

FEATURES

- Double Side Cooling
- High Surge Capability
- High Mean Current
- Fatigue Free

TYPICAL APPLICATIONS

- High Power Drives
- High Voltage Power Supplies
- DC Motor Control

TECHNICAL DATA

DEVICE TYPE	V_{DRM}/V_{RRM} (V)	V_{RSM} (V)
DCR804SG1212	1200	1300
DCR804SG1616	1600	1700
DCR804SG1818	1800	1900
DCR804SG2121	2100	2200



CURRENT RATINGS

$T_{case} = 60^{\circ}C$ unless stated otherwise

Symbol	Parameter	Conditions	Max.	Units
Double Side Cooled				
$I_{T(AV)}$	Mean on-state current	Half wave resistive load	1045	A
$I_{T(RMS)}$	RMS value	-	1641	A
I_T	Continuous (direct) on-state current	-	1450	A
Single Side Cooled (Anode side)				
$I_{T(AV)}$	Mean on-state current	Half wave resistive load	675	A
$I_{T(RMS)}$	RMS value	-	1060	A
I_T	Continuous (direct) on-state current	-	862	A

CURRENT RATINGS

$T_{case} = 80^{\circ}\text{C}$ unless stated otherwise

Symbol	Parameter	Conditions	Max.	Units
Double Side Cooled				
$I_{T(AV)}$	Mean on-state current	Half wave resistive load	820	A
$I_{T(RMS)}$	RMS value	-	1285	A
I_T	Continuous (direct) on-state current	-	1085	A
Single Side Cooled (Anode side)				
$I_{T(AV)}$	Mean on-state current	Half wave resistive load	505	A
$I_{T(RMS)}$	RMS value	-	793	A
I_T	Continuous (direct) on-state current	-	620	A

SURGE RATINGS

Symbol	Parameter	Conditions	Max.	Units
I_{TSM}	Surge (non-repetitive) on-state current	10ms half sine; $T_{case} = 125^{\circ}\text{C}$	11.2	kA
I^2t	I^2t for fusing	$V_R = 50\% V_{RRM}$ - 1/4 sine	625×10^3	A^2s
I_{TSM}	Surge (non-repetitive) on-state current	10ms half sine; $T_{case} = 125^{\circ}\text{C}$	14.0	kA
I^2t	I^2t for fusing	$V_R = 0$	975×10^3	A^2s

THERMAL AND MECHANICAL DATA

Symbol	Parameter	Conditions	Min.	Max.	Units	
$R_{th(j-c)}$	Thermal resistance - junction to case	Double side cooled	dc	-	0.032	$^{\circ}\text{C/W}$
		Single side cooled	Anode dc	-	0.064	$^{\circ}\text{C/W}$
			Cathode dc	-	0.064	$^{\circ}\text{C/W}$
$R_{th(c-h)}$	Thermal resistance - case to heatsink	Clamping force 12.5kN with mounting compound	Double side	-	0.008	$^{\circ}\text{C/W}$
			Single side	-	0.016	$^{\circ}\text{C/W}$
T_{vj}	Virtual junction temperature	On-state (conducting)	-	135	$^{\circ}\text{C}$	
		Reverse (blocking)	-	125	$^{\circ}\text{C}$	
T_{stg}	Storage temperature range		-55	125	$^{\circ}\text{C}$	
-	Clamping force		11.0	13.0	kN	

DYNAMIC CHARACTERISTICS

Symbol	Parameter	Conditions	Typ.	Max.	Units	
I_{RRM}/I_{DRM}	Peak reverse and off-state current	At V_{RRM}/V_{DRM} , $T_{case} = 125^{\circ}C$	-	50	mA	
dV/dt	Maximum linear rate of rise of off-state voltage	To 67% V_{DRM} , $T_j = 125^{\circ}C$. Gate open circuit.	-	1000	V/ μ s	
di/dt	Rate of rise of on-state current	From 67% V_{DRM} to 1500A Gate source 1.5A $t_r = 0.5\mu$ s, $T_j = 125^{\circ}C$	Repetitive 50Hz	-	500	A/ μ s
			Non-repetitive	-	1000	A/ μ s
$V_{T(TO)}$	Threshold voltage	At $T_{vj} = 125^{\circ}C$	-	0.85	V	
r_T	On-state slope resistance	At $T_{vj} = 125^{\circ}C$	-	0.38	m Ω	
t_{gd}	Delay time	$V_D = 67\% V_{DRM}$, Gate source 30V, 15 Ω $t_r = 0.5\mu$ s, $T_j = 25^{\circ}C$	-	1.5	μ s	
t_q	Turn-off time	$I_T = 1000A$, $t_p = 1ms$, $T_j = 125^{\circ}C$, $V_R = 50V$, $dI_{RR}/dt = 20A/\mu$ s, $V_{DR} = 67\% V_{DRM}$, $dV_{DR}/dt = 20V/\mu$ s linear	200	300	μ s	
I_L	Latching current	$T_j = 25^{\circ}C$, $V_D = 5V$	350	1000	mA	
I_H	Holding current	$T_j = 25^{\circ}C$, $V_D = 5V$	40	100	mA	

GATE TRIGGER CHARACTERISTICS AND RATINGS

Symbol	Parameter	Conditions	Typ.	Max.	Units
V_{GT}	Gate trigger voltage	$V_{DRM} = 5V$, $T_{case} = 25^{\circ}C$	1.0	3.5	V
I_{GT}	Gate trigger current	$V_{DRM} = 5V$, $T_{case} = 25^{\circ}C$	-	200	mA
V_{GD}	Gate non-trigger voltage	At V_{DRM} , $T_{case} = 125^{\circ}C$	-	0.25	V
I_{GD}	Gate non-trigger current	At V_{DRM} , $T_{case} = 125^{\circ}C$	-	-	A
V_{FGM}	Peak forward gate voltage	Anode positive with respect to cathode	-	30	V
V_{FGN}	Peak forward gate voltage	Anode negative with respect to cathode	-	0.25	V
V_{RGM}	Peak reverse gate voltage		-	5	V
I_{FGM}	Peak forward gate current	Anode positive with respect to cathode	-	30	A
P_{GM}	Peak gate power	See table, gate characteristics curve	-	150	W
$P_{G(AV)}$	Mean gate power		-	10	W

CURVES

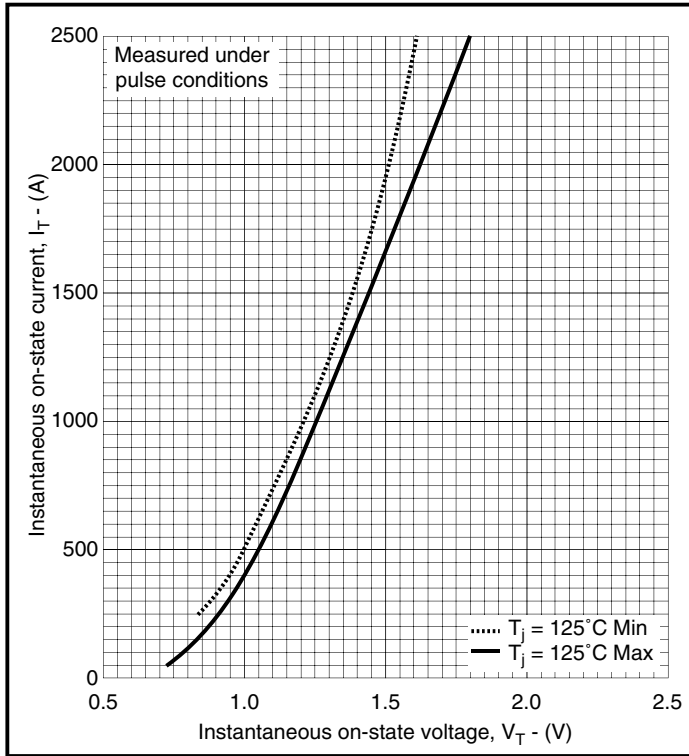


Fig.2 Maximum (limit) on-state characteristics

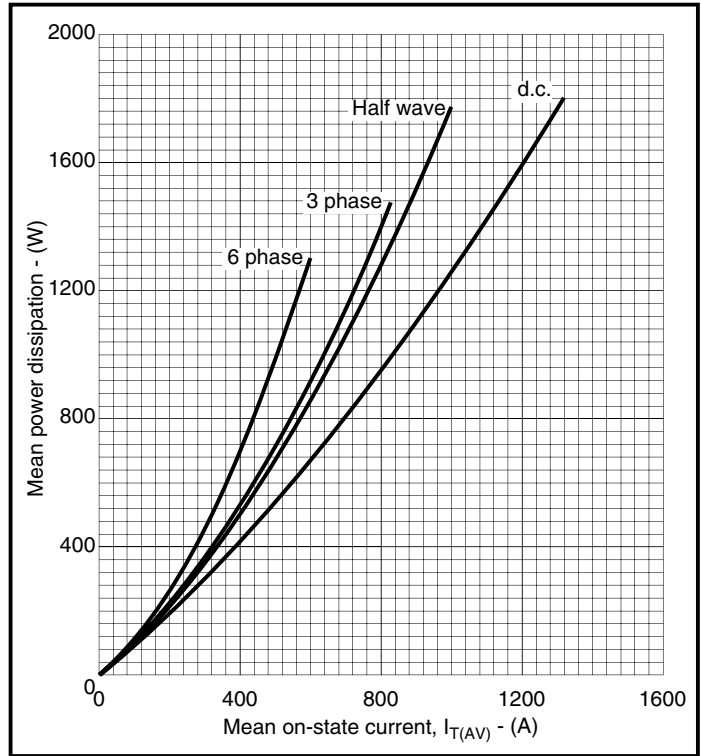


Fig.3 Dissipation curves

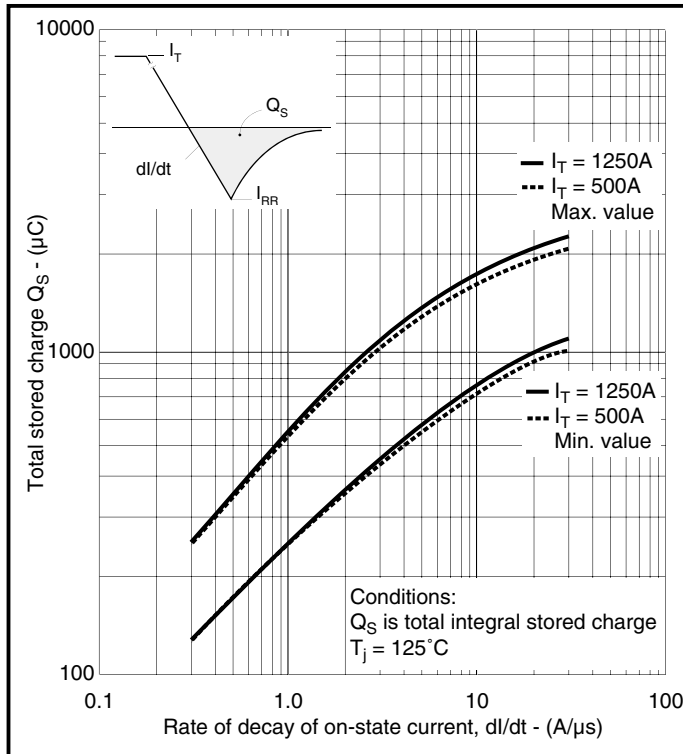


Fig.4 Stored charge

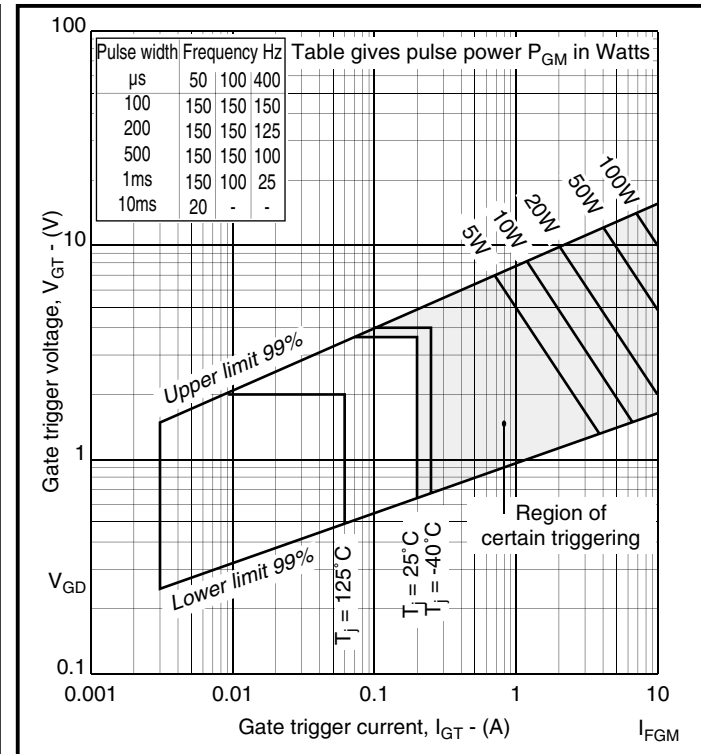


Fig.5 Gate characteristics

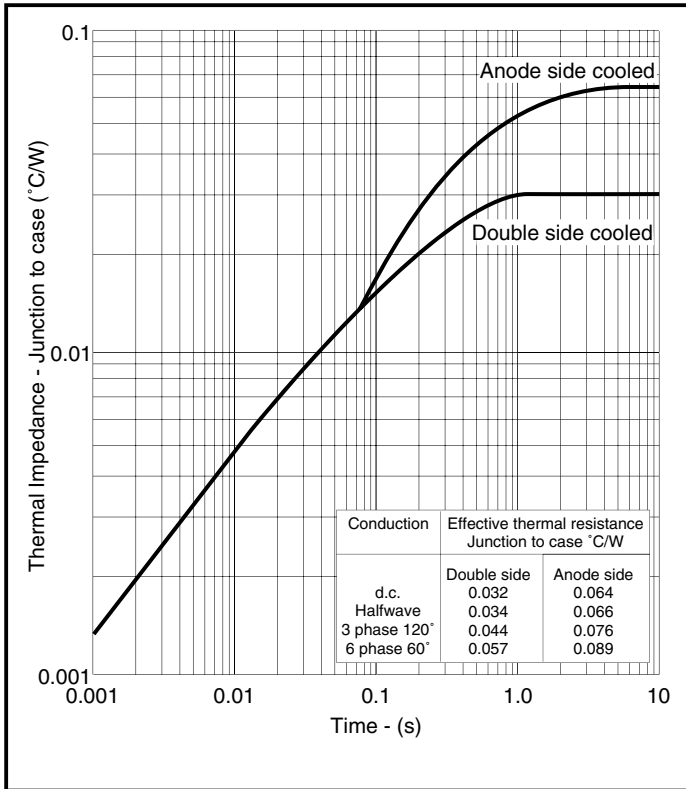


Fig.6 Maximum (limit) transient thermal impedance - junction to case

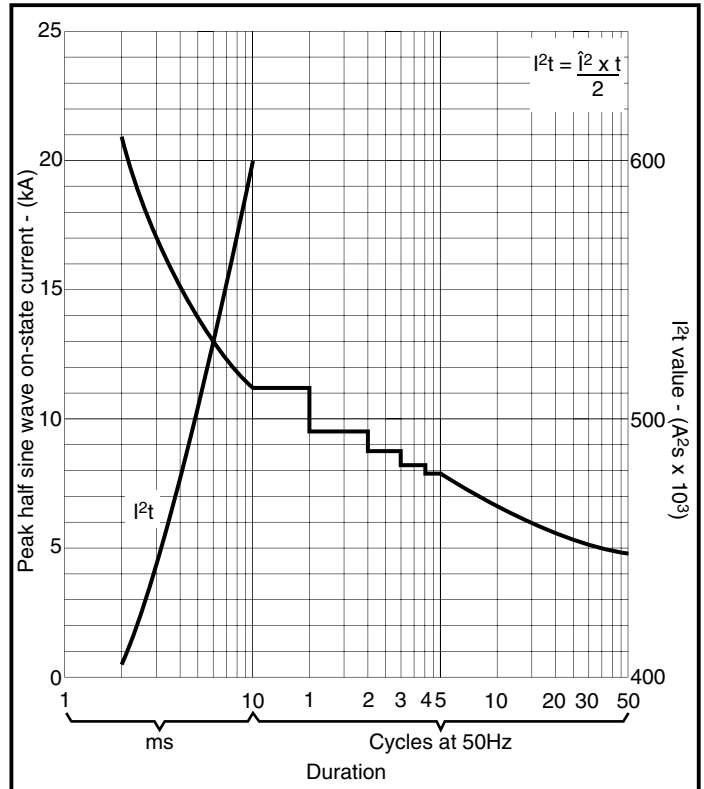
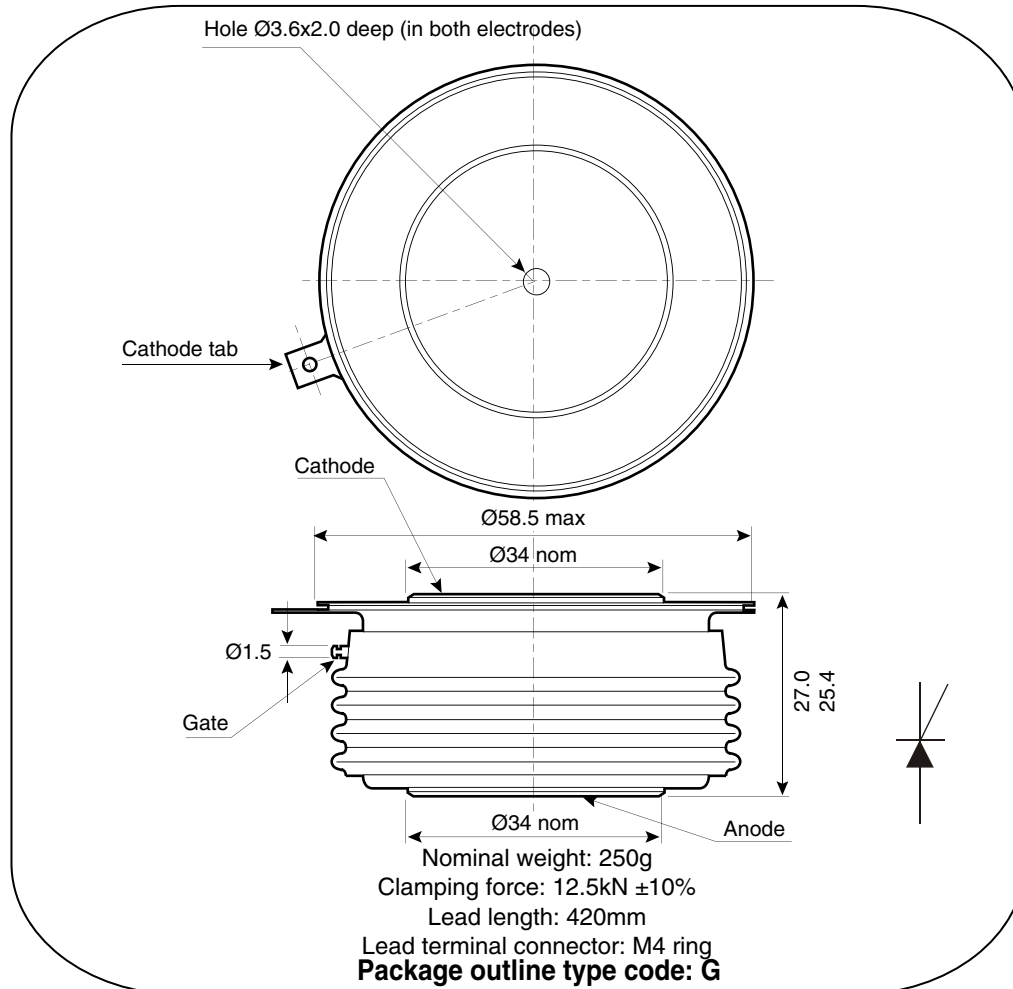


Fig.7 Surge (non-repetitive) on-state current vs time (with 50% V_{RRM} at $T_{\text{case}} 125^{\circ}\text{C}$)

PACKAGE OUTLINE



All dimensions are in mm.

Insel Rectifiers (India) Pvt. Ltd.

(An ISO 9001:2008 Certified Company)

Head Office : 15/C-40, Connaught Place, New Delhi-110001 (INDIA)

Tel.: 011-23417822, 23413974, 23418975, Fax : 011-23417843,

E-mail : insel@rectifierindia.com, sales@rectifierindia.com

WORKS: UNIT-I : Shalimar Bagh, Delhi-110088.

UNIT-II : Plot No. 151, Udyog Kendra Ext -II, Greater Noida-201306.

Tel.: 0120-2350808