

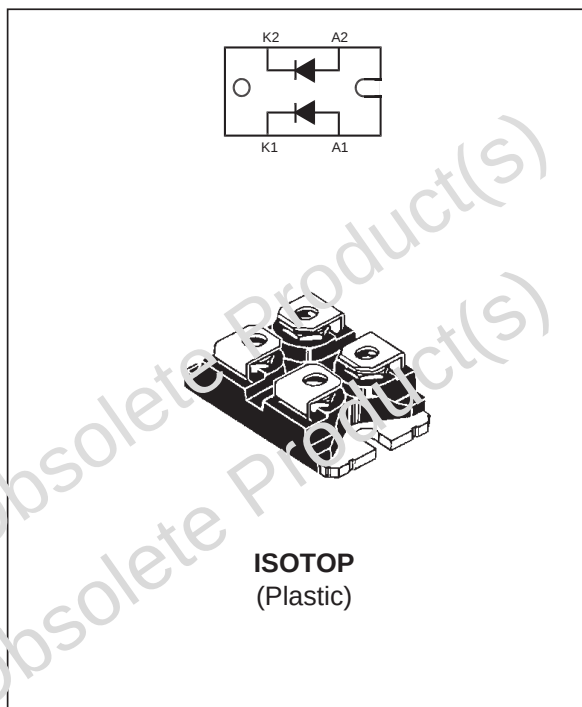
## HIGH EFFICIENCY FAST RECOVERY RECTIFIER DIODES

### FEATURES

- SUITED FOR SMPS
- VERY LOW FORWARD LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- HIGH SURGE CURRENT CAPABILITY
- HIGH AVALANCHE ENERGY CAPABILITY
- INSULATED :  
Insulating voltage = 2500 V<sub>RMS</sub>  
Capacitance = 55 pF

### DESCRIPTION

Dual rectifier suited for switchmode power supply and high frequency DC to DC converters. Packaged in ISOTOP™ this device is intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications.



### ABSOLUTE MAXIMUM RATINGS

| Symbol             | Parameter                              |                                   |           | Value                          | Unit                                 |
|--------------------|----------------------------------------|-----------------------------------|-----------|--------------------------------|--------------------------------------|
| $I_{F(RMS)}$       | RMS forward current                    |                                   | Per diode | 150                            | A                                    |
| $I_{F(AV)}$        | Average forward current $\delta = 0.5$ | $T_c = 110^\circ\text{C}$         | Per diode | 100                            | A                                    |
| $I_{FSM}$          | Surge non repetitive forward current   | $t_p = 10\text{ms}$<br>sinusoidal | Per diode | 1600                           | A                                    |
| $T_{stg}$<br>$T_j$ | Storage and junction temperature range |                                   |           | - 40 to + 150<br>- 40 to + 150 | $^\circ\text{C}$<br>$^\circ\text{C}$ |

| Symbol    | Parameter                       | Value | Unit |
|-----------|---------------------------------|-------|------|
| $V_{RRM}$ | Repetitive peak reverse voltage | 200   | V    |

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**BYV255V****THERMAL RESISTANCE**

| Symbol    | Parameter        |           | Value | Unit |
|-----------|------------------|-----------|-------|------|
| Rth (j-c) | Junction to case | Per diode | 0.4   | °C/W |
|           |                  | Total     | 0.25  |      |
| Rth (c)   | Coupling         |           | 0.1   | °C/W |

When the diodes 1 and 2 are used simultaneously :

$$T_j - T_c (\text{diode 1}) = P(\text{diode 1}) \times R_{th(j-c)} (\text{Per diode}) + P(\text{diode 2}) \times R_{th(c)}$$

**ELECTRICAL CHARACTERISTICS (Per diode)****STATIC CHARACTERISTICS**

| Symbol            | Test Conditions        |                                   | Min. | Typ. | Max. | Unit |
|-------------------|------------------------|-----------------------------------|------|------|------|------|
| I <sub>R</sub> *  | T <sub>j</sub> = 25°C  | V <sub>R</sub> = V <sub>RRM</sub> |      |      | 100  | μA   |
|                   | T <sub>j</sub> = 100°C |                                   |      |      | 10   | mA   |
| V <sub>F</sub> ** | T <sub>j</sub> = 125°C | I <sub>F</sub> = 100 A            |      |      | 0.85 | V    |
|                   | T <sub>j</sub> = 125°C | I <sub>F</sub> = 200 A            |      |      | 1.00 |      |
|                   | T <sub>j</sub> = 25°C  | I <sub>F</sub> = 200 A            |      |      | 1.15 |      |

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

\*\* tp = 380 μs, duty cycle < 2 %

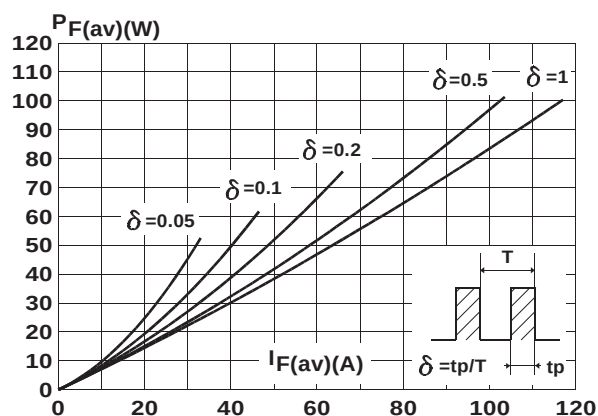
**RECOVERY CHARACTERISTICS**

| Symbol          | Test Conditions        |                                                               |                               | Min. | Typ. | Max. | Unit |
|-----------------|------------------------|---------------------------------------------------------------|-------------------------------|------|------|------|------|
| trr             | T <sub>j</sub> = 25 °C | I <sub>F</sub> = 0.5A<br>I <sub>R</sub> = 1A                  | I <sub>rr</sub> = 0.25A       |      |      | 55   | ns   |
|                 |                        | I <sub>F</sub> = 1A<br>V <sub>R</sub> = 30V                   | dI <sub>F</sub> /dt = -50A/μs |      |      | 80   |      |
| t <sub>rr</sub> | T <sub>j</sub> = 25°C  | I <sub>F</sub> = 1A<br>V <sub>FR</sub> = 1.1 x V <sub>F</sub> | tr = 5 ns                     |      | 10   |      | ns   |
| V <sub>FP</sub> | T <sub>j</sub> = 25°C  | I <sub>F</sub> = 1A                                           | tr = 5 ns                     |      | 1.5  |      | V    |

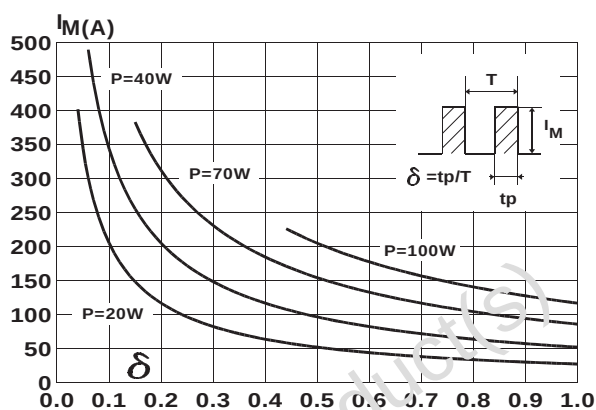
**TURN-OFF SWITCHING CHARACTERISTICS**

| Symbol          | Test Conditions        |                                                                                            |                                | Min. | Typ. | Max. | Unit |
|-----------------|------------------------|--------------------------------------------------------------------------------------------|--------------------------------|------|------|------|------|
| I <sub>RM</sub> | T <sub>j</sub> = 100°C | I <sub>F</sub> = 100A<br>L <sub>p</sub> @ 0.05μH<br>V <sub>CC</sub> @ 0.6 V <sub>RRM</sub> | dI <sub>F</sub> /dt = -200A/μs |      |      | 16   | A    |
|                 |                        |                                                                                            | dI <sub>F</sub> /dt = -400A/μs |      | 24   |      |      |

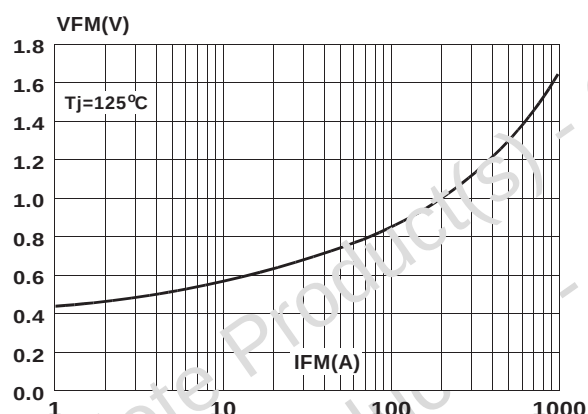
**Fig.1** : Average forward power dissipation versus average forward current.



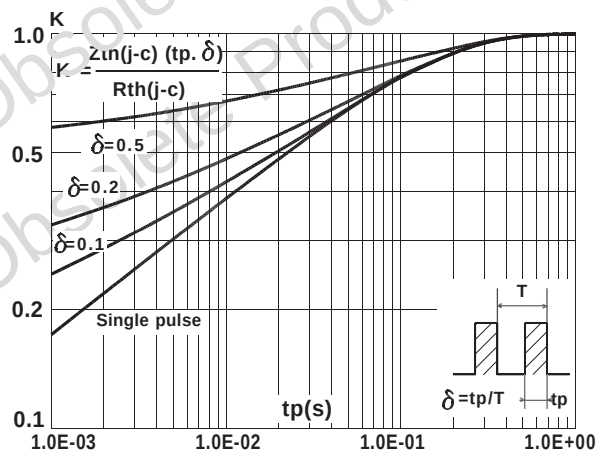
**Fig.2** : Peak current versus form factor.



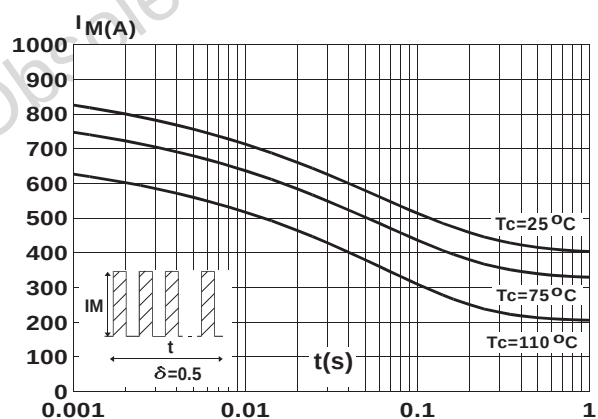
**Fig.3** : Forward voltage drop versus forward current (maximum values).



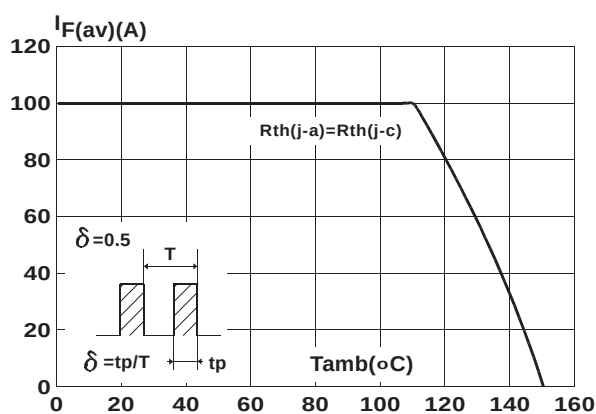
**Fig.4** : Relative variation of thermal impedance junction to case versus pulse duration.



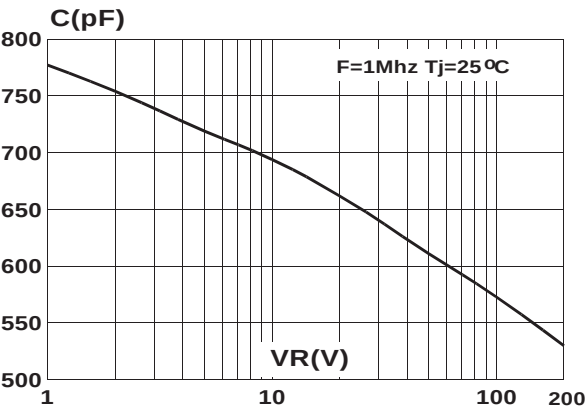
**Fig.5** : Non repetitive surge peak forward current versus overload duration.



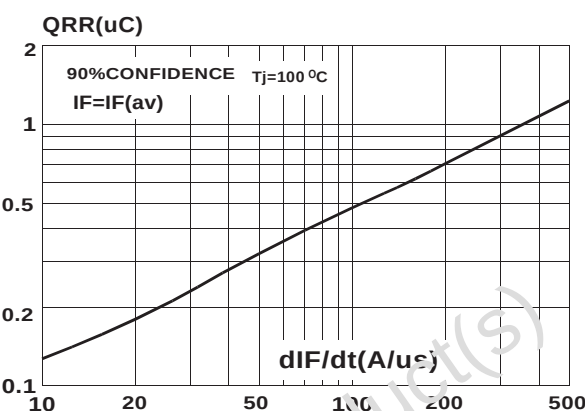
**Fig.6** : Average current versus ambient temperature. (duty cycle : 0.5)



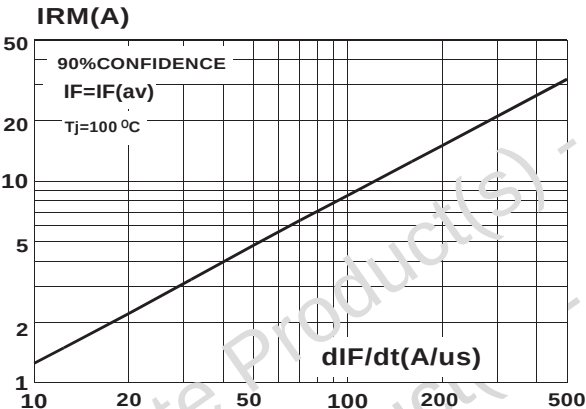
**Fig.7 :** Junction capacitance versus reverse voltage applied (Typical values).



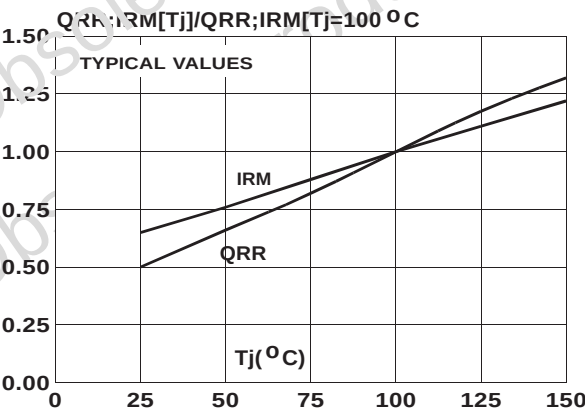
**Fig.8 :** Recovery charges versus  $dI_F/dt$ .



**Fig.9 :** Peak reverse current versus  $dI_F/dt$ .



**Fig.10 :** Dynamic parameters versus junction temperature.



# **PACKAGE MECHANICAL DATA** **ISOTOP**

| REF. | DIMENSIONS  |       |            |       |
|------|-------------|-------|------------|-------|
|      | Millimeters |       | Inches     |       |
|      | Min.        | Max.  | Min.       | Max.  |
| A    | 11.80       | 12.20 | 0.465      | 0.480 |
| A1   | 8.90        | 9.10  | 0.350      | 0.358 |
| B    | 7.8         | 8.20  | 0.307      | 0.323 |
| C    | 0.75        | 0.85  | 0.030      | 0.033 |
| C2   | 1.95        | 2.05  | 0.077      | 0.081 |
| D    | 37.80       | 38.20 | 1.488      | 1.504 |
| D1   | 31.50       | 31.70 | 1.240      | 1.248 |
| E    | 25.15       | 25.50 | 0.990      | 1.004 |
| E1   | 23.85       | 24.15 | 0.939      | 0.951 |
| E2   | 24.80 typ.  |       | 0.976 typ. |       |
| G    | 14.90       | 15.10 | 0.587      | 0.594 |
| G1   | 12.60       | 12.80 | 0.496      | 0.504 |
| G2   | 3.50        | 4.30  | 0.138      | 0.169 |
| F    | 4.10        | 4.30  | 0.161      | 0.169 |
| F1   | 4.60        | 5.00  | 0.181      | 0.197 |
| F2   | 4.00        | 4.30  | 0.157      | 0.169 |
| P1   | 4.00        | 4.40  | 0.157      | 0.173 |
| S    | 30.10       | 30.30 | 1.185      | 1.193 |

- **Marking** : Type number
- Cooling method : C
- Weight : 27 g
- Epoxy meets UL94, V0

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