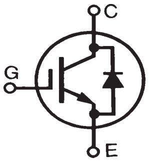
GenX3™ 600V IGBTs w/ Diode

IXGA30N60C3D4
IXGP30N60C3D4

V_{CES} = 600V
I_{C110} = 30A
$V_{CE(sat)}$ ≤ 3.0V
$t_{fi(typ)}$ = 47ns

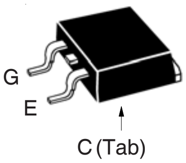
High-Speed PT IGBTs for 40-100kHz Switching



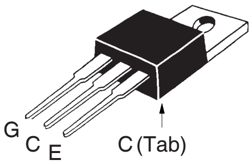
Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_C = 25°C to 150°C	600	V
V_{CGR}	T_J = 25°C to 150°C, R_{GE} = 1MΩ	600	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	T_C = 25°C	60	A
I_{C110}	T_C = 110°C	30	A
I_{CM}	T_C = 25°C, 1ms	150	A
SSOA	V_{GE} = 15V, T_{VJ} = 125°C, R_G = 5Ω	I_{CM} = 60	A
(RBSOA)	Clamped Inductive Load	@ ≤ V_{CES}	
P_C	T_C = 25°C	220	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
T_L	1.6mm (0.062 in.) from Case for 10s	300	°C
T_{SOLD}	Plastic Body for 10 seconds	260	°C
M_d	Mounting Torque (TO-220)	1.13/10	Nm/lb.in.
Weight	TO-220	2.5	g
	TO-263	3.0	g

Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
BV_{CES}	I_C = 250μA, V_{GE} = 0V	600			V
$V_{GE(th)}$	I_C = 250μA, V_{CE} = V_{GE}	4.0		5.5	V
I_{CES}	V_{CE} = V_{CES}, V_{GE} = 0V			75	μA
	T_J = 125°C			500	μA
I_{GES}	V_{CE} = 0V, V_{GE} = ± 20V			±100	nA
$V_{CE(sat)}$	I_C = 20A, V_{GE} = 15V, Note 1		2.6	3.0	V
	T_J = 125°C		1.8		V

TO-263 AA (IXGA)



TO-220AB (IXGP)



G = Gate
D = Collector
S = Emitter
Tab = Collector

Features

- Optimized for Low Switching Losses
- Square RBSOA
- Anti-Parallel Ultra Fast Diode
- International Standard Packages

Advantages

- High Power Density
- Low Gate Drive Requirement

Applications

- Power Inverters
- UPS
- Motor Drives
- SMPS
- PFC Circuits
- Battery Chargers
- Welding Machines
- Lamp Ballasts
- High Frequency Power Inverters

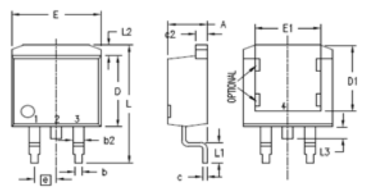
Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	I_C = 20A, V_{CE} = 10V, Note 1	9	16		S
C_{ies}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz		915		pF
C_{oes}			78		pF
C_{res}			32		pF
Q_g	I_C = 20A, V_{GE} = 15V, V_{CE} = 0.5 • V_{CES}		38		nC
Q_{ge}			8		nC
Q_{gc}			17		nC
$t_{d(on)}$	**Inductive Load, T_J = 25°C** I_C = 20A, V_{GE} = 15V V_{CE} = 300V, R_G = 5Ω		16		ns
t_{ri}			26		ns
E_{on}			0.27		mJ
$t_{d(off)}$			42	75	ns
t_{fi}			47		ns
E_{off}			0.09	0.18	mJ
$t_{d(on)}$	**Inductive Load, T_J = 125°C** I_C = 20A, V_{GE} = 15V V_{CE} = 300V, R_G = 5Ω		17		ns
t_{ri}			28		ns
E_{on}			0.44		mJ
$t_{d(off)}$			70		ns
t_{fi}			90		ns
E_{off}			0.33		mJ
R_{thJC}				0.56	°C/W
R_{thCS}	TO-220		0.50		°C/W

Reverse Diode (FRED)

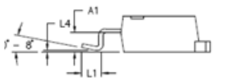
Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)		Characteristic Values Min.	Typ.	Max.	
V_F	I_F = 10A, V_{GE} = 0V, Note 1				3.0	V
		T_J = 150°C		1.7		V
t_{rr}	I_F = 10A, -di_F/dt = 200A/μs V_R = 300V	T_J = 100°C		60		ns
I_{RM}		T_J = 25°C			3	A
		T_J = 100°C			4	A
R_{thJC}					2.5	°C/W

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

TO-263 Outline

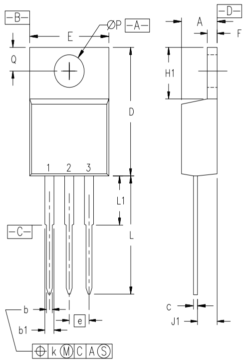


1 = Gate
2 = Collector
3 = Emitter
4 = Collector



SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.160	.190	4.06	4.83
A1	.080	.110	2.03	2.79
b	.020	.039	0.51	0.99
b2	.045	.055	1.14	1.40
c	.016	.029	0.40	0.74
c2	.045	.055	1.14	1.40
D	.340	.380	8.64	9.65
D1	.315	.350	8.00	8.89
E	.380	.410	9.65	10.41
E1	.245	.320	6.22	8.13
e	.100 BSC		2.54 BSC	
L	.575	.625	14.61	15.88
L1	.090	.110	2.29	2.79
L2	.040	.055	1.02	1.40
L3	.050	.070	1.27	1.78
L4	0	.005	0	0.13

TO-220 Outline



1 = Gate 2 = Collector
3 = Emitter

SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.170	.190	4.32	4.83
b	.025	.040	0.64	1.02
b1	.045	.065	1.15	1.65
c	.014	.022	0.35	0.56
D	.580	.630	14.73	16.00
E	.390	.420	9.91	10.66
e	.100 BSC		2.54 BSC	
F	.045	.055	1.14	1.40
H1	.230	.270	5.85	6.85
J1	.090	.110	2.29	2.79
k	0	.015	0	0.38
L	.500	.550	12.70	13.97
L1	.110	.230	2.79	5.84
ØP	.139	.161	3.53	4.08
Q	.100	.125	2.54	3.18

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 4,850,072 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

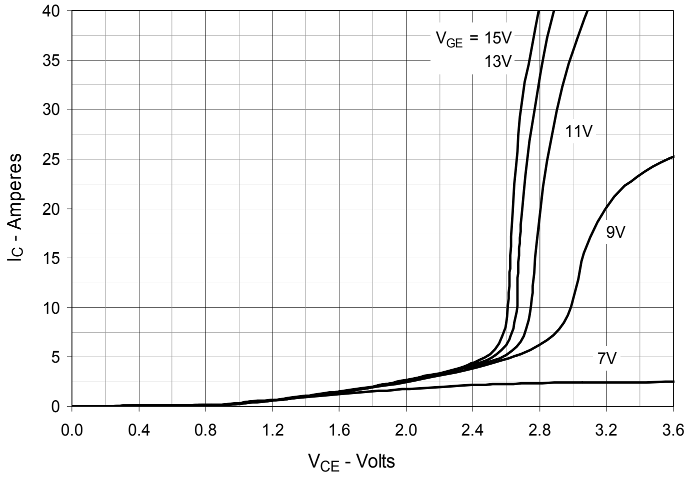


Fig. 1. Output Characteristics @ T_J = 25ºC

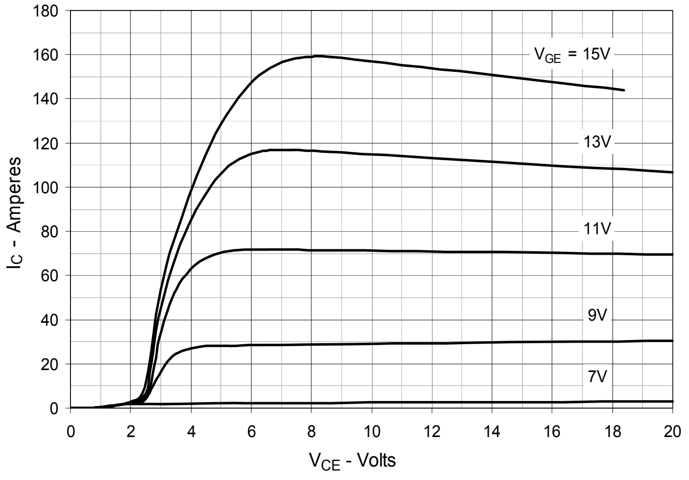


Fig. 2. Extended Output Characteristics @ T_J = 25ºC

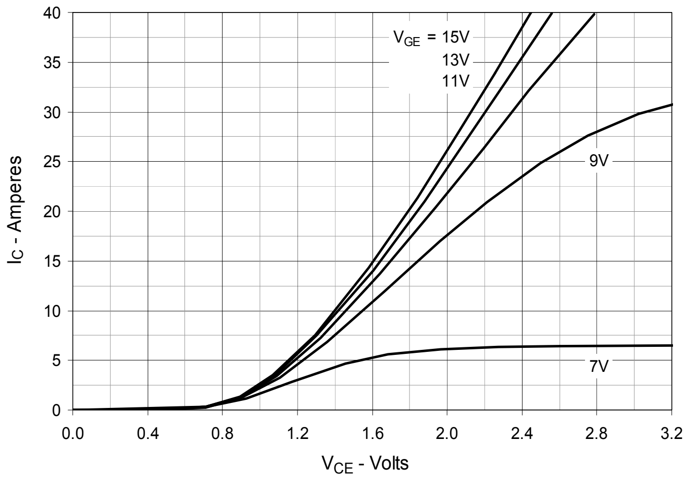


Fig. 3. Output Characteristics @ T_J = 125ºC

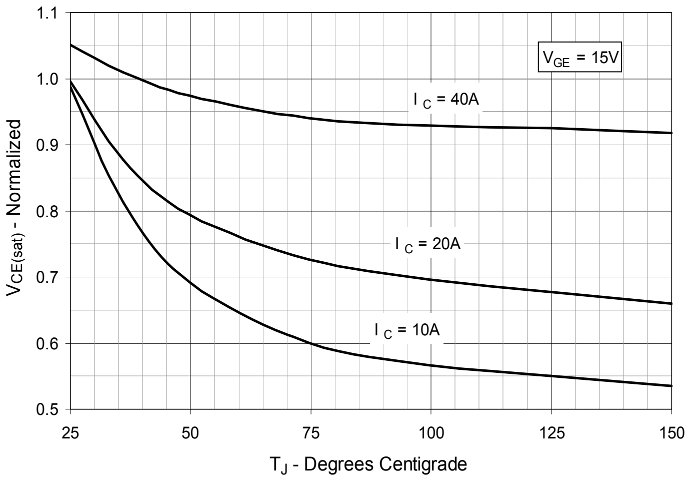


Fig. 4. Dependence of $V_{CE(sat)}$ on JunctionTemperature

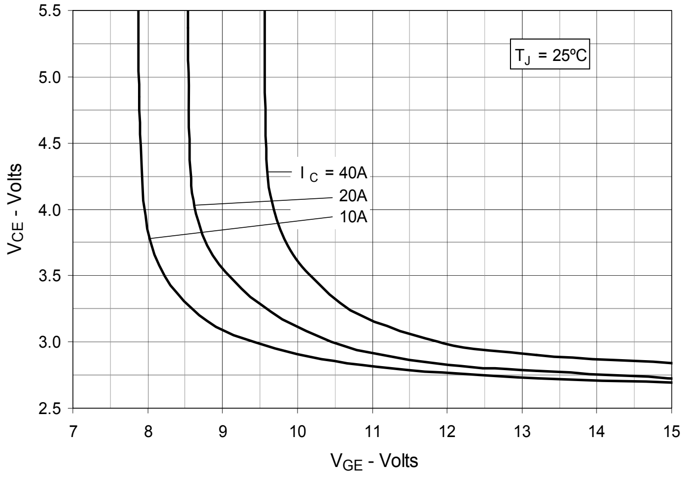


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

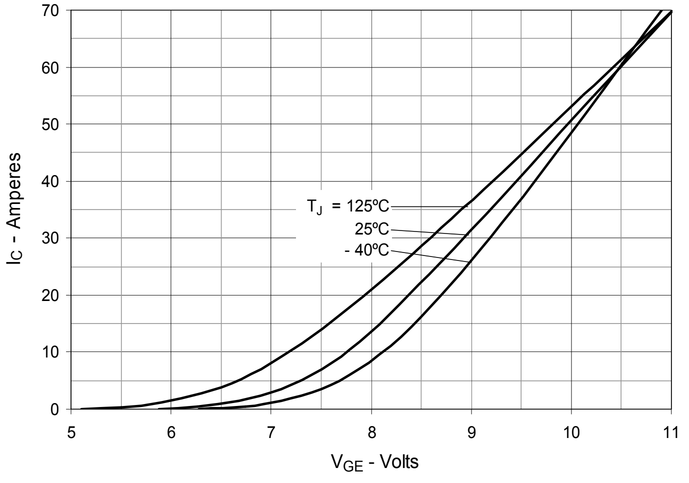


Fig. 6. Input Admittance

Fig. 7. Transconductance

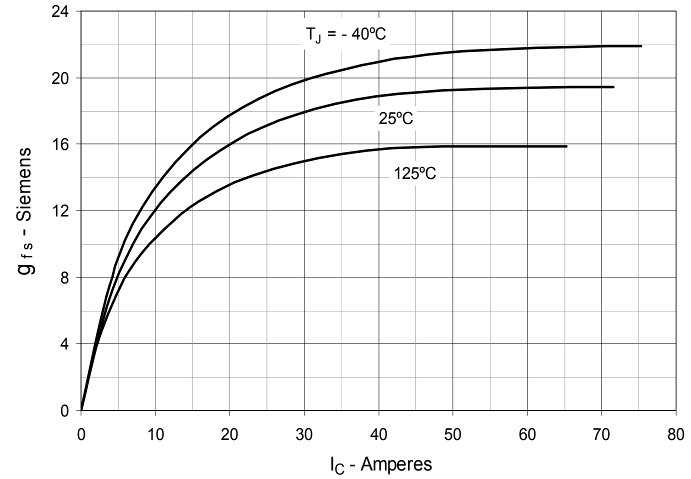


Fig. 8. Gate Charge

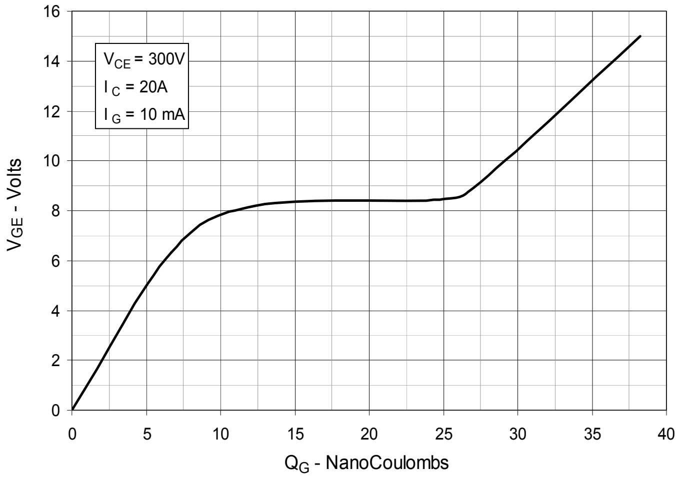


Fig. 9. Capacitance

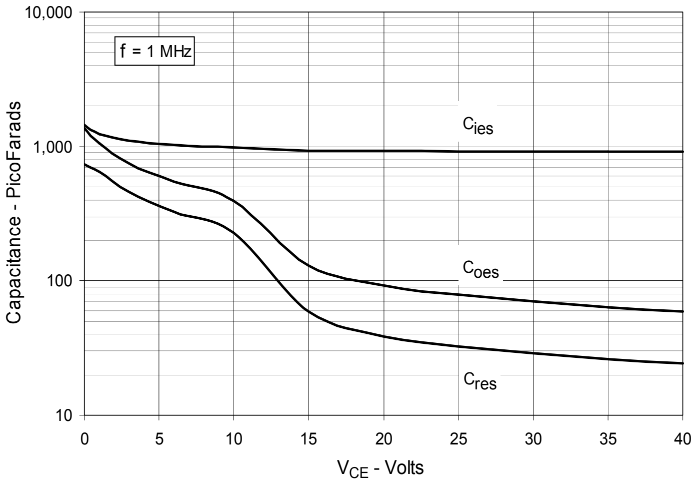


Fig. 10. Reverse-Bias Safe Operating Area

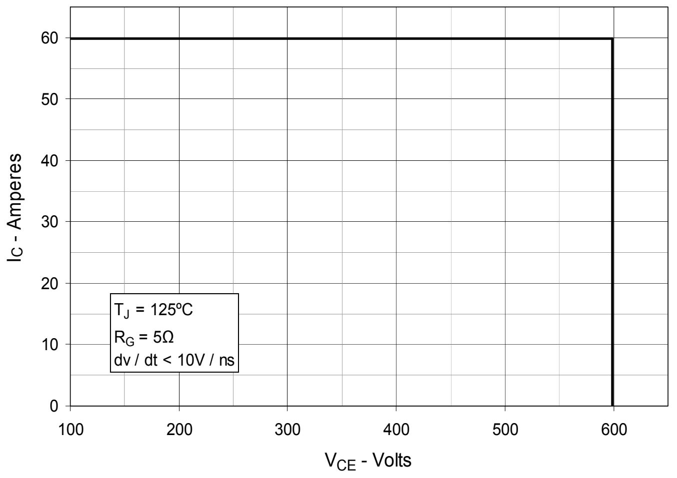
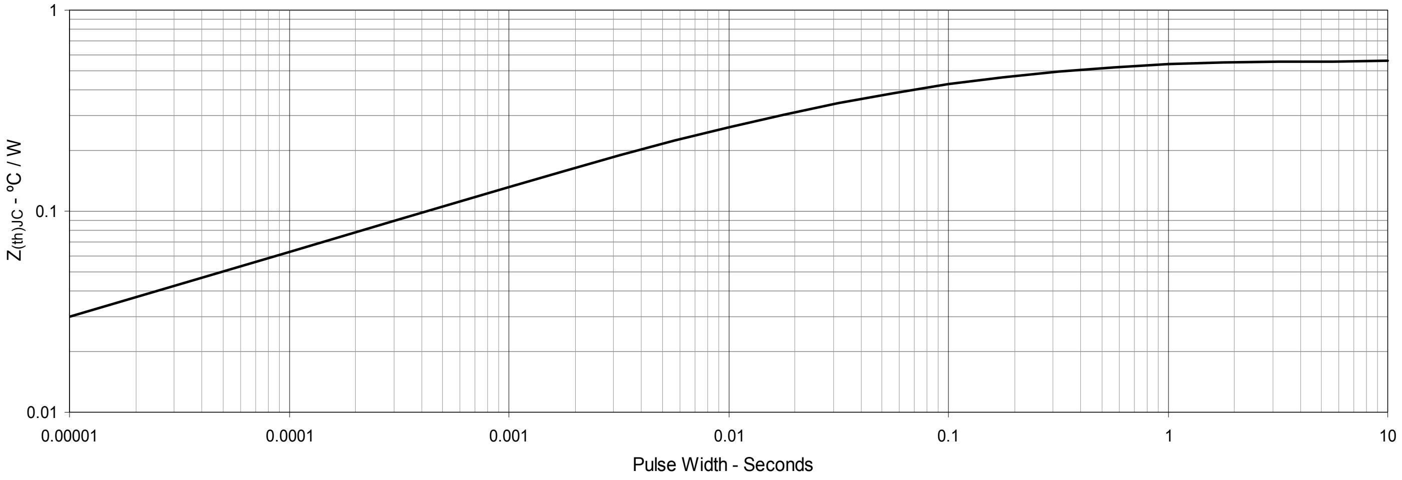


Fig. 11. Maximum Transient Thermal Impedance



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

Fig. 12. Inductive Switching Energy Loss vs. Gate Resistance

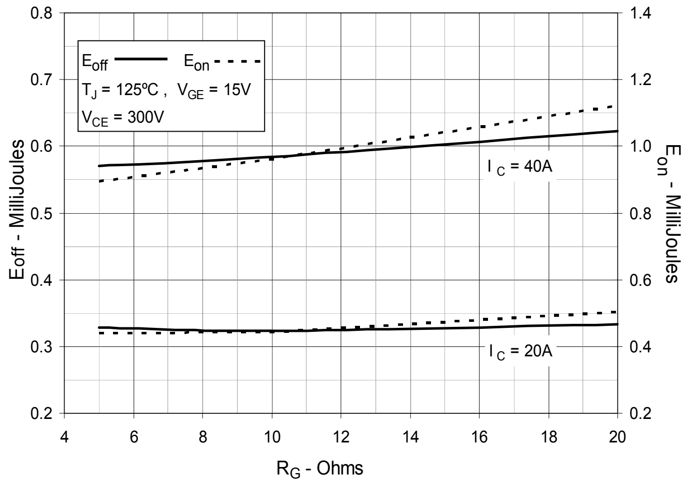


Fig. 13. Inductive Switching Energy Loss vs. Collector Current

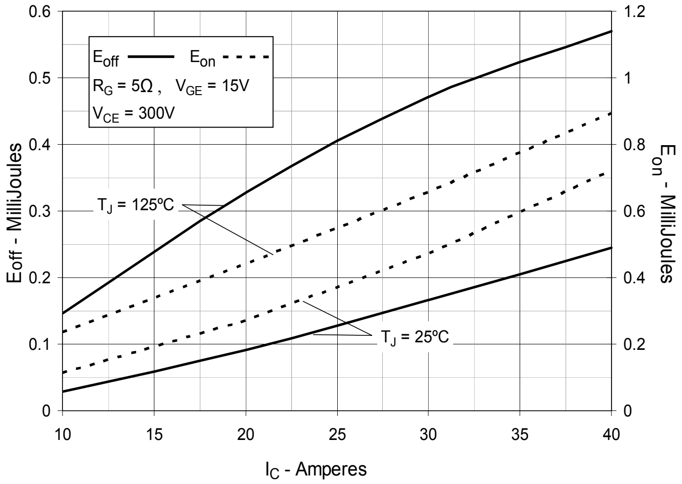


Fig. 14. Inductive Switching Energy Loss vs. Junction Temperature

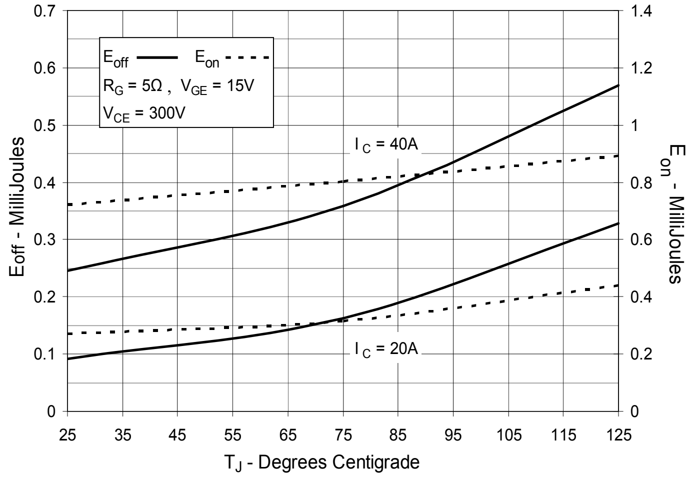


Fig. 15. Inductive Turn-off Switching Times vs. Gate Resistance

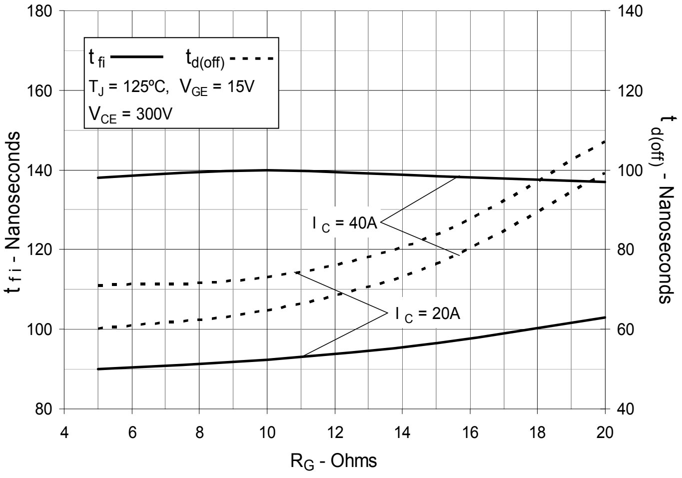


Fig. 16. Inductive Turn-off Switching Times vs. Collector Current

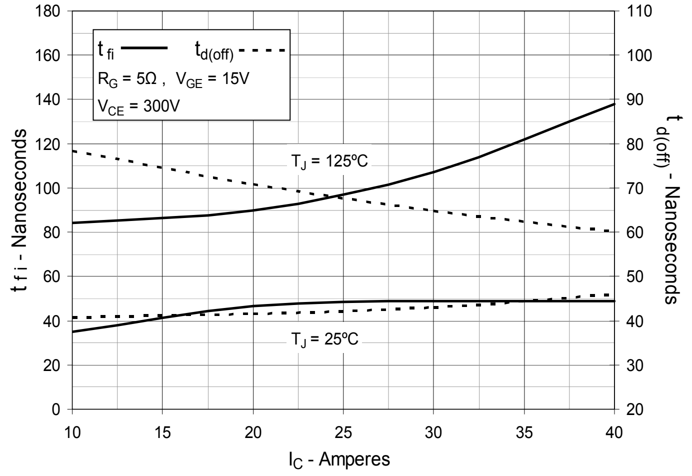


Fig. 17. Inductive Turn-off Switching Times vs. Junction Temperature

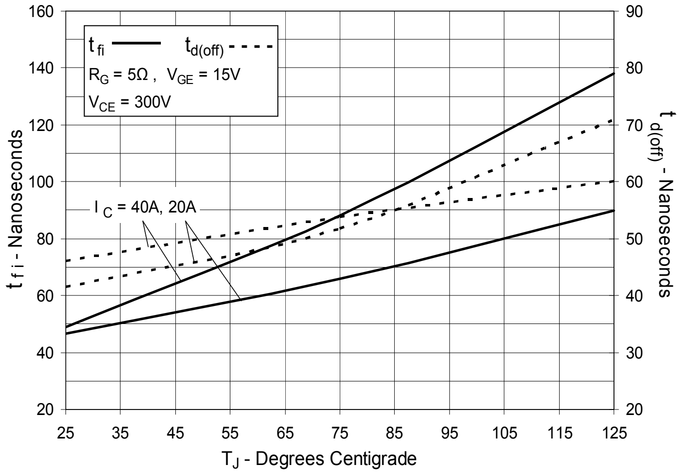


Fig. 18. Inductive Turn-on Switching Times vs. Gate Resistance

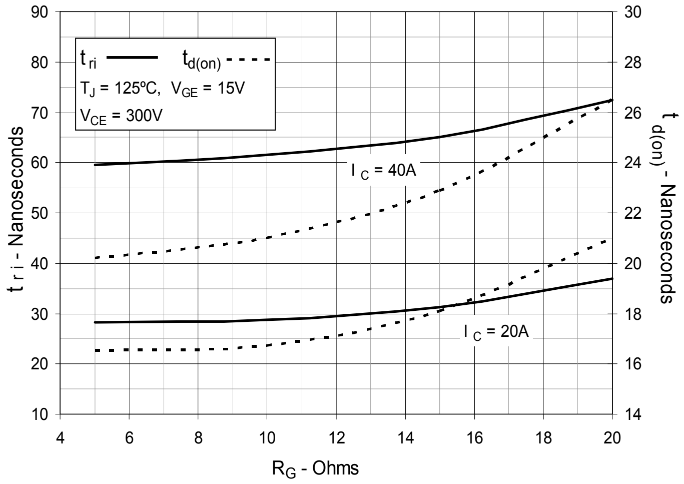


Fig. 19. Inductive Turn-on Switching Times vs. Collector Current

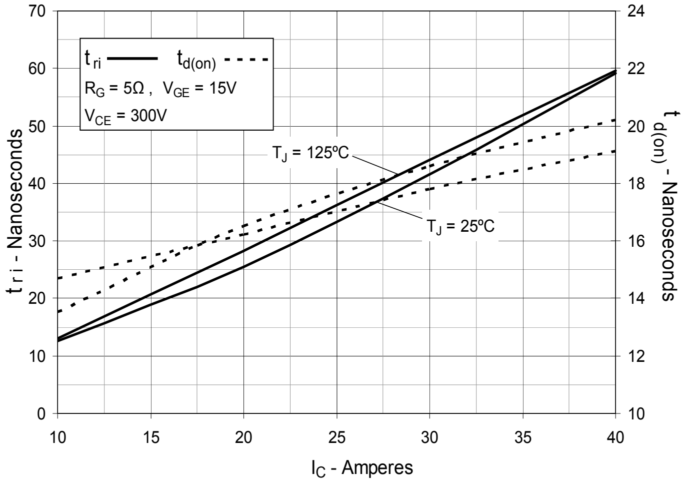
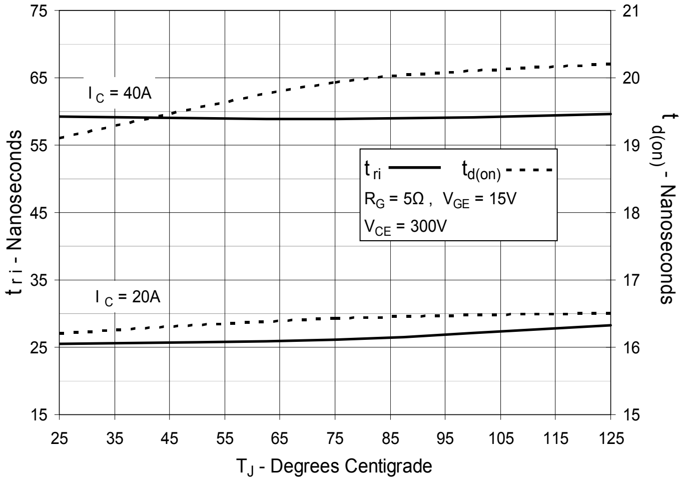


Fig. 20. Inductive Turn-on Switching Times vs. Junction Temperature



IXYS REF: G_30N60C3(4D)05-02-11-A

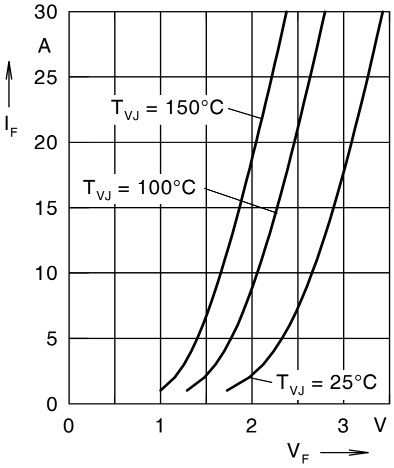


Fig. 21. Forward current I_F versus V_F

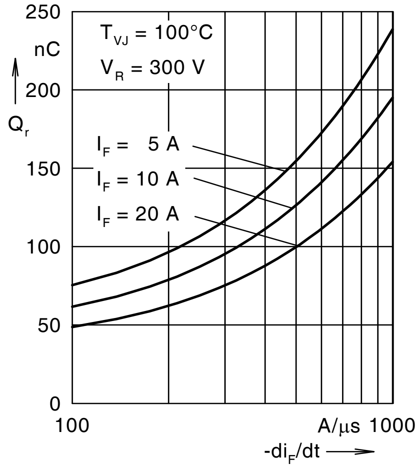


Fig. 22. Reverse recovery charge Q_r

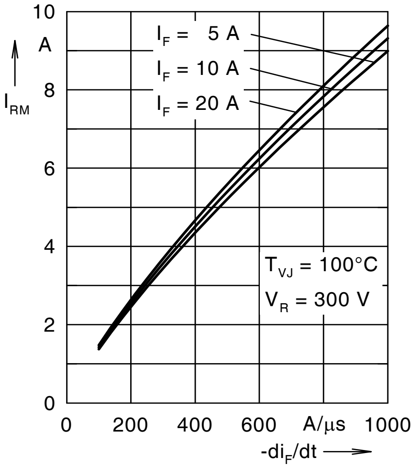


Fig. 23. Peak reverse current I_{RM}

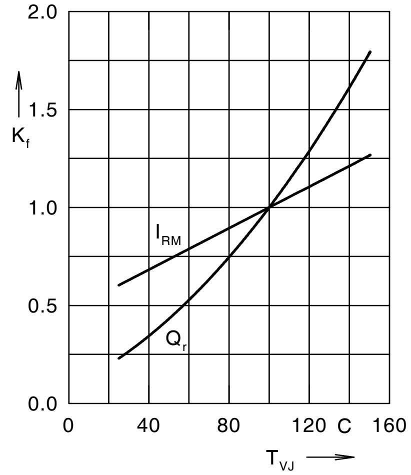


Fig. 24. Dynamic parameters Q_r, I_{RM}

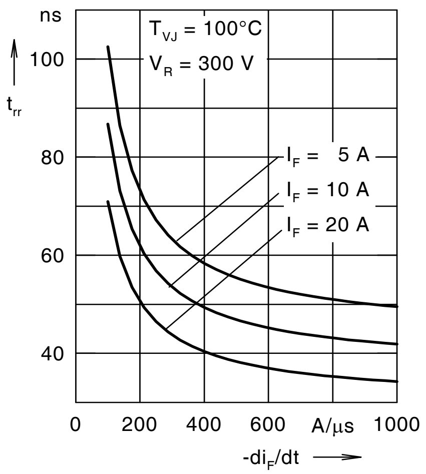


Fig. 25. Recovery time t_{rr} versus $-di_F/dt$

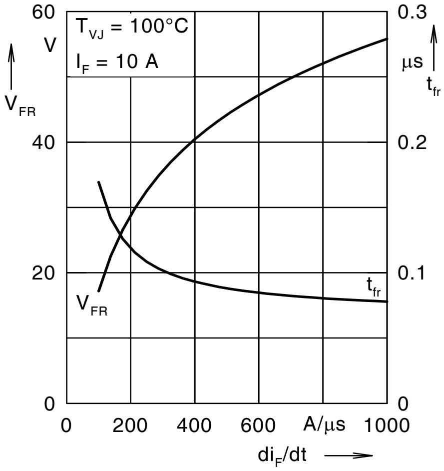


Fig. 26. Peak forward voltage V_{FR} and

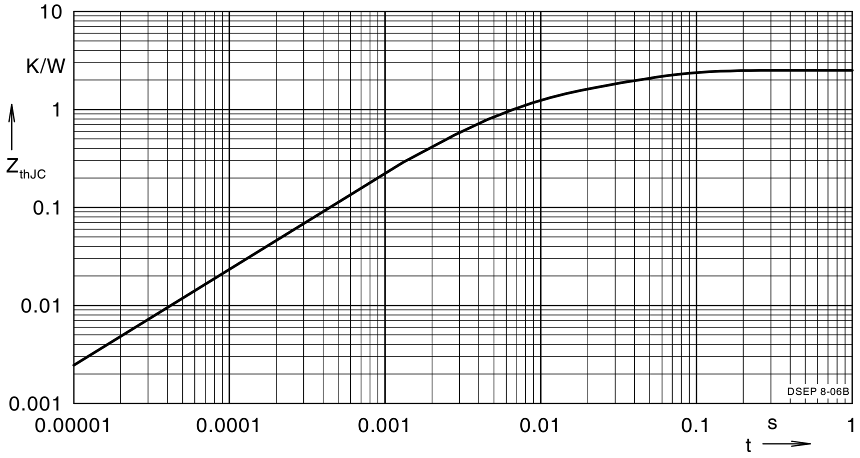


Fig. 27. Transient thermal resistance junction-to-case

NOTE: Fig. 2 to Fig. 6 shows typical values

MOSCHIP.RU
ВМЕСТЕ МЫ СОЗДАЕМ БУДУЩЕЕ

ПОСТАВКА
ЭЛЕКТРОННЫХ КОМПОНЕНТОВ

многоканальный
+7 495 668 12 70
info@moschip.ru

Общество с ограниченной ответственностью «МосЧип» ИНН 7719860671 / КПП 771901001
Адрес: 105318, г.Москва, ул.Щербаковская д.3, офис 1107

Данный компонент на территории Российской Федерации

Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

http://moschip.ru/get-element

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:
moschip.ru
moschip.ru_4
moschip.ru_6
moschip.ru_9