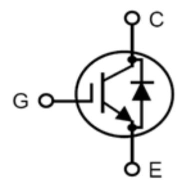
Preliminary Technical Information

900V XPT™ IGBT GenX3™ w/Diode

IXYH24N90C3D1

V_{CES} = 900V
I_{C90} = 24A
$V_{CE(sat)}$ ≤ 2.7V
$t_{fi(typ)}$ = 90ns

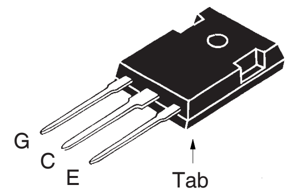
High-Speed IGBT
for 20-50 kHz Switching



Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_J = 25°C to 150°C	900	V
V_{CGR}	T_J = 25°C to 150°C, R_{GE} = 1MΩ	900	V
V_{GES}	Continuous	±20	V
V_{GEM}	Transient	±30	V
I_{C25}	T_C = 25°C	44	A
I_{C90}	T_C = 90°	24	A
I_{F110}	T_C = 110°C	15	A
I_{CM}	T_C = 25°C, 1ms	105	A
I_A	T_C = 25°C	15	A
E_{AS}	T_C = 25°C	150	mJ
SSOA (RBSOA)	V_{GE} = 15V, T_{VJ} = 125°C, R_G = 10Ω Clamped Inductive Load	I_{CM} = 48 @$V_{CE} \leq V_{CES}$	A
P_C	T_C = 25°C	200	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		6	g

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
BV_{CES}	I_C = 250µA, V_{GE} = 0V	950			V
$V_{GE(th)}$	I_C = 250µA, V_{CE} = V_{GE}	3.5		6.0	V
I_{CES}	V_{CE} = V_{CES}, V_{GE} = 0V			75	µA
	T_J = 125°C			400	µA
I_{GES}	V_{CE} = 0V, V_{GE} = ±20V			±100	nA
$V_{CE(sat)}$	I_C = 24A, V_{GE} = 15V, Note 1		2.30	2.70	V
	T_J = 125°C		2.95		V

TO-247



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

Features

- Optimized for Low Switching Losses
- Square RBSOA
- Positive Thermal Coefficient of Vce(sat)
- Anti-Parallel Ultra Fast Diode
- Avalanche Rated
- High Current Handling Capability
- International Standard Package

Advantages

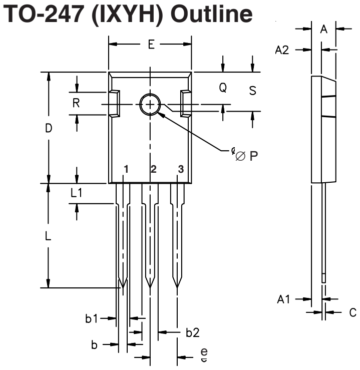
- High Power Density
- Low Gate Drive Requirement

Applications

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

Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	I_C = 24A, V_{CE} = 10V, Note 1	8	14		S
C_{ies}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz		1190		pF
C_{oes}			64		pF
C_{res}			22		pF
$Q_{g(on)}$	I_C = 24A, V_{GE} = 15V, V_{CE} = 0.5 • V_{CES}		40		nC
Q_{ge}			10		nC
Q_{gc}			18		nC
$t_{d(on)}$	**Inductive load, T_J = 25°C**		20		ns
t_{ri}	I_C = 24A, V_{GE} = 15V		36		ns
E_{on}	V_{CE} = 0.5 • V_{CES}, R_G = 10Ω		1.35		mJ
$t_{d(off)}$	Note 2		73		ns
t_{fi}			90		ns
E_{off}			0.40	0.70	mJ
$t_{d(on)}$	**Inductive load, T_J = 125°C**		22		ns
t_{ri}	I_C = 24A, V_{GE} = 15V		38		ns
E_{on}	V_{CE} = 0.5 • V_{CES}, R_G = 10Ω		2.60		mJ
$t_{d(off)}$	Note 2		85		ns
t_{fi}			130		ns
E_{off}			0.55		mJ
R_{thJC}				0.62	°C/W
R_{thCS}			0.21		°C/W

TO-247 (IXYH) Outline



Terminals: 1 - Gate 2 - Collector 3 - Emitter

Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	4.7	5.3	.185	.209
A_1	2.2	2.54	.087	.102
A_2	2.2	2.6	.059	.098
b	1.0	1.4	.040	.055
b_1	1.65	2.13	.065	.084
b_2	2.87	3.12	.113	.123
C	.4	.8	.016	.031
D	20.80	21.46	.819	.845
E	15.75	16.26	.610	.640
e	5.20	5.72	0.205	0.225
L	19.81	20.32	.780	.800
L1		4.50		.177
∅P	3.55	3.65	.140	.144
Q	5.89	6.40	0.232	0.252
R	4.32	5.49	.170	.216
S	6.15 BSC		242 BSC	

Reverse Diode (FRED)

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)		Characteristic Value Min.	Typ.	Max.	
V_F	I_F = 15A, V_{GE} = 0V, Note 1				3.25	V
		T_J = 150°C		2.0		V
I_{RM}	I_F = 15A, V_{GE} = 0V, $-di_F/dt$ = 250A/μs,	T_J = 100°C		14		A
t_{rr}	V_R = 600V	T_J = 100°C		340		ns
R_{thJC}					1.6	°C/W

Notes:

1. Pulse test, t ≤ 300μs, duty cycle, d ≤ 2%.
2. Switching times & energy losses may increase for higher V_{CE}(clamp), T_J or R_G.

PRELIMANARY TECHNICAL INFORMATION

The product presented herein is under development. The Technical Specifications offered are derived from a subjective evaluation of the design, based upon prior knowledge and experience, and constitute a "considered reflection" of the anticipated result. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

Fig. 1. Output Characteristics @ T_J = 25ºC

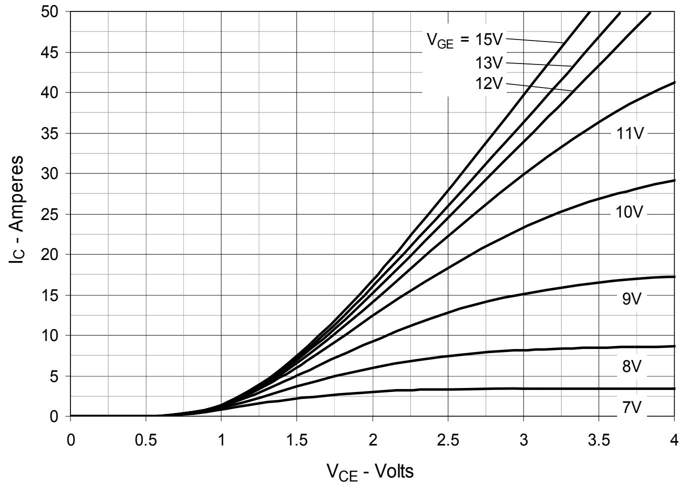


Fig. 2. Extended Output Characteristics @ T_J = 25ºC

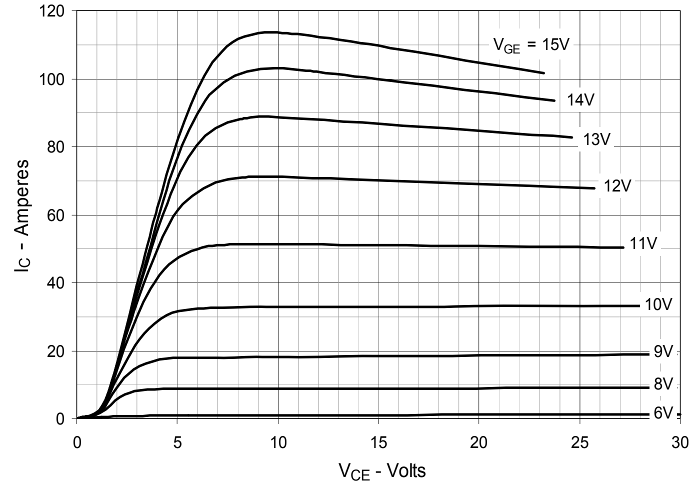


Fig. 3. Output Characteristics @ T_J = 125ºC

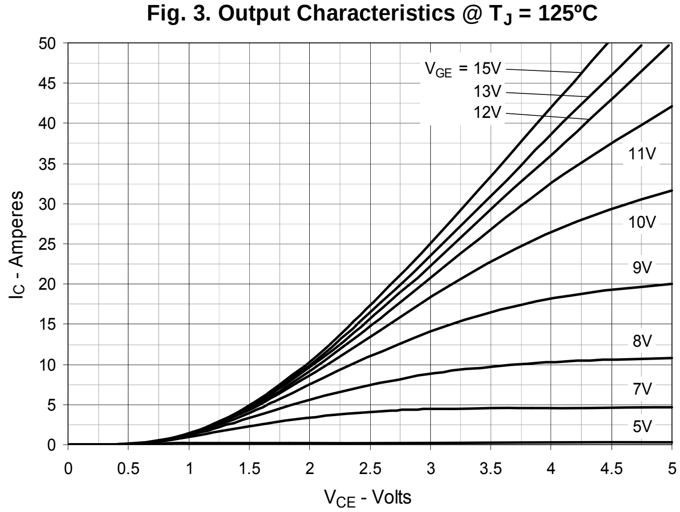


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

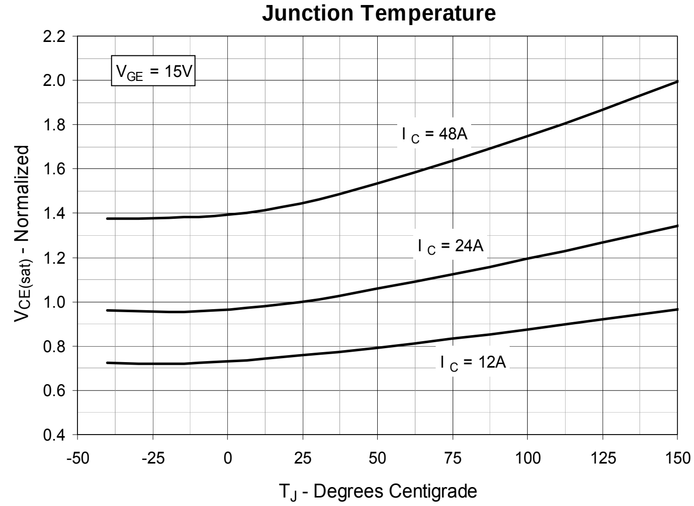


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

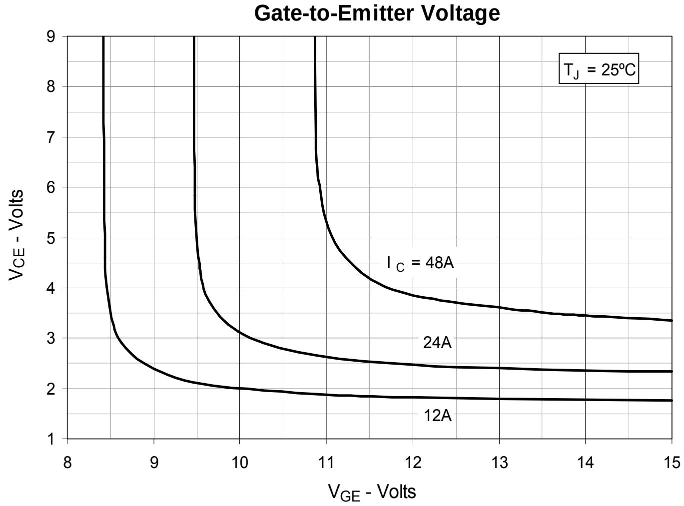


Fig. 6. Input Admittance

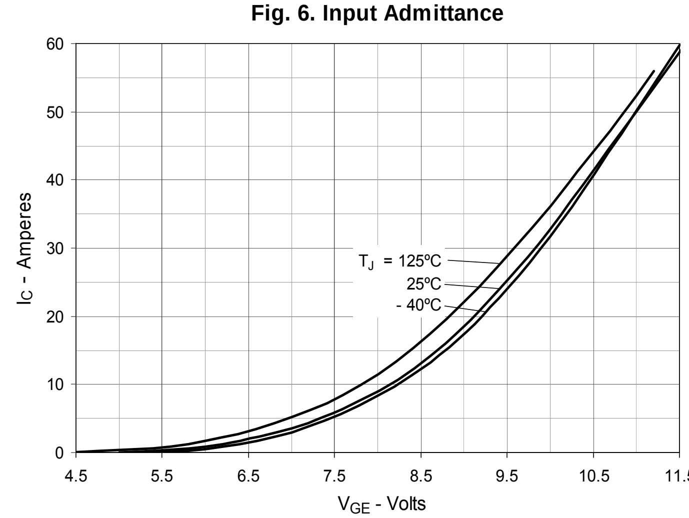


Fig. 7. Transconductance

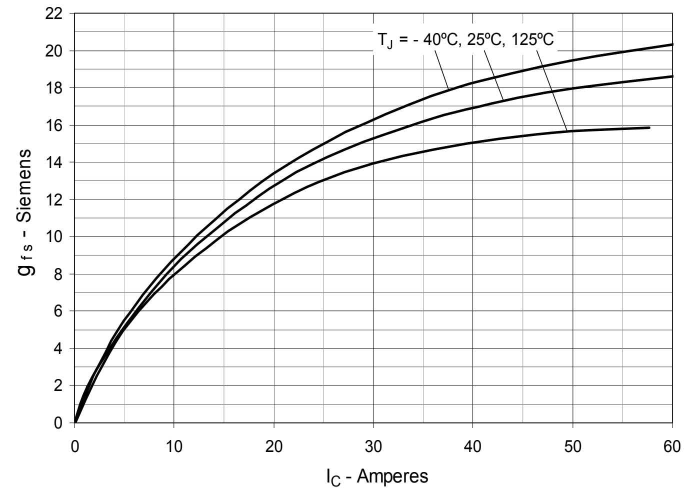


Fig. 8. Gate Charge

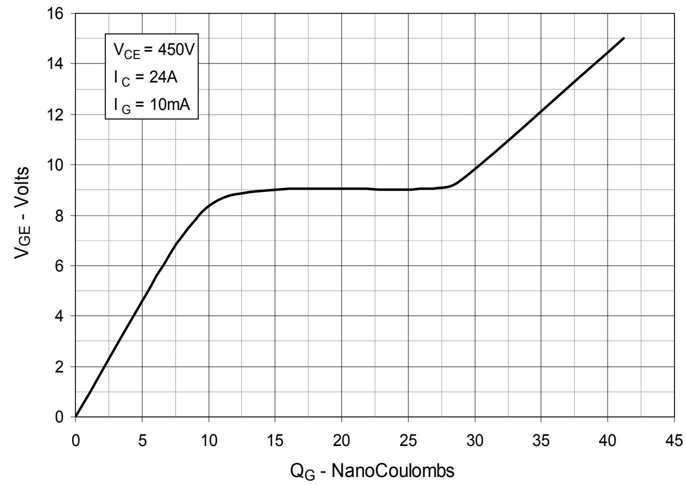


Fig. 9. Capacitance

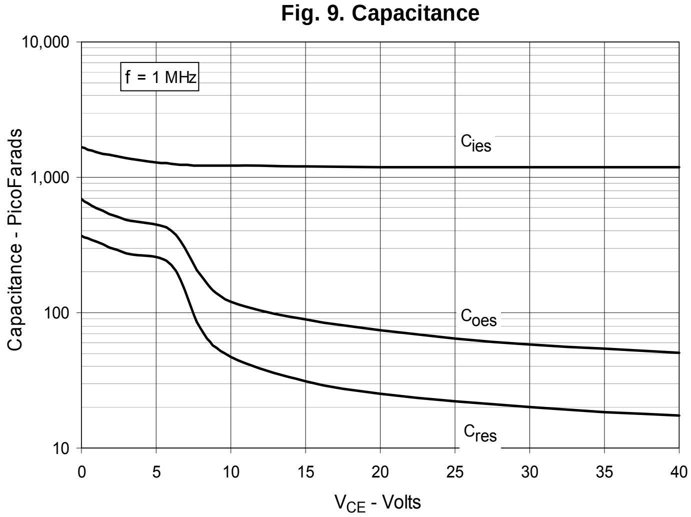


Fig. 10. Reverse-Bias Safe Operating Area

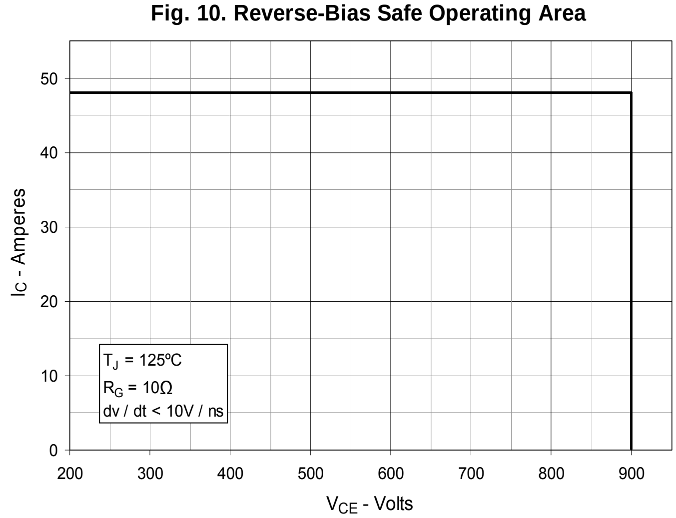


Fig. 11. Maximum Transient Thermal Impedance

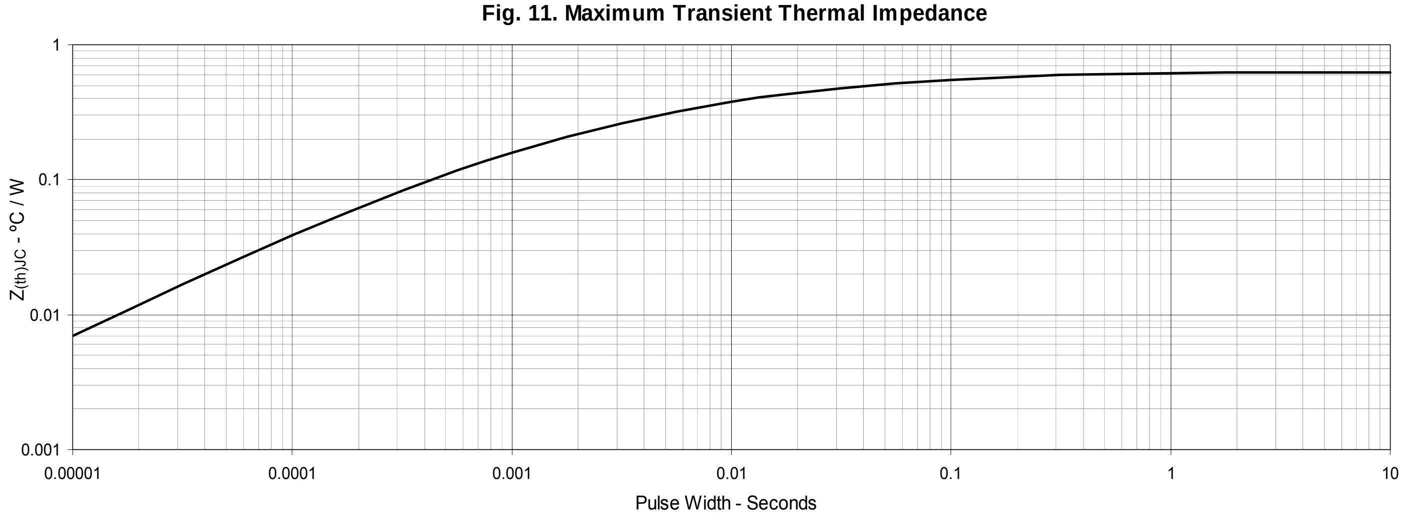


Fig. 12. Inductive Switching Energy Loss vs. Gate Resistance

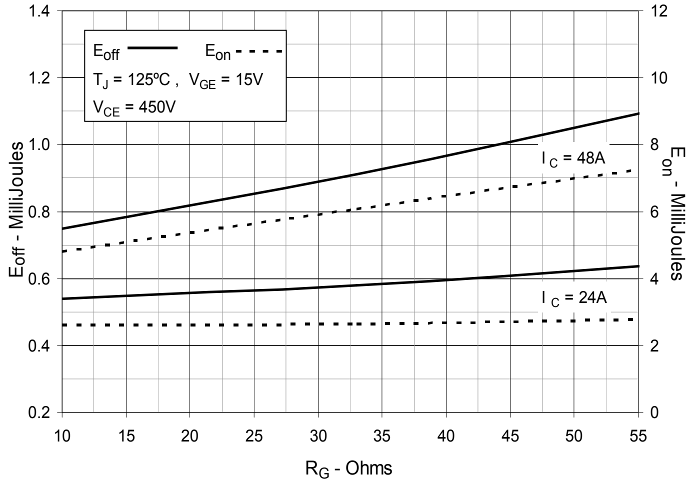


Fig. 13. Inductive Switching Energy Loss vs. Collector Current

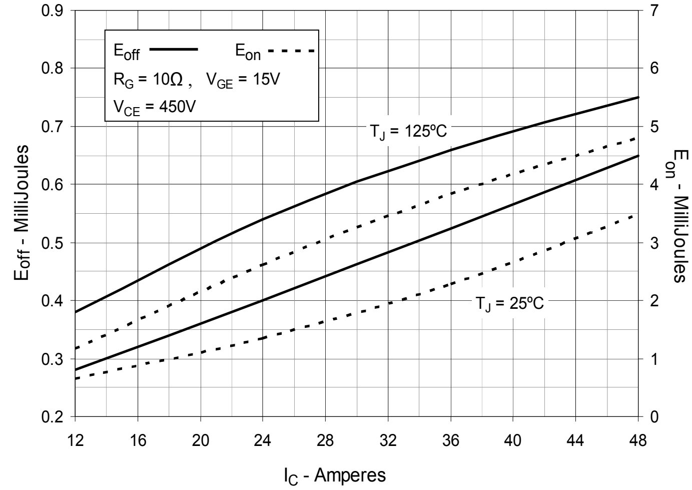


Fig. 14. Inductive Switching Energy Loss vs. Junction Temperature

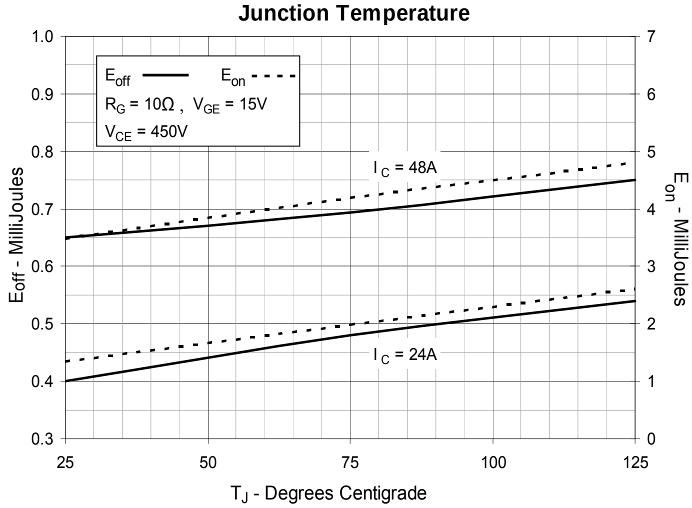


Fig. 15. Inductive Turn-off Switching Times vs. Gate Resistance

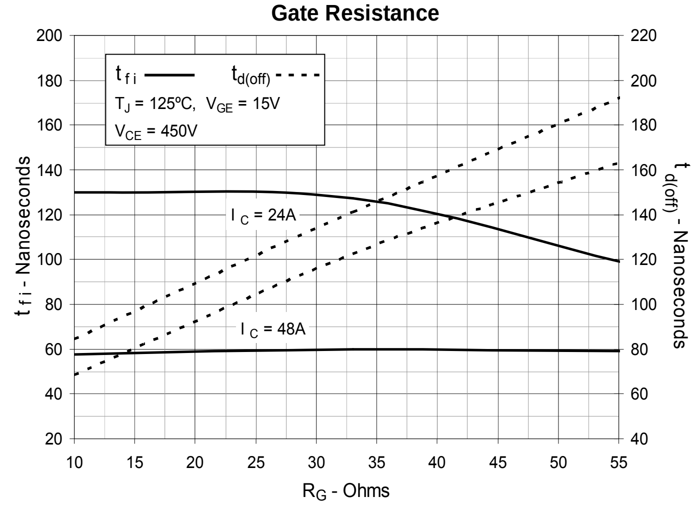


Fig. 16. Inductive Turn-off Switching Times vs. Collector Current

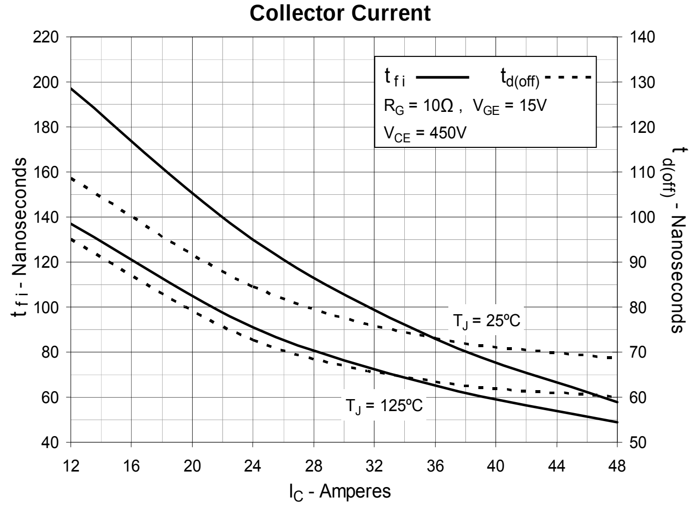


Fig. 17. Inductive Turn-off Switching Times vs. Junction Temperature

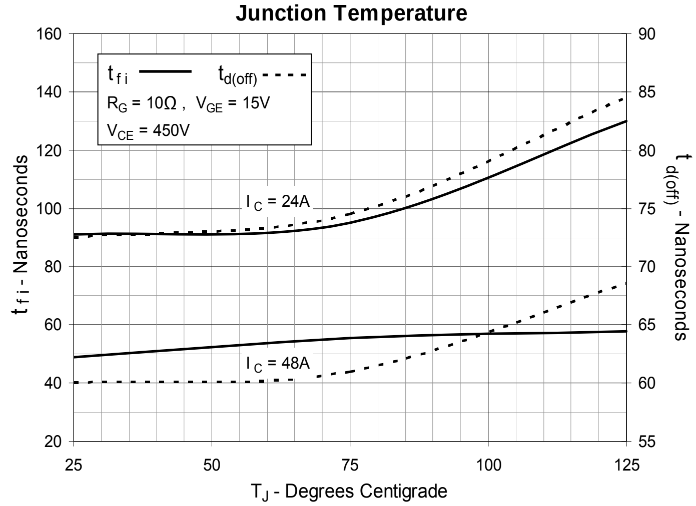


Fig. 18. Inductive Turn-on Switching Times vs. Gate Resistance

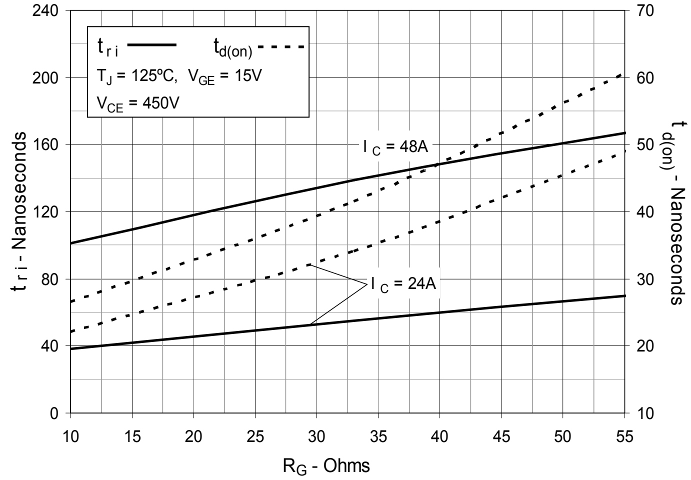


Fig. 19. Inductive Turn-on Switching Times vs. Collector Current

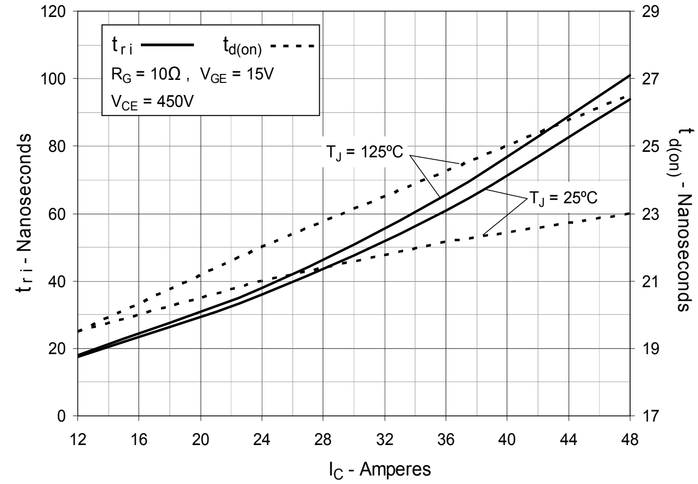
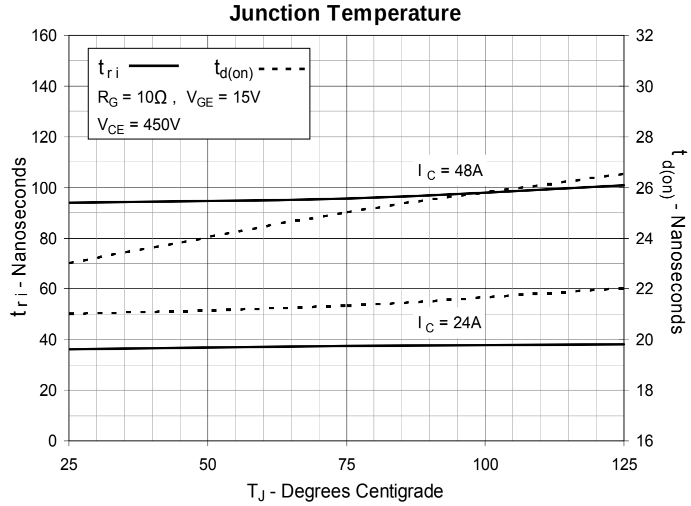


Fig. 20. Inductive Turn-on Switching Times vs. Junction Temperature



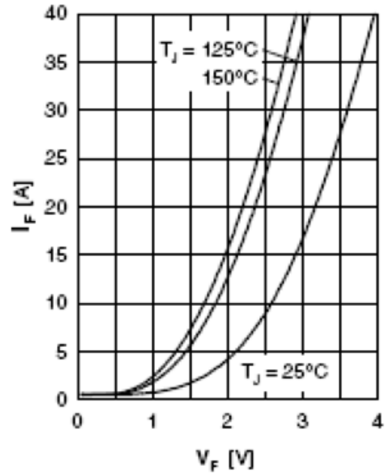


Fig. 21. Typ forward current I_F vs V_F

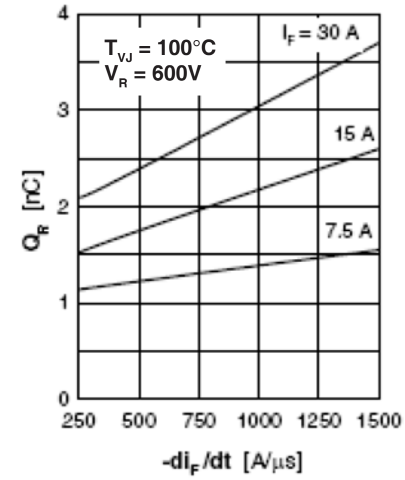


Fig. 22. Typ. reverse recovery charge Q_{rr} versus $-di_F/dt$

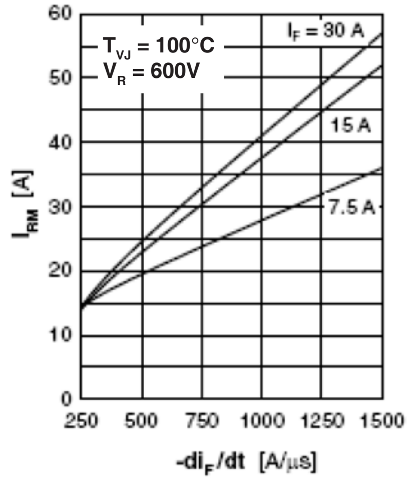


Fig. 23. Typ. peak reverse current I_{RM} versus $-di_F/dt$

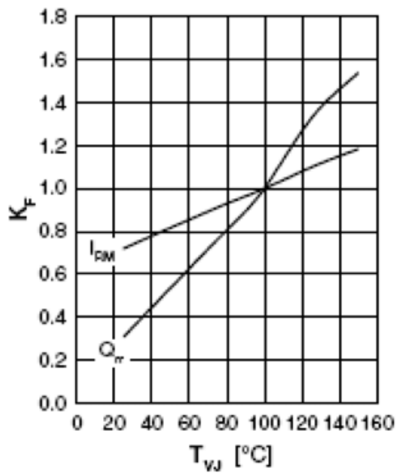


Fig. 24. Dynamic parameters Q_{RR}, I_{RM} versus T_{VJ}

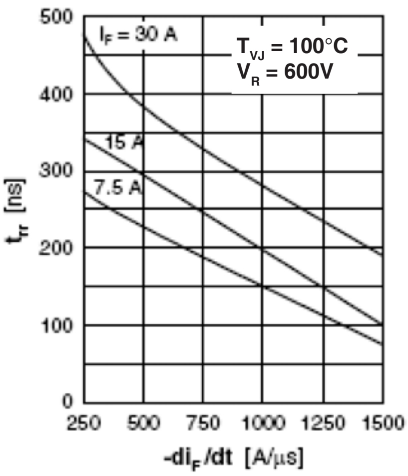


Fig. 25. Typ. recovery time t_{rr} versus $-di_F/dt$

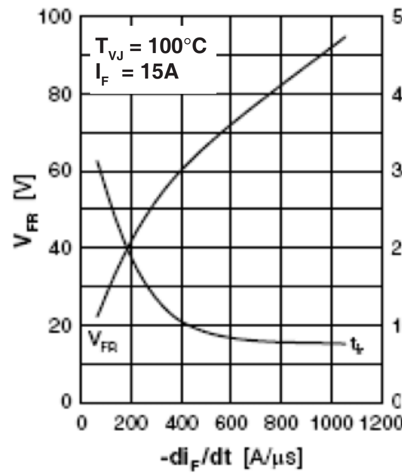


Fig. 26. Typ. peak forward voltage V_{FR} and t_{fr} versus $-di_F/dt$

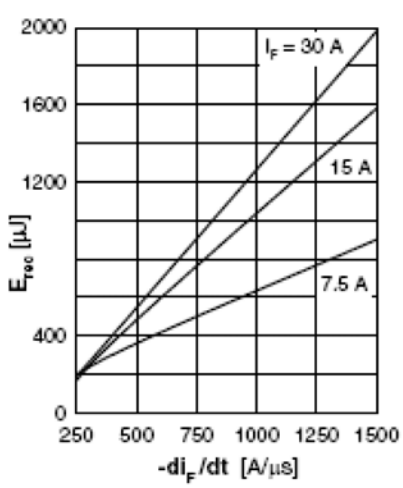


Fig. 27. Typ. recovery energy E_{rec} versus $-di_F/dt$

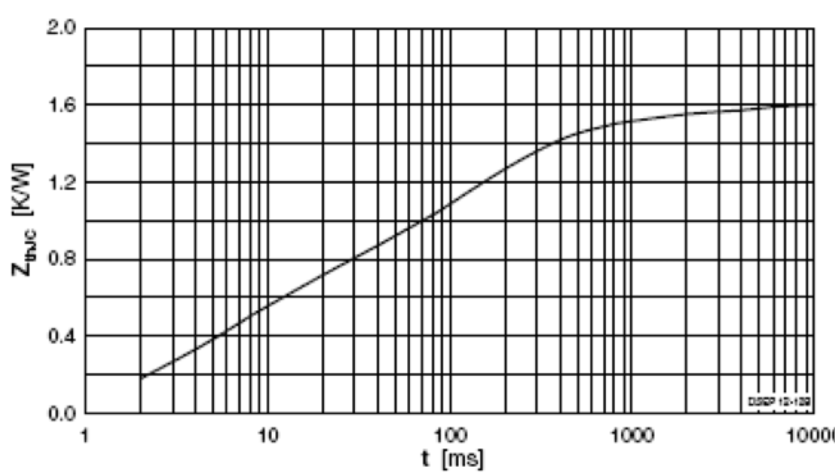


Fig. 28. Maximum transient thermal resistance junction to case

Стандарт
Электрон
Связь

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