

10RIA, 16RIA, 25RIA SERIES

Power Silicon Controlled Rectifiers

25, 35, 40, Amp RMS SCRs

Types : 10RIA10-10RIA140, 16RIA10-16RIA-140, 25RIA10-25RIA140

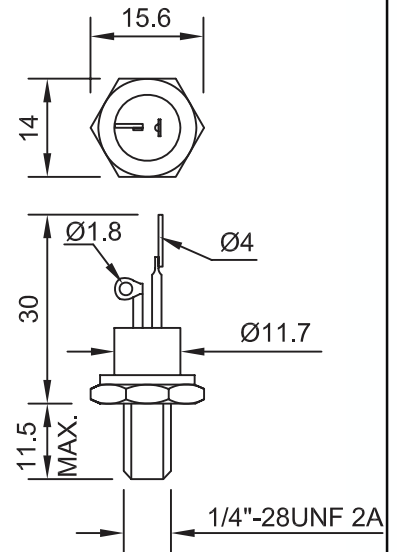
FEATURES

- ⊘ All diffused series / UNF threading.
- ⊘ Full current rating @ 85°C case temperature.
- ⊘ High di/dt and dv/dt capabilities.
- ⊘ Excellent dynamic characteristics.
- ⊘ Glass passivation for high reliability.

THERMAL MECHANICAL SPECIFICATIONS

R_{thjc}	Maximum thermal resistance junction to case DC operation	10RIA	16RIA	25RIA
		1.85°C/W	1.15°C/W	0.75°C/W
R_{thcs}	Contact thermal resistance case-to-sink	0.35°C/W		
T_j	Junction operating temp. range	-40°C to +125°C		
T_{stg}	Storage temperature range	-40°C to +125°C		
	Mounting torque (Non-lubricated threads)	0.2 M-Kg min. 0.3 M-Kg max.		
	Approximate weight	14 gms.		

10/16/25 RIA



UNIT :- M M

ELECTRICAL RATINGS

DEVICE 10RIA DISCONTINUED WITH EFFECT FROM SEPT. 01, 2007

TYPE	10RIA / 16RIA / 25RIA	10	20	40	60	80	100	120	140
V_{DRM}	Max. repetitive peak off state voltage (V) (1)	100	200	400	600	800	1000	1200	1400
V_{RRM}	Max. repetitive peak reverse voltage (V) (2)	100	200	400	600	800	1000	1200	1400
V_{RSM}	Max. non-repetitive peak reverse voltage (V) (3)	150	300	500	700	900	1100	1300	1500
I_{RM} & I_{DM}	Max. peak reverse & off state current @ rated V_{DRM} & V_{RRM} 125°C -mA	20	10	10	10	10	10	10	10

SILICON CONTROLLED RECTIFIERS

10 RIA, 16 RIA, 25 RIA SERIES

ELECTRICAL SPECIFICATIONS

		10RIA	16RIA	25RIA			
$I_{T(RMS)}$	Maximum RMS on-state current (A)	25	35	40			
$I_{T(AV)}$	Maximum average on-state current 180° conduction case temperature 85°C (A)	10	16	25			
I_{TSM}	Maximum peak one cycle non-repetitive surge current : (A) No voltage reapplied 50 Hz. 100% V_{RRM} Reapplied, sinusoidal 10ms half period	Initial	$T_J = 125^\circ\text{C}$	(4)	225	340	420
			$T_J = 45^\circ\text{C}$		270	395	470
		Initial	$T_J = 125^\circ\text{C}$	190	285	350	
			$T_J = 45^\circ\text{C}$	225	335	395	
I^2t	Max. I^2t for fusing (A ² Sec) t = 10ms, 100% V_{RRM} Reapplied t = 1.5ms, No Volt Reapplied	Initial	$T_J = 125^\circ\text{C}$		180	405	615
			$T_J = 45^\circ\text{C}$		255	555	780
		Initial	$T_J = 125^\circ\text{C}$	100	220	335	
			$T_J = 45^\circ\text{C}$	140	303	425	
V_{TM}	Maximum peak on-state voltage @ 25°C, 180°C conduction $I_{T(AV)}$ (V)	10A (32A peak) 16A (50A peak) 25A (79A peak)	1.75	1.75	1.70		
I_H	Maximum holding current @ 25°C (mA)	(5)	100				
I_L	Maximum latching current @ 25°C	(6)	200				
tgt	Typical turn-on time $T_J = 25^\circ\text{C}$ (μ sec)	(7)	0.9				
t _{rr}	Typical reverse recovery time $T_J = 125^\circ\text{C}$ (μ sec)	(8)	4.0				
t _q	Typical turn-off time $T_J = 125^\circ\text{C}$ (μ sec)	(9)	110				
dv/dt	Critical rate of rise of off state voltage $T_J = 125^\circ\text{C}$ Exponential to 100% V_{DRM} (V/μs) Exponential to 67% V_{DRM} (V/μs)		100 300				
di/dt	Maximum repetitive rate of rise of turned on current $V_{DRM} \leq 600\text{V}$ (A/μs)	(10)	200				

TRIGGERING

P_{GM}	Maximum peak gate power 125°C (W)	8.0	
$P_{G(AV)}$	Maximum average gate power 125°C (W)	2.0	
I_{GM}	Maximum peak positive gate current 125°C (A)	1.5	
$-V_{GM}$	Maximum peak negative gate voltage 125°C (V)	10.0	
I_{GT}	Maximum required gate current to trigger (mA)	-65°C	90.0
		25°C	60.0
		125°C	35.0
V_{GT}	Maximum required gate voltage to trigger (V)	-65°C	3.0
		25°C	2.0
		125°C	1.0
V_{GD}	Maximum required gate voltage that will not trigger 125°C V	(11)	0.2

SILICON CONTROLLED RECTIFIERS

ORDER INFORMATION TABLE

10/16/25	RIA	40	M
----------	-----	----	---

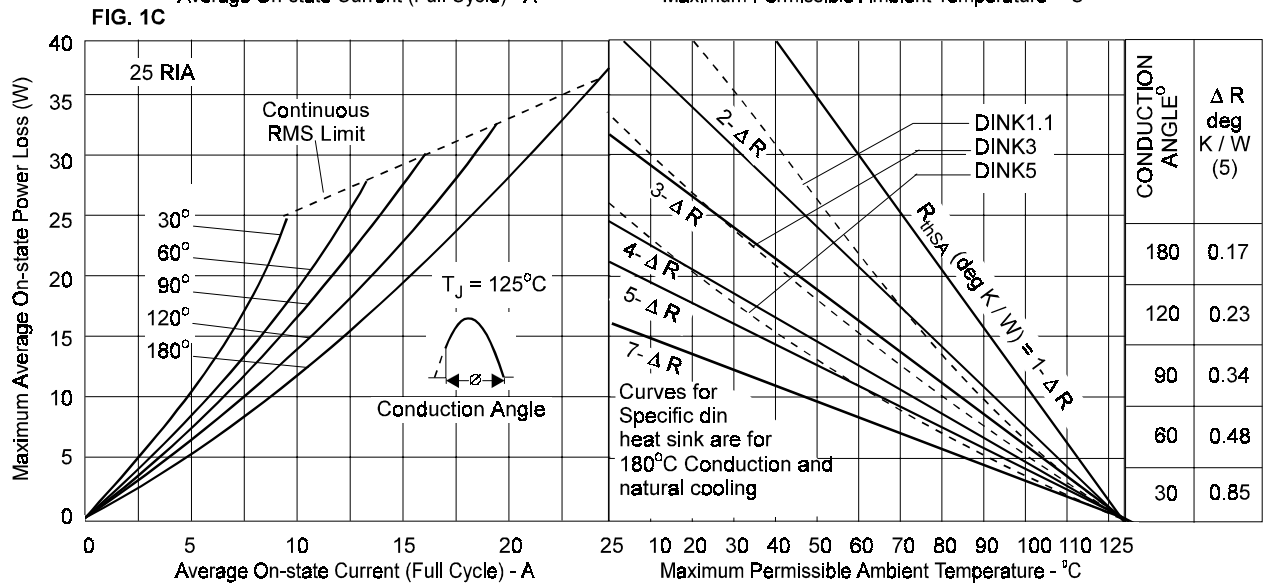
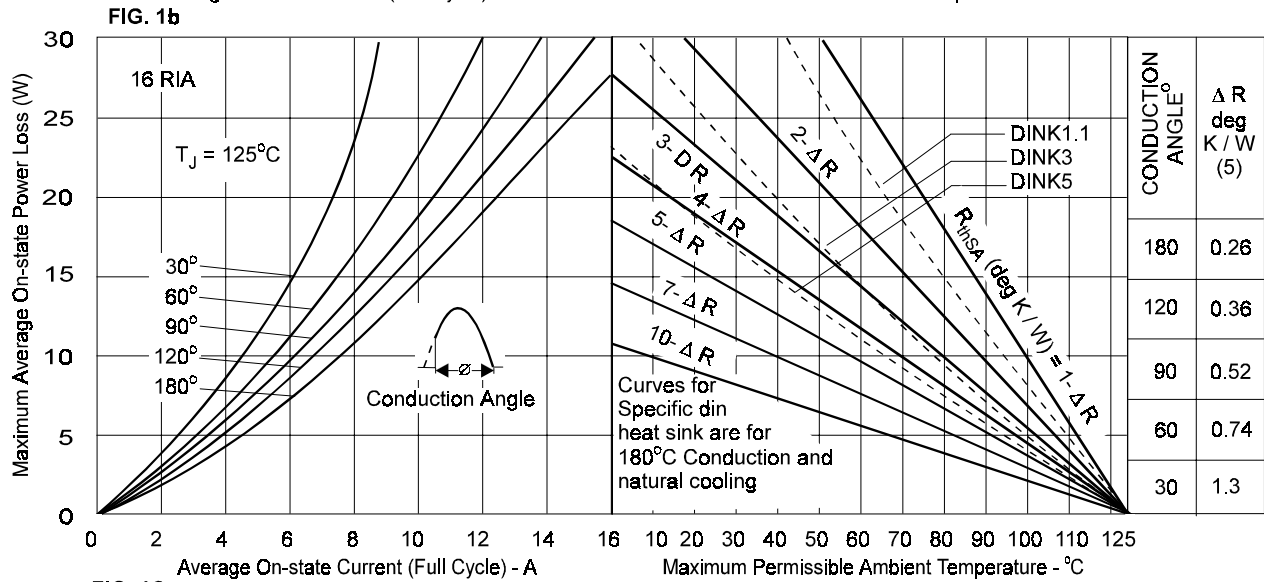
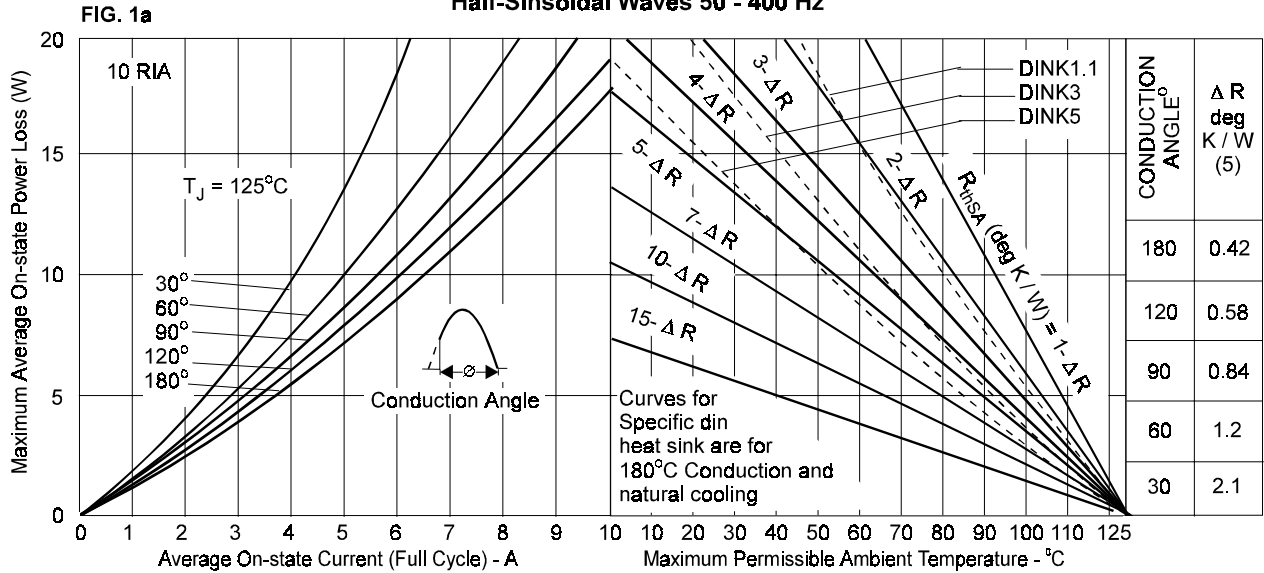
① ② ③ ④

- ① - Current Code
10/16/25 - without external lead.
11/17/26 - with external lead.
- ② - Essential part number
- ③ - Voltage Rating (See table)
- ④ - None - Stud 1/4" 28UNF 2A Threading
M - Stud M6 x 1P Matric threading

SILICON CONTROLLED RECTIFIERS

10RIA, 16RIA, 25RIA SERIES

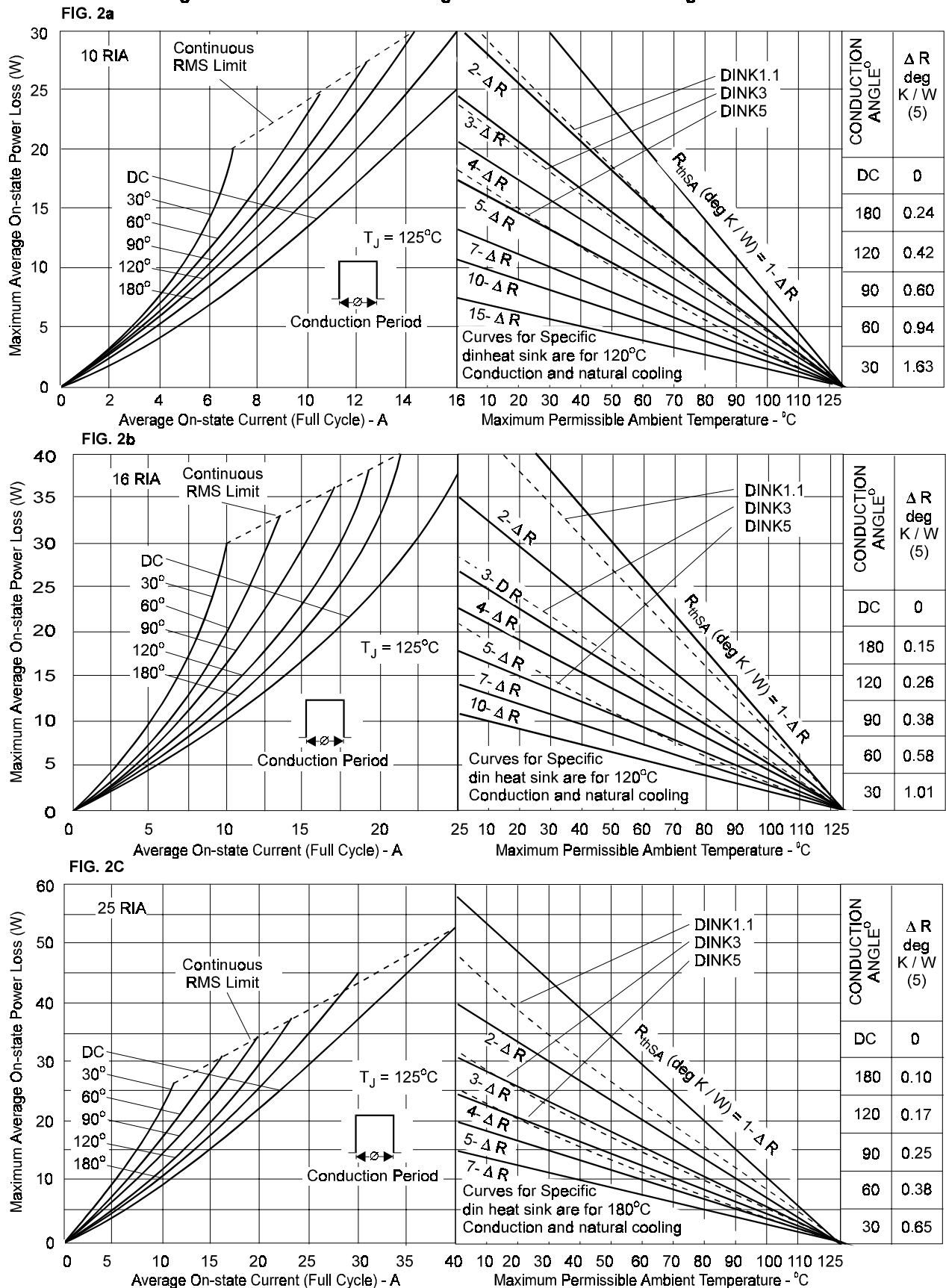
Fig. 1- Continuous Current Rating Characteristics For Phase Angle Controlled Half-Sinoidal Waves 50 - 400 Hz



SILICON CONTROLLED RECTIFIERS

10RIA, 16RIA, 25RIA SERIES

Fig. 2- Continuous Current Rating Characteristics For Rectangular Waves



SILICON CONTROLLED RECTIFIERS

10RIA, 16RIA, 25RIA SERIES

Fig. 3 - Maximum On-state Voltage Drop Vs Current

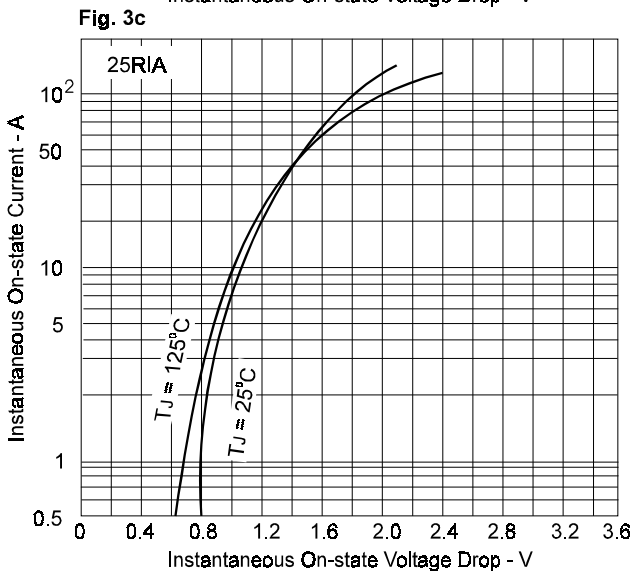
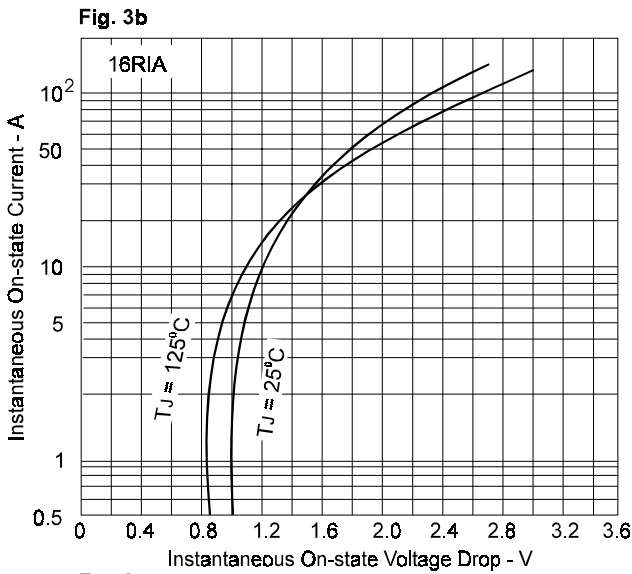
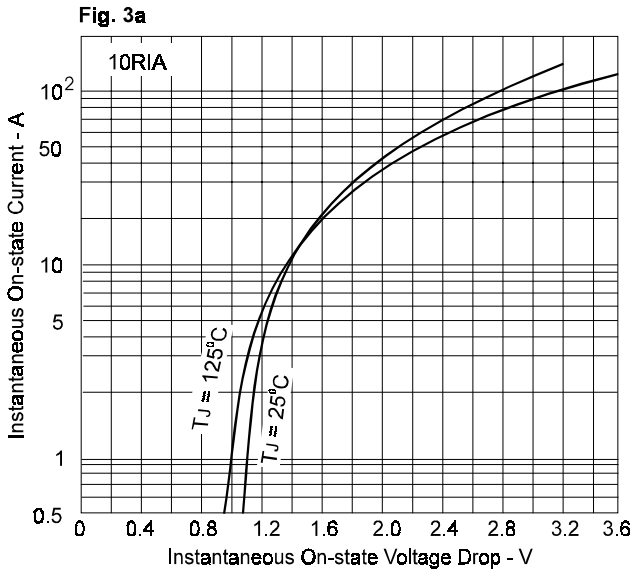
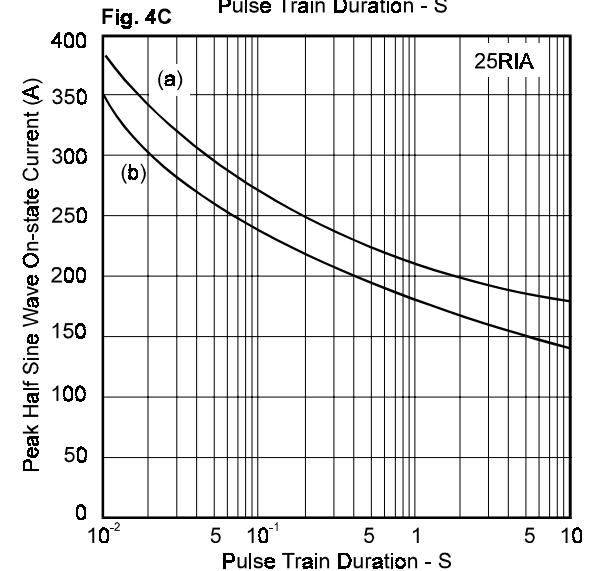
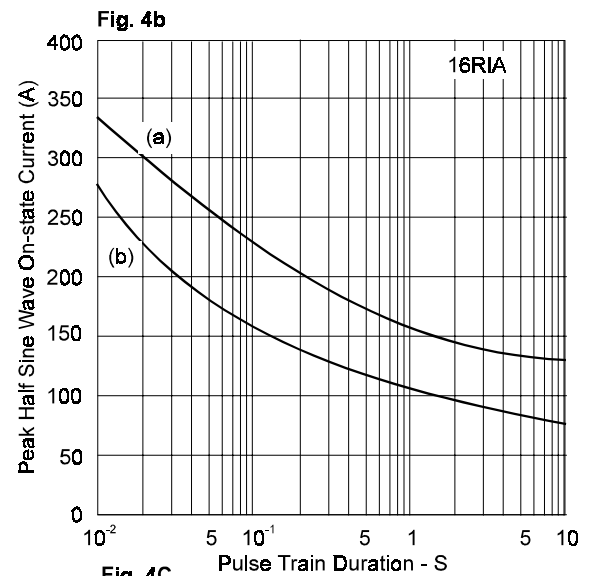
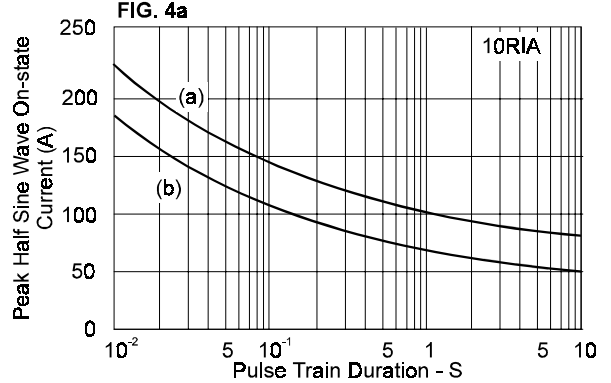


Fig. 4 - Non-Repetitive Surge Current

- (a) Initial $T_J = 45^\circ\text{C}$ 100% rated voltage reappplied sinusoidally in either direction after each current pulse
- (b) Initial $T_J = 125^\circ\text{C}$ 100% rated voltage reappplied sinusoidally, in the reverse direction after each current pulse

Control of conduction maintained under all conditions



SILICON CONTROLLED RECTIFIERS

10RIA, 16RIA, 25RIA SERIES

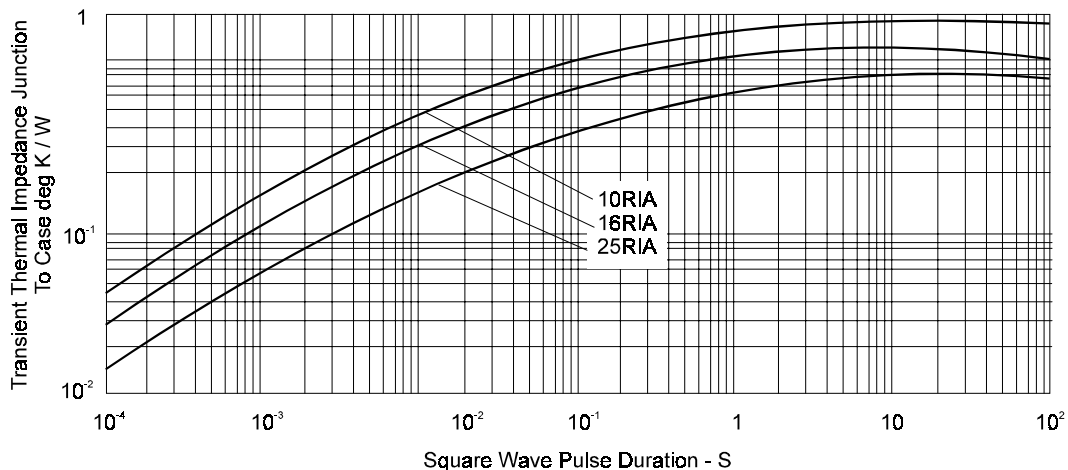
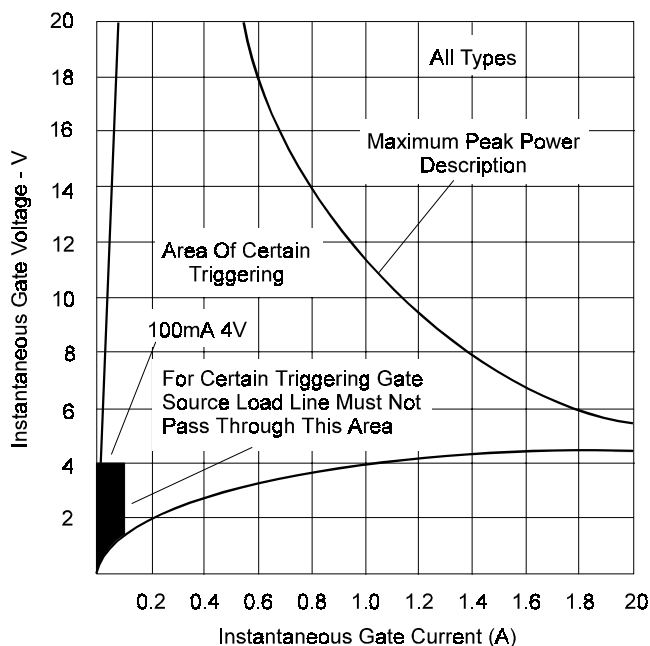


Fig. 5 - Maximum Transient Thermal Impedance Versus Square Wave Pulse Duration



NOTES

- 1 - GATE OPEN CURRENT.
- 2 - WITH ZERO OR NEGATIVE GATE BIAS VOLTAGE.
- 3 - FOR VOLTAGE PULSE LESS THAN 10m Sec.
- 4 - VOLTAGE REAPPLIED SINUSOIDALLY, 10ms HALF PERIOD
- 5 - 6V ANODE SUPPLY, RESISTIVE LOAD, GATE OPEN.
- 6 - 6V ANODE SUPPLY, RESISTIVE LOAD
- 7 - GATE CURRENT = 200mA, RISE TIME 0.5 μ s PULSE DURATION AT LEAST 6 μ s $V_D = 0.5 V_{DRM}$ RESISTIVE CIRCUIT $I_{TM} = 0.1 \times I_T (AV)$
- 8 - $I_{TM} = I_T (AV)$ FOR AT LEAST 200 μ s, $dv/dt = 10A/\mu$ s
- 9 - $I_{TM} = I_T (AV)$, $dv/dt = 10\mu$ s, ON-STATE CURRENT PULSE AT LEAST 200 μ s DURATION. RESERVE VOLTAGE DURING TURN OFF 100V, REAPPLIED $dv/dt = 20V/\mu$ s EXPONENTIAL TO 0.67 V_{DRM} .
- 10 - FROM 0.67 V_{DRM} , $T_J = 125^\circ C$. PEAK GATE CURRENT = 0.5 RISE TIME 1 μ s, PULSE DURATION AT LEAST 6 μ s. $I_{TM} = A \times I_T (AV)$
- 11 - WITH V_{DRM} APPLIED, $I_{TM} = 0.1 \times I_T (AV)$
- 12 - TO DETERMINE REQUIRED HEAT SINK THERMAL RESISTANCE (R_{thSA}) IN DEG C / W USE VALUE OF ΔR APPROPRIATE TO CONDUCTION ANGLE STATED IN TABLE AND SUBSTITUTE IN FORMULA $R_{thSA} = X - \Delta R$.
e.g. FOR 10RIA AT 180 $^\circ C$ CONDUCTION ANGLE, AND 60 $^\circ C$ AMBIENT TEMPERATURE $R_{thSA} = 3 - 0.42 = 2.58$ DEG C / W (FIG. 1)