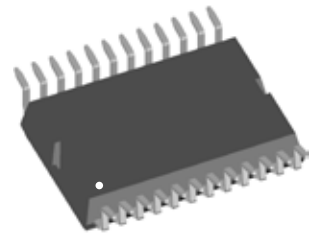
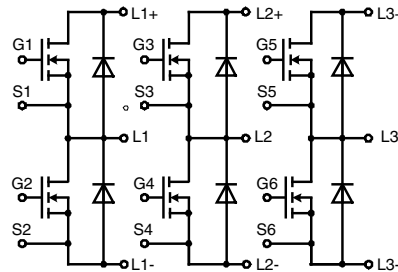


Three phase full Bridge with Trench MOSFETs in DCB isolated high current package

$$\begin{aligned}
 V_{DSS} &= 150 \text{ V} \\
 I_{D25} &= 50 \text{ A} \\
 R_{DSon \text{ typ.}} &= 19 \text{ m}\Omega
 \end{aligned}$$

Preliminary Data



MOSFETs			
Symbol	Conditions	Maximum Ratings	
V_{DSS}	$T_{VJ} = 25^{\circ}\text{C}$ to 150°C	150	V
V_{GS}	continous	± 15	V
	transient	± 20	V
I_{D25}	$T_C = 25^{\circ}\text{C}$	50	A
I_{D90}	$T_C = 90^{\circ}\text{C}$	38	A
I_{D110}	$T_C = 110^{\circ}\text{C}$	33	A
I_{F25}	$T_C = 25^{\circ}\text{C}$ (diode)	150	A
I_{F90}	$T_C = 90^{\circ}\text{C}$ (diode)	85	A
I_{F110}	$T_C = 110^{\circ}\text{C}$ (diode)	65	A

Symbol	Conditions	Characteristic Values ($T_{VJ} = 25^{\circ}\text{C}$, unless otherwise specified)			
		min.	typ.	max.	
$R_{DSon}^{1)}$	on chip level at $V_{GS} = 10 \text{ V}$; $I_D = 38 \text{ A}$		19	24	$\text{m}\Omega$
			38		$\text{m}\Omega$
$V_{GS(th)}$	$V_{DS} = 20 \text{ V}$; $I_D = 1 \text{ mA}$	2.5		4.5	V
I_{DSS}	$V_{DS} = V_{DSS}$; $V_{GS} = 0 \text{ V}$		0.5	5	μA
	$T_{VJ} = 25^{\circ}\text{C}$				mA
	$T_{VJ} = 125^{\circ}\text{C}$				
I_{GSS}	$V_{GS} = \pm 20 \text{ V}$; $V_{DS} = 0 \text{ V}$			0.2	μA
Q_g	$V_{GS} = 10 \text{ V}$; $V_{DS} = 75 \text{ V}$; $I_D = 38 \text{ A}$		97		nC
Q_{gs}			29		nC
Q_{gd}			30		nC
C_{iss}	$V_{GS} = 10 \text{ V}$; $V_{DS} = 25 \text{ V}$; $f = 1 \text{ MHz}$		5800		pF
C_{oss}			490		pF
C_{rss}			85		pF
$t_{d(on)}$	inductive load $V_{GS} = 10 \text{ V}$; $V_{DS} = 75 \text{ V}$ $I_D = 38 \text{ A}$; $R_{G(on)} = 39 \Omega$; $R_{G(off)} = 4.7 \Omega$ $T_J = 125^{\circ}\text{C}$		120		ns
t_r			50		ns
$t_{d(off)}$			100		ns
t_f			25		ns
E_{on}			0.25		mJ
E_{off}			0.05		mJ
E_{recoff}			0.02		mJ
R_{thJC}	with heat transfer paste (IXYS test setup)		1.3	1.0	K/W
R_{thJH}				1.6	K/W

¹⁾ $V_{DS} = I_D \cdot (R_{DS(on)} + 2R_{Pin \text{ to Chip}})$

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

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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
 - aux. terminals for MOSFET control
 - terminals for soldering or welding connections
 - isolated DCB ceramic base plate with optimized heat transfer
- Space and weight savings

Source-Drain Diode

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
V_{SD}	(diode) $I_F = 38\text{ A}$; $V_{GS} = 0\text{ V}$		0.85	1.0
t_{rr}	$I_F = 38\text{ A}$; $-di_F/dt = 900\text{ A}/\mu\text{s}$; $R_{G(on)} = 39\ \Omega$; $V_R = 75\text{ V}$; $T_{VJ} = 125^\circ\text{C}$		65	ns
Q_{RM}			1.6	μC
I_{RM}			40	A

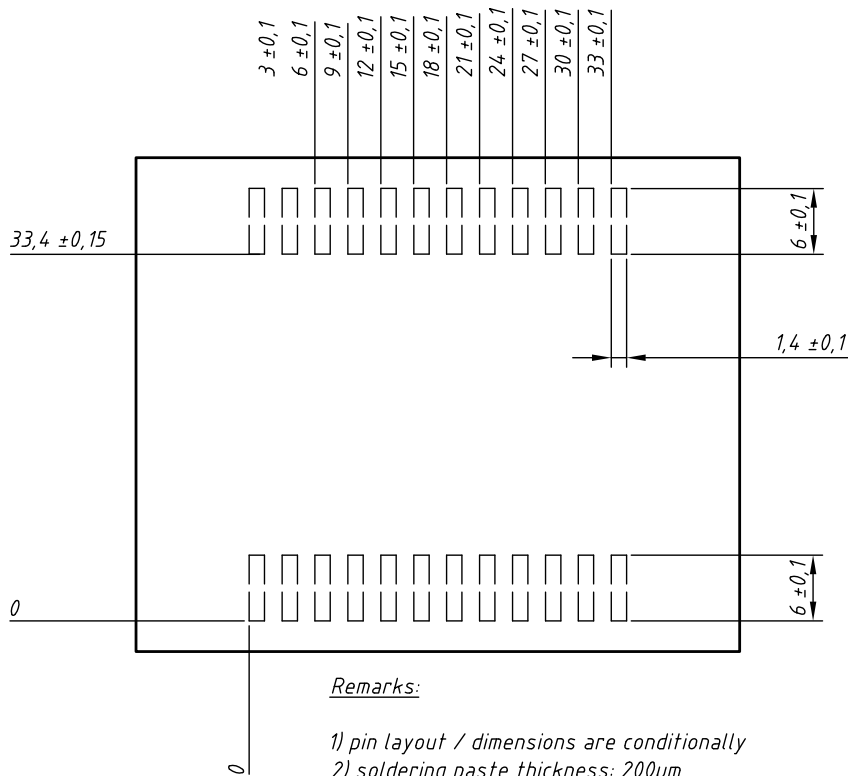
Component

Symbol	Conditions	Maximum Ratings	
I_{RMS}	per pin in main current paths (L+, L-, N-, L1, L2, L3) may be additionally limited by external connections 2 pins for output L1, L2, L3	75	A
T_J		-55...+175	$^\circ\text{C}$
T_{stg}		-55...+125	$^\circ\text{C}$
V_{ISOL}	$I_{ISOL} \leq 1\text{ mA}$, 50/60 Hz, $f = 1\text{ minute}$	1000	V~
F_c	mounting force with clip	50 - 250	N

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
$R_{pin\ to\ chip}^{1)}$	L+ to L1/L2/L3 or L- to L1/L2/L3		0.9	$m\Omega$
C_P	coupling capacity between shorted pins and back side metallization		160	pF
Weight			25	g

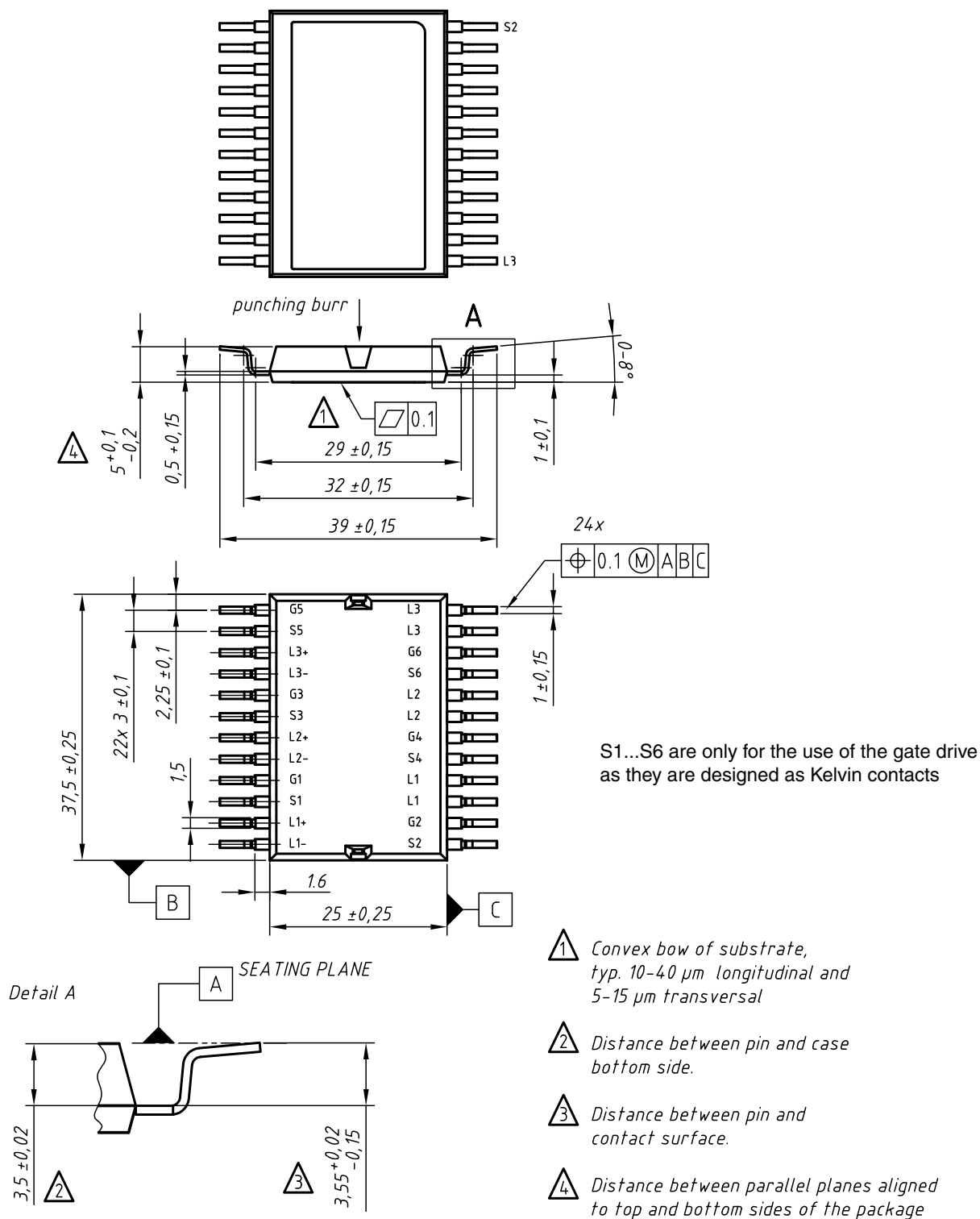
$$^1) V_{DS} = I_D \cdot (R_{DS(on)} + 2R_{Pin\ to\ Chip})$$

Recommended printed circuit board lay-out



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

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contact pin:

- galv. tin plating, per pin side: Sn 10...25 μm , undercoating Ni 0,2...1 μm
- stamping edges may be free of tin
- punching burr: $\leq 0,05\text{mm}$

Leads	Ordering	Part Name & Packing Unit Marking	Part Marking	Delivering Mode	Base Qty.	Ordering Code
SMD	Standard	GMM 3x60-015X2 - SMD	GMM 3x60-015X2	Blister	28	510635

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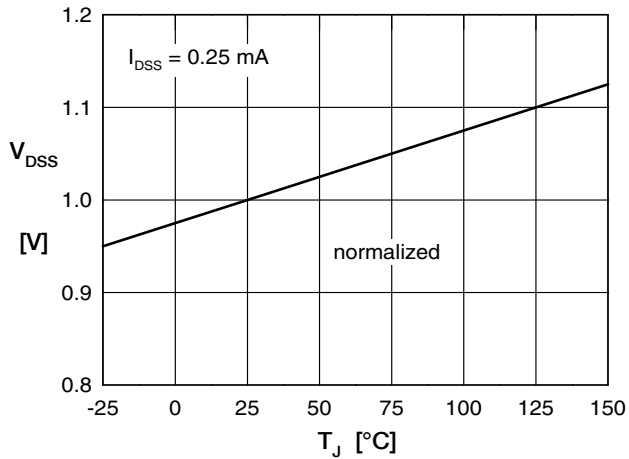


Fig.1 Drain source breakdown voltage V_{DS} vs. junction temperature T_{J}

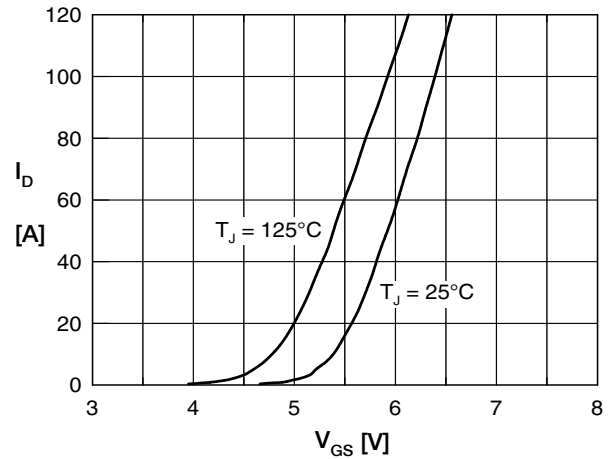


Fig. 2 Typ. transfer characteristics

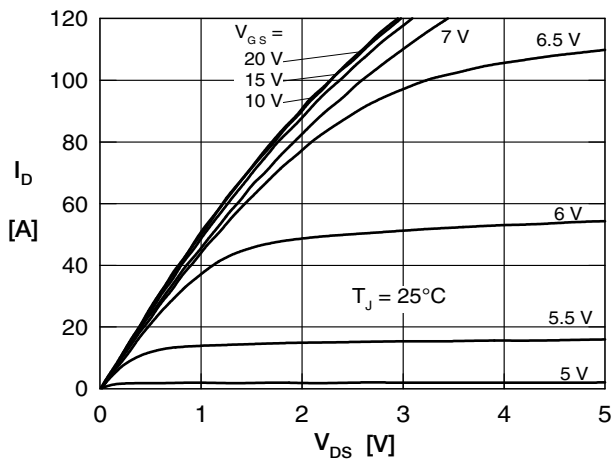


Fig. 3 Typ. output characteristics

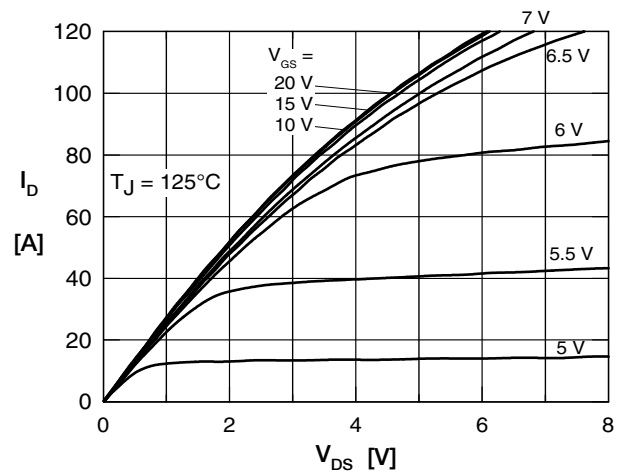


Fig. 4 Typ. output characteristics

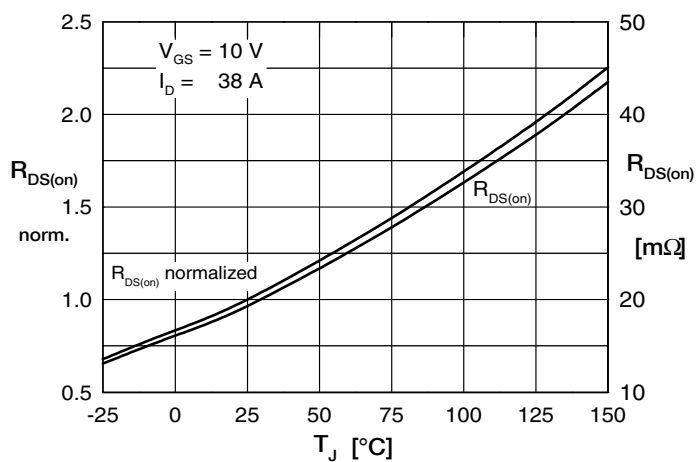


Fig.5 Drain source on-state resistance $R_{DS(on)}$ versus junction temperature T_{J}

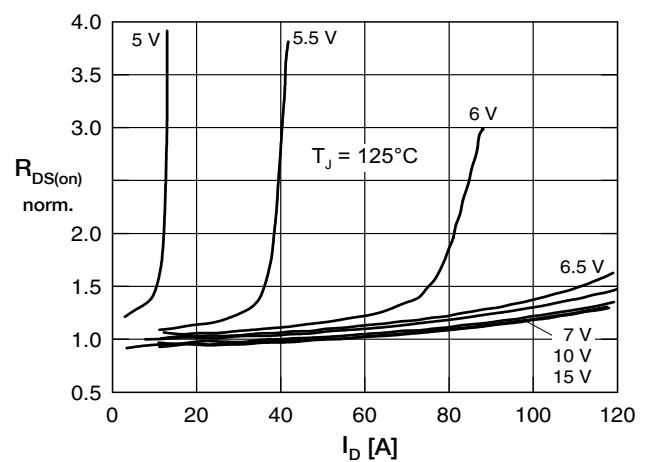
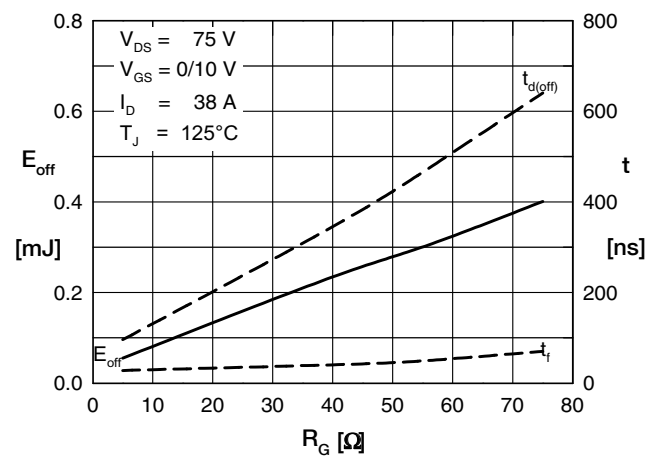
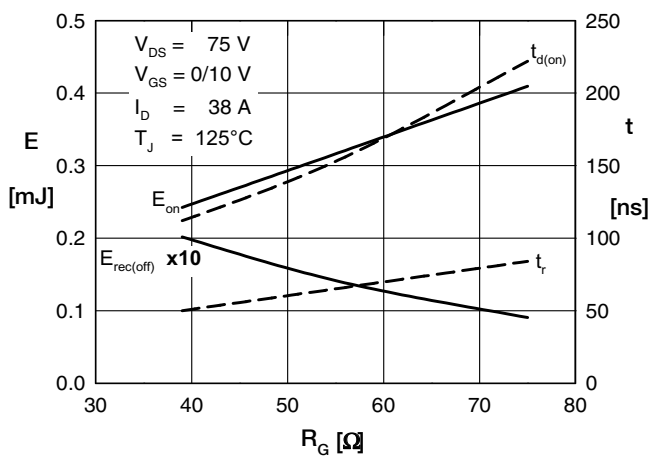
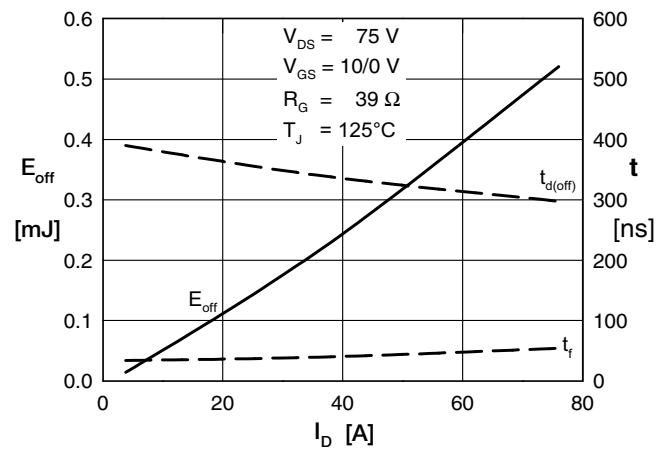
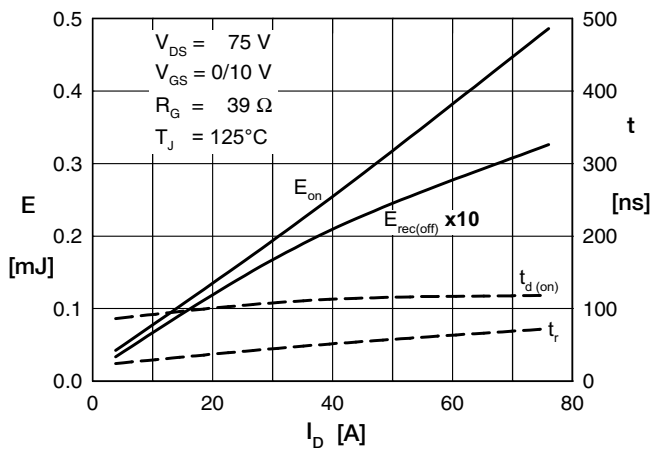
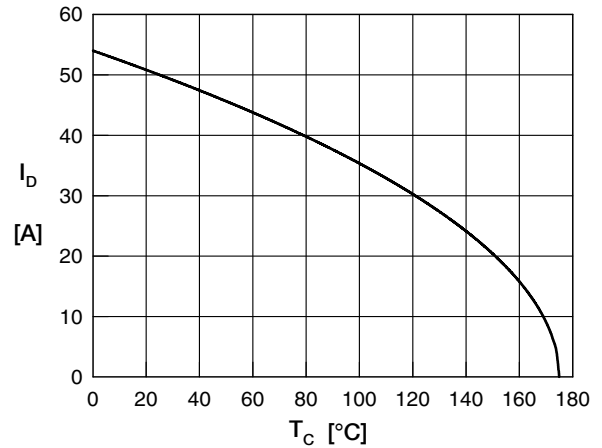
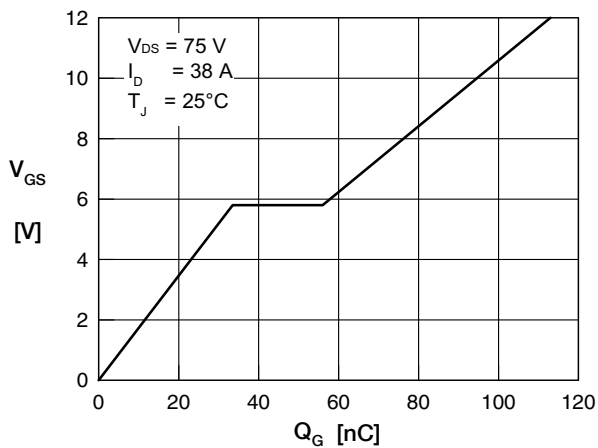
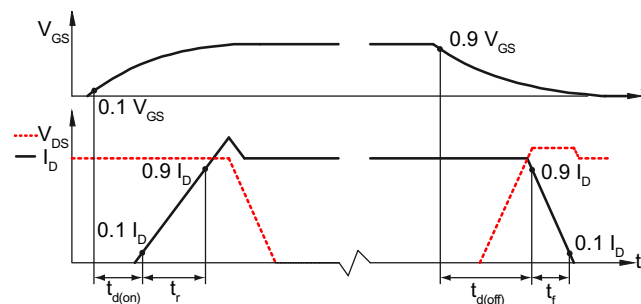
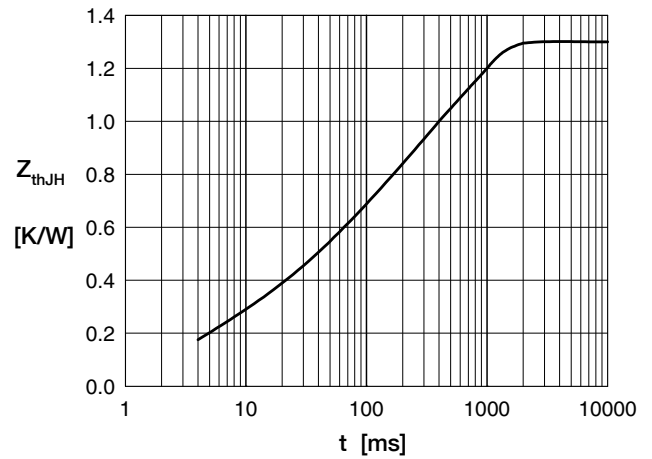
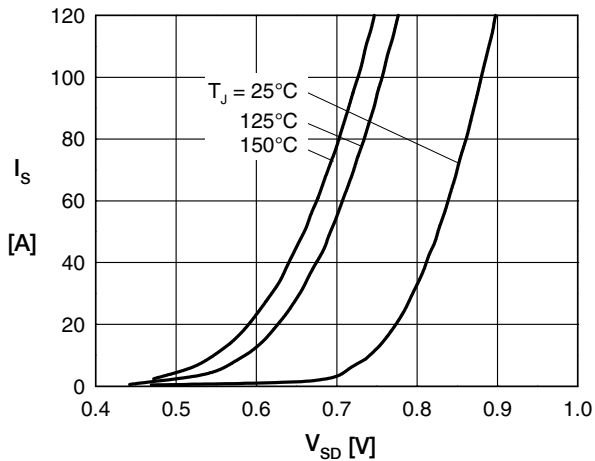
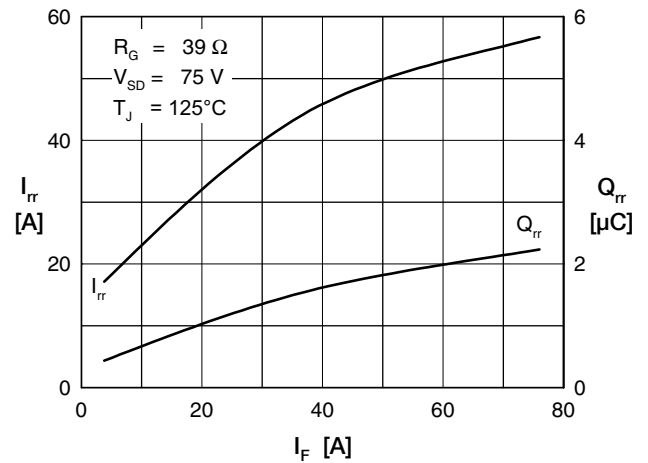
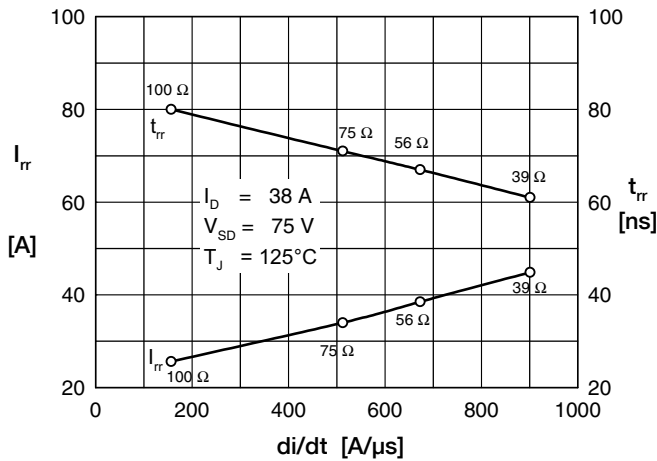


Fig. 6 Drain source on-state resistance $R_{DS(on)}$ versus I_D





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