SGS-THOMSON MICROELECTRONICS

2N 5204 → 2N 5207

THYRISTORS

- GLASS PASSIVATED CHIP
- HIGH STABILITY AND RELIABILITY

Thread : 1/4" -28 UNF : type N°
M6 on request : type N° + suffix M

TO 48
(Metal)

DESCRIPTION

General purpose SCR suited for power supplies up to 400 Hz on resistive or inductive loads.

ABSOLUTE RATINGS (limiting values)

Symbol	Parameter		Value	Unit
$I_{T(RMS)}$	RMS on-state Current (1)	T_c = 75 °C	35	A
$I_{T(AV)}$	Mean on-state Current (1)	T_c = 75 °C	22.5	A
I_{TSM}	Non Repetitive Surge Peak on-state Current (T_j initial ≤ 125 °C) (2)	t = 8.3 ms	360	A
		t = 10 ms	330	
I^2t	I^2t Value for Fusing	t = 10 ms	545	A^2s
di/dt	Critical Rate of Rise of on-state Current (3)		100	A/µs
T_{stg} T_j	Storage and Operating Junction Temperature Range		– 40 to 150 – 40 to 125	°C °C

Symbol	Parameter	2N5204	2N5205	2N5206	2N5207	Unit
V_{DRM} , V_{RRM}	Repetitive Peak off-state Voltage (4)	600	800	1000	1200	V

(1) Single phase circuit, 180° conduction angle.
(2) Half sine wave.
(3) I_G = 0.4 A di_G/dt = 1 A/µs.
(4) T_j = 125 °C.

THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
$R_{th\ (j-c)}$	Junction-case for D.C.	1	°C/W
$R_{th\ (c-h)}$	Contact (case to heatsink)	0.4	°C/W

GATE CHARACTERISTICS (maximum values)

P_{GM} = 60 W (t_p = 500 µs) I_{FGM} = 10 A (t_p = 500 µs) V_{RGM} = 5 V

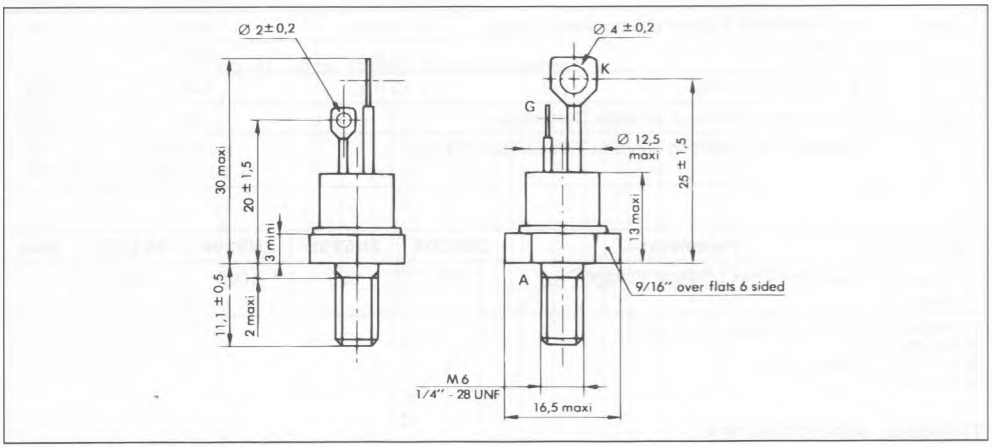
$P_{G(AV)}$ = 1 W V_{FGM} = 15 V (t_p = 500 µs)

ELECTRICAL CHARACTERISTICS

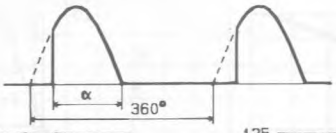
Symbol	Test Conditions			Min.	Typ.	Max.	Unit
I_{GT}	T_j = 25 °C Pulse Duration > 20 µs	V_D = 12 V	R_L = 33 Ω			40	mA
V_{GT}	T_j = 25 °C Pulse Duration > 20 µs	V_D = 12 V	R_L = 33 Ω			1.5	V
V_{GD}	T_j = 125 °C	V_D = V_{DRM}	R_L = 3.3 kΩ	0.25			V
I_H	T_j = 25 °C	I_T = 0.5 A	Gate Open			100	mA
I_L	T_j = 25 °C Pulse Duration > 20 µs	V_D = 12 V	I_G = 80 mA			200	mA
V_{TM}	T_j = 25 °C	I_{TM} = 70 A	t_p = 10 ms			2.3	V
I_{DRM}	V_{DRM} Specified		T_j = 25 °C			0.02	mA
			T_j = 125 °C			3.3	
I_{RRM}	V_{RRM} Specified		T_j = 25 °C			0.02	mA
			T_j = 125 °C			3.3	
t_{gt}	T_j = 25 °C I_G = 200 mA	V_D = V_{DRM} di_G/dt = 2 A/µs	I_T = 70 A		2		µs
t_q	T_j = 125 °C V_D = 67 % V_{DRM} Gate Open	I_T = 70 A di/dt = 30 A/µs	V_R = 30 V dv/dt = 20 V/µs		100		µs
dv/dt*	T_j = 125 °C Linear Slope up to V_D = 67 % V_{DRM}	Gate Open		200			V/µs

* For higher guaranteed values, please consult us.

PACKAGE MECHANICAL DATA : TO 48 Metal



Cooling method : by conduction (method C)
Marking : type number
Weight : 13.5 ± 1g
Polarity : anode to case
Stud torque : 3.5 mΛN min - 3.8 mΛN max.



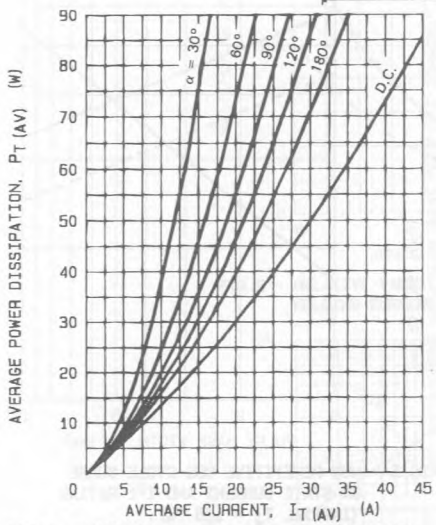


FIG.1 - MAXIMUM ON-STATE POWER DISSIPATION FOR SINUSOIDAL CURRENT WAVEFORM

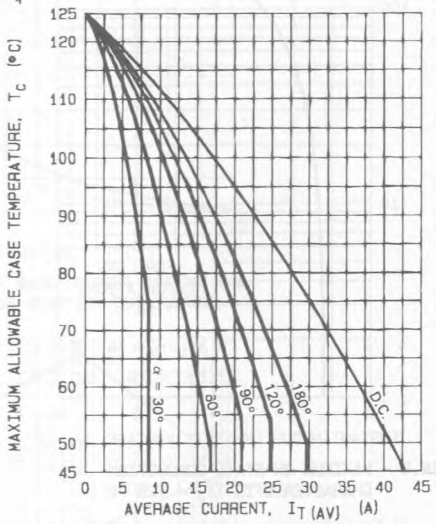
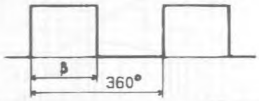


FIG.2 - MAXIMUM ALLOWABLE CASE TEMPERATURE FOR SINUSOIDAL CURRENT WAVEFORM



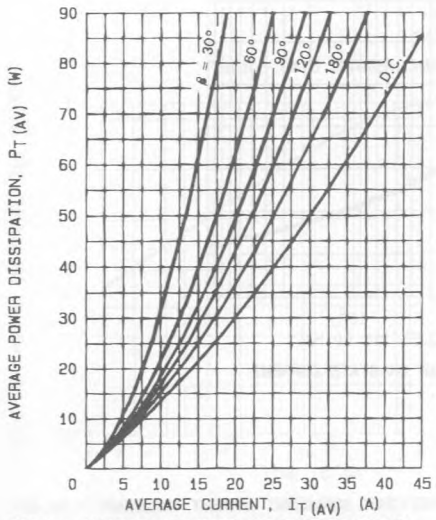


FIG.3 - MAXIMUM ON-STATE POWER DISSIPATION FOR RECTANGULAR CURRENT WAVEFORM

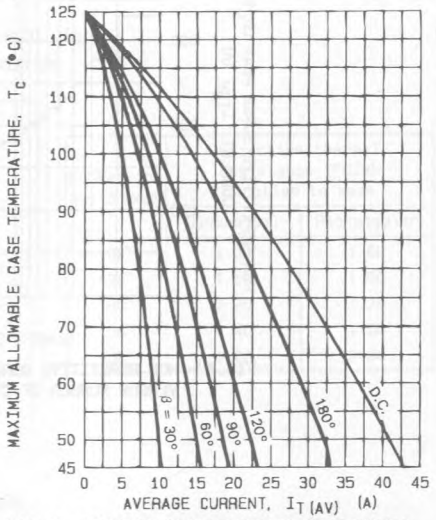


FIG.4 - MAXIMUM ALLOWABLE CASE TEMPERATURE FOR RECTANGULAR CURRENT WAVEFORM

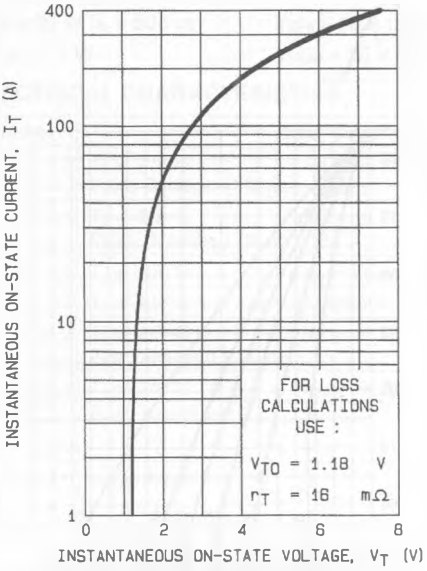


FIG.5 - MAXIMUM ON-STATE CONDUCTION CHARACTERISTIC (T_J = 125 °C).

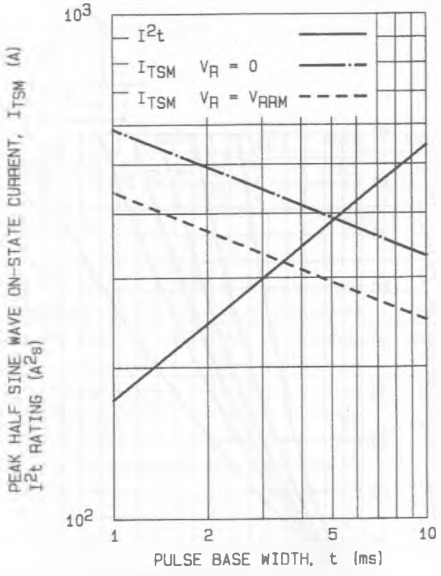


FIG.6 - NON REPETITIVE SUB-CYCLE SURGE ON-STATE CURRENT AND I^2t RATING (INITIAL T_J = 125 °C).

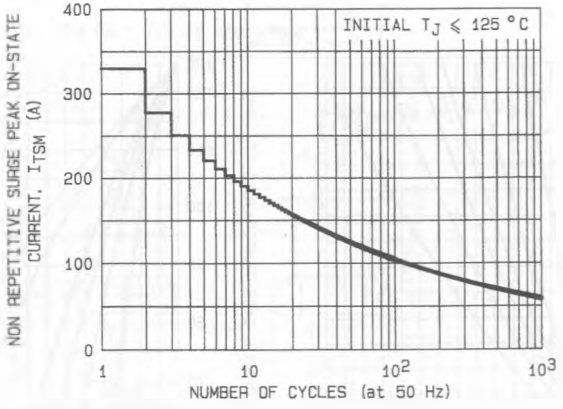


FIG.7 - NON REPETITIVE SURGE PEAK ON-STATE CURRENT VERSUS NUMBER OF CYCLES.

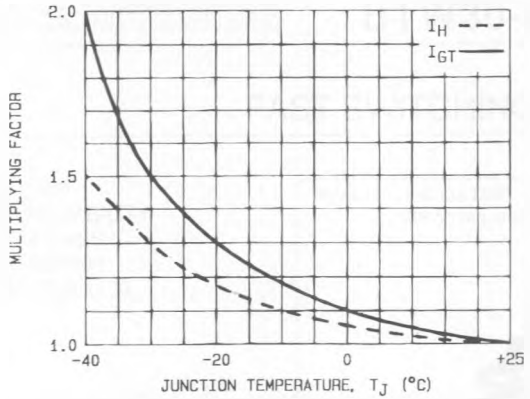


FIG.8 - RELATIVE VARIATION OF GATE TRIGGER CURRENT AND HOLDING CURRENT VERSUS JUNCTION TEMPERATURE.

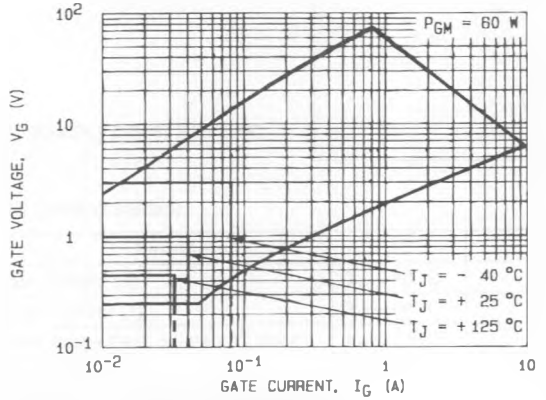
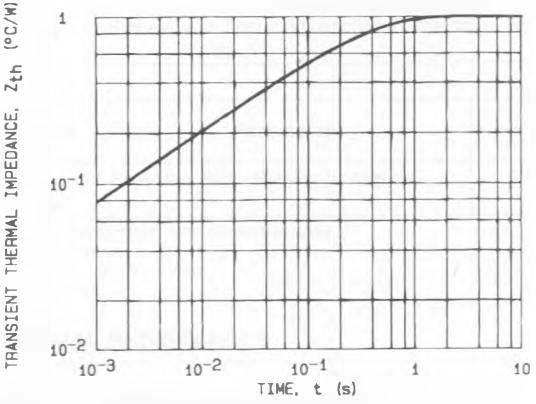


FIG.9 - GATE TRIGGER CHARACTERISTICS.



Conduction angle (α,β)	Effective thermal resistance (°C/W) junction to case	
	Sinusoidal	Rectangular
180°	1.08	1.06
120°	1.12	1.50
90°	1.20	1.70
60°	1.40	1.90
30°	1.80	2.40

FIG.10 - TRANSIENT THERMAL IMPEDANCE JUNCTION TO CASE.