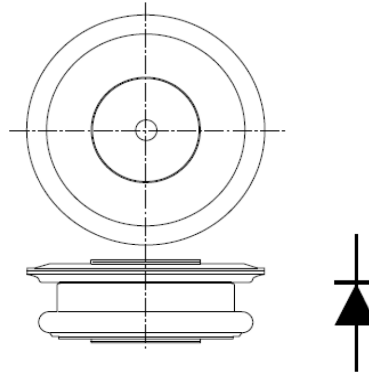


Phase Control Thyristor

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, $T_{case} = 125^{\circ}\text{C}$ $V_R = 0$ | 6.3 | kA |
| I^2t | I^2t for fusing | | 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°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 = 600A, T _{case} = 125°C | | 1.4 | V | |
| V _{T(TO)} | Threshold voltage | T _{case} = 125°C | | 0.96 | | |
| r _T | On-state slope resistance – Low level | T _{case} = 125°C | | 0.68 | 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 = 2000A, t _p = 1000us, T _j = 125°C, dI/dt = 10A/μs, | | 1000 | μC | |
| I _{RR} | Reverse recovery current | | | 75 | 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

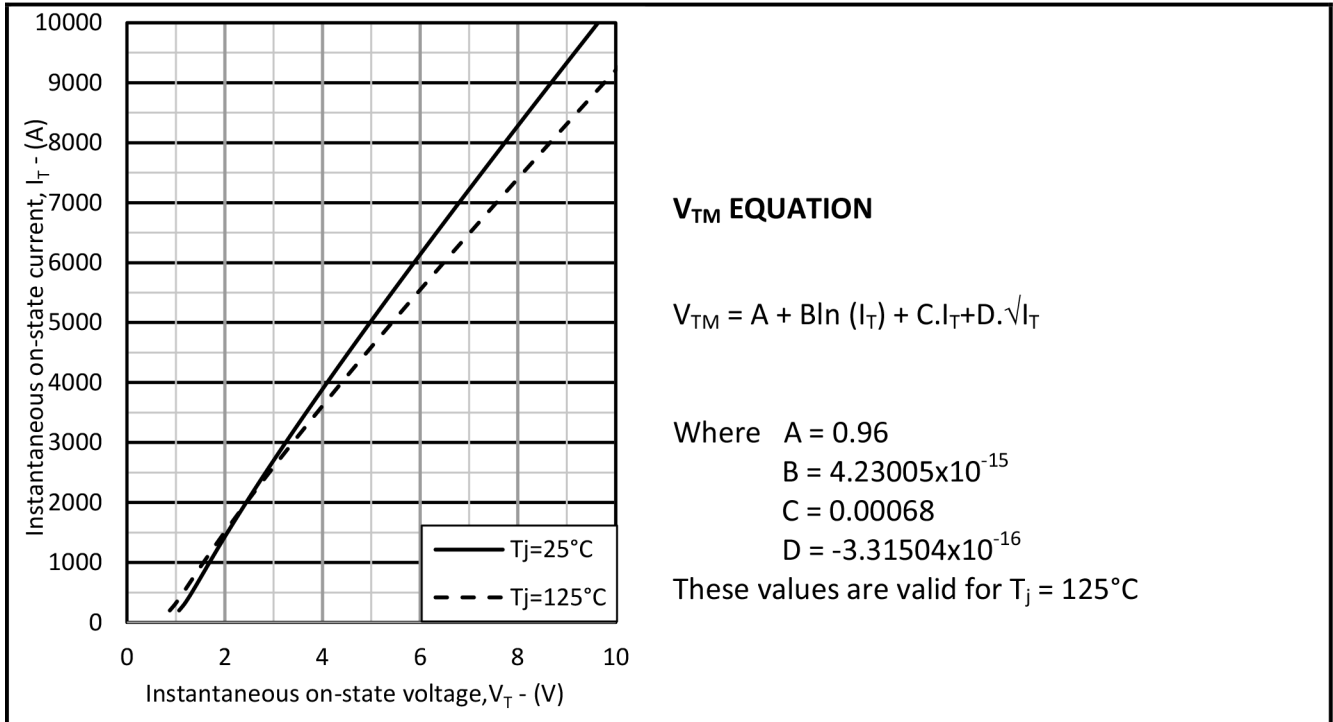


Fig.2 Maximum & minimum on-state characteristics

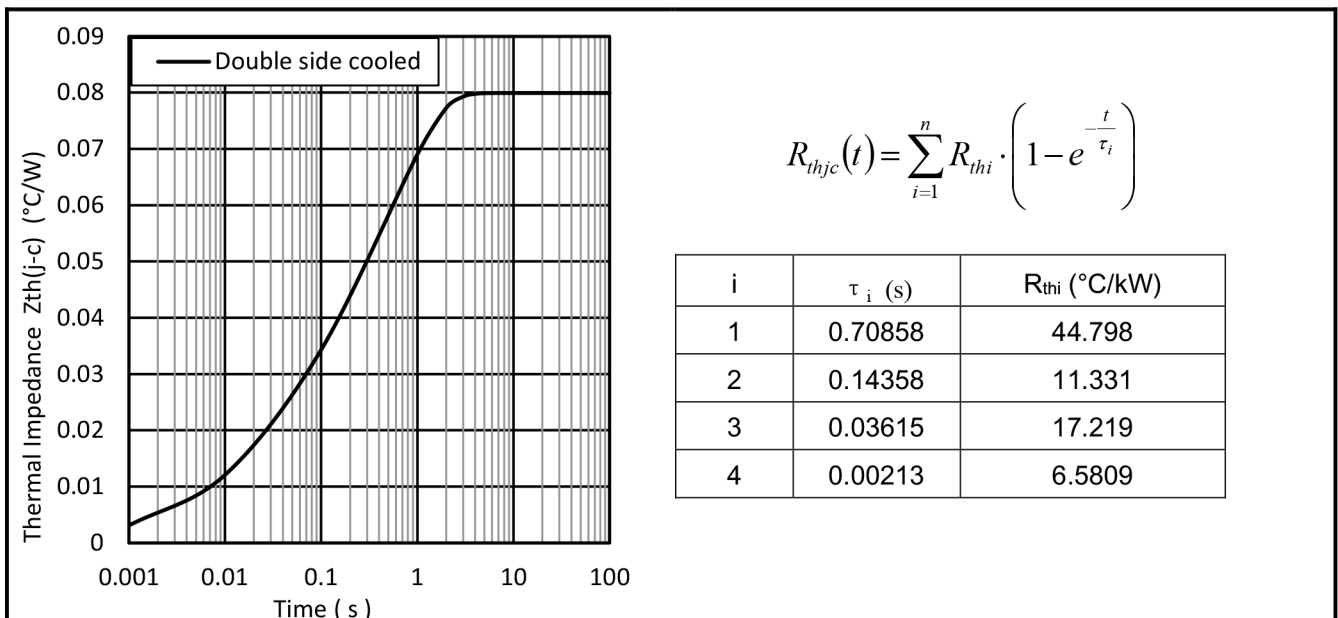


Fig.3 Maximum (limit) transient thermal impedance – junction to case (°C/W)

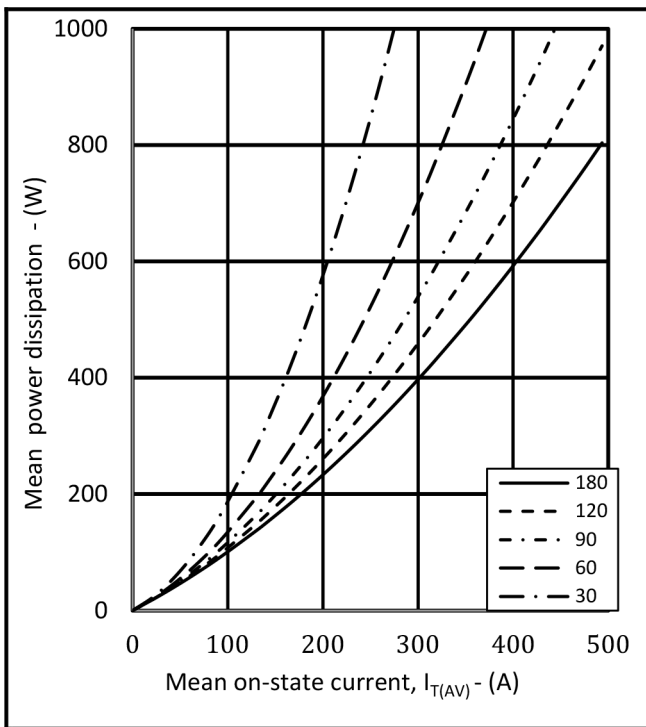


Fig.4 On-state power dissipation – sine wave

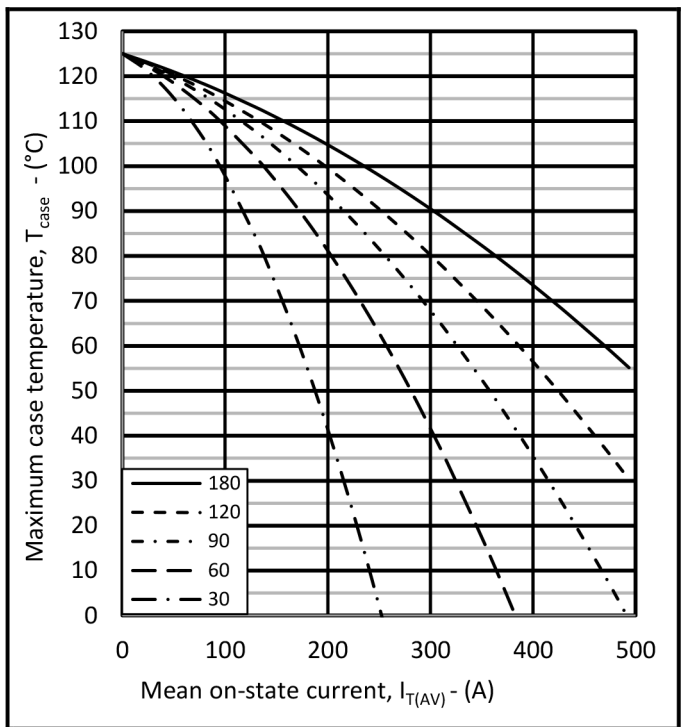


Fig.5 Maximum permissible case temperature, double side cooled – sine wave

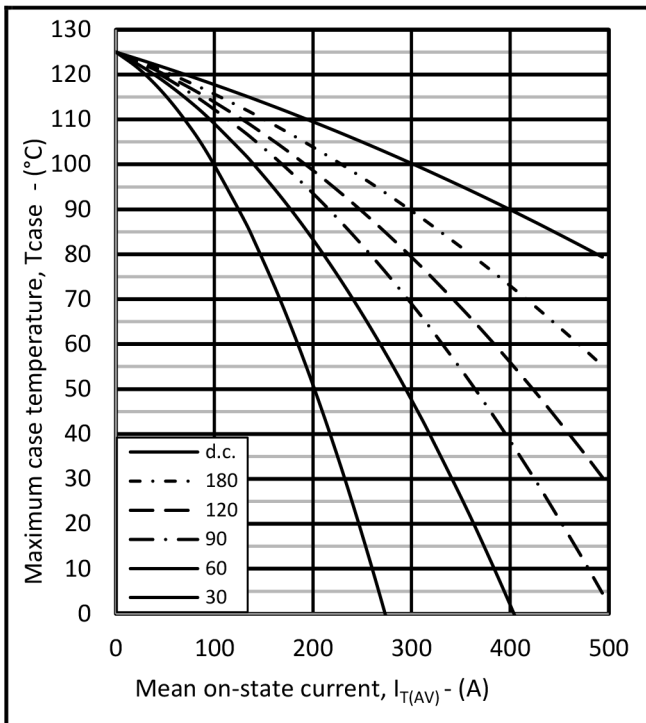


Fig.6 Maximum permissible case temperature, double side cooled – rectangular wave

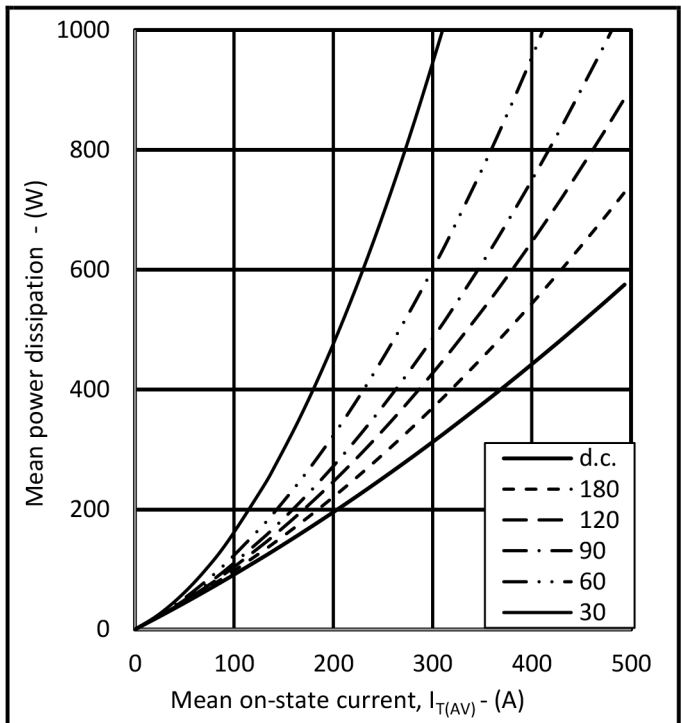


Fig.7 On-state power dissipation – rectangular wave

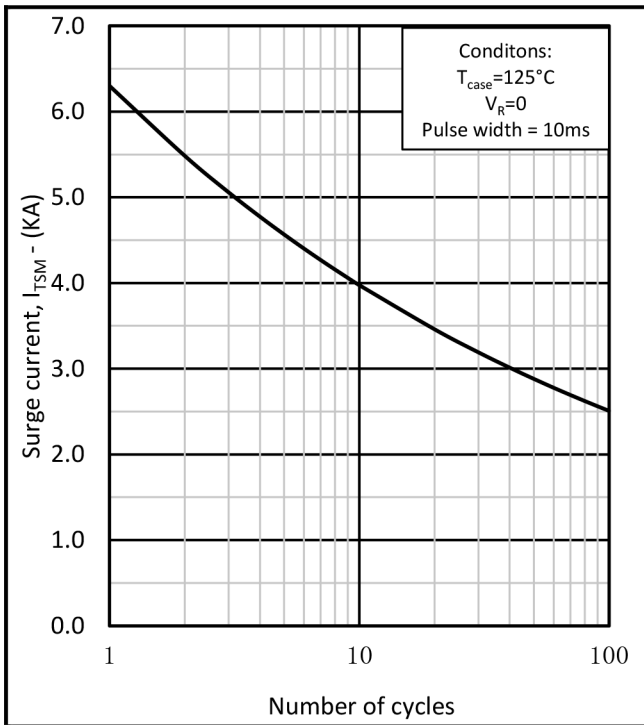


Fig.8 Multi-cycle surge current

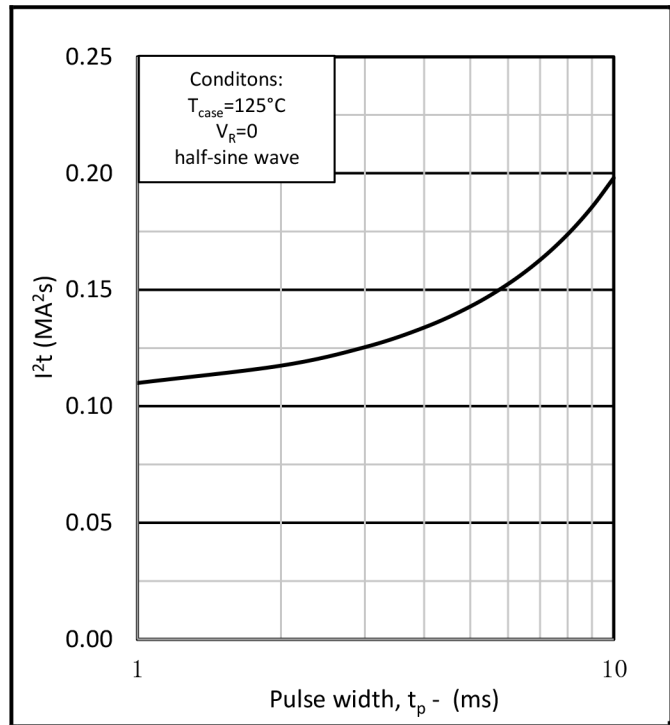


Fig.9 Single-cycle I^2t

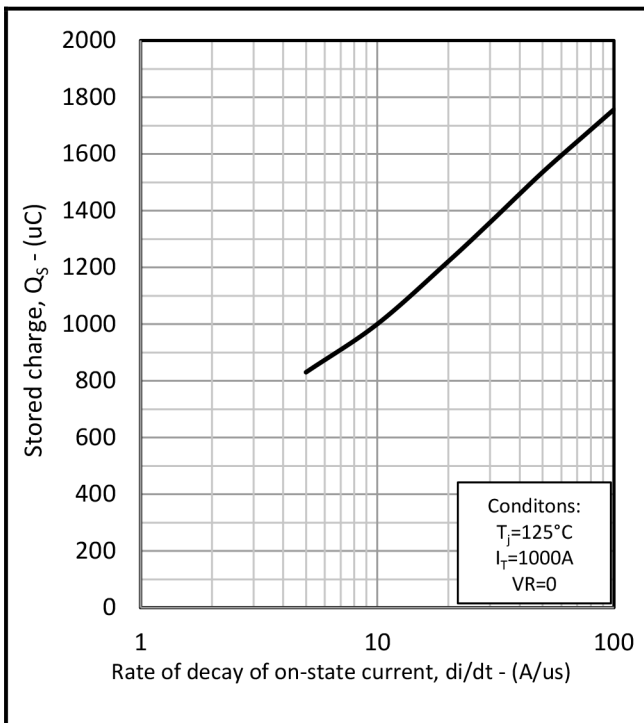


Fig.10 Stored charge vs di/dt

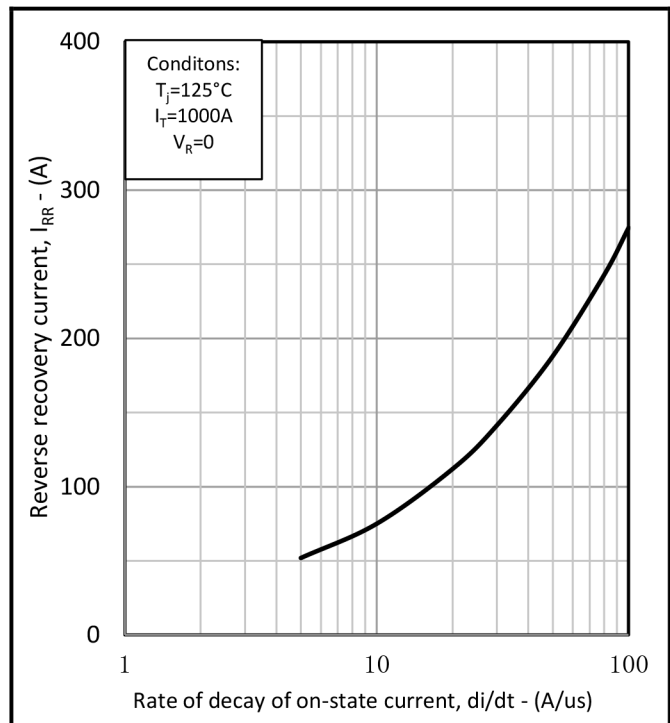


Fig.11 Reverse recovery current vs di/dt

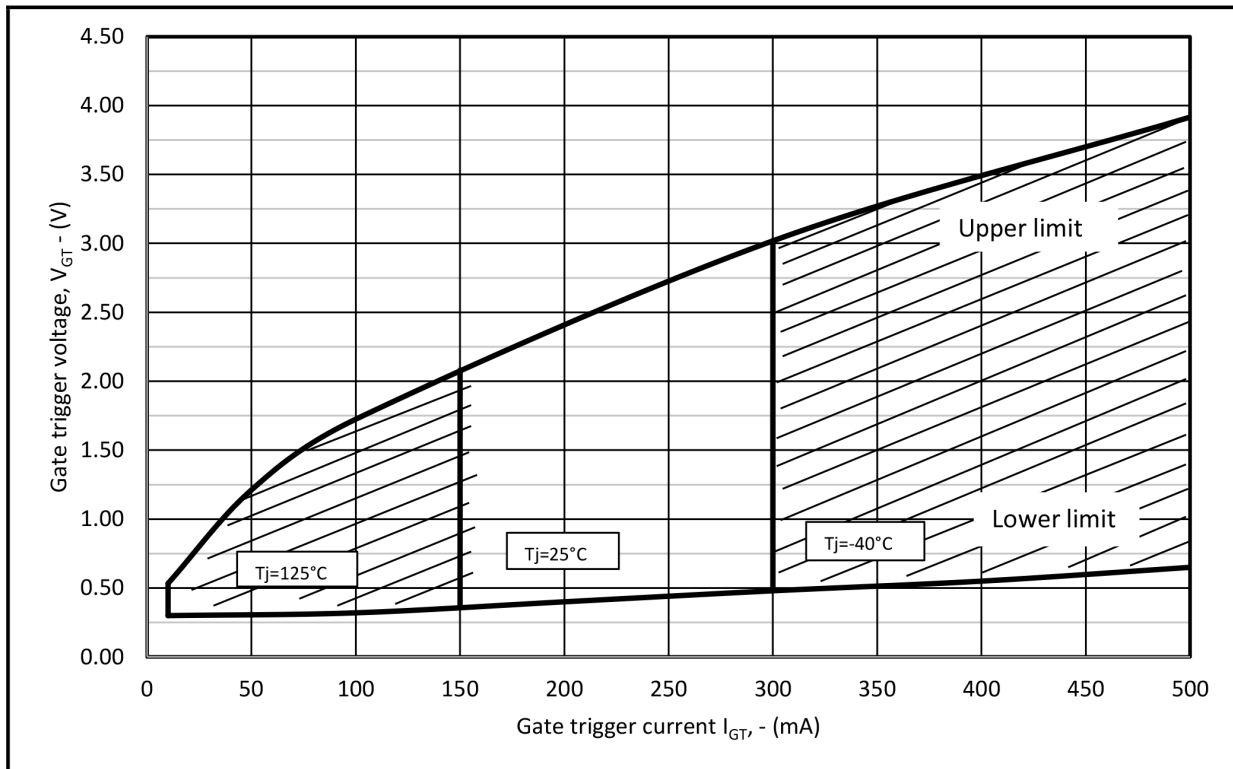
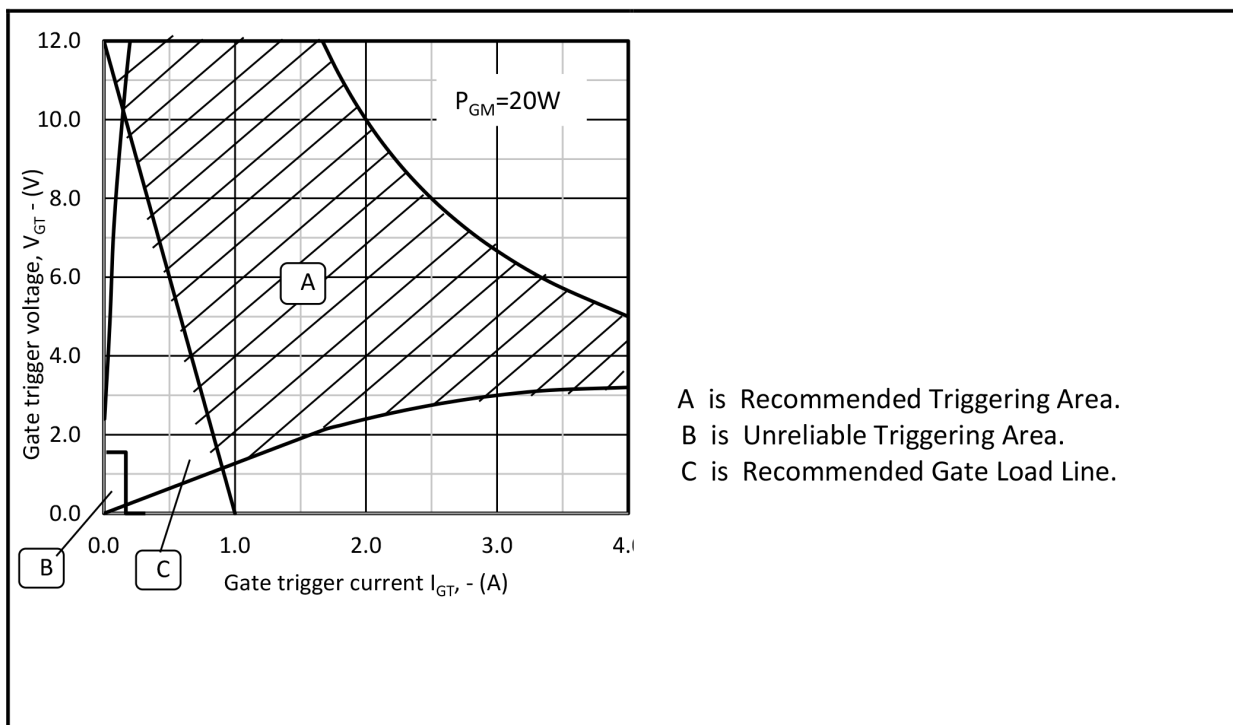


Fig.12 Gate characteristics

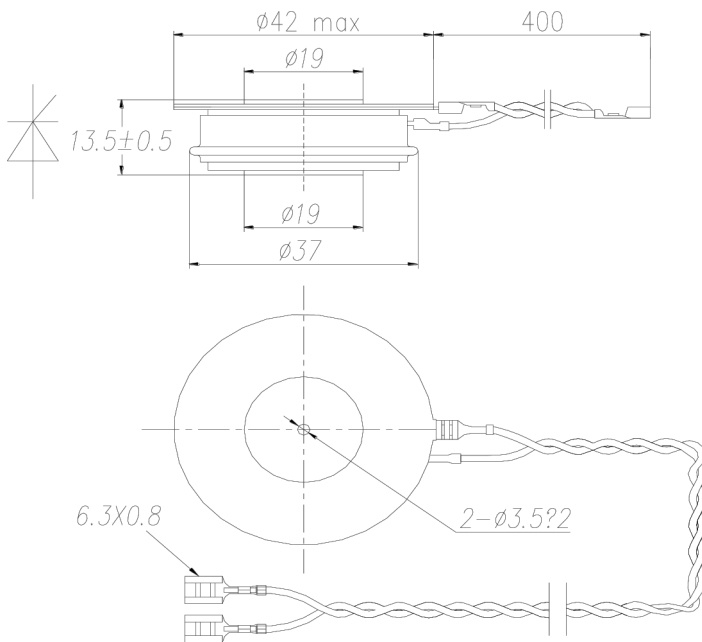


A is Recommended Triggering Area.
 B is Unreliable Triggering Area.
 C is Recommended Gate Load Line.

Fig.13 Gate characteristics

Phase Control Thyristor

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Package outline type code: T

Part Number Table

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

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