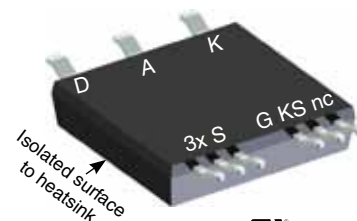
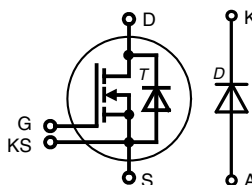


CoolMOS™¹⁾ Power MOSFET

ISOPLUS™ - electrically isolated surface to heatsink
Surface Mount Power Device

$$\begin{aligned} V_{DSS} &= 600 \text{ V} \\ I_{D25} &= 50 \text{ A} \\ R_{DS(on) \text{ max}} &= 45 \text{ m}\Omega \end{aligned}$$

Preliminary data



E72873

MOSFET T

Symbol	Conditions	Maximum Ratings	
V_{DSS}	$T_{VJ} = 25^{\circ}\text{C to } 150^{\circ}\text{C}$	600	V
V_{GS}		± 20	V
I_{D25}	$T_C = 25^{\circ}\text{C}$	50	A
I_{D80}	$T_C = 80^{\circ}\text{C}$	38	A
E_{AS} E_{AR}	single pulse repetitive } $I_D = 11 \text{ A}; T_C = 25^{\circ}\text{C}$	1950 3	mJ mJ
dV/dt	MOSFET dV/dt ruggedness $V_{DS} = 0 \dots 480 \text{ V}$	50	V/ns

Symbol Conditions Characteristic Values

($T_{VJ} = 25^{\circ}\text{C}$, unless otherwise specified)

Symbol	Conditions	min.	typ.	max.	
$R_{DS(on)}$	$I_D = 44 \text{ A}; V_{GS} = 10 \text{ V}$		40	45	m Ω
$V_{GS(th)}$	$I_D = 3 \text{ mA}; V_{DS} = V_{GS}$	2.5	3	3.5	V
I_{DSS}	$V_{DS} = V_{DSS}; V_{GS} = 0 \text{ V}; T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$		50	10	μA μA
I_{GSS}	$V_{DS} = 0 \text{ V}; V_{GS} = \pm 20 \text{ V}$			100	nA
$t_{d(on)}$ t_r $t_{d(off)}$ t_f E_{on} E_{off} E_{rec}	Inductive switching boost mode with diode D $V_{DS} = 380 \text{ V}; I_D = 30 \text{ A}$ $V_{GS} = 10 \text{ V}; R_G = 33 \Omega$		80 40 750 40 1.3 0.45 0.35		ns ns ns ns mJ mJ mJ
C_{iss} C_{oss}	$V_{GS} = 0 \text{ V}; V_{DS} = 100 \text{ V}; f = 1 \text{ MHz}$		6800 320		pF pF
Q_g Q_{gs} Q_{gd}	$V_{DS} = 400 \text{ V}; I_D = 44 \text{ A}$ $V_{GS} = 10 \text{ V}; R_G = 3.3 \Omega$		150 35 50	190	nC nC nC
R_{thJC} R_{thJH}	with heatsink compound (IXYS test setup)		tbd	0.4 tbd	K/W K/W

Features

- **Fast CoolMOS™¹⁾** power MOSFET 4th generation
 - high blocking capability
 - lowest resistance
 - avalanche rated for unclamped inductive switching (UIS)
 - low thermal resistance due to reduced chip thickness
- **Package**
 - isolated surface to heatsink
 - low coupling capacity between pins and heatsink
 - PCB space saving
 - enlarged creepage towards heatsink
 - application friendly pinout
 - low inductive current path
 - high reliability

Applications

- Buck / boost chopper
- Optimized for boost configuration
- PFC stage

¹⁾ CoolMOS™ is a trademark of Infineon Technologies AG.

Source-Drain Diode of MOSFET T

Symbol	Conditions	Maximum Ratings			
I _{S25}	T _C = 25°C	50	A		
I _{S80}	T _C = 80°C	38	A		
Symbol	Conditions	Characteristic Values			
(T _{VJ} = 25°C, unless otherwise specified)					
		min.	typ.	max.	
V _{SD}	I _F = 44 A; V _{GS} = 0 V		0.9	1.0	V
t _{rr}	I _F = 44 A; -di _F /dt = 100 A/μs; V _R = 400 V		600		ns
Q _{RM}			17		μC
I _{RM}			60		A

Diode D

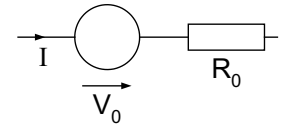
Symbol	Conditions	Maximum Ratings			
I _{F25}	T _C = 25°C; DC	96	A		
I _{F80}	T _C = 80°C; DC	61	A		
Symbol	Conditions	Characteristic Values			
(T _{VJ} = 25°C, unless otherwise specified)					
		min.	typ.	max.	
V _{RRM}	T _{VJ} = 25°C			600	V
V _F	I _F = 25 A	T _{VJ} = 25°C T _{VJ} = 125°C	1.2 1.3	1.4	V
I _R	V _R = V _{RRM}	T _{VJ} = 25°C T _{VJ} = 125°C		150	μA mA
I _{RM}	I _F = 30 A; V _R = 350 V -di/dt = 240 A/μs	T _{VJ} = 100°C	10		A
t _{rr}	I _F = 1 A; V _R = 30 V -di/dt = 100 A/μs	T _{VJ} = 100°C	35	50	ns
R _{thJC} R _{thJH}	per diode with heatsink compound (IXYS test setup)		tbd	0.7	K/W k/W

Component

Symbol	Conditions	Maximum Ratings			
T_{VJ}		-55...+150			°C
T_{stg}		-55...+125			°C
V_{ISOL}	$I_{ISOL} \leq 1\text{ mA}; 50/60\text{ Hz}$	2500			V~
F_C	mounting force	40 ... 130			N
Symbol	Conditions	Characteristic Values			
		min.	typ.	max.	
C_P	coupling capacity between shorted pins and backside metal		90		pF
d_S, d_A	pin - pin	1.65			mm
d_S, d_A	pin - backside metal	4			mm
CTI		400			
Weight			8		g

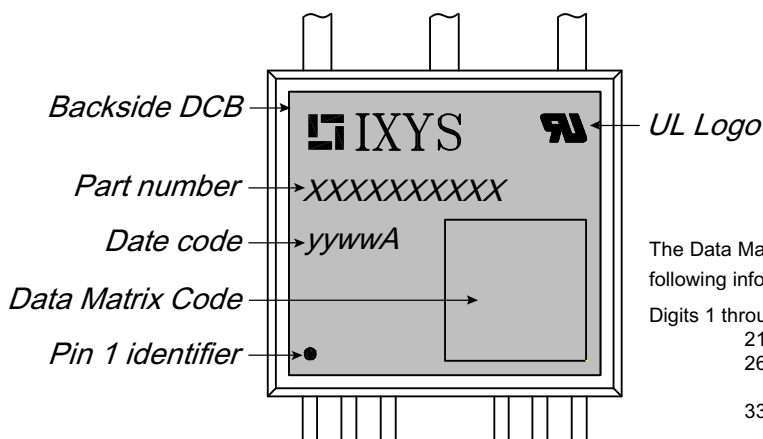
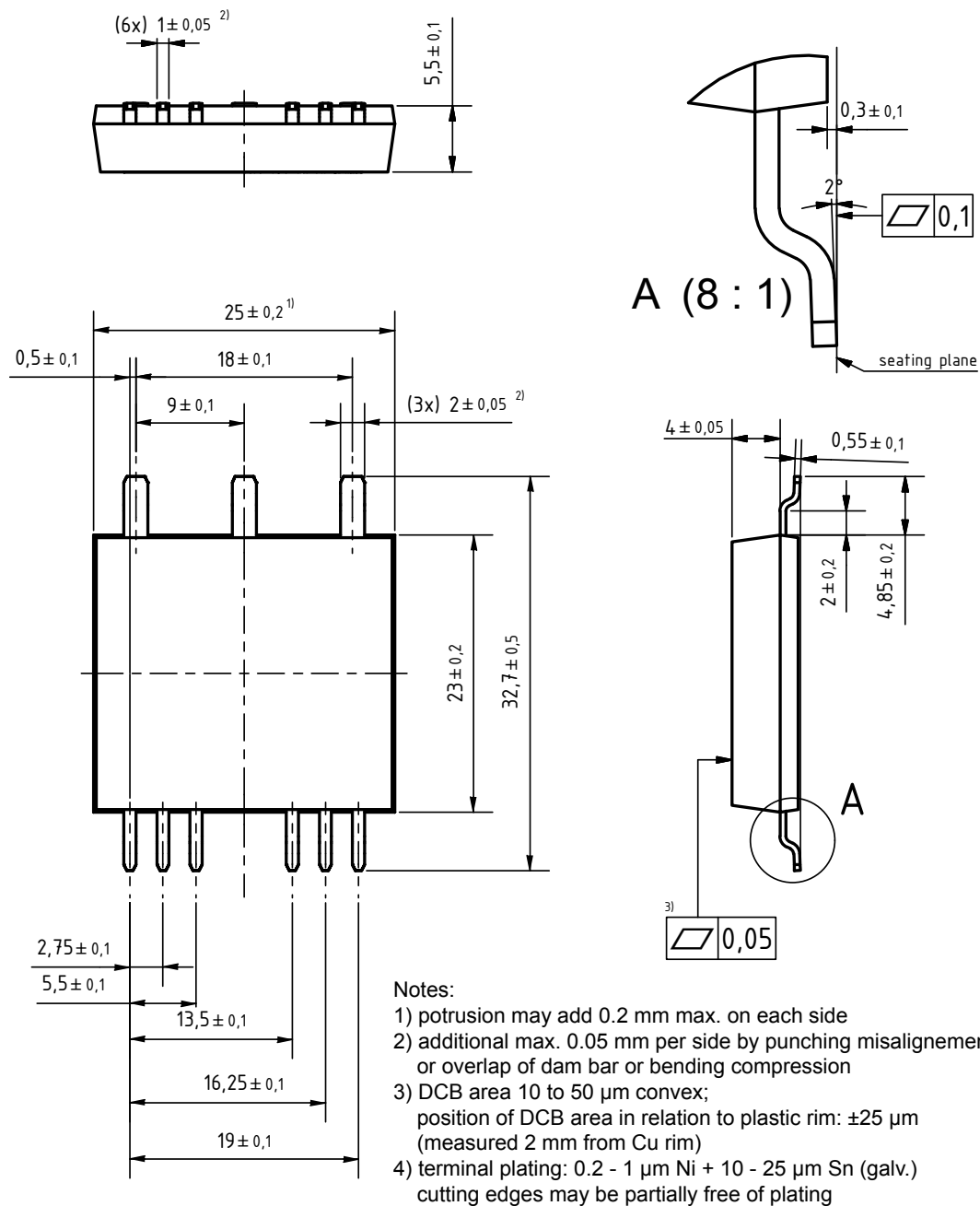
Equivalent Circuits for Simulation

Conduction



Boost Diode (typ. at $T_J = 125^\circ\text{C}$)
 $V_0 = tbd\text{ V}; R_0 = tbd\text{ m}\Omega$

Ordering	Part Number	Marking on Product	Delivering Mode	Base Qty	Ordering Code
Standard	MKE38RK600DFELB-TRR	MKE38RK600DFELB	Tape & Reel	200	510479
	MKE38RK600DFELB	MKE38RK600DFELB	Blister	45	510231



The Data Matrix Code contains the following information in 36 digits:

Digits 1 through 20: part number
 21 to 25: date code (YYWWA)
 26 to 31: assembly lot code
 32: reserved for special information
 33 to 36: may be used for subsequent module numbering within the assembly lot

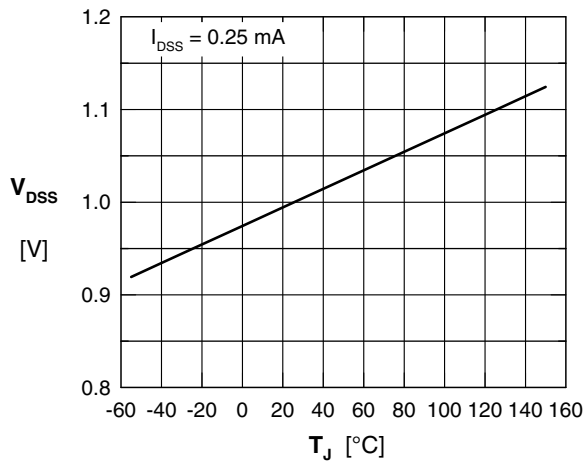


Fig.1 Drain source breakdown voltage versus temperature T_{VJ}

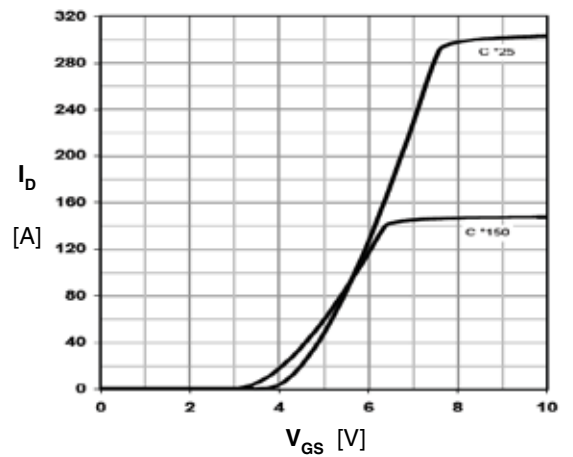


Fig. 2 Typ. transfer characteristics

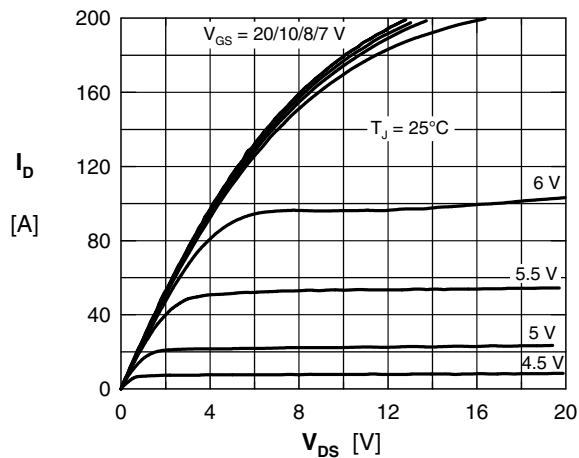


Fig. 3 Typical output characteristics

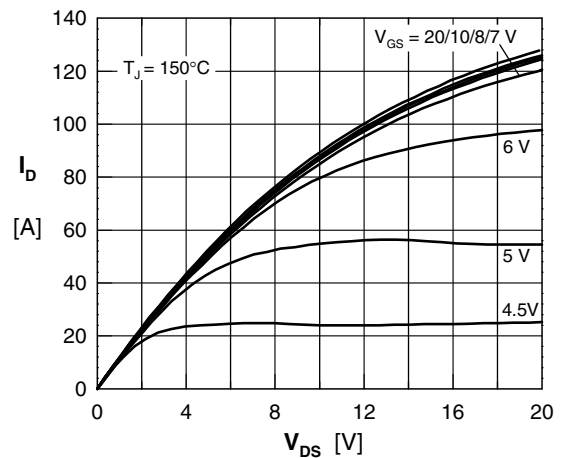


Fig. 4 Typical output characteristics

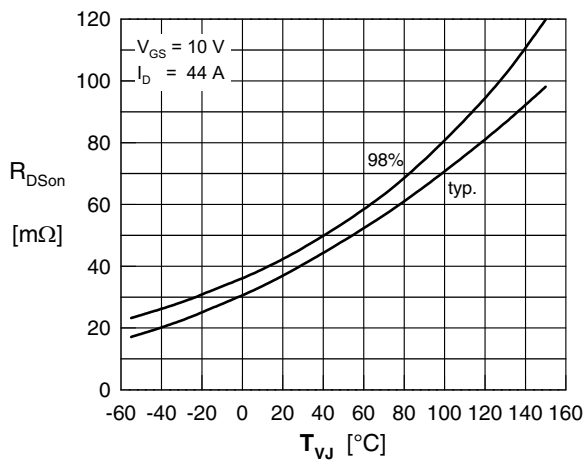


Fig.5 Drain source on-state resistance $R_{DS(on)}$ vs. junction temperature T_{VJ}

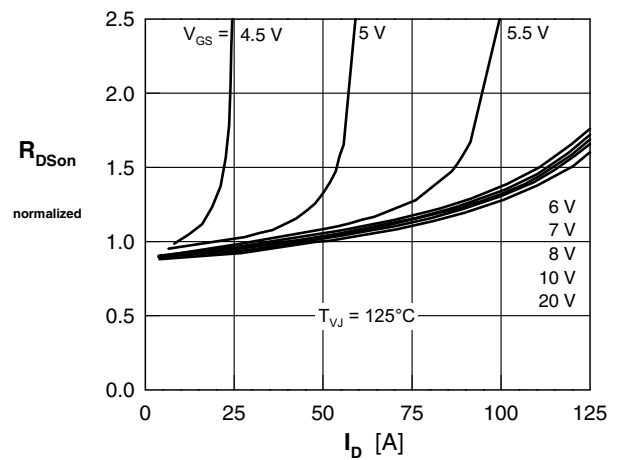
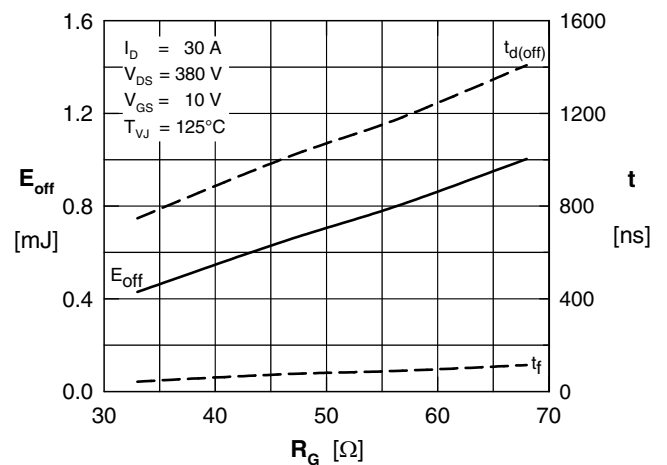
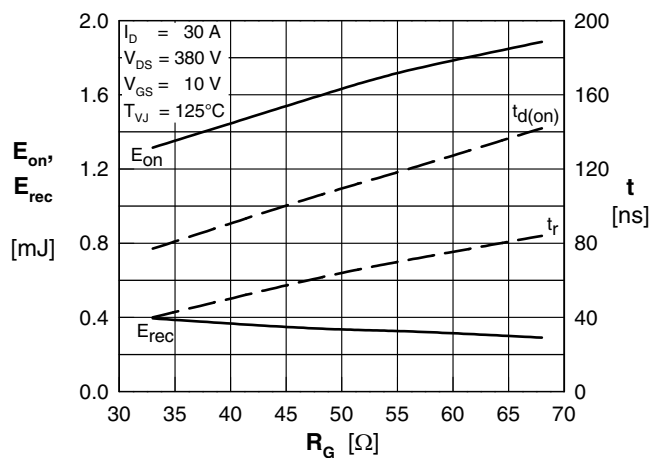
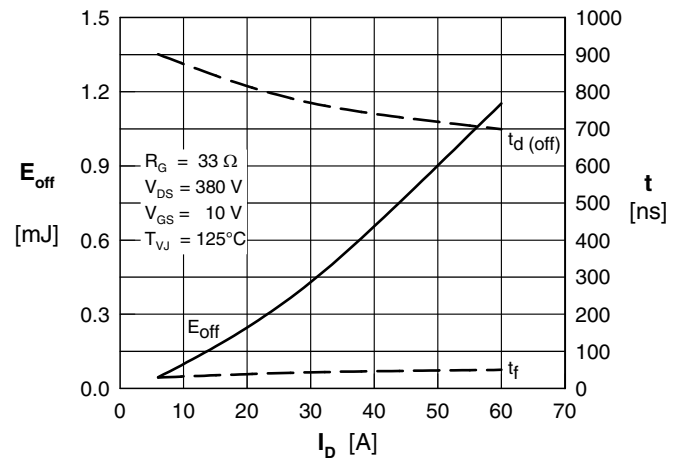
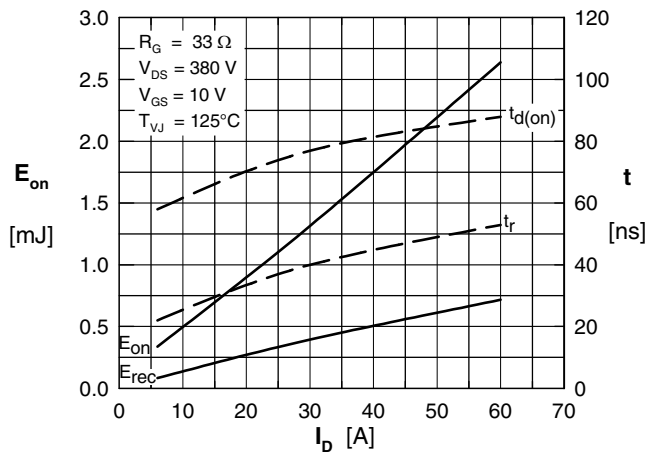
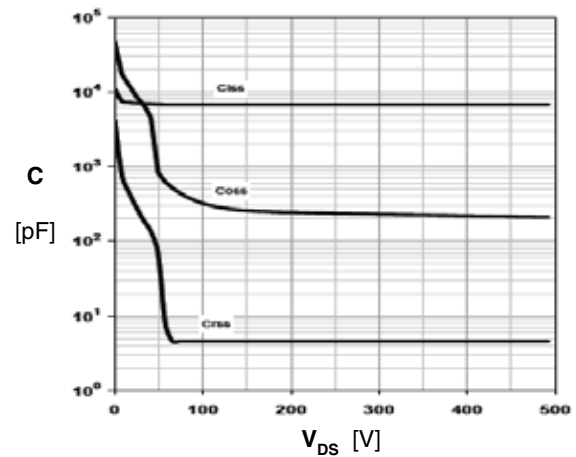
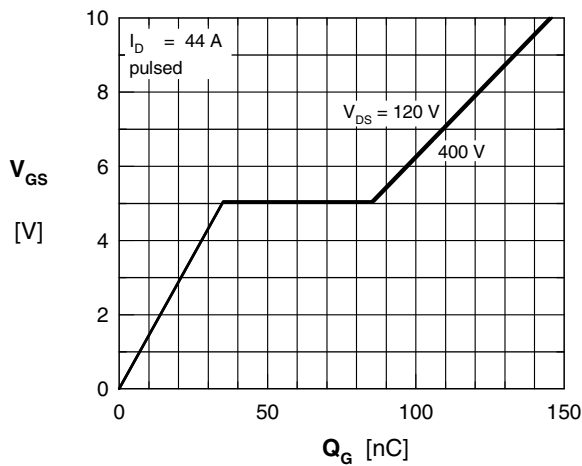
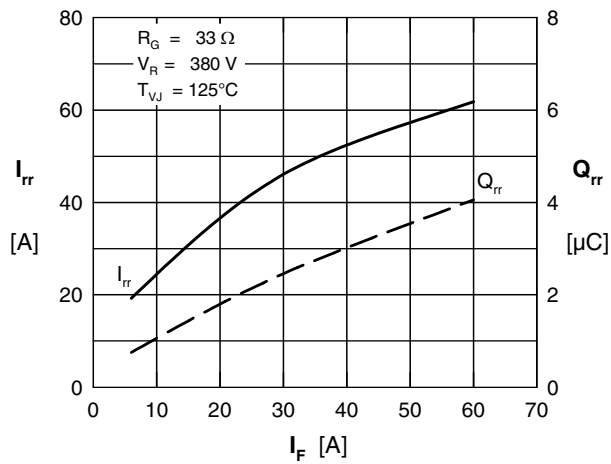
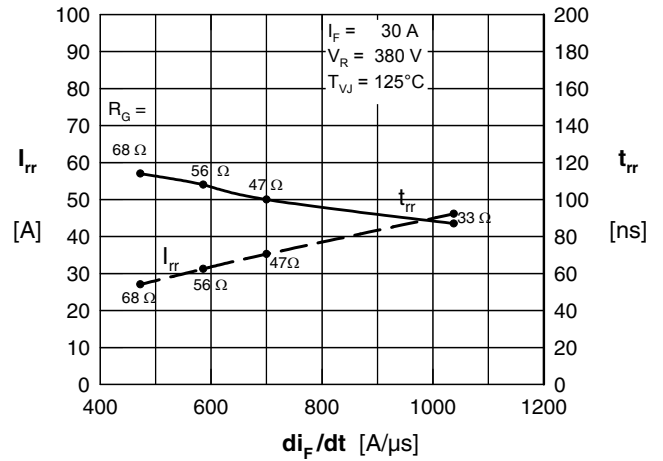
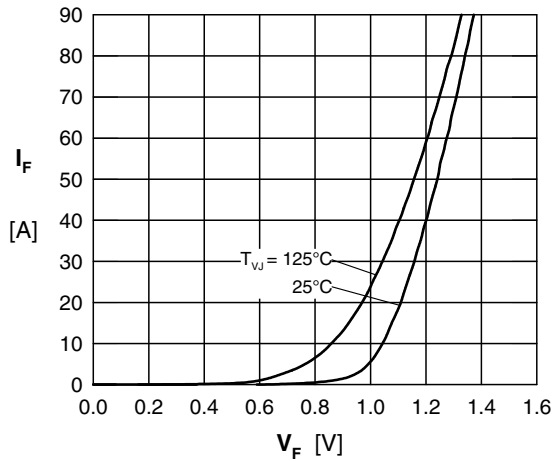


Fig. 6 Drain source on-state resistance, $R_{DS(on)}$ versus I_D







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