

125RK SERIES Power Silicon Controlled Rectifiers

Types : 125RK20 TO 125RK160

FEATURES

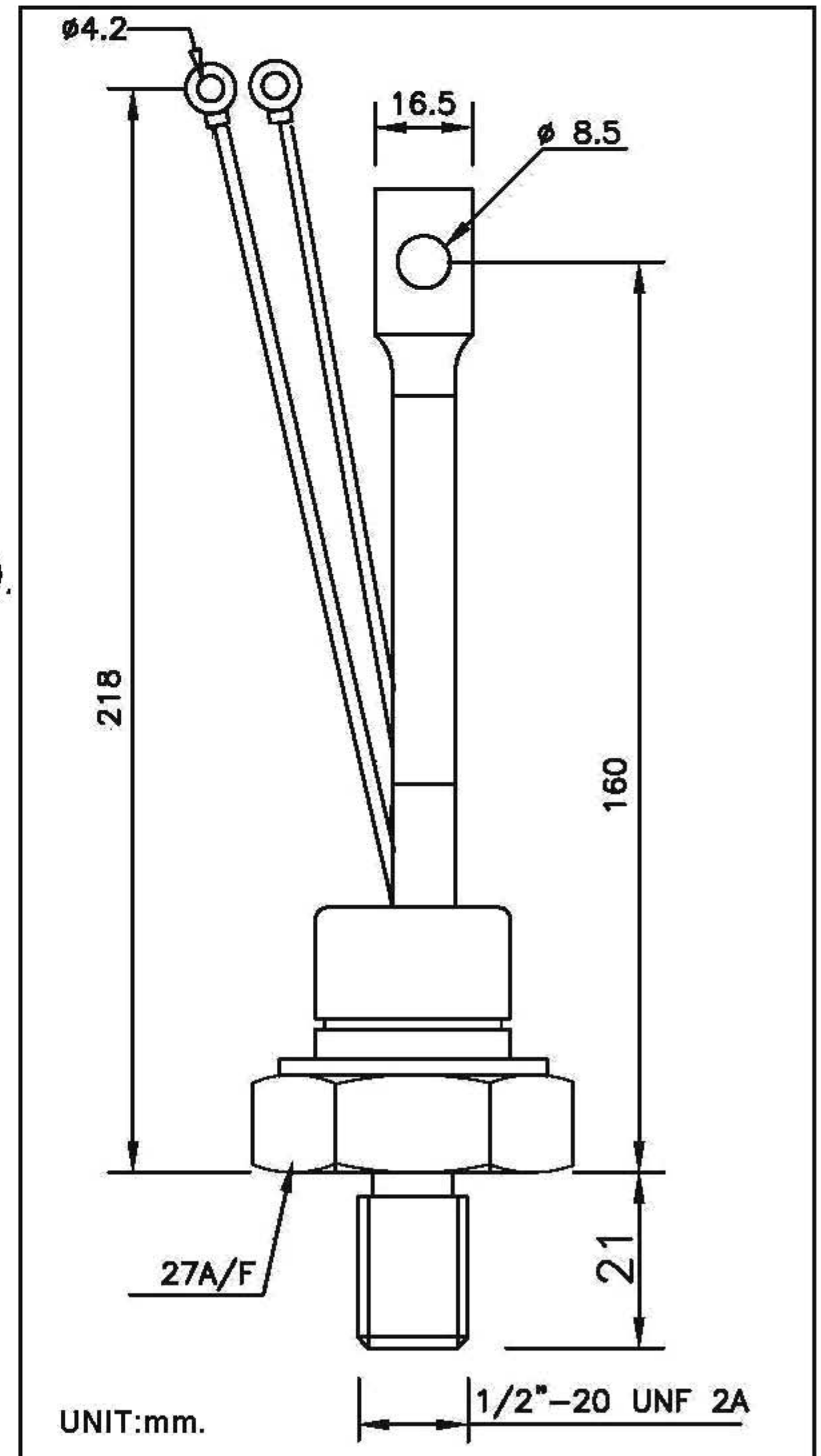
- ❖ Centre Amplifying Gate
- ❖ International Standard case TO-209Ac (TO-94).
- ❖ Threaded studs UNF 1/2" - 20UNF2A.
- ❖ Compression Bonded Encapsulation for heavy duty operations such as severe thermal cycling.

TYPICAL APPLICATIONS

- ❖ DC motor control (e.g. for machine tools).
- ❖ Controlled rectifiers (e.g. for battery charging, UPS).
- ❖ AC controllers (e.g. temperature control, lights control).

THERMAL MECHANICAL SPECIFICATIONS

R_{thjc}	Maximum thermal resistance junction to case	0.19K/W
R_{thcs}	Contact thermal resistance case-to-sink	0.08K/W
T_J	Junction operating temp. range	-40°C to +125°C
T_{stg}	Storage temperature range	-40°C to +150°C
	Mounting torque (Non-lubricated threads)	14.0Nm. Min. 15.5Nm. Max.
	Approximate weight	130 gms.



ELECTRICAL RATINGS

TYPE	125RK	20	40	60	80	100	120	140	160
V_{DRM}	Max. repetitive peak off state voltage (V)	200	400	600	800	1000	1200	1400	1600
V_{RRM}	Max. repetitive peak reverse voltage (V)	200	400	600	800	1000	1200	1400	1600
V_{RSM}	Max. non-repetitive peak reverse voltage (V)	300	500	700	900	1100	1300	1500	1700
I_{RM} & I_{DM}	Max. peak reverse & off state current @ rated V_{DRM} & V_{RRM} 125°C -mA	20	20	20	20	20	20	20	20

SILICON CONTROLLED RECTIFIERS

125RK SERIES

ELECTRICAL SPECIFICATION ON-STATE CONDITION

	Parameter	125RK	Units	Conditions
$I_{T(AV)}$	Max. average on-state current @ case temperature	125	A	180°C conduction, half sine wave
		85	°C	
$I_{T(RMS)}$	Max. RMS on-state current	200		
I_{TSM}	Max. peak one cycle non-repetitive surge current	2570	A	t = 10ms Sinusoidal half wave, Initial $T_J = T_J$ max.
I^2t	Maximum I^2t for fusing	33	kA ² s	t = 10ms
$V_{T(TO)}$	Threshold voltage	0.90	V	$T_J = T_J$ max.
r_t	On state slope resistance	1.79	mΩ	$T_J = T_J$ max.
V_{TM}	Max. on state voltage	1.55	V	$I_{pk} = 400A$, $T_J = 125^\circ C$, $t_p = 10ms$ sine pulse
I_H	Maximum holding current	300	mA	$T_J = 25^\circ C$, anode supply 12V resistive load
I_L	Latching current	600		

TRIGGERING

	Parameter	125RK	Units	Conditions
P_{GM}	Maximum peak gate power	5	W	$T_J = 125^\circ C$, $t_p \leq 5ms$
$P_{G(AV)}$	Maximum average gate power	1		$T_J = 125^\circ C$, f = 50Hz, d% = 50
I_{GM}	Max. peak positive gate current	2.0	A	$T_J = 125^\circ C$, $t_p \leq 5ms$
$+V_{GM}$	Max. peak positive gate voltage	20	V	$T_J = 125^\circ C$, $t_p \leq 5ms$
$-V_{GM}$	Max. peak negative gate voltage	5.0		
I_{GT}	DC gate current required to trigger	Typ	Max	$T_J = 25^\circ C$ Max. required gate trigger / current / voltage are the lowest value which will trigger all units 12V anode-to-cathode applied.
		90	150	
V_{GT}	DC gate voltage required to trigger	1.8	3.0	$T_J = 25^\circ C$
I_{GD}	DC gate current not to trigger	10	mA	$T_J = 125^\circ C$ Max. gate current / voltage not to trigger is the max. value which will not trigger any unit with rated V_{DRM} anode-to-cathode applied.
V_{GD}	DC gate voltage not to trigger	0.25		

SILICON CONTROLLED RECTIFIERS

ORDER INFORMATION TABLE

125	RK	40	M
-----	----	----	---

① ② ③ ④

- ① - Current Code
- ② - RK - Essential part number
- ③ - Voltage Rating (See table)
- ④ - None - Stud 1/2" 20UNF 2A Threading
M - Stud M16 x 1.5P Metric Threading

SILICON CONTROLLED RECTIFIERS

125RK SERIES

Switching

Parameter	125RK	Unit	Condition
di/dt Max. non-repetitive rate of rise of turned-on current	100	A/μs	Gate drive 20V, 20Ω, tr ≤ 1μs T _J -125°C, anode voltage < 80% V _{DRM}
t _d Typical delay time	2.0	μs	Gate current 1A, di _g /dt -1A/μs V _d -0.67% V _{DRM} , T _J -25°C
t _q Typical turn-off time	100	μs	I _{TM} -100A, T _J -125°C, di/dt- 10A/μs, V _r -50V dv/dt -20V/μs, Gate 0v 100Ω, t _p - 500μs

Blocking

Parameter	125RK	Unit	Condition
dv/dt Max. critical rate of rise of off-state voltage	500	V/μs	T _J -125°C, Linear to 80% rated V _{DRM}
I _{RRM} / I _{DRM} Max. peak reverse and off-stage leakage current	20	mA	T _J -125°C, rated V _{DRM} / V _{RRM} applied

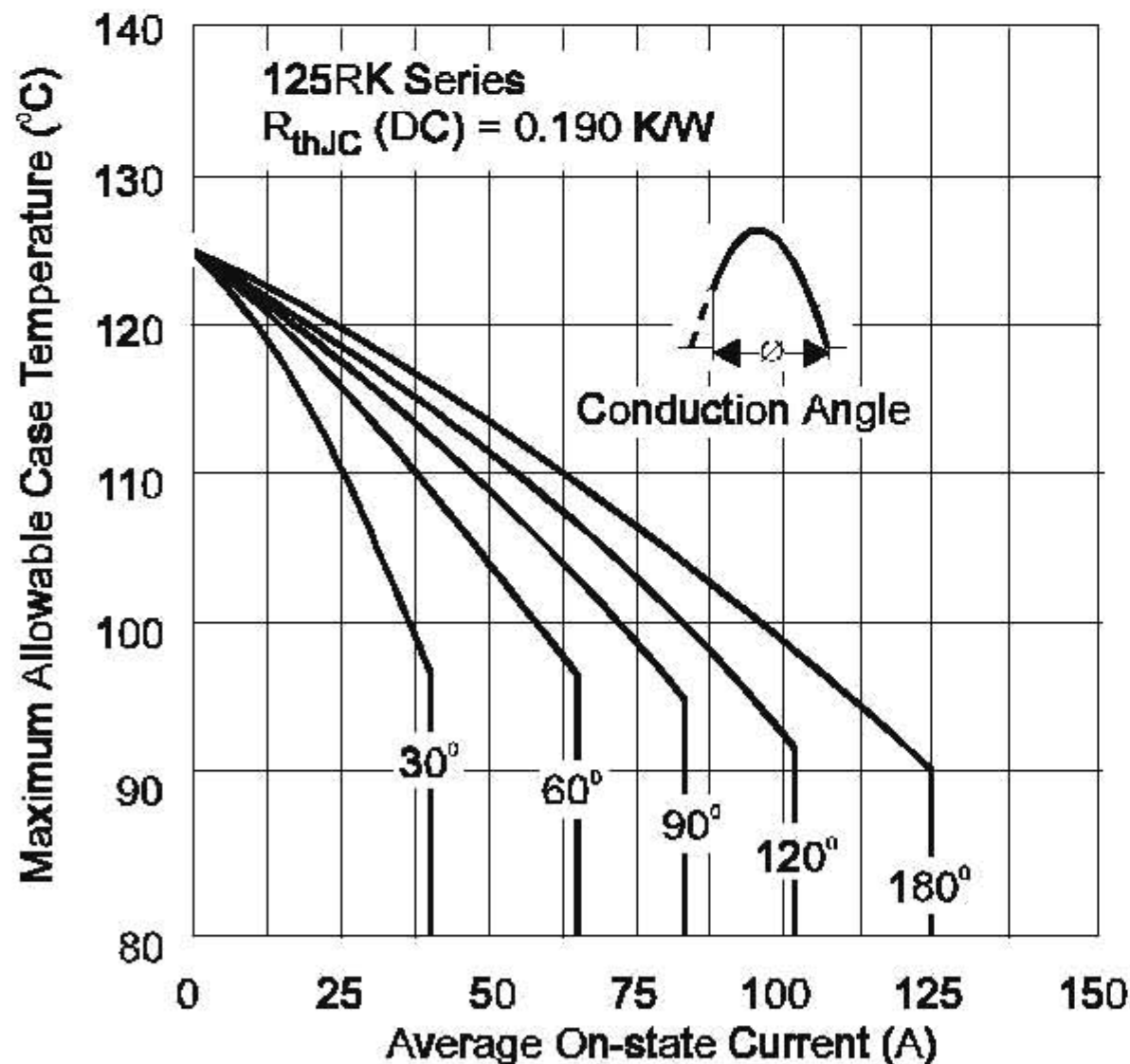


Fig. 1 - Current Ratings Characteristics

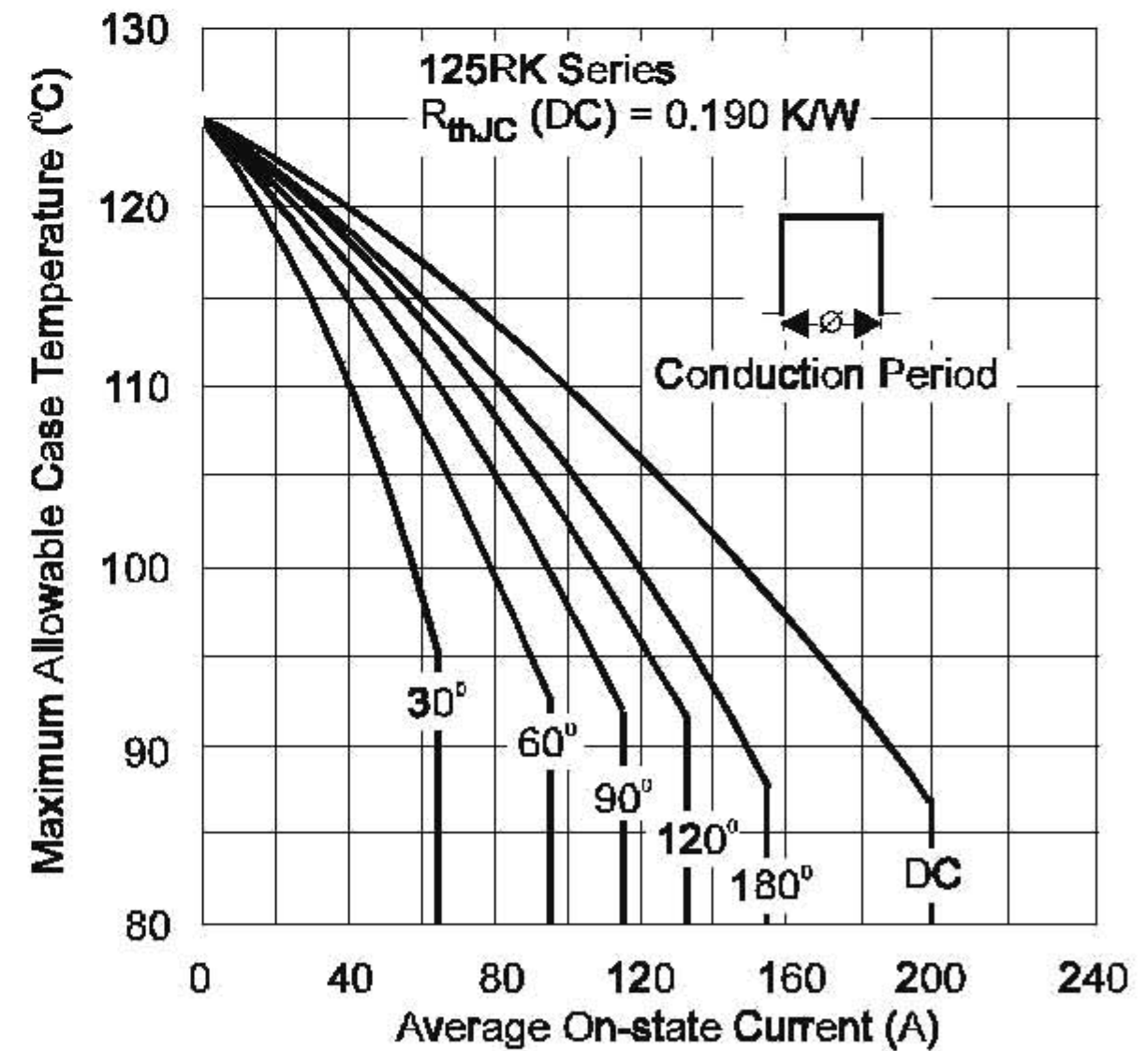


Fig. 2 - Current Ratings Characteristics

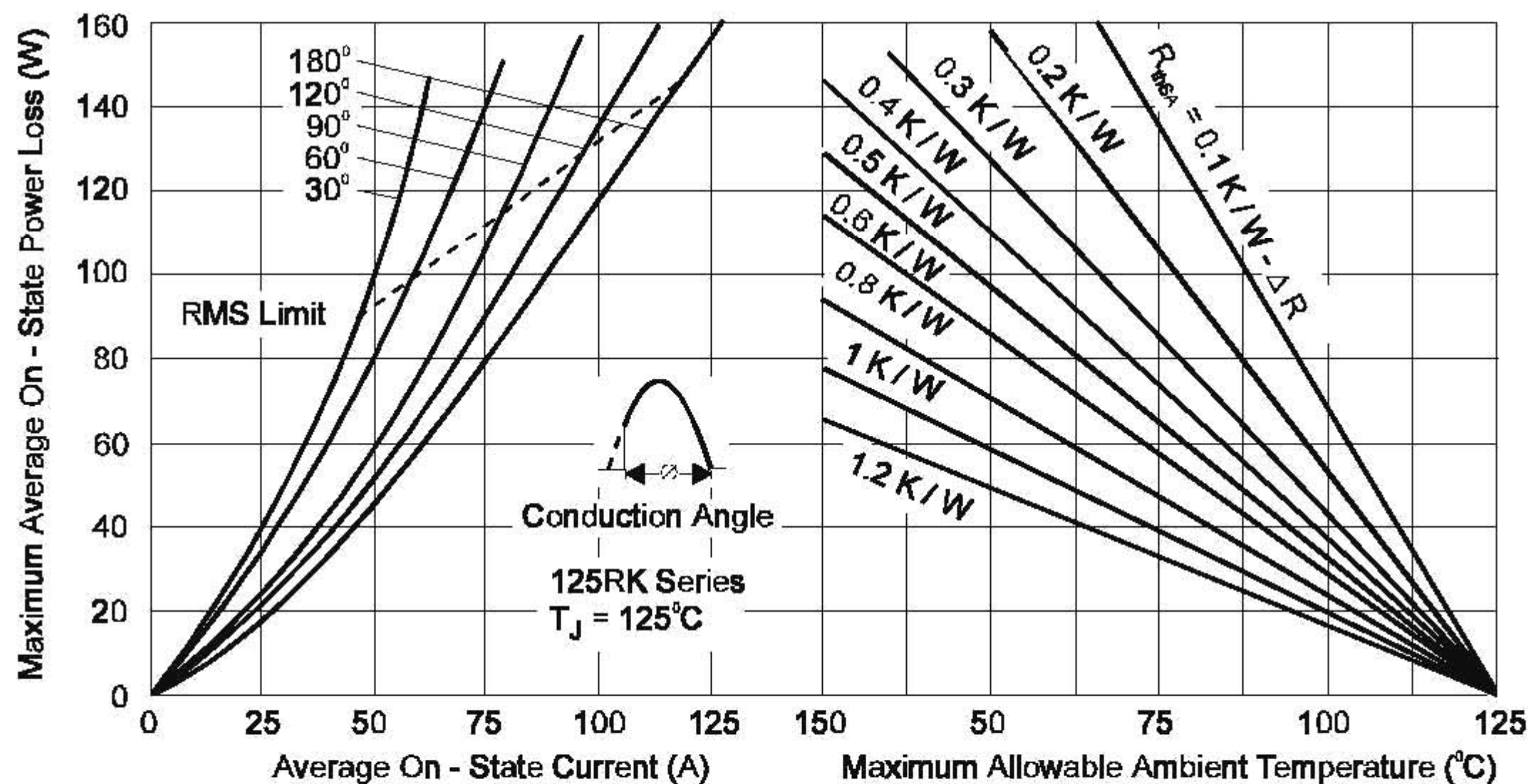


Fig. 3 - On-State Power Loss Characteristics

SILICON CONTROLLED RECTIFIERS

125RK SERIES

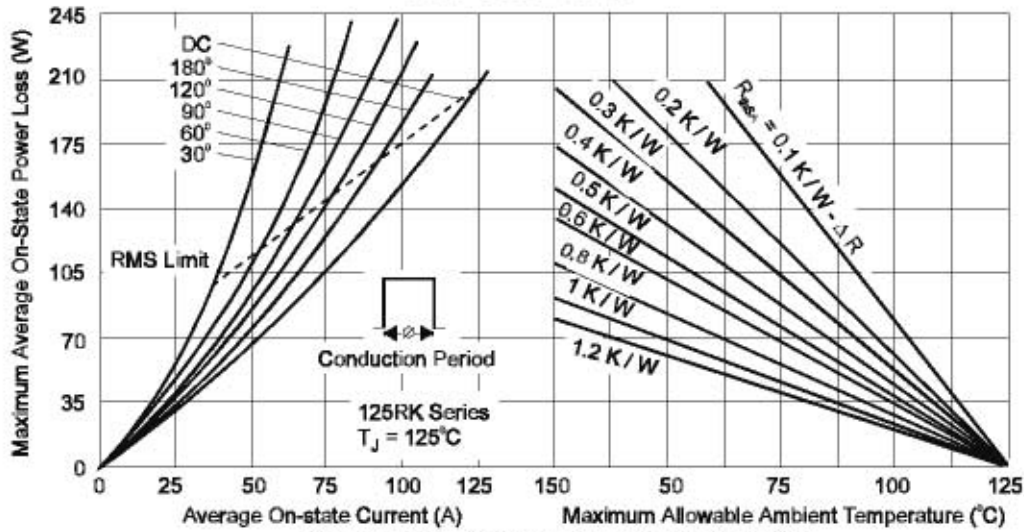


Fig. 4 - On-State Power Loss Characteristics

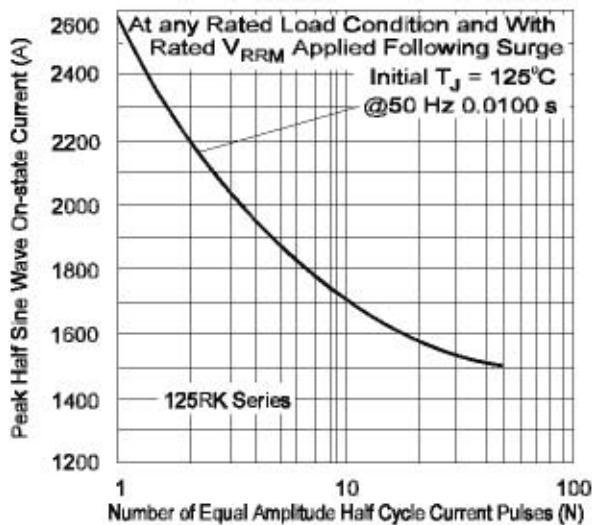


Fig. 5 - Maximum Non-Repetitive Surge Current

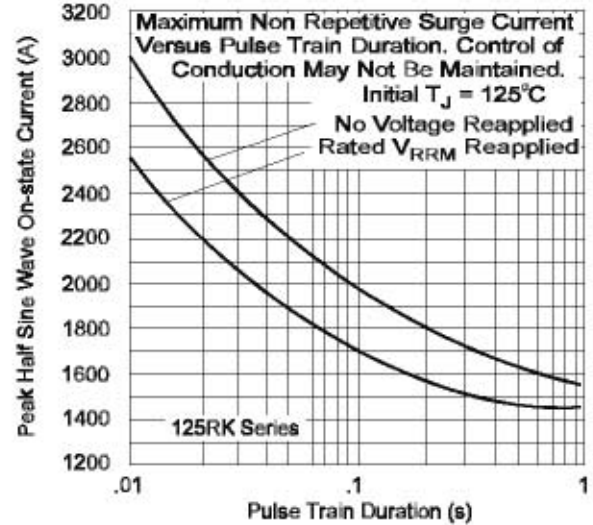


Fig. 6 - Maximum Non-Repetitive Surge Current

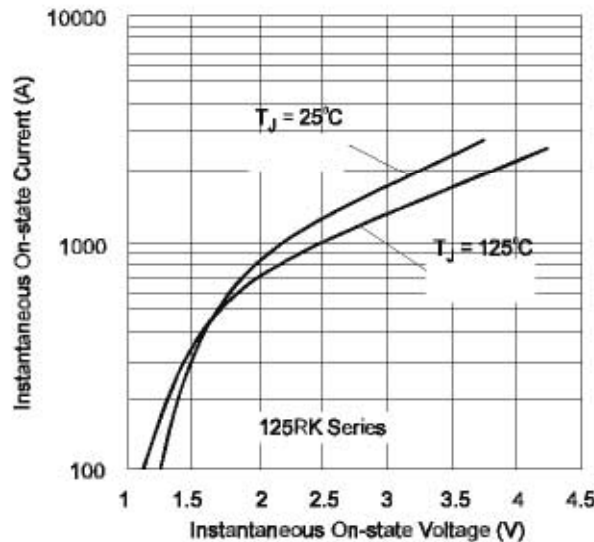


Fig. 7 - On-state Voltage Drop Characteristics

SILICON CONTROLLED RECTIFIERS

125RK SERIES

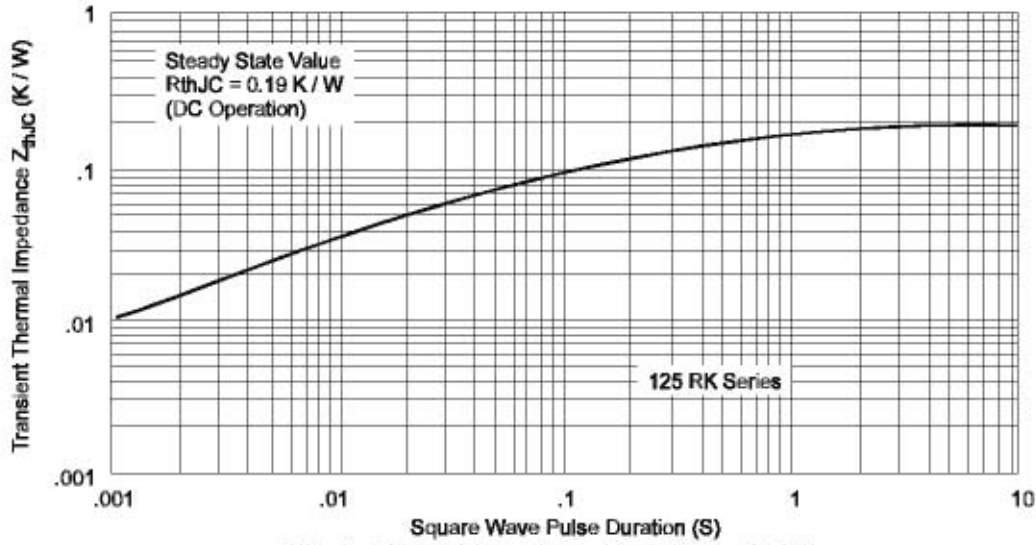


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

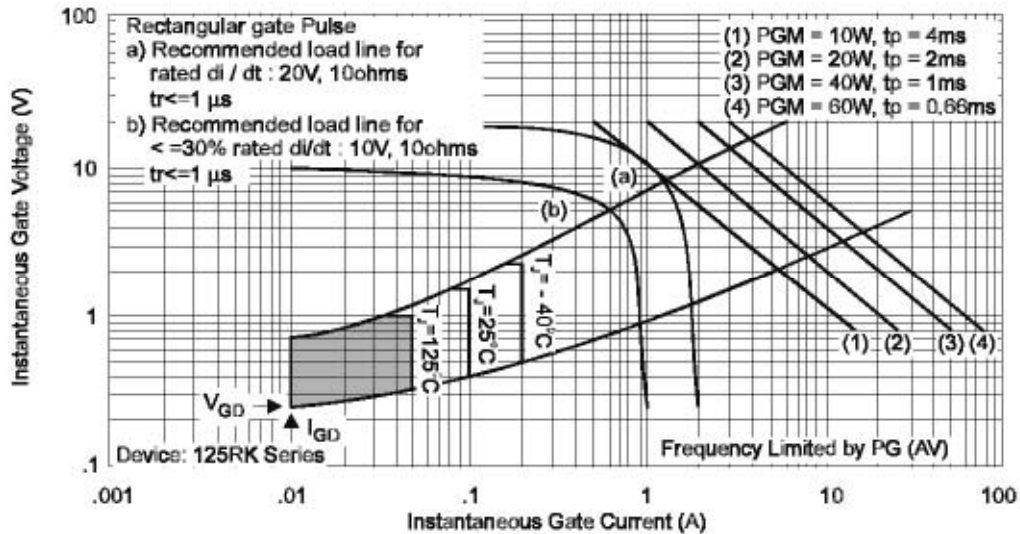


Fig. 9 - Gate Characteristics