PolarHT™ Module

N-Channel Enhancement Mode

V_{DSS} = 200 V
I_{D80} = 1600 A
$R_{DS(on)}$ = 1.7 mΩ max.
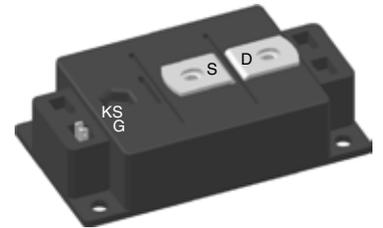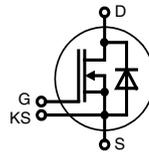
MOSFET			
Symbol	**Conditions**	**Maximum Ratings**	
V_{DSS}	T_{VJ} = 25°C to 150°C	200	V
V_{GS}		± 20	V
I_{D25}	T_C = 25°C	1900	A
I_{D80}	T_C = 80°C	1600	A
I_{F25}	T_C = 25°C (diode)	1900	A
I_{F80}	T_C = 80°C (diode)	1600	A

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		1.58	1.7	mΩ
	T_{VJ} = 125°C		3.25	3.6	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			0.5	mA
	T_{VJ} = 125°C		5.0		mA
I_{GSS}	V_{GS} = ± 20 V; V_{DS} = 0 V			2	µA
Q_g			2900		nC
Q_{gs}	V_{GS} = 10 V; V_{DS} = 0.5·V_{DSS}; I_D = I_{D80}		600		nC
Q_{gd}			1600		nC
$t_{d(on)}$			320		ns
t_r			1220		ns
$t_{d(off)}$	inductive load		620		ns
t_f	V_{GS} = 10 V; V_{DS} = 100 V		700		ns
E_{on}	I_D = 1600 A; R_G = 1.8 Ω T_{VJ} = 25°C		24		mJ
E_{off}			152		mJ
E_{rec}			3.7		mJ
$t_{d(on)}$			340		ns
t_r			1220		ns
$t_{d(off)}$	inductive load		740		ns
t_f	V_{GS} = 10 V; V_{DS} = 100 V		580		ns
E_{on}	I_D = 1600 A; R_G = 1.8 Ω T_{VJ} = 125°C		28		mJ
E_{off}			147		mJ
E_{rec}			4.9		mJ
R_{thJC}				0.03	K/W
R_{thJH}	with heat transfer paste		0.037	0.056	K/W

Features

- PolarHT™ technology
  - low R_{DSon}
  - 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

IXYS reserves the right to change limits, test conditions and dimensions.

20100302b

Source Drain Diode

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

Module

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

Symbol	Conditions		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

IXYS reserves the right to change limits, test conditions and dimensions.

20100302b

Dicke = 0.8
Mutter M6 x5 DIN 970
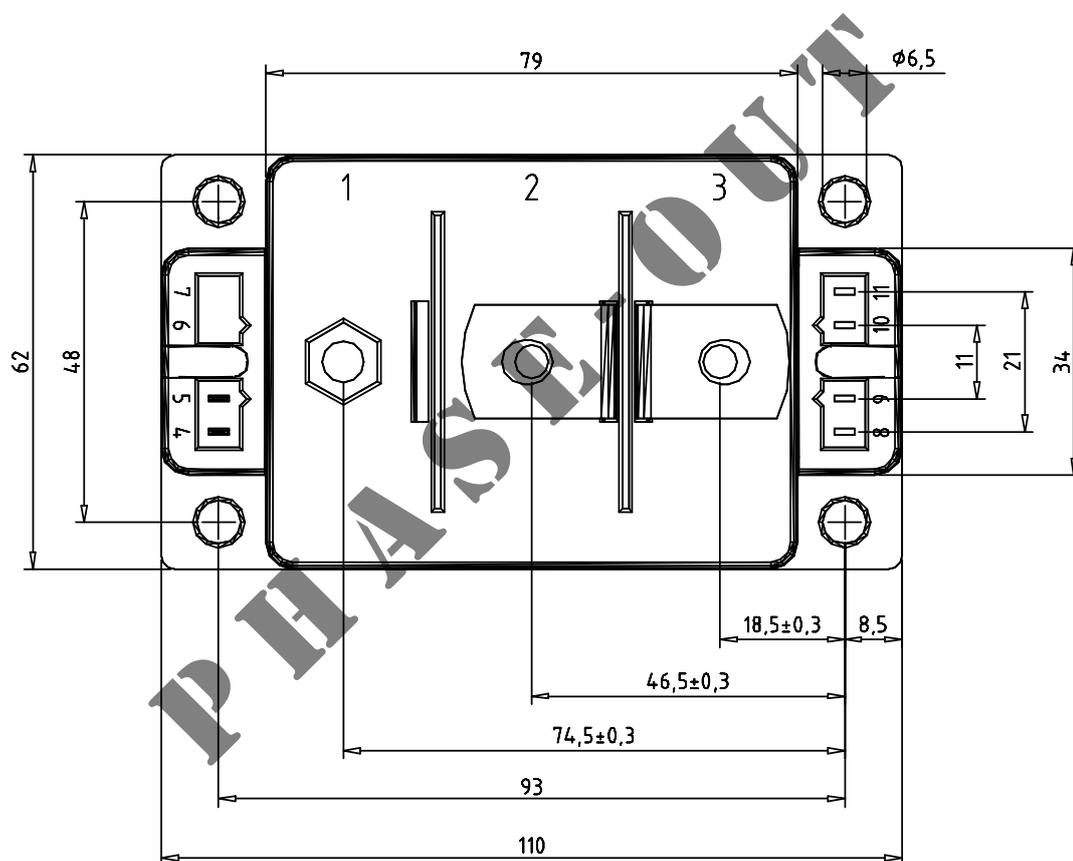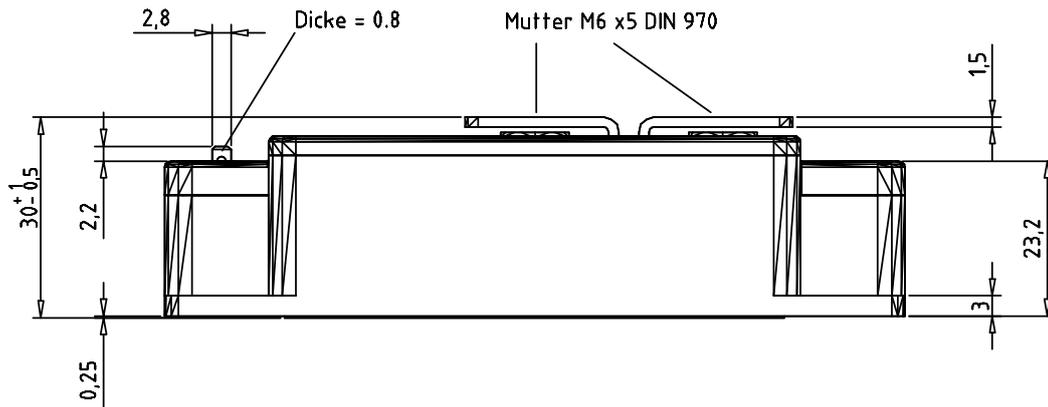
Optional accessories for modules

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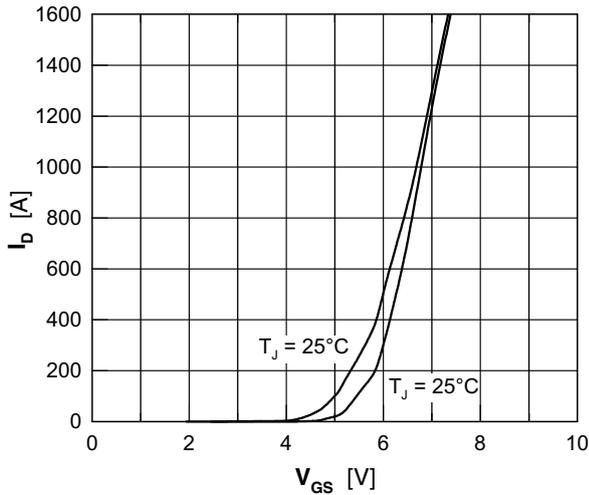 for pins 4 (Gate, yellow wire)
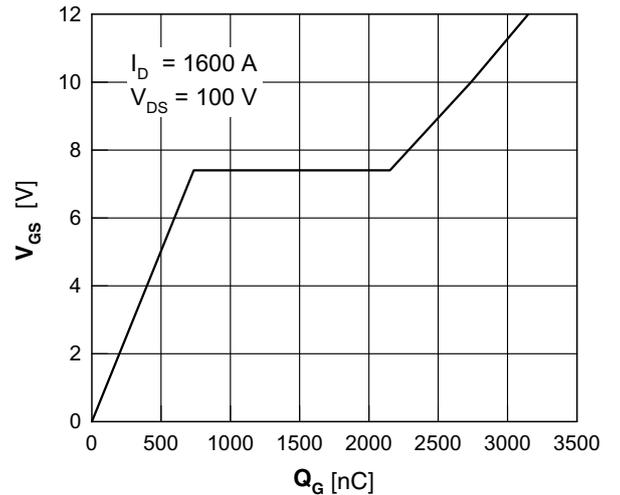 and 5 (Kelvin Source, red wire)

IXYS reserves the right to change limits, test conditions and dimensions.

20100302b

Fig. 1 Typical transfer characteristic

Fig. 2 Typical gate charge characteristic
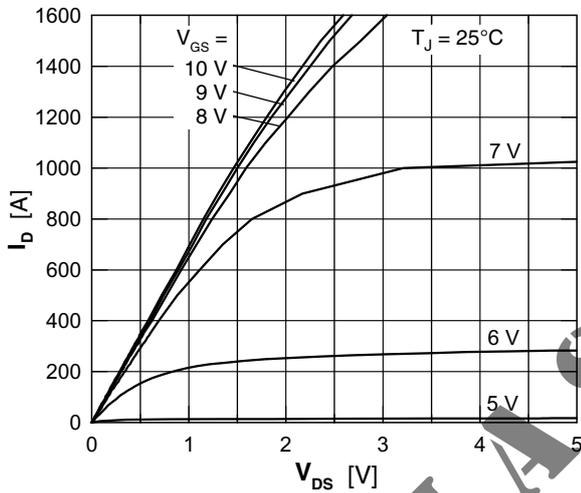
Fig. 3 Typical output characteristic
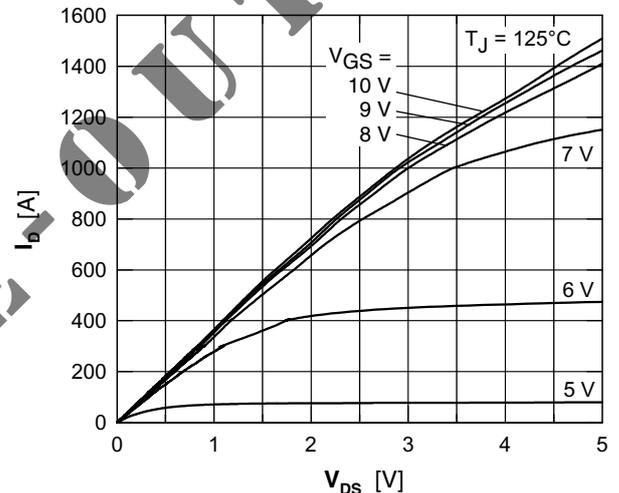
Fig. 4 Typical output characteristic
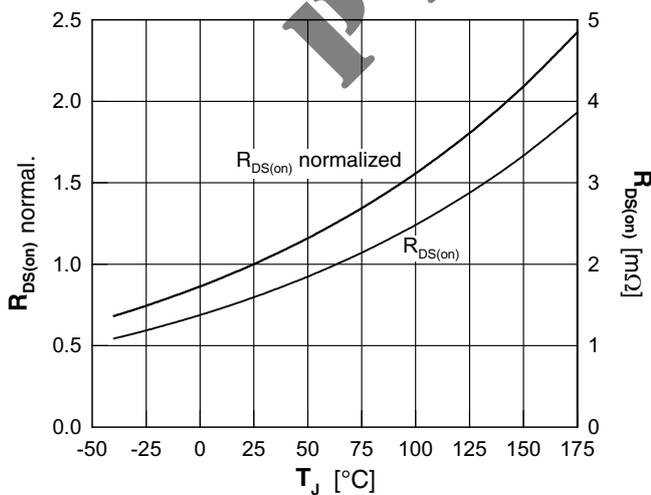
Fig. 5 Typ. drain source on-state resistance $R_{DS(on)}$ versus junction temperature T_{VJ}
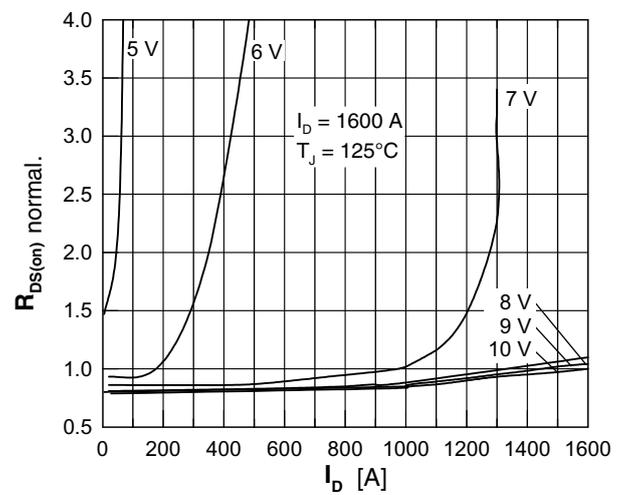
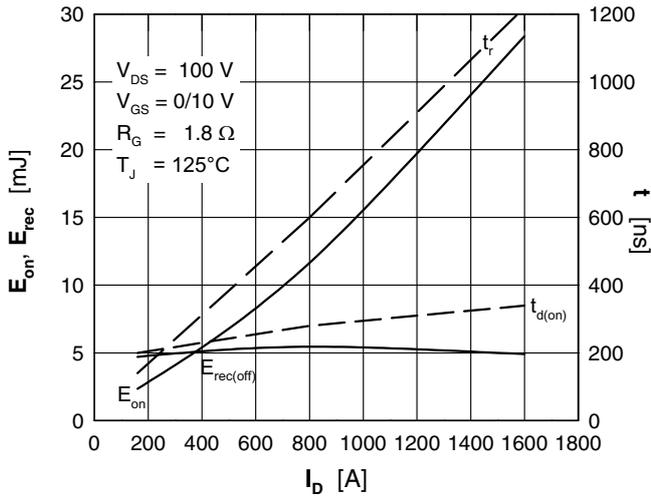Fig. 6 Typ. drain source on-stateresistance $R_{DS(on)}$ versus I_D

IXYS reserves the right to change limits, test conditions and dimensions.

20100302b

Fig.7 Typ. turn-on energy & switching times vs. drain source current, inductive switching
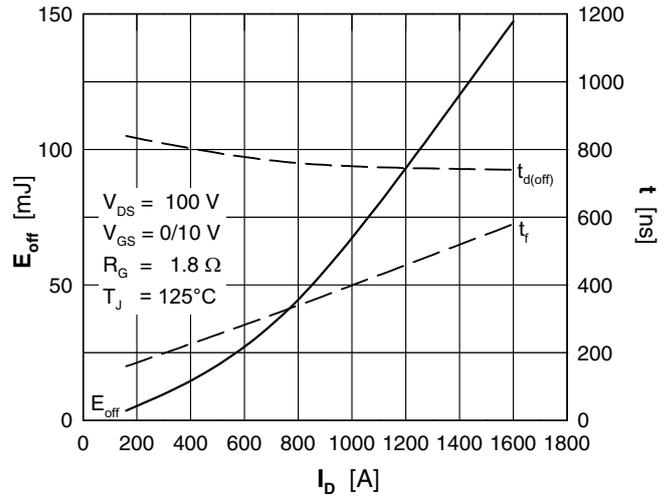
Fig. 8 Typ. turn-off energy & switching times vs. drain source current, inductive switching
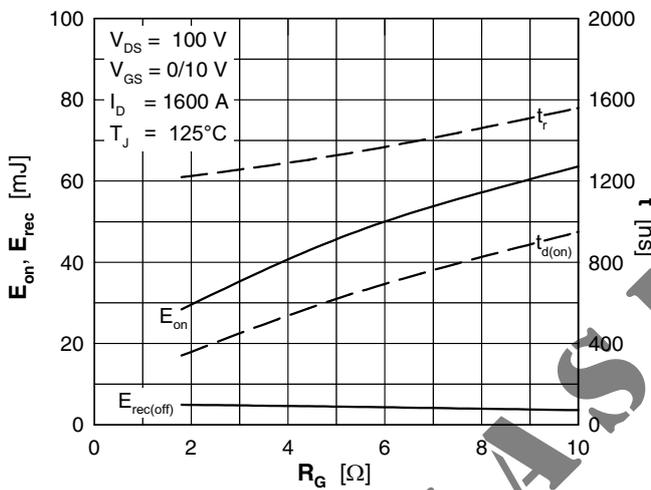

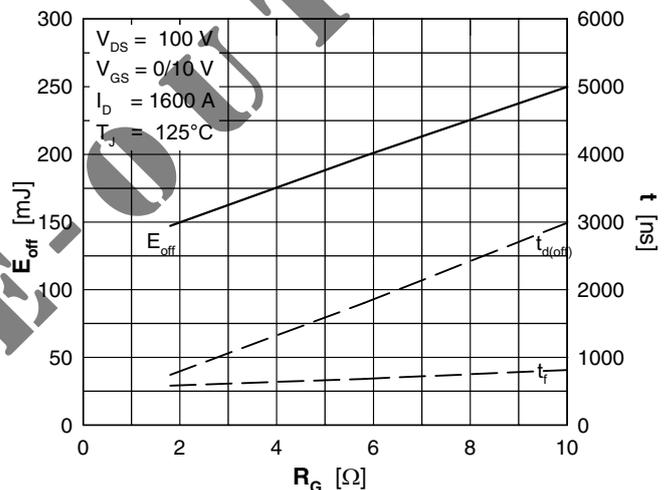Fig. 9 Typ. turn-on energy & switching times vs. gate resistor, inductive switching

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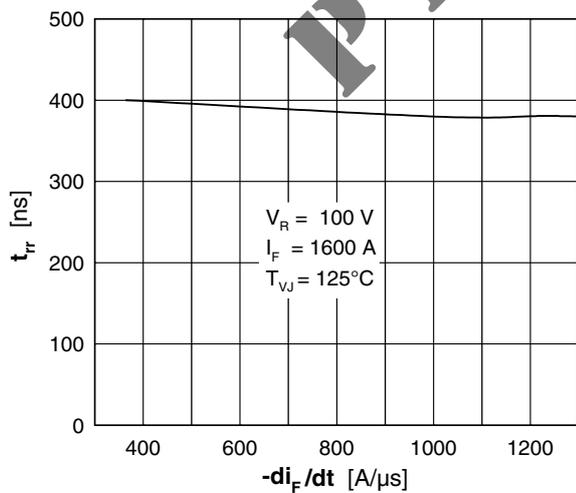

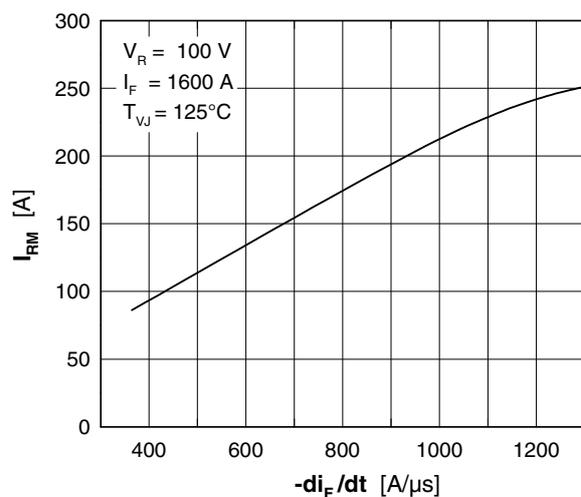Fig.11 Typ. reverse recovery time t_{rr} of the body diode versus di/dt

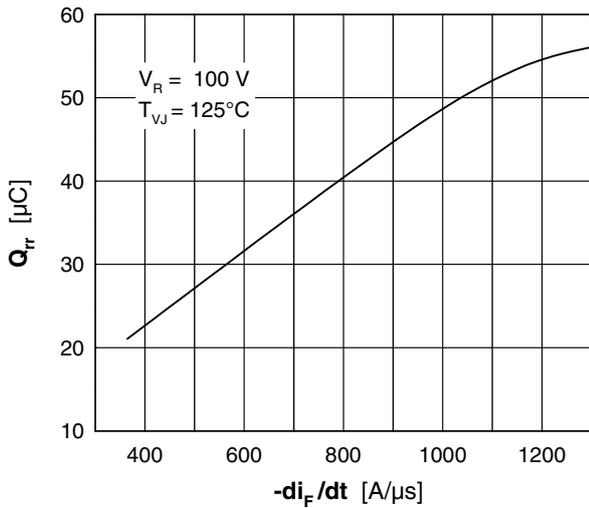Fig. 12 Typ. reverse recovery current I_{RM} of the body diode versus di/dt

IXYS reserves the right to change limits, test conditions and dimensions.

20100302b

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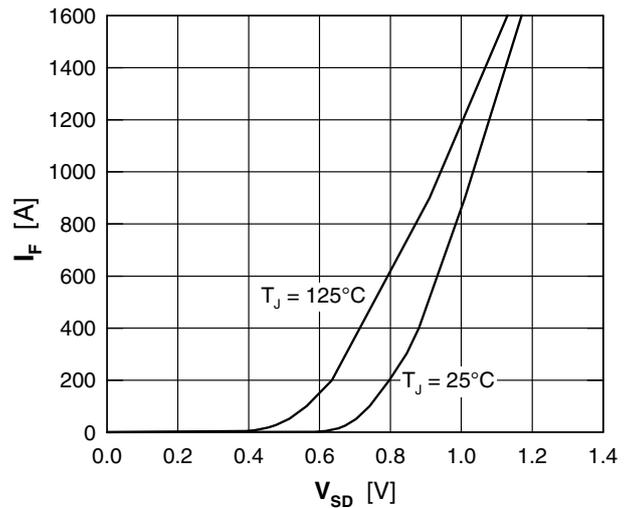

Fig. 14 Source drain current I$_F$ (body diode) vs. typical source drain voltage V$_{SD}$
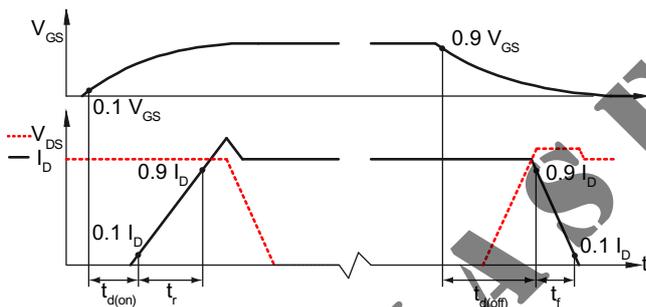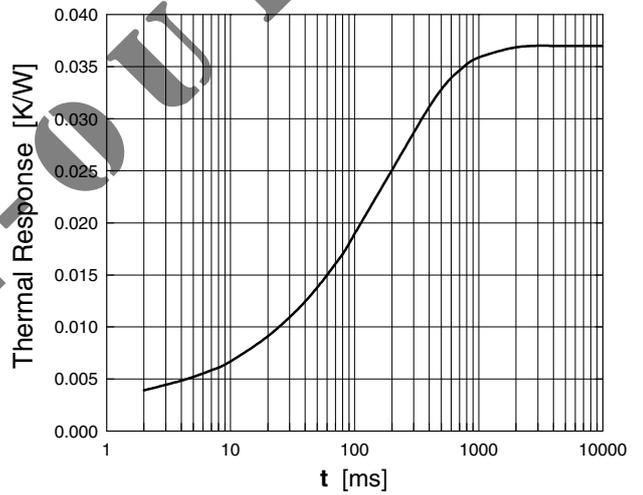

Fig. 15 Definition of switching times

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

IXYS reserves the right to change limits, test conditions and dimensions.

20100302b

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[IXYS](#):
  [VMO1600-02P](#)