

## Excellent Integrated System Limited

Stocking Distributor

Click to view price, real time Inventory, Delivery & Lifecycle Information:

[IXYS Corporation](#)  
[GWM180-004X2-SL](#)

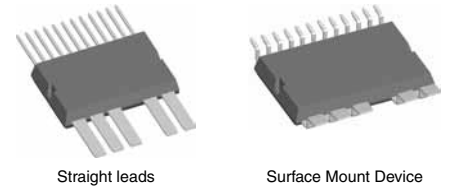
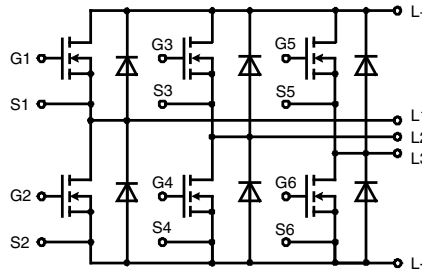
For any questions, you can email us directly:  
[sales@integrated-circuit.com](mailto:sales@integrated-circuit.com)

**IXYS** **GWM 180-004X2**

**Three phase full Bridge**  
 with Trench MOSFETs  
 in DCB isolated high current package

$V_{DSS} = 40\text{ V}$   
 $I_{D25} = 180\text{ A}$   
 $R_{DSon\ typ.} = 1.9\text{ m}\Omega$

Preliminary data



MOSFETs		Maximum Ratings	
Symbol	Conditions		
$V_{DSS}$	$T_J = 25^\circ\text{C to } 150^\circ\text{C}$	40	V
$V_{GS}$		$\pm 20$	V
$I_{D25}$	$T_C = 25^\circ\text{C}$	180	A
$I_{D90}$	$T_C = 90^\circ\text{C}$	136	A
$I_{D110}$	$T_C = 110^\circ\text{C}$	120	A
$I_{F25}$	$T_C = 25^\circ\text{C}$ (diode)	182	A
$I_{F90}$	$T_C = 90^\circ\text{C}$ (diode)	112	A
$I_{F110}$	$T_C = 110^\circ\text{C}$ (diode)	88	A

**Applications**

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

**Features**

- 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

Symbol	Conditions	Characteristic Values				
		min.	typ.	max.		
$(T_J = 25^\circ\text{C, unless otherwise specified})$						
$R_{DSon}^{1)}$	on chip level at $V_{GS} = 10\text{ V}; I_D = 100\text{ A}$		1.9 2.8	2.5	$\text{m}\Omega$ $\text{m}\Omega$	
$V_{GS(th)}$	$V_{DS} = 20\text{ V}; I_D = 1\text{ mA}$	2.5		4.5	V	
$I_{DSS}$	$V_{DS} = V_{DSS}; V_{GS} = 0\text{ V}$		50	5	$\mu\text{A}$ $\mu\text{A}$	
$I_{GSS}$	$V_{GS} = \pm 20\text{ V}; V_{DS} = 0\text{ V}$			0.2	$\mu\text{A}$	
$Q_g$ $Q_{gs}$ $Q_{gd}$	$V_{GS} = 10\text{ V}; V_{DS} = 20\text{ V}; I_D = 100\text{ A}$		110 33 30		nC nC nC	
$t_{d(on)}$ $t_r$ $t_{d(off)}$ $t_f$		inductive load $V_{GS} = +10/0\text{ V}; V_{DS} = 24\text{ V}$ $I_D = 135\text{ A}; R_G = 39\ \Omega;$ $T_J = 125^\circ\text{C}$		150 240 350 170		ns ns ns ns
$E_{on}$ $E_{off}$ $E_{recoff}$				0.12 0.51 0.003		mJ mJ mJ
$R_{thJC}$ $R_{thJH}$	with heat transfer paste (IXYS test setup)			1.3	1.0 1.6	K/W K/W

<sup>1)</sup>  $V_{DS} = I_D \cdot (R_{DS(on)} + R_{Pin\ to\ Chip})$

Recommended replacement for the SMD type: MTI150W40GC

**Source-Drain Diode**

Symbol	Conditions	Characteristic Values			
		min.	typ.	max.	
(T <sub>J</sub> = 25°C, unless otherwise specified)					
V <sub>SD</sub>	(diode) I <sub>F</sub> = 100 A; V <sub>GS</sub> = 0 V		0.9	1.2	V
t <sub>rr</sub>	I <sub>F</sub> = 100 A; -di <sub>F</sub> /dt = 600 A/μs V <sub>R</sub> = 15 V; T <sub>VJ</sub> = 125°C		38		ns
Q <sub>RM</sub>			0.31		μC
I <sub>RM</sub>			14		A

**Component**

Symbol	Conditions	Maximum Ratings	
I <sub>RMS</sub>	per pin in main current paths (P+, N-, L1, L2, L3) may be additionally limited by external connections	300	A
T <sub>J</sub>		-55...+175	°C
T <sub>stg</sub>		-55...+125	°C
V <sub>ISOL</sub>	I <sub>ISOL</sub> ≤ 1 mA, 50/60 Hz, f = 1 minute	1000	V~
F <sub>C</sub>	mounting force with clip	50 - 250	N

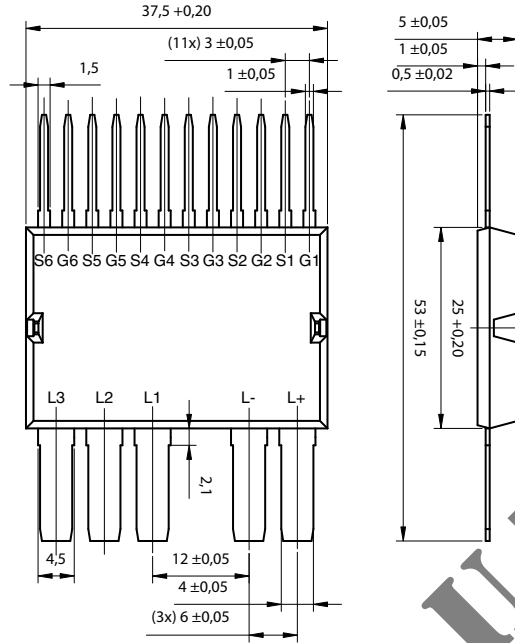
Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
R <sub>pin to chip</sub> <sup>1)</sup>	L+ to L1/L2/L3 or L- to L1/L2/L3		1.0	mΩ
C <sub>P</sub>	coupling capacity between shorted pins and mounting tab in the case		160	pF
Weight			25	g

<sup>1)</sup> V<sub>DS</sub> = I<sub>D</sub> · (R<sub>DS(on)</sub> + R<sub>Pin to Chip</sub>)

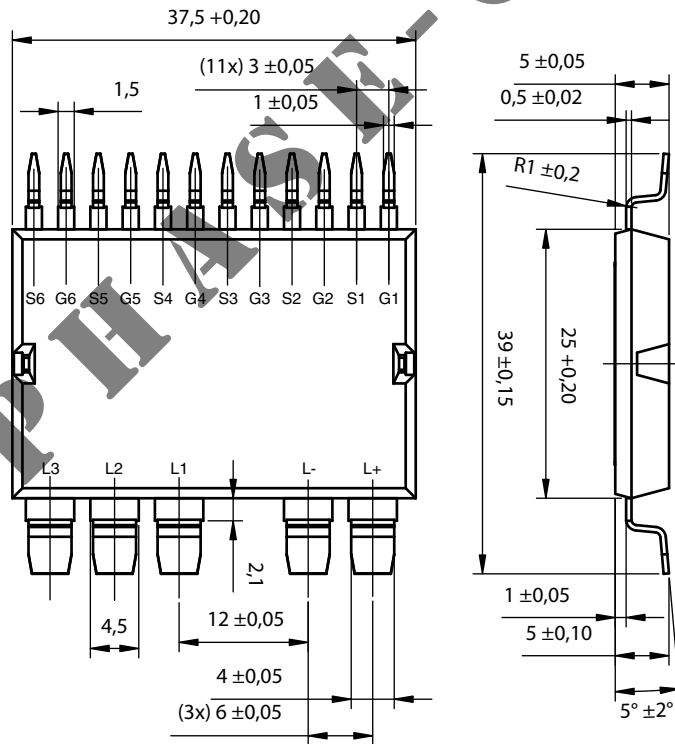
PHASEROUT

**IXYS** **GWM 180-004X2**

**Straight Leads GWM 180-004X2-SL**



**Surface Mount Device GWM 180-004X2-SMD**



Leads	Ordering	Part Name & Packing Unit Marking	Part Marking	Delivering Mode	Base Qty.	Ordering Code
Straight	Standard	GWM 180-004X2 - SL	GWM 180-004X2	Blister	28	508 772
SMD	Standard	GWM 180-004X2 - SMD	GWM 180-004X2	Blister	28	508 786

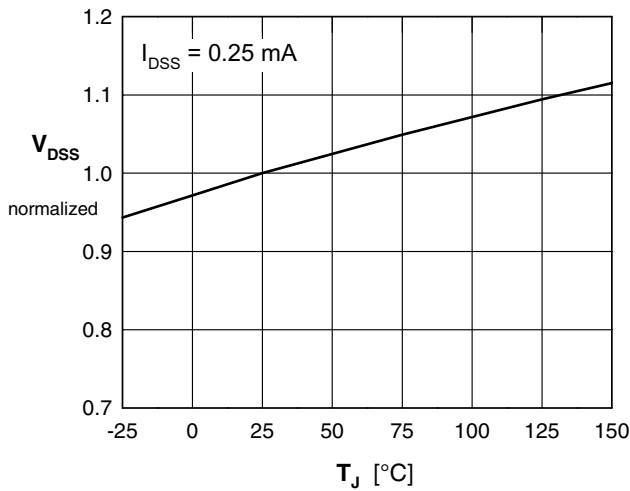


Fig. 1 Drain source breakdown voltage  $V_{DSS}$  versus junction temperature  $T_{VJ}$

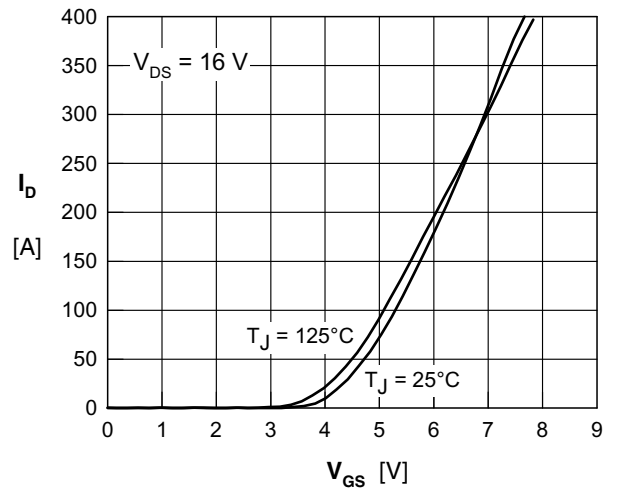


Fig. 2 Typical transfer characteristic

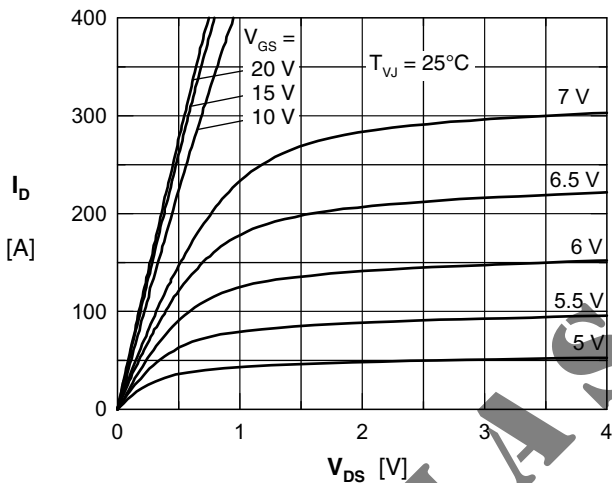


Fig. 3 Typical output characteristic

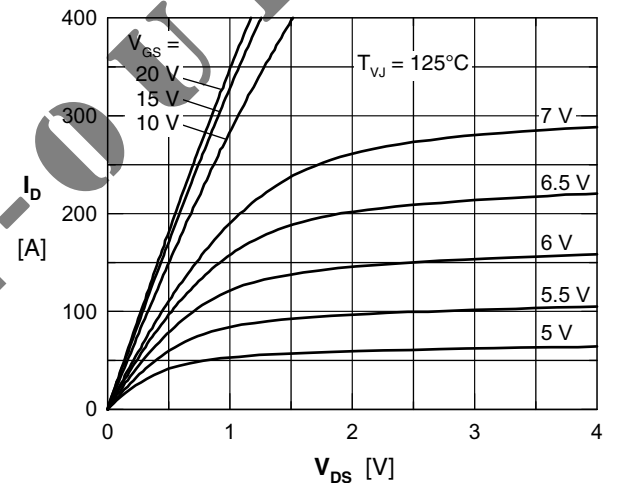


Fig. 4 Typical output characteristic

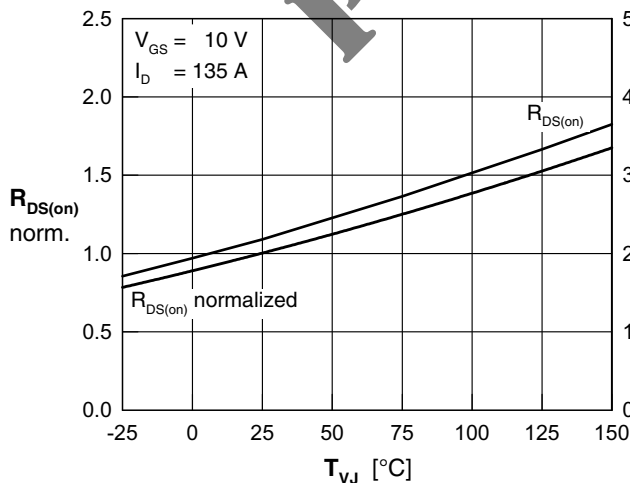


Fig. 5 Typ. drain source on-state resistance  $R_{DS(on)}$  versus junction temperature  $T_J$

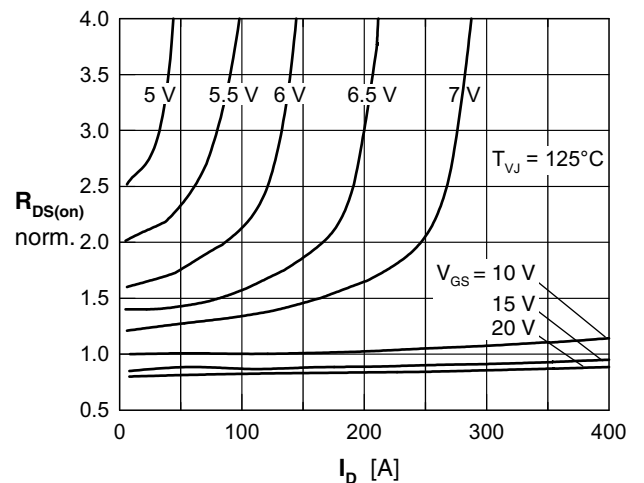


Fig. 6 Typ. drain source on-state resistance  $R_{DS(on)}$  versus  $I_b$

**IXYS** **GWM 180-004X2**

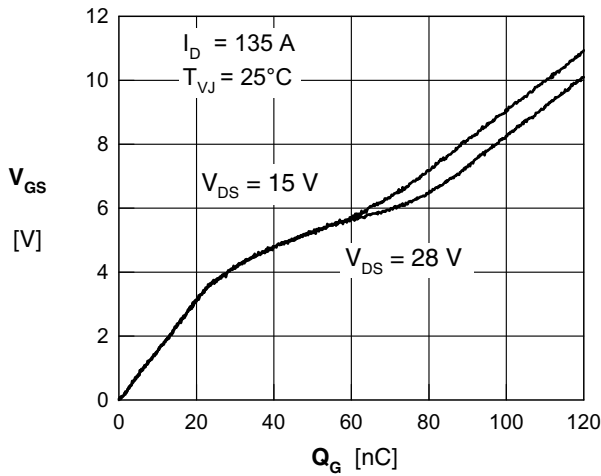


Fig. 7 Gate charge characteristics

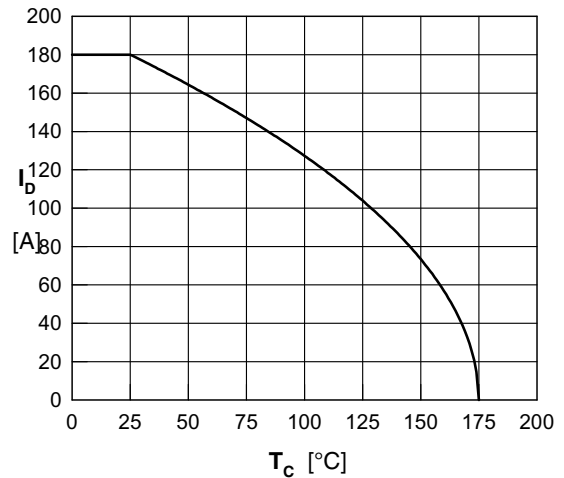


Fig. 8 Drain current  $I_D$  vs. temperature  $T_C$

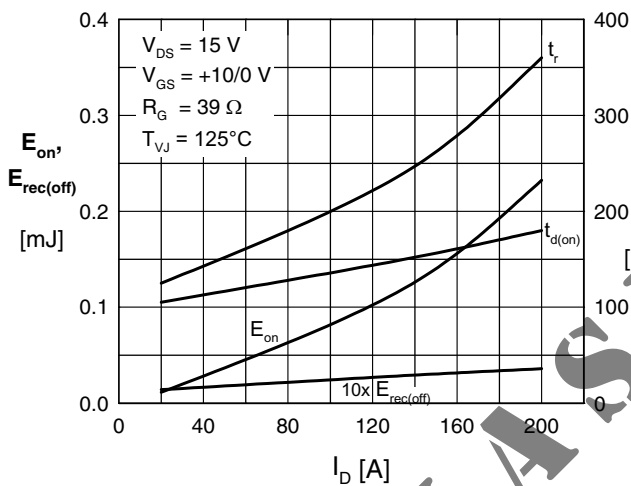


Fig. 9 Typ. turn-on energy & switching times vs. collector current, inductive switching

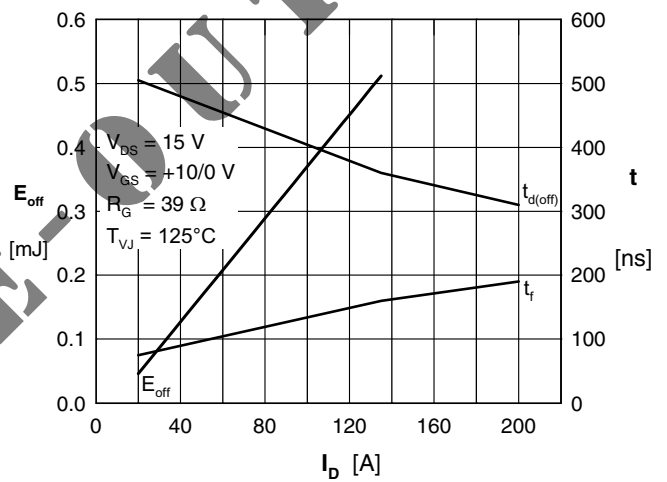


Fig. 10 Typ. turn-off energy & switching times vs. collector current, inductive switching

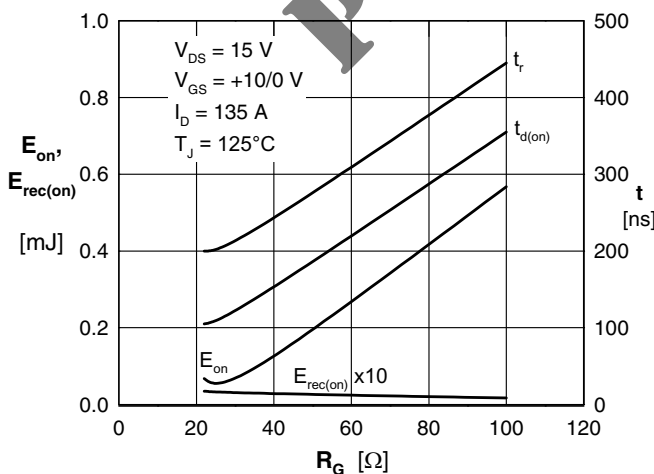


Fig. 11 Typ. turn-on energy & switching times vs. gate resistor, inductive switching

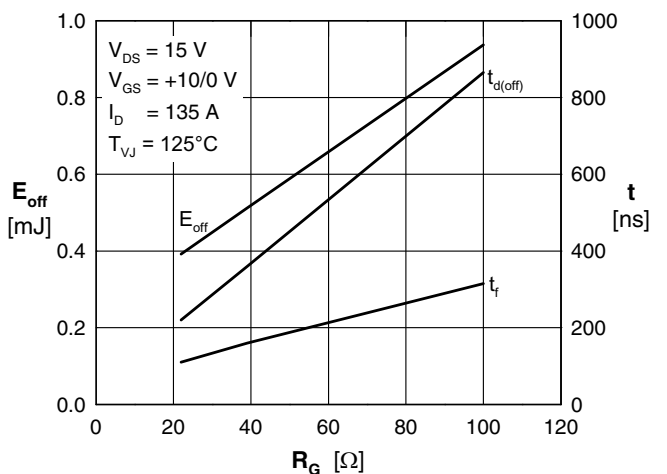


Fig. 12 Typ. turn-off energy & switching times vs. gate resistor, inductive switching

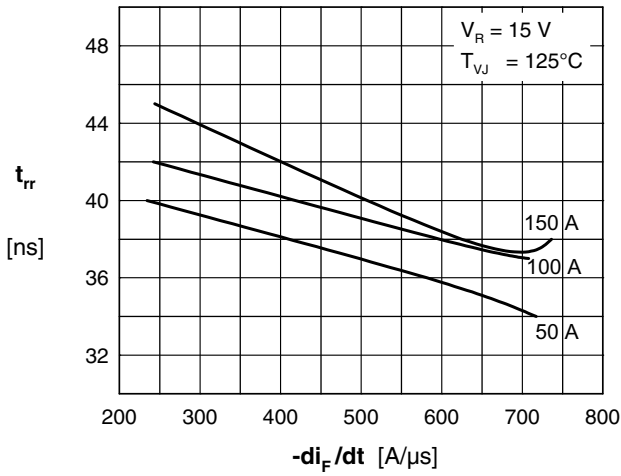


Fig. 13 Reverse recovery time  $t_{rr}$  of the body diodes vs.  $di/dt$

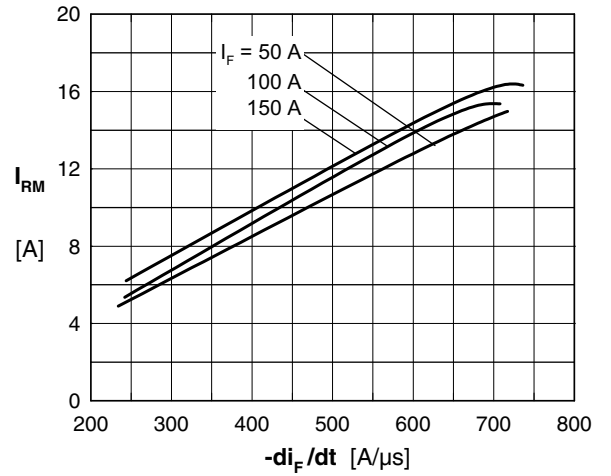


Fig. 14 Reverse recovery current  $I_{RM}$  of the body diodes versus  $di/dt$

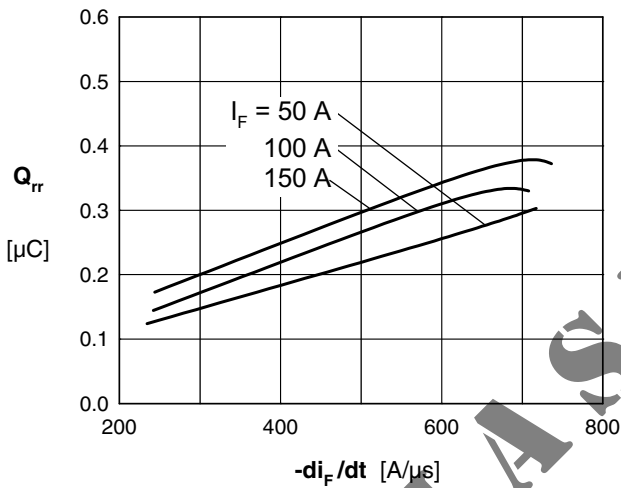


Fig. 15 Reverse recovery charge  $Q_{rr}$  of the body diodes versus  $di/dt$

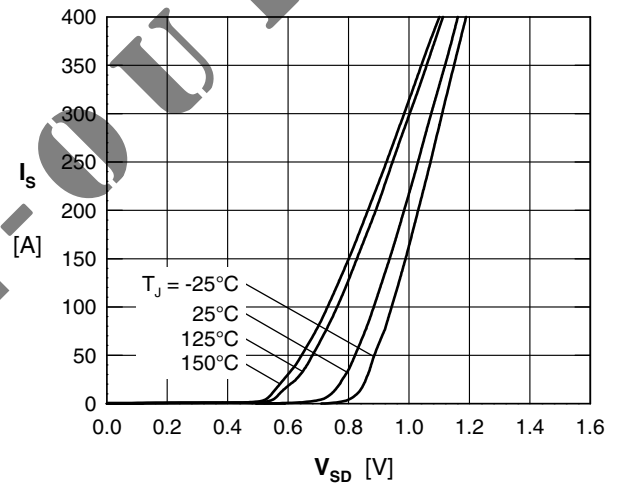


Fig. 16 Source current  $I_s$  versus source drain voltage  $V_{SD}$  (body diode)

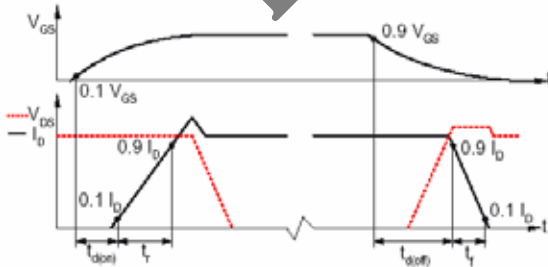


Fig. 17 Definition of switching times