

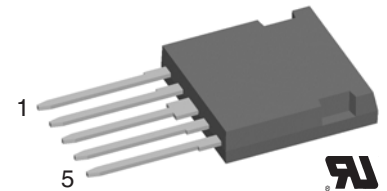
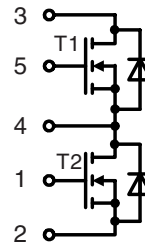
Trench Power MOSFET

Phaseleg Topology
in ISOPLUS i4-PAC™

$$I_{D25} = 150 \text{ A}$$

$$V_{DSS} = 75 \text{ V}$$

$$R_{DS(on) \text{ typ}} = 3.2 \text{ m}\Omega$$



MOSFET T1/T2

Symbol	Conditions	Maximum Ratings	
V_{DSS}	$T_{VJ} = 25^{\circ}\text{C}$ to T_{VJmax}	75	V
V_{GS}		± 20	V
I_{D25}	$T_C = 25^{\circ}\text{C}$	150	A
I_{D90}	$T_C = 90^{\circ}\text{C}$	120	A
I_{F25}	(body diode) $T_C = 25^{\circ}\text{C}$	150	A
I_{F90}	(body diode) $T_C = 90^{\circ}\text{C}$	100	A

Symbol	Conditions	Characteristic Values ($T_{VJ} = 25^{\circ}\text{C}$, unless otherwise specified)		
		min.	typ.	max.
R_{DSon}	$V_{GS} = 10 \text{ V}; I_D = I_{D90};$ on chip level		3.2	4.2 m Ω
V_{GSth}	$V_{DS} = 20 \text{ V}; I_D = 1 \text{ mA}$	2		4 V
I_{DSS}	$V_{DS} = 75 \text{ V}; V_{GS} = 0 \text{ V}; T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$		0.1	10 μA mA
I_{GSS}	$V_{GS} = \pm 20 \text{ V}; V_{DS} = 0 \text{ V}$			200 nA
Q_g Q_{gs} Q_{gd}	$V_{GS} = 10 \text{ V}; V_{DS} = 60 \text{ V}; I_D = 50 \text{ A}$		225 30 85	nC nC nC
$t_{d(on)}$ t_r $t_{d(off)}$ t_f			75 100 400 90	ns ns ns ns
E_{on} E_{off} $E_{rec(off)}$			0.31 0.5 0.05	mJ mJ mJ
V_F	(body diode) $I_F = 75 \text{ A}; V_{GS} = 0 \text{ V}$		1.1	1.5 V
t_{rr}	(body diode) $I_F = 20 \text{ A}; -di/dt = 100 \text{ A}/\mu\text{s}; V_{DS} = 30 \text{ V}$		90	ns
R_{thJC} R_{thJH}	with heat transfer paste		1.0	0.6 K/W K/W

Features

- trench MOSFET
 - very low on state resistance R_{DSon}
 - fast switching
- ISOPLUS i4-PAC™ package
 - isolated back surface
 - low coupling capacity between pins and heatsink
 - enlarged creepage towards heatsink
 - application friendly pinout
 - low inductive current path
 - high reliability
 - industry standard outline
 - UL registered E 72873

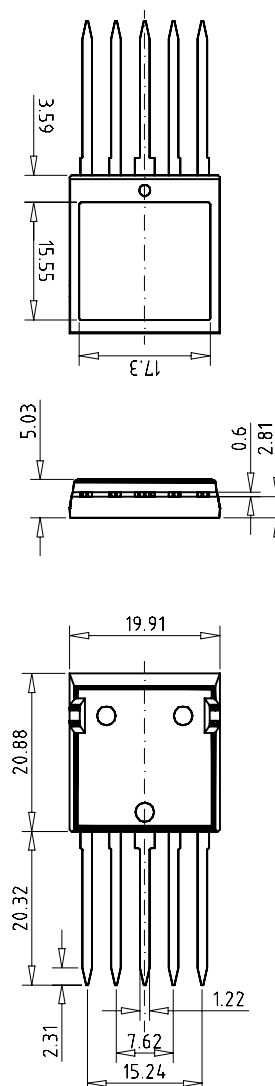
Applications

- automotive
 - AC drives - starter generator for 42V etc.
 - choppers - replacing series resistors for DC drives, heating etc.
 - DC-DC converters - between 12V and 42V system etc.
 - electronic switches - replacing relays and fuses
- power supplies
 - DC-DC converters
 - solar inverters
- battery supplied systems
 - choppers or inverters for drives in hand held tools
 - battery chargers

Component

Symbol	Conditions	Maximum Ratings	
I_{RMS}	per pin	75	A
T_{VJ}		-55...+175	°C
T_{stg}		-55...+125	°C
V_{ISOL}	$I_{ISOL} \leq 1 \text{ mA}; 50/60 \text{ Hz}$	2500	V~
F_c	mounting force with clip	20...120	N

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
$R_{pin-chip}$	$R_{pin-P2} > R_{DS(on)} + R_{pin-chip}$		1.6	mΩ
C_p	coupling capacity between shorted pins and mounting tab in the case		40	pF
d_s, d_A	pin - pin	1.7		mm
d_s, d_A	pin - backside metal	5.5		mm
Weight			9	g

Dimensions in mm (1 mm = 0.0394")


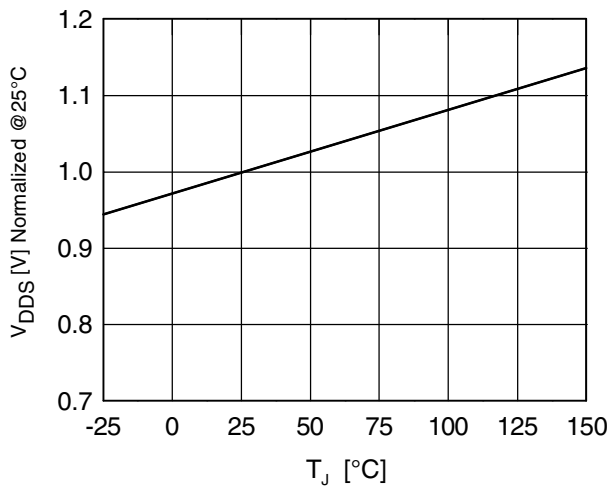


Fig. 1 Drain source breakdown voltage V_{DS} vs. junction temperature T_J

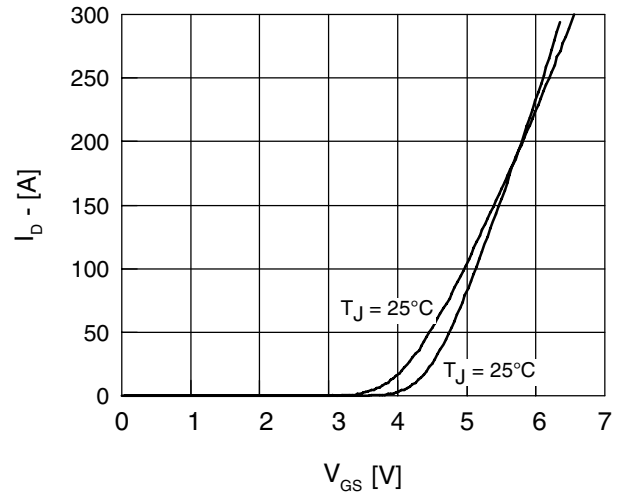


Fig. 2 Typical transfer characteristic

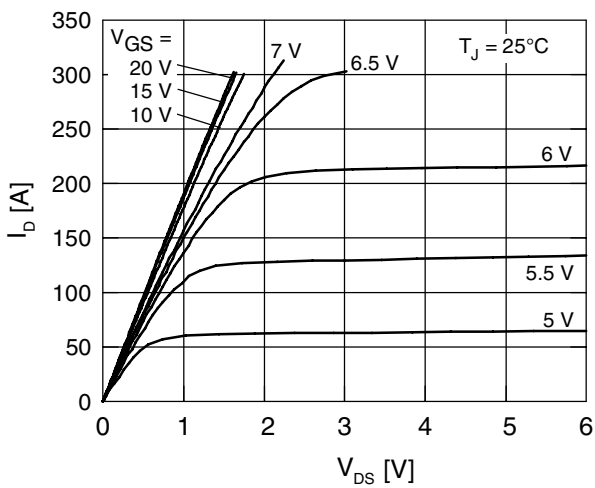


Fig. 3 Typical output characteristic

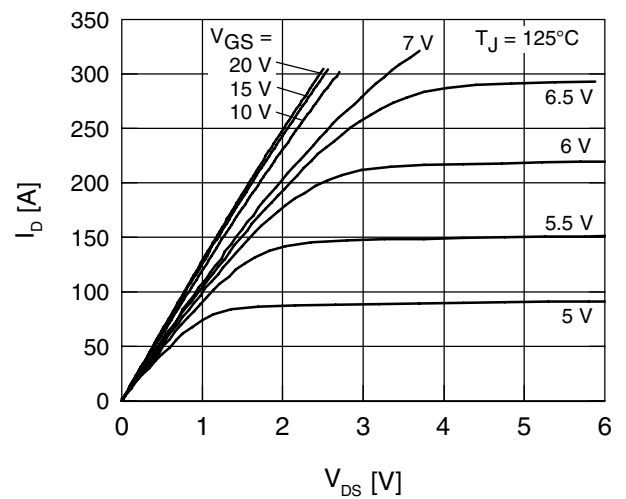


Fig. 4 Typical output characteristic

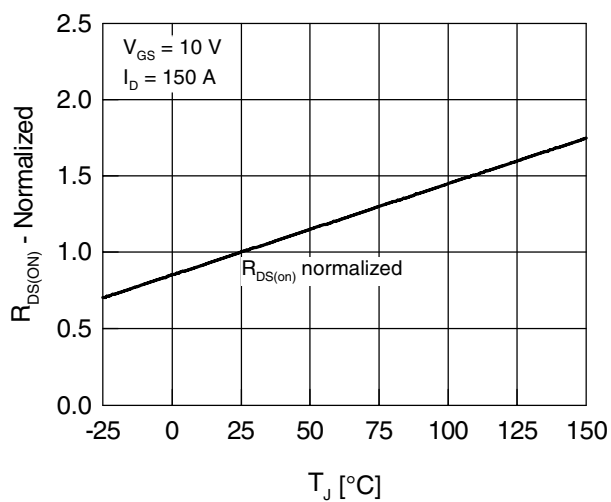


Fig. 5 Drain source on-state resistance $R_{DS(on)}$ vs. junction temperature T_J

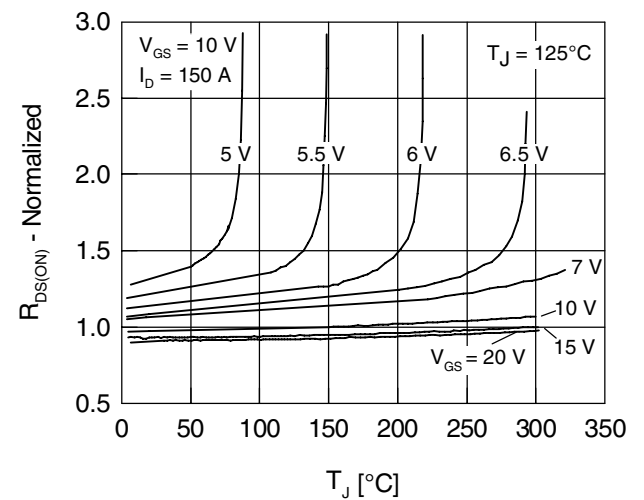


Fig. 6 Drain source on-state resistance $R_{DS(on)}$ versus I_D

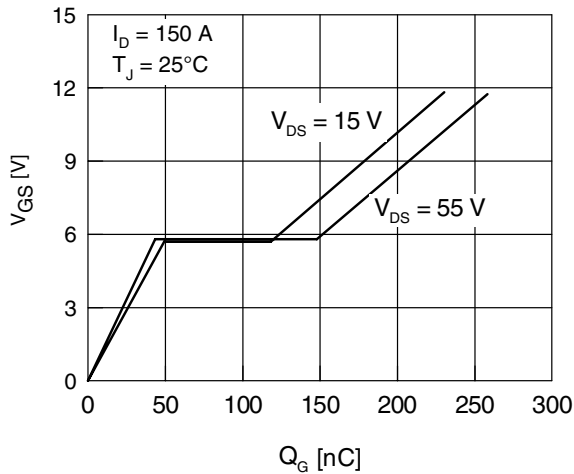


Fig. 7 Gate charge characteristic

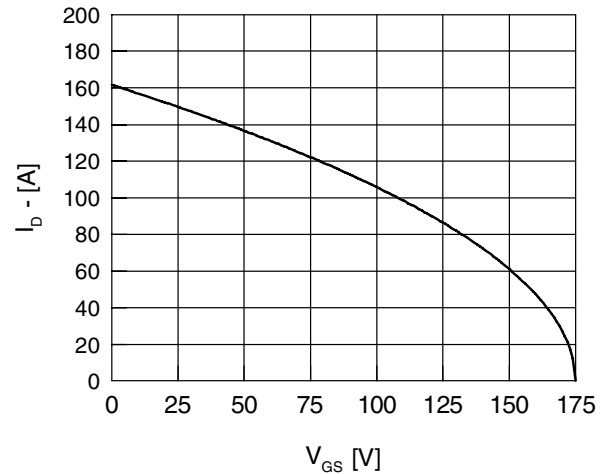


Fig. 8 Drain current I_D vs. case temperature T_C

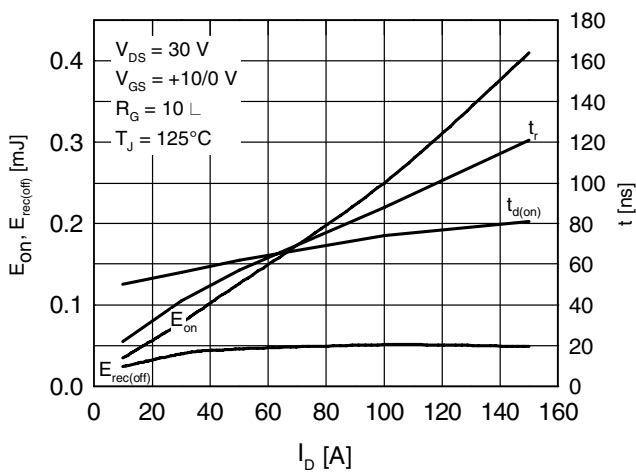


Fig. 9 Typ. turn-on energy & switching times vs. collector current, inductive switching

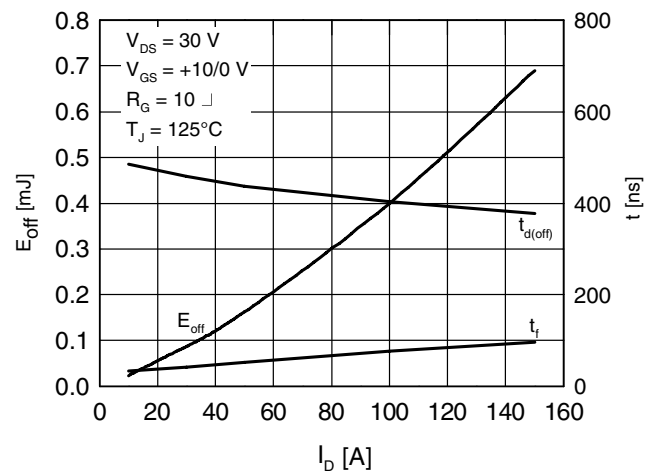


Fig. 10 Typ. turn-off energy & switching times vs. collector current, inductive switching

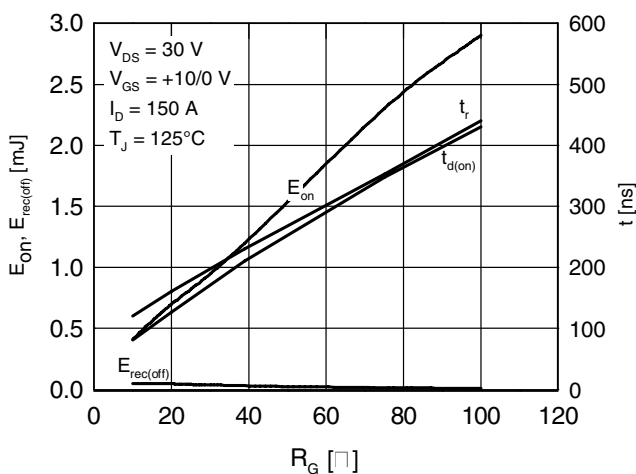


Fig. 11 Typ. turn-on energy & switching times vs. gate resistor, inductive switching

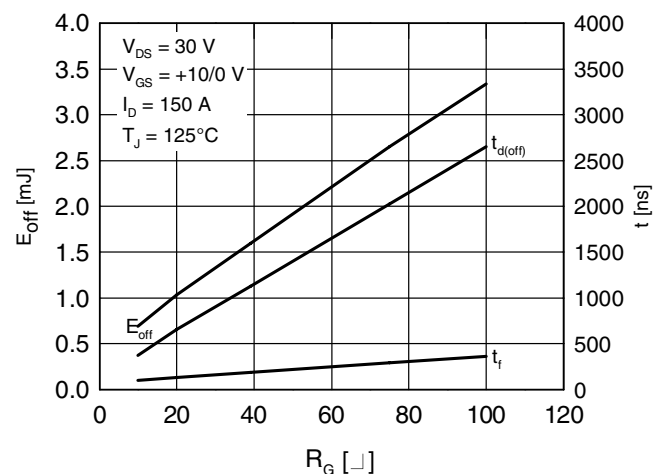


Fig. 12 Typ. turn-off energy & switching times vs. gate resistor, inductive switching

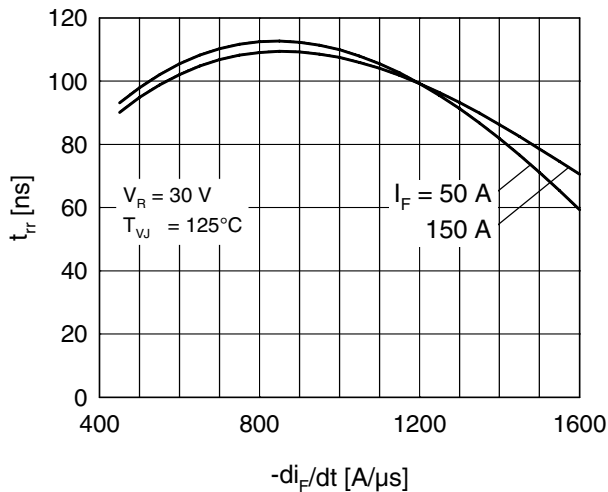


Fig. 13 Reverse recovery time t_{rr} of the body diode vs. di/dt

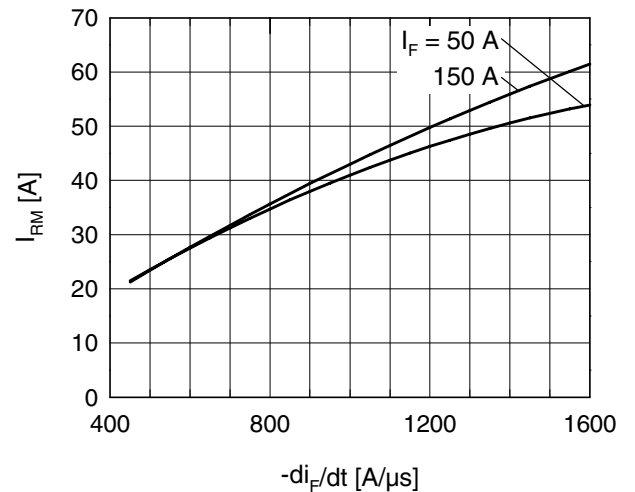


Fig. 14 Reverse recovery current I_{RM} of the body diode vs. di/dt

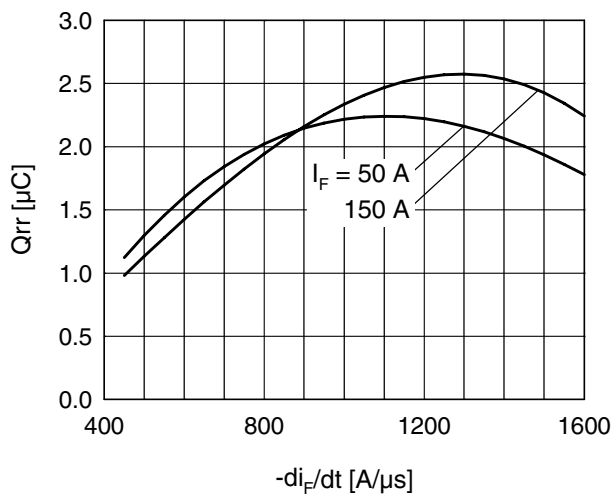


Fig. 15 Reverse recovery charge Q_{rr} of the body diode vs. di/dt

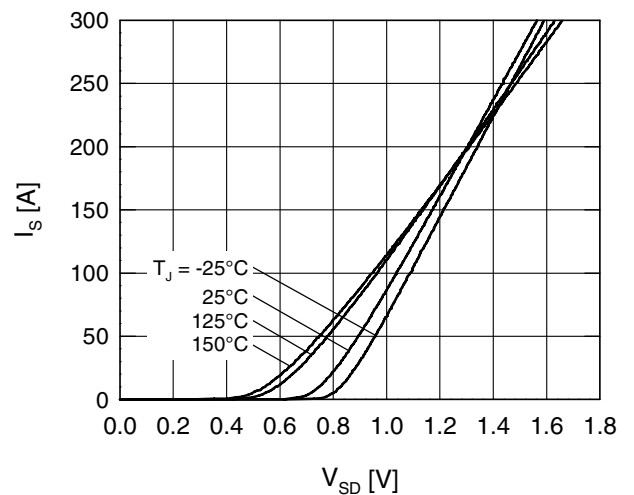


Fig. 16 Source current I_S vs. source drain voltage V_{SD} (body diode)

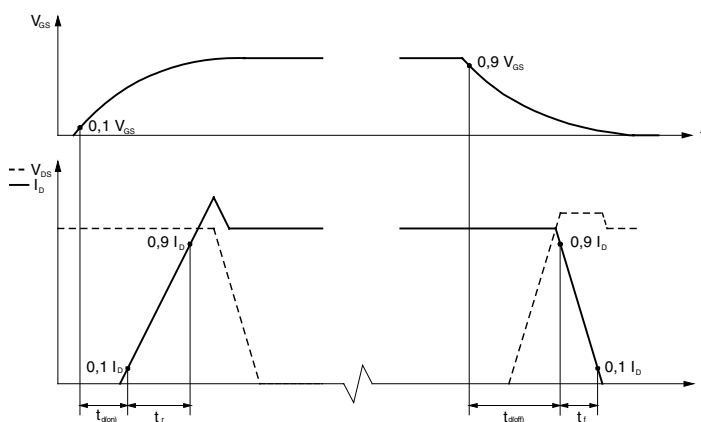


Fig. 17 Definition of switching times

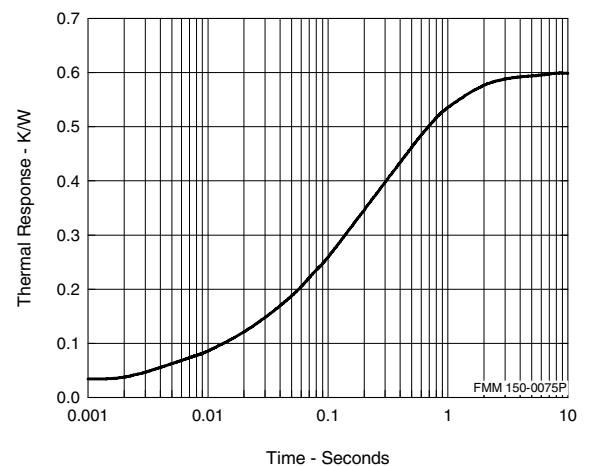


Fig. 18 Therm. impedance junction to case Z_{thJC}