

**Features:**

- n n-state rms current:41A
- n Blocking voltage:1600V
- n Gate current:50mA

**Typical Applications:**

- n Solid state relay
- n Battery charging system
- n Uninterruptible power supply
- n Variable speed motor drive
- n Industrial welding systems
- n By pass AC switch

SYMBOL	CHARACTERISTIC	TEST CONDITIONS	T <sub>j</sub> (°C)	VALUE			UNIT
				Min	Type	Max	
I <sub>T(RMS)</sub>	RMS on-state current	T <sub>c</sub> =25°C	125			41	A
V <sub>DRM</sub> / V <sub>RPM</sub>	Repetitive peak off-state voltage Repetitive peak reverse voltage	tp=10ms	25			1600	V
I <sub>DRM</sub>	Repetitive peak off-state current	at V <sub>DRM</sub>	25		10		µA
I <sub>RPM</sub>	Repetitive peak reverse current	at V <sub>RPM</sub>			5		mA
I <sub>TSM</sub>	Surge on-state current	10ms half sine wave	25			410	A
I <sup>2</sup> t	I <sup>2</sup> t value for fusing	V <sub>R</sub> =0.6V <sub>RPM</sub>					800
V <sub>TM</sub>	Peak on-state voltage	I <sub>TM</sub> =60A, tp=380µs	25		1.55		V
di/dt	Critical rate of rise of on-state current	I <sub>G</sub> =2*I <sub>GT</sub>	25		50		A/µs
I <sub>GM</sub>	Peak gate current				4		A
P <sub>G(AV)</sub>	Average gate power dissipation				1		W
P <sub>GM</sub>	Peak gate power				10		W
R <sub>th(j-c)</sub>	Thermal resistance Junction to case	TO-247			0.8		°C/W
		TO-3PF			1.2		
T <sub>stg</sub>	Storage junction temperature range			-40		150	°C
T <sub>j</sub>	Operating Junction Temperature			-40		150	°C
Outline	TO-247 / TO-3PF						

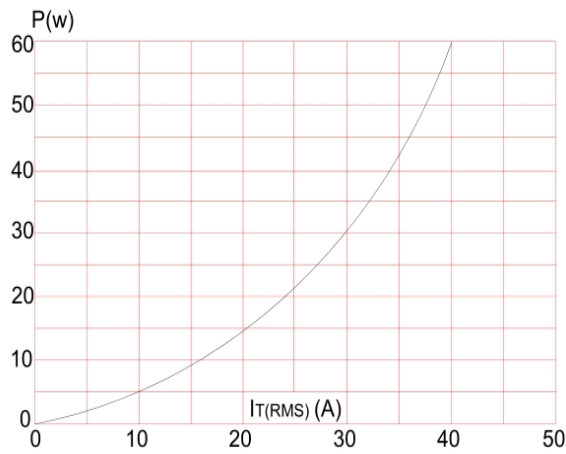
## b) Quadrants

Symbol	Test Conditions	Quadrant	Min	Typ	Max	Unit
$I_{GT}$	$V_D=12V$ $R_L=33\ \Omega$	I - II - III			50	mA
$V_{GT}$		I - II - III			1.3	V
$V_{GD}$	$V_D=V_{DRM}$ $T_j=125^\circ C$ $R_L=3.3k\ \Omega$	I - II - III	0.2			V
$I_L$	$I_G=1.2I_{GT}$	I - III			80	mA
		II			100	
$I_H$	$I_T=100mA$				60	mA
dv/dt	$V_D=2/3V_{DRM}$ Gate Open $T_j=125^\circ C$		1000			V/ $\mu s$
(dv/dt)/c	Without snubber $T_j=125^\circ C$		20			V/ $\mu s$

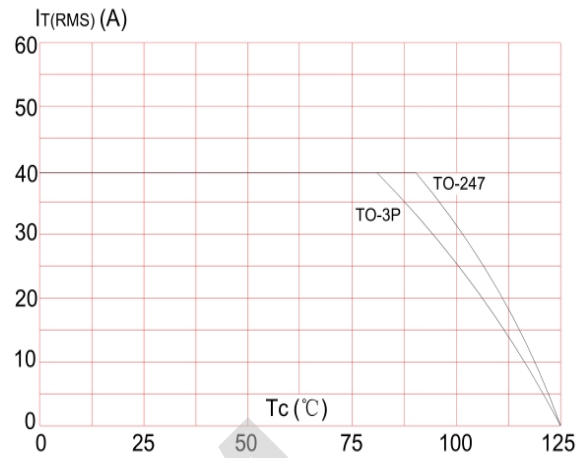
## c) Quadrants

Symbol	Test Conditions	Quadrant	Min	Typ	Max	Unit
$I_{GT}$	$V_D=12V$ $R_L=33\ \Omega$	I - II - III			50	mA
		IV			70	
$V_{GT}$		ALL			1.5	V
$V_{GD}$	$V_D=V_{DRM}$ $T_j=125^\circ C$ $R_L=3.3k\ \Omega$	ALL	0.2			V
$I_L$	$I_G=1.2I_{GT}$	I - II - III			90	mA
		II			100	
$I_H$	$I_T=100mA$				80	mA
dv/dt	$V_D=2/3V_{DRM}$ Gate Open $T_j=125^\circ C$		500			V/ $\mu s$
(dv/dt)/c	Without snubber $T_j=125^\circ C$		20			V/ $\mu s$

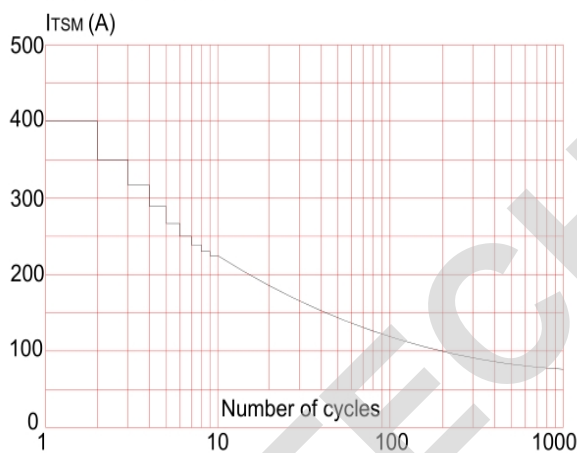
**FIG.1** Maximum power dissipation versus RMS on-state current



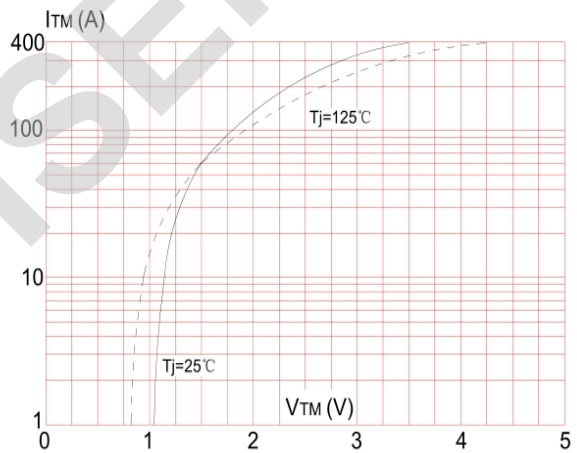
**FIG.2:** RMS on-state current versus case temperature



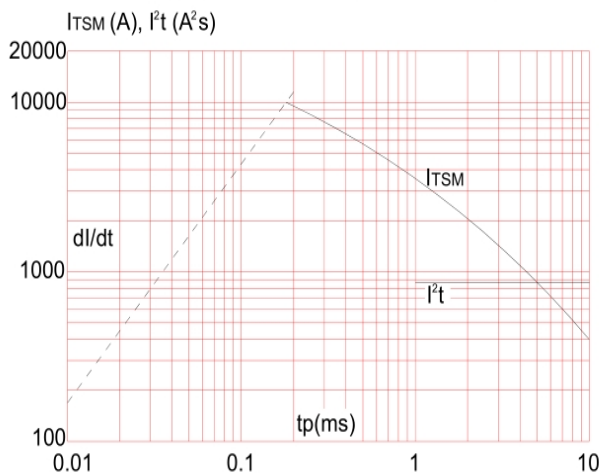
**FIG.3:** Surge peak on-state current versus number of cycles



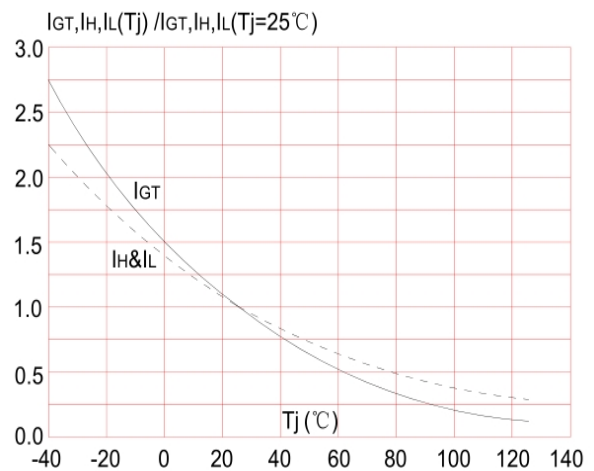
**FIG.4:** On-state characteristics (maximum values)



**FIG.5:** Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 10\text{ms}$ , and corresponding value of  $I^2t$  ( $di/dt < 50\text{A}/\mu\text{s}$ )

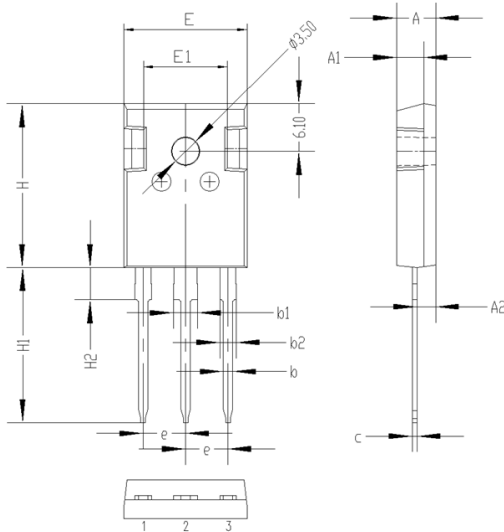


**FIG.6:** Relative variations of gate trigger current, holding current and latching current versus junction temperature



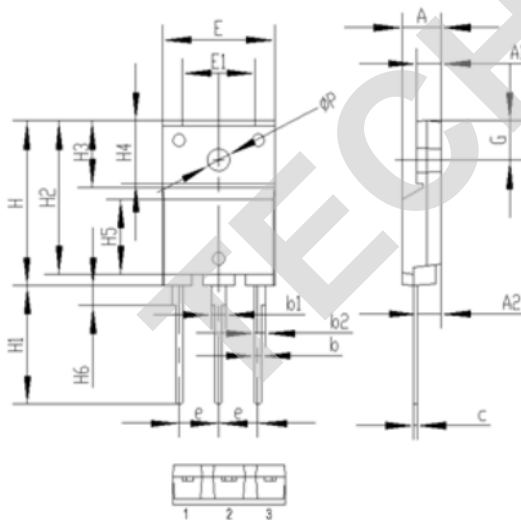
Outline:

**TO-247 PACKAGE**



Symbol	Dimensions(millimeters)	
	Min.	Max.
A	4.80	5.20
A1	3.30	3.70
A2	2.10	2.50
b	1.00	1.40
b1	2.90	3.30
b2	1.90	2.30
c	0.40	0.80
e	5.25	5.65
E	15.6	16.0
E1	10.6	11.00
H	20.8	21.2
H1	19.4	20.4
H2	3.90	4.30
G	5.90	6.30
ΦP	3.30	3.70

**TO-3PF PACKAGE**



Symbol	Dimensions(millimeters)	
	Min.	Max.
A	5.30	5.70
A1	3.25	3.65
A2	3.15	3.55
b	0.80	1.20
b1	1.85	2.15
b2	1.45	1.75
c	0.40	0.80
e	5.25	5.65
E	15.4	15.8
E1	10.0	10.4
H	22.5	23.2
H1	16.0	17.0
H2	21.2	21.6
H3	9.10	9.50
H4	8.55	8.95
H5	10.20	10.60
H6	2.55	2.85
G	5.30	5.70
ΦP	3.00	3.40