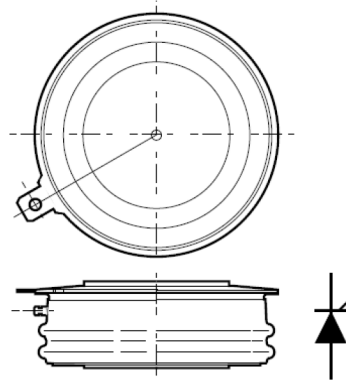


Phase Control Thyristor

multicomp PRO

**RoHS
Compliant**



Outline type code: E

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
MPPCT780E140	1400	780 A	9100 A	1000 V/ μ s	200 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	780	A
$I_{T(RMS)}$	RMS value	-	1220	
I_T	Continuous (direct) on-state current	-	1100	

Surge Ratings

Symbol	Parameter	Test Conditions	Max.	Units
I_{TSM}	Surge (non-repetitive) on-state current	10ms half sine, $T_{case} = 125^{\circ}\text{C}$ $V_R = 0$	9.1	kA
I^2t	I^2t for fusing		0.414	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	-	0.041	°C/W
R _{th(c-h)}	Thermal resistance – case to heatsink			0.01	
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°C	-	30	mA
dV/dt	Max. linear rate of rise of off-state voltage	To 67% V _{DRM} , T _j = 125°C, gate open	1000	-	V/μs
dI/dt	Rate of rise of on-state current	From 67% V _{DRM} to 1000A Gate source 30V, 10Ω, t _r < 0.5μs, T _j = 125°C	Repetitive 50Hz	200	A/μs
			Non-repetitive	1000	
V _T	On-state voltage	I _T = 1500A, T _{case} = 125°C		1.75	V
V _{T(TO)}	Threshold voltage	T _{case} = 125°C		0.95	
r _T	On-state slope resistance	T _{case} = 125°C		0.53	mΩ
t _{gd}	Delay time	V _D = 67% V _{DRM} , gate source 30V, 10Ω t _r = 0.5μs, T _j = 25°C		3	μs
t _q	Turn-off time	T _j = 125°C, V _R = 100V, dI/dt = 10A/μs, dV _{DR} /dt = 20V/μs linear to 67% V _{DRM}		150	
Q _s	Stored charge	I _T = 1000A, t _p = 1000us, T _j = 125°C, dI/dt = 10A/μs,		1000	μC
I _{RR}	Reverse recovery current			95	A
I _L	Latching current	T _j = 25°C,		1	
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	0.3	
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	20	

Performance Curves

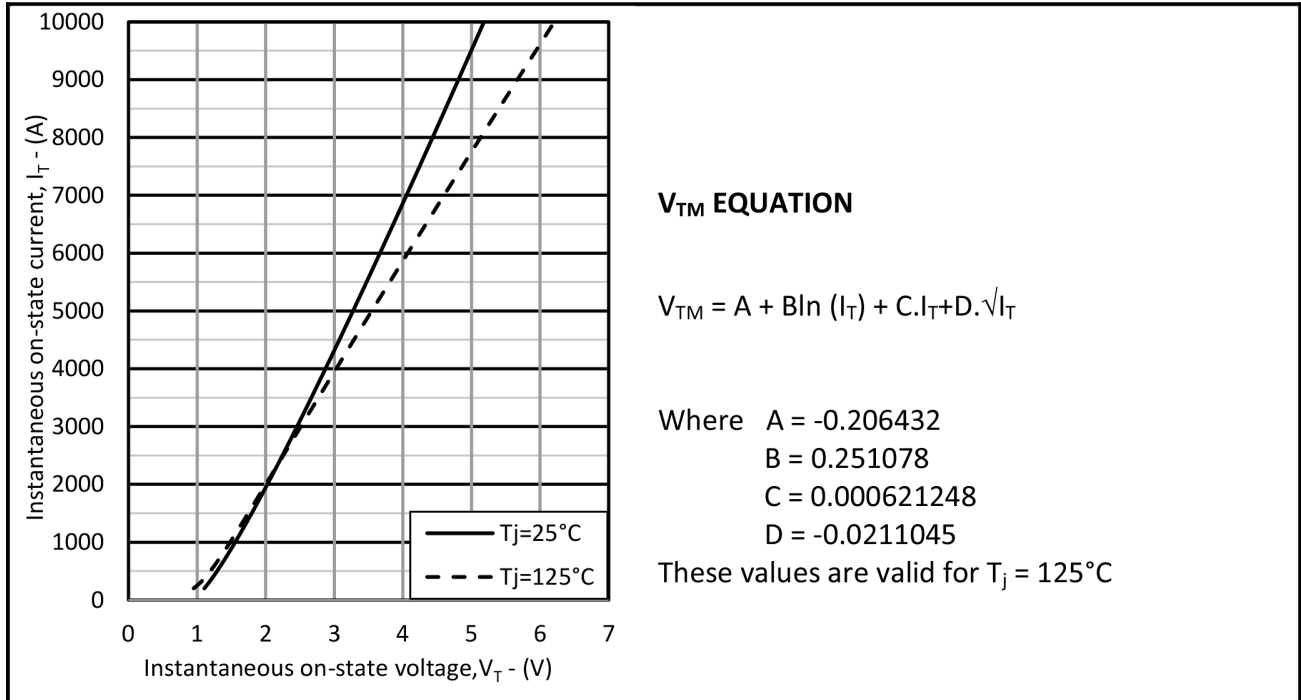


Fig.2 Maximum & minimum on-state characteristics

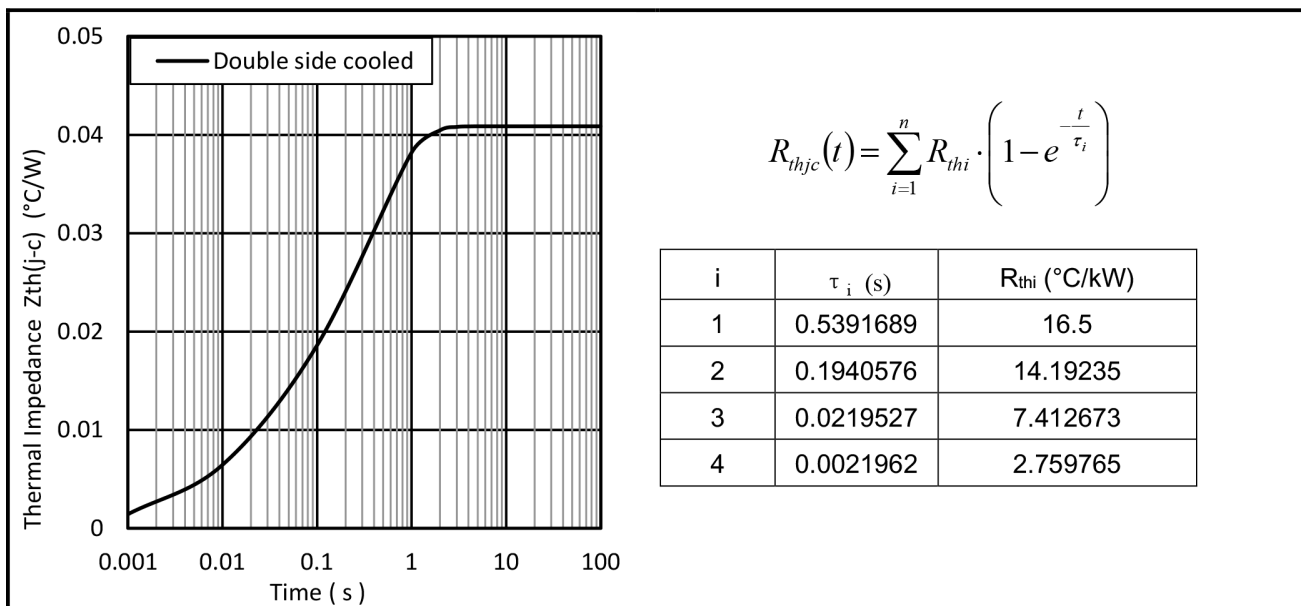


Fig.3 Maximum (limit) transient thermal impedance – junction to case (°C/W)

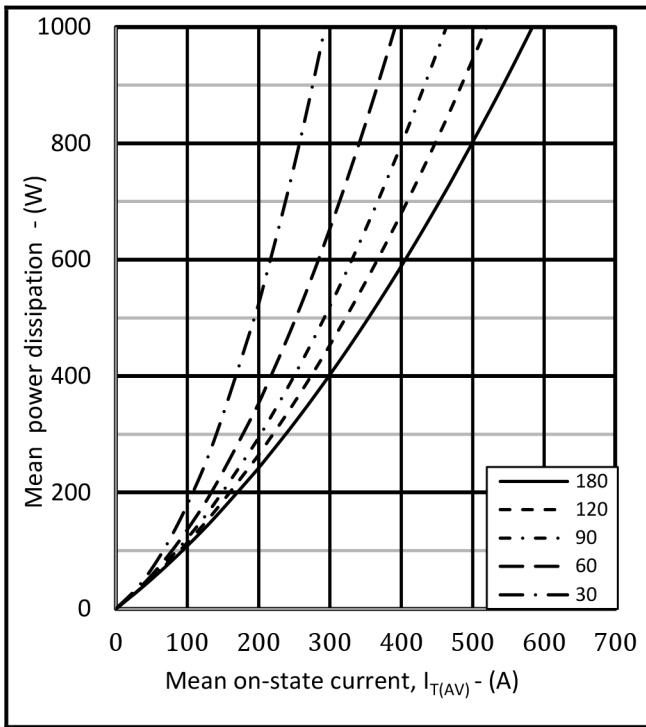


Fig.4 On-state power dissipation – sine wave

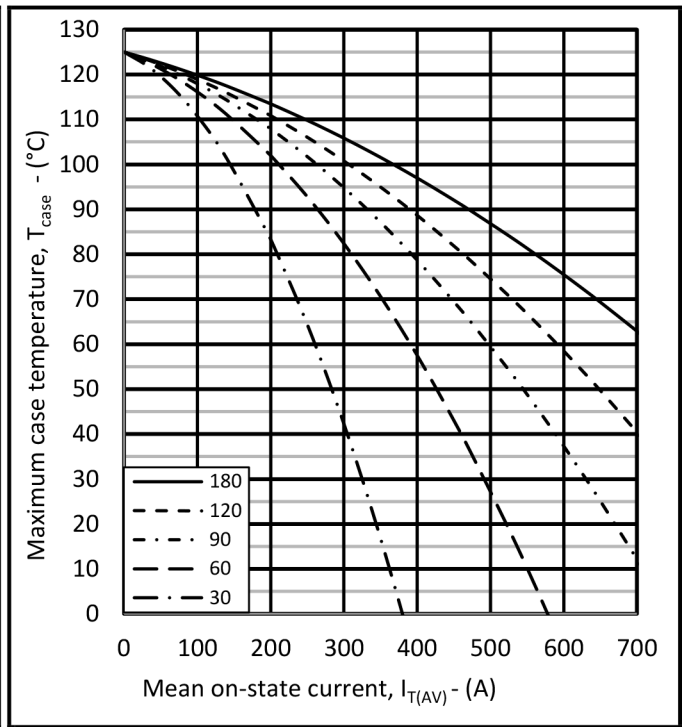


Fig.5 Maximum permissible case temperature, double side cooled – sine wave

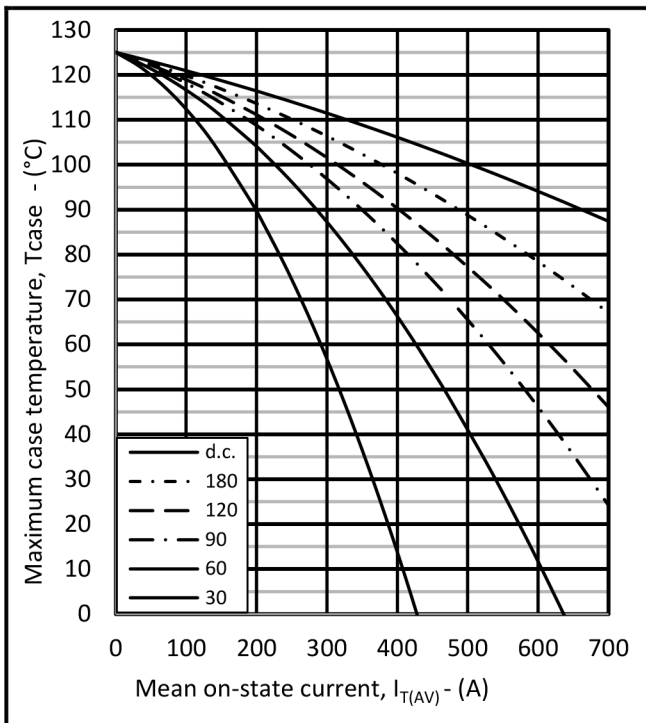


Fig.6 Maximum permissible case temperature, double side cooled – rectangular wave

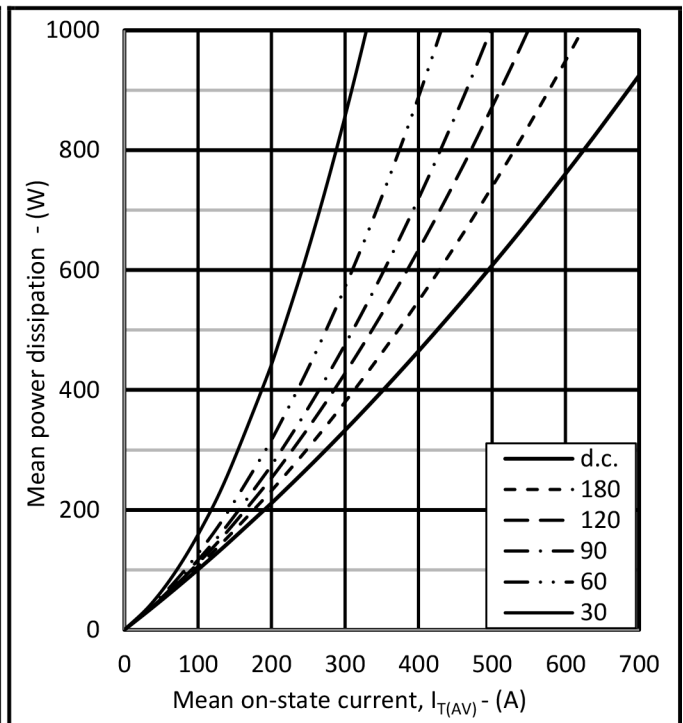


Fig.7 On-state power dissipation – rectangular wave

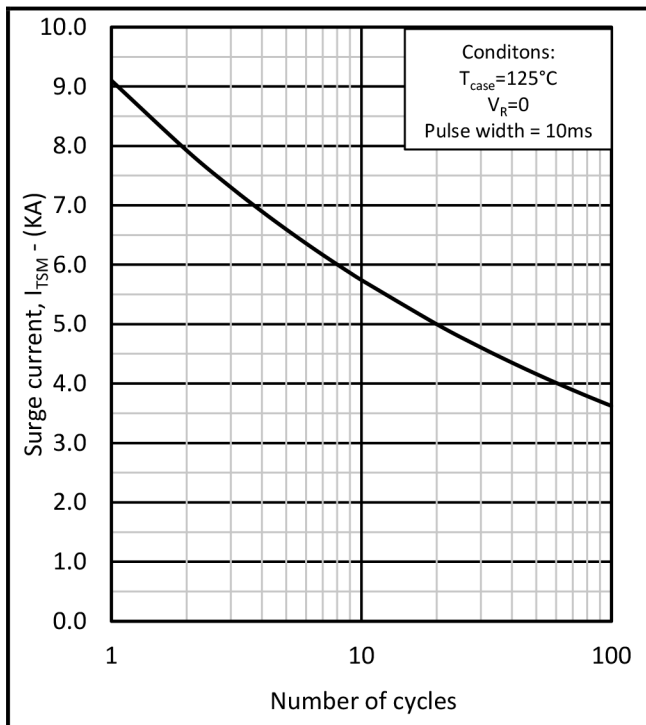


Fig.8 Multi-cycle surge current

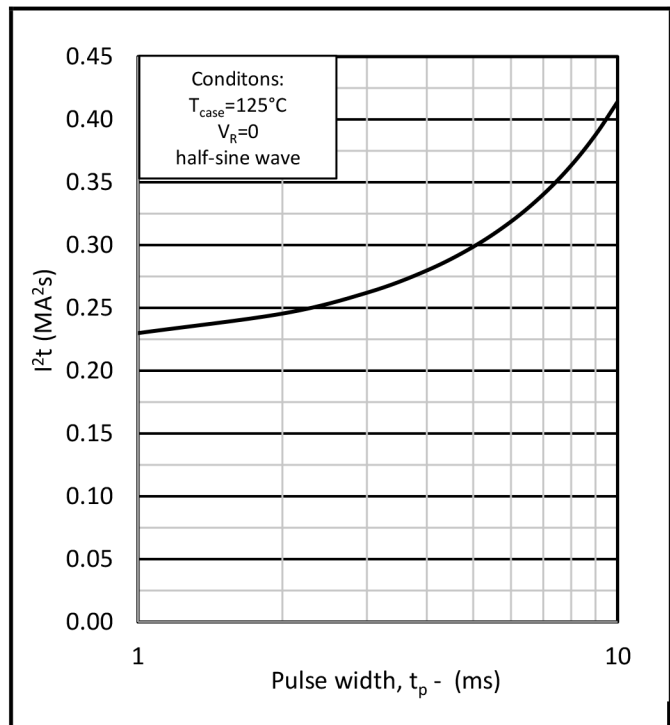


Fig.9 Single-cycle I^2t

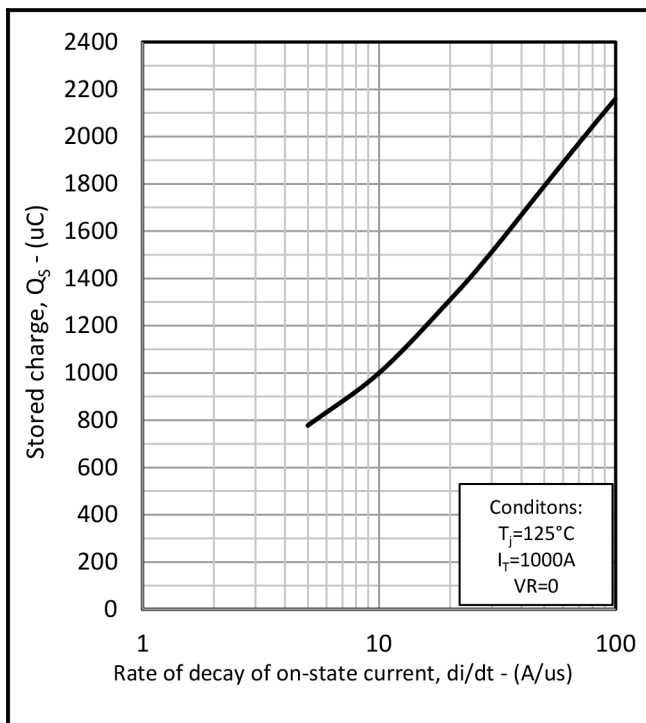


Fig.10 Stored charge vs di/dt

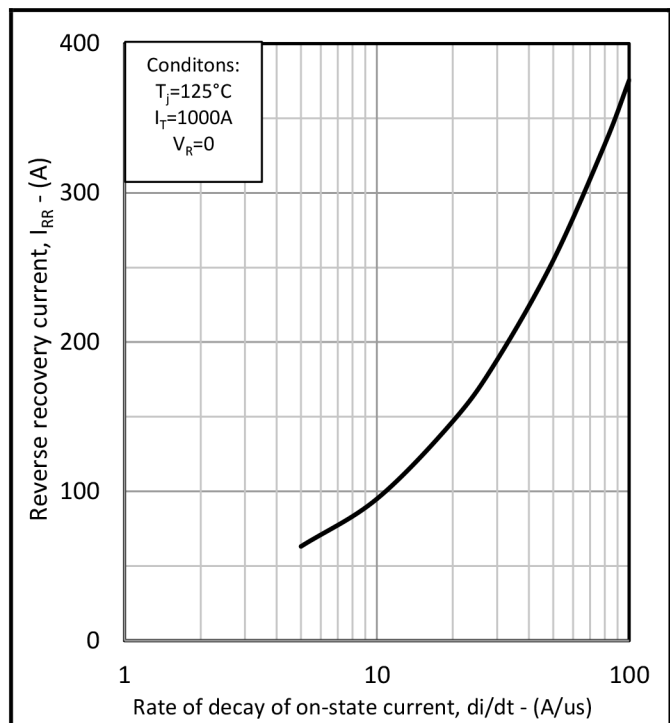


Fig.11 Reverse recovery current vs di/dt

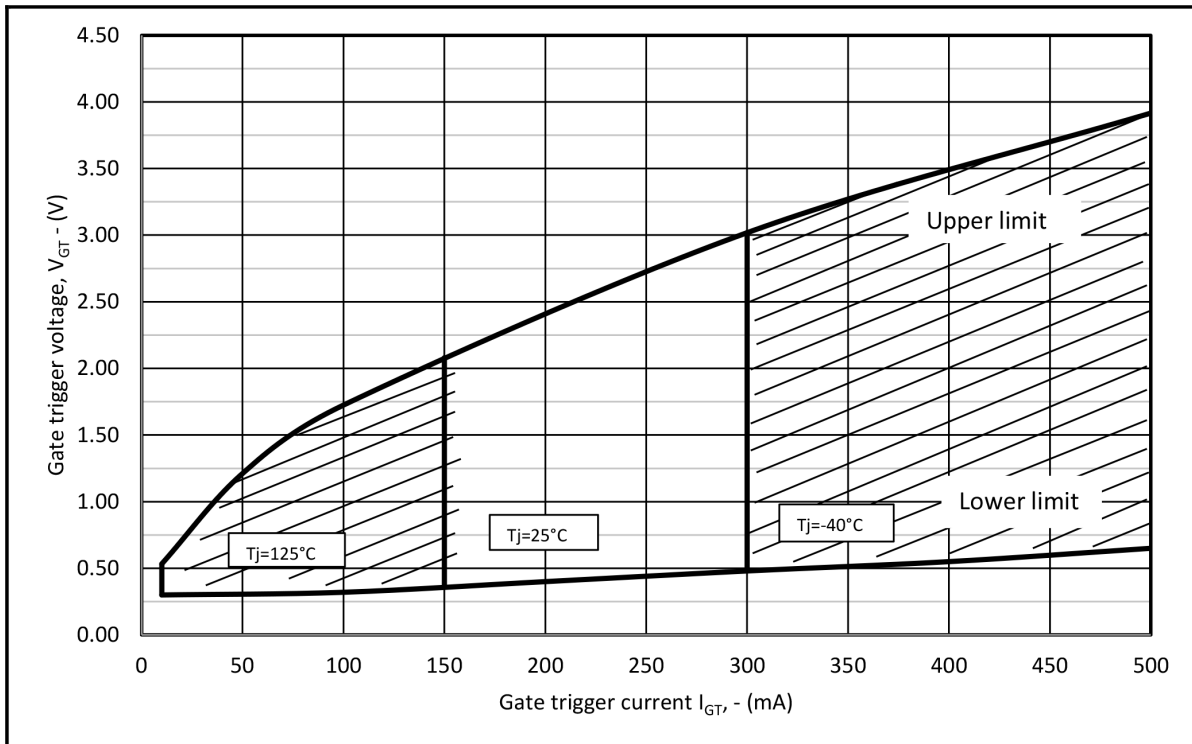
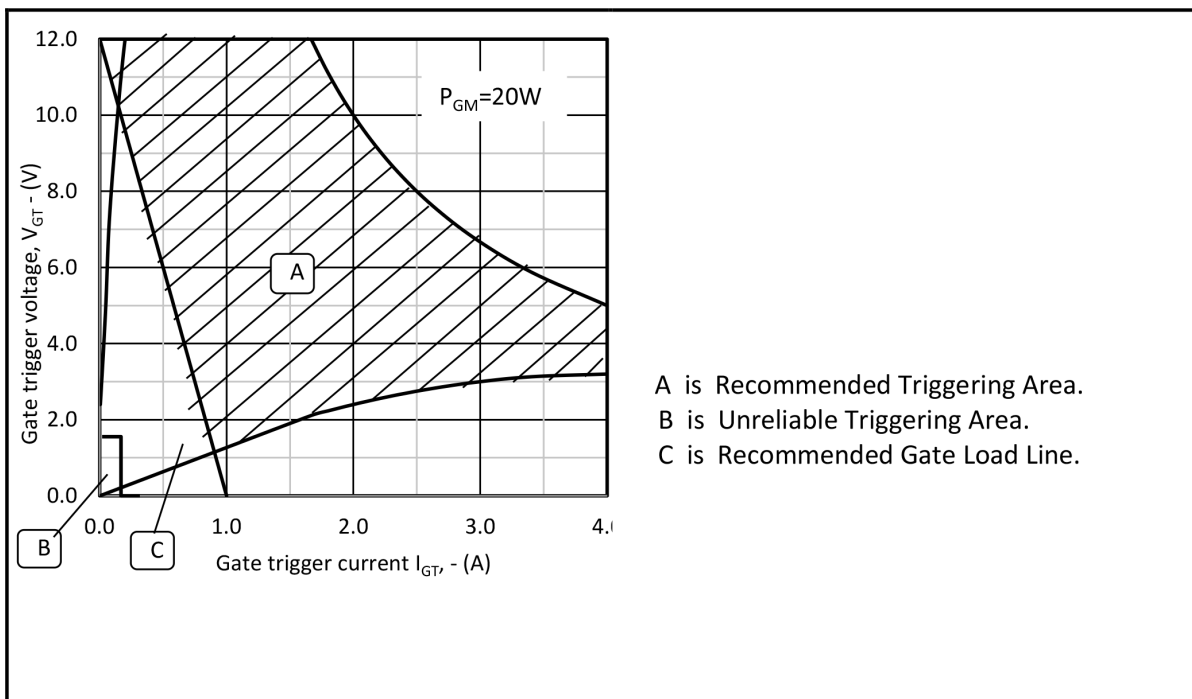


Fig.12 Gate characteristics

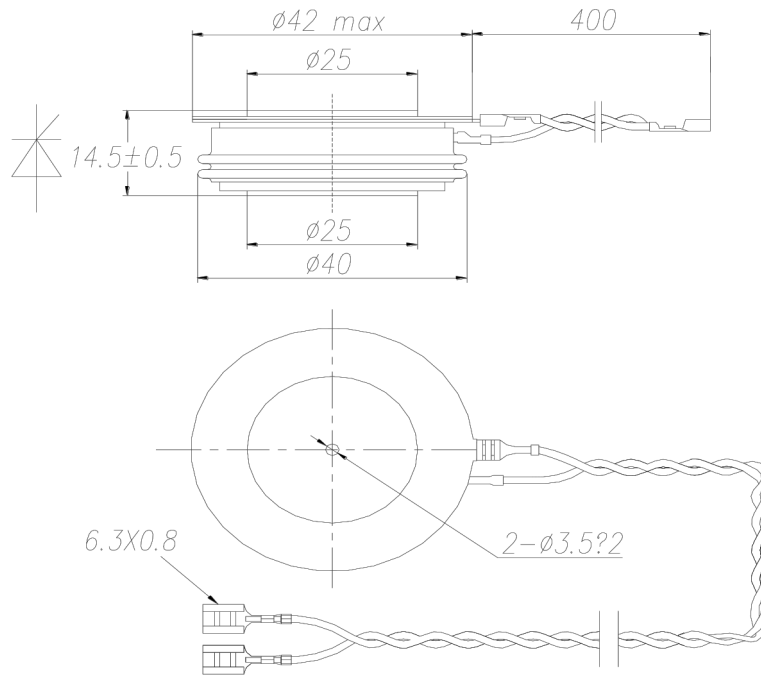


A is Recommended Triggering Area.
 B is Unreliable Triggering Area.
 C is Recommended Gate Load Line.

Fig.13 Gate characteristics

Phase Control Thyristor

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Package outline type code: E

Part Number Table

Description	Part Number
Phase Control Thyristor Module, 1400V, 780A, E Case Code	MPPCT780E140

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