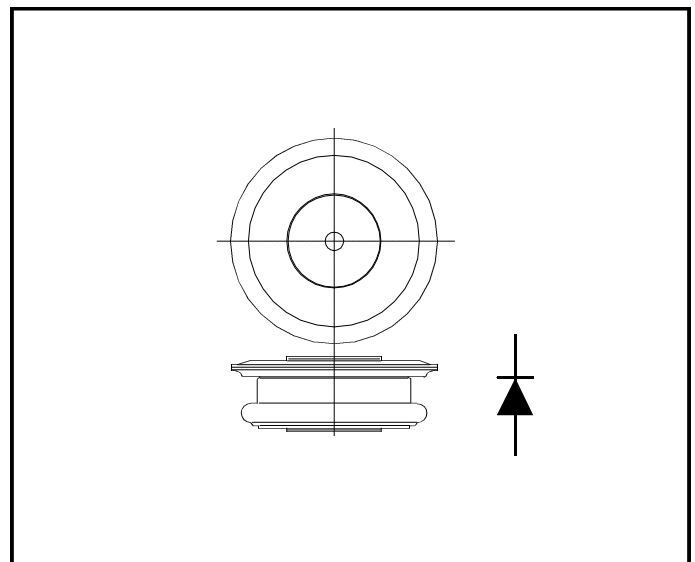
### FEATURES

- Double Side Cooling
- High Surge Capability

### VOLTAGE RATINGS

| Type Number | Repetitive Peak Reverse Voltage<br>$V_{RRM}$<br>V | Conditions                 |
|-------------|---------------------------------------------------|----------------------------|
| TR402ST14   | 1400                                              | $V_{RSM} = V_{RRM} + 100V$ |
| TR402ST13   | 1300                                              |                            |
| TR402ST12   | 1200                                              |                            |
| TR402ST11   | 1100                                              |                            |
| TR402ST10   | 1000                                              |                            |
| TR402ST09   | 900                                               |                            |

Lower voltage grades available.



Outline type code: T.  
See Package Details for further information.

### CURRENT RATINGS

| Symbol                                 | Parameter                           | Conditions                                          | Max. | Units |
|----------------------------------------|-------------------------------------|-----------------------------------------------------|------|-------|
| <b>Double Side Cooled</b>              |                                     |                                                     |      |       |
| $I_{F(AV)}$                            | Mean forward current                | Half wave resistive load, $T_{case} = 100^{\circ}C$ | 505  | A     |
| $I_{F(RMS)}$                           | RMS value                           | $T_{case} = 100^{\circ}C$                           | 793  | A     |
| $I_F$                                  | Continuous (direct) forward current | $T_{case} = 100^{\circ}C$                           | 640  | A     |
| <b>Single Side Cooled (Anode side)</b> |                                     |                                                     |      |       |
| $I_{F(AV)}$                            | Mean forward current                | Half wave resistive load, $T_{case} = 100^{\circ}C$ | 365  | A     |
| $I_{F(RMS)}$                           | RMS value                           | $T_{case} = 100^{\circ}C$                           | 573  | A     |
| $I_F$                                  | Continuous (direct) forward current | $T_{case} = 100^{\circ}C$                           | 390  | A     |

TR402ST

SURGE RATINGS

| Symbol    | Parameter                              | Conditions                                                                   | Max.              | Units  |
|-----------|----------------------------------------|------------------------------------------------------------------------------|-------------------|--------|
| $I_{FSM}$ | Surge (non-repetitive) forward current | 10ms half sine; $T_{case} = 175^{\circ}C$<br>$V_R = 50\% V_{RRM} - 1/4$ sine | 4.5               | kA     |
| $I^2t$    | $I^2t$ for fusing                      |                                                                              | $101 \times 10^3$ | $A^2s$ |
| $I_{FSM}$ | Surge (non-repetitive) forward current | 10ms half sine; $T_{case} = 175^{\circ}C$<br>$V_R = 0$                       | 5.6               | kA     |
| $I^2t$    | $I^2t$ for fusing                      |                                                                              | $155 \times 10^3$ | $A^2s$ |

THERMAL AND MECHANICAL DATA

| Symbol        | Parameter                             | Conditions                                  |             | Min. | Max. | Units         |
|---------------|---------------------------------------|---------------------------------------------|-------------|------|------|---------------|
| $R_{th(j-c)}$ | Thermal resistance - junction to case | Double side cooled                          | dc          | -    | 0.08 | $^{\circ}C/W$ |
|               |                                       | Single side cooled                          | Anode dc    | -    | 0.16 | $^{\circ}C/W$ |
|               |                                       |                                             | Cathode dc  | -    | 0.16 | $^{\circ}C/W$ |
| $R_{th(c-h)}$ | Thermal resistance - case to heatsink | Clamping force 4.5kN with mounting compound | Double side | -    | 0.02 | $^{\circ}C/W$ |
|               |                                       |                                             | Single side | -    | 0.04 | $^{\circ}C/W$ |
| $T_{vj}$      | Virtual junction temperature          | On-state (conducting)                       |             | -    | 185  | $^{\circ}C$   |
|               |                                       | Reverse (blocking)                          |             | -    | 175  | $^{\circ}C$   |
| $T_{stg}$     | Storage temperature range             |                                             |             | -55  | 200  | $^{\circ}C$   |
| -             | Clamping force                        |                                             |             | 3.5  | 5.0  | kN            |

CHARACTERISTICS

| Symbol    | Parameter            | Conditions                               | Min. | Max. | Units      |
|-----------|----------------------|------------------------------------------|------|------|------------|
| $V_{FM}$  | Forward voltage      | At 450A peak, $T_{case} = 25^{\circ}C$   | -    | 1.25 | V          |
| $I_{RRM}$ | Peak reverse current | At $V_{RRM}$ , $T_{case} = 175^{\circ}C$ | -    | 15   | mA         |
| $V_{TO}$  | Threshold voltage    | At $T_{vj} = 175C$                       | -    | 0.81 | V          |
| $r_T$     | Slope resistance     | At $T_{vj} = 175C$                       | -    | 0.84 | m $\Omega$ |

CURVES

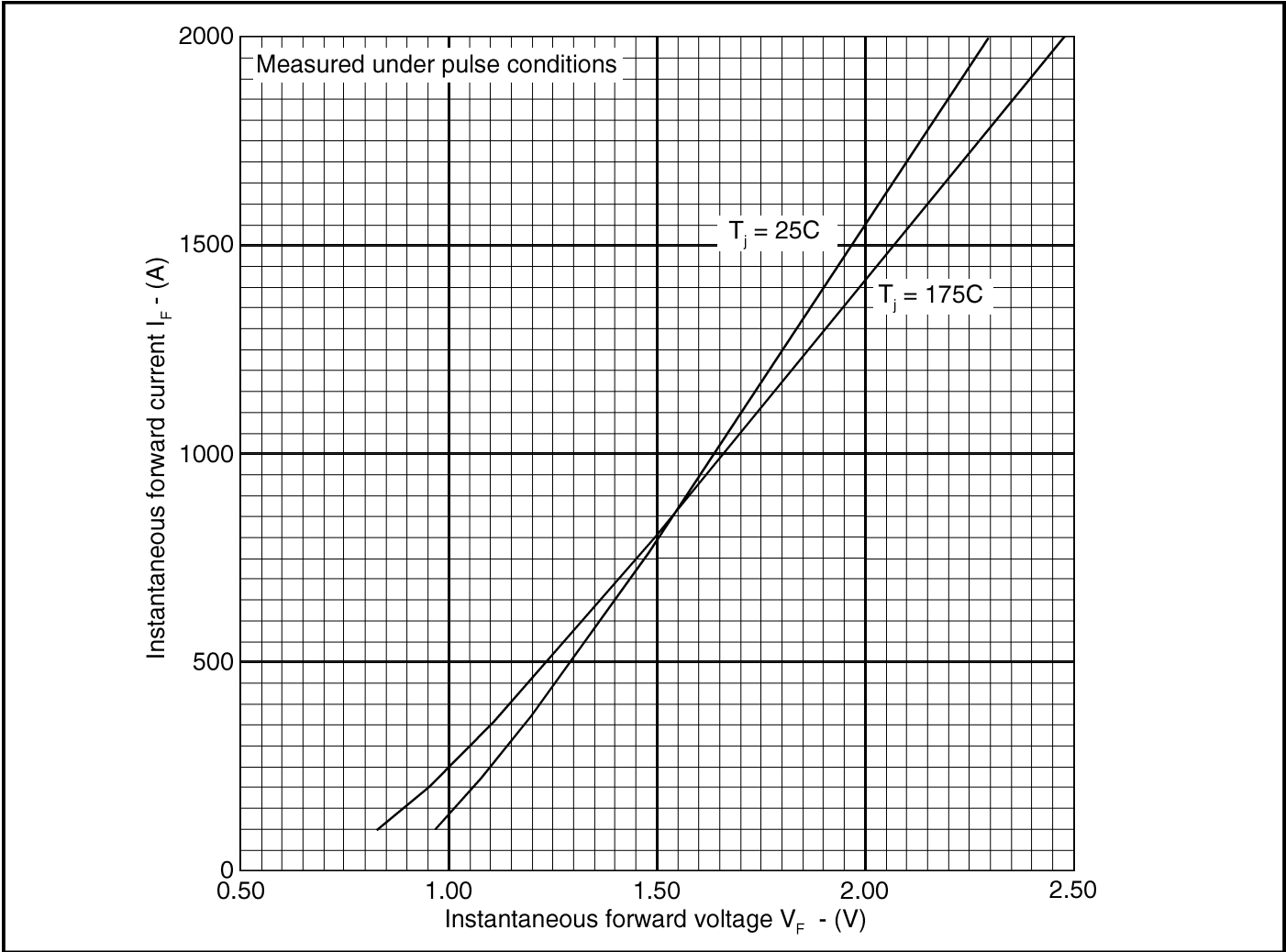


Fig. 1 Maximum (limit) forward characteristics

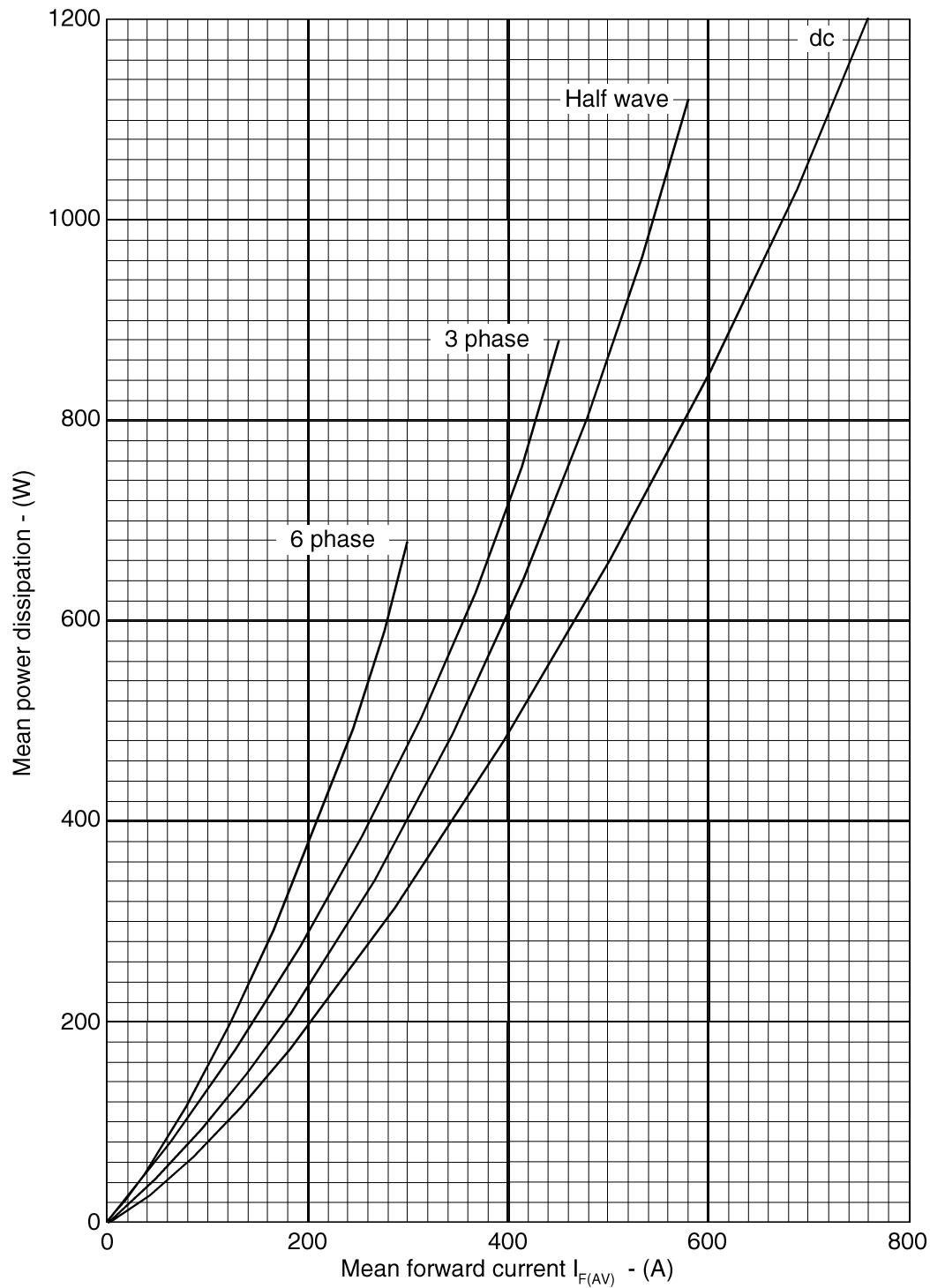


Fig. 2 Dissipation curves

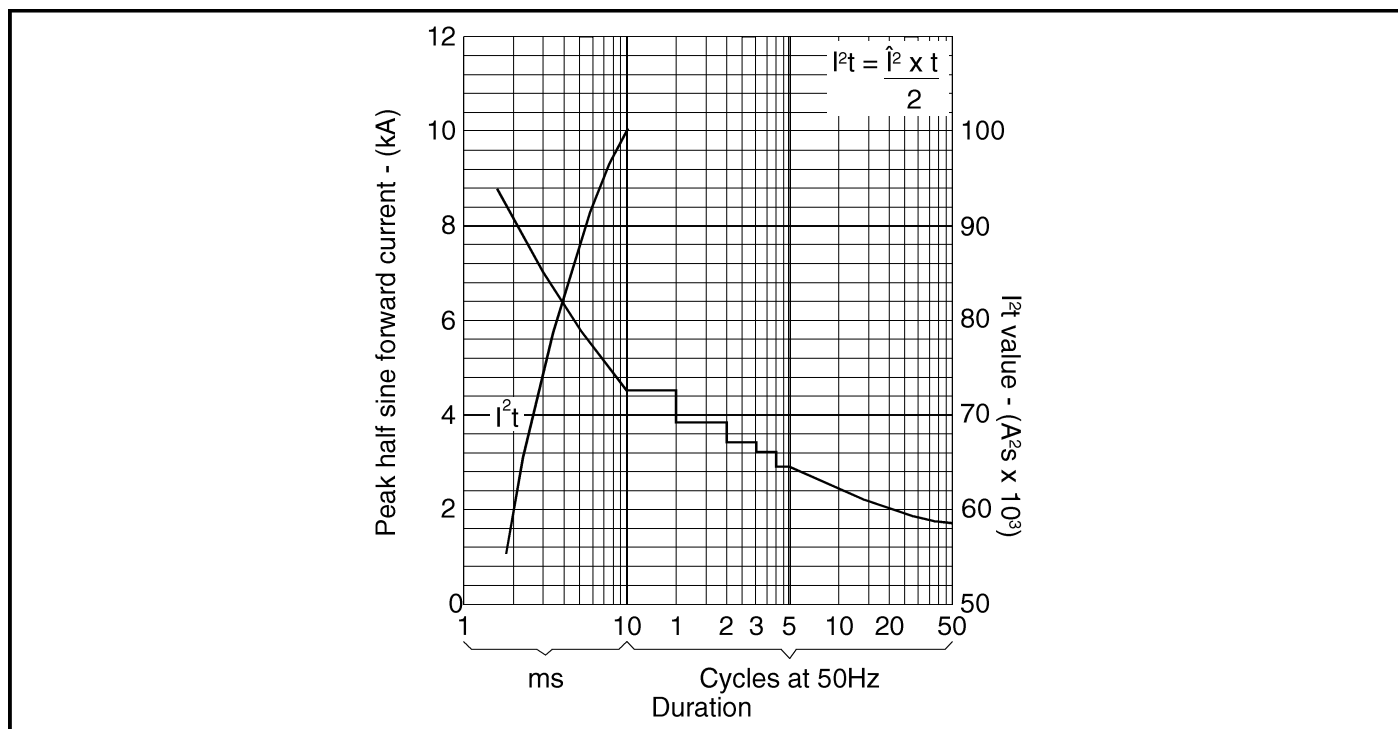


Fig. 3 Surge (non-repetitive) forward current vs time (with 50%  $V_{RRM}$ ,  $T_{case} = 175C$ )

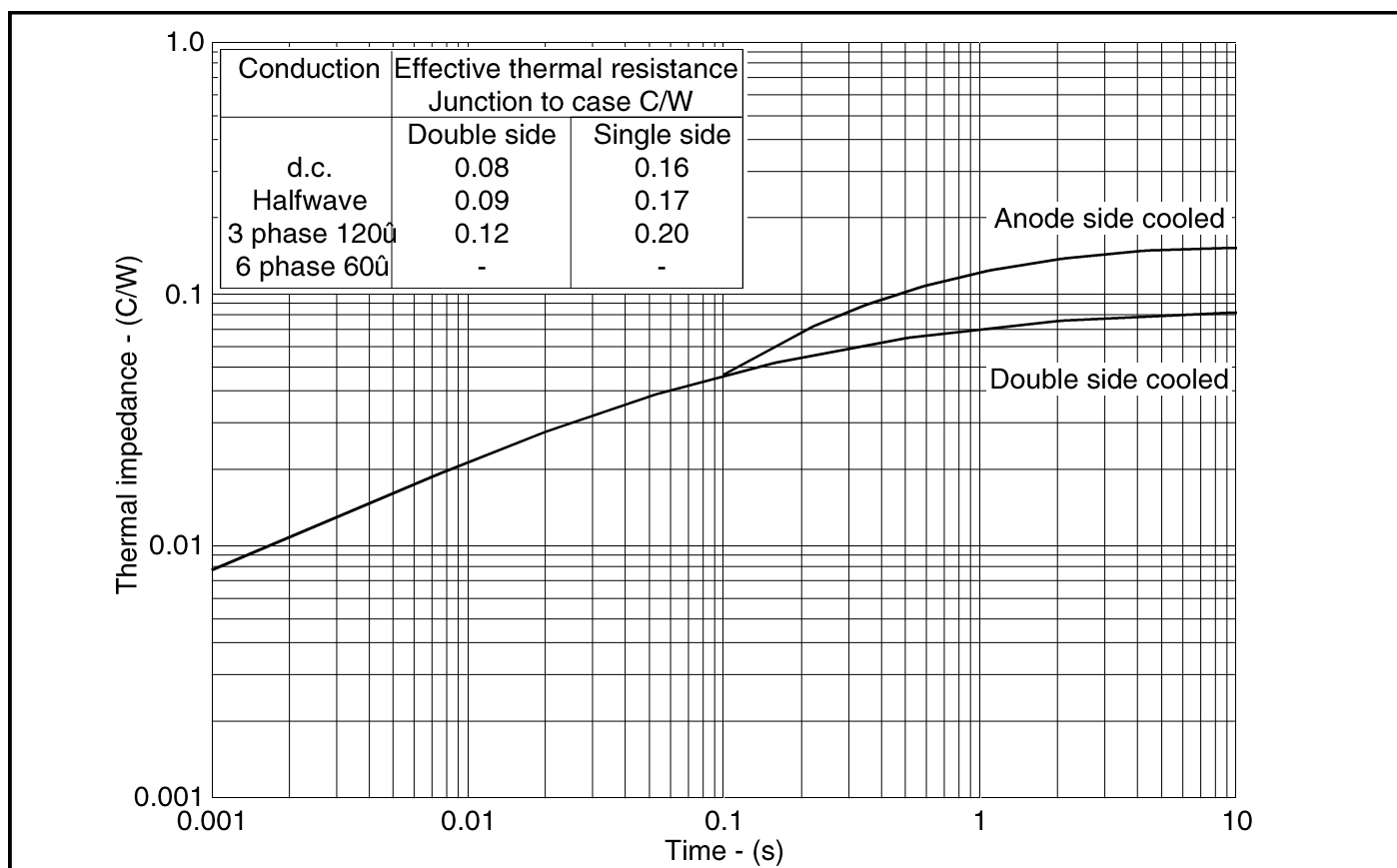


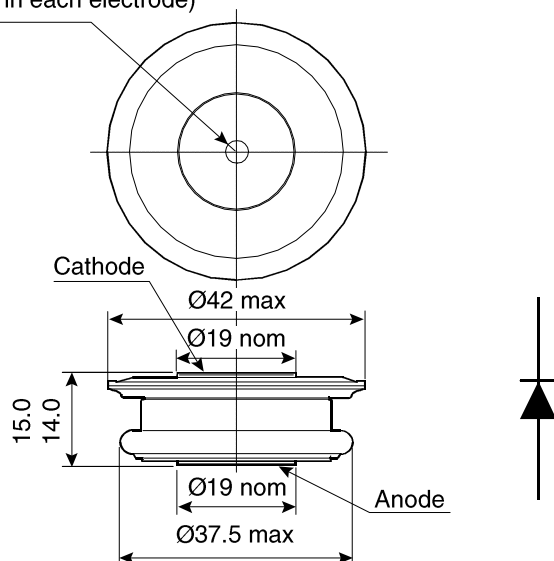
Fig. 4 Transient thermal impedance - junction to case - (C/W)

## TR402ST

### PACKAGE DETAILS

For further package information, please contact your local Customer Service Centre. All dimensions in mm, unless stated otherwise.  
DO NOT SCALE.

2 holes Ø3.6 x 2.0 deep  
(One in each electrode)



Nominal weight: 50g  
Clamping force: 4.5kN  $\pm$ 10%

**Package outline type code: T**