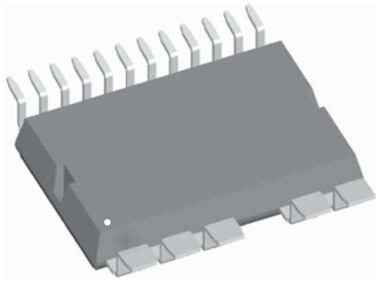
Three phase full Bridge

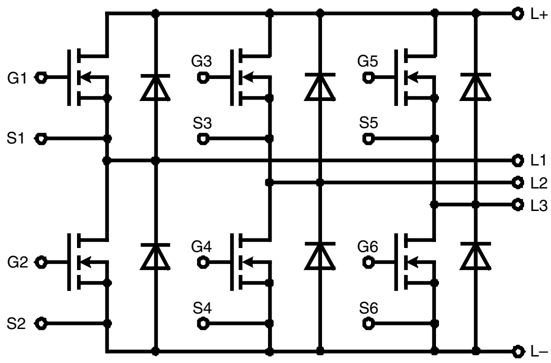
with Trench MOSFETs
in DCB-isolated high-current package

V_{DSS} = 100 V
I_{D25} = 120 A
$R_{DSon\ typ.}$ = 3.2 mΩ

Part number
MTI85W100GC



Surface Mount Device



Features / Advantages:

- MOSFETs in trench technology:
  - low R_{DSon}
  - optimized intrinsic reverse diode
- Package:
  - high level of integration
  - high current capability (300 A max.)
  - aux. terminals for MOSFET control
  - terminals for soldering or welding connections
  - isolated DCB ceramic base plate with optimized heat transfer
- Space and weight savings

Applications:

AC drives
- in automobiles
  - electric power steering
  - starter generator
- in industrial vehicles
  - propulsion drives
  - fork lift drives
- in battery supplied equipment

Package: ISOPLUS-DIL®

- High level of integration
- RoHS compliant
- High current capability
- Aux. Terminals for MOSFET control
- Terminals for soldering or welding connections
- Space and weight savings

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

20150130a

MOSFETs						Ratings		
Symbol	**Definitions**	**Conditions**		**min.**	**typ.**	**max.**	**Unit**
V_{DSS}	*drain source breakdown voltage*		T_{VJ} = 25°C to 150°C			100	V
V_{GS} V_{GSM}	*gate source voltage* *max. transient gate source voltage*					±15 ±20	V V
I_{D25} I_{D90}	*continuous drain current*		T_C = 25°C T_C = 90°C			120 90	A A
I_{F25} I_{F90}	*forward current*		T_C = 25°C T_C = 90°C				A A
$R_{DS(on)}$ [1]	*static drain source on resistance*	on-chip level at I_D = 80 A; V_{GS} = 10 V	T_{VJ} = 25°C T_{VJ} = 125°C		3.2 5.4	4	mΩ mΩ
$V_{GS(th)}$	*gate threshold voltage*	I_D = 150 µA; V_{DS} = V_{GS}	T_{VJ} = 25°C	2.0		3.5	V
I_{DSS}	*drain source leakage current*	V_{DS} = V_{DSS}; V_{GS} = 0 V	T_{VJ} = 25°C T_{VJ} = 125°C		 10	1 100	µA µA
I_{GSS}	*gate source leakage current*	V_{GS} = ±20 V; V_{DS} = 0 V				500	nA
R_G	*gate resistance*	on-chip level					Ω
Q_g Q_{gs} Q_{gd}	*total gate charge* *gate source charge* *gate drain (Miller) charge*	V_{GS} = 10 V; V_{DS} = 50 V; I_D = 80 A			88 30 18		nC nC nC
$t_{d(on)}$ t_r $t_{d(off)}$ t_f E_{on} E_{off} $E_{rec(off)}$	*turn-on delay time* *current rise time* *turn-off delay time* *current fall time* *turn-on energy per pulse* *turn-off energy per pulse* *turn-off reverse recovery losses*	inductive load V_{GS} = 10 V; V_{DS} = 50 V I_D = 80 A; R_G = 39 Ω	T_{VJ} = 125°C		90 55 480 40 130 390 10		ns ns ns ns µJ µJ µJ
R_{thJC}	*thermal resistance junction to case*					1.2	K/W
R_{thCH}	*thermal resistance case to heatsink*	with heat transfer paste (IXYS test setup)			1.5		K/W
		[1] $V_{DS} = I_D \cdot (R_{DS(on)} + 2 \cdot R_{Pin\ to\ Chip})$					
Source-Drain Diode							
V_{SD}	*source drain voltage*	I_F = 80 A; V_{GS} = 0 V	T_{VJ} = 25°C		0.9	1.2	V
Q_{RM} I_{RM} t_{rr}	*reverse recovery charge* *max. reverse recovery current* *reverse recovery time*	V_R = 50 V; I_F = 80 A; R_G = 39 Ω di/dt = 1500 A/µs	T_{VJ} = 125°C		1.3 44 45		µC A ns

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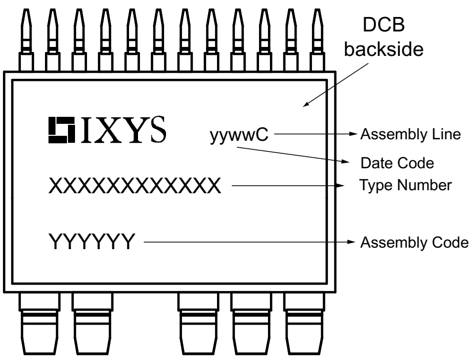
Package ISOPLUS-DIL®				Ratings			
Symbol	**Definitions**	**Conditions**		**min.**	**typ.**	**max.**	**Unit**
I_{RMS}	*RMS current*	per pin in main current paths (P+, N–, L1, L2, L3) may be additionally limited by external connections 2 pins for output L1, L2, L3				300	A
T_{stg}	*storage temperature*			-55		125	°C
T_{VJM}	*virtual junction temperature*			-55		175	°C
V_{ISOL}	*isolation voltage*	t = 1 second	50/60 Hz, RMS, $I_{ISOL} \le 1$ mA	1200			V
		t = 1 minute		1000			V
$R_{pin\text{-}chip}$	*resistance terminal to chip*	$V_{DS} = I_D \cdot (R_{DS(on)} + 2 \cdot R_{pin\ to\ chip})$			0.6		mΩ
C_P	*coupling capacity*	between shorted pins and back side metallization			160		pF
F_C	*mounting force with clip*			50		250	N
Weight					25		g



Part number

M = Module
T = Trench MOSFET
I = Infineon Trench
145 = Current Rating [A]
W = 6-Pack
100 = Reverse Voltage [V]
GC = ISOPLUS-DIL

Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Ordering Code
Standard	MTI85W100GC	MTI85W100GC	Blister	28	513341

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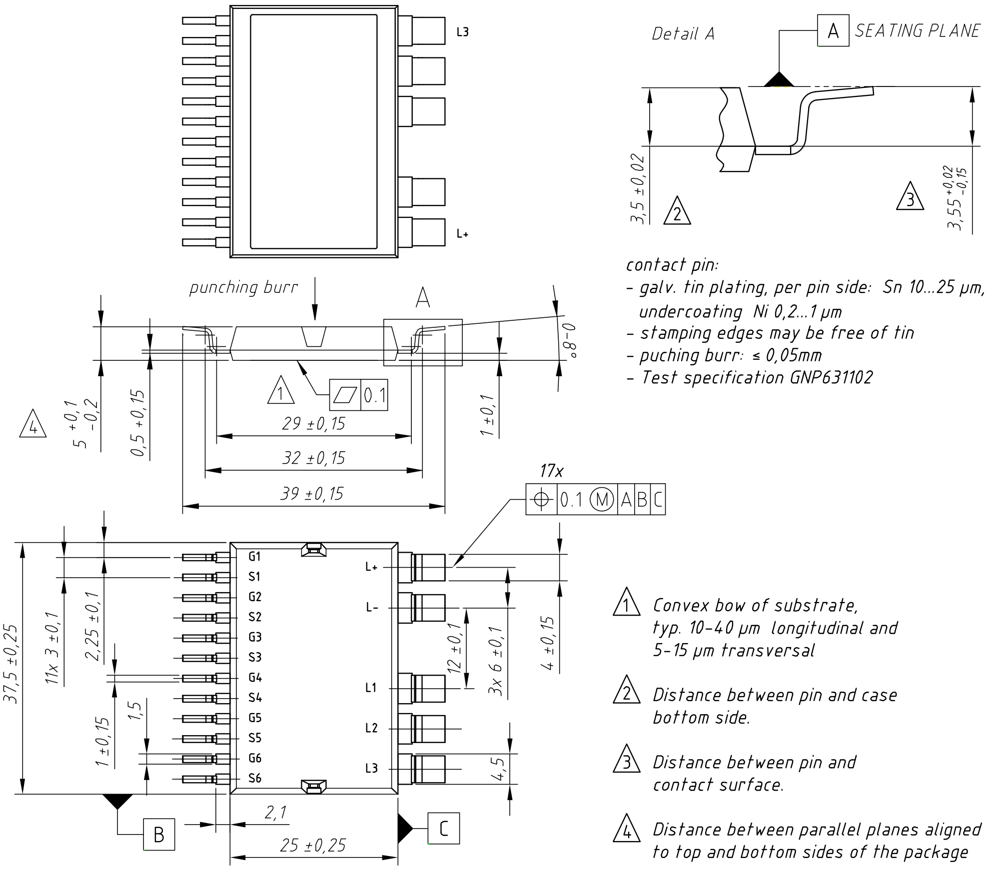
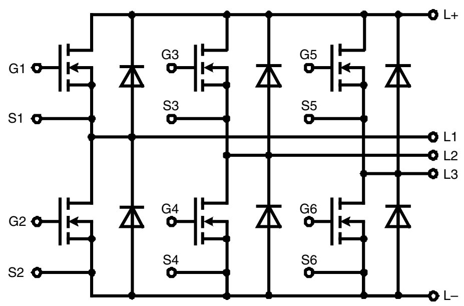
Outlines ISOPLUS-DIL®





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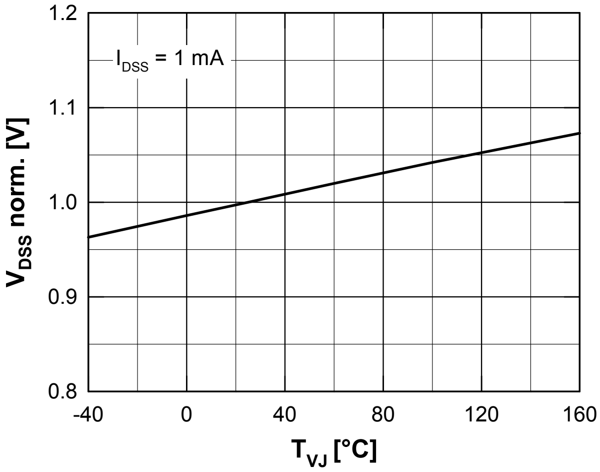

Fig. 1 Drain source breakdown voltage V_{DSS} vs. junction temperature T_{VJ}

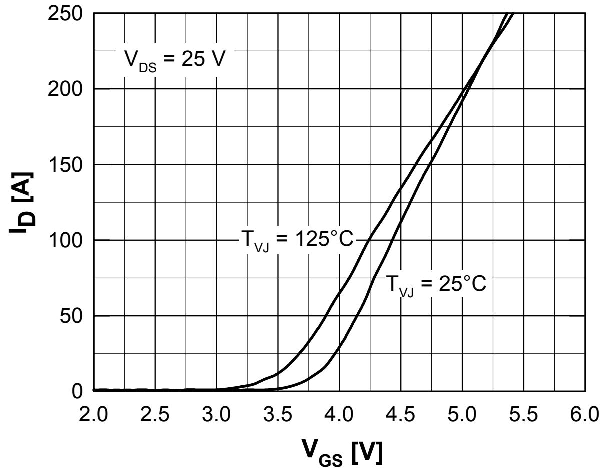

Fig. 2 Typ. transfer characteristics

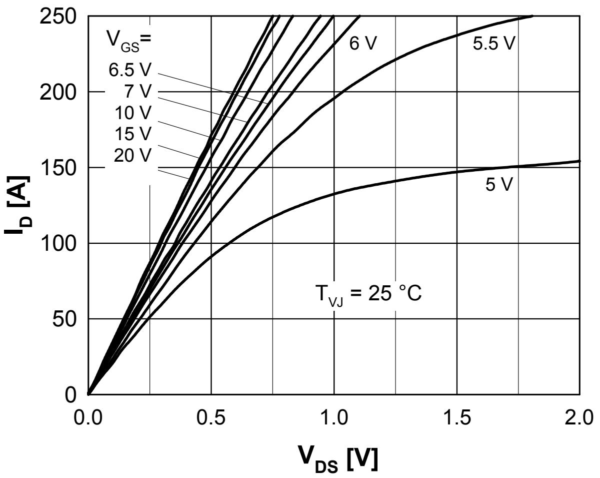

Fig. 3 Typ. output characteristics (25 °C)

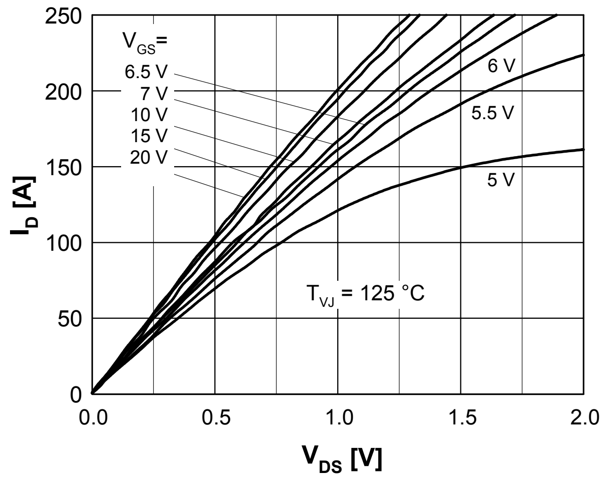

Fig. 4 Typ. output characteristics (125 °C)

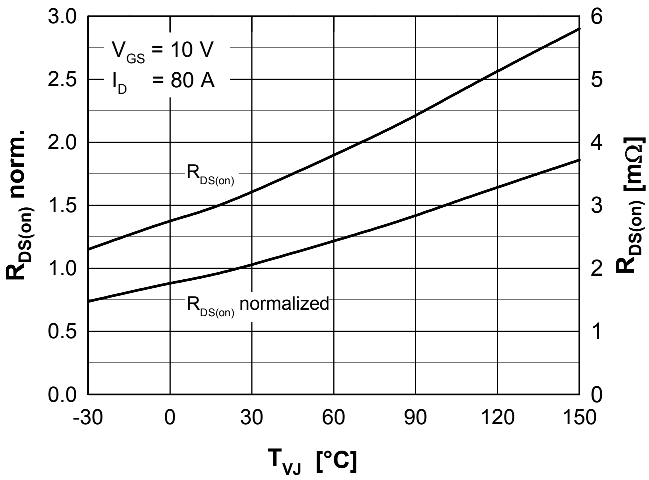

Fig. 5 Drain source on-state resistance versus junction temperature

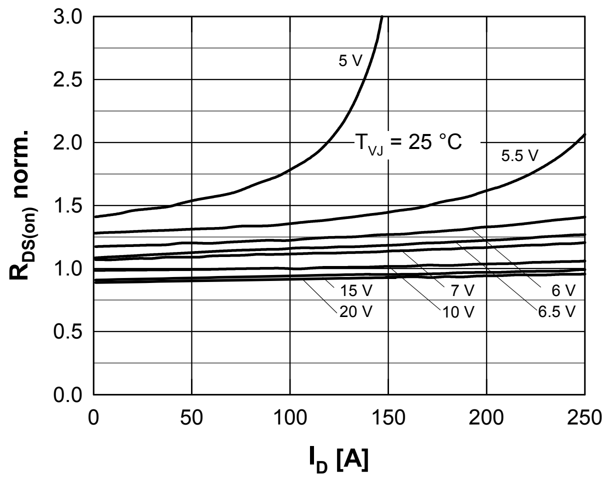

Fig. 6 Drain source on-state resistance versus I_D

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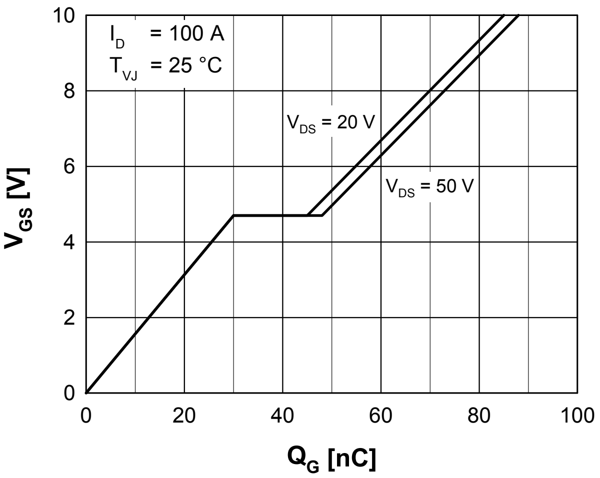

Fig. 7 Typical turn on gate charge

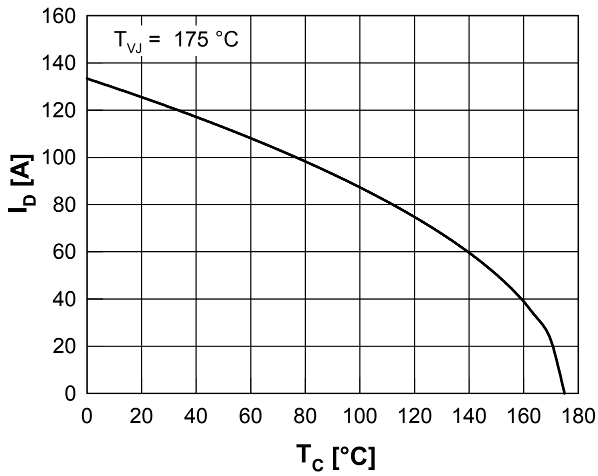

Fig. 8 Drain current I_D vs. case temperature T_C (chip capability)

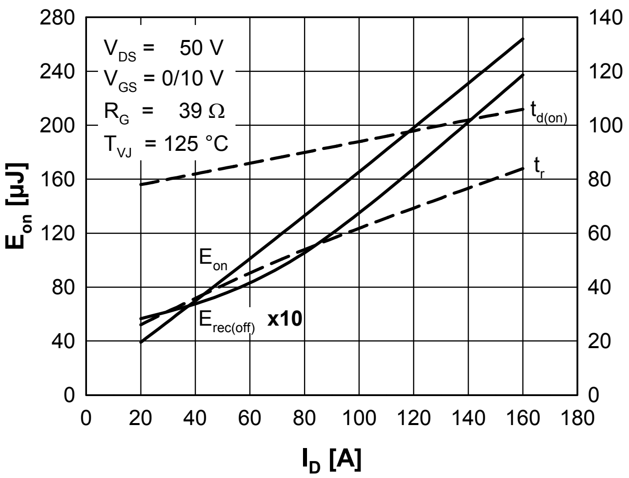

Fig. 9 Typ. turn-on energy and switching times versus drain current, inductive switching

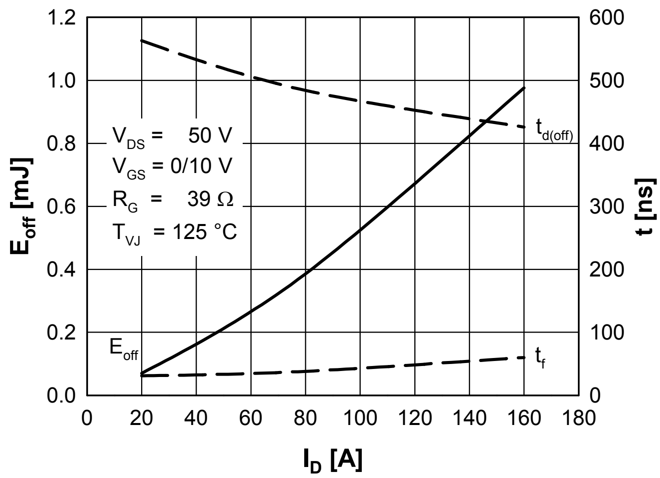

Fig. 10 Typ. turn-off energy and switching times versus drain-current, inductive switching

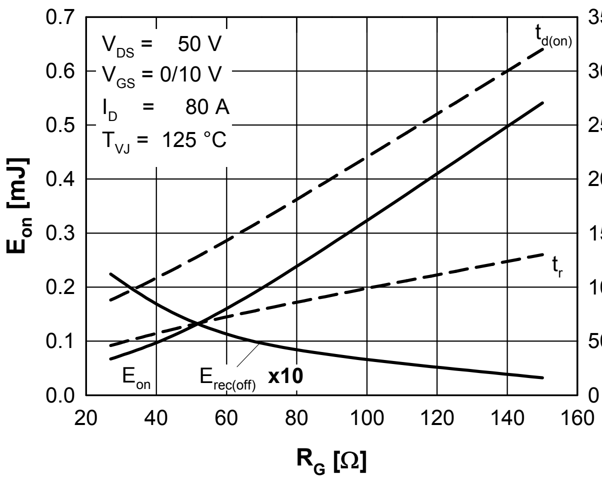

Fig. 11 Typ. turn-on energy and switching times versus gate resistor, inductive switching

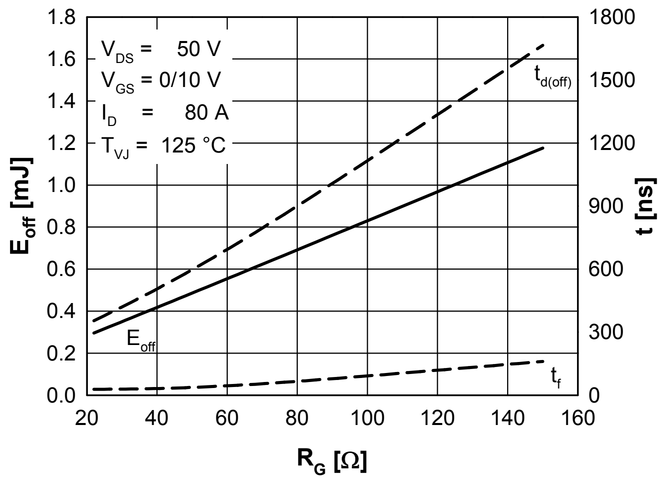

Fig. 12 Typ. turn-off energy and switching times versus gate resistor, inductive switching

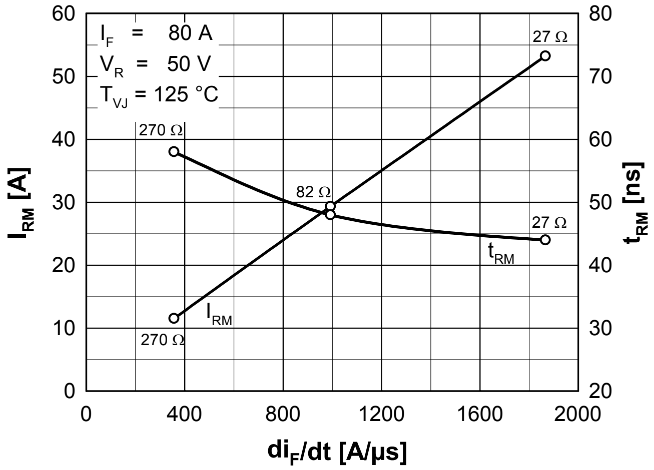

Fig. 13 Reverse recovery time t_{RM} of the body diode vs. di_F/dt

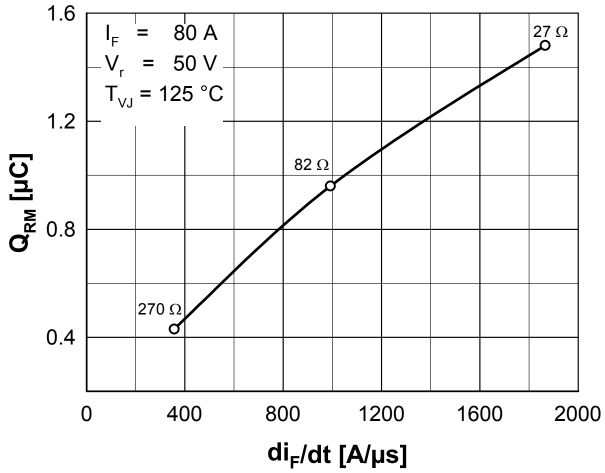

Fig. 14 Reverse recovery charge Q_{RM} of the body diode vs. di_F/dt

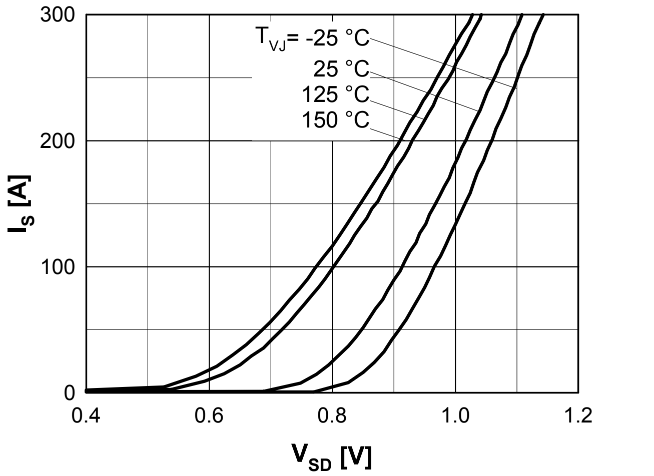

Fig.15 Source current I_S vs. source drain voltage V_{SD} (body diode)

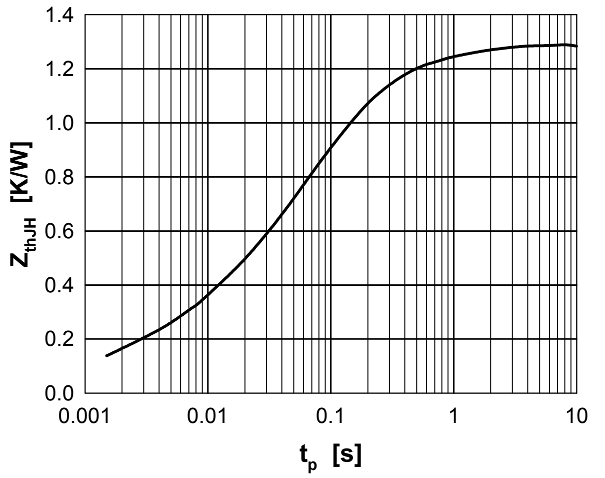

Fig. 16 Typ. thermal impedance junction to heatsink Z_{thJH} with heat transfer paste (IXYS test setup)

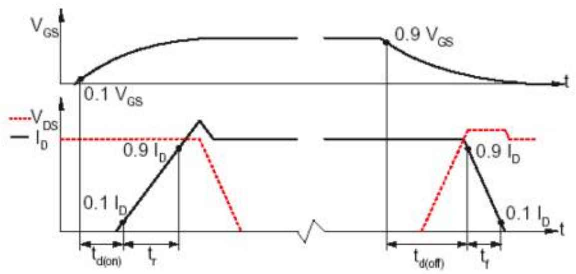

Fig. 17 Definition of switching times