

Phase Control Thyristor

DS6030-1 April 2011 (LN28241)

FEATURES

- Double Side Cooling
- High Surge Capability

APPLICATIONS

- High Power Drives
- High Voltage Power Supplies
- Static Switches

VOLTAGE RATINGS

Part and Ordering Number	Repetitive Peak Voltages V _{DRM} and V _{RRM} V	Conditions
DCR2830C18 DCR2830C16 DCR2830C14 DCR2830C12	1800 1600 1400 1200	$\begin{split} T_{vj} = -40^{\circ}\text{C to } 125^{\circ}\text{C}, \\ I_{DRM} = I_{RRM} = 250\text{mA}, \\ V_{DRM}, V_{RRM} t_p = 10\text{ms}, \\ V_{DSM} \& V_{RSM} = \\ V_{DRM} \& V_{RRM} + 100V \\ respectively \end{split}$

Lower voltage grades available.

ORDERING INFORMATION

When ordering, select the required part number shown in the Voltage Ratings selection table.

For example:

DCR2830C18

Note: Please use the complete part number when ordering and quote this number in any future correspondence relating to your order.

KEY PARAMETERS

V_{DRM}	1800 V
$I_{T(AV)}$	2830 A
I _{TSM}	45000 A
dV/dt*	1000 V/µs
dI/dt	200 A/μs

* Higher dV/dt selections available

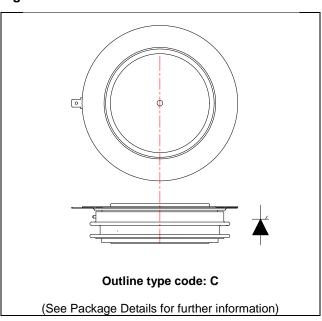


Fig. 1 Package outline



CURRENT RATINGS

T_{case} = 60°C unless stated otherwise

Symbol	Parameter	Test Conditions		Units	
Double Si	Double Side Cooled				
I _{T(AV)}	Mean on-state current	Half wave resistive load	2830	А	
I _{T(RMS)}	RMS value	-	4440	А	
Ι _Τ	Continuous (direct) on-state current	-	4000	А	

SURGE RATINGS

Symbol	Parameter	Test Conditions	Max.	Units
I _{TSM}	Surge (non-repetitive) on-state current	10ms half sine, $T_{case} = 125$ °C	45.0	kA
l ² t	I ² t for fusing	$V_R = 0$	10.10	MA ² s

THERMAL AND MECHANICAL RATINGS

Symbol	Parameter Test Conditions		Min.	Max.	Units	
R _{th(j-c)}	Thermal resistance – junction to case	Double side cooled	DC	-	0.0125	°C/W
R _{th(c-h)}	Thermal resistance – case to heatsink	Double side cooled	DC		0.004	°C/W
T_{vj}	Virtual junction temperature	Blocking V _{DRM} / _{VRRM}			125	°C
T _{stg}	Storage temperature range			-40	140	°C
F _m	Clamping force			40	50	kN



DYNAMIC CHARACTERISTICS

Symbol	Parameter	Test Conditions		Min.	Max.	Units
I _{RRM} /I _{DRM}	Peak reverse and off-state current	At V _{RRM} /V _{DRM} , T _{case} = 125°C		-	250	mA
dV/dt	Max. linear rate of rise of off-state voltage	To 67% V_{DRM} , $T_j = 125$ °C, ga	To 67% V _{DRM} , T _j = 125°C, gate open		-	V/µs
dl/dt	Rate of rise of on-state current	From 67% V _{DRM} to 4000A	Repetitive 50Hz	-	200	A/µs
		Gate source 30V, 10Ω,	Non-repetitive	-	1000	A/µs
		$t_r < 0.5 \mu s, T_j = 125 ^{\circ} C$				
V_{T}	On-state voltage	I _T = 3000A, T _{case} = 125°C			1.27	V
V _{T(TO)}	Threshold voltage	T _{case} = 125°C		-	0.91	٧
r _T	On-state slope resistance	T _{case} = 125°C		-	0.12	mΩ
t _{gd}	Delay time	$V_D = 67\% V_{DRM}$, gate source 30V, 10Ω		-	3.0	μs
	,	$t_r = 0.5 \mu s, T_j = 25^{\circ}C$				
tq	Turn-off time	$T_j = 125$ °C, $V_R = 100$ V, $dI/dt = 10$ A/ μ s,		-	300	μs
		dV _{DR} /dt = 20V/μs linear to 67% V _{DRM}				
Qs	Stored charge	$I_T = 4000A$, tp = 1000us, $T_j = 125$ °C, dl/dt =10A/ μ s,		-	3000	μC
I _{RR}	Reverse recovery current			-	165	Α
lι	Latching current	T _j = 25°C,		-	1	Α
I _H	Holding current	$T_j = 25$ °C,		-	200	mA

GATE TRIGGER CHARACTERISTICS AND RATINGS

Symbol	Parameter	Test Conditions	Max.	Units
V_{GT}	Gate trigger voltage	V _{DRM} = 5V, T _{case} = 25°C	3	V
V_{GD}	Gate non-trigger voltage	At 40% V _{DRM} , T _{case} = 125°C	TBD	V
I _{GT}	Gate trigger current	V _{DRM} = 5V, T _{case} = 25°C	300	mA
I _{GD}	Gate non-trigger current	At 40% V _{DRM} , T _{case} = 125°C	TBD	mA



CURVES

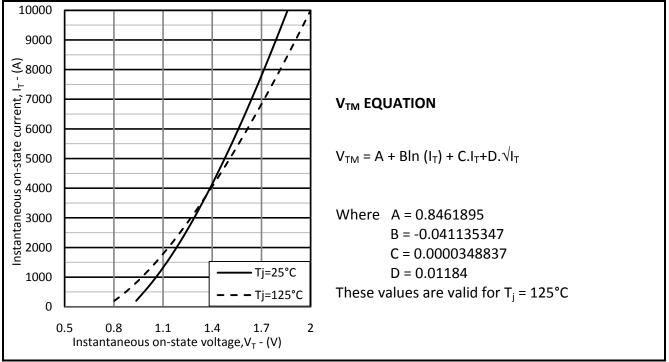


Fig.2 Maximum &minimum on-state characteristics

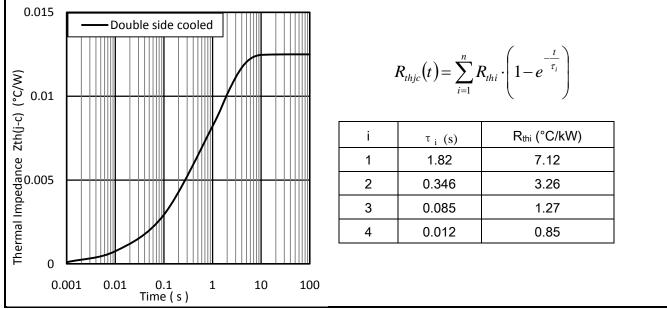
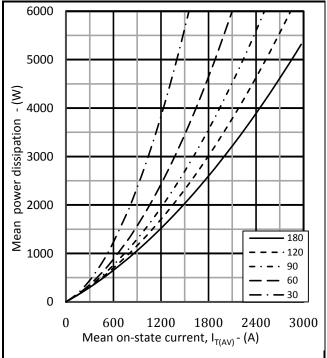


Fig.3 Maximum (limit) transient thermal impedance – junction to case (°C/W)





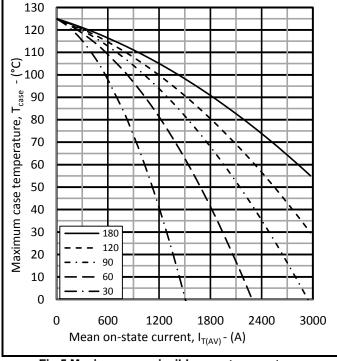
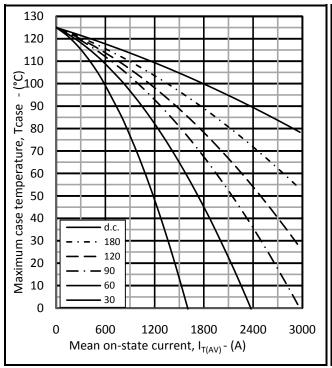
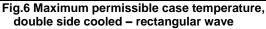


Fig.4 On-state power dissipation – sine wave

Fig.5 Maximum permissible case temperature, double side cooled – sine wave





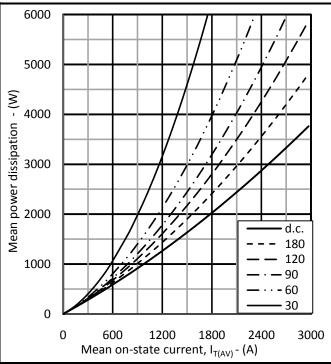
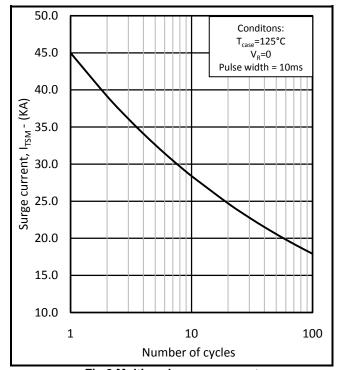
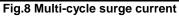


Fig.7 On-state power dissipation - rectangular wave







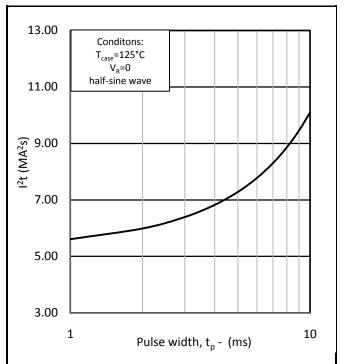


Fig.9 Single-cycle I2t

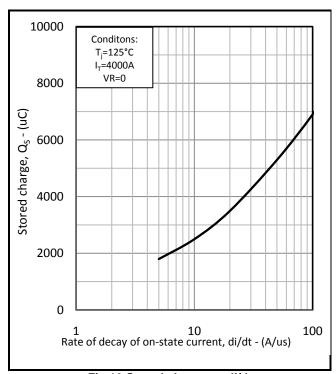


Fig.10 Stored charge vs di/dt

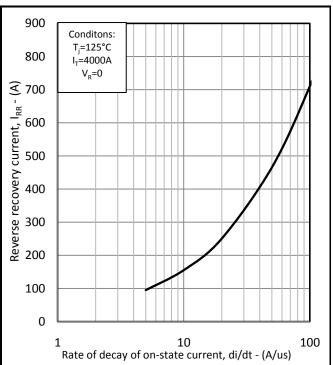


Fig.11 Reverse recovery current vs di/dt



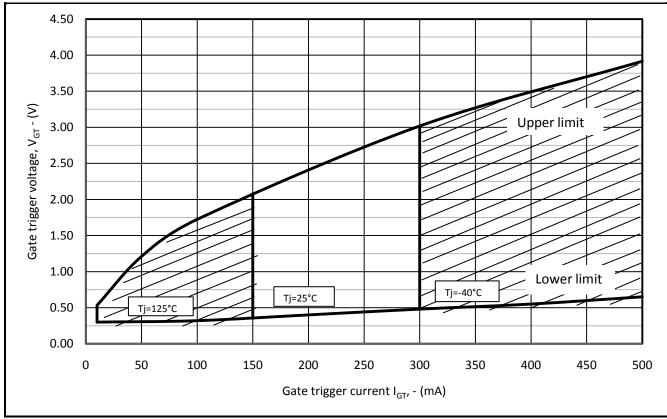


Fig.12 Gate characteristics

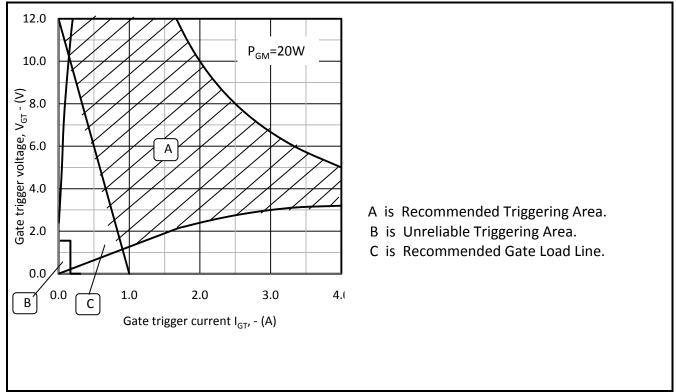


Fig.13 Gate characteristics



PACKAGE DETAILS

For further package information, please contact Customer Services. All dimensions in mm, unless stated otherwise. DO NOT SCALE.

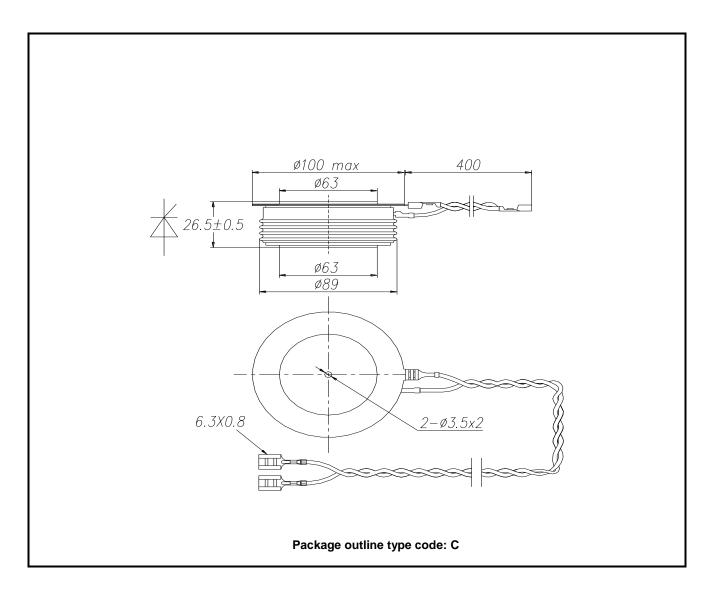


Fig.14 Package outline



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