

1. General description

Pressure contact thyristor in industrial standard 50mm package for use in applications requiring high blocking voltage capability, high inrush current capability and high thermal cycling performance.

2. Features and benefits

- High blocking voltage capability
- High surge current capability
- High thermal cycling performance
- Pressure contact module with high reliability
- Easy mounting

3. Applications

- Heat and Temperature Control
- Power Converter
- Industrial Motor Drive & Soft Starter
- Lighting Control
- UPS

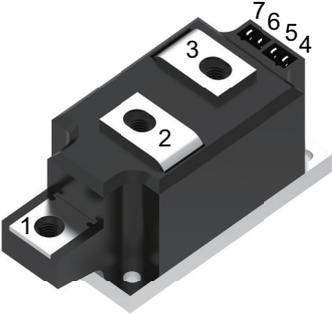
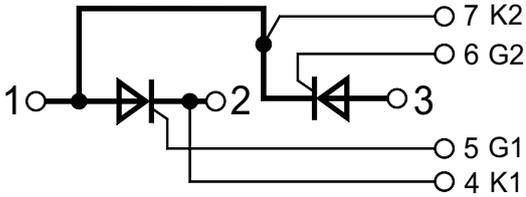
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Notes	Values			Unit
Absolute maximum rating							
V_{DRM}	repetitive peak forward voltage			1600			V
V_{RRM}	repetitive peak reverse voltage			1600			V
$I_{T(AV)}$	average on-state current	half sine wave; $T_c = 85\text{ °C}$		280			A
I_{TSM}	non-repetitive peak on-state current	half sine wave; $T_{j(\text{init})} = 25\text{ °C}$; $t_p = 10\text{ ms}$		10000			A
		half sine wave; $T_{j(\text{init})} = 125\text{ °C}$; $t_p = 10\text{ ms}$		9000			A
		half sine wave; $T_{j(\text{init})} = 25\text{ °C}$; $t_p = 8.3\text{ ms}$		11000			A
		half sine wave; $T_{j(\text{init})} = 125\text{ °C}$; $t_p = 8.3\text{ ms}$		9900			A
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Static characteristics							
I_{GT}	gate trigger current	$V_D = 12\text{ V}$; $I_T = 0.1\text{ A}$; $T_j = 25\text{ °C}$		30	-	150	mA
V_{GT}	gate trigger voltage	$V_D = 12\text{ V}$; $I_T = 0.1\text{ A}$; $T_j = 25\text{ °C}$		-	-	2.5	V
V_T	on-state voltage	$I_T = 750\text{ A}$; $T_j = 25\text{ °C}$		-	-	1.55	V

5. Pinning information

Table 2. Pinning information

Simplified outline	Graphic symbol
	

6. Ordering information

Table 3. Ordering information

Type number	Orderable part number	Packing method	Small packing quantity
WTMH280E16	WTMH280E16T	Tray	18

7. Marking

Table 4. Marking codes

Type number	Marking codes
WTMH280E16	WTMH280E16

8. Limiting values

Table 5. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Notes	Values	Unit
V_{DRM}	repetitive peak forward voltage			1600	V
V_{RRM}	repetitive peak reverse voltage			1600	V
$I_{T(AV)}$	average on-state current	half sine wave; $T_c = 85\text{ °C}$		280	A
$I_{T(RMS)}$	RMS on-state current	half sine wave; $T_c = 85\text{ °C}$		440	A
I_{TSM}	non-repetitive peak on-state current	half sine wave; $T_{j(\text{init})} = 25\text{ °C}$; $t_p = 10\text{ ms}$		10000	A
		half sine wave; $T_{j(\text{init})} = 125\text{ °C}$; $t_p = 10\text{ ms}$		9000	A
		half sine wave; $T_{j(\text{init})} = 25\text{ °C}$; $t_p = 8.3\text{ ms}$		11000	A
		half sine wave; $T_{j(\text{init})} = 125\text{ °C}$; $t_p = 8.3\text{ ms}$		9900	A
I^2t	I^2t for fusing	$t_p = 10\text{ ms}$; SIN; $T_{vj} = 25\text{ °C}$		500	kA^2s
		$t_p = 10\text{ ms}$; SIN; $T_{vj} = 125\text{ °C}$		405	kA^2s
di_T/dt	rate of rise of on-state current	$I_G = 300\text{ mA}$; $T_j = 125\text{ °C}$		250	$\text{A}/\mu\text{s}$
I_{GM}	peak gate current			10	A
V_{RGM}	peak reverse gate voltage			5	V
P_{GM}	peak gate power			20	W
$P_{G(AV)}$	average gate power	over any 20 ms period		0.5	W
T_{vj}	virtual junction temperature			-40 to 125	$^{\circ}\text{C}$
T_{op}	operation temperature			-40 to 125	$^{\circ}\text{C}$
T_{stg}	storage temperature			-40 to 125	$^{\circ}\text{C}$

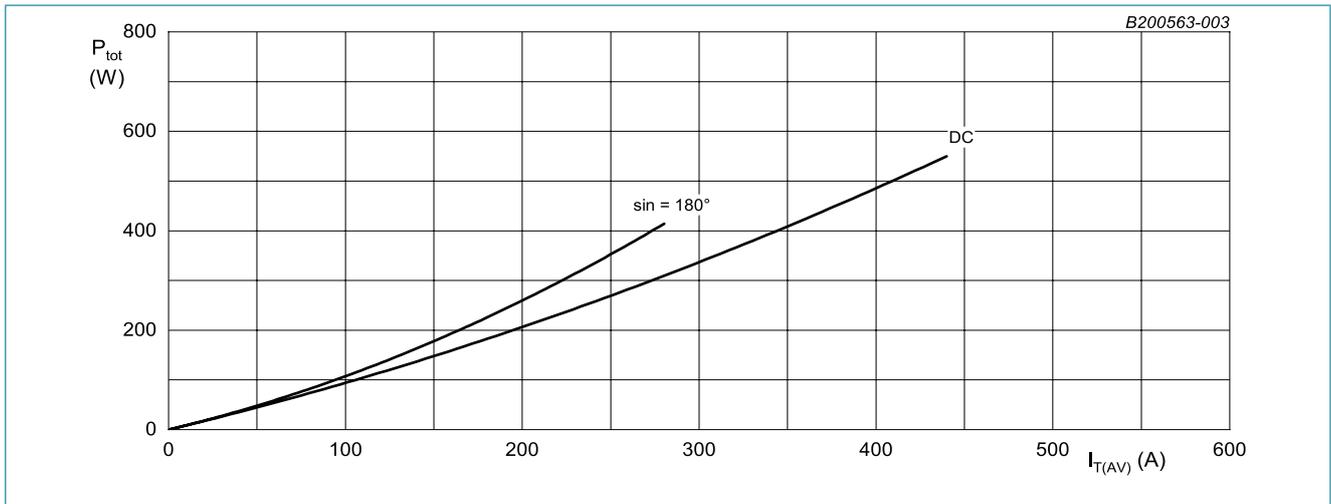


Fig. 1. Total power dissipation as a function of average on-state current; maximum values; per thyristor

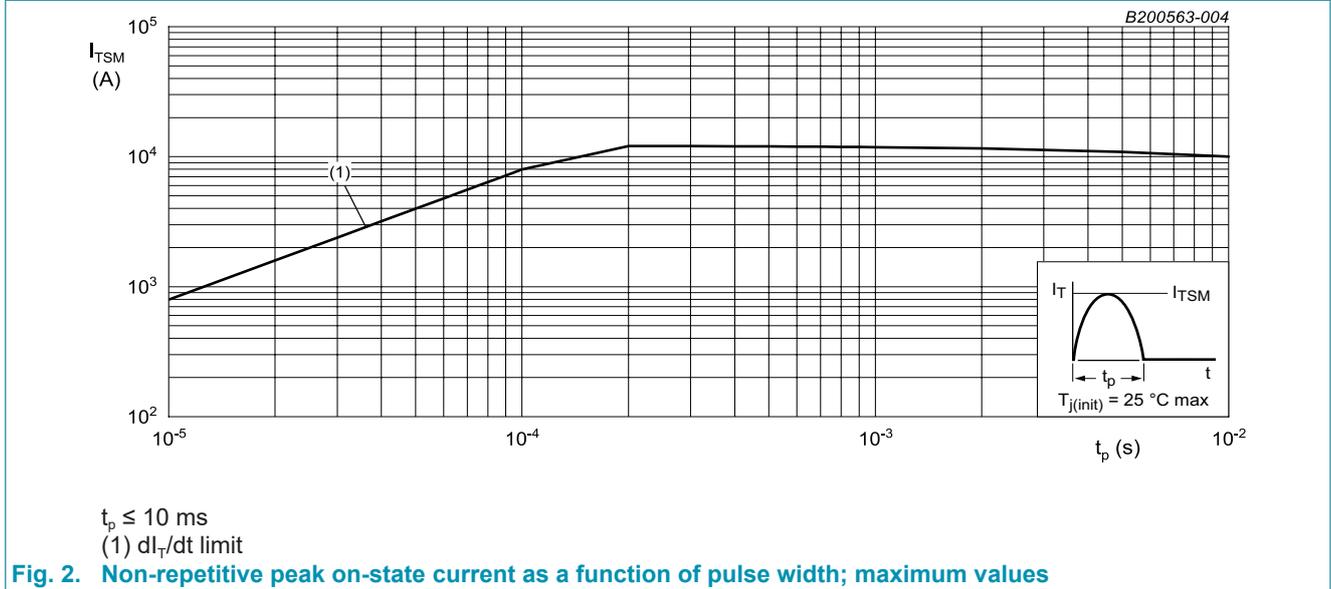


Fig. 2. Non-repetitive peak on-state current as a function of pulse width; maximum values

9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$R_{th(j-c)}$	thermal resistance from junction to case	per thyristor	-	-	0.12	K/W
$R_{th(j-h)}$	thermal resistance from junction to heatsink	per thyristor	-	-	0.04	K/W

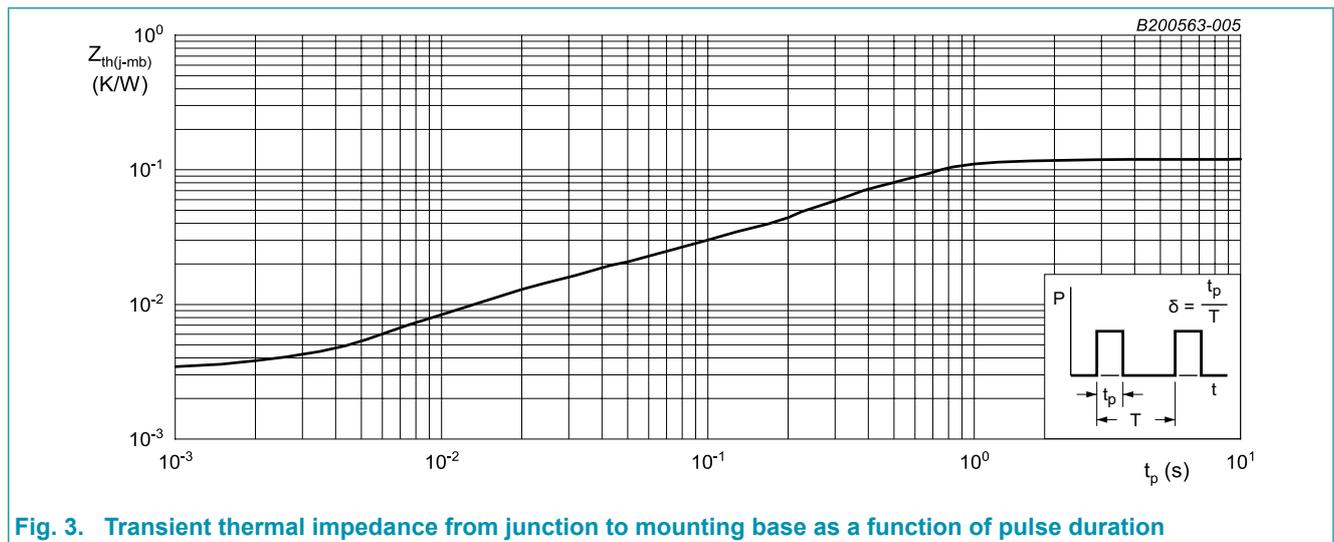


Fig. 3. Transient thermal impedance from junction to mounting base as a function of pulse duration

10. Package characteristics

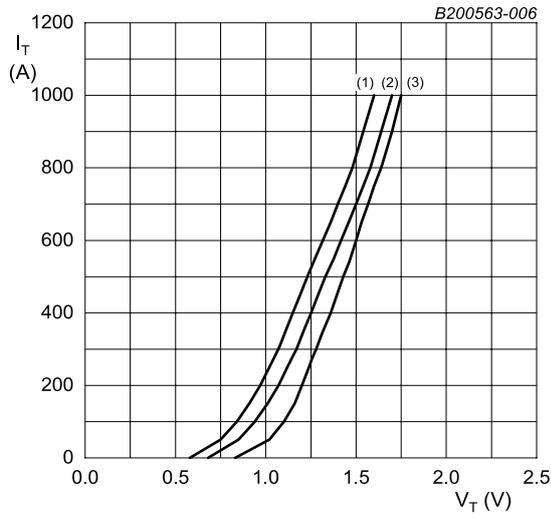
Table 7. Isolation characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{isol}	isolation voltage	50/60 Hz; RMS; t = 1 minute; AC	-	-	2500	V

11. Characteristics

Table 8. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static characteristics						
I_{GT}	gate trigger current	$V_D = 12\text{ V}; I_T = 0.1\text{ A}; T_j = 25\text{ °C}$	30	-	150	mA
V_{GT}	gate trigger voltage	$V_D = 12\text{ V}; I_T = 0.1\text{ A}; T_j = 25\text{ °C}$	-	-	2.5	V
I_{GD}	gate non-trigger current	$T_j = 125\text{ °C}$	-	-	10	mA
V_{GD}	gate non-trigger voltage	$T_j = 125\text{ °C}$	-	-	0.25	V
I_L	latching current	$V_D = 12\text{ V}; I_T = 0.1\text{ A}; T_j = 25\text{ °C}$	-	-	500	mA
I_H	holding current	$V_D = 12\text{ V}; T_j = 25\text{ °C}$	-	-	150	mA
V_T	on-state voltage	$I_T = 750\text{ A}; T_j = 25\text{ °C}$	-	-	1.55	V
V_{TO}	threshold voltage	$T_j = 125\text{ °C}$	-	-	0.83	V
r_T	slope resistance	$T_j = 125\text{ °C}$	-	-	0.91	mΩ
I_D	off-state current	$V_D = 1600\text{ V}; T_j = 25\text{ °C}$	-	-	1	mA
		$V_D = 1600\text{ V}; T_j = 125\text{ °C}$	-	-	25	mA
I_R	reverse current	$V_R = 1600\text{ V}; T_j = 25\text{ °C}$	-	-	1	mA
		$V_R = 1600\text{ V}; T_j = 125\text{ °C}$	-	-	25	mA
Dynamic characteristics						
dV_D/dt	rate of rise of off-state voltage	$V_{DM} = 1072\text{ V}; T_j = 125\text{ °C}; (V_{DM} = 67\% \text{ of } V_{DRM}); \text{exponential waveform; gate open circuit}$	1500	-	-	V/μs
t_{gt}	gate-controlled turn-on time	$V_D = 800\text{ V}; I_G = 300\text{ mA}; (dI_G/dt)_M = 1\text{ A}/\mu\text{s}; T_j = 25\text{ °C}$	-	5	-	μs
t_q	commutated turn-off time	$I_{TM} = 2\text{ A}; t_p = 50\text{ μs}; dV_D/dt = 5\text{ V}/\mu\text{s}; dI/dt = 30\text{ A}/\mu\text{s}; T_j = 25\text{ °C}$	-	150	-	μs



$V_{TO} = 0.830 \text{ V}; r_T = 0.00091 \Omega$
 (1) $T_j = 125 \text{ }^\circ\text{C}$; typical values
 (2) $T_j = 125 \text{ }^\circ\text{C}$; maximum values
 (3) $T_j = 25 \text{ }^\circ\text{C}$; maximum values

Fig. 4. On-state current as a function of on-state voltage

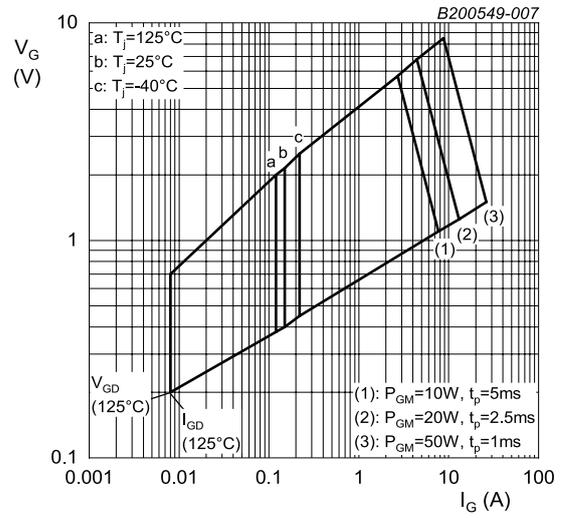
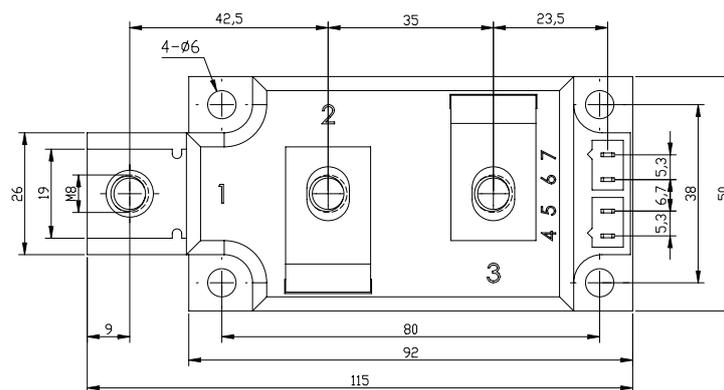
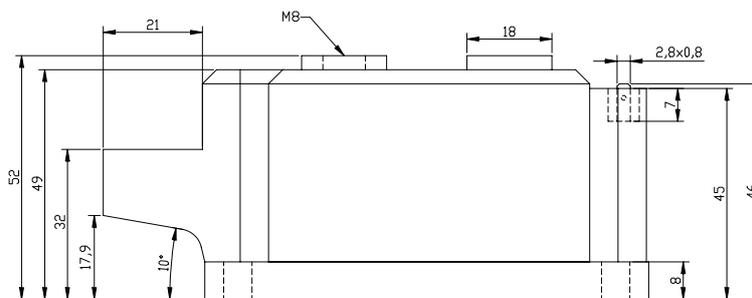
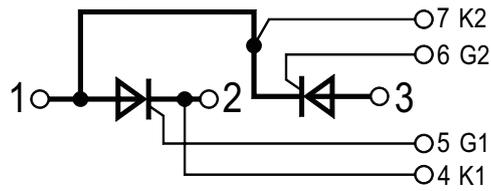


Fig. 5. Gate voltage as a function of gate current

12. Package outline

Package Outline

Dimensions in mm



General tolerance ± 0.5 mm

13. Legal information

Data sheet status

Document status [1][2]	Product status [3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
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