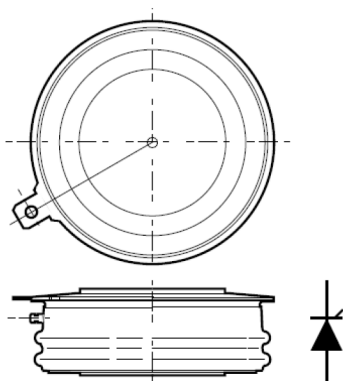


Phase Control Thyristor

multicompPRO

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
MPPCT590E220 MPPCT590E240	2200 2400	590 A	7800 A	1000 V/ μs	200 A/ μs	$T_{vj} = -40^{\circ}C$ to $125^{\circ}C$, $I_{DRM} = I_{RRM} = 30mA$, $V_{DRM}, V_{RRM} t_p = 10ms$, $V_{DSM} \& V_{RSM} =$ $V_{DRM} \& V_{RRM} +100V$ respectively

* Higher dV/dt selections available

Current Ratings

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

Symbol	Parameter	Test Conditions	Max.	Units
$I_{T(AV)}$	Mean on-state current	Half wave resistive load	590	A
$I_{T(RMS)}$	RMS value	-	930	
I_T	Continuous (direct) on-state current	-	830	

Surge Ratings

Symbol	Parameter	Test Conditions	Max.	Units
I_{TSM}	Surge (non-repetitive) on-state current	10ms half sine, $T_{case} = 125^{\circ}C$ $V_R = 0$	7.8	kA
I^2t	I^2t for fusing		0.304	MA ² s

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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
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			2.49	V
V _{T(To)}	Threshold voltage	T _{case} = 125°C			0.94	
r _T	On-state slope resistance	T _{case} = 125°C			1.036	mΩ
t _{gd}	Delay time	V _D = 67% V _{DRM} , gate source 30V, 10Ω t _r = 0.5μs, T _j = 25°C			3	μs
I _L	Latching current	T _j = 25°C,			1	A
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	$V_{DRM} = 5V$, $T_{case} = 25^{\circ}C$	3	V
V_{GD}	Gate non-trigger voltage	At 40% V_{DRM} , $T_{case} = 125^{\circ}C$	0.3	
I_{GT}	Gate trigger current	$V_{DRM} = 5V$, $T_{case} = 25^{\circ}C$	300	mA
I_{GD}	Gate non-trigger current	At 40% V_{DRM} , $T_{case} = 125^{\circ}C$	20	

Performance Curves

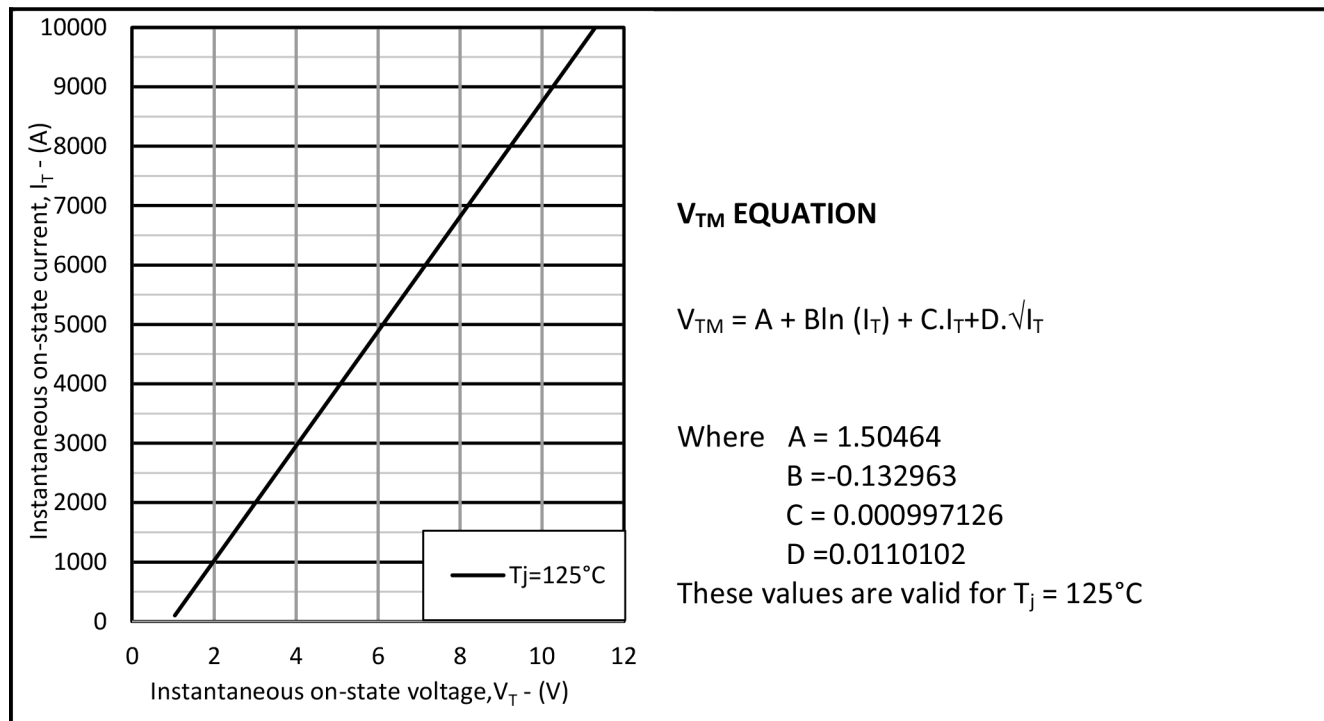


Fig.2 Maximum & minimum on-state characteristics

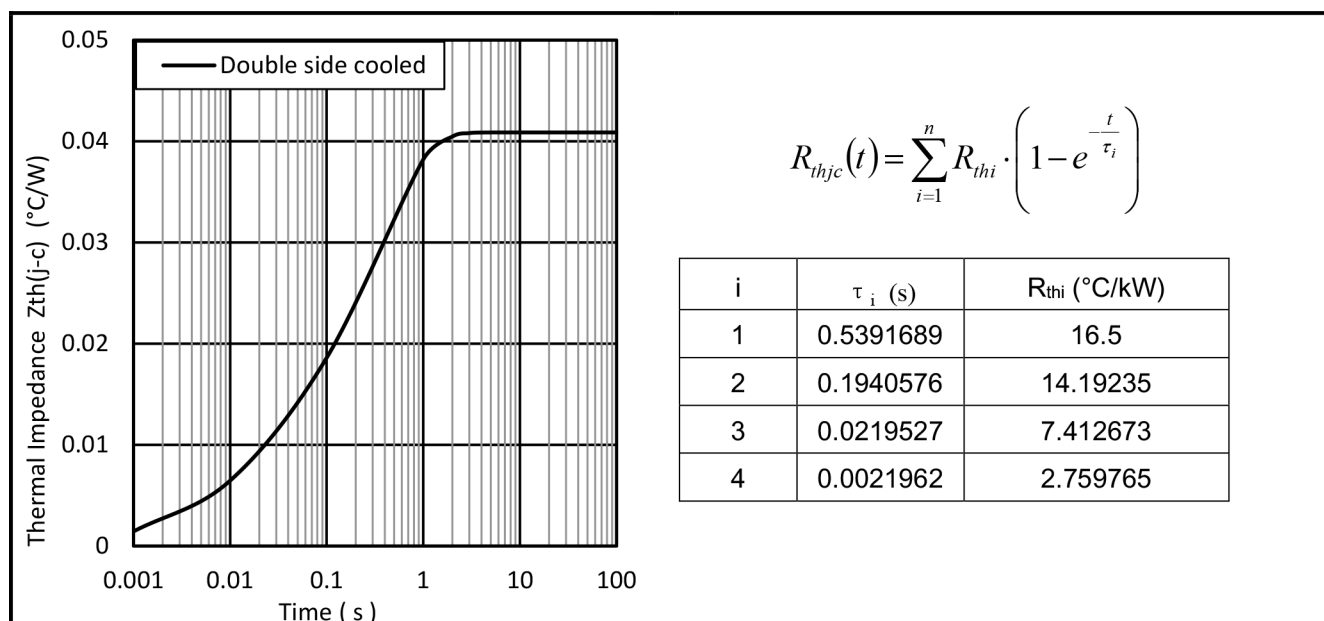


Fig.3 Maximum (limit) transient thermal impedance – junction to case (°C/W)

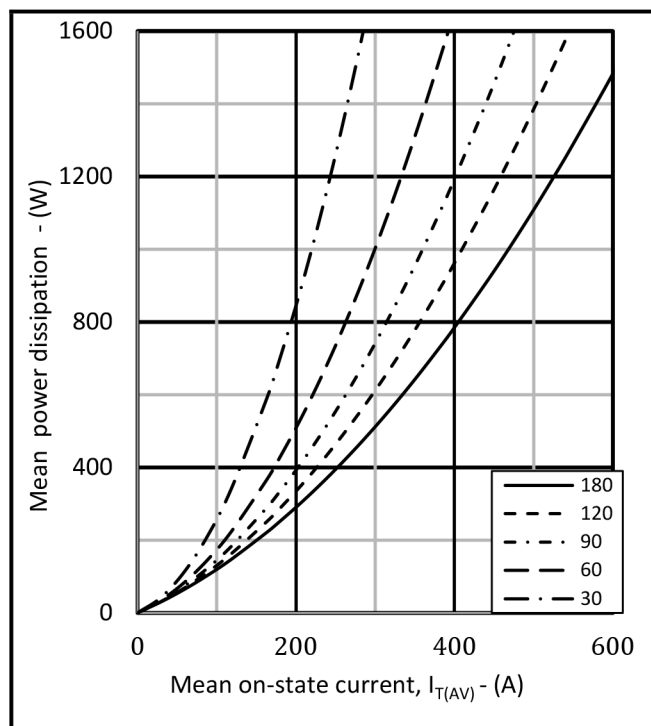


Fig.4 On-state power dissipation – sine wave

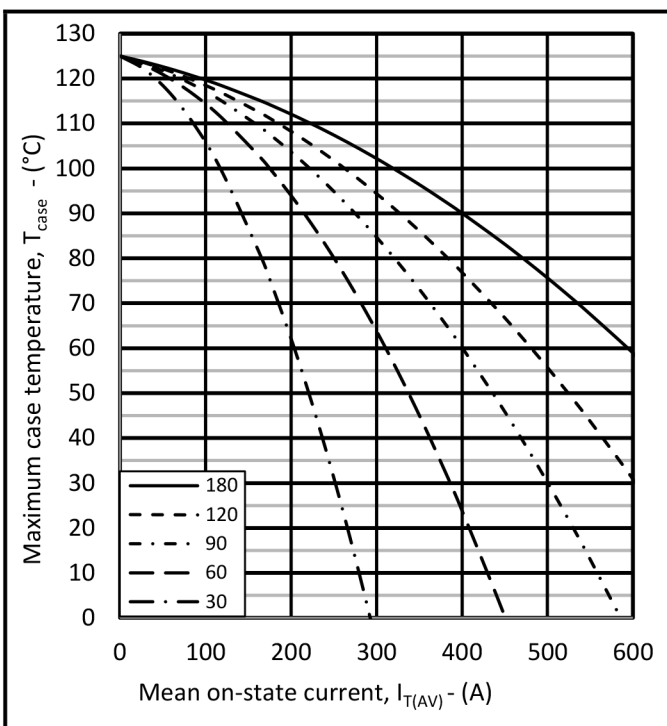


Fig.5 Maximum permissible case temperature, double side cooled – sine wave

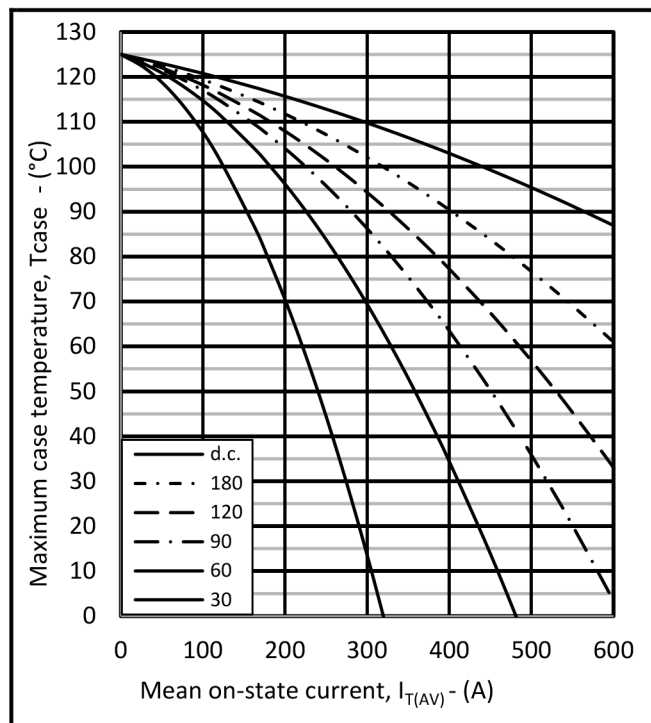


Fig.6 Maximum permissible case temperature, double side cooled – rectangular wave

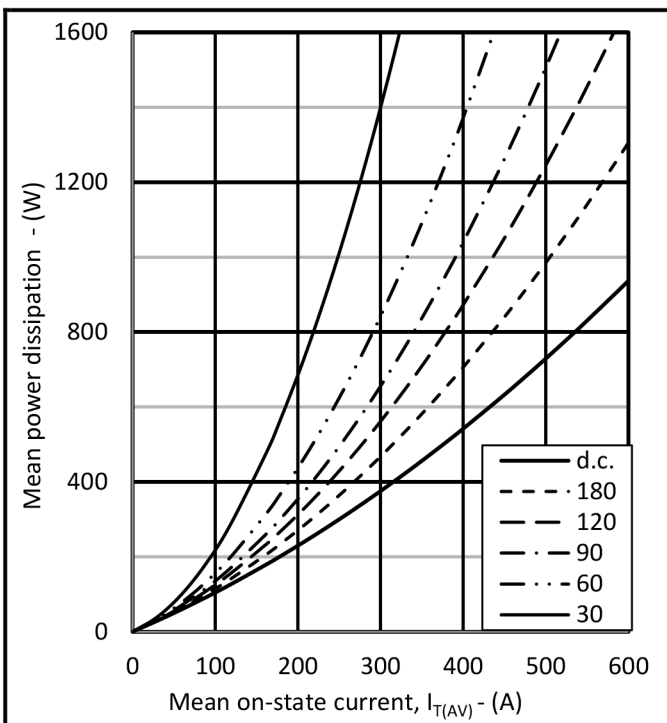


Fig.7 On-state power dissipation – rectangular wave

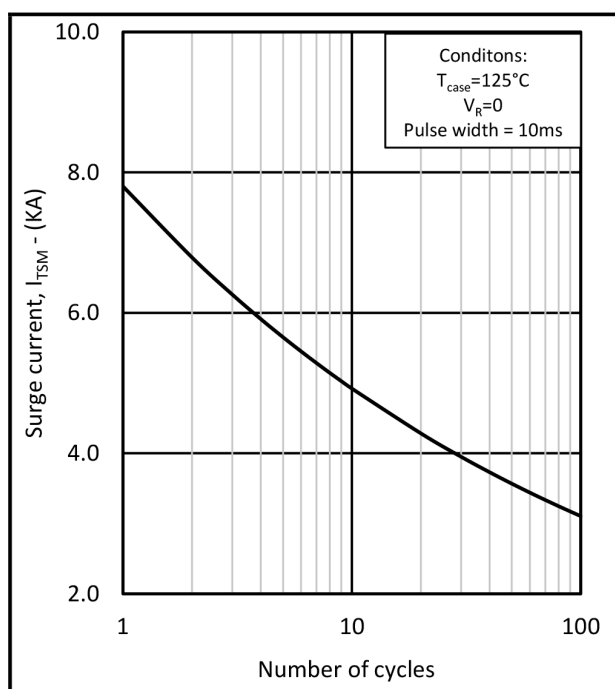


Fig.8 Multi-cycle surge current

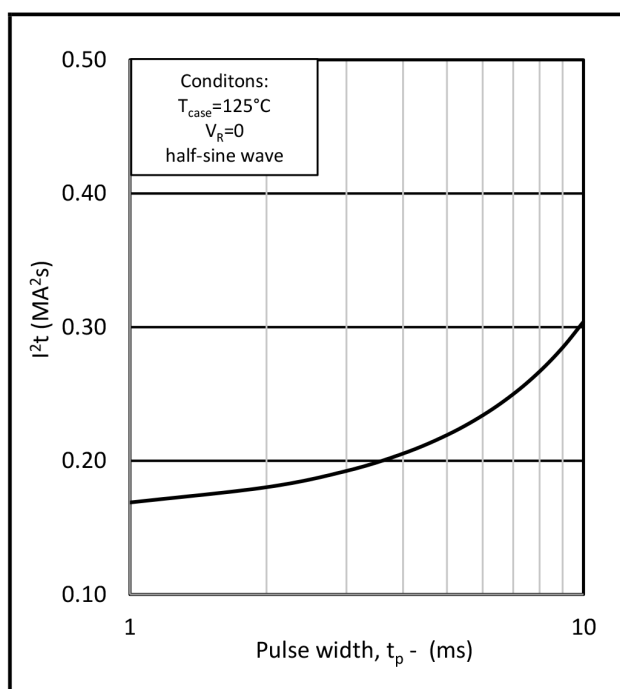


Fig.9 Single-cycle I^2t

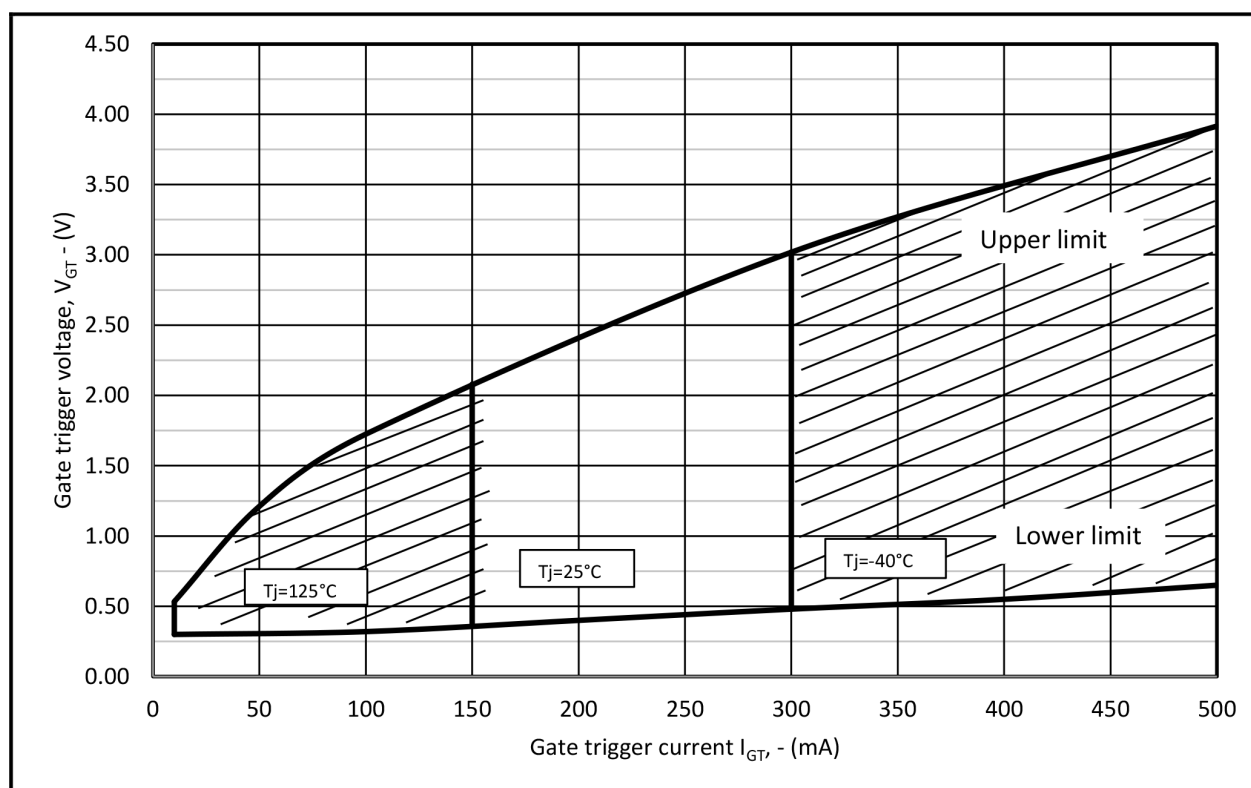


Fig.10 Gate characteristics

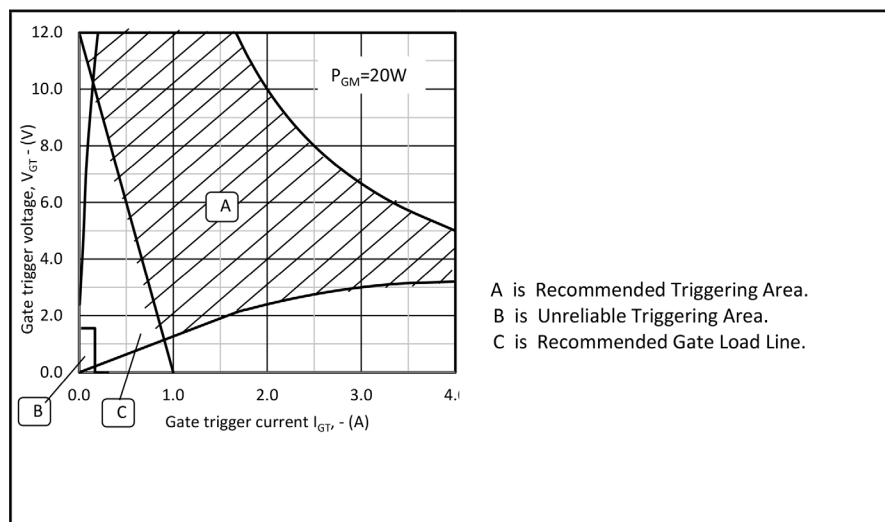
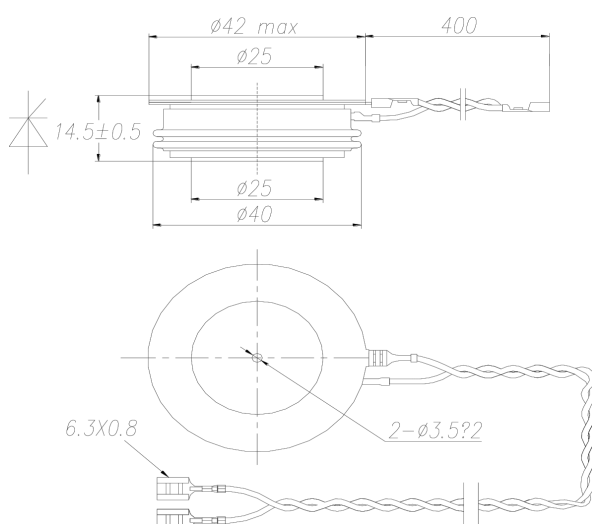


Fig.11 Gate characteristics



Part Number Table

Description	Part Number
Phase Control Thyristor Module, 2200V, 590A, E Case Code	MPPCT590E220
Phase Control Thyristor Module, 2400V, 590A, E Case Code	MPPCT590E240

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