

GenX3™ 300V IGBT

IXGH100N30B3*

***Obsolete Part Number**

Medium speed low Vsat PT IGBTs for 10-50 kHz switching



Symbol	Test Conditions	Maximum Ratings	Unit
V_{CES}	$T_J = 25^{\circ}\text{C}$ to 150°C	300	V
V_{CGR}	$T_J = 25^{\circ}\text{C}$ to 150°C , $R_{GE} = 1\text{M}\Omega$	300	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	$T_C = 25^{\circ}\text{C}$ (limited by leads)	75	A
I_{C110}	$T_C = 110^{\circ}\text{C}$	100	A
I_{CM}	$T_C = 25^{\circ}\text{C}$, 1ms	400	A
SSOA (RBSOA)	$V_{GE} = 15\text{V}$, $T_J = 125^{\circ}\text{C}$, $R_G = 2\Omega$ Clamped inductive load @ $V_{CE} \leq 300\text{V}$	$I_{CM} = 200$	A
P_C	$T_C = 25^{\circ}\text{C}$	460	W
T_J		$-55 \dots +150$	$^{\circ}\text{C}$
T_{JM}		150	$^{\circ}\text{C}$
T_{stg}		$-55 \dots +150$	$^{\circ}\text{C}$
M_d	Mounting torque	1.13 / 10	Nm/lb.in.
T_L	Maximum lead temperature for soldering	300	$^{\circ}\text{C}$
T_{SOLD}	1.6mm (0.062 in.) from case for 10s	260	$^{\circ}\text{C}$
Weight		6	g

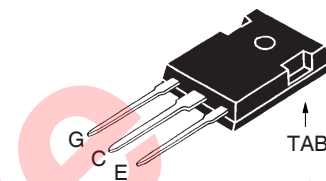
$$V_{CES} = 300V$$

$$I_{C110}^{CES} = 100A$$

$$V_{CE(sat)} \leq 1.7V$$

$$t_{fi(typ)}^{OE(sat)} = 33ns$$

TO-247 (IXGH)



G = Gate C = Collector
E = Emitter TAB = Collector

Features

- Optimized for low switching losses
- Square RBSOA
- International standard package

Advantages

- High power density
- Low gate drive requirement

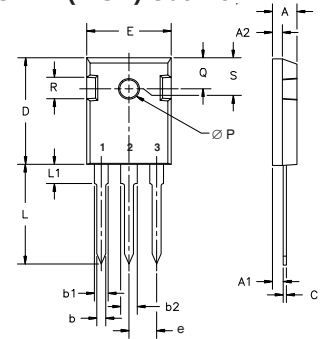
Applications

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

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$, unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
V_{CES}	$I_C = 250\mu\text{A}$, $V_{GE} = 0\text{V}$	300		V
$V_{GE(th)}$	$I_C = 250\mu\text{A}$, $V_{CE} = V_{GE}$	3.0		5.0 V
I_{CES}	$V_{CE} = V_{CES}$ $V_{GE} = 0\text{V}$ $T_J = 125^\circ\text{C}$			10 μA 500 μA
I_{GES}	$V_{CE} = 0\text{V}$, $V_{GE} = \pm 20\text{V}$			± 100 nA
$V_{CE(sat)}$	$I_C = 100\text{A}$, $V_{GE} = 15\text{V}$, Note 1 $T_J = 125^\circ\text{C}$	1.35 1.40		V V

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$, unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
g_{fs}	$I_C = 50\text{A}$, $V_{CE} = 10\text{V}$, Note 1	45	77	S
C_{ies}	$V_{CE} = 25\text{V}$, $V_{GE} = 0\text{V}$, $f = 1\text{MHz}$		5010	pF
C_{oes}			370	pF
C_{res}			93	pF
Q_g	$I_C = 100\text{A}$, $V_{GE} = 15\text{V}$, $V_{CE} = 0.5 \cdot V_{CES}$		166	nC
Q_{ge}			30	nC
Q_{gc}			65	nC
$t_{d(on)}$	Resistive load, $T_J = 25^\circ\text{C}$ $I_C = 50\text{A}$, $V_{GE} = 15\text{V}$ $V_{CE} = 240\text{V}$, $R_G = 2\Omega$		27	ns
t_r			51	ns
$t_{d(off)}$			110	ns
t_f			33	ns
$t_{d(on)}$	Resistive load, $T_J = 125^\circ\text{C}$ $I_C = 50\text{A}$, $V_{GE} = 15\text{V}$ $V_{CE} = 240\text{V}$, $R_G = 2\Omega$		24	ns
t_r			61	ns
$t_{d(off)}$			124	ns
t_f			148	ns
R_{thJC}			0.21	$^\circ\text{C/W}$
R_{thCK}				$^\circ\text{C/W}$

TO-247 (IXGH) Outline



Terminals: 1 - Gate
3 - Source
2 - Drain
Tab - Drain

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

Notes: 1. Pulse test, $t \leq 300\mu\text{s}$; duty cycle, $d \leq 2\%$.

PRELIMINARY TECHNICAL INFORMATION

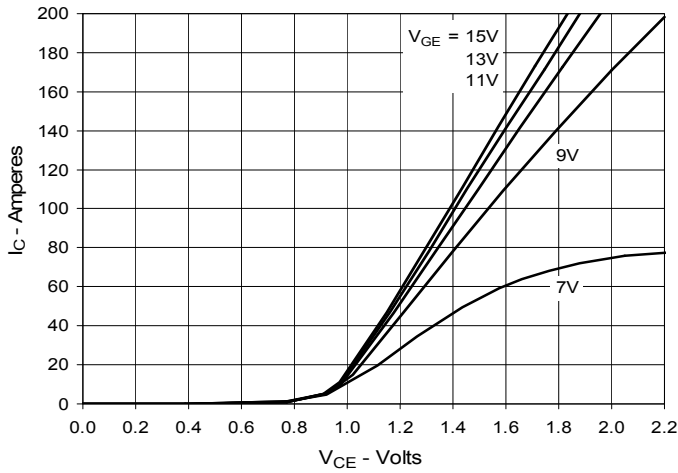
The product presented herein is under development. The Technical Specifications offered are derived from data gathered during objective characterizations of preliminary engineering lots; but also may yet contain some information supplied during a pre-production design evaluation. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

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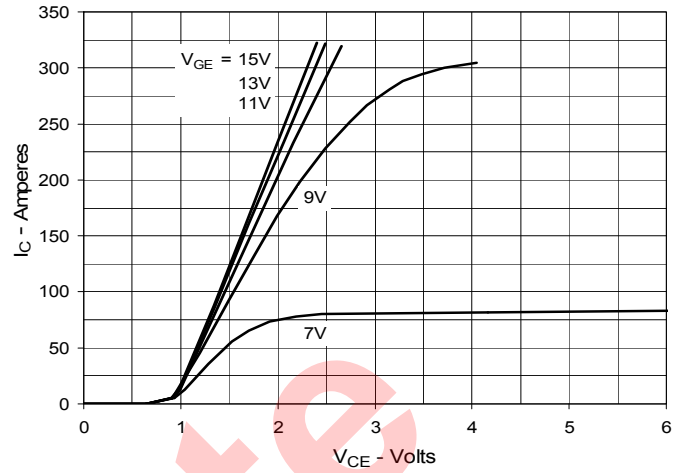
IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents:

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	

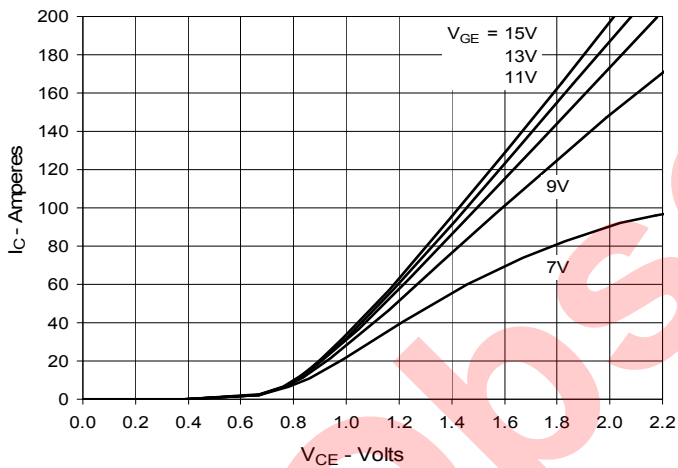
**Fig. 1. Output Characteristics
@ 25°C**



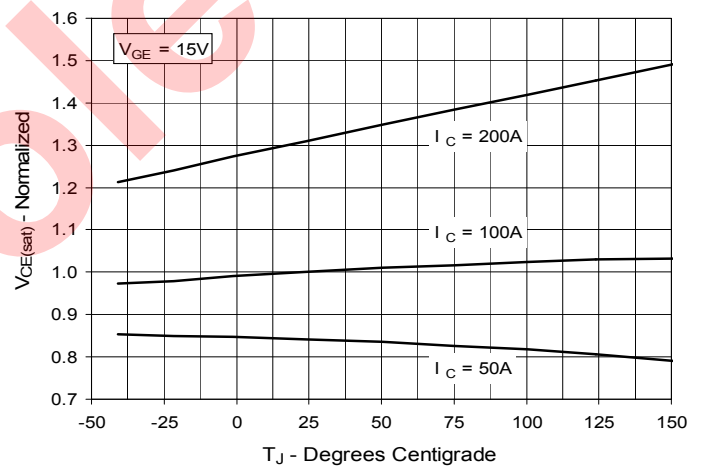
**Fig. 2. Extended Output Characteristics
@ 25°C**



**Fig. 3. Output Characteristics
@ 125°C**



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



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

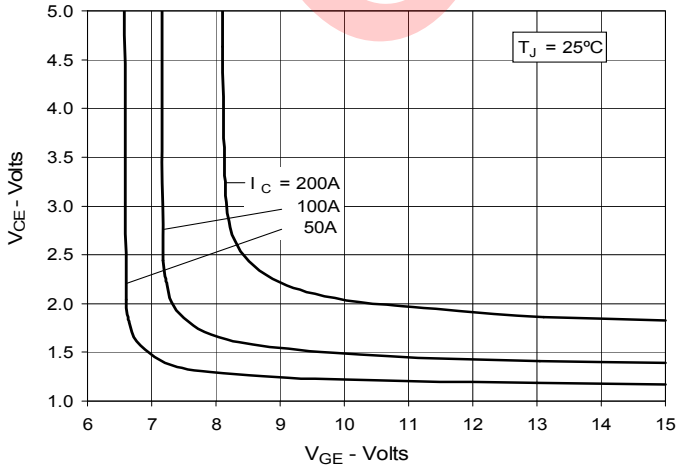


Fig. 6. Input Admittance

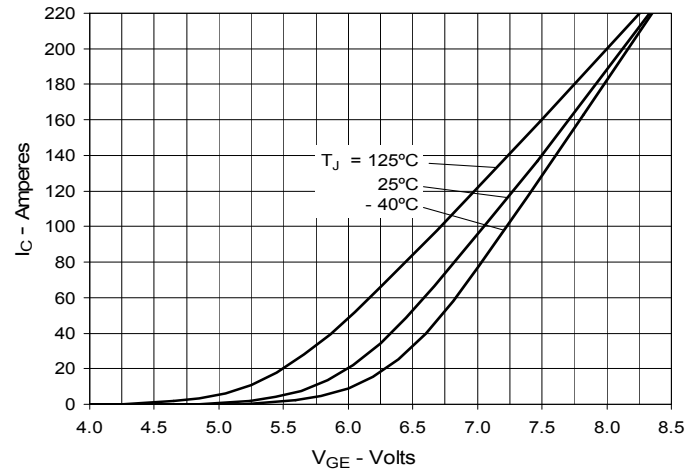


Fig. 7. Transconductance

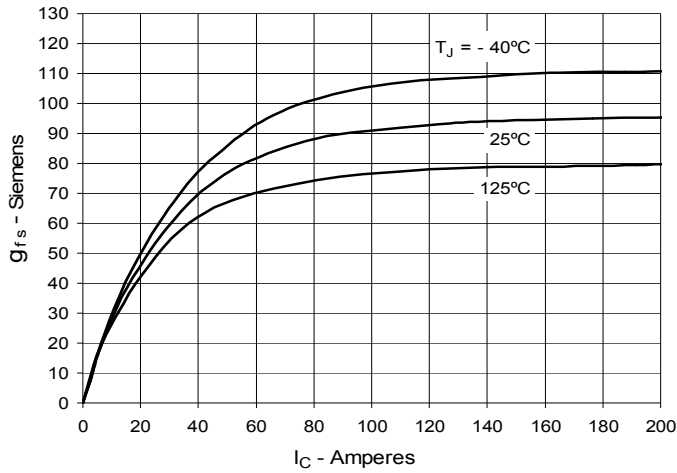


Fig. 8. Gate Charge

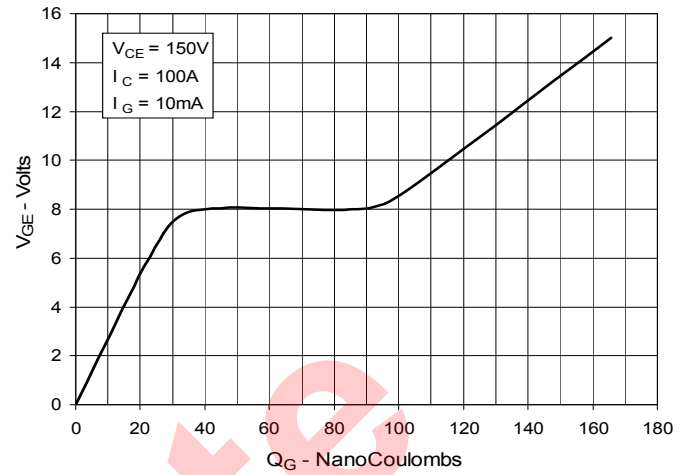


Fig. 9. Reverse-Bias Safe Operating Area

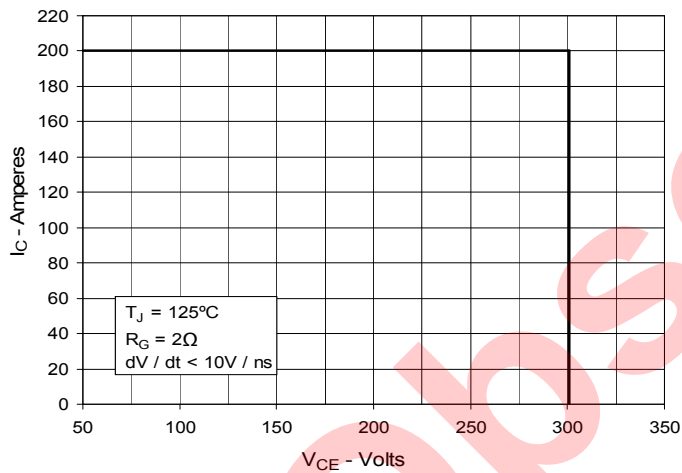


Fig. 10. Capacitance

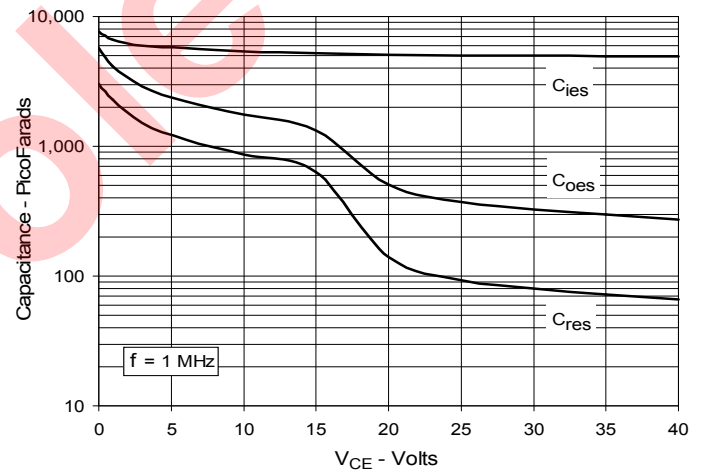


Fig. 11. Forward-Bias Safe Operating Area

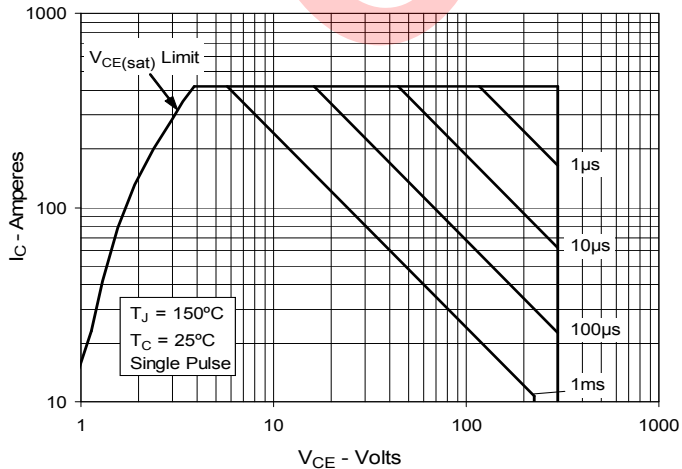


Fig. 12. Maximum Transient Thermal Impedance

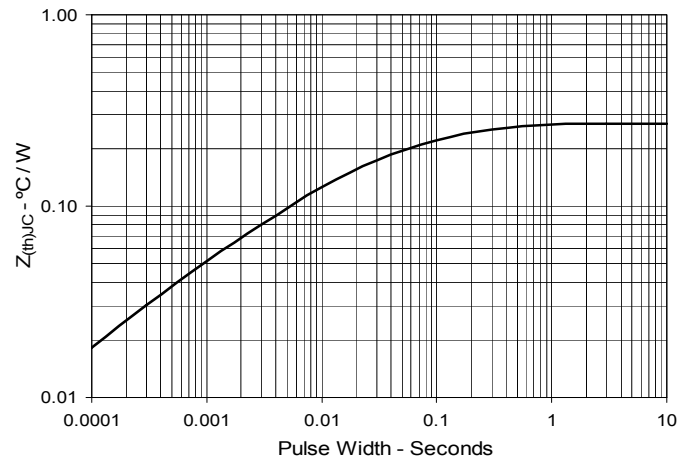
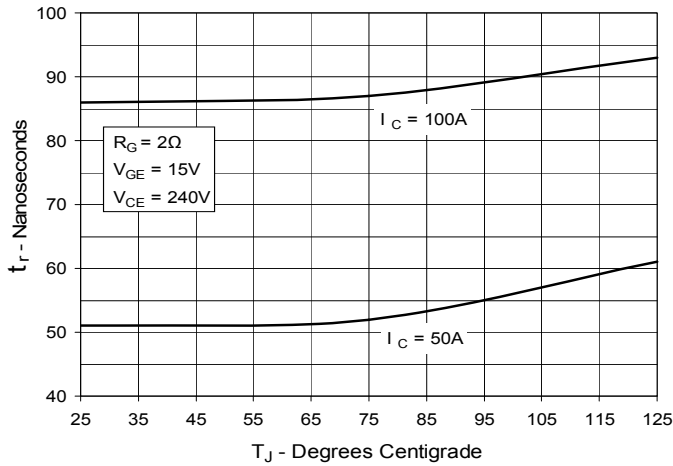
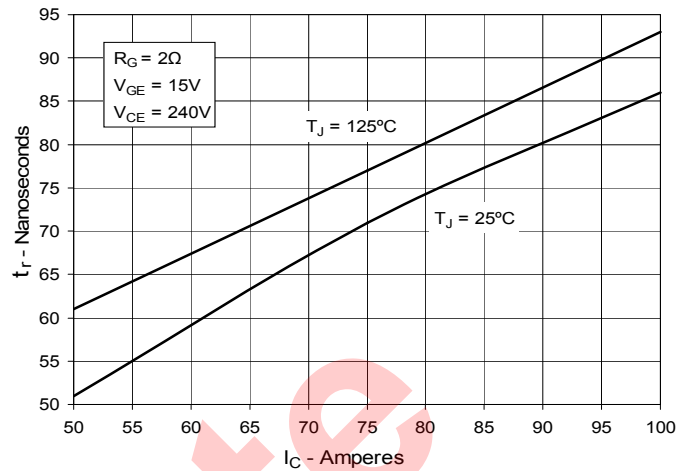
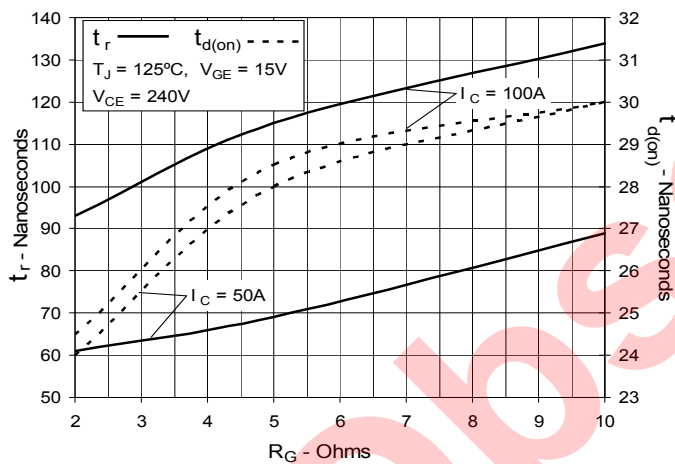
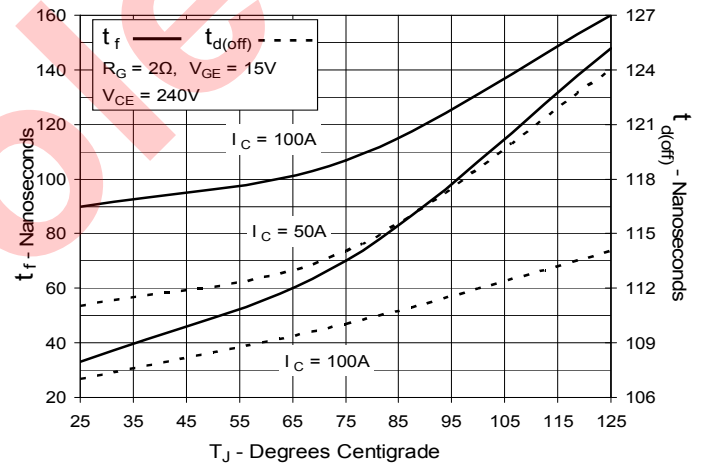
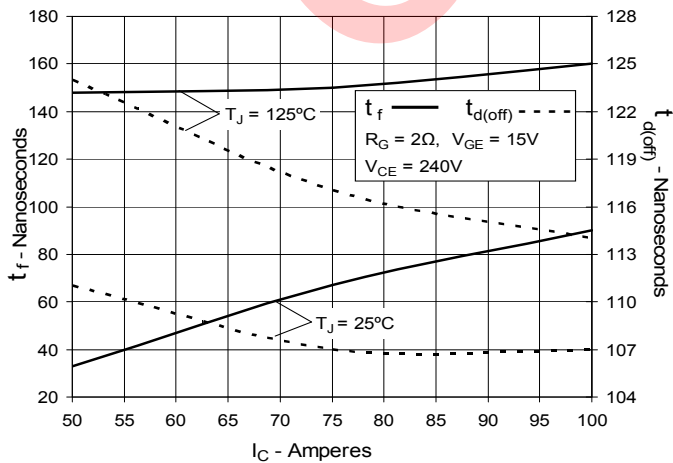
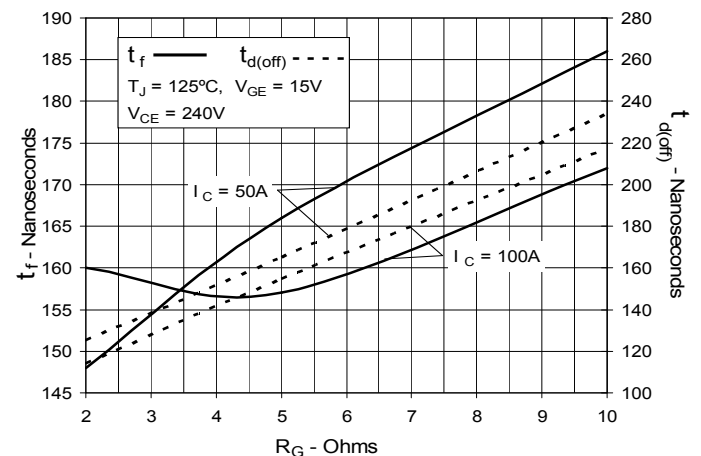


Fig. 13. Resistive Turn-on Rise Time vs. Junction Temperature

Fig. 14. Resistive Turn-on Rise Time vs. Collector Current

Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance

Fig. 16. Resistive Turn-off Switching Times vs. Junction Temperature

Fig. 17. Resistive Turn-off Switching Times vs. Collector Current

Fig. 18. Resistive Turn-off Switching Times vs. Gate Resistance


Obsolete



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