# DS2012SF

## RECTIFIER DIODE

### APPLICATIONS

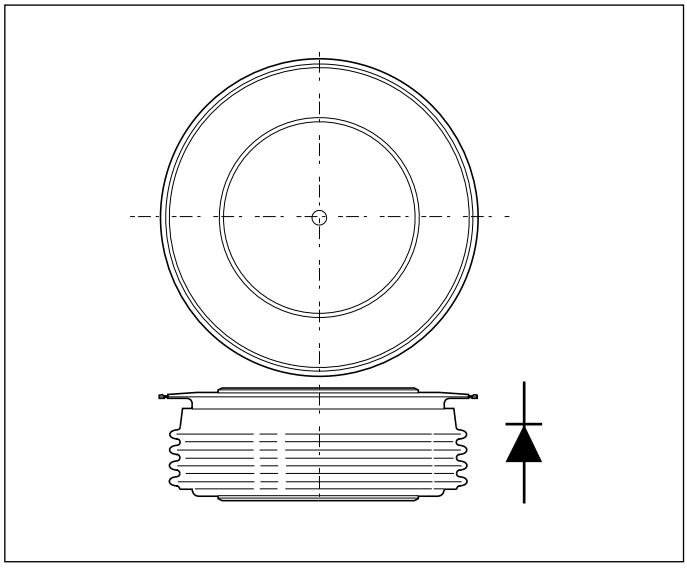
- Rectification.
- Freewheel Diode.
- DC Motor Control.
- Power Supplies.
- Welding.
- Battery Chargers.

### KEY PARAMETERS

| | |
|---|---|
| $V_{RRM}$ | 6000V |
| $I_{F(AV)}$ | 1015A |
| $I_{FSM}$ | 16500A |

### FEATURES

- Double Side Cooling.
- High Surge Capability.



*Outline type code: F. Turn to page 7 for further information.*

### VOLTAGE RATINGS

| Type Number | Repetitive Peak Reverse Voltage $V_{RRM}$ V | Conditions |
|---|---|---|
| DS2012SF60 | 6000 | $V_{RSM} = V_{RRM} + 100V$ |
| DS2012SF59 | 5900 | |
| DS2012SF58 | 5800 | |
| DS2012SF57 | 5700 | |
| DS2012SF56 | 5600 | |
| DS2012SF55 | 5500 | |

*Lower voltage grades available.*

### CURRENT RATINGS

| Symbol | Parameter | Conditions | Max. | Units |
|---|---|---|---|---|
| **Double Side Cooled** | | | | |
| $I_{F(AV)}$ | Mean forward current | Half wave resistive load, $T_{case}$ = 100°C | 1015 | A |
| $I_{F(RMS)}$ | RMS value | $T_{case}$ = 100°C | 1594 | A |
| $I_F$ | Continuous (direct) forward current | $T_{case}$ = 100°C | 1480 | A |
| **Single Side Cooled (Anode side)** | | | | |
| $I_{F(AV)}$ | Mean forward current | Half wave resistive load, $T_{case}$ = 100°C | 680 | A |
| $I_{F(RMS)}$ | RMS value | $T_{case}$ = 100°C | 1067 | A |
| $I_F$ | Continuous (direct) forward current | $T_{case}$ = 100°C | 920 | A |

## SURGE RATINGS

| Symbol | Parameter | Conditions | Max. | Units |
|---|---|---|---|---|
| $I_{FSM}$ | Surge (non-repetitive) forward current | 10ms half sine; $T_{case}$ = 150°C | 13.5 | kA |
| $I^2t$ | $I^2t$ for fusing | $V_R$ = 50% $V_{RRM}$ - 1/4 sine | 0.92 x $10^6$ | $A^2s$ |
| $I_{FSM}$ | Surge (non-repetitive) forward current | 10ms half sine; $T_{case}$ = 150°C | 16.5 | kA |
| $I^2t$ | $I^2t$ for fusing | $V_R$ = 0 | 1.425 x $10^6$ | $A^2s$ |

## THERMAL AND MECHANICAL DATA

| Symbol | Parameter | Conditions | | Min. | Max. | Units |
|---|---|---|---|---|---|---|
| $R_{th(j-c)}$ | Thermal resistance - junction to case | Double side cooled | dc | - | 0.022 | °C/W |
| | | Single side cooled | Anode dc | - | 0.038 | °C/W |
| | | | Cathode dc | - | 0.052 | °C/W |
| $R_{th(c-h)}$ | Thermal resistance - case to heatsink | Clamping force 19.5kN with mounting compound | Double side | - | 0.004 | °C/W |
| | | | Single side | - | 0.008 | °C/W |
| $T_{vj}$ | Virtual junction temperature | Forward (conducting) | | - | 160 | °C |
| | | Reverse (blocking) | | - | 150 | °C |
| $T_{stg}$ | Storage temperature range | | | -55 | 175 | °C |
| - | Clamping force | | | 18.0 | 22.0 | kN |

## CHARACTERISTICS

| Symbol | Parameter | Conditions | Min. | Max. | Units |
|---|---|---|---|---|---|
| $V_{FM}$ | Forward voltage | At 3400A peak, $T_{case}$ = 25°C | - | 2.1 | V |
| $I_{RRM}$ | Peak reverse current | At $V_{RRM}$, $T_{case}$ = 150°C | - | 75 | mA |
| $Q_S$ | Total stored charge | $I_F$ = 2000A, $dI_{RR}/dt$ = 3A/µs, | - | 4500 | µC |
| $I_{RR}$ | Peak recovery current | $T_{case}$ = 150°C, $V_R$ = 100V | - | 120 | A |
| $V_{TO}$ | Threshold voltage | At $T_{vj}$ = 150°C | - | 1.0 | V |
| $r_T$ | Slope resistance | At $T_{vj}$ = 150°C | - | 0.42 | mΩ |

## CURVES

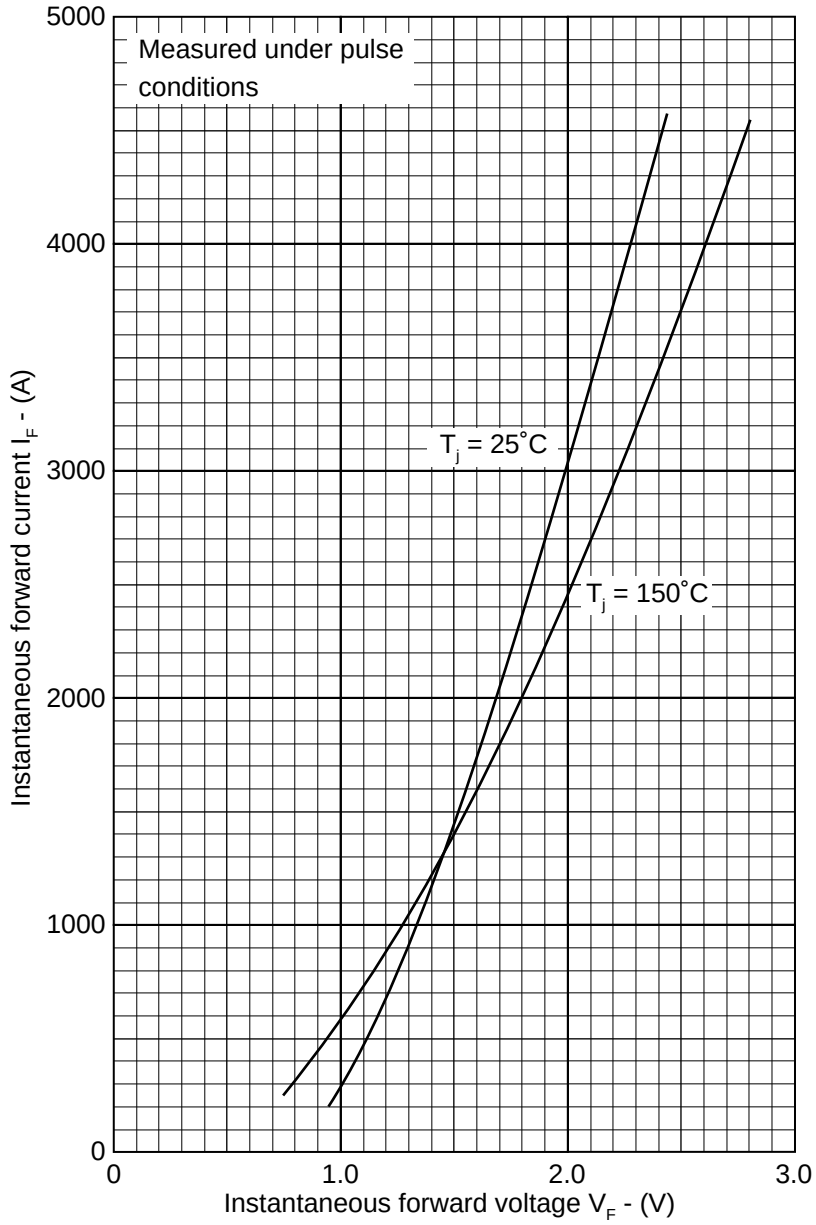



***FIG. 1 MAXIMUM (LIMIT) FORWARD CHARACTERISTICS***

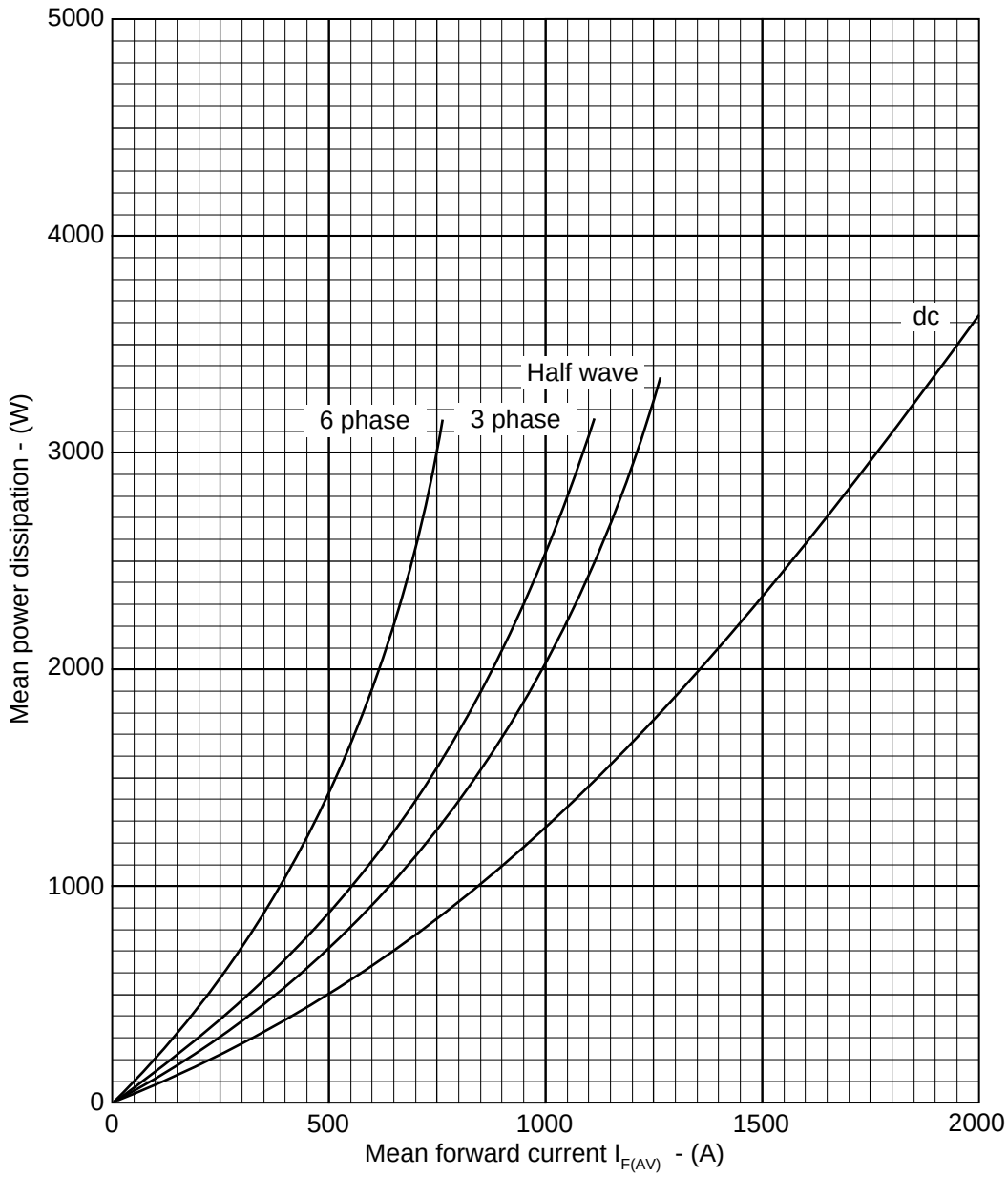



***FIG. 2 DISSIPATION CURVES***

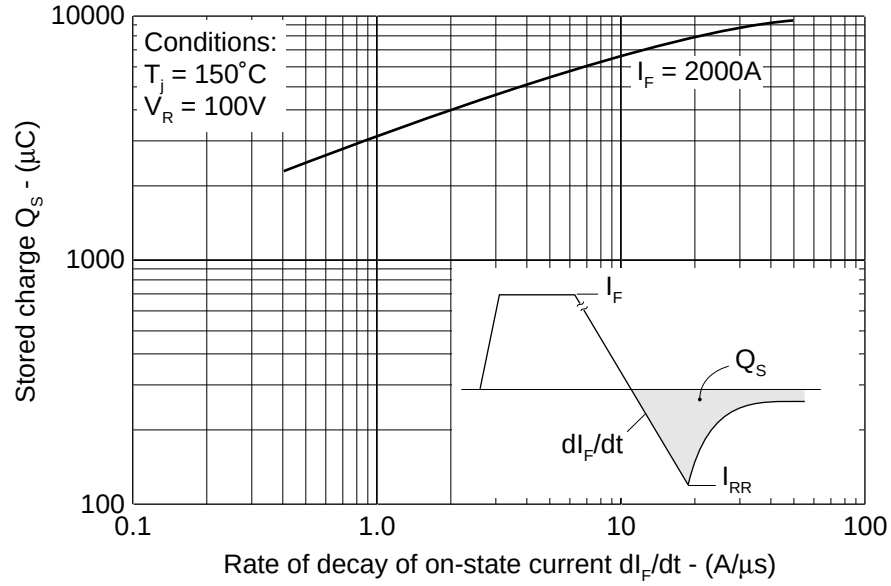



***FIG. 3 MAXIMUM TOTAL STORED CHARGE***

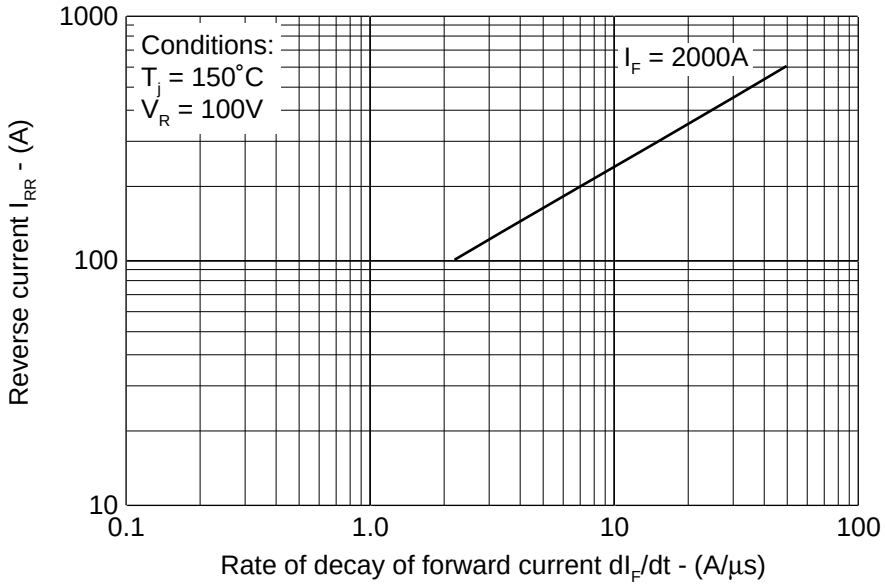



***FIG. 4 MAXIMUM REVERSE RECOVERY CURRENT***

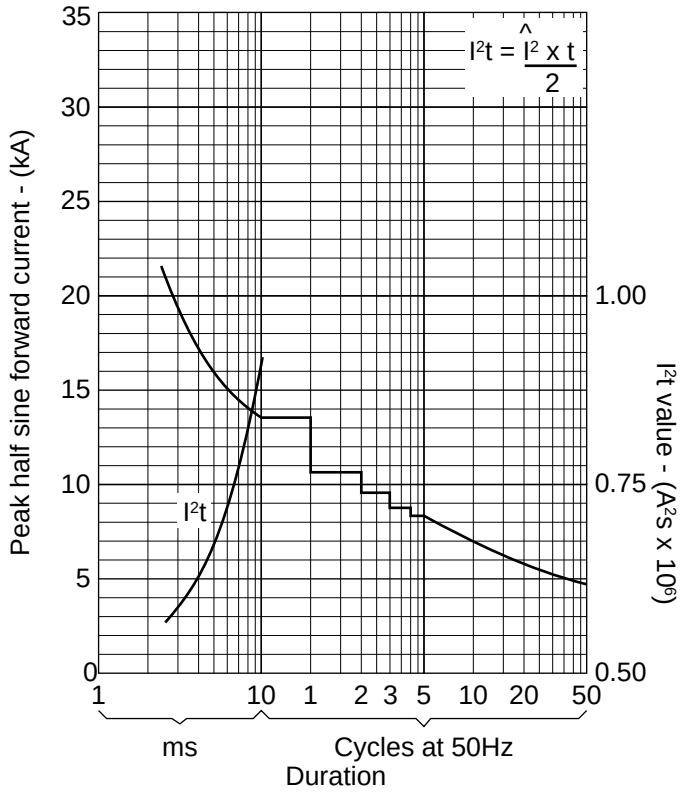



***FIG. 5 SURGE (NON-REPETITIVE) FORWARD CURRENT vs TIME (WITH 50% $V_{RRM}$ $T_{case}$ = 125˚C)***

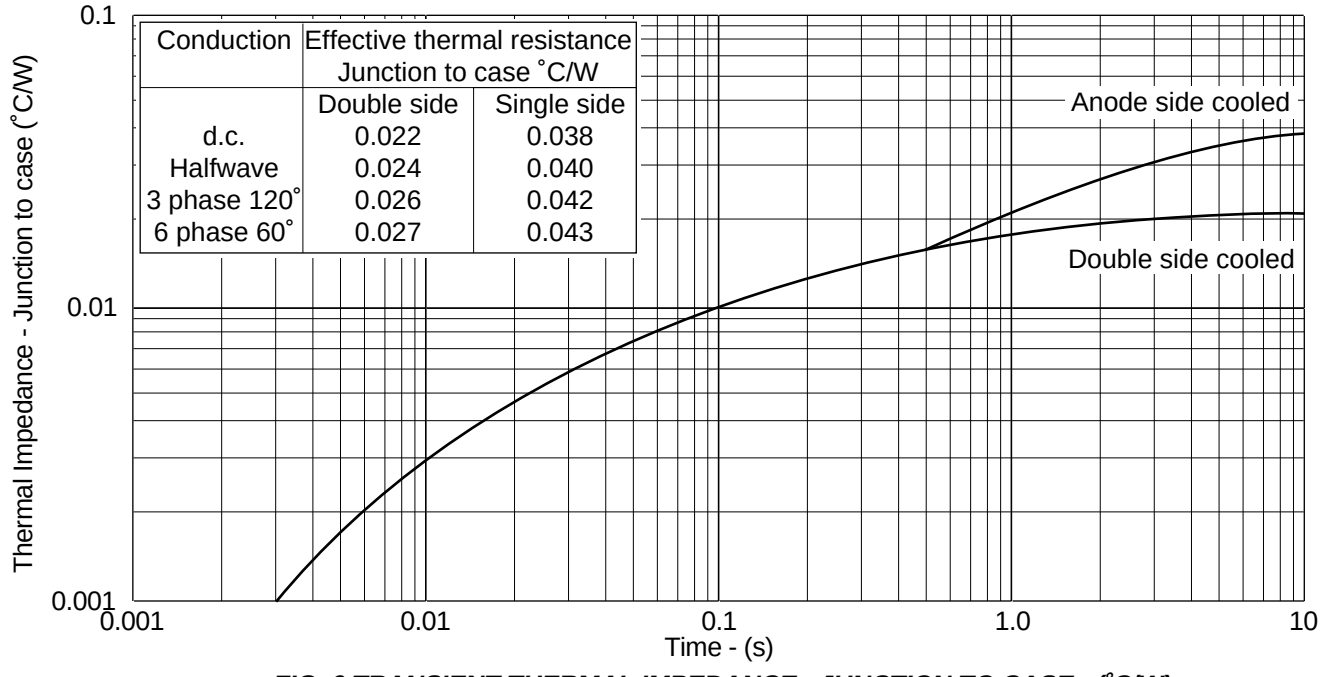
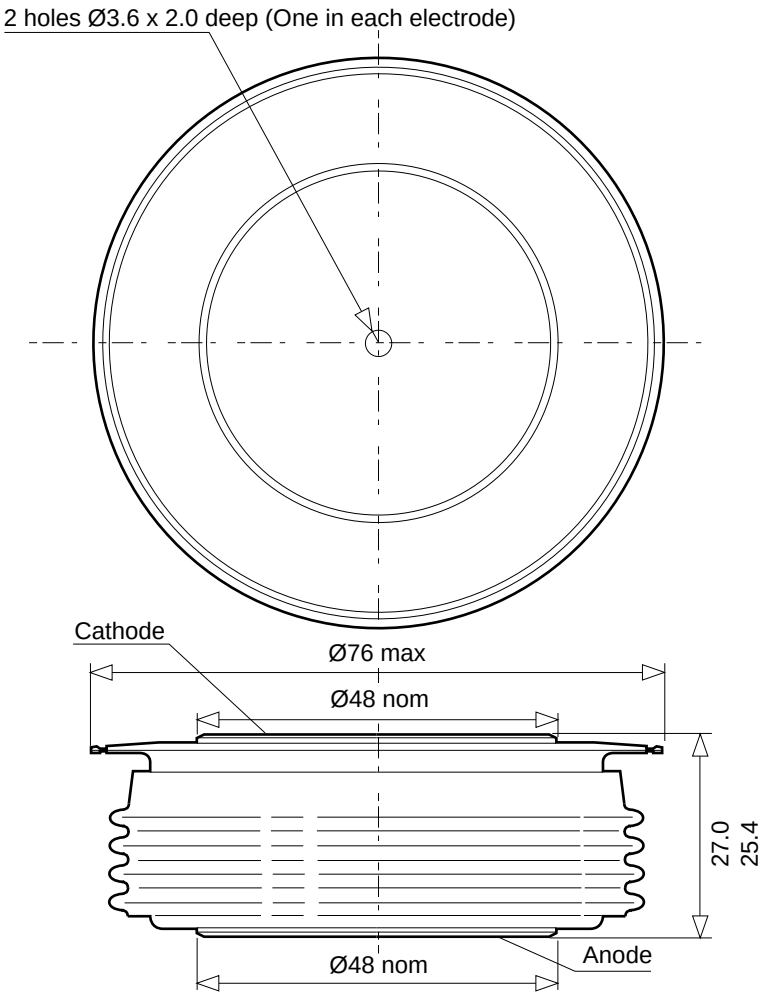



***FIG. 6 TRANSIENT THERMAL IMPEDANCE - JUNCTION TO CASE - (˚C/W)***

## PACKAGE DETAILS - F

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




Weight: 500g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