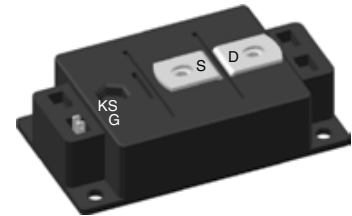
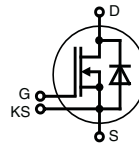


PolarHT™ Module

N-Channel Enhancement Mode

$$\begin{aligned} V_{DSS} &= 200 \text{ V} \\ I_{D80} &= 1600 \text{ A} \\ R_{DS(on)} &= 1.7 \text{ m}\Omega \text{ max.} \end{aligned}$$



MOSFET						
Symbol	Conditions	Maximum Ratings				
V _{DSS}	T _{VJ} = 25°C to 150°C		200		V	
V _{GS}			± 20		V	
I _{D25}	T _C = 25°C		1900		A	
I _{D80}	T _C = 80°C		1600		A	
I _{F25}	T _C = 25°C (diode)		1900		A	
I _{F80}	T _C = 80°C (diode)		1600		A	
Symbol	Conditions	Characteristic Values				
(T _{VJ} = 25°C, unless otherwise specified)						
		min.	typ.	max.		
R _{DSon}	V _{GS} = 10 V; I _D = 1600 A; T _{VJ} = 25°C T _{VJ} = 125°C		1.58 3.25	1.7 3.6	mΩ mΩ	
V _{GS(th)}	V _{DS} = 20 V; I _D = 5 mA	2.5		5	V	
I _{DSS}	V _{DS} = V _{DSS} ; V _{GS} = 0 V; T _{VJ} = 25°C T _{VJ} = 125°C		5.0	0.5	mA mA	
I _{GSS}	V _{GS} = ± 20 V; V _{DS} = 0 V			2	μA	
Q _g Q _{gs} Q _{gd}	V _{GS} = 10 V; V _{DS} = 0.5·V _{DSS} ; I _D = I _{D80}		2900 600 1600		nC nC nC	
t _{d(on)} t _r t _{d(off)} t _f E _{on} E _{off} E _{rec}		inductive load V _{GS} = 10 V; V _{DS} = 100 V I _D = 1600 A; R _G = 1.8 Ω T _{VJ} = 25°C		320 1220 620 700 24 152 3.7	ns ns ns ns mJ mJ mJ	
t _{d(on)} t _r t _{d(off)} t _f E _{on} E _{off} E _{rec}			inductive load V _{GS} = 10 V; V _{DS} = 100 V I _D = 1600 A; R _G = 1.8 Ω T _{VJ} = 125°C		340 1220 740 580 28 147 4.9	ns ns ns ns mJ mJ mJ
R _{thJC} R _{thJH}	with heat transfer paste				0.03 0.037	K/W K/W
					0.056	

Features

- PolarHT™ technology
 - low $R_{DS(on)}$
 - dv/dt ruggedness
 - fast intrinsic reverse diode
- Package
 - low inductive current path
 - screw connection to high current main terminals
 - use of non interchangeable connectors for auxiliary terminals possible
 - Kelvin source terminals for easy drive
 - isolated ceramic base plate

Applications

- converters with high power density for
 - main & aux. AC drives of electric vehicles
 - DC drives
 - power supplies

Source Drain Diode

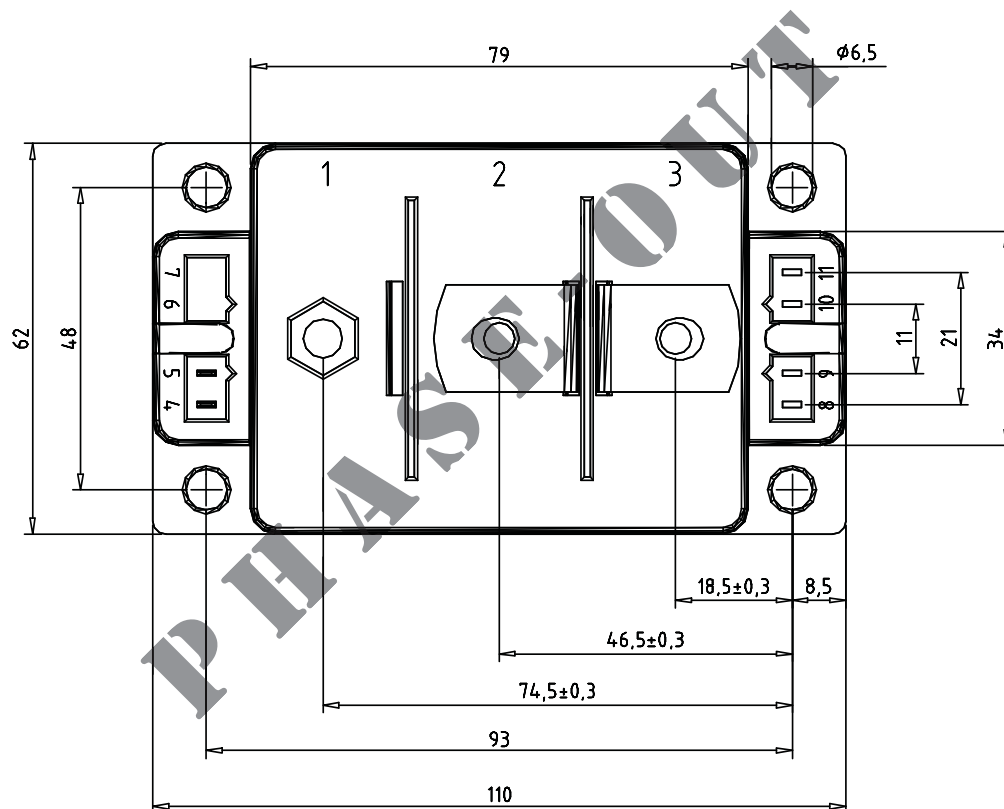
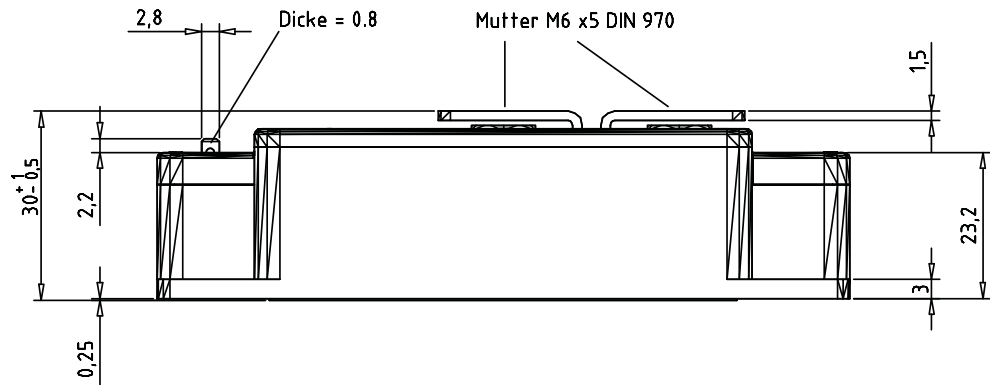
Symbol	Conditions	Characteristic Values			
		min.	typ.	max.	
V_{SD}	$I_F = 1600 \text{ A}; V_{GS} = 0 \text{ V};$ $T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 125^\circ\text{C}$		1.17 1.13		V V
t_{rr} Q_{rr} I_{RM}	$V_{DS} = 100 \text{ V}; I_F = 1600 \text{ A}$ $dV_F/dt = 1300 \text{ A}/\mu\text{s}$ $T_{VJ} = 25^\circ\text{C}$		340 40 210		ns μC A
t_{rr} Q_{rr} I_{RM}	$V_{DS} = 100 \text{ V}; I_F = 1600 \text{ A}$ $dV_F/dt = 1300 \text{ A}/\mu\text{s}$ $T_{VJ} = 125^\circ\text{C}$		380 56 250		ns μC A

Module

Symbol	Conditions	Maximum Ratings		
T_{VJ}		-40...+150		$^\circ\text{C}$
T_{stg}		-40...+125		$^\circ\text{C}$
V_{ISOL}	$I_{ISOL} \leq 1 \text{ mA}; 50/60 \text{ Hz}$	3600		V~
M_d	mounting torque (M6) terminal connection torque (M6)	2.25 - 2.75 4.5 - 5.5		Nm Nm

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
Weight			250	g

Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Code Key
Standard	VMO 1600-02P	VMO 1600-02P	Box	2	504288


Optional accessories for modules
Dimensions in mm (1 mm = 0.0394")

keyed twin plugs
(UL758, style 1385, CSA class 5851,
guide 460-1-1)

- Type ZY180L with wire length 350 mm
for pins 4 (Gate, yellow wire)
and 5 (Kelvin Source, red wire)

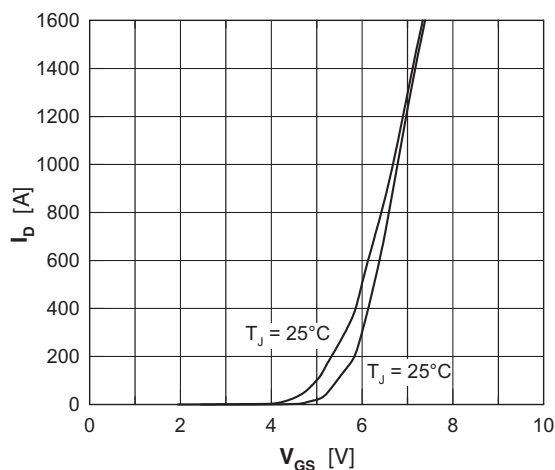


Fig. 1 Typical transfer characteristic

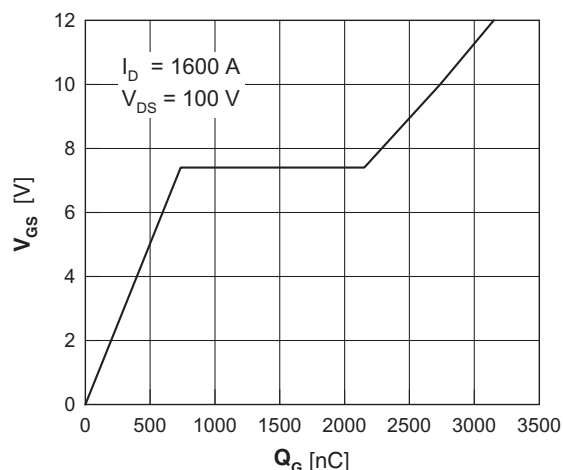


Fig. 2 Typical gate charge characteristic

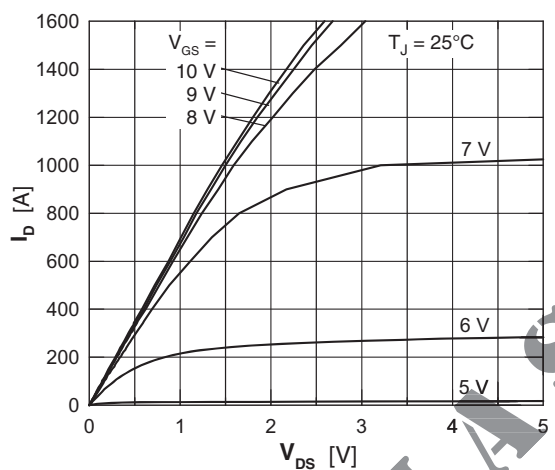


Fig. 3 Typical output characteristic

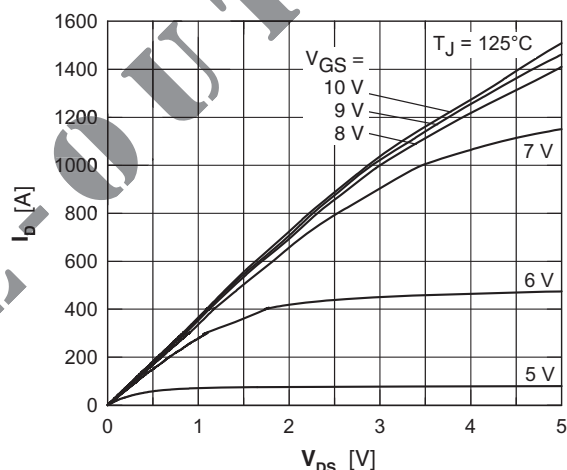


Fig. 4 Typical output characteristic

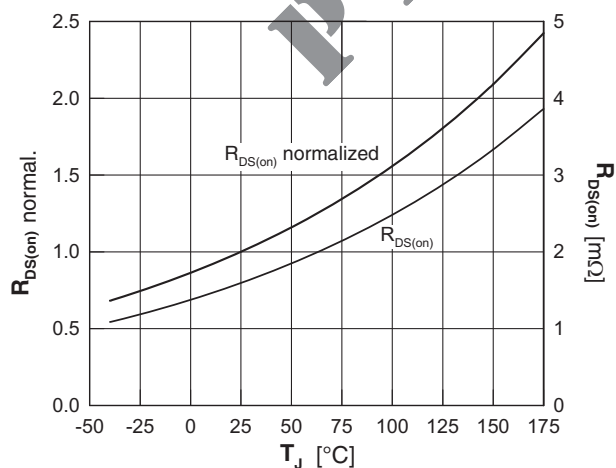


Fig. 5 Typ. drain source on-state resistance $R_{DS(on)}$ versus junction temperature T_J

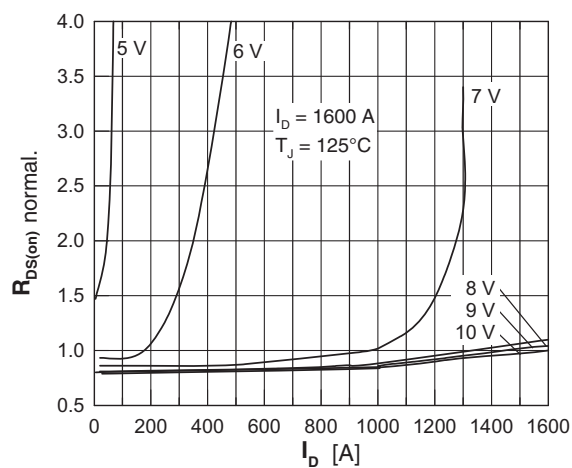


Fig. 6 Typ. drain source on-state resistance $R_{DS(on)}$ versus I_D

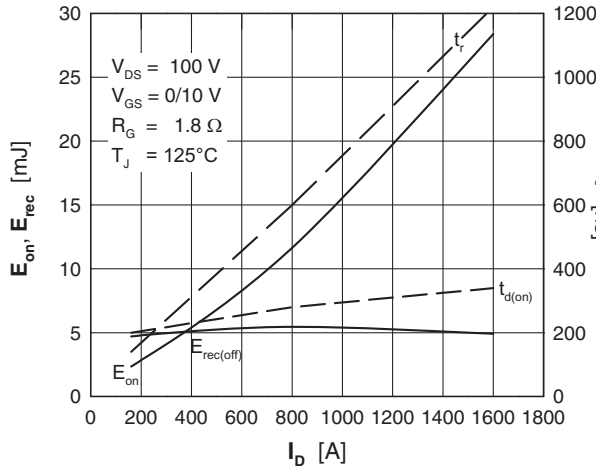


Fig. 7 Typ. turn-on energy & switching times vs. drain source current, inductive switching

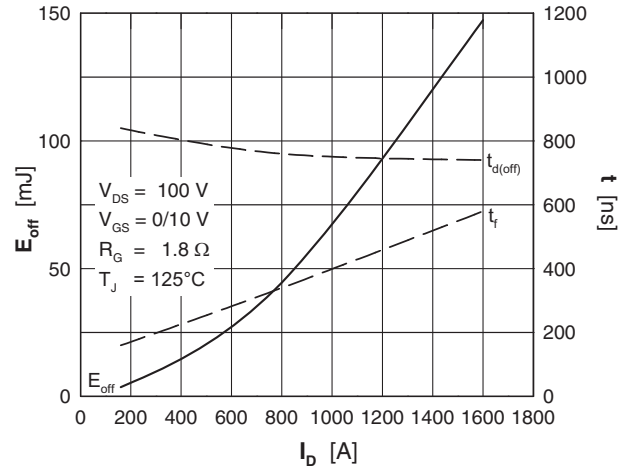


Fig. 8 Typ. turn-off energy & switching times vs. drain source current, inductive switching

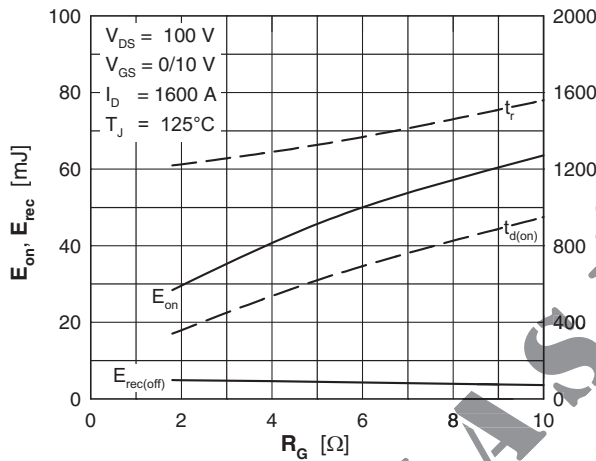


Fig. 9 Typ. turn-on energy & switching times vs. gate resistor, inductive switching

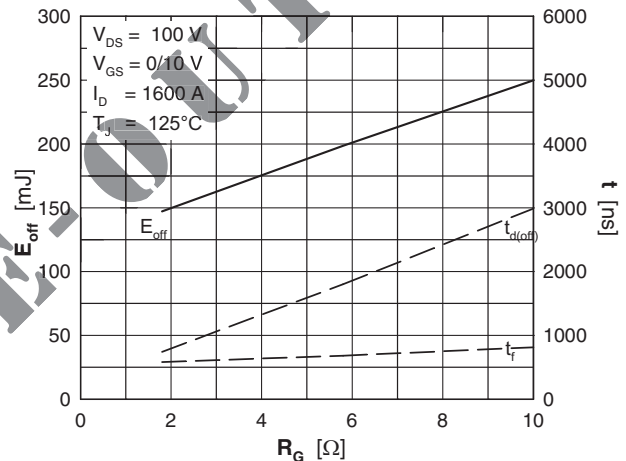


Fig. 10 Typ. turn-off energy & switching times vs. gate resistor, inductive switching

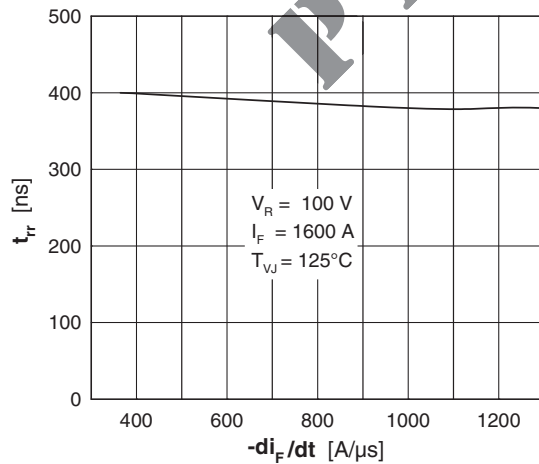


Fig. 11 Typ. reverse recovery time t_{rr} of the body diode versus di/dt

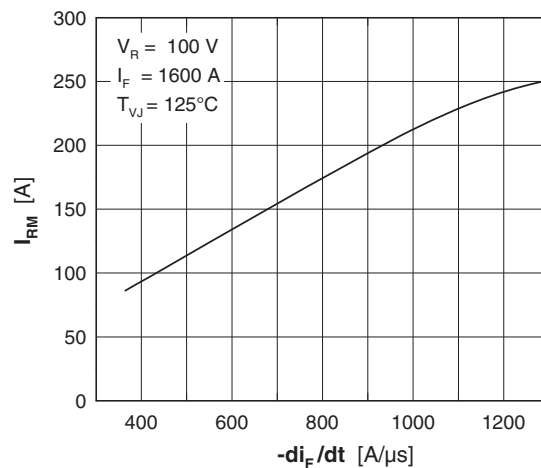


Fig. 12 Typ. reverse recovery current I_{RM} of the body diode versus di/dt

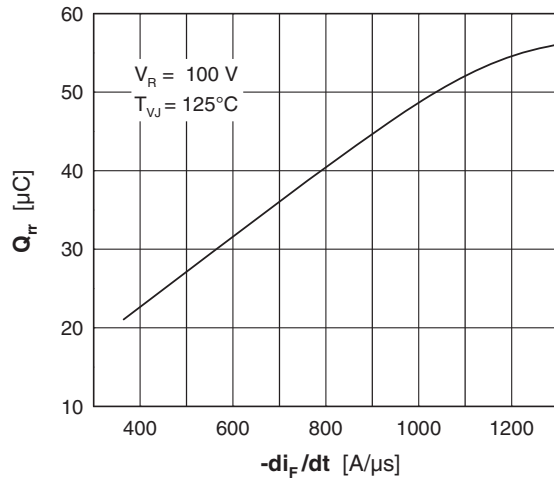


Fig. 13 Typical reverse recovery charge Q_{rr} of the body diode versus di/dt

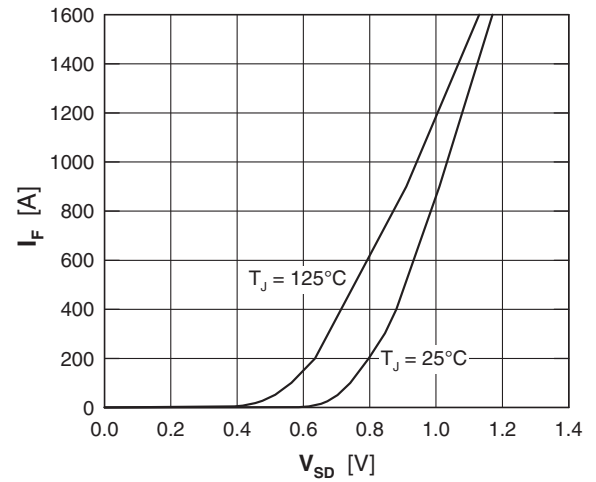


Fig. 14 Source drain current I_F (body diode) vs. typical source drain voltage V_{SD}

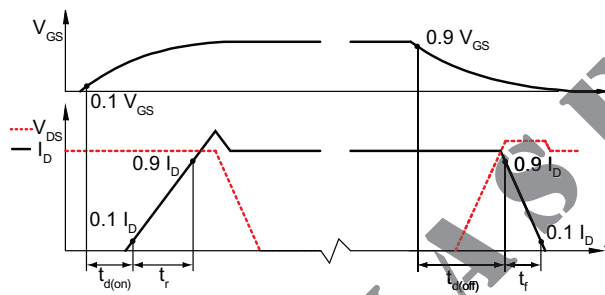


Fig. 15 Definition of switching times

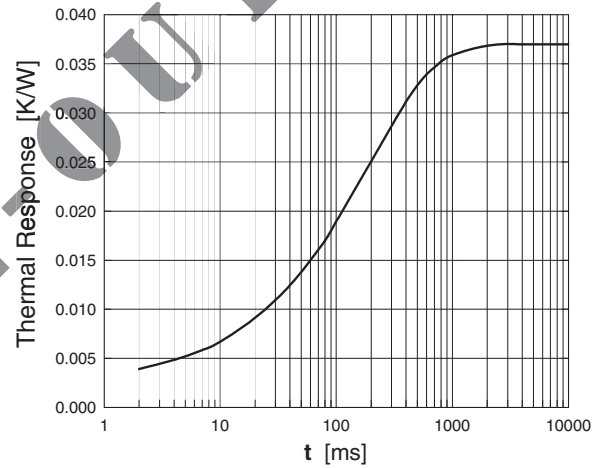


Fig. 16 Typ. thermal impedance junction to heatsink Z_{thJH} with heat transfer paste