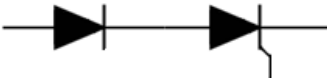



## PHASE CONTROL DIODE-THYRISTOR MODULES

### MDT-125

<ul style="list-style-type: none"> <li>◆ <math>V_{DRM}/V_{RRM} = \mathbf{400 - 1600 V}</math></li> <li>◆ <math>I_{T(AV)} = \mathbf{125 A}</math> (<math>T_C = 85,7\text{ }^\circ\text{C}</math>)</li> <li>◆ <math>I_{TSM} = \mathbf{3,0 kA}</math> (<math>T_j = 125\text{ }^\circ\text{C}</math>)</li> </ul>		
<ul style="list-style-type: none"> <li>◆ Heat transfer through AlN ceramic isolated metal baseplate</li> <li>◆ Presspack construction</li> <li>◆ High reliability at thermal cycles (<math>10^5</math> at <math>\Delta T_C = 70\text{ }^\circ\text{C}</math>)</li> <li>◆ Case width 34 mm</li> </ul>		

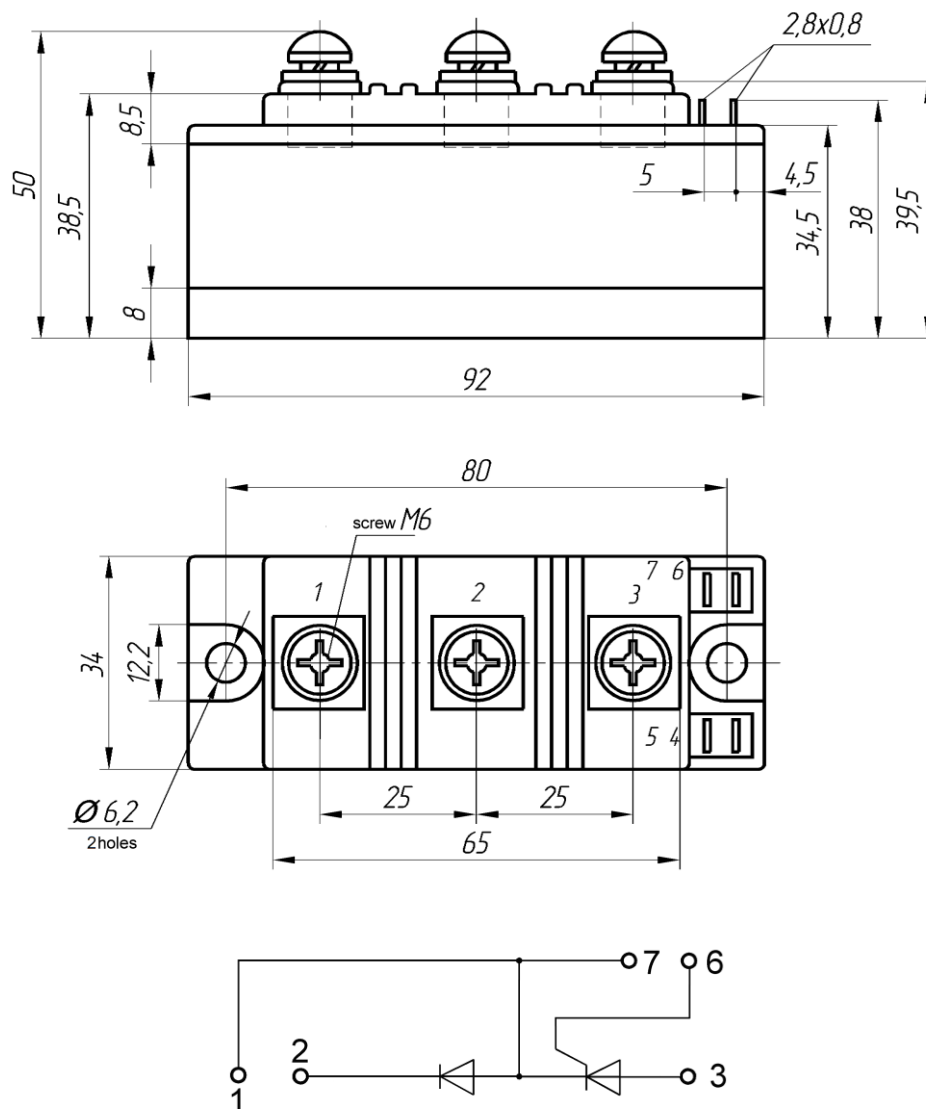
#### MAXIMUM RATED VALUES

Parameter and conditions	Symbol	Values	Units
Repetitive peak off-state voltage / Repetitive peak reverse voltage, $T_j = -40 \dots +125\text{ }^\circ\text{C}$	$V_{DRM} / V_{RRM}$	400-1600	V
Non-repetitive peak off-state voltage/ Non-repetitive peak reverse voltage, $T_j = -40 \dots +125\text{ }^\circ\text{C}$	$V_{DSM} / V_{RSM}$	500-1700	
Repetitive peak off-state current/ Repetitive peak reverse current, $T_j = 125\text{ }^\circ\text{C}$ , $V_D / V_R = V_{DRM} / V_{RRM}$	$I_{DRM} / I_{RRM}$	25	mA
Maximum average on-state current, $f = 50\text{ Hz}$ , $T_C = 85,7\text{ }^\circ\text{C}$	$I_{T(AV)}$	125	A
RMS on-state current, $T_C = 85,7\text{ }^\circ\text{C}$	$I_{TRMS}$	196	
Surge non-repetitive current, $T_j = 125\text{ }^\circ\text{C}$ , $t_p = 10\text{ ms}$ , $V_R = 0$	$I_{TSM}$	3,0	kA
Safety factor	$I^2t$	$0,045 \cdot 10^6$	$A^2s$
Critical rate of rise of on-state current, $T_j = 125\text{ }^\circ\text{C}$ , $V_D = 0,67V_{DRM}$ , $I_T = 250\text{ A}$ , $I_{FG} = 1\text{ A}$ , $t_r \leq 1\text{ } \mu\text{s}$ , $f = 50\text{ Hz}$	$(di_T/dt)_{crit}$	200	$A/\mu\text{s}$
Critical rate of rise of off-state voltage $T_j = 125\text{ }^\circ\text{C}$ , $V_D = 0,67V_{DRM}$	$(dv_D/dt)_{crit}$	500-1600	$V/\mu\text{s}$
Gate power loss, DC	$P_{GM}$	4	W
Operation junction temperature range	$T_j$	-40 ... +125	$^\circ\text{C}$
Storage temperature range	$T_{stg}$	-40 ... +50	

## MDT-125

<b>ELECTRICAL CHARACTERISTICS</b>					
Parameter and conditions	Symbol	Values			Units
		min	type	max	
Maximum peak on-state voltage, $T_j = 25\text{ °C}$ , $I_T = 392\text{ A}$	$V_{TM}$	-	-	1,75	V
On-state threshold voltage, $T_j = 125\text{ °C}$ , $I_T = 200 - 600\text{ A}$	$V_{T(TO)}$	-	-	1,10	
On-state slope resistance, $T_j = 125\text{ °C}$ , $I_T = 200 - 600\text{ A}$	$r_T$	-	-	1,80	mΩ
Delay time, $T_j = 25\text{ °C}$ , $V_D = 0,67V_{DRM}$ , $I_T = 125\text{ A}$ , $I_{FG} = 1\text{ A}$ , $t_r \leq 1\text{ }\mu\text{s}$	$t_d$	-	-	5,0	μs
Circuit-commutated turn-off time, $T_j = 125\text{ °C}$ , $I_T = 125\text{ A}$ , $di_T/dt = -5\text{ A}/\mu\text{s}$ , $V_R \geq 100\text{ V}$ , $V_D = 0,67V_{DRM}$ , $dv_D/dt = 50\text{ V}/\mu\text{s}$	$t_q$	-	160	-	
Holding current, $T_j = 25\text{ °C}$ , $V_D = 12\text{ V}$	$I_H$	-	-	250	mA
Gate trigger voltage, $V_D = 12\text{ V}$  $T_j = -40\text{ °C}$ $T_j = 25\text{ °C}$ $T_j = 125\text{ °C}$	$V_{GT}$	-	-	4,5 2,5 2,0	V
Gate trigger current, $V_D = 12\text{ V}$  $T_j = -40\text{ °C}$ $T_j = 25\text{ °C}$ $T_j = 125\text{ °C}$	$I_{GT}$	-	-	350 200 150	mA
Gate non-trigger voltage, $T_j = 125\text{ °C}$ , $V_D = 0,67V_{DRM}$	$V_{GD}$	0,25	-	-	V
Electrical isolated baseplate (RMS), $f = 50\text{ Hz}$ , $t = 1\text{ sec}/1\text{ min}$	$V_{isol}$	-	-	3000/2500	V
<b>THERMAL PARAMETERS</b>					
Thermal resistance junction to case	$R_{th(j-c)}$	-	-	0,190	°C/W
Thermal resistance case to heatsink	$R_{th(c-h)}$	-	-	0,010	
<b>MECHANICAL PARAMETERS</b>					
Weight	w	-	0,45	-	kg
Heatsink mounting torque	$M_s$	4	-	6	Nm
Terminal connection torque	$M_t$	1,5	-	3,5	Nm
Maximum acceleration (at nominal mounting force)	a	-	-	50	m/s <sup>2</sup>

## MDT-125



1 – Anode/Cathode; 2 – Cathode; 3 – Anode; 6 – Gate; 7 - Auxiliary cathode

### Device Outline Drawing

(dimensions in mm)



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