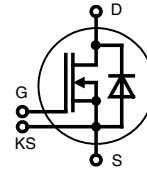


PolarHT™ Module

N-Channel Enhancement Mode

$$\begin{aligned} V_{DSS} &= 100 \text{ V} \\ I_{D25} &= 1220 \text{ A} \\ R_{DS(on)} &= 1.25 \text{ m}\Omega \text{ max.} \end{aligned}$$



MOSFET						
Symbol	Conditions	Maximum Ratings				
V _{DSS}	T _{VJ} = 25°C to 150°C	100	V			
V _{GS}		± 20	V			
I _{D25}	T _C = 25°C	1220	A			
I _{D80}	T _C = 80°C	970	A			
I _{F25}	T _C = 25°C (diode)	1220	A			
I _{F80}	T _C = 80°C (diode)	970	A			
Symbol	Conditions	Characteristic Values				
(T _{VJ} = 25°C, unless otherwise specified)						
		min.	typ.	max.		
R _{DSon}	V _{GS} = 10 V; I _D = I _{D80} T _{VJ} = 25°C T _{VJ} = 125°C		1.00 1.62	1.25 2.00	mΩ mΩ	
V _{GS(th)}	V _{DS} = 20 V; I _D = 3 mA	3		5	V	
I _{DSS}	V _{DS} = 0.8 • V _{DSS} ; V _{GS} = 0 V; T _{VJ} = 25°C T _{VJ} = 125°C			0.3 6	mA mA	
I _{GSS}	V _{GS} = ± 20 V; V _{DS} = 0 V			1.2	μA	
Q _g Q _{gs} Q _{gd}	V _{GS} = 10 V; V _{DS} = 50 V; I _D = 1000 A		1710 396 1020		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} = 50 V I _D = 1000 A; R _G = 1.8 Ω R _G = R _{G ext} + R _{out driver} T _{VJ} = 25°C	360 1620 460 1020 7.7 62.3 0.57		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} = 50 V I _D = 1000 A; R _G = 1.8 Ω R _G = R _{G ext} + R _{out driver} T _{VJ} = 125°C	400 1640 560 820 8.5 58.9 0.82		ns ns ns ns mJ mJ mJ
R _{thJC} R _{thJH}	with heat transfer paste (IXYS test setup)			0.053 0.065	0.088	K/W K/W

Features

- PolarHT™ MOSFET 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 DCB ceramic base plate

Applications

- converters with high power density for
 - main and auxiliary AC drives of electric vehicles
 - DC drives
 - power supplies

Source Drain Diode

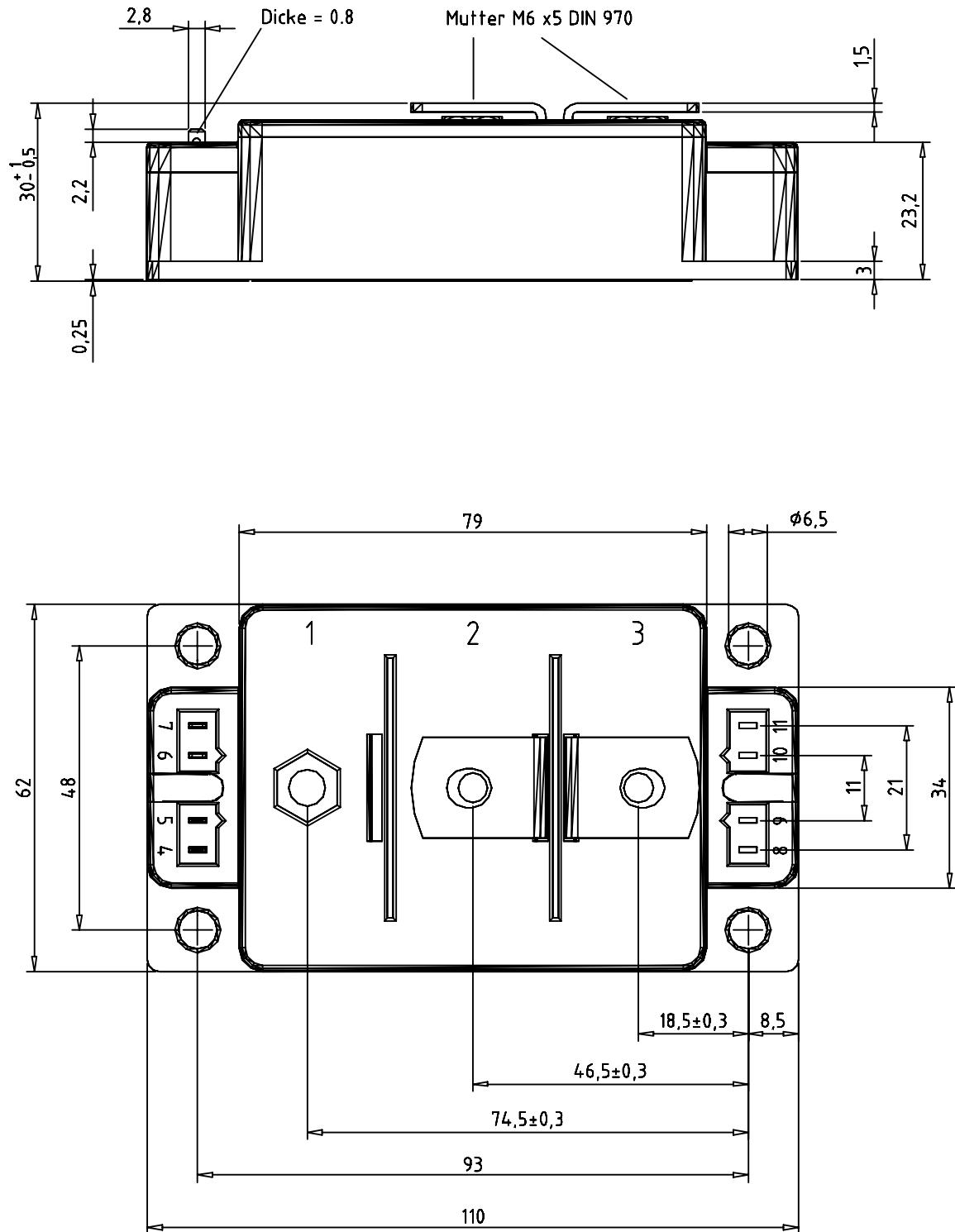
Symbol	Conditions	Characteristic Values			
		min.	typ.	max.	
V_{SD}	$I_F = 1000 \text{ A}; V_{GS} = 0 \text{ V};$ $T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 125^\circ\text{C}$		1.03 0.96		V V
t_{rr} Q_{rr} I_{RM}	$V_{DS} = 50 \text{ V}; I_F = 1000 \text{ A}$ $di_F/dt = 650 \text{ A}/\mu\text{s}$ $T_{VJ} = 25^\circ\text{C}$		300 12.7 72		ns μC A
t_{rr} Q_{rr} I_{RM}	$V_{DS} = 50 \text{ V}; I_F = 1000 \text{ A}$ $di_F/dt = 630 \text{ A}/\mu\text{s}$ $T_{VJ} = 125^\circ\text{C}$		340 18 88		ns μC A

Module

Symbol	Conditions	Ratings			
		min.	typ.	max.	
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)	2.25		2.75	Nm
	Terminal connection torque (M6)	4.5		5.5	Nm
Weight			250		g

Product Marking

Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Code Key
Standard	VMO1200-01F	VMO1200-01F	Box	2	501051



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

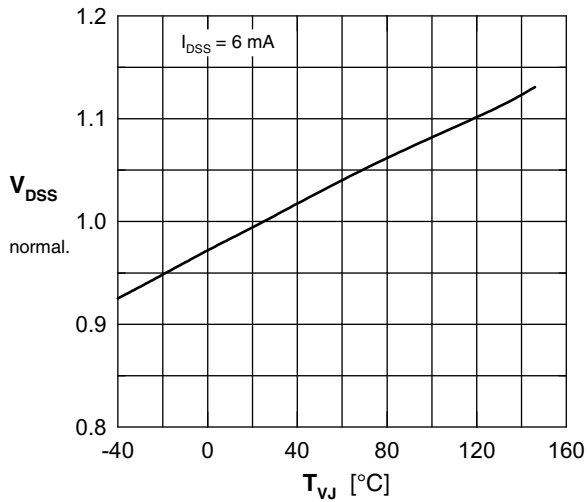


Fig. 1 Drain source breakdown voltage V_{DSS} versus junction temperature T_{VJ}

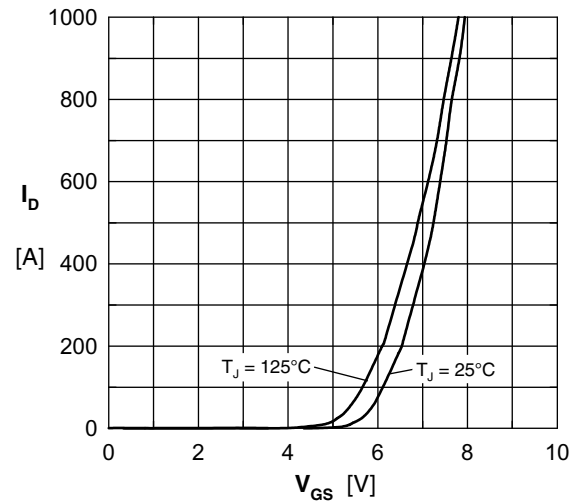


Fig. 2 Typical transfer characteristic

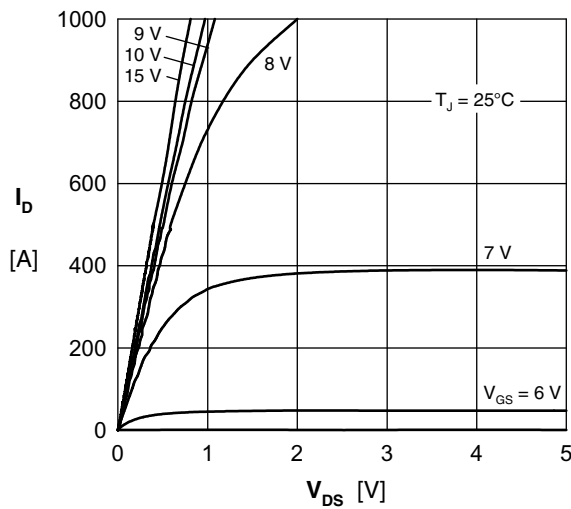


Fig. 3 Typical output characteristic

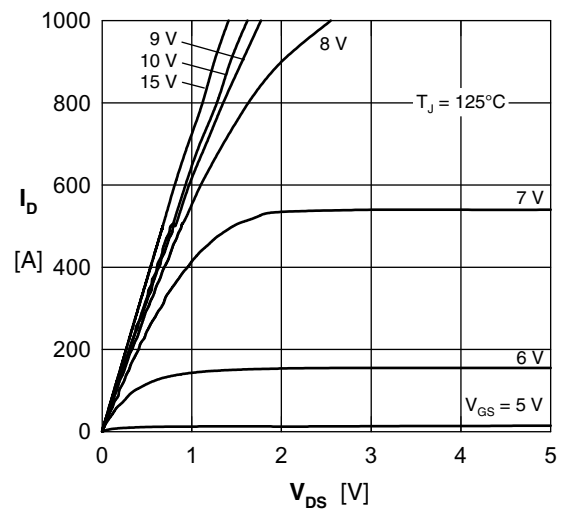


Fig. 4 Typical output characteristic

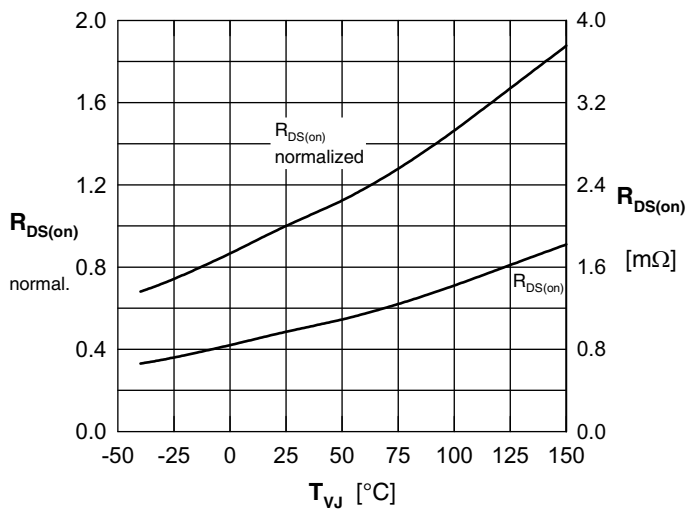


Fig. 5 Typ. drain source on-state resistance $R_{DS(on)}$ versus junction temperature T_{VJ}

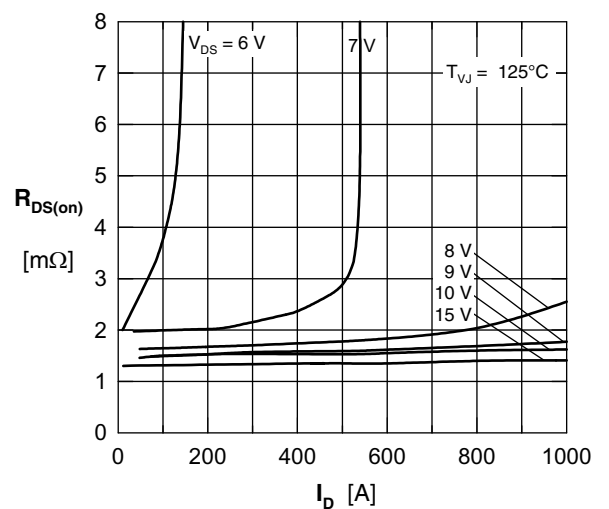


Fig. 5 Typ. drain source on-state resistance $R_{DS(on)}$ versus I_D

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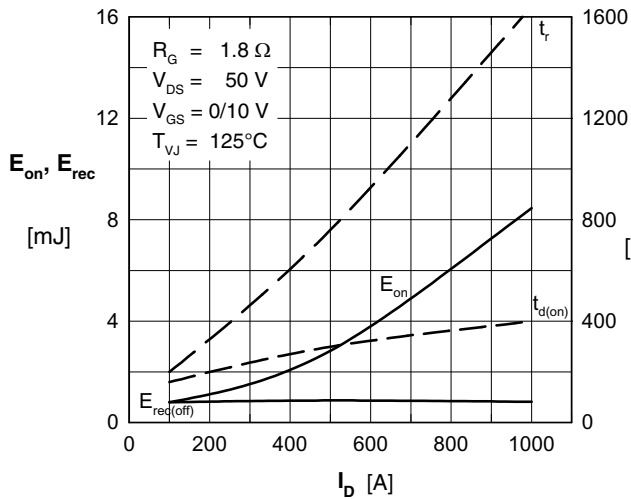


Fig. 6 Typ. turn-on energy & switching times vs. drain source current, inductive switching

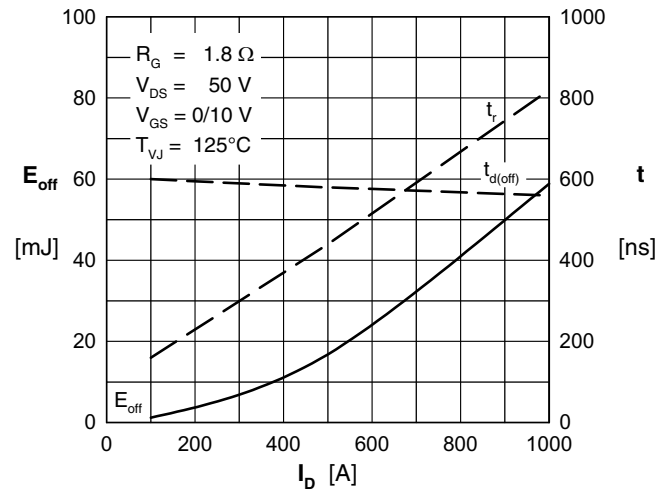


Fig. 7 Typ. turn-off energy & switching times vs. drain source current, inductive switching

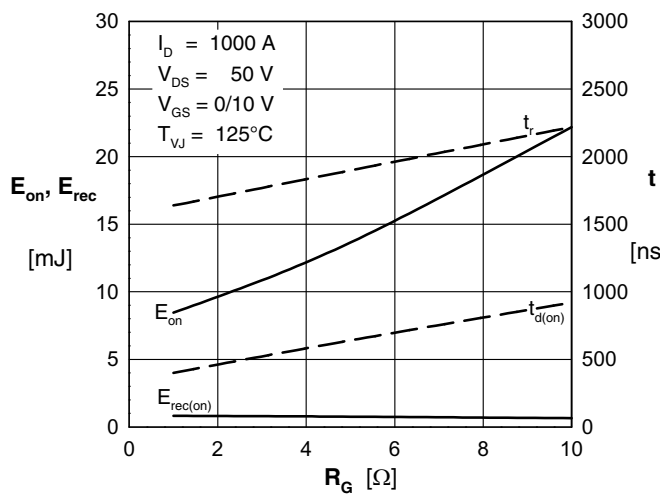


Fig. 8 Typ. turn-on energy & switching times vs. gate resistor, inductive switching

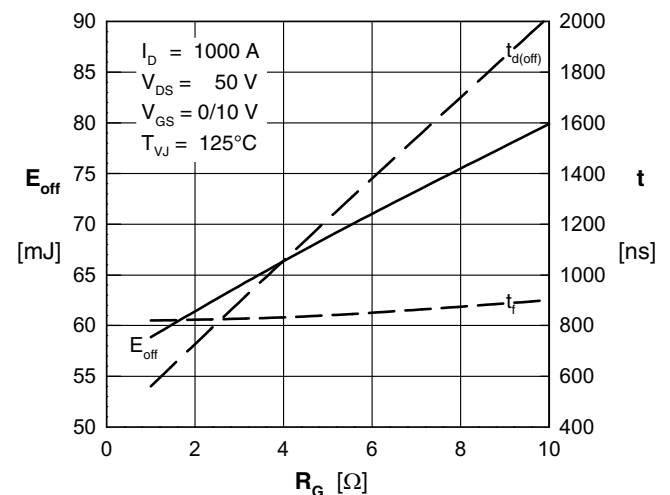


Fig. 9 Typ. turn-off energy & switching times vs. gate resistor, inductive switching

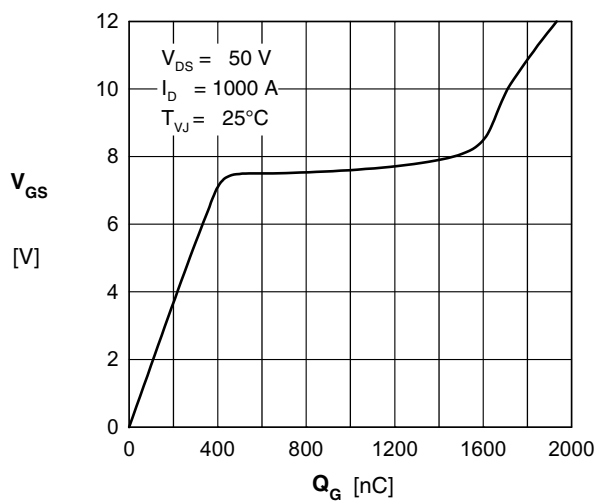


Fig. 10 Typical gate charge characteristic

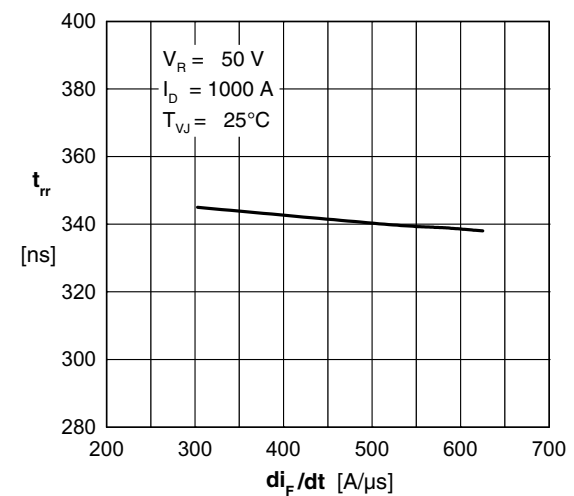


Fig. 11 Typ. reverse recovery time t_{rr} of the body diode versus di/dt

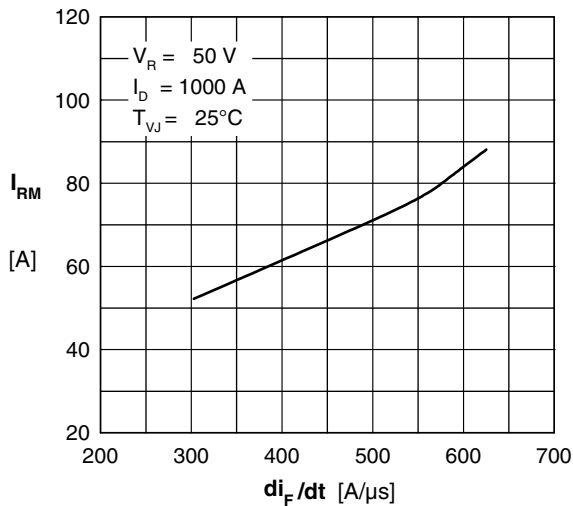


Fig. 13 Typ. reverse recovery current I_{RM} of the body diode versus di/dt

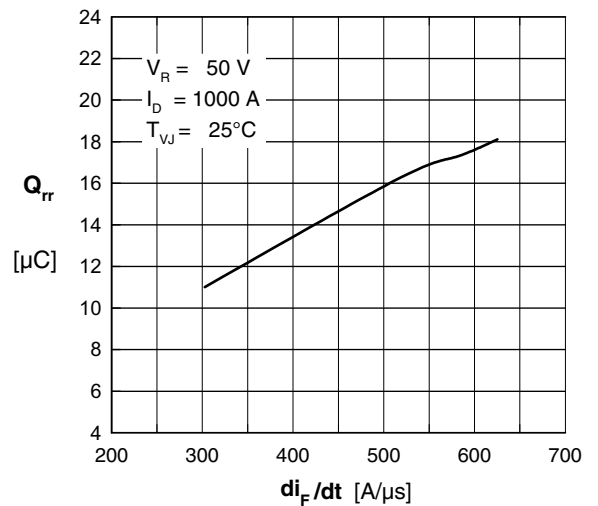


Fig. 14 Typical reverse recovery charge Q_{rr} of the body diode versus di/dt

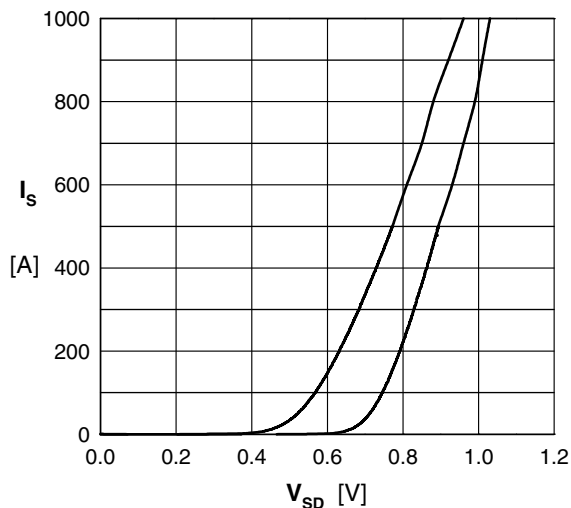


Fig. 15 Source drain current I_F (body diode) vs. typical source drain voltage V_{SD}

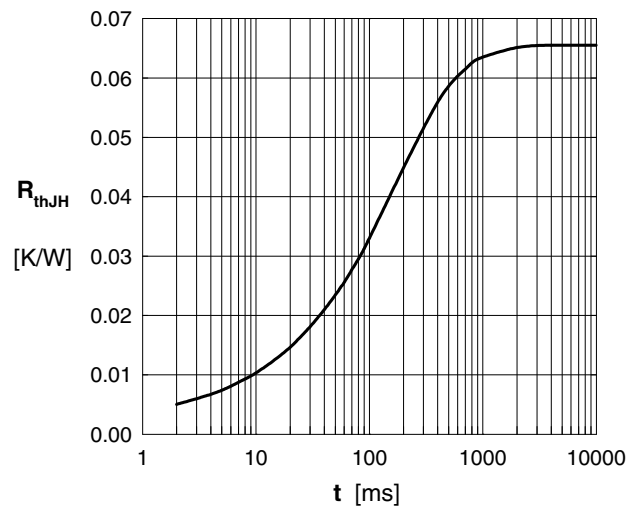


Fig. 16 Typ. transient thermal impedance with heat transfer paste (IXYS test setup)

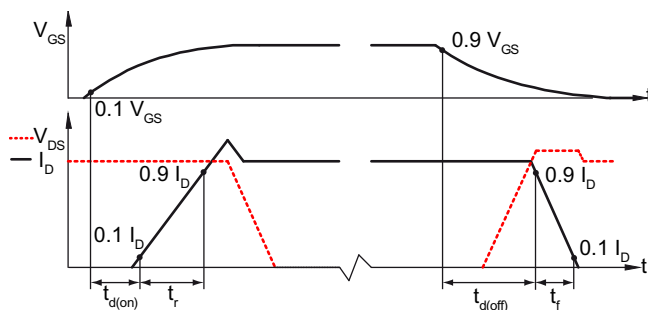


Fig. 17 Definition of switching times