

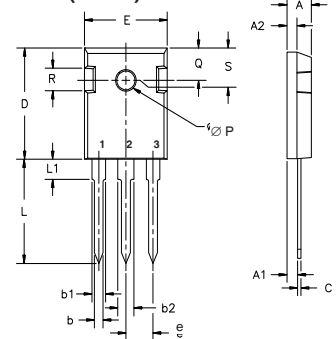
Symbol Test Conditions

($T_J = 25^\circ\text{C}$ unless otherwise specified)

Characteristic Values

Symbol	Test Conditions	Min.	Typ.	Max.
g_{fs}	$I_C = 32\text{A}$, $V_{CE} = 10\text{V}$, Note 1	30	48	S
C_{ies}	$V_{CE} = 25\text{V}$, $V_{GE} = 0\text{V}$, $f = 1\text{MHz}$		3190	pF
C_{oes}			175	pF
C_{res}			43	pF
Q_g	$I_C = 32\text{A}$, $V_{GE} = 15\text{V}$, $V_{CE} = 0.5 \cdot V_{CES}$		110	nC
Q_{ge}			21	nC
Q_{gc}			42	nC
$t_{d(on)}$	Inductive Load, $T_J = 25^\circ\text{C}$ $I_C = 32\text{A}$, $V_{GE} = 15\text{V}$ $V_{CE} = 480\text{V}$, $R_G = 5\Omega$ Note 2		25	ns
t_{ri}			30	ns
E_{on}			0.95	mJ
$t_{d(off)}$			334	ns
t_{fi}			224	ns
E_{off}			2.9	mJ
$t_{d(on)}$	Inductive Load, $T_J = 125^\circ\text{C}$ $I_C = 32\text{A}$, $V_{GE} = 15\text{V}$ $V_{CE} = 480\text{V}$, $R_G = 5\Omega$ Note 2		24	ns
t_{ri}			30	ns
E_{on}			1.97	mJ
$t_{d(off)}$			545	ns
t_{fi}			380	ns
E_{off}			5.6	mJ
R_{thJC}			0.21	$^\circ\text{C/W}$
R_{thCS}				$^\circ\text{C/W}$

TO-247 (IXGH) Outline



Terminals: 1 - Gate 2 - Collector
3 - Emitter

Dim.	Millimeter	Inches
	Min. Max.	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
ØP	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)

($T_J = 25^\circ\text{C}$, Unless Otherwise Specified)

Symbol	Test Conditions	Min.	Typ.	Max.
V_F	$I_F = 30\text{A}$, $V_{GE} = 0\text{V}$, Note 1 $T_J = 150^\circ\text{C}$		1.6	3.0 V
I_{RM}	$I_F = 30\text{A}$, $V_{GE} = 0\text{V}$, $-di_F/dt = 100\text{A}/\mu\text{s}$, $T_J = 100^\circ\text{C}$ $V_R = 300\text{V}$			4 A
t_{rr}	$I_F = 1\text{A}$, $V_R = 30\text{V}$, $-di_F/dt = 100\text{A}/\mu\text{s}$		100	ns
			25	ns
R_{thJC}				0.9 $^\circ\text{C/W}$

Notes:

1. Pulse test, $t \leq 300\mu\text{s}$, duty cycle, $d \leq 2\%$.
2. Switching times & energy losses may increase for higher $V_{CE}(\text{clamp})$, T_J or R_G .

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 7,157,338 B2
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

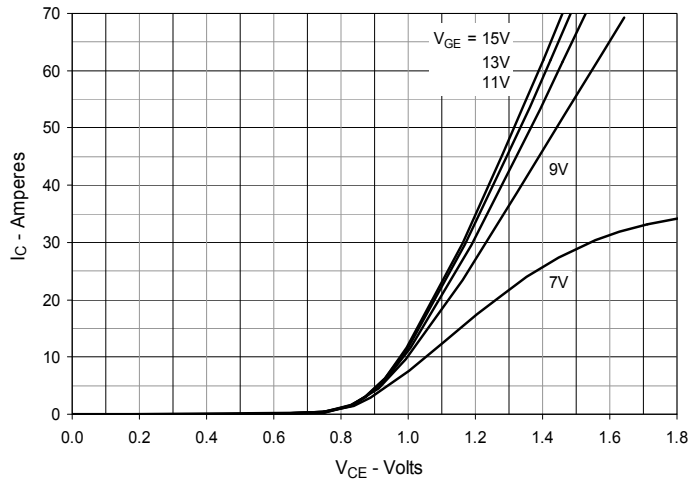
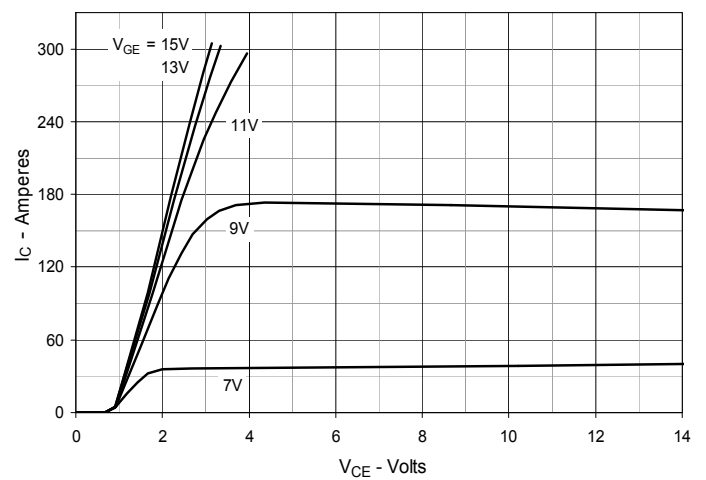
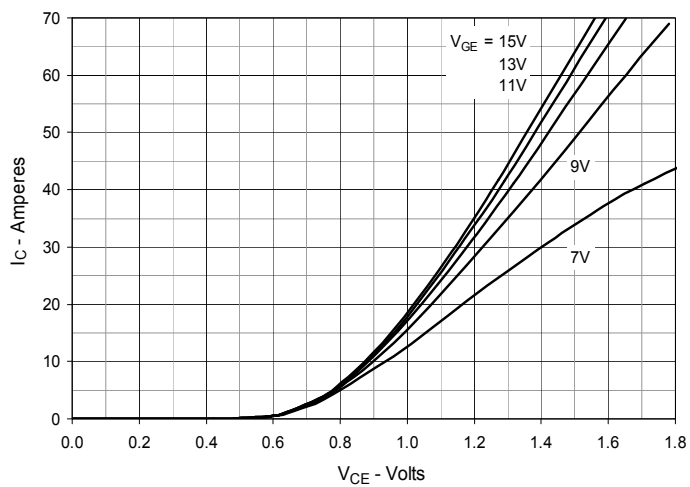
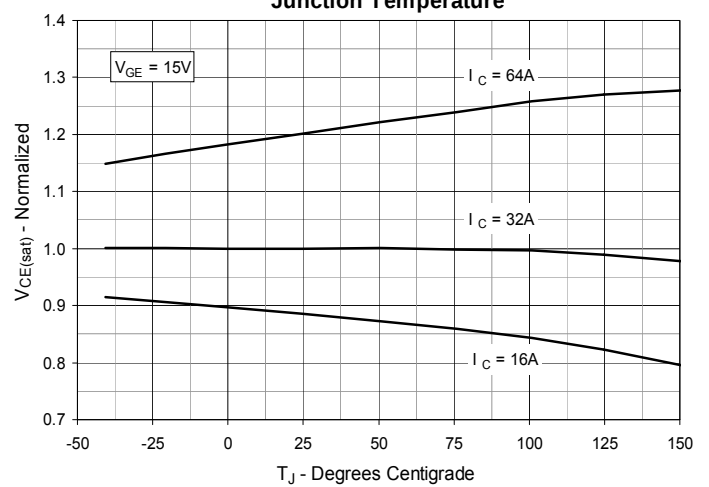
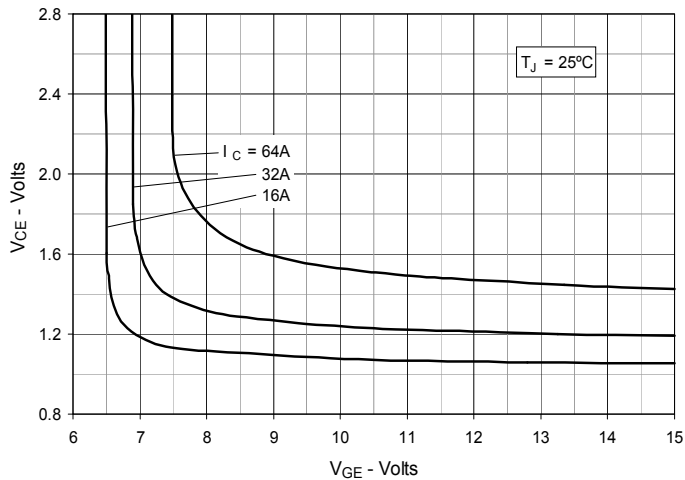
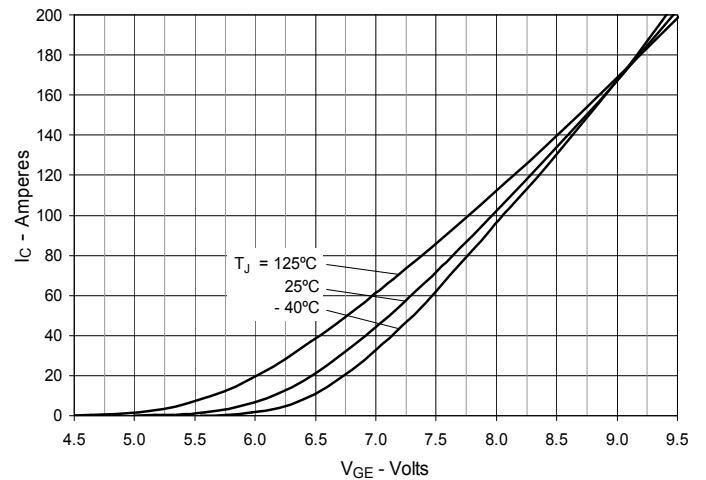
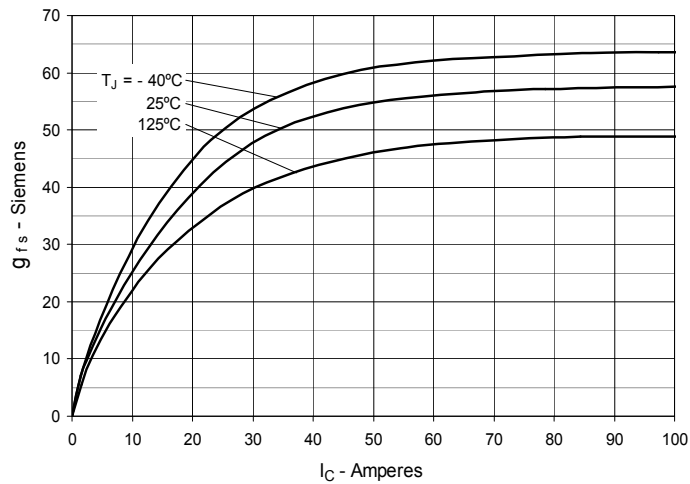
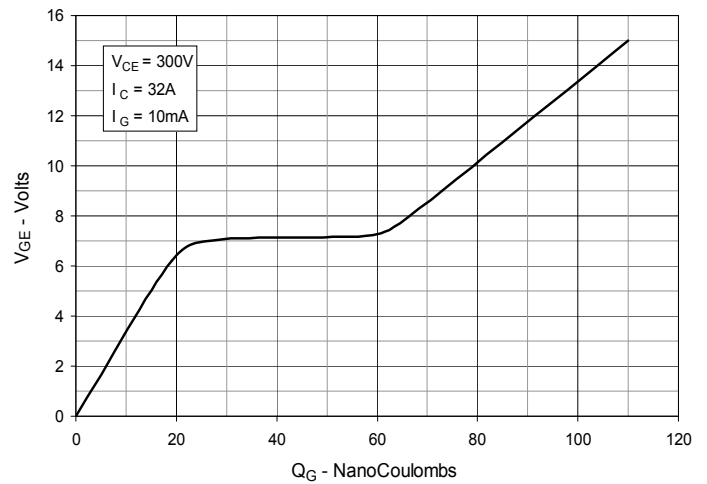
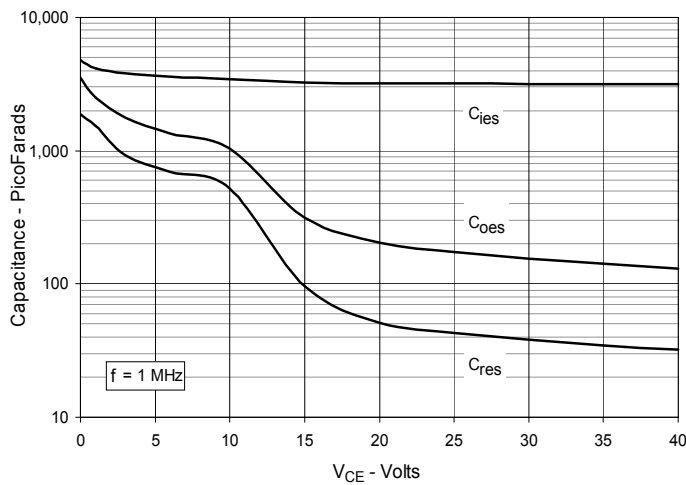
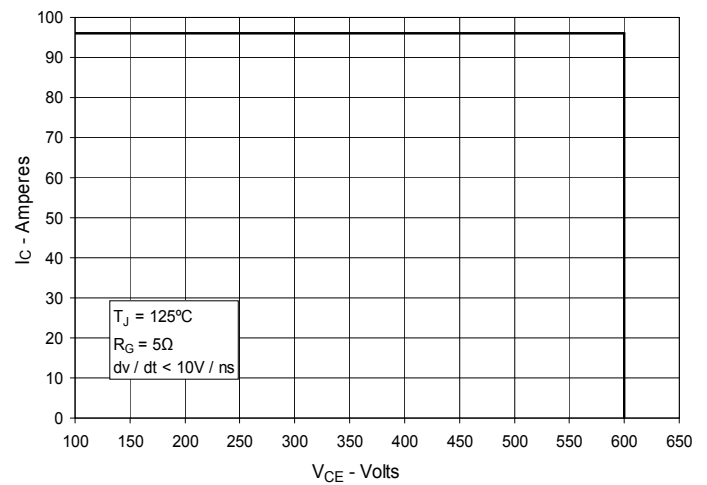
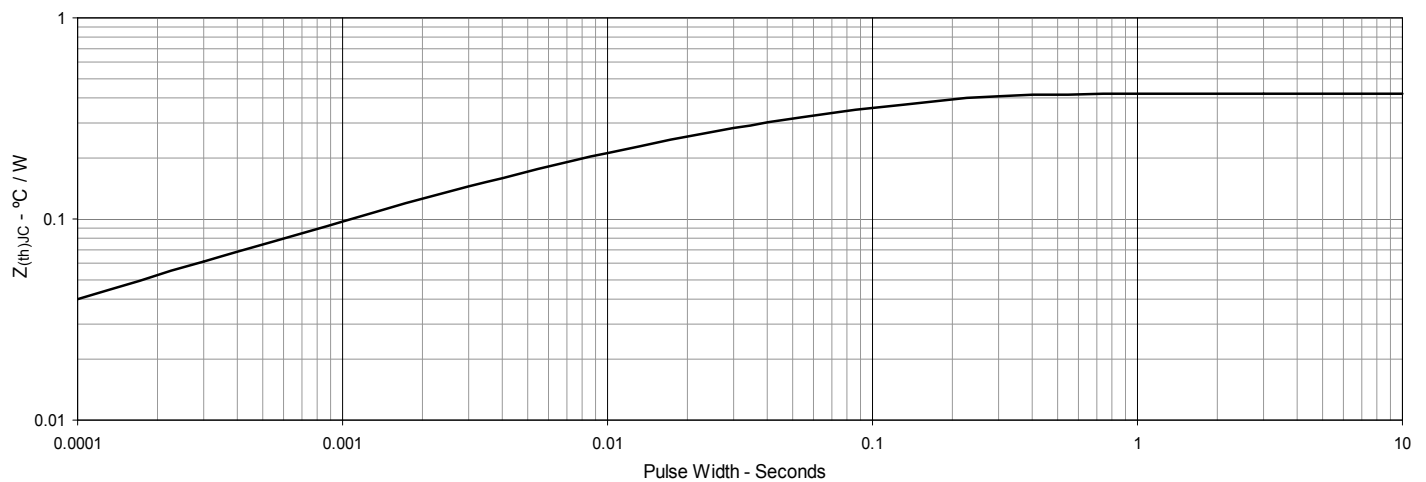
Fig. 1. Output Characteristics @ $T_J = 25^\circ\text{C}$

Fig. 2. Extended Output Characteristics @ $T_J = 25^\circ\text{C}$

Fig. 3. Output Characteristics @ $T_J = 125^\circ\text{C}$

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


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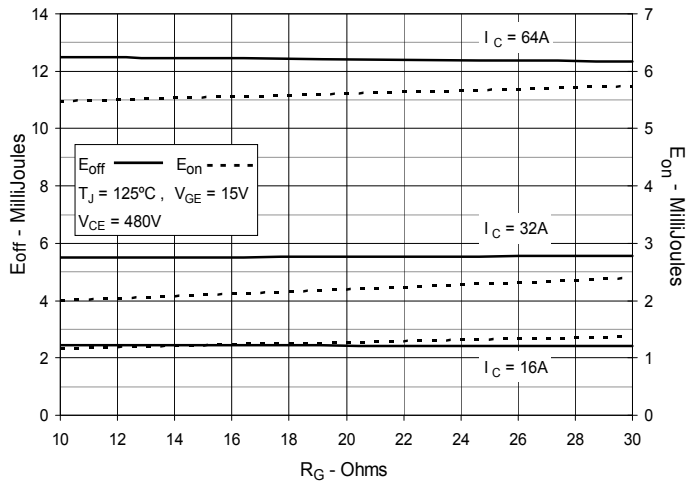
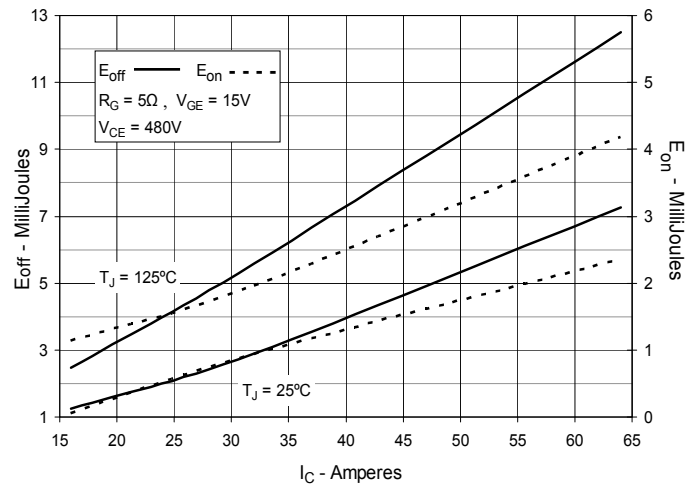
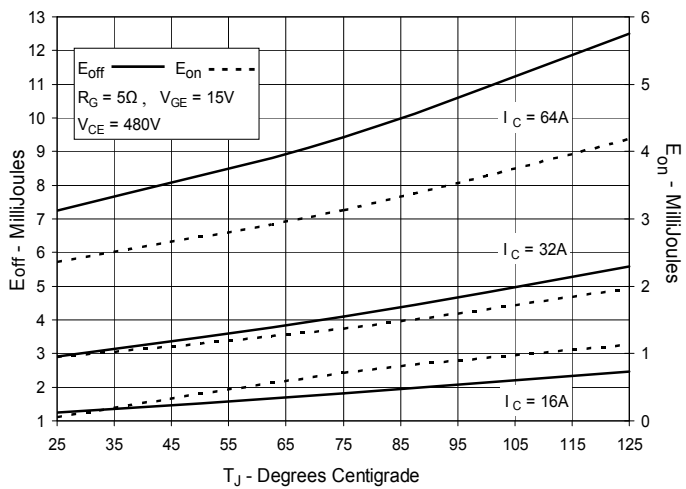
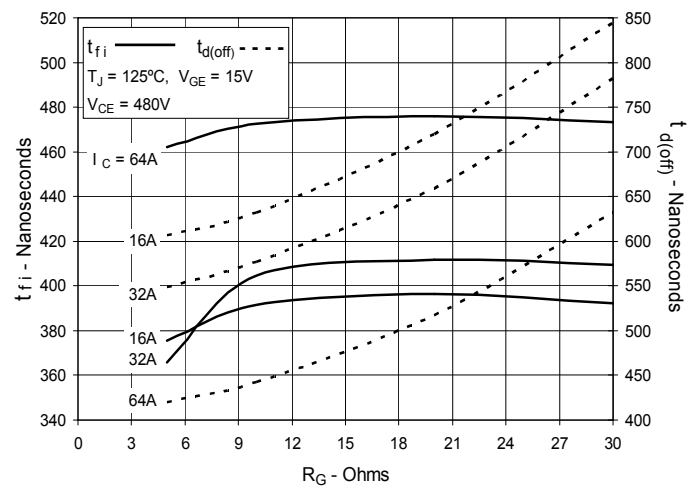
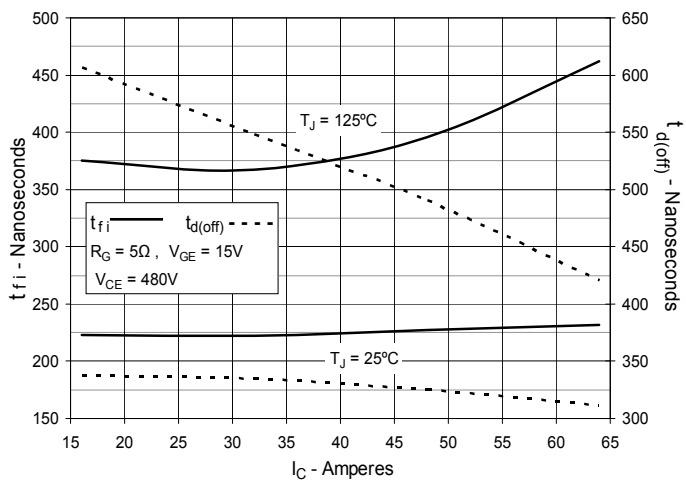
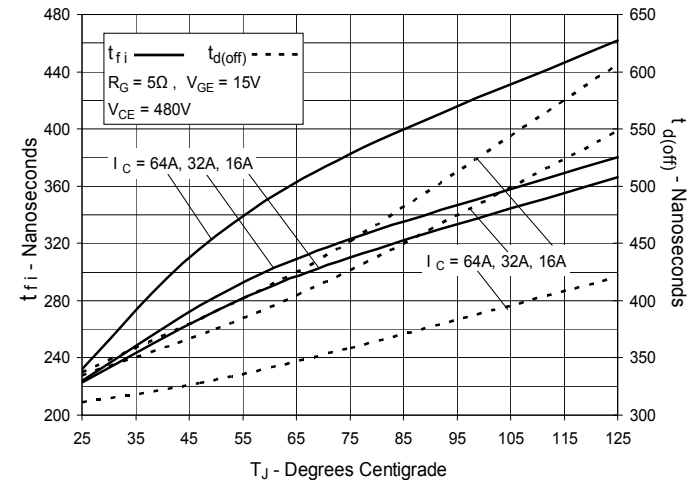
Fig. 12. Inductive Switching Energy Loss vs. Gate Resistance

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

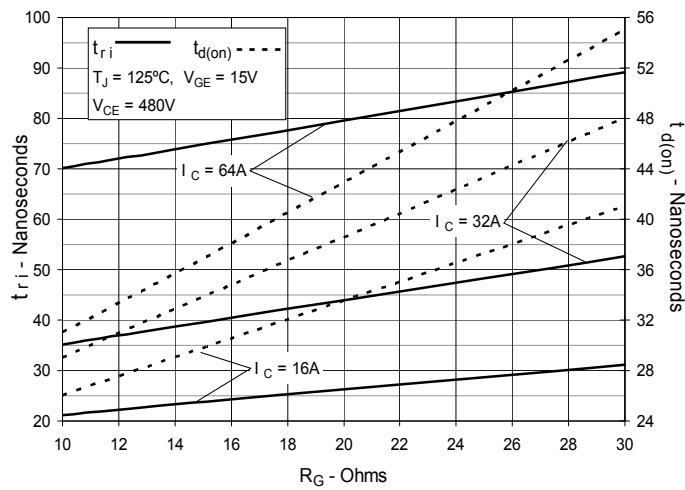


Fig. 19. Inductive Turn-on Switching Times vs. Collector Current

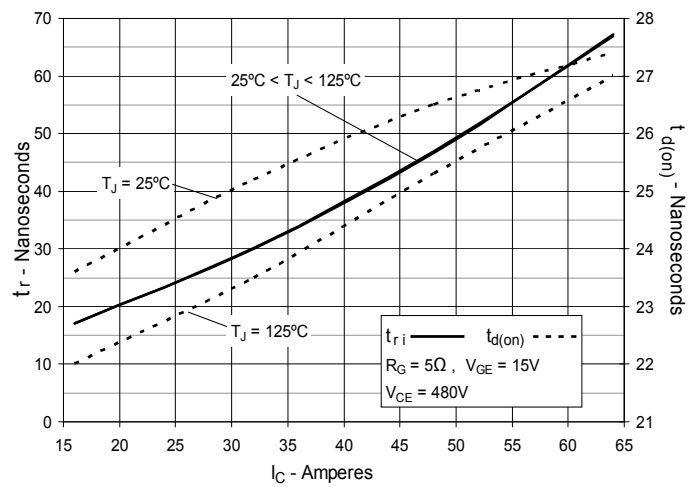
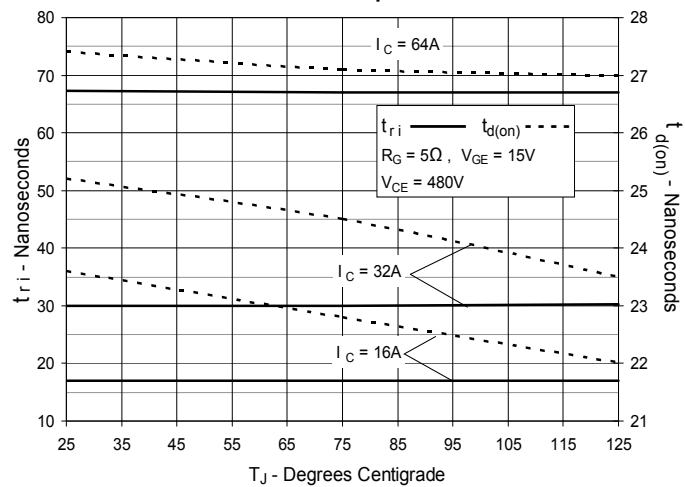


Fig. 20. Inductive Turn-on Switching Times vs. Junction Temperature



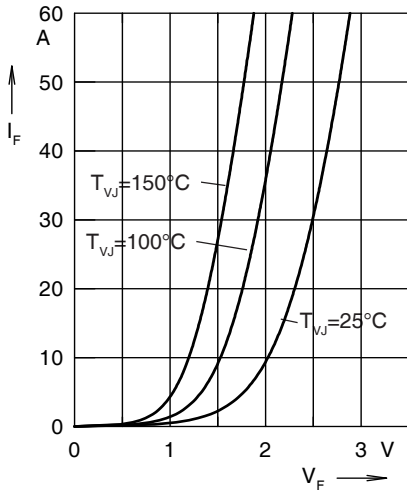


Fig. 21. Forward current I_F versus V_F

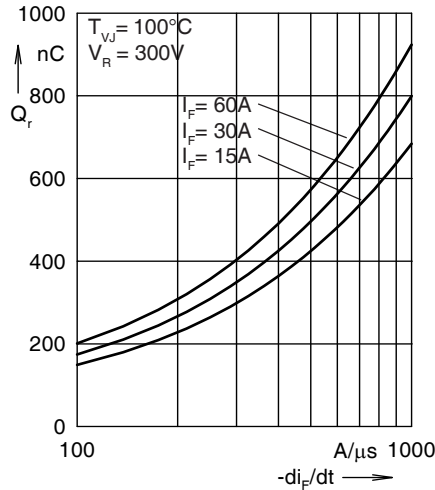


Fig. 22. Reverse recovery charge Q_r versus $-di_F/dt$

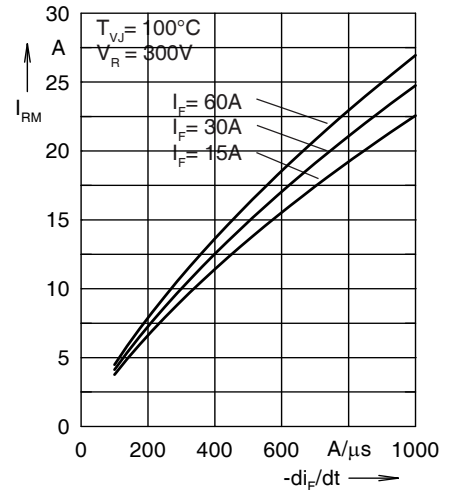


Fig. 23. Peak reverse current I_{RM} versus $-di_F/dt$

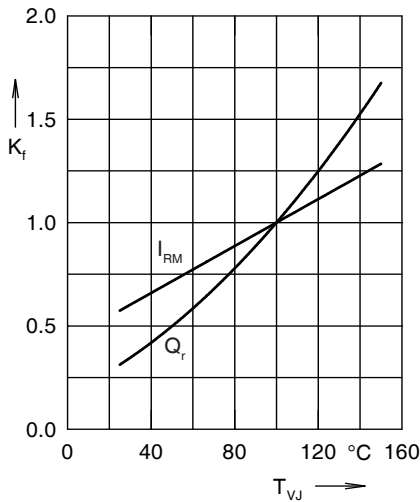


Fig. 24. Dynamic parameters Q_r , I_{RM} versus T_{VJ}

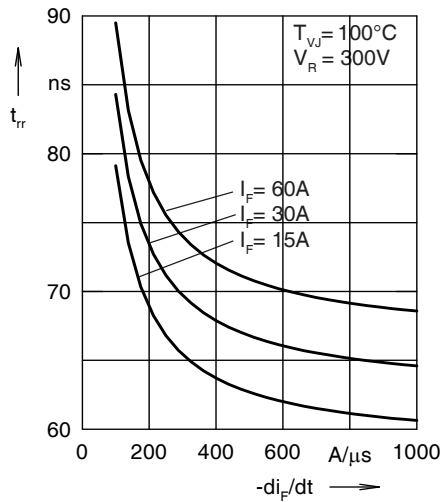


Fig. 25. Recovery time t_{rr} versus $-di_F/dt$

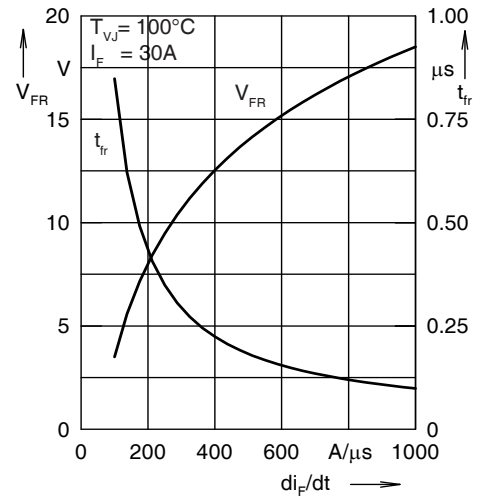


Fig. 26. Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

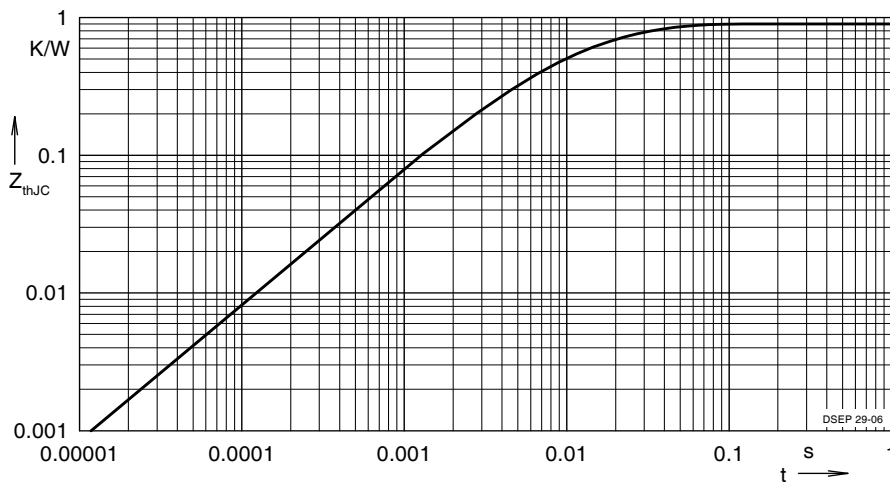


Fig. 27. Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.502	0.0052
2	0.193	0.0003
3	0.205	0.0162



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