



## ESM765PI-800

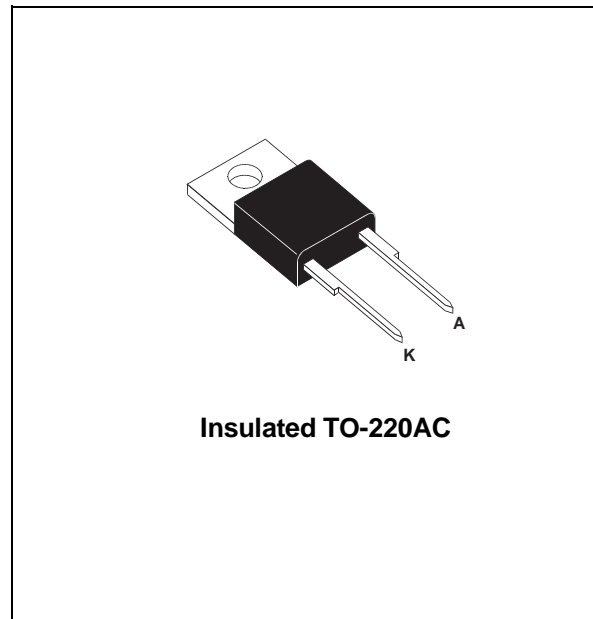
### RECOVERY RECTIFIER DIODES

#### MAIN PRODUCTS CHARACTERISTICS

$I_{F(AV)}$	10 A
$V_{RRM}$	800 V
$T_j$ (max)	150°C
$V_F$ (max)	1.35 V
$t_{rr}$ (max)	300 ns

#### FEATURES

- HIGH VOLTAGE CAPABILITY
- FAST AND SOFT RECOVERY
- THE SPECIFICATIONS AND CURVES ENABLE THE DETERMINATION OF THE  $t_{rr}$  AND  $I_{RM}$  AT 100°C UNDER USERS CONDITIONS
- MOTOR CONTROLS AND CONVERTERS
- SWITCH MODE POWER SUPPLIES
- INSULATED PACKAGE: TO-220AC  
Insulating voltage = 2500  $V_{RMS}$



#### DESCRIPTION

Fast recovery rectifiers suited for applications in combination with superswitch transistors.

Symbol	Parameter		Value	Unit
$V_{RRM}$	Repetitive peak reverse voltage	$t_p \leq 20\mu s$	800	V
$I_{F(RMS)}$	RMS forward current		16	A
$I_{F(AV)}$	Average forward current	$T_c = 100^\circ C$ $\delta = 0.5$	10	A
$I_{FSM}$	Surge non repetitive forward current	$T_p = 10$ ms Sinusoidal	120	A
$P_{tot}$	Power dissipation	$T_c = 100^\circ C$	20	W
$T_{stg}$	Storage temperature range		- 40 to + 150	°C
$T_j$	Maximum operating junction temperature		+ 150	

# ESM765PI-800

## THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
R <sub>th(j-c)</sub>	Junction to case	3.5	°C/W

## STATIC ELECTRICAL CHARACTERISTICS

Symbol	Parameters	Test conditions	Min.	Typ.	Max.	Unit
I <sub>R</sub> *	Reverse leakage current	T <sub>j</sub> = 25°C	V <sub>R</sub> = V <sub>RRM</sub>		20	mA
		T <sub>j</sub> = 100°C			1	
V <sub>F</sub> **	Forward voltage drop	T <sub>j</sub> = 25°C	I <sub>F</sub> = 10 A		1.4	V
		T <sub>j</sub> = 100°C			1.35	

Pulse test : \* t<sub>p</sub> = 5 ms, δ < 2 %  
 \*\* t<sub>p</sub> = 380 μs, δ < 2 %

To evaluate the conduction losses use the following equation :

$$P = 1.2 \times I_{F(AV)} + 0.015 \times I_{F(RMS)}^2$$

$$V_F = 1.2 + 0.015 I_F$$

## RECOVERY CHARACTERISTICS

Symbol	Test conditions			Min.	Typ.	Max.	Unit
t <sub>rr</sub>	T <sub>j</sub> = 25°C	I <sub>F</sub> = 1A	dI <sub>F</sub> /dt = - 15A/μs			300	ns
Q <sub>rr</sub>	T <sub>j</sub> = 25°C	I <sub>F</sub> = 10A	dI <sub>F</sub> /dt = - 50A/μs		2.3		μC

Fig. 1: Low frequency power losses versus average current.

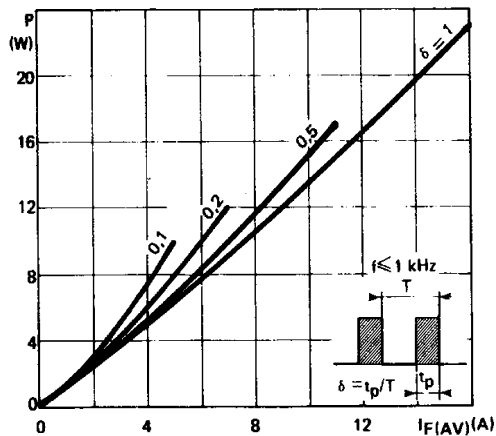
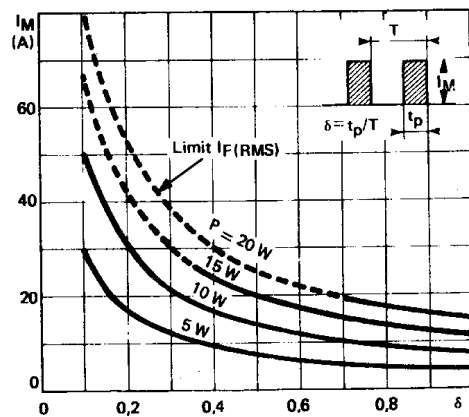
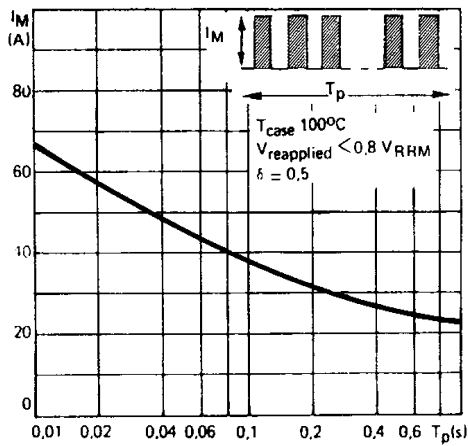


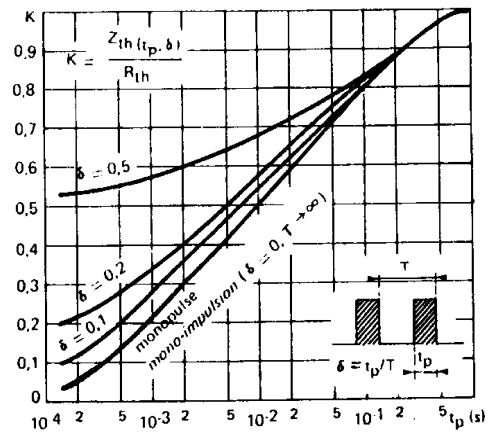
Fig. 2: Peak current versus form factor.



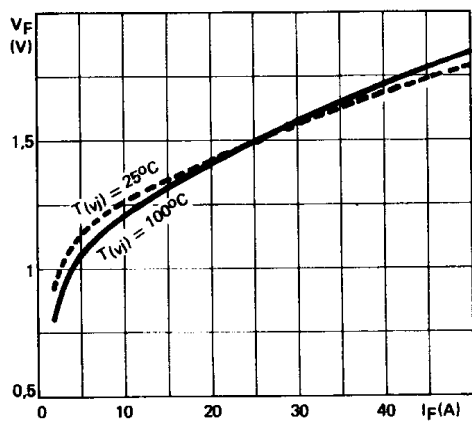
**Fig. 3:** Non repetitive peak surge current versus overload duration.



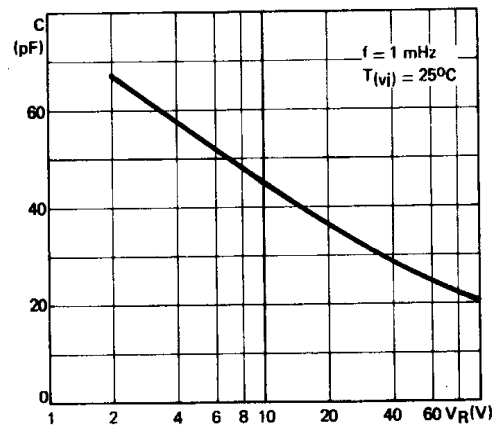
**Fig. 4:** Thermal impedance versus pulse width.



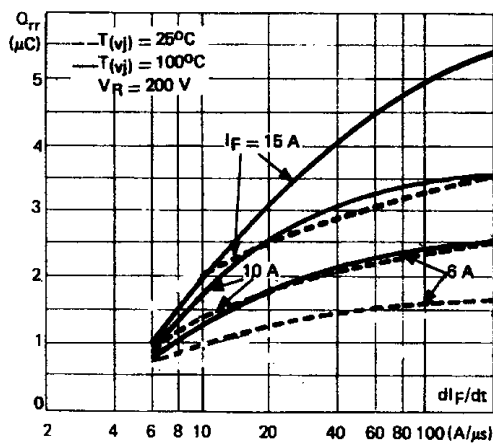
**Fig. 5:** Voltage drop versus forward current.



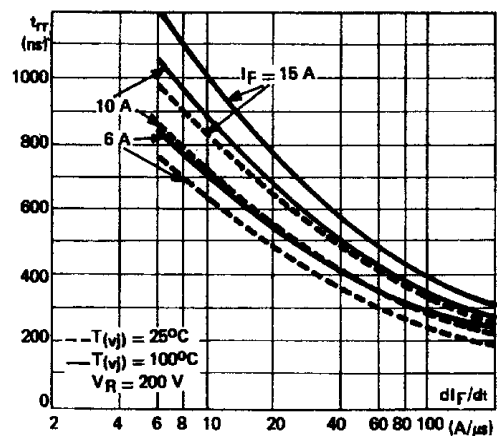
**Fig. 6:** Capacitance versus applied reverse voltage



**Fig. 7:** Recovery charge versus  $di_F/dt$ .

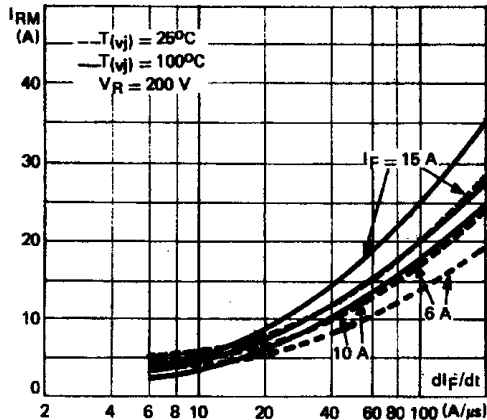


**Fig. 8:** Recovery time versus  $di_F/dt$ .



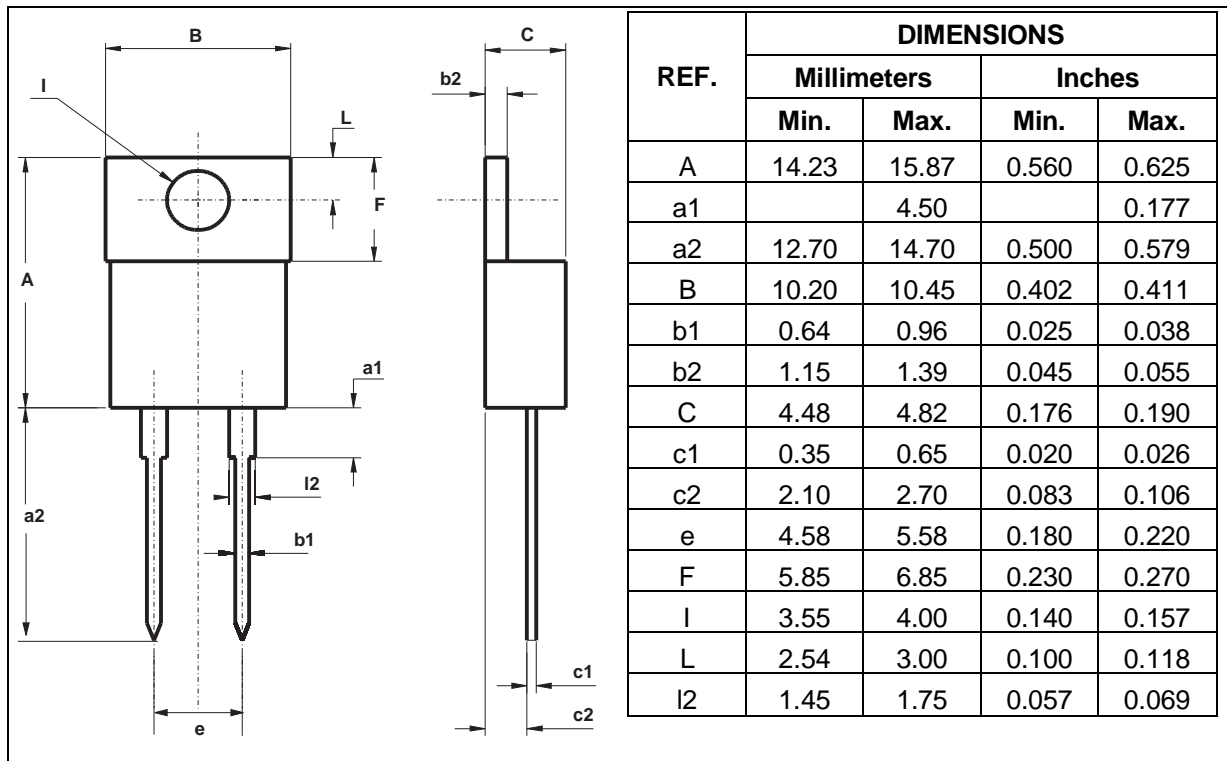
## ESM765PI-800

Fig. 9: Peak reverse current versus  $di_F/dt$ .



### PACKAGE MECHANICAL DATA

Insulated TO-220AC



Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied.

STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a registered trademark of STMicroelectronics

© 1999 STMicroelectronics - Printed in Italy - All rights reserved.

STMicroelectronics GROUP OF COMPANIES

Australia - Brazil - China - Finland - France - Germany - Hong Kong - India - Italy - Japan - Malaysia  
Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - U.S.A.

<http://www.st.com>