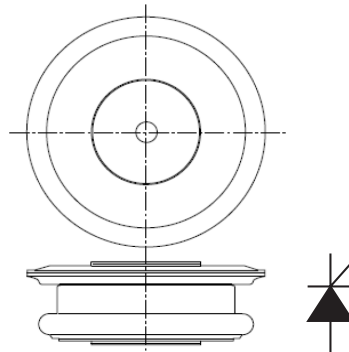


Phase Control Thyristor

multicomp^{PRO}

RoHS
Compliant



Outline type code: T

Features

- Double Side Cooling
- High Surge Capability

Applications

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

Key Parameters

Part Number	Repetitive Peak Voltages V_{DRM} and V_{RRM} V	$I_{T(AV)}$	I_{TSM}	dV/dt^*	dI/dt	Conditions
MPPCT470T140	1400	470 A	6300 A	1000 V/ μ s	250 A/ μ s	$T_{vj} = -40^{\circ}\text{C}$ to 125°C , $I_{DRM} = I_{RRM} = 30\text{mA}$, $V_{DRM}, V_{RRM} t_p = 10\text{ms}$, $V_{DSM} \& V_{RSM} =$ $V_{DRM} \& V_{RRM} + 100\text{V}$ respectively

* Higher dV/dt selections available

Current Ratings

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

Symbol	Parameter	Test Conditions	Max.	Units
$I_{T(AV)}$	Mean on-state current	Half wave resistive load	470	A
$I_{T(RMS)}$	RMS value	-	740	
I_T	Continuous (direct) on-state current	-	660	

Surge Ratings

Symbol	Parameter	Test Conditions	Max.	Units
I_{TSM}	Surge (non-repetitive) on-state current	10ms half sine, $T_{case} = 125^{\circ}\text{C}$	6.3	kA
I^2t	I^2t for fusing	$V_R = 0$	0.198	MA^2s

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Thermal and Mechanical Ratings

Symbol	Parameter	Test Conditions	Min.	Max.	Units
$R_{th(j-c)}$	Thermal resistance – junction to case	Double side cooled DC	-	0.08	°C/W
$R_{th(c-h)}$	Thermal resistance – case to heatsink			0.02	
T_{vj}	Virtual junction temperature	Blocking V_{DRM} / V_{RRM}		125	°C
T_{stg}	Storage temperature range		-40	140	
F_m	Clamping force		4	6	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} , $T_{case} = 125^\circ\text{C}$	-	30	mA
dV/dt	Max. linear rate of rise of off-state voltage	To 67% V_{DRM} , $T_j = 125^\circ\text{C}$, gate open	1000	-	V/ μs
dI/dt	Rate of rise of on-state current	From 67% V_{DRM} to 1000A Gate source 30V, 10 Ω , $t_r < 0.5\mu\text{s}$, $T_j = 125^\circ\text{C}$	Repetitive 50Hz	200	A/ μs
			Non-repetitive	1000	
V_T	On-state voltage	$I_T = 600\text{A}$, $T_{case} = 125^\circ\text{C}$		1.4	V
$V_{T(TO)}$	Threshold voltage	$T_{case} = 125^\circ\text{C}$		0.96	
r_T	On-state slope resistance – Low level	$T_{case} = 125^\circ\text{C}$		0.68	m Ω
t_{gd}	Delay time	$V_D = 67\% V_{DRM}$, gate source 30V, 10 Ω $t_r = 0.5\mu\text{s}$, $T_j = 25^\circ\text{C}$		3	μs
t_q	Turn-off time	$T_j = 125^\circ\text{C}$, $V_R = 100\text{V}$, $dI/dt = 10\text{A}/\mu\text{s}$, $dV_{DR}/dt = 20\text{V}/\mu\text{s}$ linear to 67% V_{DRM}		150	
Q_s	Stored charge	$I_T = 2000\text{A}$, $t_p = 1000\mu\text{s}$, $T_j = 125^\circ\text{C}$, $dI/dt = 10\text{A}/\mu\text{s}$,		1000	μC
I_{RR}	Reverse recovery current			75	A
I_L	Latching current	$T_j = 25^\circ\text{C}$,		1	
I_H	Holding current	$T_j = 25^\circ\text{C}$,		200	mA

Gate Trigger Characteristics and Ratings

Symbol	Parameter	Test Conditions	Max.	Units
V_{GT}	Gate trigger voltage	$V_{DRM} = 5\text{V}$, $T_{case} = 25^\circ\text{C}$	3	V
V_{GD}	Gate non-trigger voltage	At 40% V_{DRM} , $T_{case} = 125^\circ\text{C}$	0.3	
I_{GT}	Gate trigger current	$V_{DRM} = 5\text{V}$, $T_{case} = 25^\circ\text{C}$	300	mA
I_{GD}	Gate non-trigger current	At 40% V_{DRM} , $T_{case} = 125^\circ\text{C}$	20	

Performance Curves

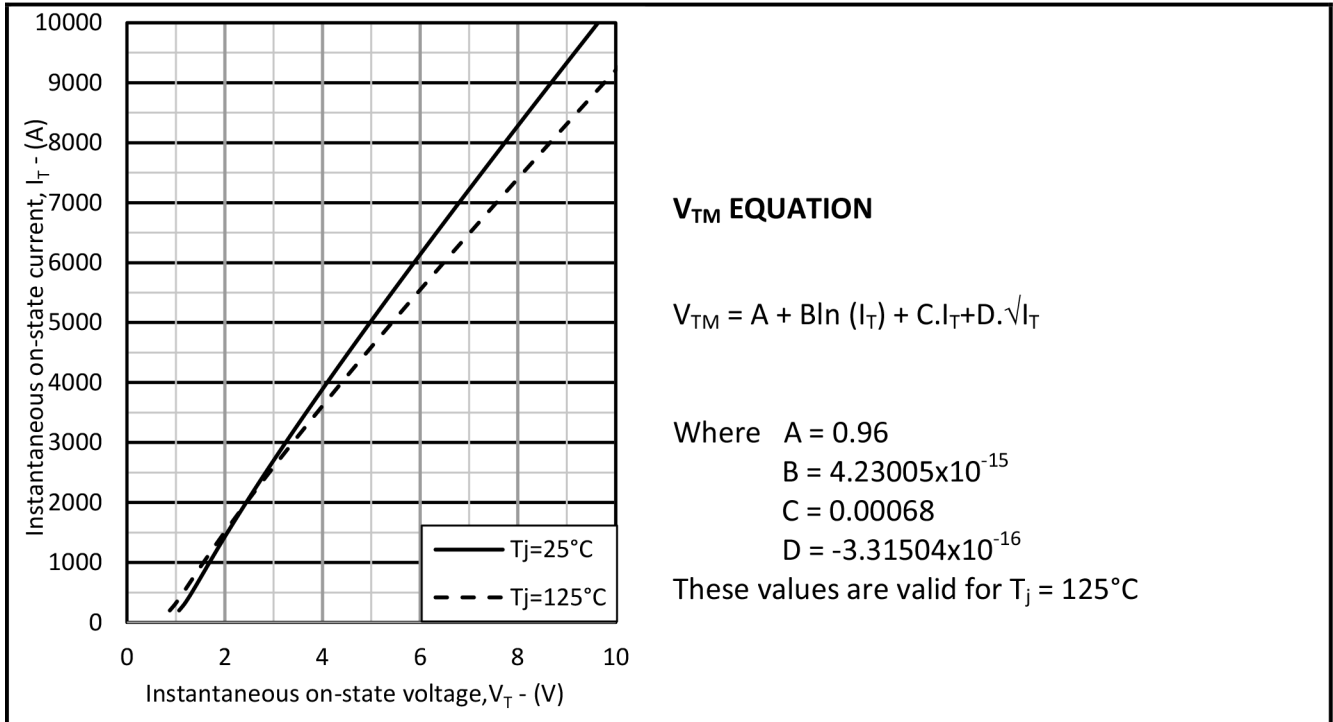


Fig.2 Maximum & minimum on-state characteristics

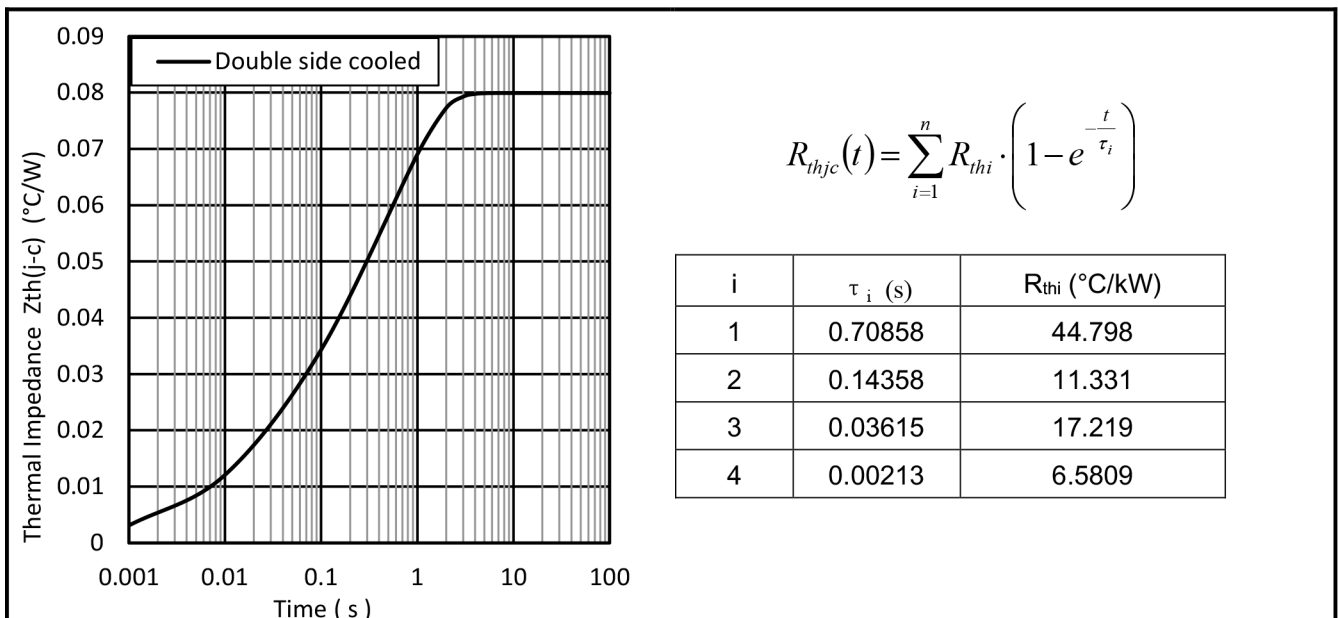


Fig.3 Maximum (limit) transient thermal impedance – junction to case (°C/W)

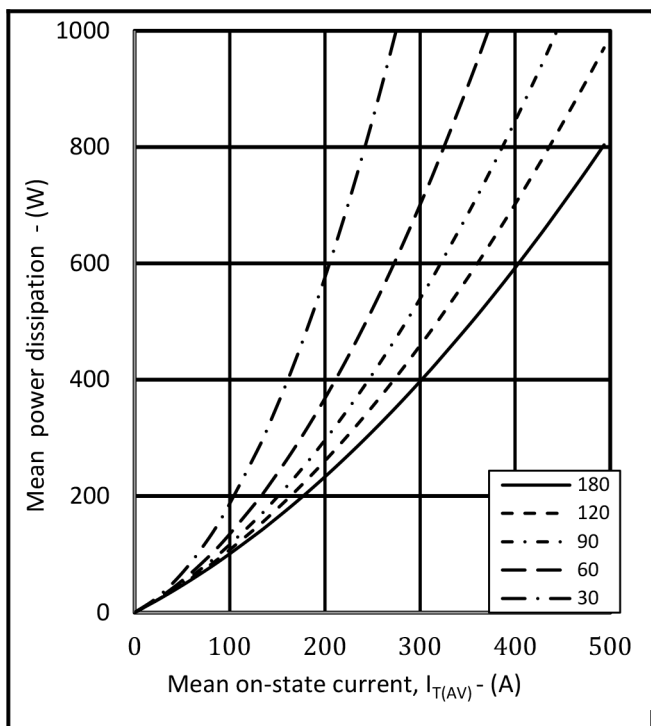


Fig.4 On-state power dissipation – sine wave

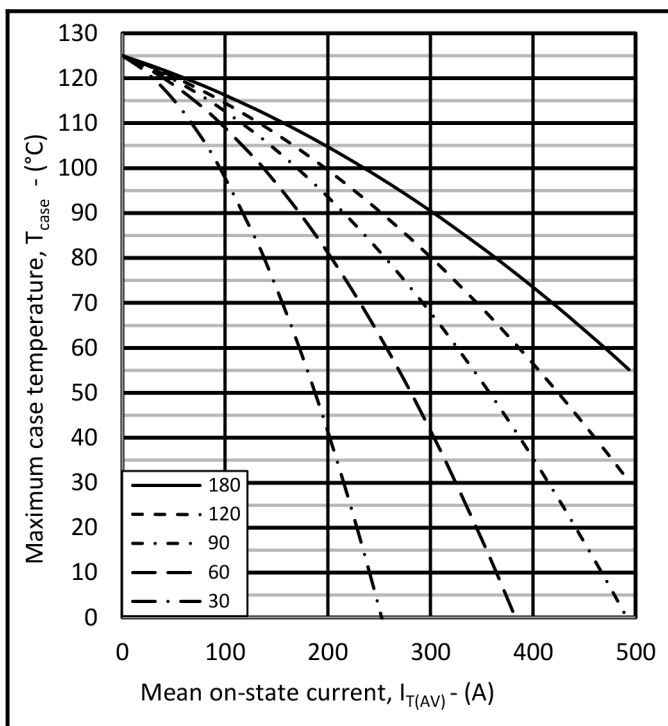


Fig.5 Maximum permissible case temperature, double side cooled – sine wave

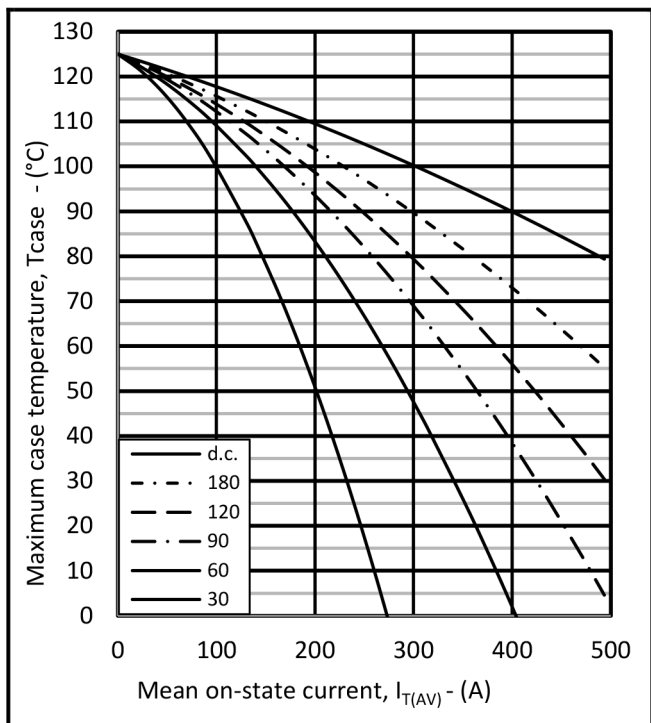


Fig.6 Maximum permissible case temperature, double side cooled – rectangular wave

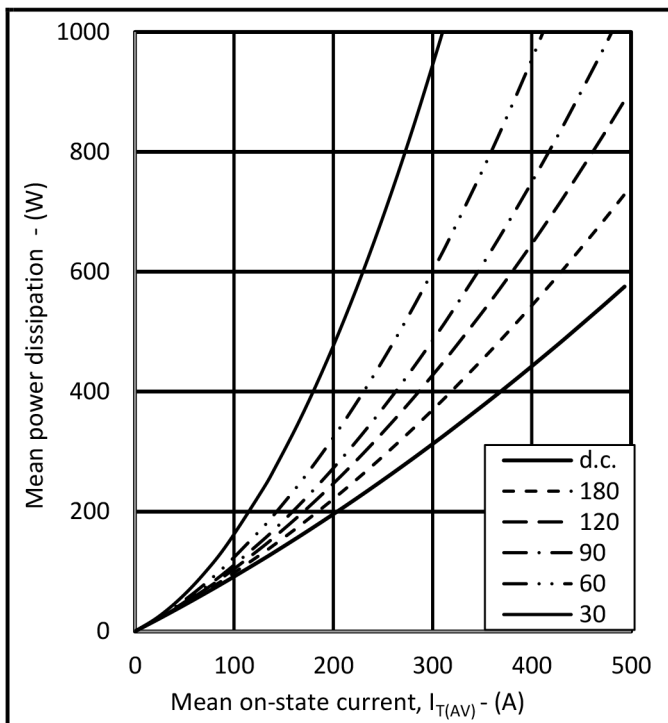


Fig.7 On-state power dissipation – rectangular wave

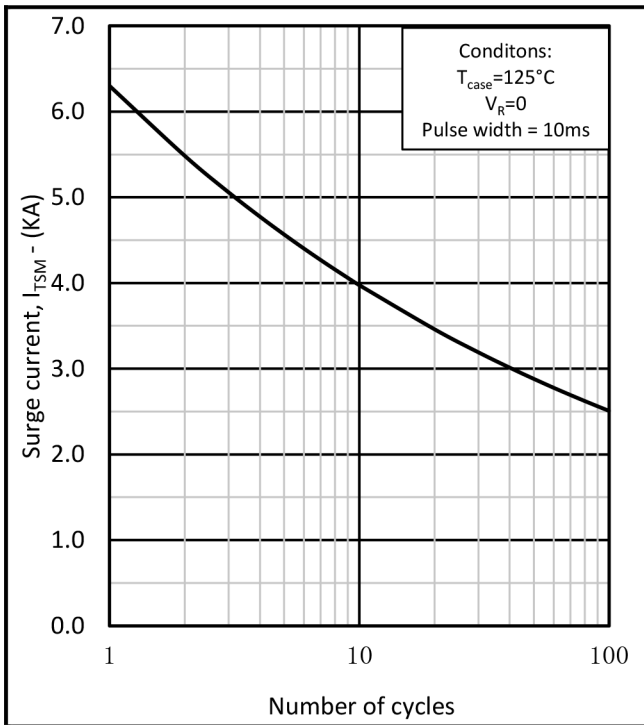


Fig.8 Multi-cycle surge current

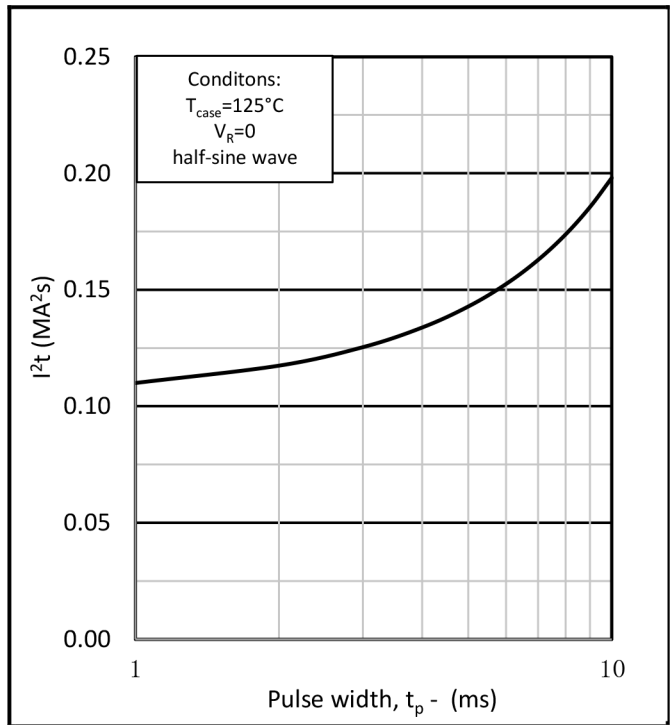


Fig.9 Single-cycle I^2t

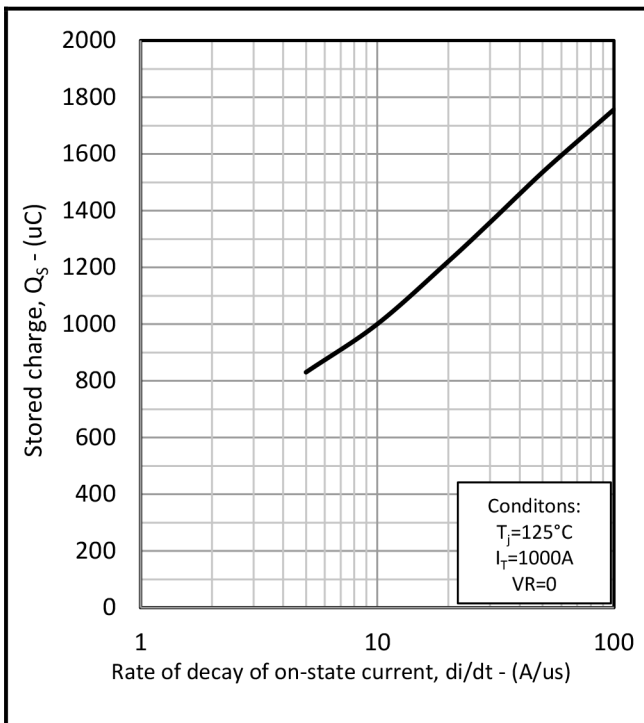


Fig.10 Stored charge vs di/dt

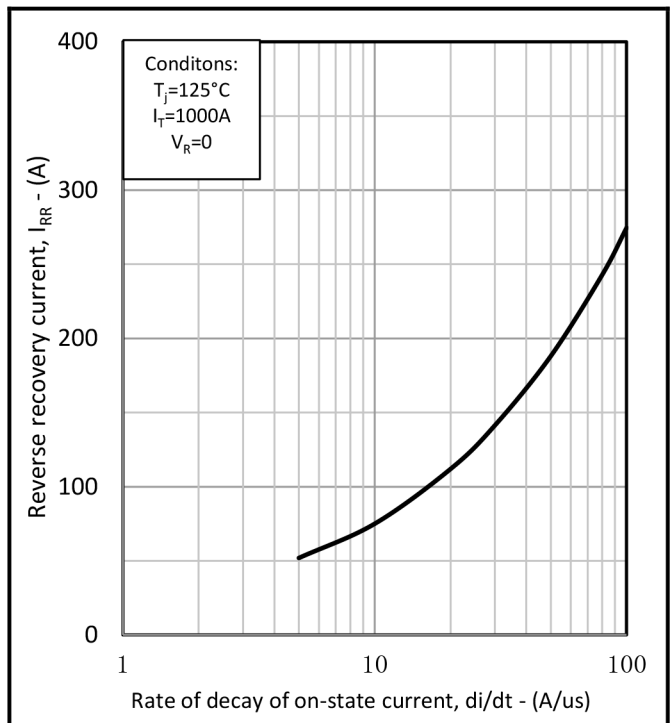


Fig.11 Reverse recovery current vs di/dt

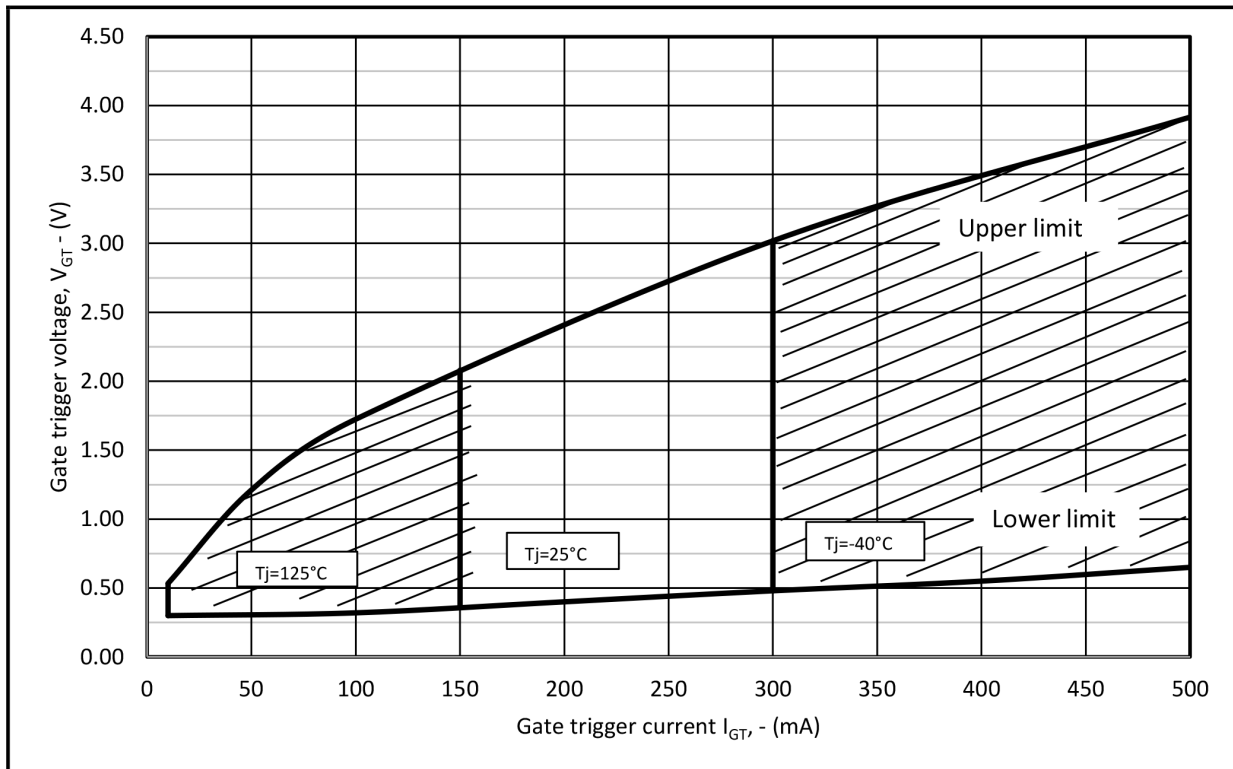
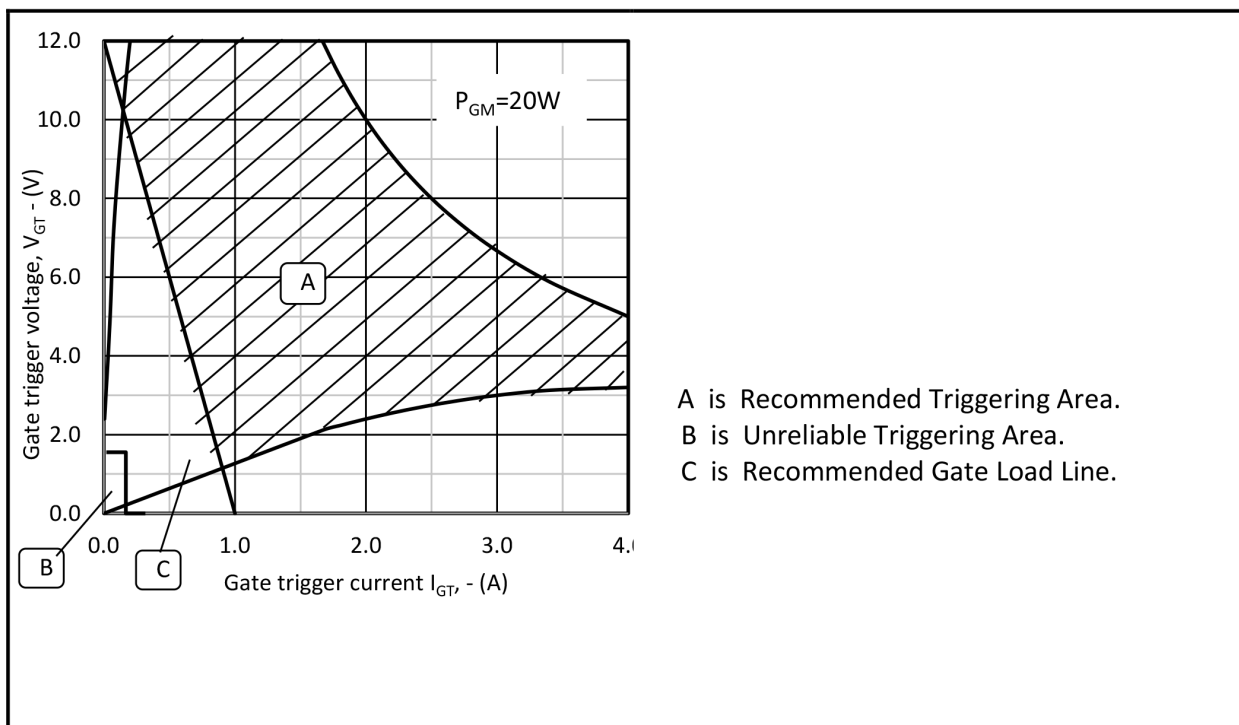


Fig.12 Gate characteristics

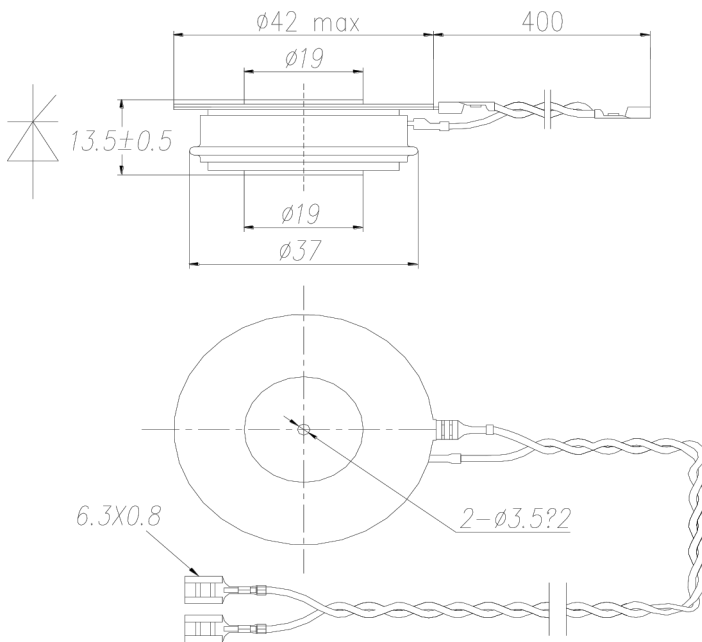


A is Recommended Triggering Area.
 B is Unreliable Triggering Area.
 C is Recommended Gate Load Line.

Fig.13 Gate characteristics

Phase Control Thyristor

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Package outline type code: T

Part Number Table

Description	Part Number
Phase Control Thyristor Module, 1400V, 470A, T Case Code	MPPCT470T140

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