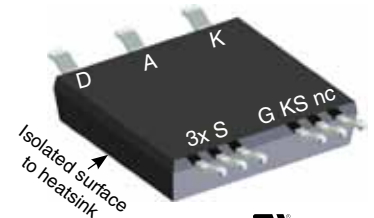
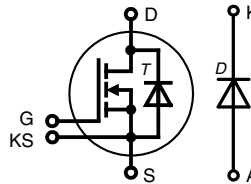


CoolMOS™¹⁾ Power MOSFET

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°C to 150°C	600		V			
V _{GS}		±20		V			
I _{D25}	T _C = 25°C	50		A			
I _{D80}	T _C = 80°C	38		A			
E _{AS} E _{AR}	single pulse repetitive	1950 3	mJ mJ	I _D = 11 A; T _C = 25°C			
dV/dt	MOSFET dV/dt ruggedness V _{DS} = 0...480 V					50	V/ns
Symbol	Conditions	Characteristic Values					
(T _{VJ} = 25°C, unless otherwise specified)							
		min.	typ.	max.			
R _{DSon}	I _D = 44 A; V _{GS} = 10 V		40	45	mΩ		
V _{GS(th)}	I _D = 3 mA; V _{DS} = V _{GS}	2.5	3	3.5	V		
I _{DSS}	V _{DS} = V _{DSS} ; V _{GS} = 0 V; T _{VJ} = 25°C T _{VJ} = 125°C		50	10	μA μA		
I _{GSS}	V _{DS} = 0 V; V _{GS} = ± 20 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 V; I _D = 30 A V _{GS} = 10 V; R _G = 33 Ω		80 40 750 40 1.3 0.45 0.35		ns ns ns ns mJ mJ mJ		
C _{iss} C _{oss}		V _{GS} = 0 V; V _{DS} = 100 V; f = 1 MHz		6800 320		pF pF	
Q _g Q _{gs} Q _{gd}			V _{DS} = 400 V; I _D = 44 A V _{GS} = 10 V; R _G = 3.3 Ω		150 35 50	190	nC nC nC
R _{thJC} R _{thJH}		with heatsink compound (IXYS test setup)			tdb	0.4 tdb	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

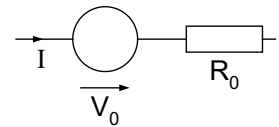
Symbol	Conditions	Maximum Ratings			
I _{S25}	T _C = 25°C			50	A
I _{S80}	T _C = 80°C			38	A
Symbol	Conditions	Characteristic Values			
(T _{VJ} = 25°C, unless otherwise specified)					
		min.	typ.	max.	
V _{SD}	I _F = 44 A; V _{GS} = 0 V		0.9	1.0	V
t _{rr}	I _F = 44 A; -di _F /dt = 100 A/μs; V _R =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

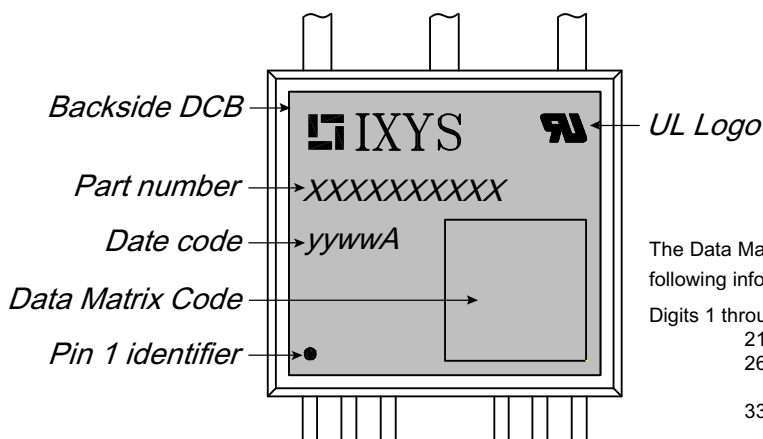
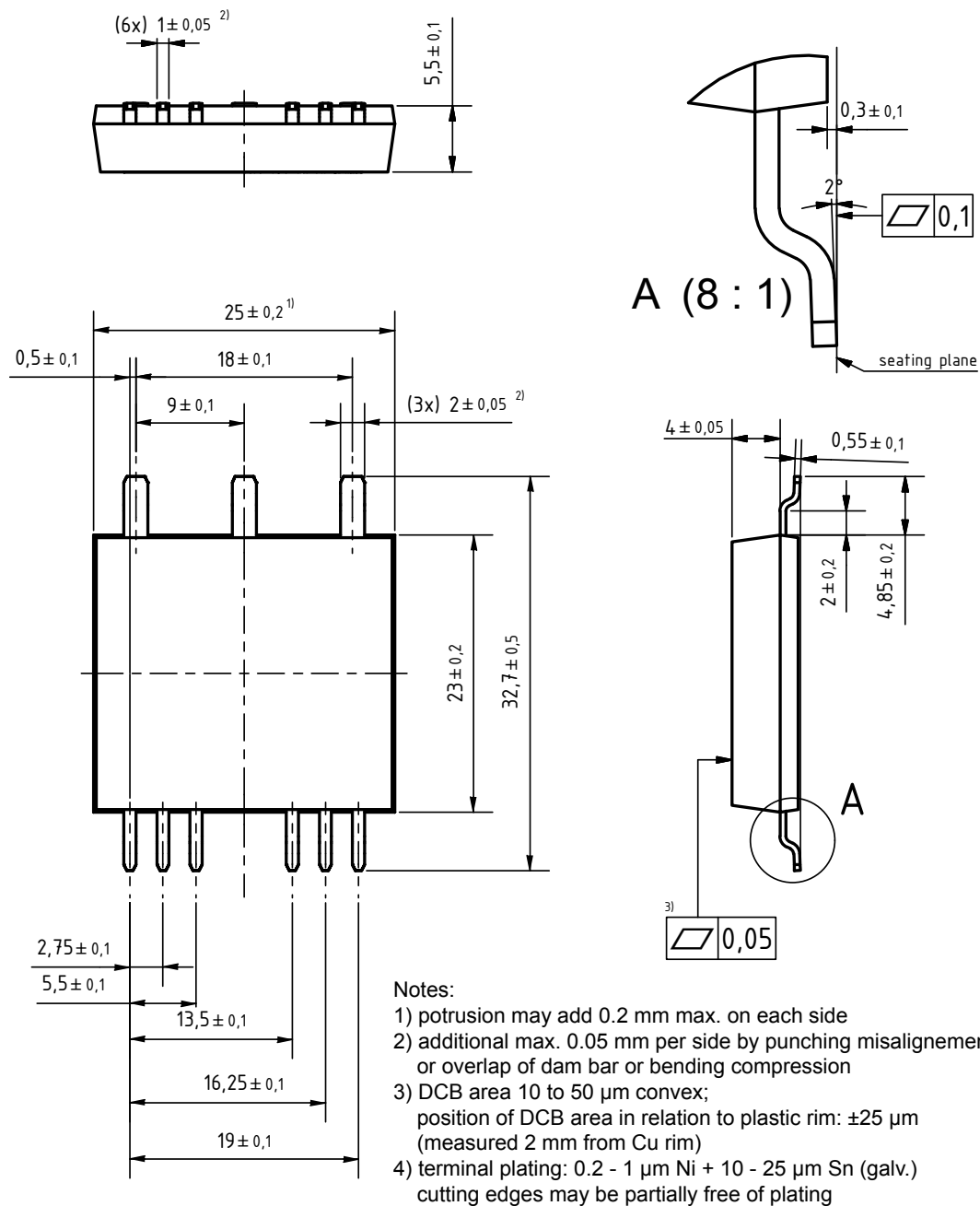
Component

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

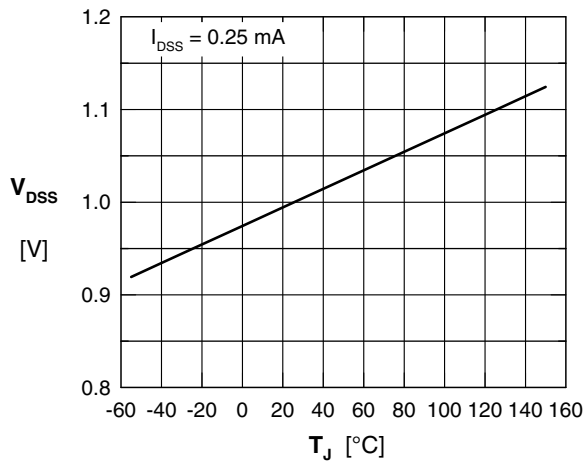


Fig.1 Drain source breakdown voltage versus temperature T_{VJ}

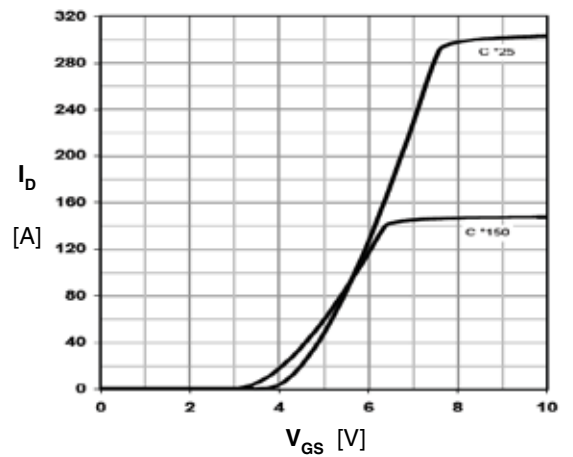


Fig. 2 Typ. transfer characteristics

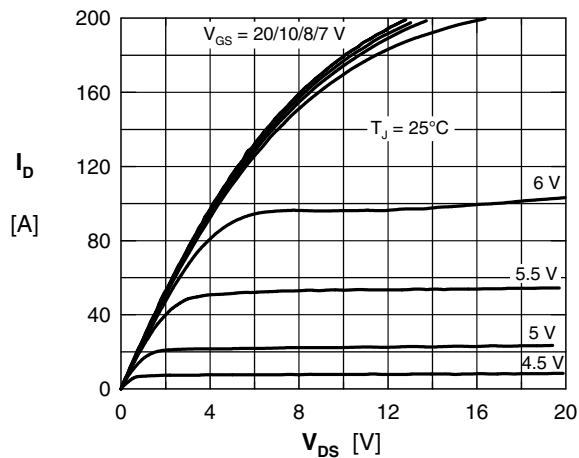


Fig. 3 Typical output characteristics

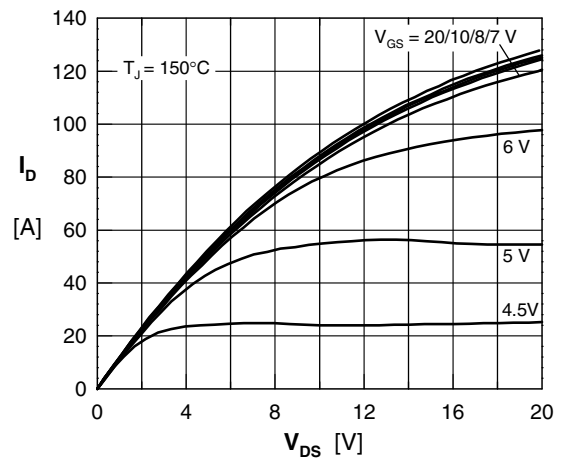


Fig. 4 Typical output characteristics

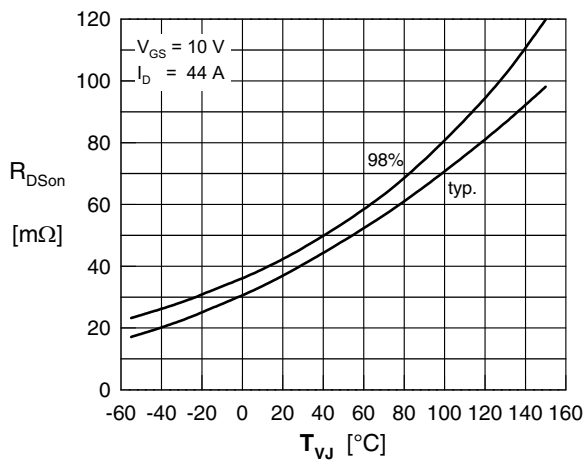


Fig.5 Drain source on-state resistance $R_{DS(on)}$ vs. junction temperature T_{VJ}

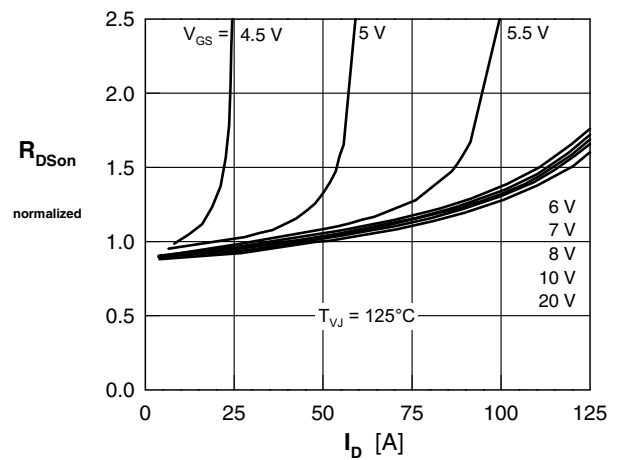


Fig. 6 Drain source on-state resistance, $R_{DS(on)}$ versus I_D

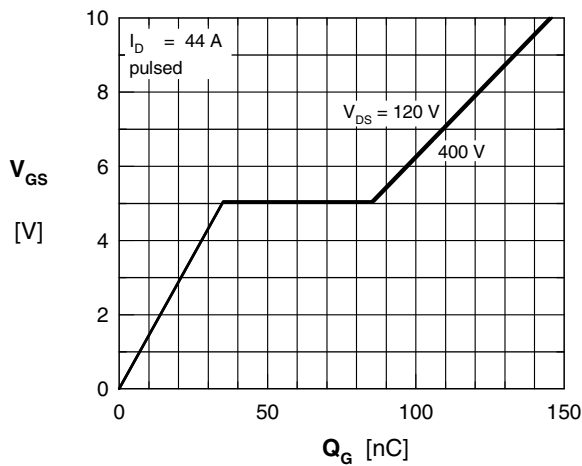


Fig. 7 Typ. turn-on gate charge

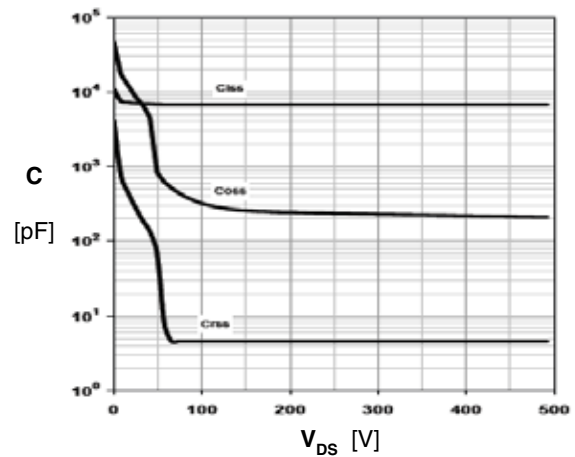


Fig. 8 Typ. capacities, MOSFET only

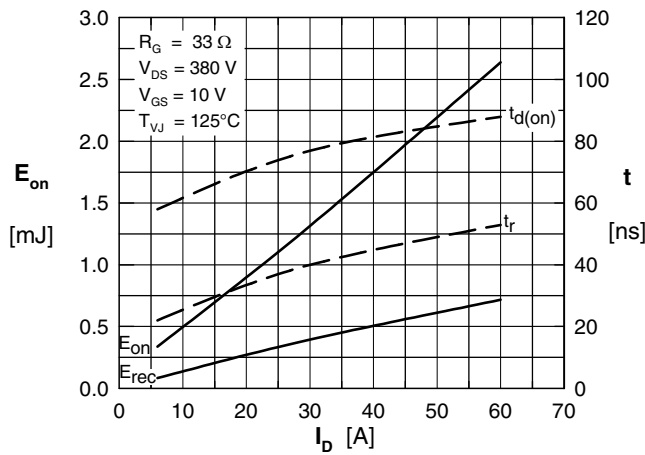


Fig. 9 Typ. turn-on energy and switching times vs. collector current, inductive switching

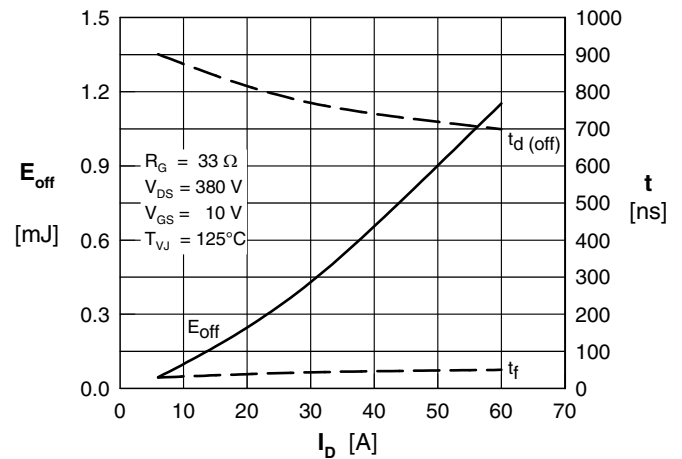


Fig. 10 Typ. turn-off energy and switching times vs. collector-current, inductive switching

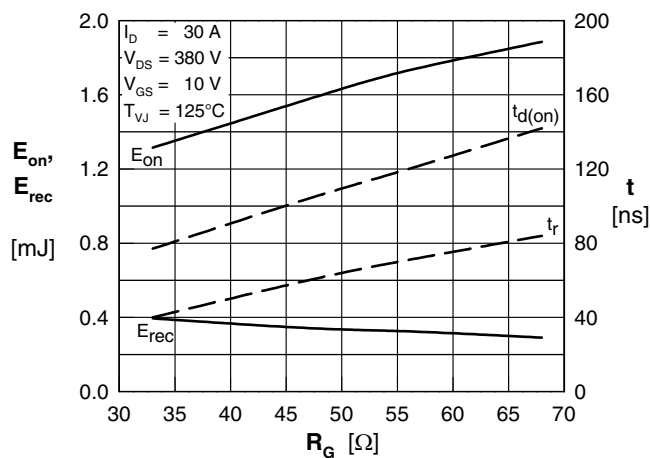


Fig. 11 Typ. turn-on energy and switching times vs. gate resistor, inductive switching

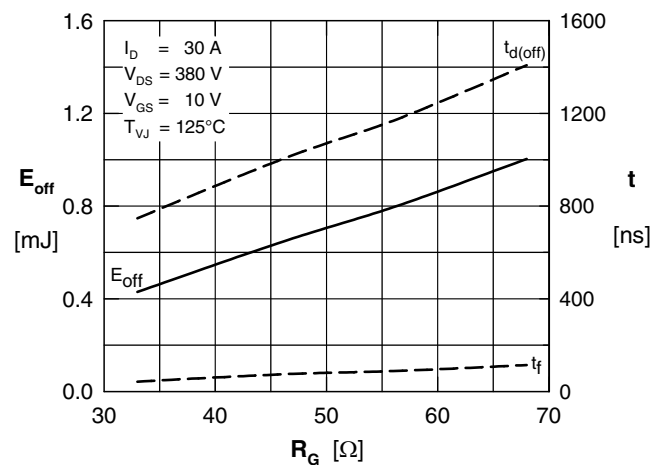


Fig. 12 Typ. turn-off energy and switching times vs. gate resistor, inductive switching

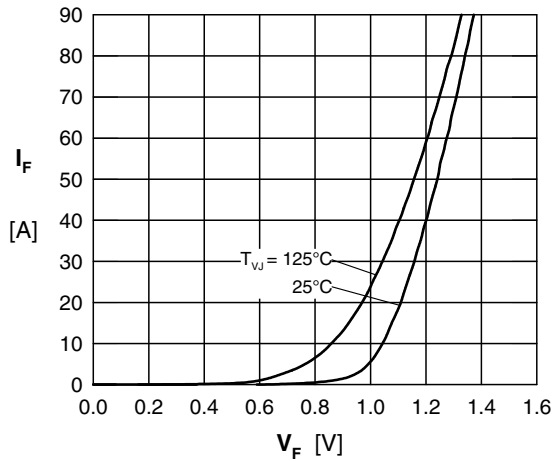


Fig. 13 Typ. forward characteristics of diode D

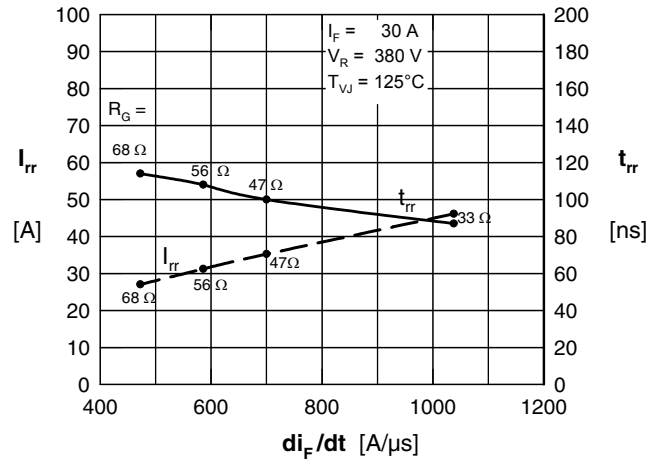


Fig. 14 Typ. reverse recovery characteristics of diode D

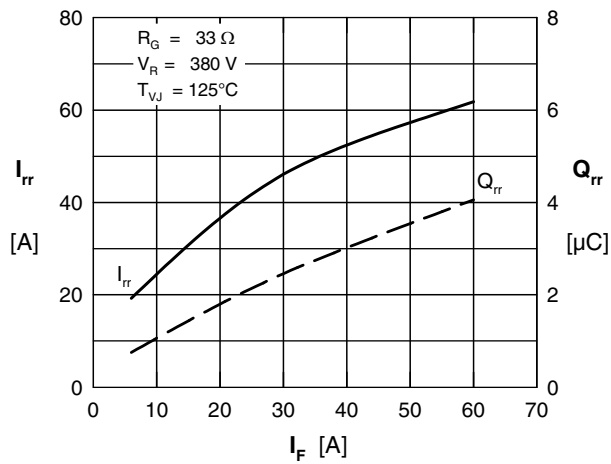


Fig. 15 Typ. reverse recovery characteristics of diode D



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