IXYS

Preliminary Technical Information

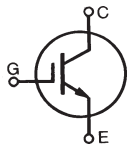
GenX3™ 600V IGBT

IXGR64N60A3*

***Obsolete Part Number**

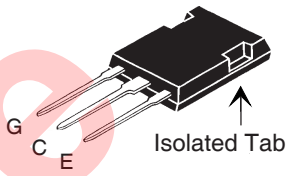
V_{CES} = 600V
I_{C110} = 47A
$V_{CE(sat)}$ ≤ 1.35V

Ultra-low Vsat PT IGBTs for up to 5kHz switching



Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_J = 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_{C110}	T_C = 110°C	47	A
I_{CM}	T_C = 25°C, 1ms	350	A
SSOA (RBSOA)	V_{GE} = 15V, T_{VJ} = 125°C, R_G = 3Ω Clamped inductive load @ V_{CE} ≤ 600V	I_{CM} = 100	A
P_C	T_C = 25°C	200	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
F_C	Mounting Force	20..120/4.5..27	N/lb.
T_L	1.6mm (0.063 in.) from case for 10s	300	°C
T_{SOLD}	Plastic body for 10s	260	°C
V_{ISOL}	50/60 Hz, RMS t = 1min	2500	V~
	I_{ISOL} ≤ 1mA t = 1s	3000	V~
Weight		6	g

ISOPLUS247™ (IXGR)
E153432



G = Gate E = Emitter
C = Collector

Features

- Silicon chip on Direct-Copper Bond (DCB) substrate
- Isolated mounting surface
- 2500V electrical isolation

Advantages

- High power density
- Low gate drive requirement

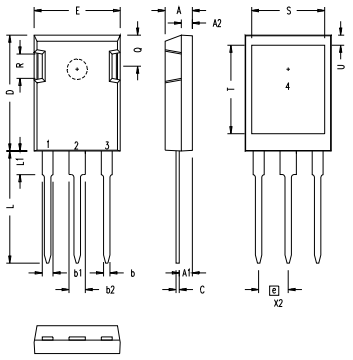
Applications

- Power Inverters
- UPS
- Motor Drives
- SMPS
- PFC Circuits
- Battery Chargers
- Welding Machines
- Lamp Ballasts
- Inrush Current Protection Circuits

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}	3.0		5.0	V
I_{CES}	V_{CE} = V_{CES}			50	μA
	V_{GE} = 0V T_J = 125°C			500	μA
I_{GES}	V_{CE} = 0V, V_{GE} = ± 20V			± 100	nA
$V_{CE(sat)}$	I_C = 50A, V_{GE} = 15V, Note 1			1.35	V

Symbol	Test Conditions (T_J = 25°C unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	I_C = 50A, V_{CE} = 10V, Note 1	40	70		S
C_{ies}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz		4850		pF
C_{oes}			270		pF
C_{res}			66		pF
Q_g	$I_C = I_{C110}$, V_{GE} = 15V, $V_{CE} = 0.5 \bullet V_{CES}$		167		nC
Q_{ge}			28		nC
Q_{gc}			60		nC
$t_{d(on)}$	**Inductive Load, T_J = 25°C**		26		ns
t_{ri}			40		ns
E_{on}	I_C = 50A, V_{GE} = 15V		1.42		mJ
$t_{d(off)}$	$V_{CE} = 0.8 \bullet V_{CES}$, R_G = 3Ω		268		ns
t_{fi}			222		ns
E_{off}			3.28		mJ
$t_{d(on)}$	**Inductive Load, T_J = 125°C**		25		ns
t_{ri}			40		ns
E_{on}	I_C = 50A, V_{GE} = 15V		2.76		mJ
$t_{d(off)}$	$V_{CE} = 0.8 \bullet V_{CES}$, R_G = 3Ω		415		nS
t_{fi}			362		ns
E_{off}			6.03		mJ
R_{thJC}				0.62	°C/W
R_{thCS}			0.15		°C/W

ISOPLUS247 (IXGR) Outline



SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.190	.205	4.83	5.21
A1	.090	.100	2.29	2.54
A2	.075	.085	1.91	2.16
b	.045	.055	1.14	1.40
b1	.075	.084	1.91	2.13
b2	.115	.123	2.92	3.12
C	.024	.031	0.61	0.80
D	.819	.840	20.80	21.34
E	.620	.635	15.75	16.13
e	.215 BSC		5.45 BSC	
L	.780	.800	19.81	20.32
L1	.150	.170	3.81	4.32
Q	.220	.244	5.59	6.20
R	.170	.190	4.32	4.83
S	.520	.540	13.21	13.72
T	.620	.640	15.75	16.26
U	.065	.080	1.65	2.03

1 – GATE
2 – DRAIN (COLLECTOR)
3 – SOURCE (EMITTER)
4 – NO CONNECTION

NOTE: This drawing will meet all dimensions requirement of JEDEC outline TO-247AD except screw hole.

Notes:1. Pulse test, t ≤ 300µs; dutycycle, d ≤ 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.

Fig. 1. Output Characteristics @ 25ºC

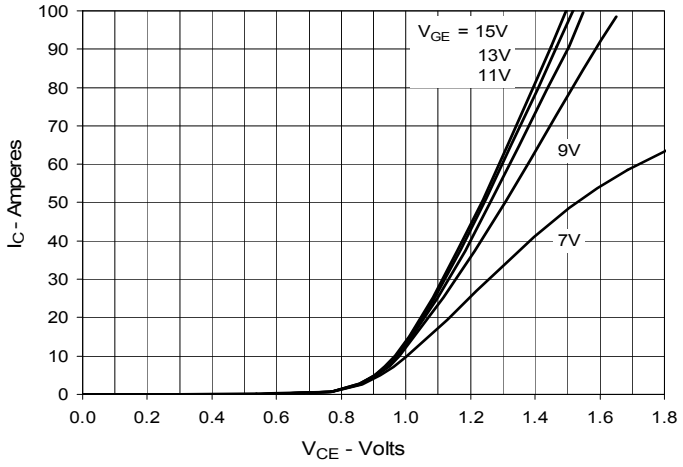


Fig. 2. Extended Output Characteristics @ 25ºC

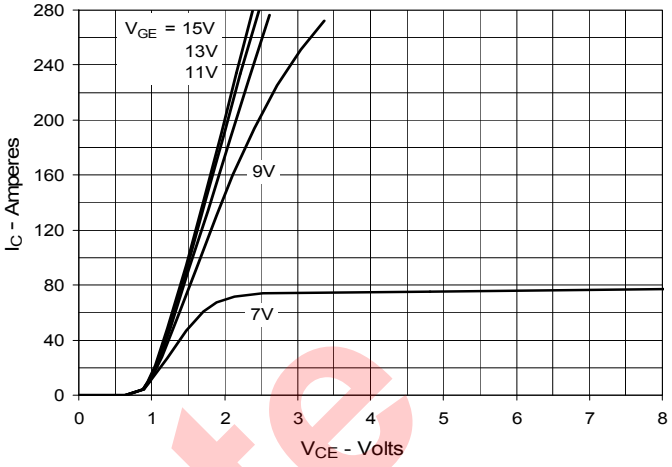


Fig. 3. Output Characteristics @ 125ºC

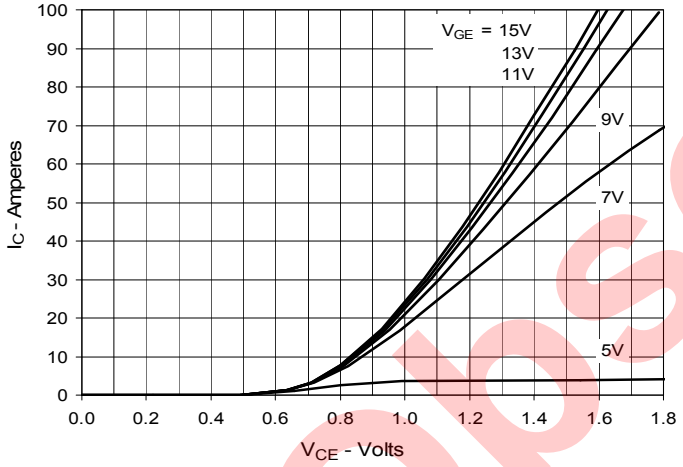


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

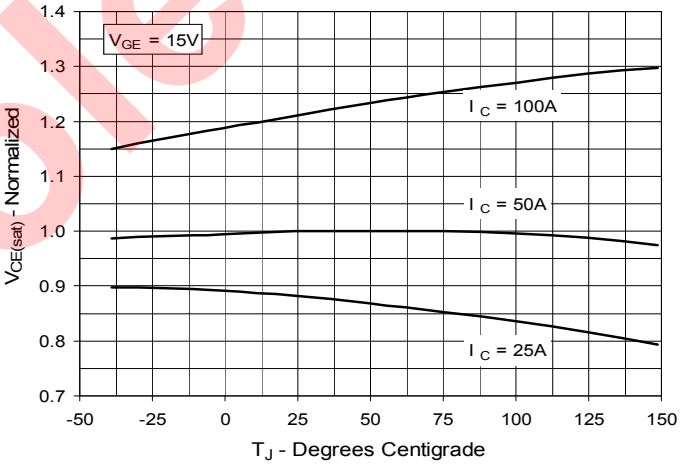


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

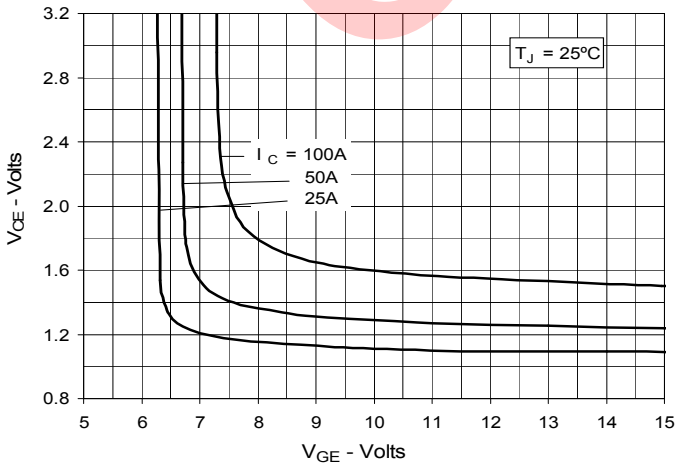


Fig. 6. Input Admittance

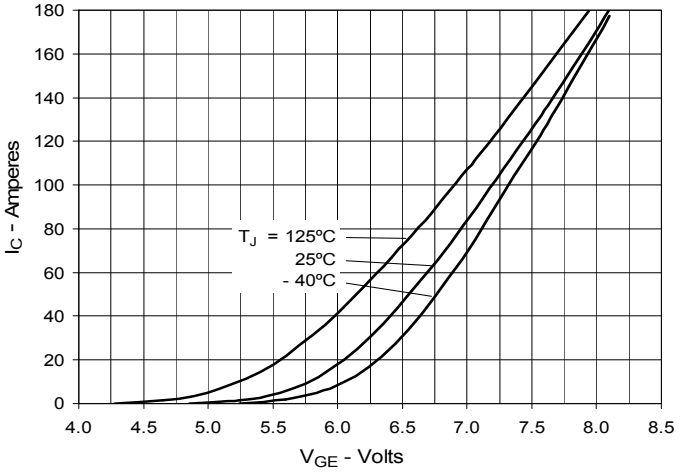


Fig. 7. Transconductance

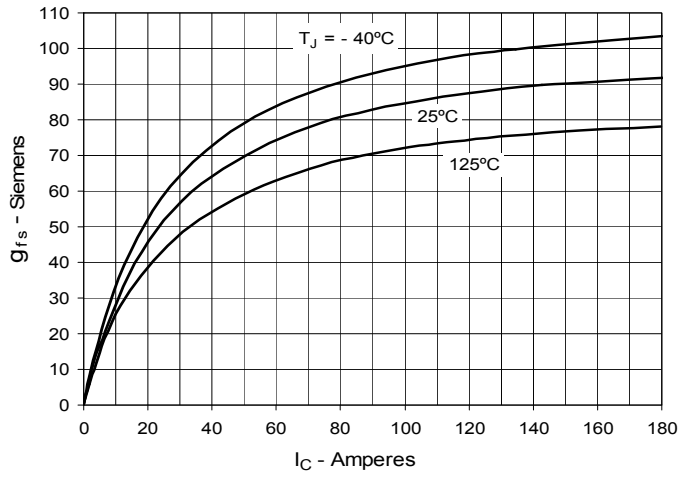


Fig. 8. Gate Charge

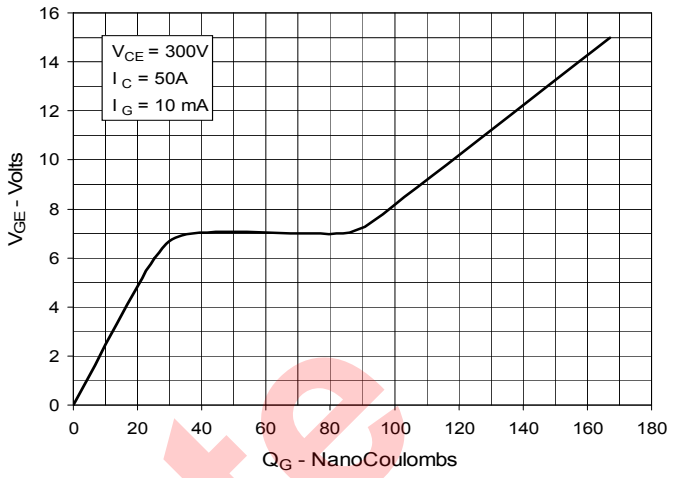


Fig. 9. Capacitance

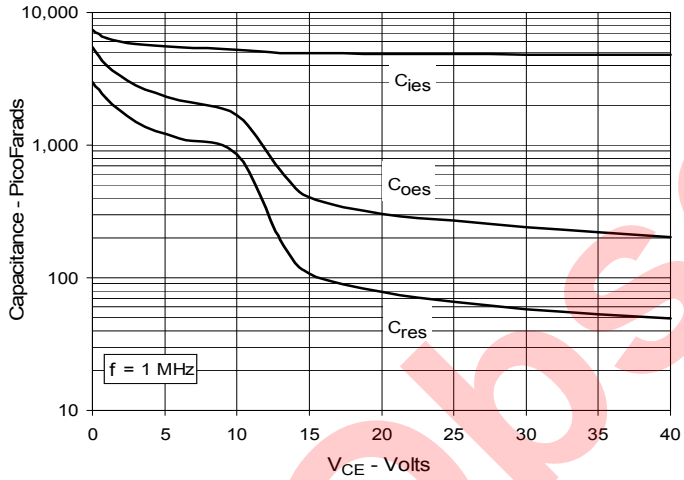


Fig. 10. Reverse-Bias Safe Operating Area

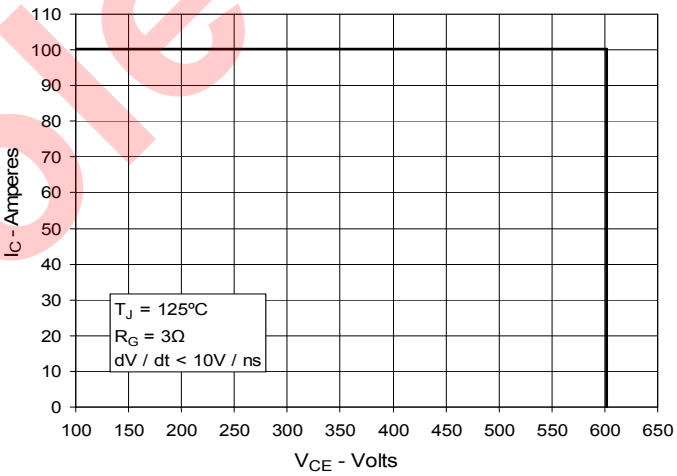


Fig. 11. Maximum Transient Thermal Impedance

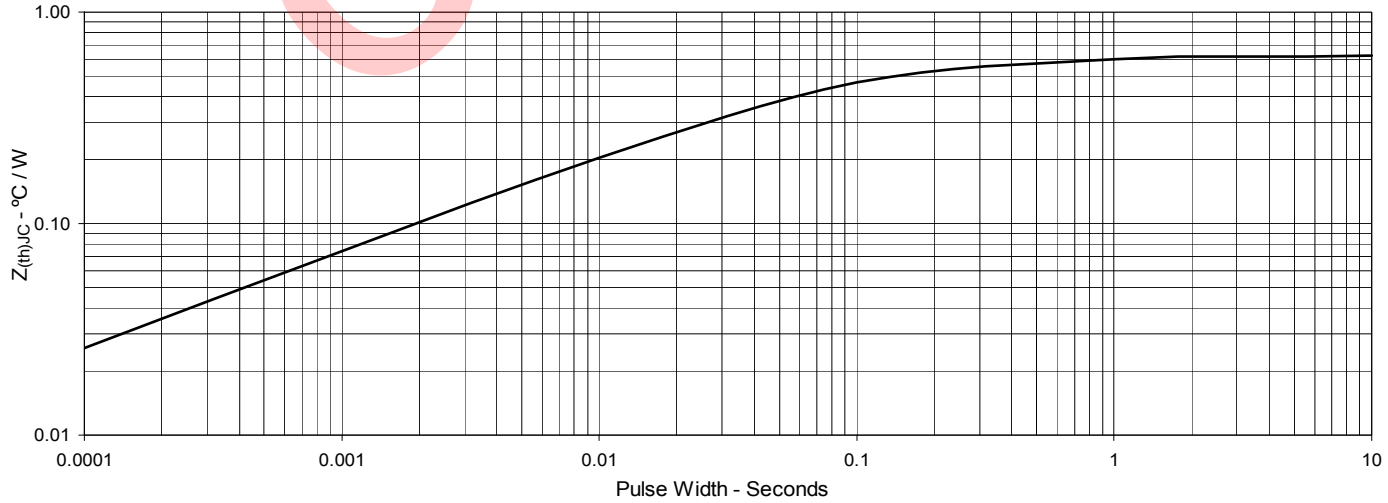


Fig. 12. Inductive Switching Energy Loss vs. Gate Resistance

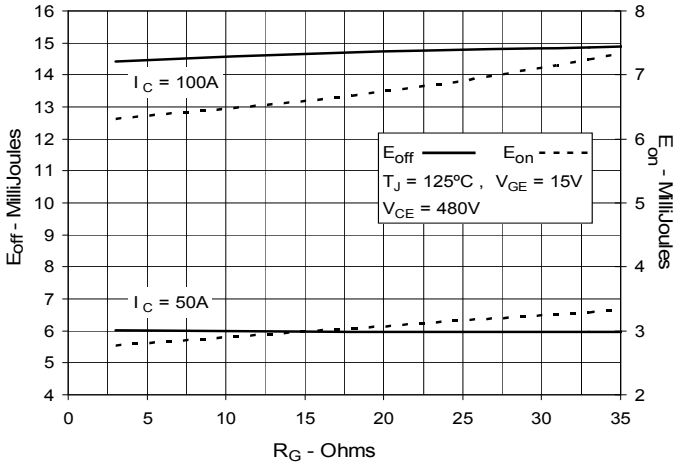


Fig. 13. Inductive Switching Energy Loss vs. Junction Temperature

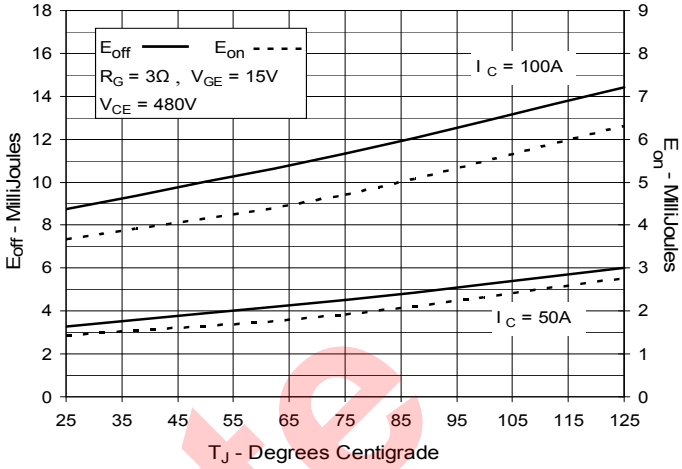


Fig. 14. Inductive Switching Energy Loss vs. Collector Current

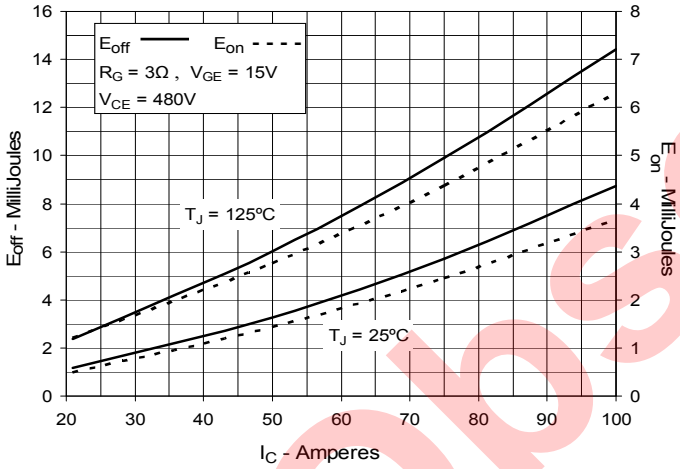


Fig. 15. Inductive Turn-off Switching Times vs. Gate Resistance

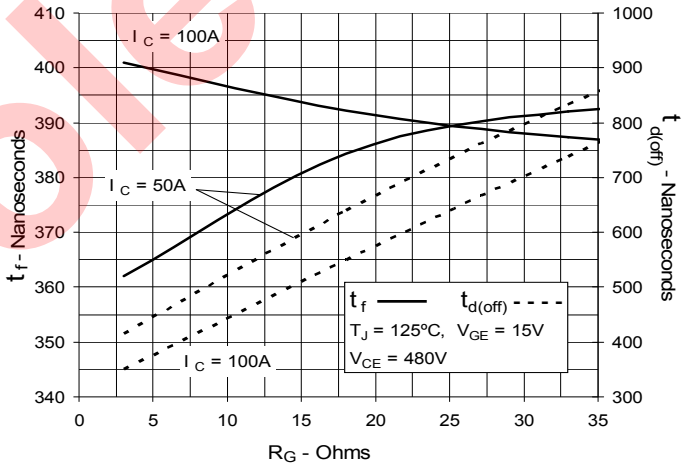


Fig. 16. Inductive Turn-off Switching Times vs. Collector Current

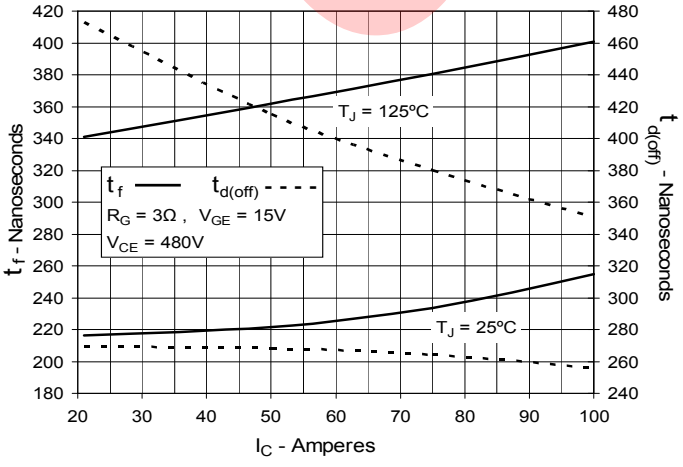


Fig. 17. Inductive Turn-off Switching Times vs. Junction Temperature

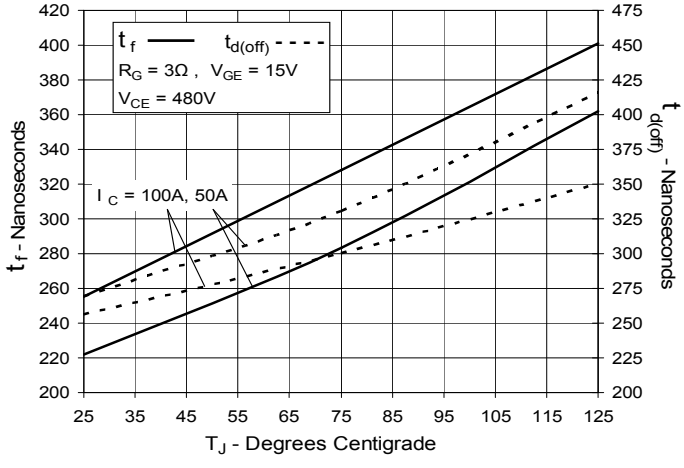


Fig. 18. Inductive Turn-on Switching Times vs. Gate Resistance

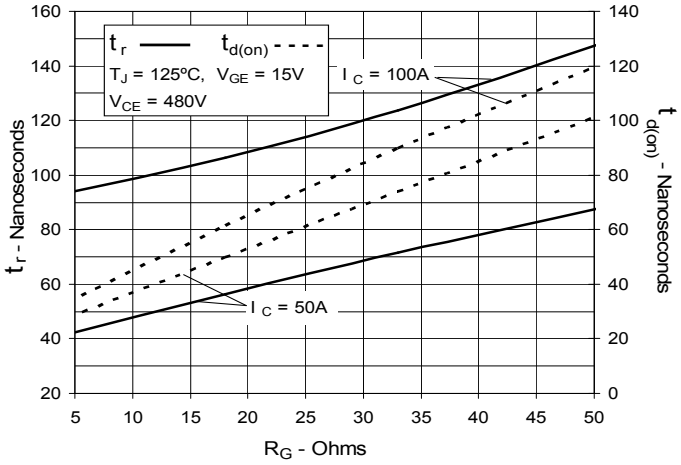


Fig. 19. Inductive Turn-on Switching Times vs. Junction Temperature

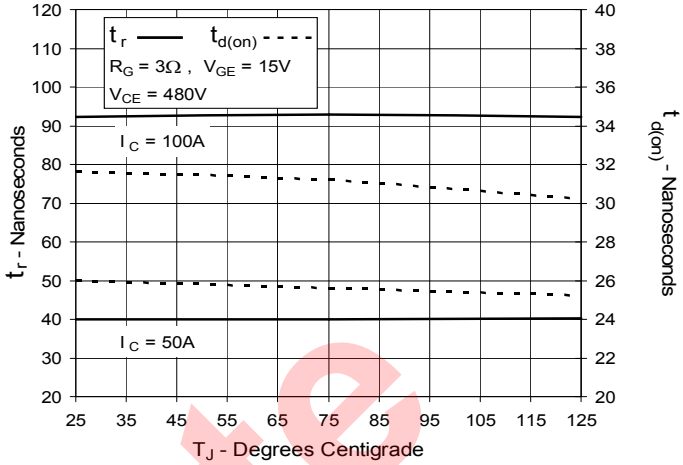
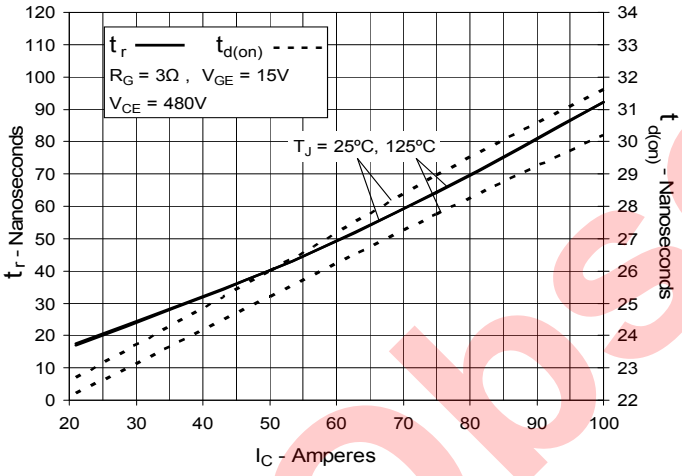


Fig. 20. Inductive Turn-on Switching Times vs. Collector Current



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