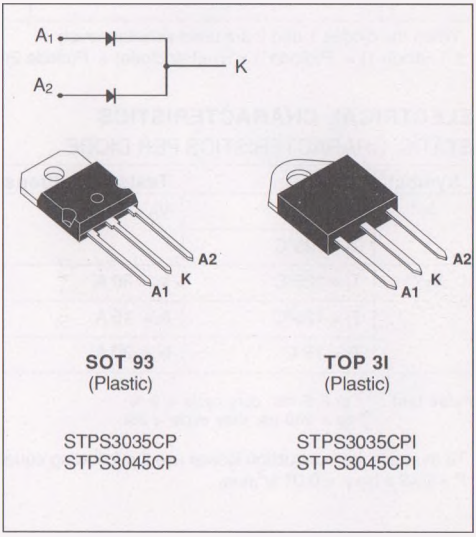
SGS-THOMSON MICROELECTRONICS

# STPS3035CP/CPI
# STPS3045CP/CPI

## POWER SCHOTTKY RECTIFIER

- VERY SMALL CONDUCTION LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- EXTREMELY FAST SWITCHING
- LOW FORWARD VOLTAGE DROP
- HIGH AVALANCHE CAPABILITY
- LOW THERMAL RESISTANCE
- INSULATED PACKAGE :
  Insulating voltage = 2500$V_{RMS}$
  Capacitance = 12pF




**SOT 93**
(Plastic)

STPS3035CP
STPS3045CP

**TOP 3I**
(Plastic)

STPS3035CPI
STPS3045CPI

### DESCRIPTION

Dual center tap schottky rectifier suited for switch-mode power supply and high frequency DC to DC converters.

Packaged in SOT 93 and TOP 3I, this device is intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications.

### ABSOLUTE RATINGS (limiting values)

| Symbol | Parameter | | | | Value | Unit |
|---|---|---|---|---|---|---|
| $I_{F(RMS)}$ | RMS Forward Current | | | Per diode | 30 | A |
| $I_{F(AV)}$ | Average Forward Current $\delta = 0.5$ | SOT 93 | Tc = 135°C | Per diode | 15 | A |
| | | TOP 3I | Tc = 125°C | Per device | 30 | |
| $I_{FSM}$ | Surge Non Repetitive Forward Current | | Tp = 10 ms Sinusoidal | Per diode | 220 | A |
| $I_{RRM}$ | Peak Repetitive Reverse Current | | Tp = 2 µs F = 1KHz | Per diode | 1 | A |
| Tstg<br>Tj | Storage and Junction Temperature Range | | | | - 65 to + 150<br>- 65 to + 150 | °C |
| dV/dt | Critical Rate of Rise of Reverse Voltage | | | | 1000 | V/µs |

| Symbol | Parameter | STPS | | Unit |
|---|---|---|---|---|
| | | 3035CP<br>3035CPI | 3045CP<br>3045CPI | |
| $V_{RRM}$ | Repetitive Peak Reverse Voltage | 35 | 45 | V |

## THERMAL RESISTANCE

| Symbol | Parameter | | | Value | Unit |
|---|---|---|---|---|---|
| $R_{TH(j-c)}$ | Junction-case | SOT 93 | Per diode | 1.5 | °C/W |
| | | | total | 0.8 | |
| | | TOP 3I | Per diode | 2.2 | |
| | | | total | 1.6 | |
| $R_{TH(c)}$ | Coupling | SOT 93 | | 0.1 | °C/W |
| | | TOP 3I | | 1.0 | |

When the diodes 1 and 2 are used simultaneously :

$\Delta T_J$(diode 1) = P(diode1) x $R_{TH}$(Per diode) + P(diode 2) x $R_{TH(c)}$

## ELECTRICAL CHARACTERISTICS

### STATIC CHARACTERISTICS PER DIODE

| Symbol | Tests Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $I_R$ * | Tj = 25°C | $V_R = V_{RRM}$ | | | 200 | µA |
| | Tj = 125°C | | | | 40 | mA |
| $V_F$ ** | Tj = 125°C | $I_F$ = 30 A | | | 0.72 | V |
| | Tj = 125°C | $I_F$ = 15 A | | | 0.57 | |
| | Tj = 25°C | $I_F$ = 30 A | | | 0.84 | |

**Pulse test :** * tp = 5 ms, duty cycle < 2 %
** tp = 380 µs, duty cycle < 2%

To evaluate the conduction losses use the following equation :

$P = 0.42 \times I_{F(AV)} + 0.01\ I_F{}^2{}_{(RMS)}$

**Fig. 1 :** Average forward power dissipation versus average forward current. (Per diode)

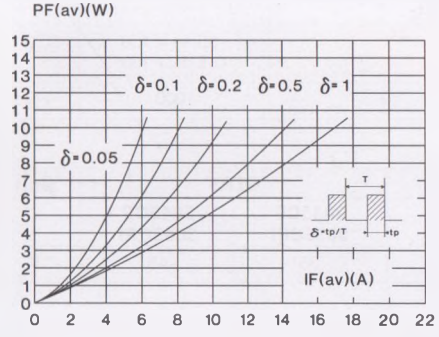


**Fig. 2 :** Average current versus ambient temperature. (duty cycle : 0.5) (Per diode) (SOT 93)

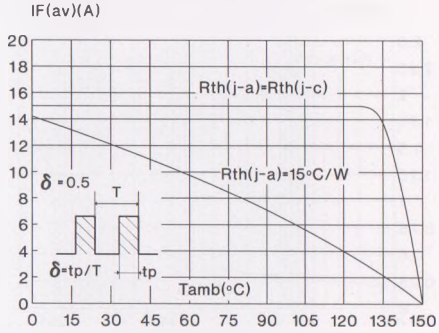



**Fig. 2 :** Average current versus ambient temperature. (duty cycle : 0.5) (Per diode) (TOP 3I)

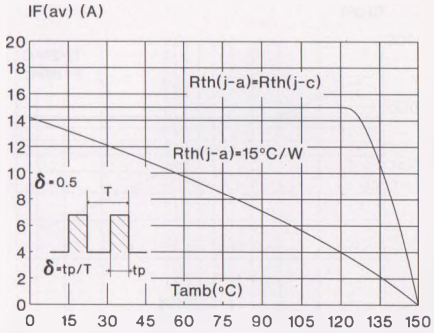



**Fig. 4 :** Non repetitive surge peak forward current versus overload duration.
(Maximum values) (Per diode) (SOT 93)

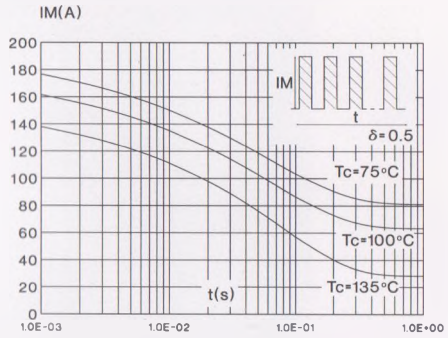



**Fig. 5 :** Non repetitive surge peak forward current versus overload duration.
(Maximum values) (Per diode) (TOP 3I)

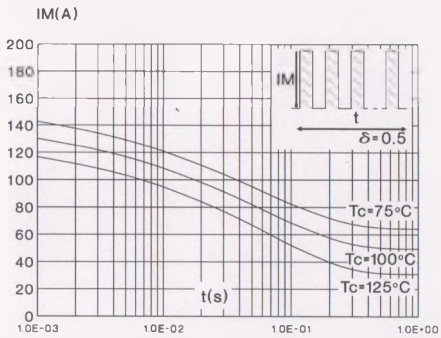



**Fig. 6** : Relative variation of thermal transient impedance junction to case versus pulse duration.

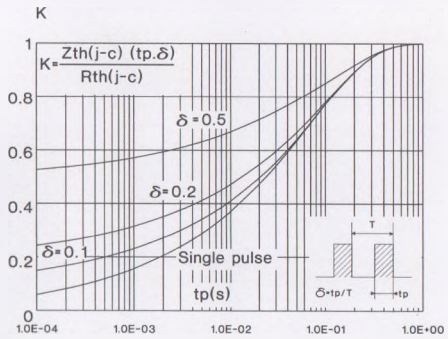



**Fig. 7** : Reverse leakage current versus reverse voltage applied. (Typical values) (Per diode)

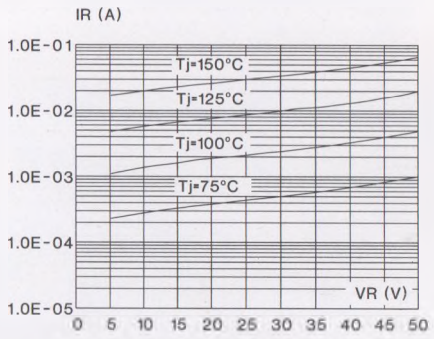


**Fig. 8** : Junction capacitance versus reverse voltage applied. (Typical values) (Per diode)

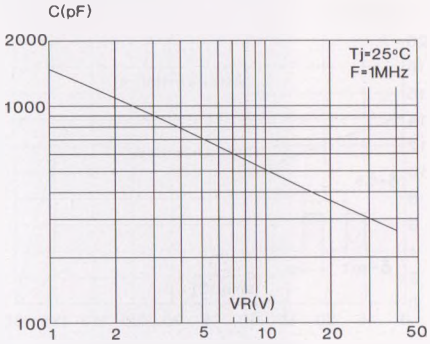



**Fig. 9** : Forward voltage drop versus forward current. (Maximum values) (Per diode)