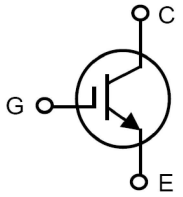
1200V XPT™ Gen 4 IGBT

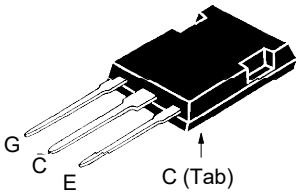
IXYX110N120B4

V_{CES} = 1200V
I_{C110} = 110A
$V_{CE(sat)}$ ≤ 2.10V
$t_{fi(typ)}$ = 130ns

Extreme Light Punch Through
IGBT for 5-30 kHz Switching



PLUS247 (IXYX)



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

Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_J = 25°C to 175°C	1200	V
V_{CGR}	T_J = 25°C to 175°C, R_{GE} = 1MΩ	1200	V
V_{GES}	Continuous	±20	V
V_{GEM}	Transient	±30	V
I_{C25}	T_C = 25°C (Chip Capability)	340	A
I_{LRMS}	Terminal Current Limit	160	A
I_{C110}	T_C = 110°C	110	A
I_{CM}	T_C = 25°C, 1ms	800	A
SSOA (RBSOA)	V_{GE} = 15V, T_{VJ} = 150°C, R_G = 2Ω Clamped Inductive Load	I_{CM} = 220 0.8 • V_{CES}	A V
P_C	T_C = 25°C	1360	W
T_J		-55 ... +175	°C
T_{JM}		175	°C
T_{stg}		-55 ... +175	°C
T_L	Maximum Lead Temperature for Soldering 1.6 mm (0.062 in.) from Case for 10s	300	°C
M_d	Mounting Force	20..120 / 4.5..27	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	1200			V
$V_{GE(th)}$	I_C = 3mA, V_{CE} = V_{GE}	4.5		6.5	V
I_{CES}	V_{CE} = V_{CES}, V_{GE} = 0V			25	μA
	T_J = 150°C			1.5	mA
I_{GES}	V_{CE} = 0V, V_{GE} = ±20V			±100	nA
$V_{CE(sat)}$	I_C = I_{C110}, V_{GE} = 15V, Note 1		1.66	2.10	V
	T_J = 150°C		1.95		V

Features

- Optimized for 5-30kHZ Switching
- Positive Thermal Coefficient of Vce(sat)
- International Standard Package

Advantages

- High Power Density
- Low Gate Drive Requirement

Applications

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

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Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.
g_{fs}	I_C = 55A, V_{CE} = 10V, Note 1	40	68	S
C_{ies}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz		5460	pF
C_{oes}			340	pF
C_{res}			220	pF
$Q_{g(on)}$	$I_C = I_{C110}$, V_{GE} = 15V, $V_{CE} = 0.5 \bullet V_{CES}$		340	nC
Q_{ge}			52	nC
Q_{gc}			144	nC
$t_{d(on)}$	**Inductive load, T_J = 25°C**		45	ns
t_{ri}	I_C = 50A, V_{GE} = 15V		50	ns
E_{on}	$V_{CE} = 0.5 \bullet V_{CES}$, $R_G = 2\Omega$		3.60	mJ
$t_{d(off)}$	Note 2		390	ns
t_{fi}			130	ns
E_{off}			3.85	mJ
$t_{d(on)}$	**Inductive load, T_J = 150°C**		34	ns
t_{ri}	I_C = 50A, V_{GE} = 15V		38	ns
E_{on}	$V_{CE} = 0.5 \bullet V_{CES}$, $R_G = 2\Omega$		4.96	mJ
$t_{d(off)}$	Note 2		440	ns
t_{fi}			210	ns
E_{off}			6.45	mJ
R_{thJC}				0.11 °C/W
R_{thCS}			0.15	°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.

Littelfuse 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 4,860,072 4,881,106 4,931,844 5,017,508 5,034,796 5,049,961 5,063,307 5,187,117 5,237,481 5,381,025 5,486,715 6,162,665 6,259,123 B1 6,306,728 B1 6,404,065 B1 6,534,343 6,583,505 6,683,344 6,710,405 B2 6,710,463 6,727,585 6,759,692 6,771,478 B2 7,005,734 B2 7,063,975 B2 7,071,537 7,157,338B2

Fig. 1. Output Characteristics @ T_J = 25ºC

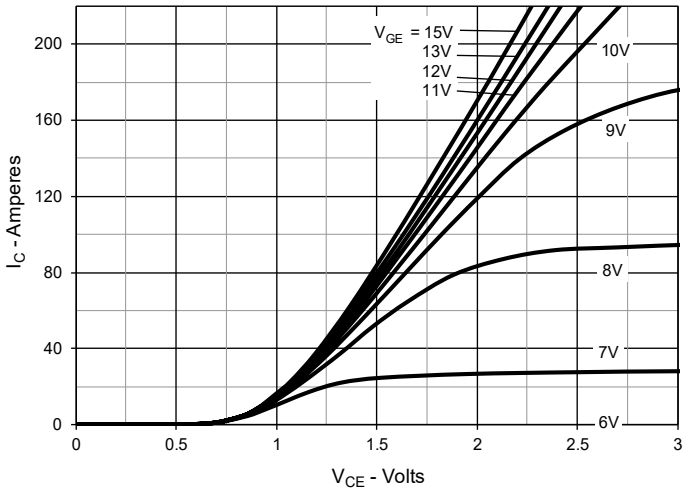


Fig. 2. Extended Output Characteristics @ T_J = 25ºC

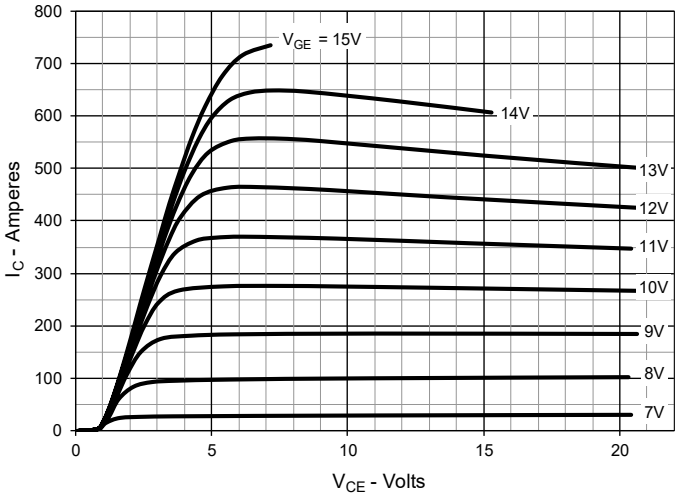


Fig. 3. Output Characteristics @ T_J = 150ºC

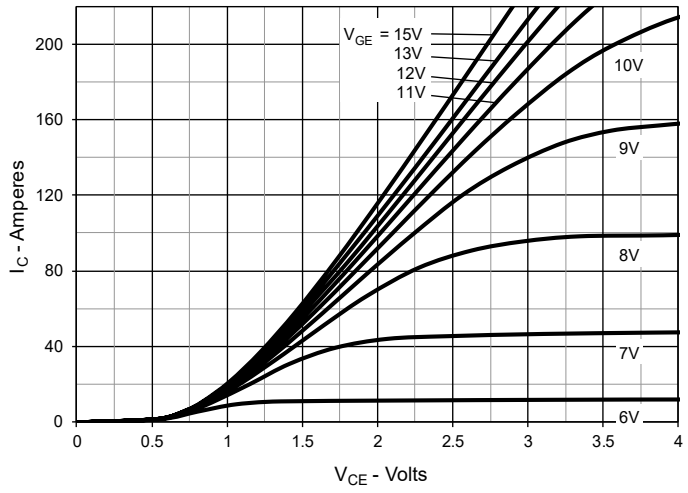


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

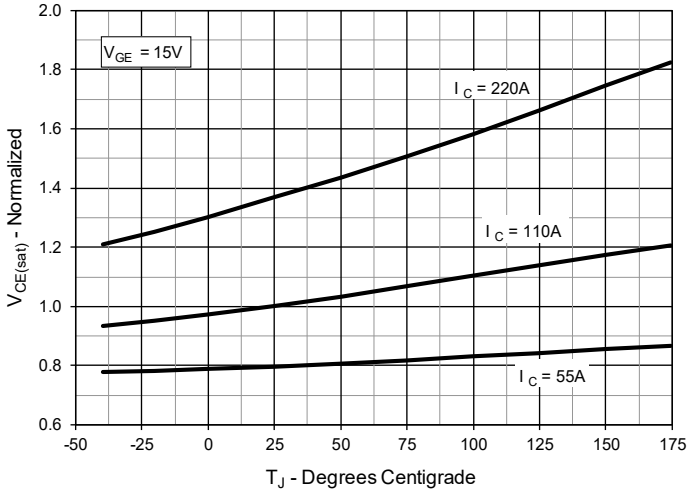


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

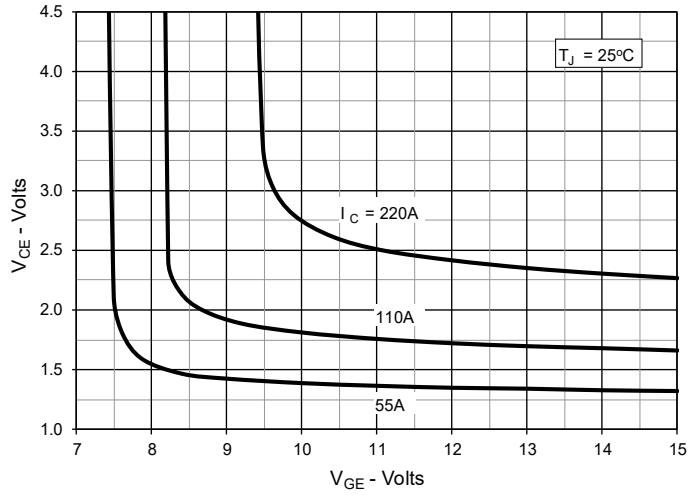
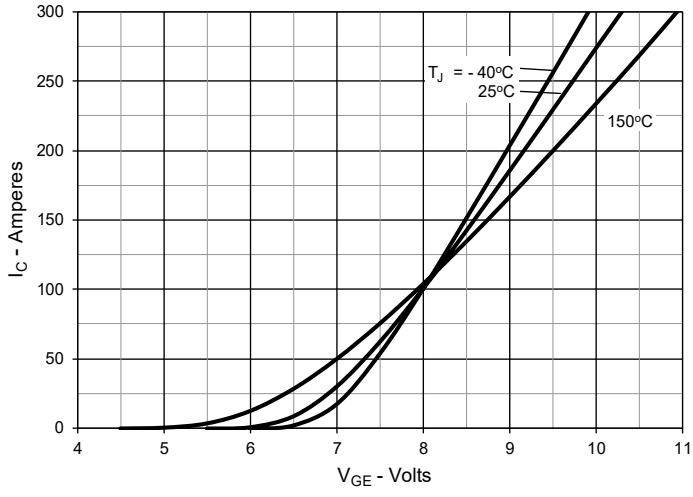


Fig. 6. Input Admittance



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Fig. 7. Transconductance

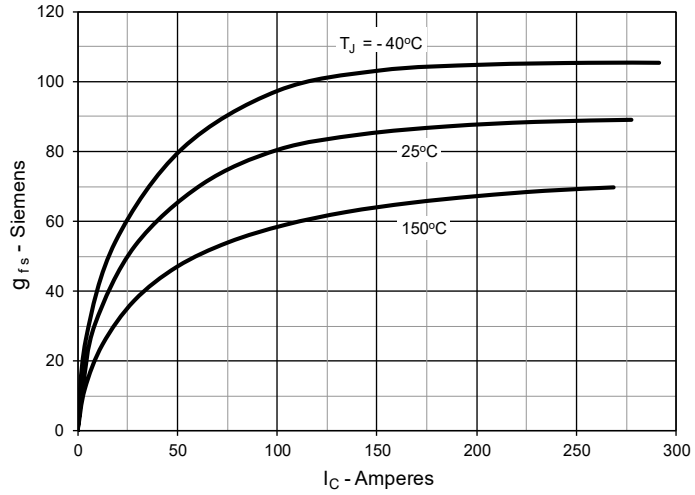


Fig. 8. Gate Charge

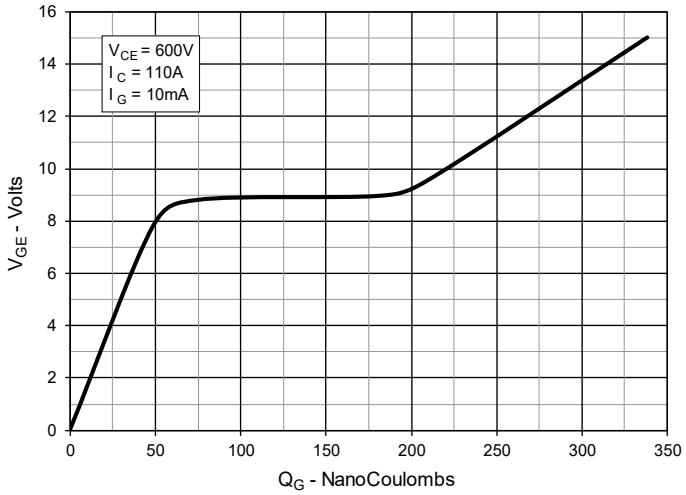


Fig. 9. Capacitance

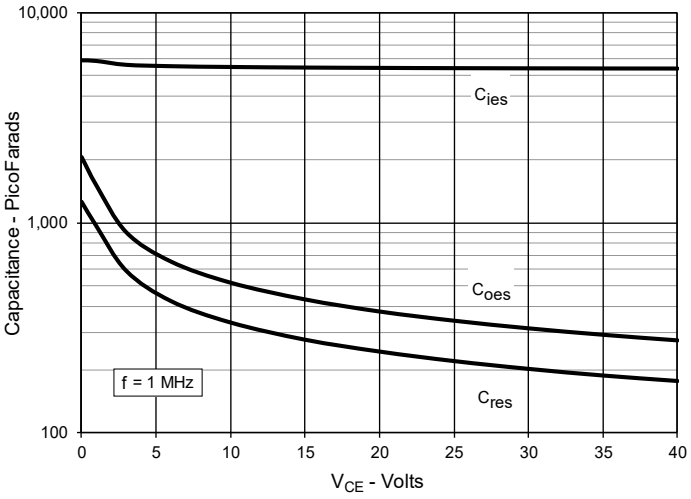


Fig. 10. Reverse-Bias Safe Operating Area

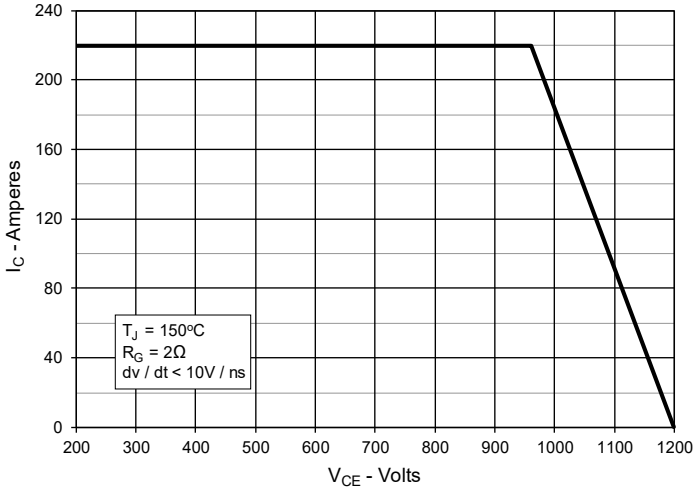
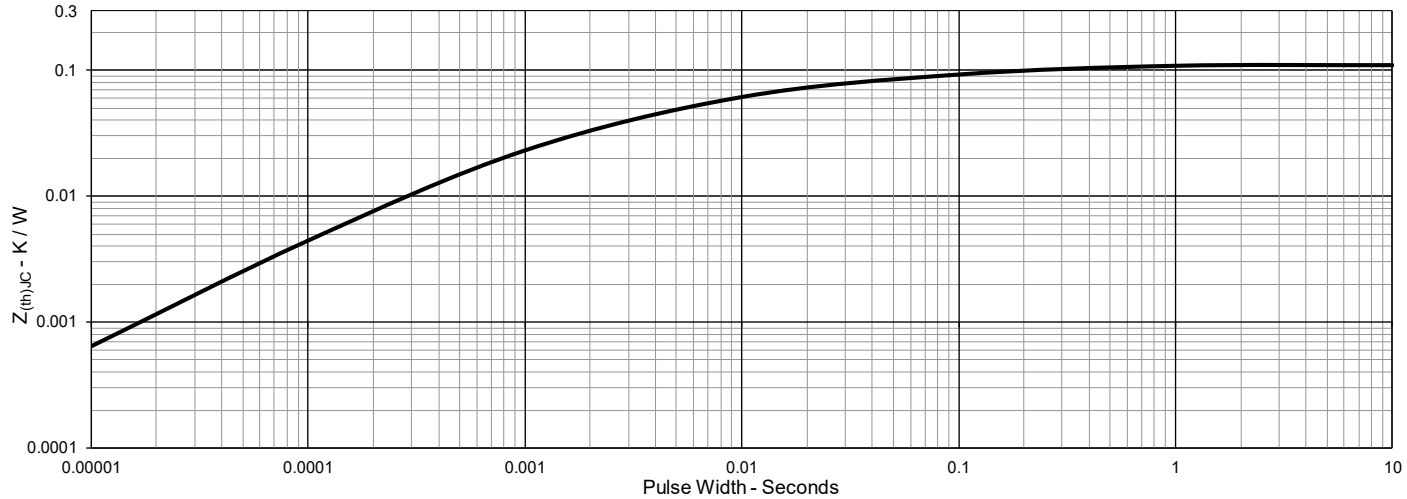


Fig. 11. Maximum Transient Thermal Impedance



Littelfuse reserves the right to change limits, test conditions, and dimensions.

Fig. 12. Inductive Switching Energy Loss vs. Collector Current

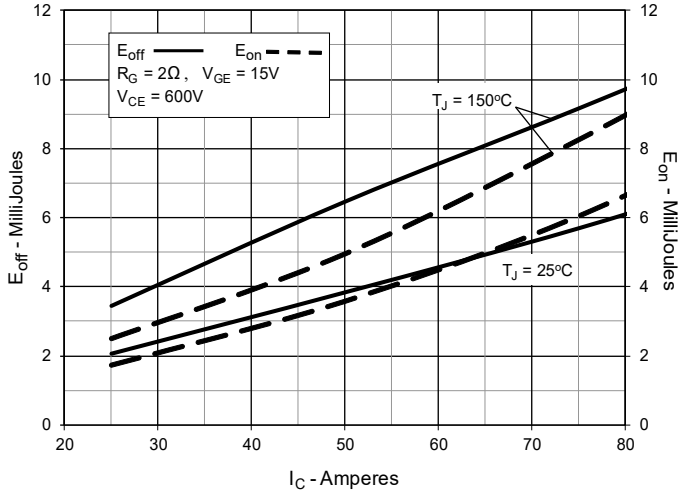


Fig. 13. Inductive Switching Energy Loss vs. Collector-Emitter Voltage

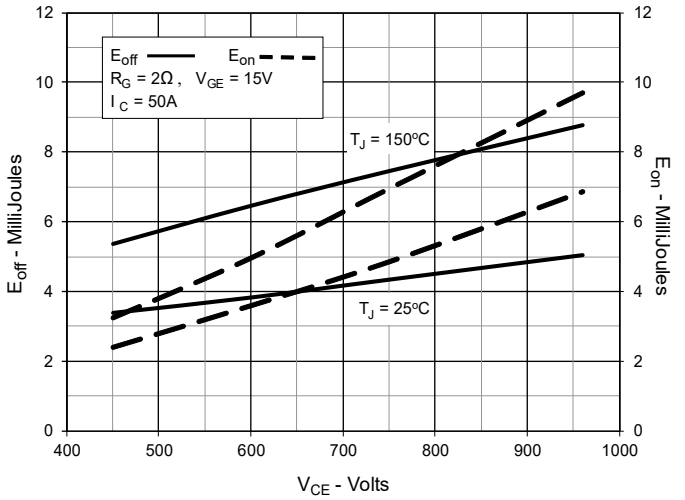


Fig. 14. Inductive Switching Energy Loss vs. Gate Resistance

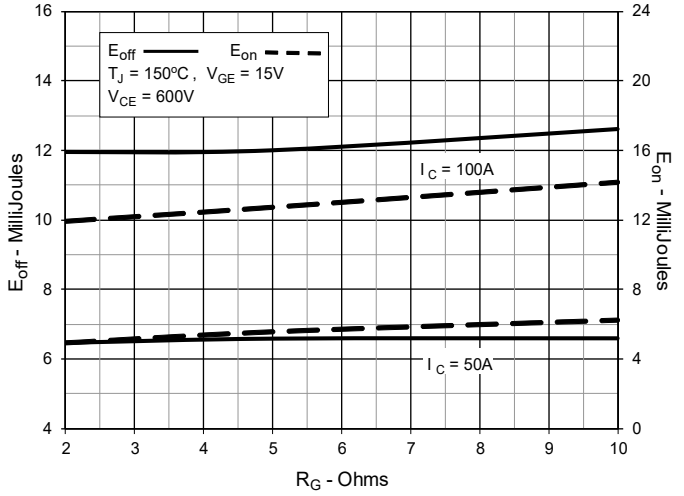


Fig. 15. Inductive Switching Energy Loss vs. Junction Temperature

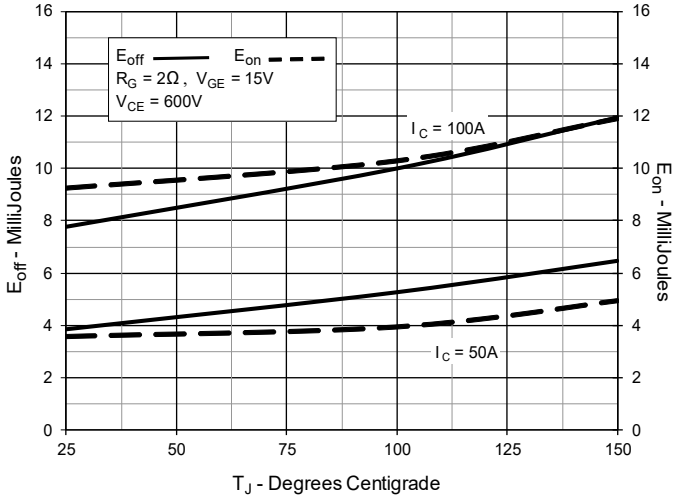


Fig. 16. Inductive Turn-off Switching Times vs. Gate Resistance

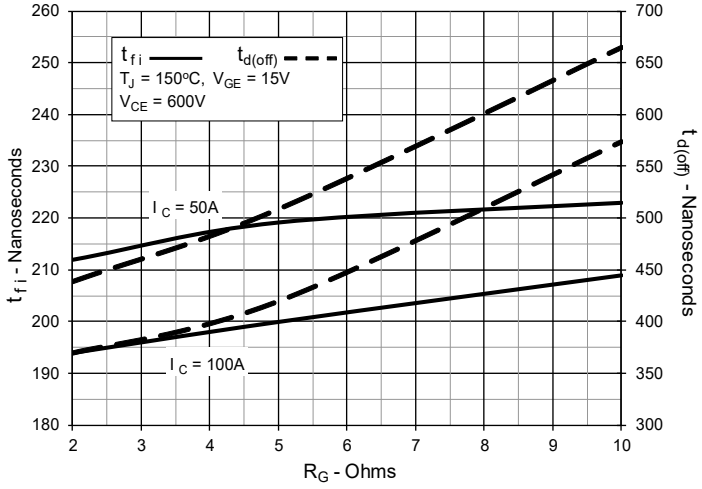
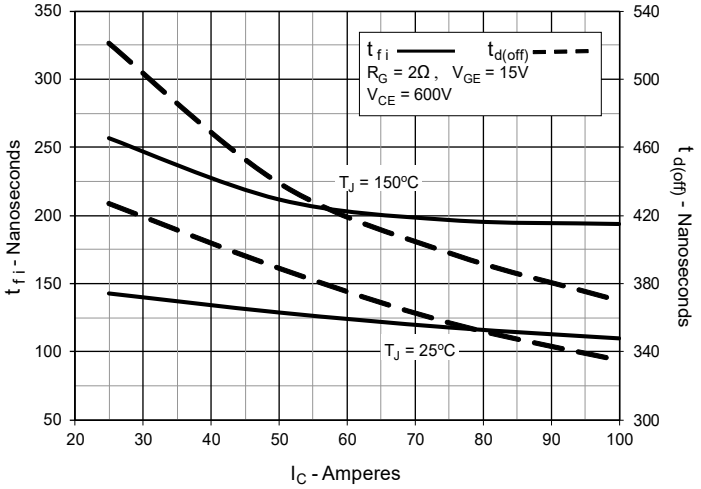


Fig. 17. Inductive Turn-off Switching Times vs. Collector Current



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Fig. 18. Inductive Turn-off Switching Times vs. Junction Temperature

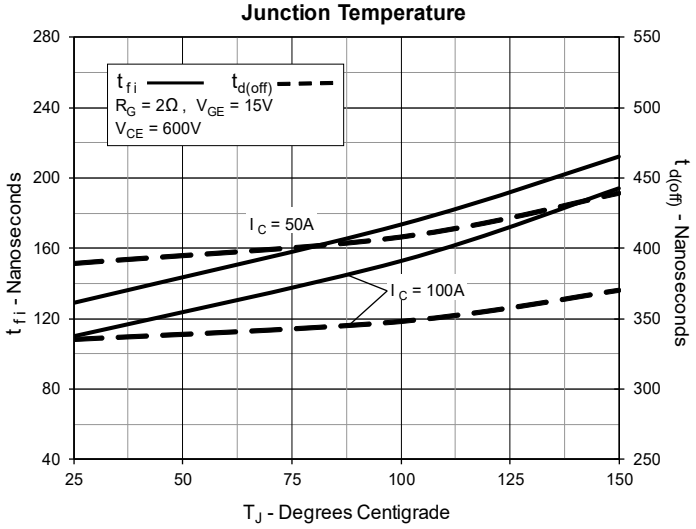


Fig. 19. Inductive Turn-on Switching Times vs. Gate Resistance

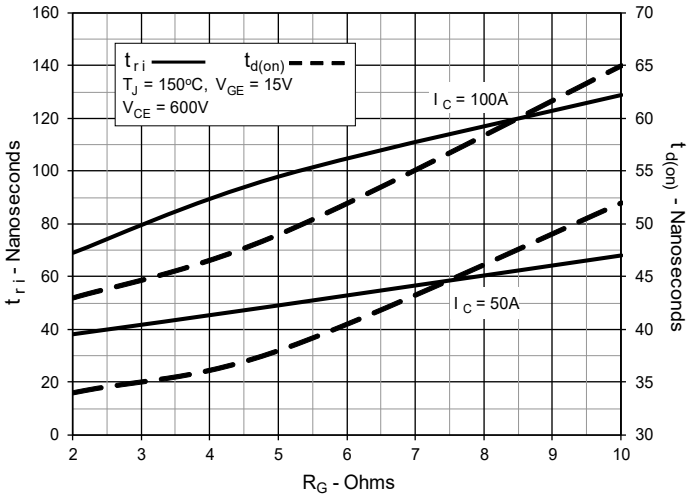


Fig. 20. Inductive Turn-on Switching Times vs. Collector Current

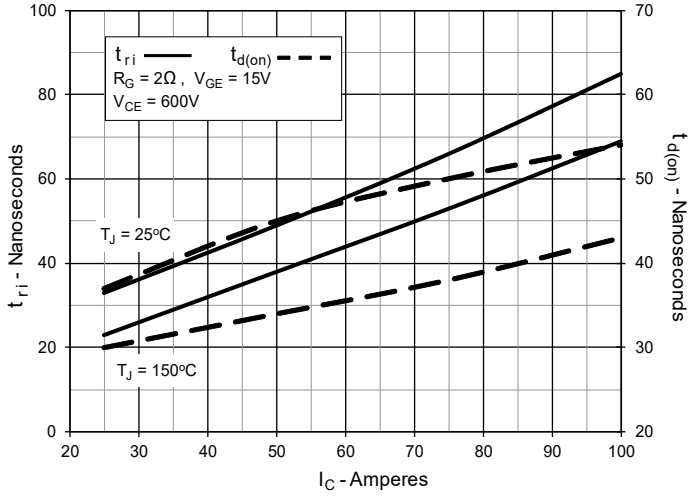
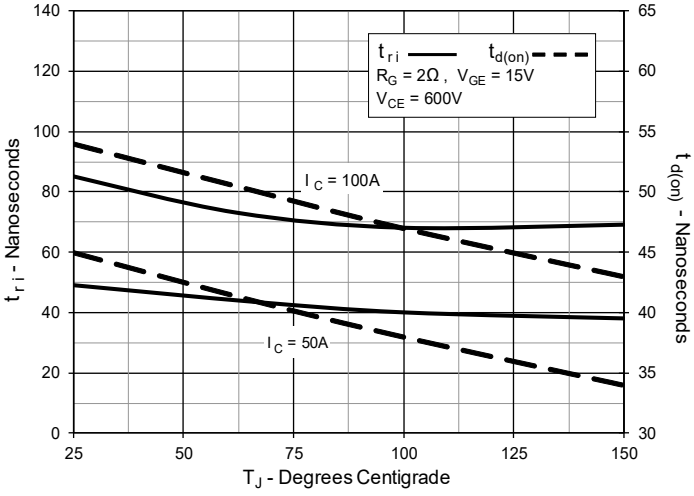
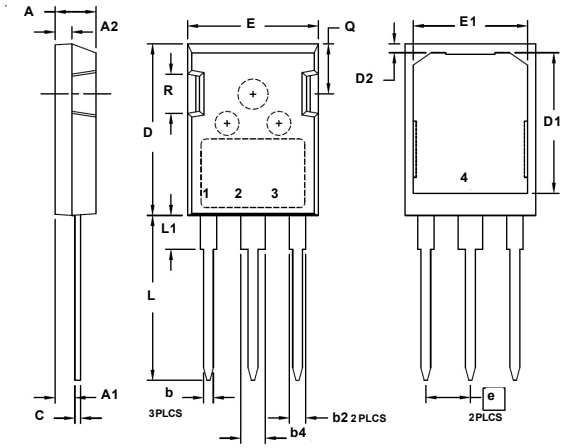


Fig. 21. Inductive Turn-on Switching Times vs. Junction Temperature



Littelfuse reserves the right to change limits, test conditions, and dimensions.

PLUS247™ Outline



1 - Gate
2,4 - Collector
3 - Emitter

SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	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
b2	.075	.087	1.91	2.20
b4	.115	.126	2.92	3.20
C	.024	.031	0.61	0.80
D	.819	.840	20.80	21.34
D1	.650	.690	16.51	17.53
D2	.035	.050	0.89	1.27
E	.620	.635	15.75	16.13
E1	.520	.560	13.08	14.22
e	.215 BSC		5.45 BSC	
L	.780	.810	19.81	20.57
L1	.150	.170	3.81	4.32
Q	.220	.244	5.59	6.20
R	.170	.190	4.32	4.83

IXYS
A Littelfuse Technology

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