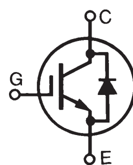
IXYS

Polar™ High Speed IGBT w/ Diode

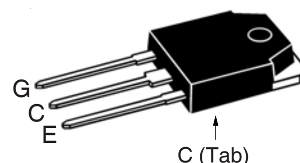
IXGQ85N33PCD1

V_{CES} = 330V
I_{CP} = 340A
$V_{CE(sat)}$ ≤ 2.10V

Anti-Parallel Diode for
PDP Sustain Circuit



TO-3P (IXGQ)



G = Gate   C = Collector
E = Emitter   Tab = Collector

Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_J = 25°C to 150°C	330	V
V_{GES}	Continuous	±20	V
V_{GEM}	Transient	±30	V
I_{C25}	T_C = 25°C	85	A
I_{DP}	T_J ≤ 150°C, tp ≤ 10μs,	40	A
I_{CP}	T_J ≤ 150°C, tp ≤ 1μs, D ≤ 1%	340	A
SSOA	V_{GE} = 15V, T_{VJ} = 150°C, R_G = 20Ω	I_{CM} = 96	A
(RBSOA)	Clamped Inductive Load	@V_{CE} ≤ 300	V
P_C	T_C = 25°C	150	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
T_L	Maximum Lead Temperature for Soldering	300	°C
T_{SOLD}	1.6 mm (0.062in.) from Case for 10s	260	°C
M_d	Mounting Torque	1.13/10	Nm/lb.in
Weight		5.5	g

Features

- International standard package
- Low $V_{CE(sat)}$
  - for minimum on-state conduction losses
- Fast switching
- Anti-Parallel Diode

Advantages

- High Power Density
- Low Gate Drive Requirement

Applications

- PDP Screen Drivers

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)		Characteristic Values Min.	Typ.	Max.	
$V_{GE(th)}$	I_C = 1mA, V_{CE} = V_{GE}		3.0		6.0	V
I_{CES}	V_{CE} = V_{CES}, V_{GE} = 0V				1	μA
		T_J = 125°C			200	μA
I_{GES}	V_{CE} = 0V, V_{GE} = ±20V				±100	nA
$V_{CE(sat)}$	I_C = 50A, V_{GE} = 15V, Note 1	T_J = 25°C		1.43	2.10	V
	I_C = 100A			1.85	3.00	V
	I_C = 50A, V_{GE} = 15V, Note 1	T_J = 125°C		1.47		V
	I_C = 100A			2.00		V

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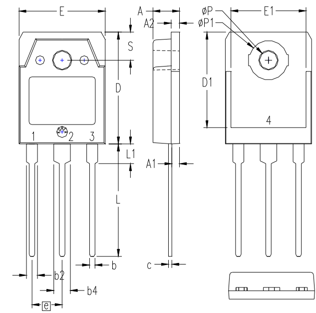
Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	I_C = 43A, V_{CE} = 10V, Note 1	30	49		S
C_{ies}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz		2200		pF
C_{oes}			155		pF
C_{res}			25		pF
Q_g	I_C = 43A, V_{GE} = 15V, V_{CE} = 0.5 • V_{CES}		80		nC
Q_{ge}			15		nC
Q_{gc}			23		nC
$t_{d(on)}$	**Resistive load, T_J = 25°C**		20		ns
t_r	I_C = 50A, V_{GE} = 15V		43		ns
$t_{d(off)}$	V_{CE} = 240V, R_G = 5Ω		87		ns
t_f			72	350	ns
$t_{d(on)}$	**Resistive load, T_J = 125°C**		20		ns
t_r	I_C = 50A, V_{GE} = 15V		95		ns
$t_{d(off)}$	V_{CE} = 240V, R_G = 5Ω		88		ns
t_f			130		ns
R_{thJC}				0.833	°C/W
R_{thCS}			0.25		°C/W

TO-3P Outline



1 = Gate 2,4 = Collector
3 = Emitter

SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.185	.193	4.70	4.90
A1	.051	.059	1.30	1.50
A2	.057	.065	1.45	1.65
b	.035	.045	0.90	1.15
b2	.075	.087	1.90	2.20
b4	.114	.126	2.90	3.20
c	.022	.031	0.55	0.80
D	.780	.799	19.80	20.30
D1	.665	.677	16.90	17.20
E	.610	.622	15.50	15.80
E1	.531	.539	13.50	13.70
e	.215 BSC		5.45 BSC	
L	.779	.795	19.80	20.20
L1	.134	.142	3.40	3.60
øP	.126	.134	3.20	3.40
øP1	.272	.280	6.90	7.10
S	.193	.201	4.90	5.10

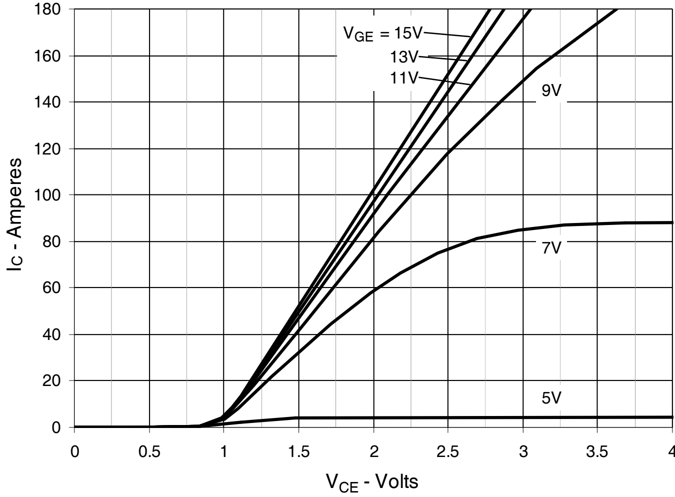
Reverse Diode (FRED)

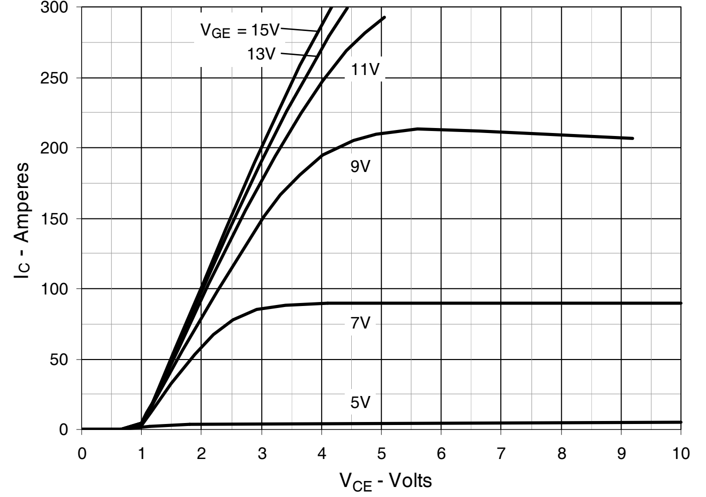
Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)		Characteristic Values Min.	Typ.	Max.	
V_F	I_F = 30A, V_{GE} = 0V, Note 1	T_J = 25°C			1.40	V
	I_F = 60A				1.69	V
	I_F = 30A, V_{GE} = 0V, Note 1	T_J = 150°C			1.13	V
	I_F = 60A				1.46	V
I_{RM}	I_F = 30A, $-di_F/dt$ = 200A/μs, V_R = 270V	T_J = 25°C		4.0		A
		T_J = 125°C		8.5		A
t_{rr}		T_J = 25°C		45		ns
		T_J = 125°C		85		ns
R_{thJC}					0.95	°C/W

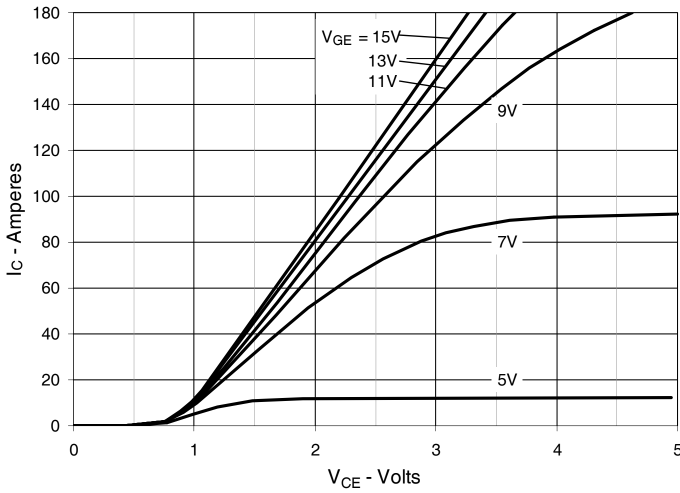
Note: 1. Pulse test, t ≤ 300μs, duty cycle, d ≤ 2%.

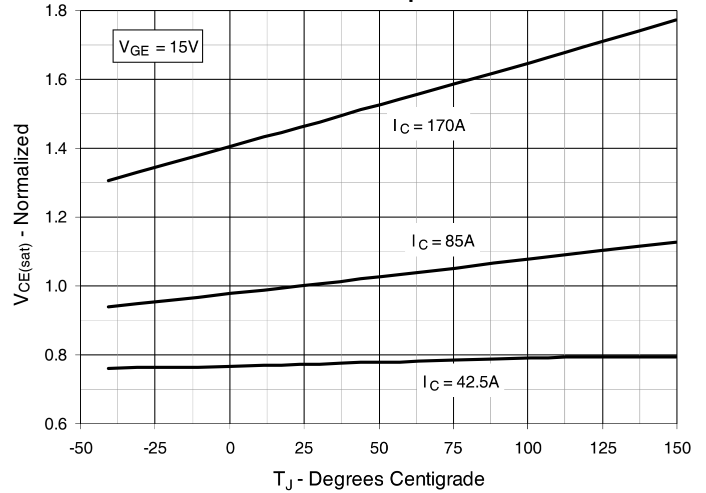
IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.

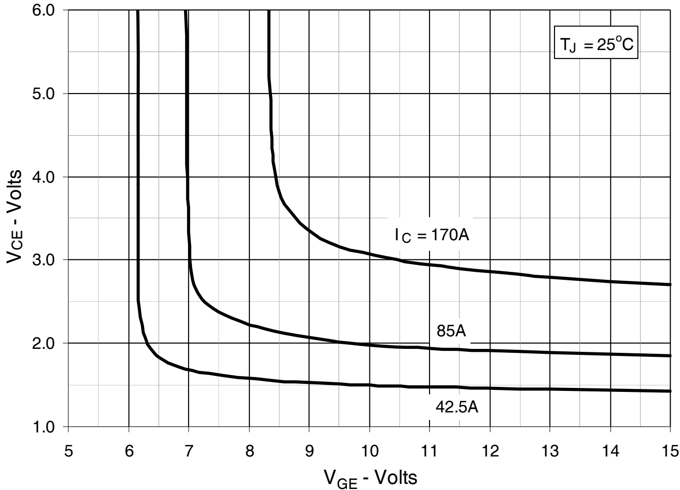
IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents: 4,835,592 4,931,844 5,049,961 5,237,481 6,162,665 6,404,065 B1 6,683,344 6,727,585 7,005,734 B2 7,157,338B2 4,860,072 5,017,508 5,063,307 5,381,025 6,259,123 B1 6,534,343 6,710,405 B2 6,759,692 7,063,975 B2 4,881,106 5,034,796 5,187,117 5,486,715 6,306,728 B1 6,583,505 6,710,463 6,771,478 B2 7,071,537

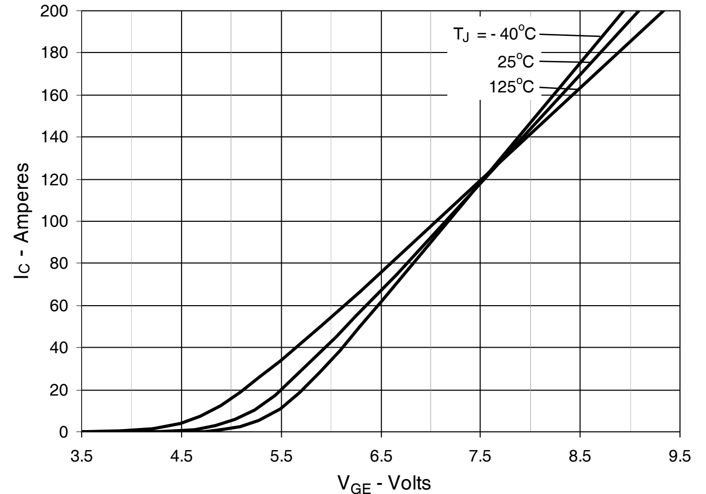












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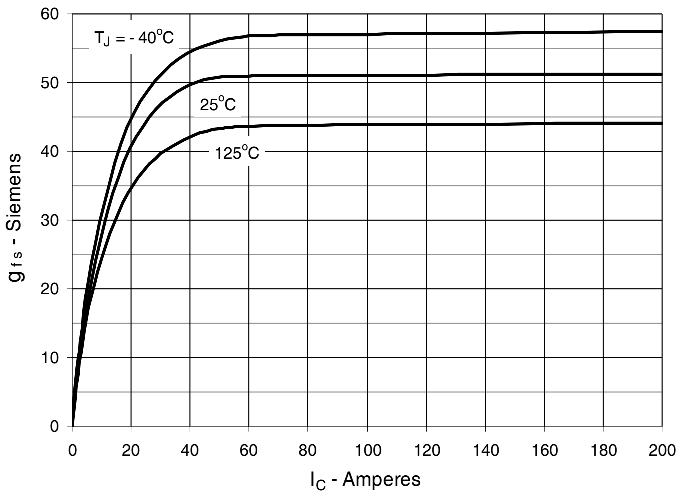

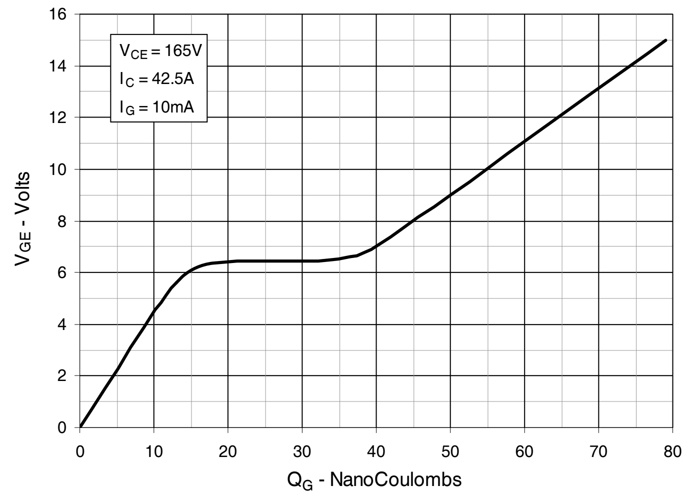

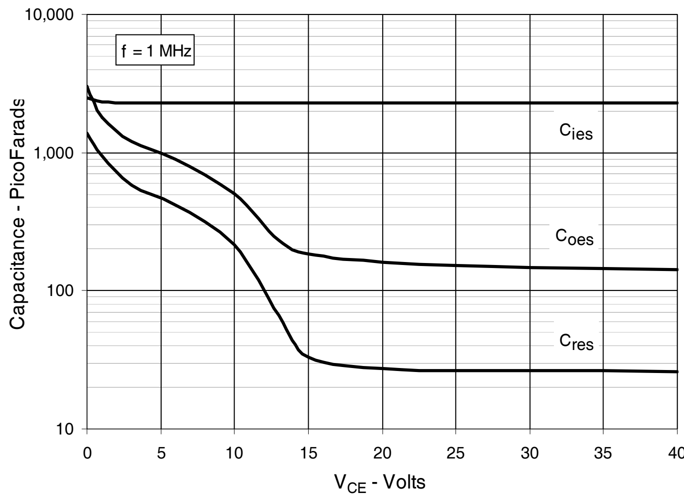

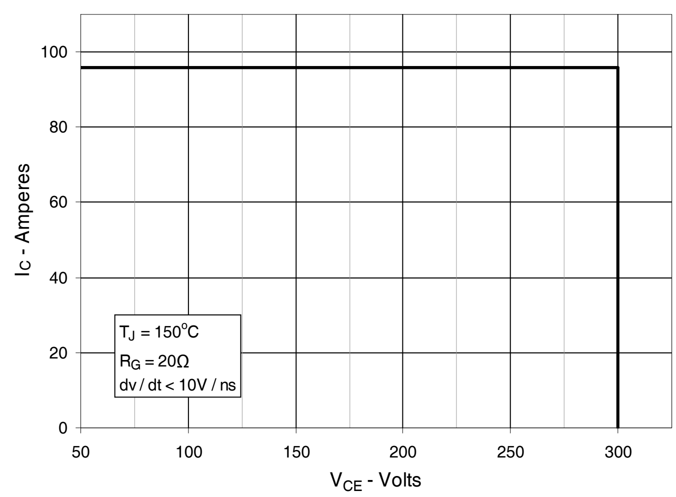

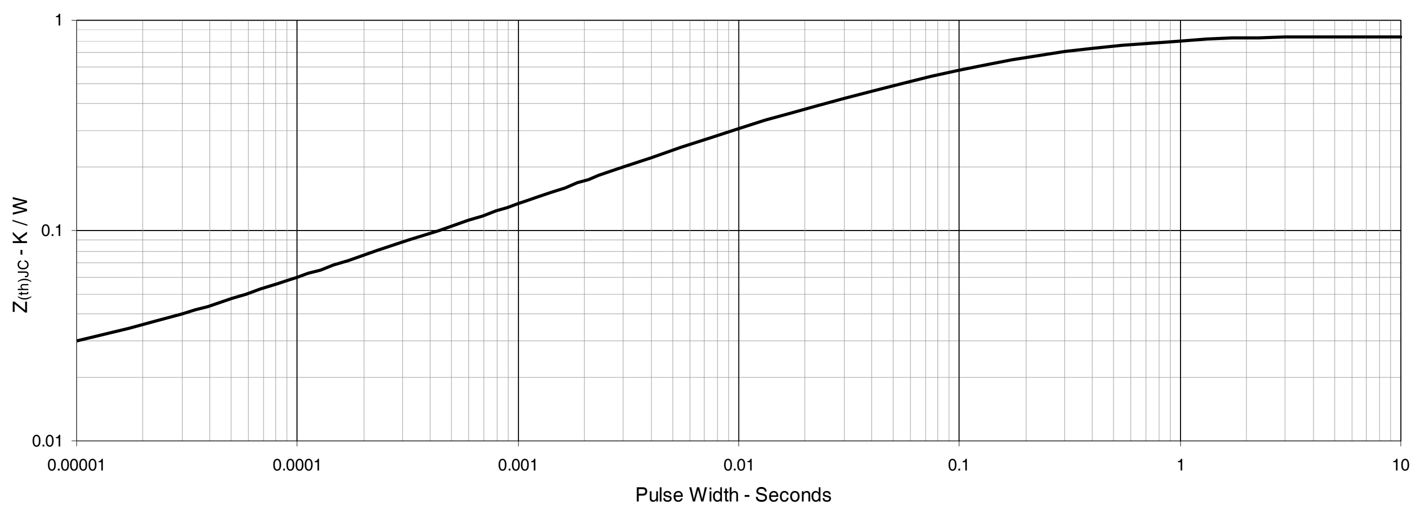

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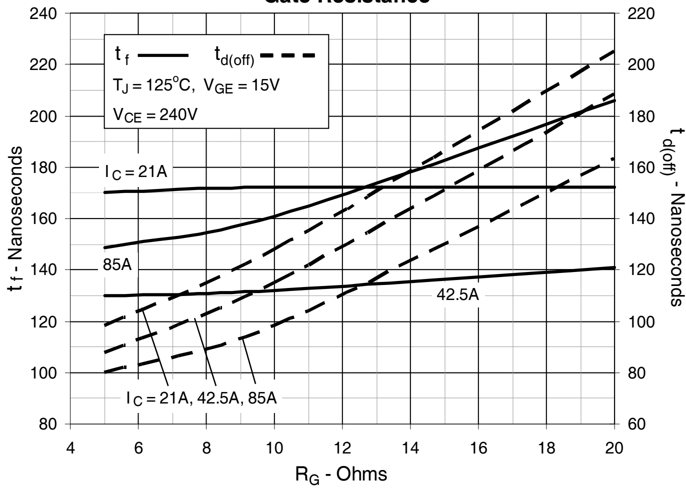

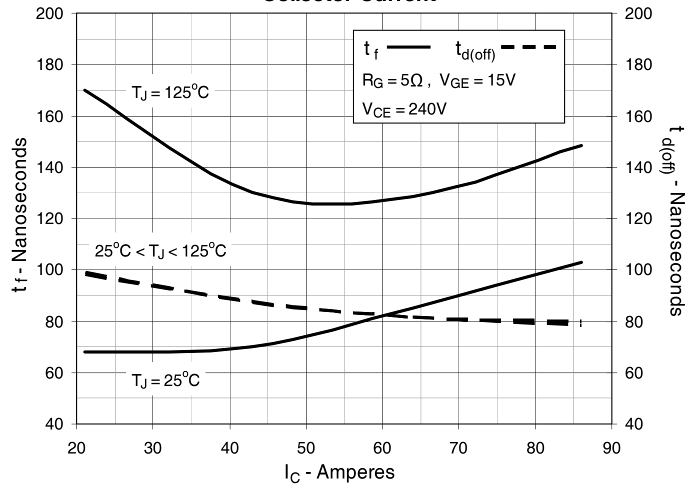

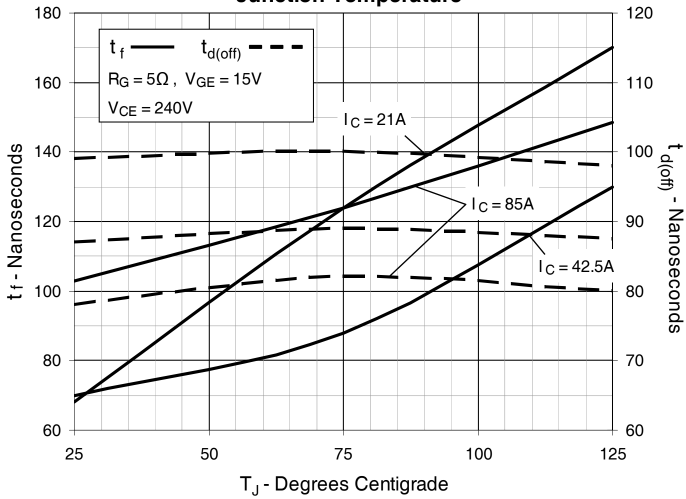

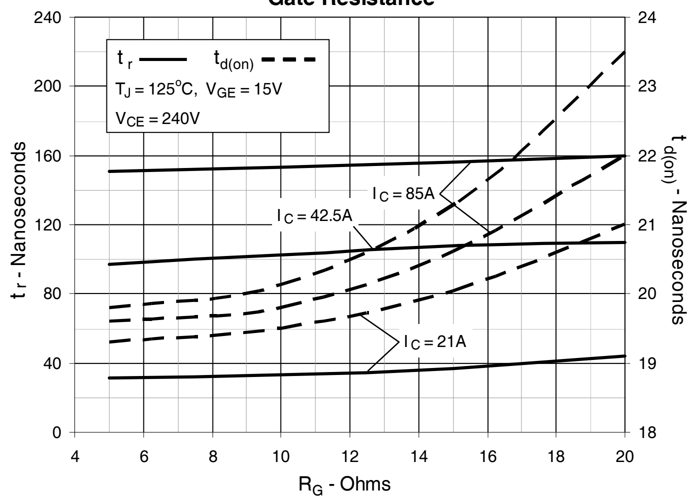

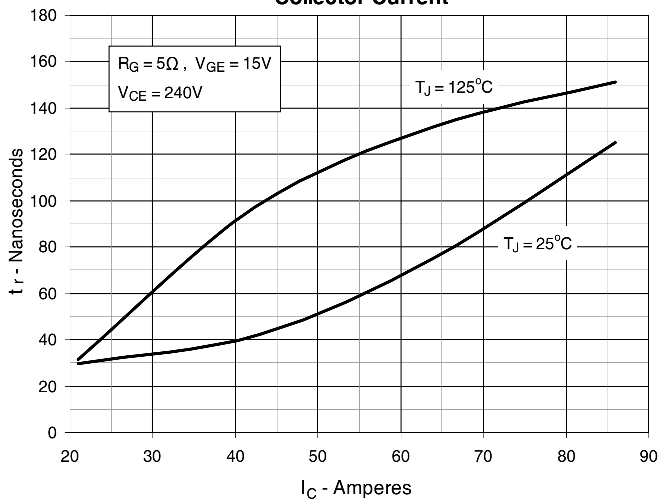

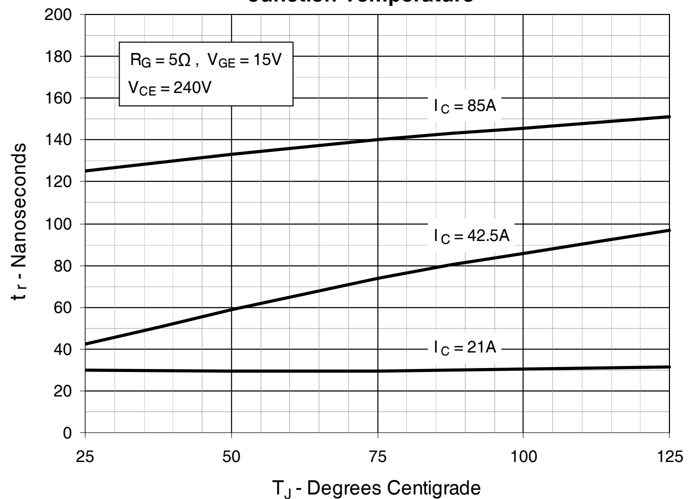

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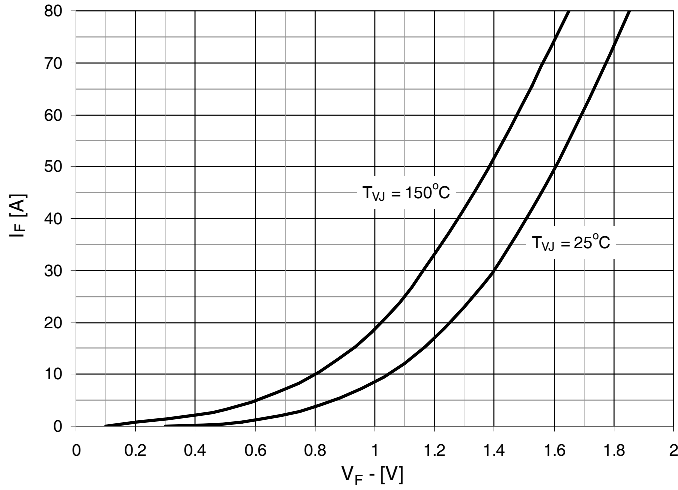

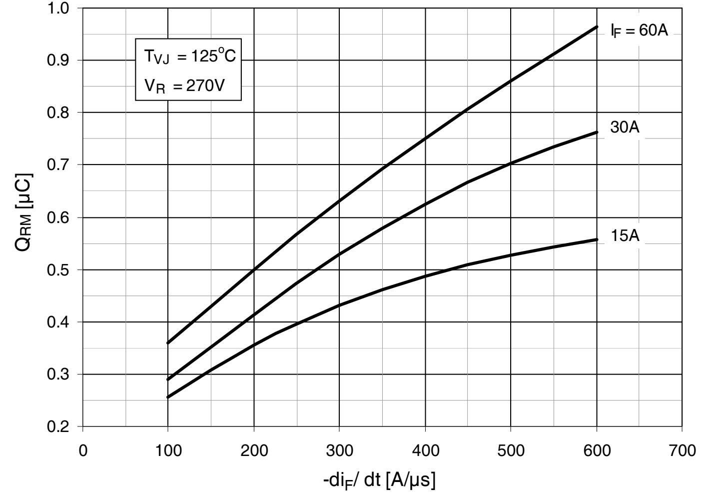

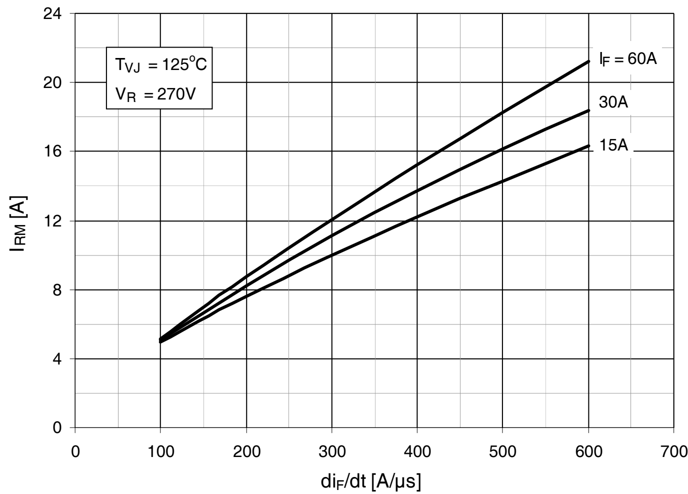

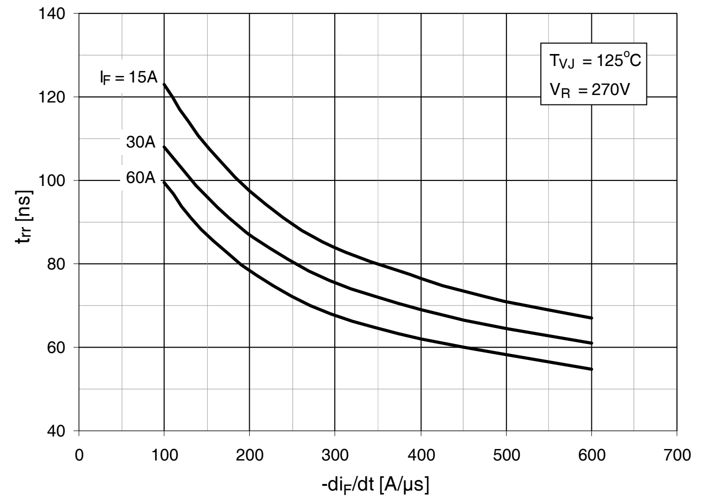

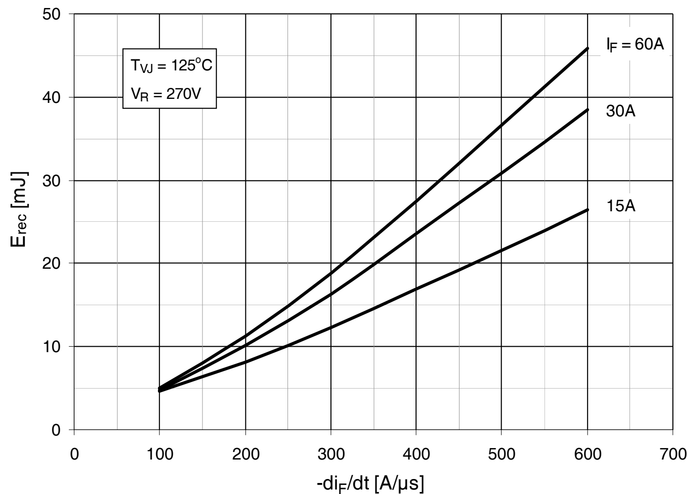

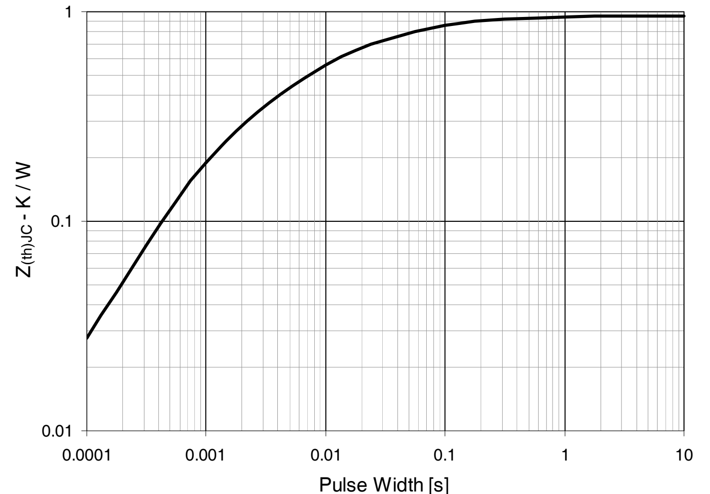

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