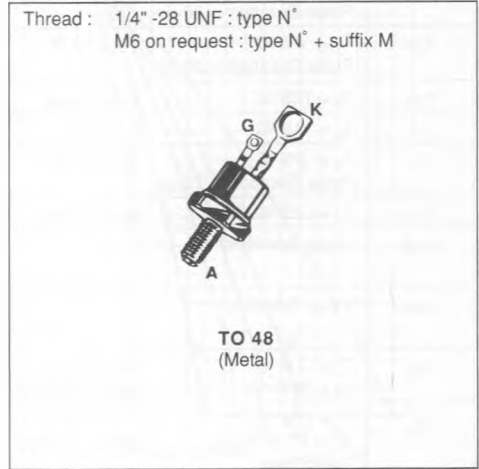




**THYRISTORS**

- GLASS PASSIVATED CHIP
- HIGH STABILITY AND RELIABILITY



**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)	$T_c = 75\text{ }^\circ\text{C}$	35	A
$I_{T(AV)}$	Mean on-state Current (1)	$T_c = 75\text{ }^\circ\text{C}$	22.5	A
$I_{TSM}$	Non Repetitive Surge Peak on-state Current ( $T_j$ initial $\leq 125\text{ }^\circ\text{C}$ ) (2)	$t = 8.3\text{ ms}$	360	A
		$t = 10\text{ ms}$	330	
$I^2t$	$I^2t$ Value for Fusing	$t = 10\text{ ms}$	545	A <sup>2</sup> s
$di/dt$	Critical Rate of Rise of on-state Current (3)		100	A/ $\mu$ s
$T_{stg}$ $T_j$	Storage and Operating Junction Temperature Range		- 40 to 150	$^\circ\text{C}$
			- 40 to 125	$^\circ\text{C}$

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)  $I_G = 0.4\text{ A}$   $di/dt = 1\text{ A}/\mu\text{s}$

(4)  $T_j = 125\text{ }^\circ\text{C}$ .

**THERMAL RESISTANCES**

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

**GATE CHARACTERISTICS** (maximum values)

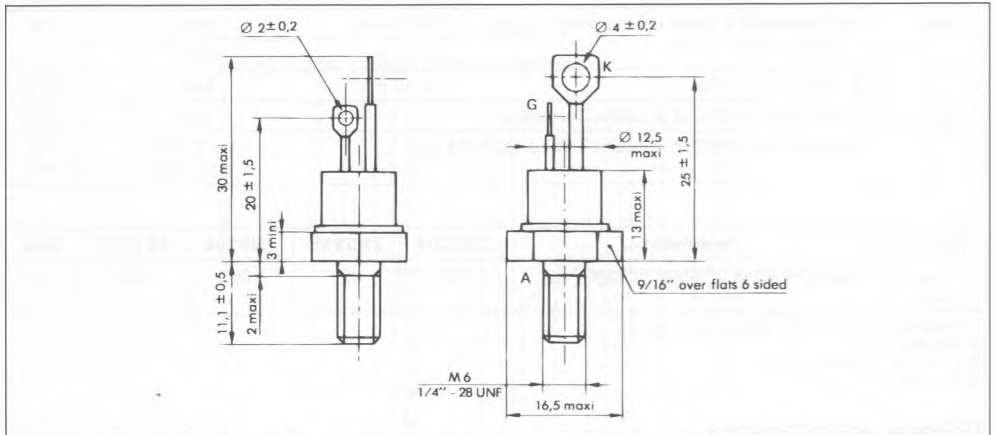
$P_{GM} = 60 \text{ W}$  ( $t_p = 500 \mu\text{s}$ )       $I_{FGM} = 10 \text{ A}$  ( $t_p = 500 \mu\text{s}$ )       $V_{RGM} = 5 \text{ V}$   
 $P_{G(AV)} = 1 \text{ W}$        $V_{FGM} = 15 \text{ V}$  ( $t_p = 500 \mu\text{s}$ )

**ELECTRICAL CHARACTERISTICS**

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

\* 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 mAN min - 3.8 mAN max.

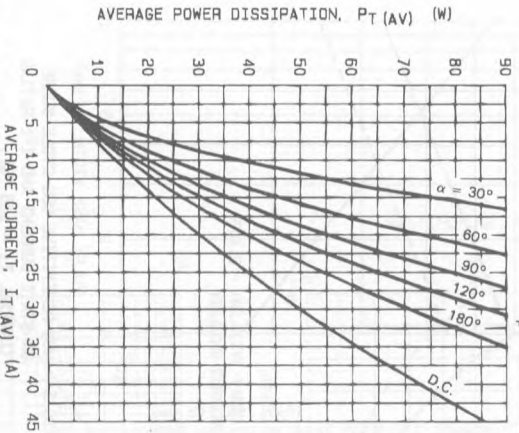


FIG. 1 - MAXIMUM ON-STATE POWER DISSIPATION FOR SIMUSOIDAL CURRENT WAVEFORM

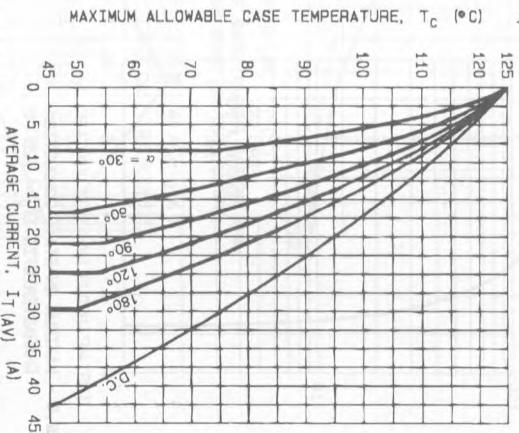


FIG. 2 - MAXIMUM ALLOWABLE CASE TEMPERATURE FOR SIMUSOIDAL CURRENT WAVEFORM

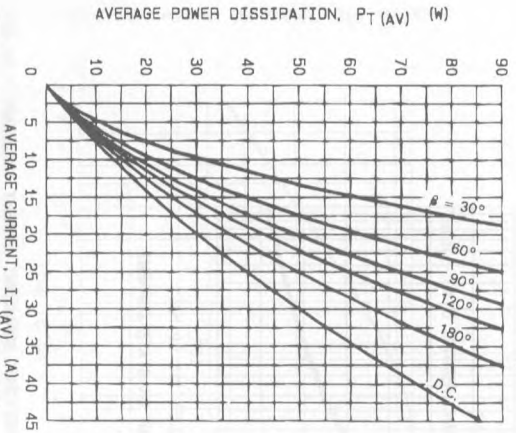
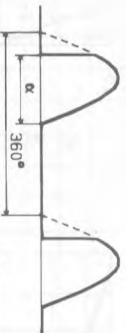


FIG. 3 - MAXIMUM ON-STATE POWER DISSIPATION FOR RECTANGULAR CURRENT WAVEFORM

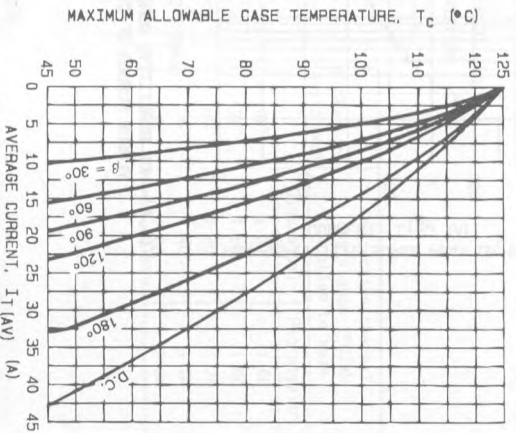
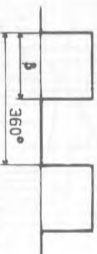


FIG. 4 - MAXIMUM ALLOWABLE CASE TEMPERATURE FOR RECTANGULAR CURRENT WAVEFORM



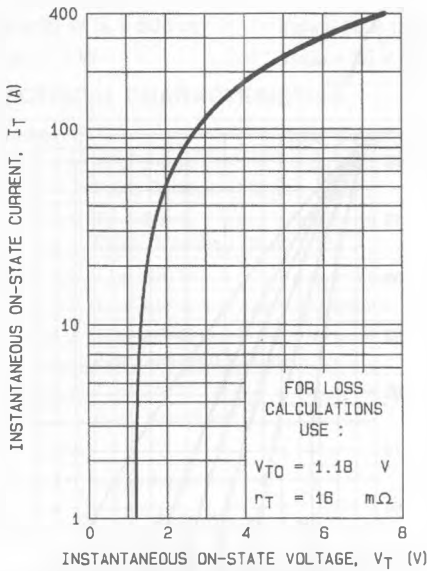


FIG. 5 - MAXIMUM ON-STATE CONDUCTION CHARACTERISTIC ( $T_J = 125^\circ\text{C}$ ).

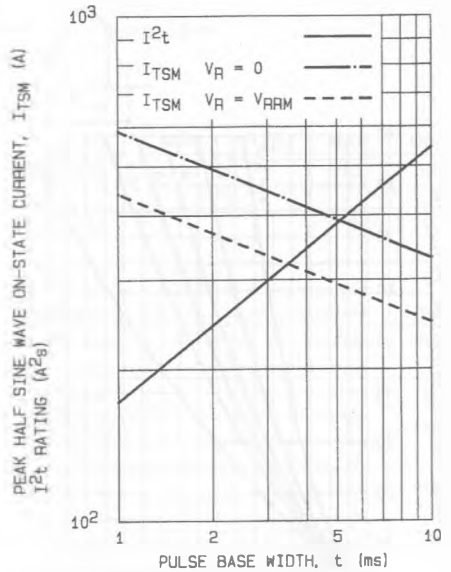


FIG. 6 - NON REPETITIVE SUB-CYCLE SURGE ON-STATE CURRENT AND  $I^2t$  RATING (INITIAL  $T_J = 125^\circ\text{C}$ ).

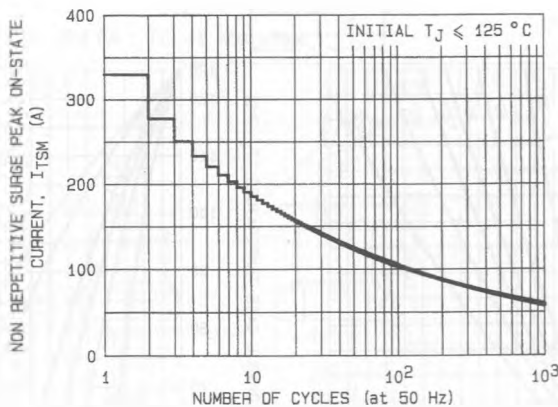


FIG. 7 - NON REPETITIVE SURGE PEAK ON-STATE CURRENT VERSUS NUMBER OF CYCLES.

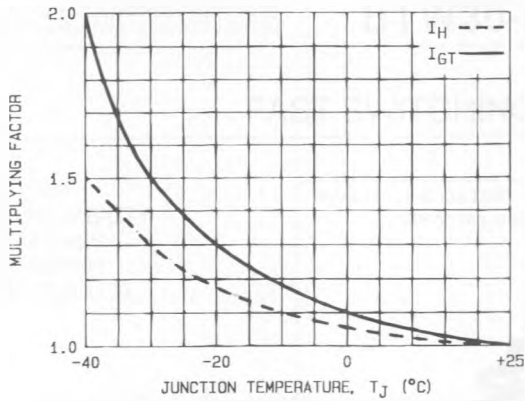


FIG.8 - RELATIVE VARIATION OF GATE TRIGGER CURRENT AND HOLDING CURRENT VERSUS JUNCTION TEMPERATURE.

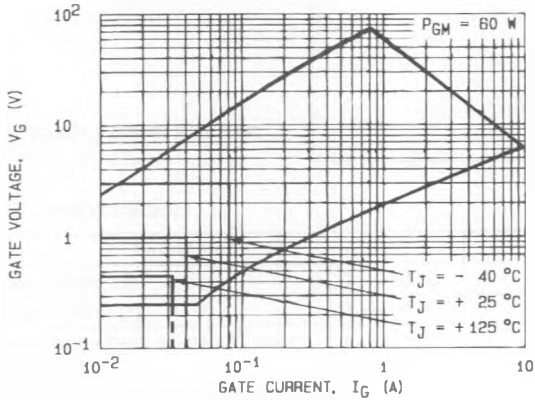
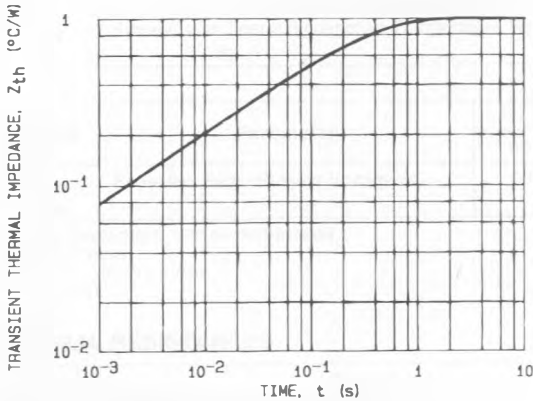


FIG.8 - GATE TRIGGER CHARACTERISTICS.



Conduction angle ( $\alpha, \beta$ )	Effective thermal resistance ( $^{\circ}\text{C}/\text{W}$ ) 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.