SGS-THOMSON MICROELECTRONICS

TGDV 601 → 612

ALTERNISTORS

- $(di/dt)_c$ > 213 A/ms (400 Hz)

APPLICATIONS

- POWER CONTROL ON INDUCTIVE LOAD (motor, transformer...)
- HIGH FREQUENCY OR HIGH $(di/dt)_c$ LEVEL CIRCUITS.

TO 65
(Metal)

DESCRIPTION

New range of solid state AC - switches with very high commutating capability.

ABSOLUTE RATINGS (limiting values)

Symbol	Parameter		Value	Unit
$I_{T(RMS)}$	RMS on-state Current (360° conduction angle)	T_C = 75 °C	60	A
I_{TSM}	Non Repetitive Surge Peak on-state Current	t = 10 ms	500	A
		t = 8.3 ms	550	
		t = 2.5 ms	840	
I^2t	I^2t Value for Fusing	t = 10 ms	1250	A^2s
di/dt	Critical Rate of Rise of on-state Current (1)		100	A/µs
T_{stg} T_j	Storage and Operating Junction Temperature Range		– 40 to 150 – 40 to 125	°C °C

Symbol	Parameter	TGDV							Unit
		601	602	604	606	608	610	612	
V_{DRM}	Repetitive Peak off-state Voltage (2)	100	200	400	600	800	1000	1200	V

(1) I_G = 1.5 A di_G/dt = 1 A/µs
(2) T_j = 125 °C.

THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
$R_{th\ (c-h)}$	Contact (case-heatsink) for Recommended Stud Torque	0.3	°C/W
$R_{th\ (j-c)}$ DC	Junction to Case for DC	0.65	°C/W
$R_{th\ (j-c)}$ AC	Junction to Case for 360° Conduction Angle (F = 50 Hz)	0.48	°C/W

GATE CHARACTERISTICS (maximum values)

P_{GM} = 40 W (t_p = 10 µs) I_{GM} = 8 A (t_p = 10 µs)

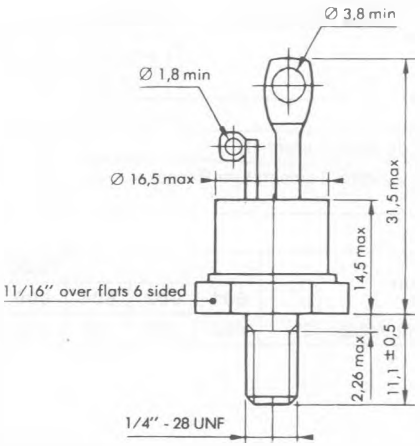
$P_{G(AV)}$ = 1 W V_{GM} = 16 V (t_p = 10 µs)

ELECTRICAL CHARACTERISTICS

Symbol	Test Conditions			Quadrants	Min.	Typ.	Max.	Unit
I_{GT}	T_j = 25 °C V_D = 12 V R_L = 33 Ω Pulse Duration > 20 µs			I-II-III			200	mA
V_{GT}	T_j = 25 °C V_D = 12 V R_L = 33 Ω Pulse Duration > 20 µs			I-II-III			1.5	V
V_{GD}	T_j = 125 °C V_D = V_{DRM} R_L = 3.3 kΩ			I-II-III	0.2			V
I_H*	T_j = 25 °C I_T = 500 mA Gate Open					50		mA
I_L	T_j = 25 °C V_D = 12 V I_G = 400 mA Pulse Duration > 20 µs			I-III		50		mA
				II		100		
V_{TM}*	T_j = 25 °C I_{TM} = 85 A t_p = 10 ms						2	V
I_{DRM}*	T_j = 100 °C V_{DRM} Specified						5	mA
dv/dt*	T_j = 125 °C Gate Open Linear Slope up to V_D = 67 % V_{DRM}		$V_{DRM} \leq$ 800 V		500			V/µs
			$V_{DRM} \geq$ 1000 V		250			
$(di/dt)_c$*	T_C = 75 °C V_D = V_{DRM} I_T = 85 A		$(dv/dt)_c$ = 200 V/µs		50			A/ms
			$(dv/dt)_c$ = 10 V/µs		213			
t_{gt}	T_j = 25 °C V_D = V_{DRM} I_T = 85 A I_G = 0.5 A di_G/dt = 3.5 A/µs			I-II-III		2.5		µs

* For either polarity of electrode A_2 voltage with reference to electrode A_1.

PACKAGE MECHANICAL DATA : TO 65 Metal



Cooling method : by conduction (method C)
Marking : type number
Weight : 19 g
Polarity : Electrode A_2 to case
Stud torque : 3.5 mΛN min - 3.8 mΛN max

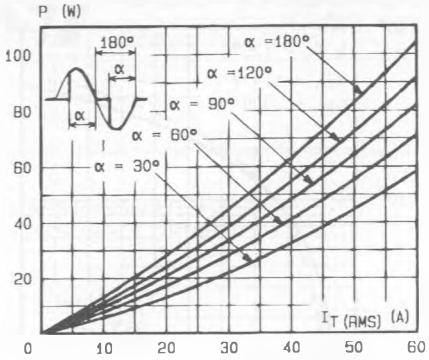


Fig.1 - Maximum mean power dissipation versus RMS on-state current.

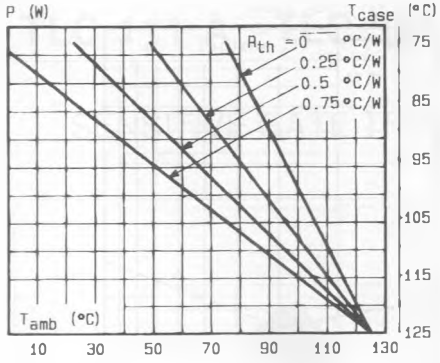


Fig.2 - Correlation between maximum mean power dissipation and maximum allowable temperatures (T_{amb} and T_{case}) for different thermal resistances heatsink + contact.

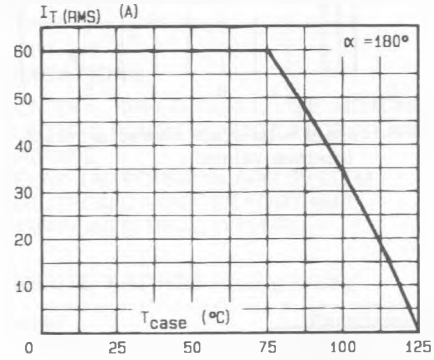


Fig.3 - RMS on-state current versus case temperature.

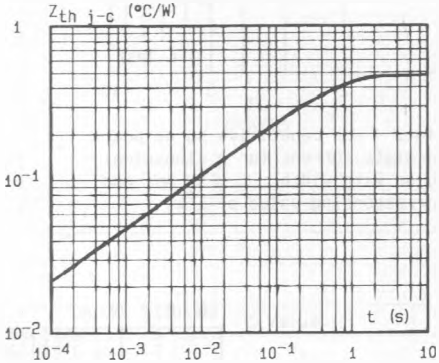


Fig.4 - Thermal transient impedance junction to case versus pulse duration.

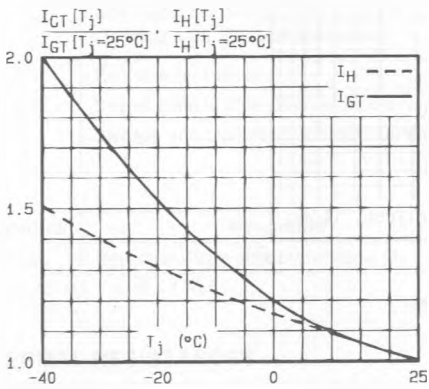


Fig.5 - Relative variation of gate trigger current and holding current versus junction temperature.

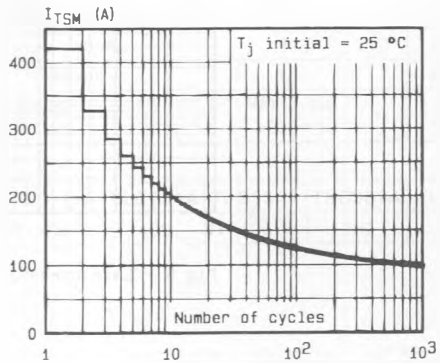


Fig.6 - Non repetitive surge peak on-state current versus number of cycles.

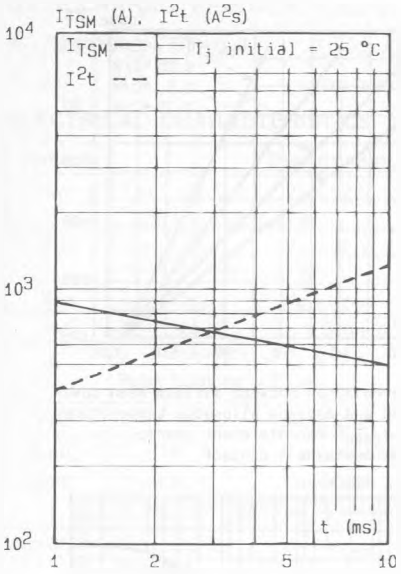


Fig.7 - Non repetitive surge peak on-state current for a sinusoidal pulse with width : $t \leqslant 10$ ms, and corresponding value of I^2t.

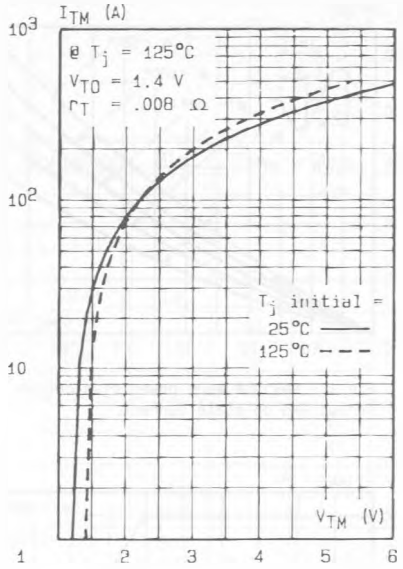


Fig.8 - On-state characteristics (maximum values).

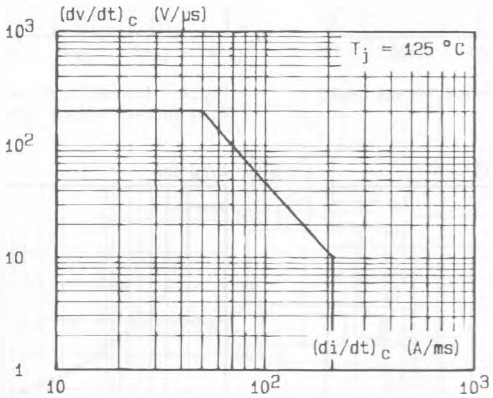


Fig.9 - Safe operating area.