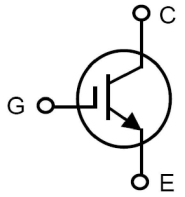
1200V XPT™ GenX4™ IGBT

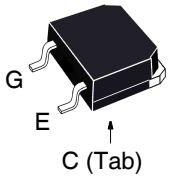
IXYT85N120A4HV

V_{CES} = 1200V
I_{C110} = 85A
$V_{CE(sat)}$ ≤ 1.8V
$t_{fi(typ)}$ = 280ns

Ultra Low-Vsat PT IGBT for up to 5kHz Switching



TO-268HV (IXYT..HV)



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)	300	A
I_{LRMS}	Terminal Current Limit	160	A
I_{C110}	T_C = 110°C	85	A
I_{CM}	T_C = 25°C, 1ms	520	A
SSOA (RBSOA)	V_{GE} = 15V, T_{VJ} = 125°C, R_G = 5Ω Clamped Inductive Load	I_{CM} = 170 $V_{CE} \leq 0.8 \bullet V_{CES}$	A
P_C	T_C = 25°C	1150	W
T_J		-55 ... +175	°C
T_{JM}		175	°C
T_{stg}		-55 ... +175	°C
T_{SOLD}	Plastic Body for 10s	260	°C
Weight		4	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 = 250μA, V_{CE} = V_{GE}	4.0		6.5	V
I_{CES}	V_{CE} = V_{CES}, V_{GE} = 0V			10	μA
	T_J = 150°C			5	mA
I_{GES}	V_{CE} = 0V, V_{GE} = ±20V			±100	nA
$V_{CE(sat)}$	I_C = 85A, V_{GE} = 15V, Note 1		1.5	1.8	V
	T_J = 150°C		1.7		V

Features

- Optimized for Low Conduction Losses
- 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
- Inrush Current Protector Circuits

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Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.
g_{fs}	I_C = 60A, V_{CE} = 10V, Note 1	46	60	S
C_{ies}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz		3700	pF
C_{oes}			210	pF
C_{res}			140	pF
$Q_{g(on)}$	I_C = 85A, V_{GE} = 15V, V_{CE} = 0.5 • V_{CES}		200	nC
Q_{ge}			30	nC
Q_{gc}			80	nC
$t_{d(on)}$	**Inductive load, T_J = 25°C**		40	ns
t_{ri}	I_C = 60A, V_{GE} = 15V		40	ns
E_{on}	V_{CE} = 0.5 • V_{CES}, R_G = 5Ω		4.9	mJ
$t_{d(off)}$	Note 2		400	ns
t_{fi}			280	ns
E_{off}			8.3	mJ
$t_{d(on)}$	**Inductive load, T_J = 150°C**		30	ns
t_{ri}	I_C = 60A, V_{GE} = 15V		43	ns
E_{on}	V_{CE} = 0.5 • V_{CES}, R_G = 5Ω		8.3	mJ
$t_{d(off)}$	Note 2		460	ns
t_{fi}			530	ns
E_{off}			13.7	mJ
R_{thJC}				0.13 °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 = 25°C

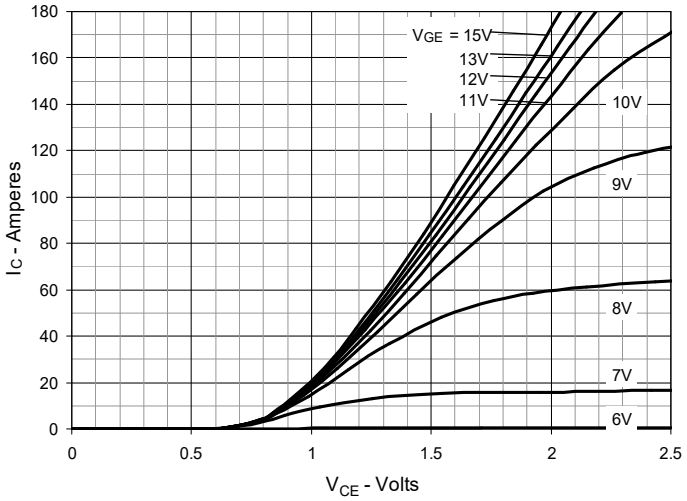


Fig. 2. Extended Output Characteristics @ T_J = 25°C

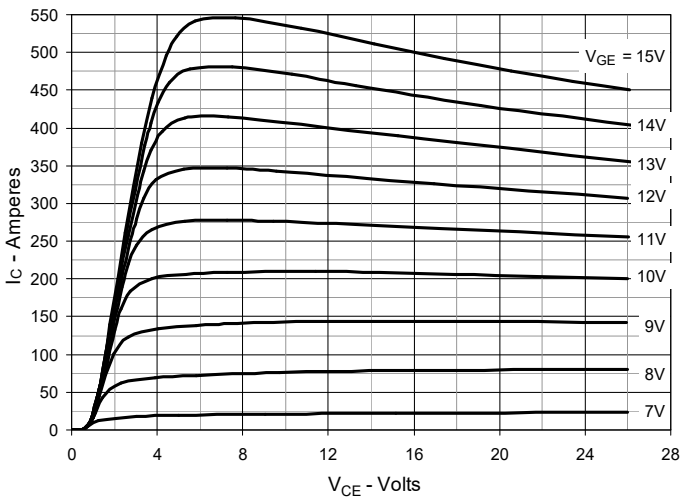


Fig. 3. Output Characteristics @ T_J = 150°C

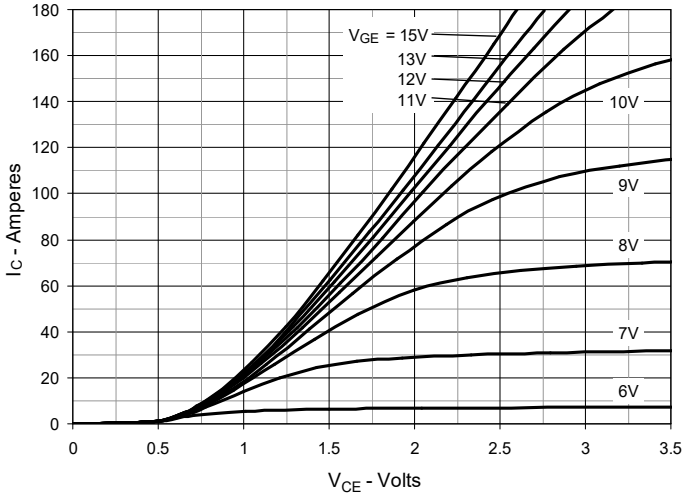


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

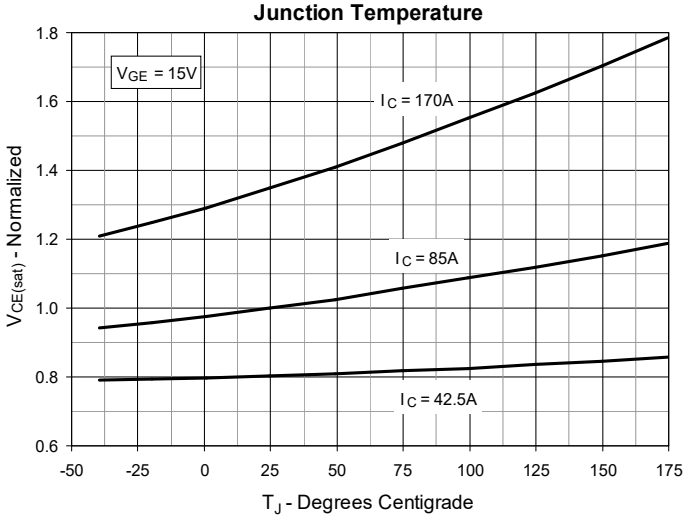


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

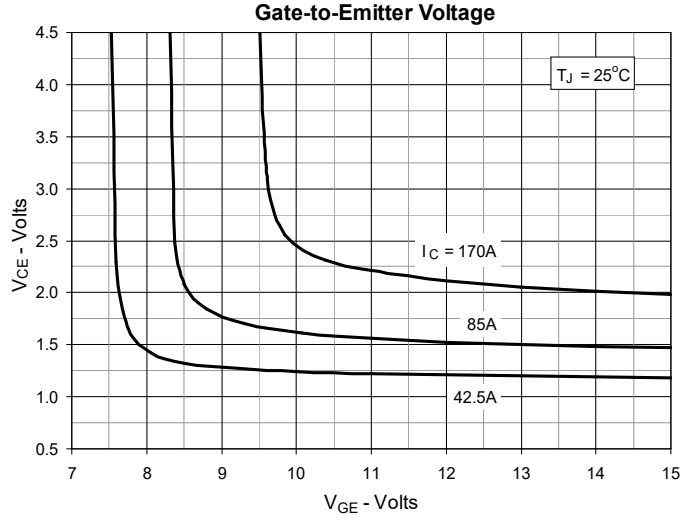
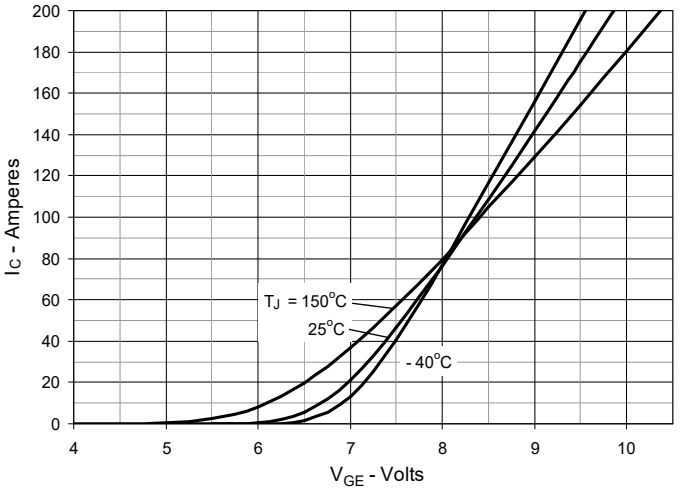


Fig. 6. Input Admittance



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Fig. 7. Transconductance

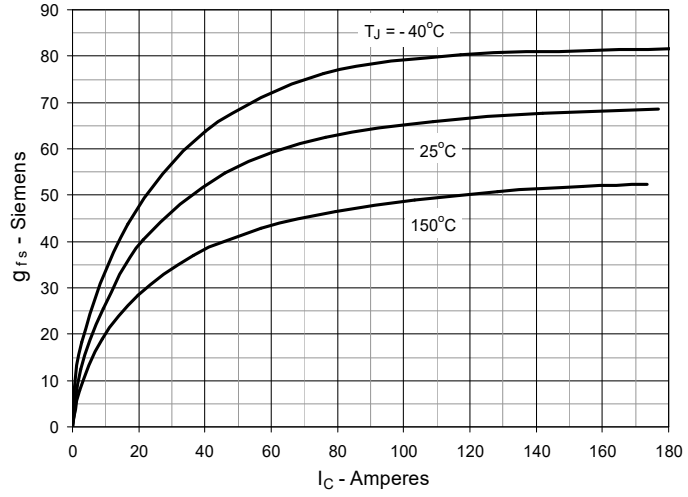


Fig. 8. Gate Charge

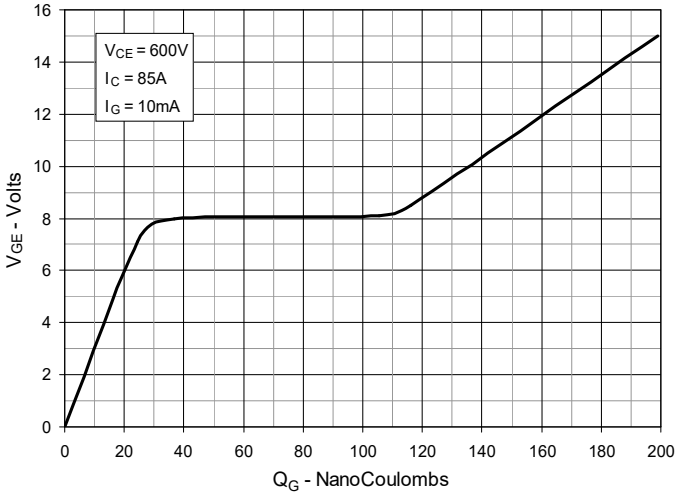


Fig. 9. Capacitance

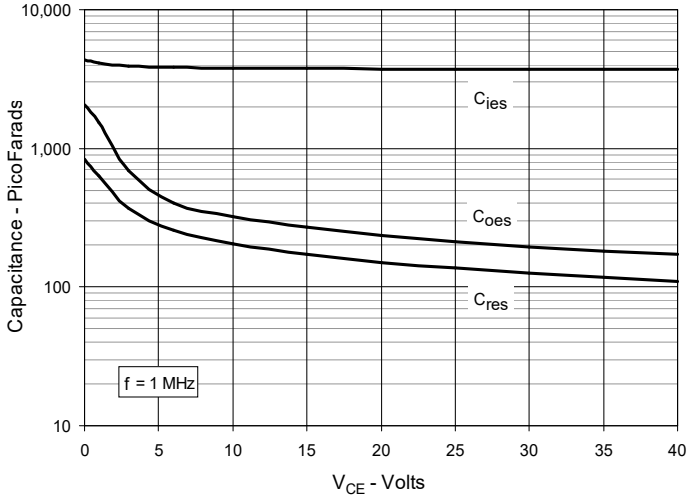


Fig. 10. Reverse-Bias Safe Operating Area

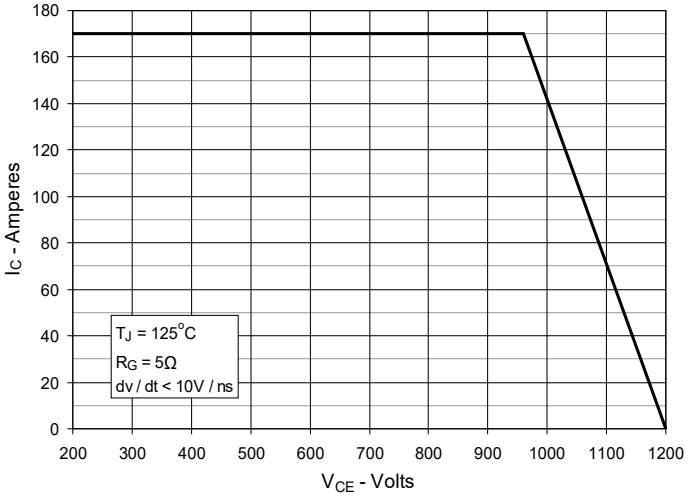
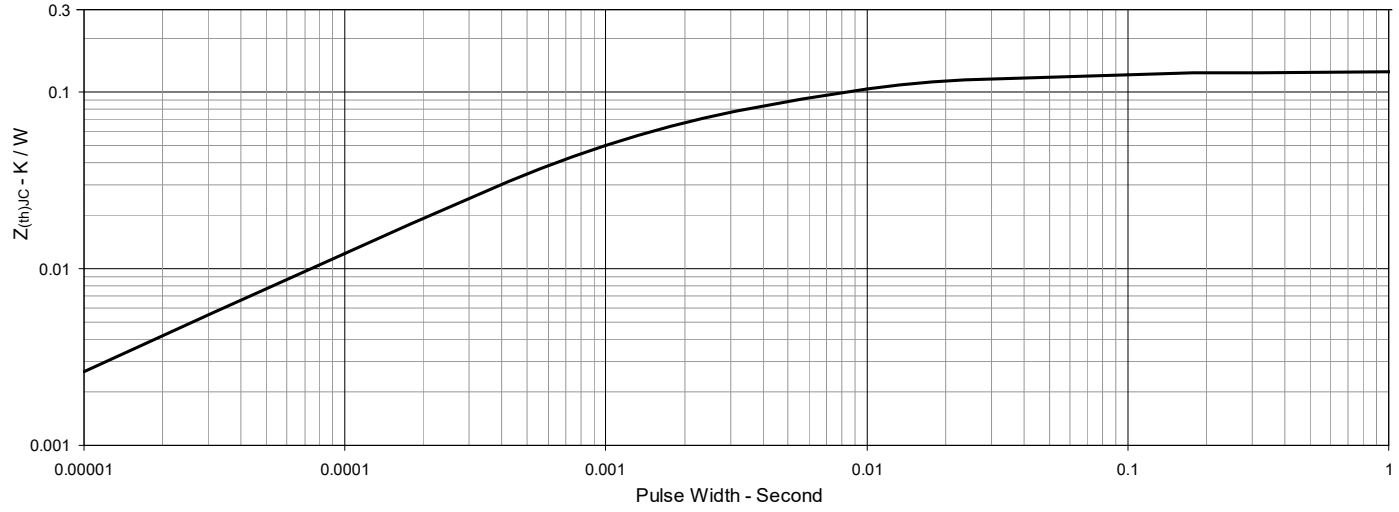


Fig. 11. Maximum Transient Thermal Impedance



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

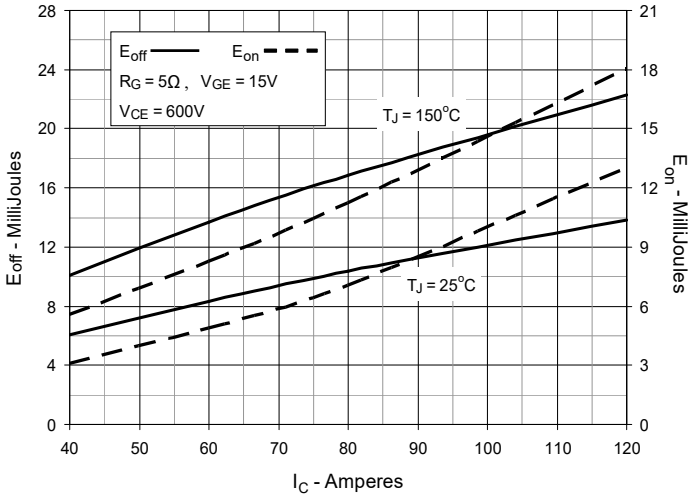


Fig. 13. Inductive Switching Energy Loss vs. Collector-Emitter Voltage

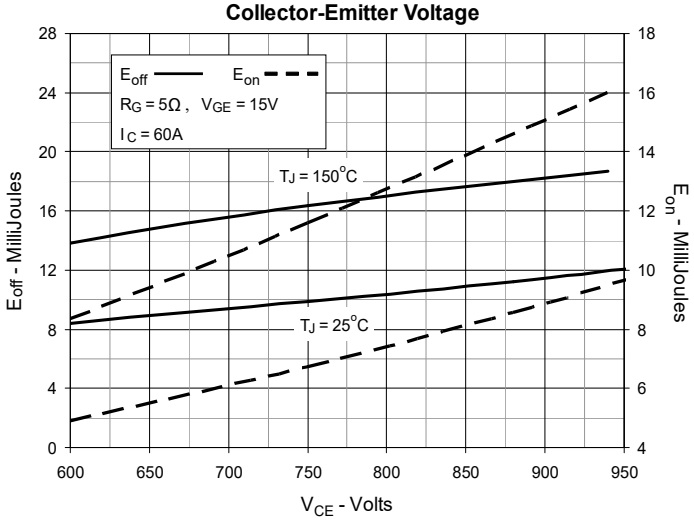


Fig. 14. Inductive Switching Energy Loss vs. Gate Resistance

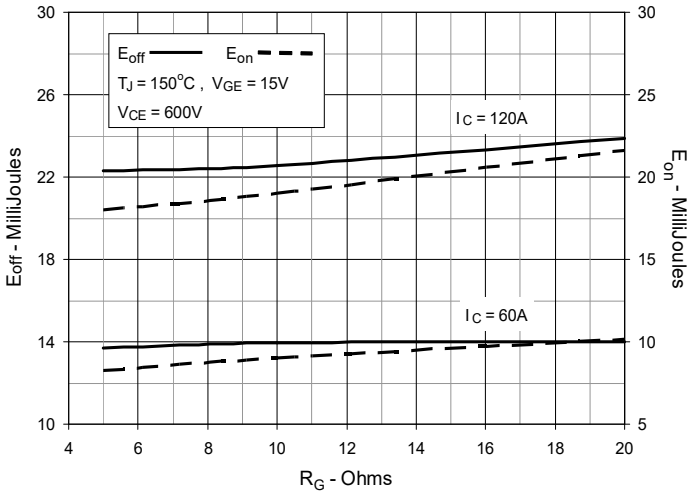


Fig. 15. Inductive Switching Energy Loss vs. Junction Temperature

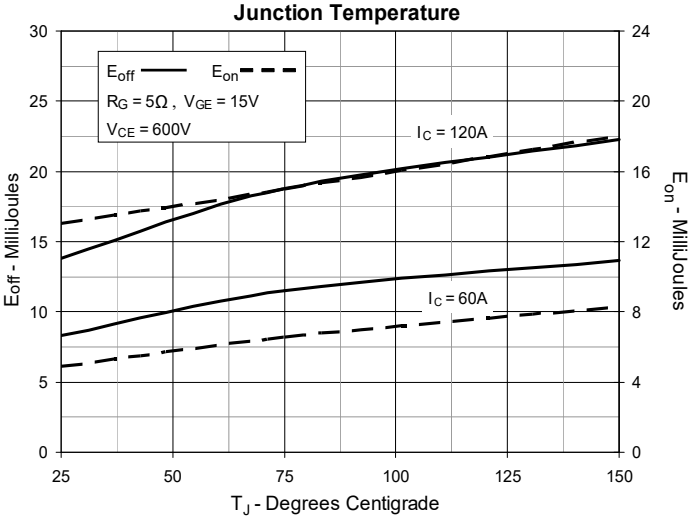


Fig. 16. Inductive Turn-off Switching Times vs. Gate Resistance

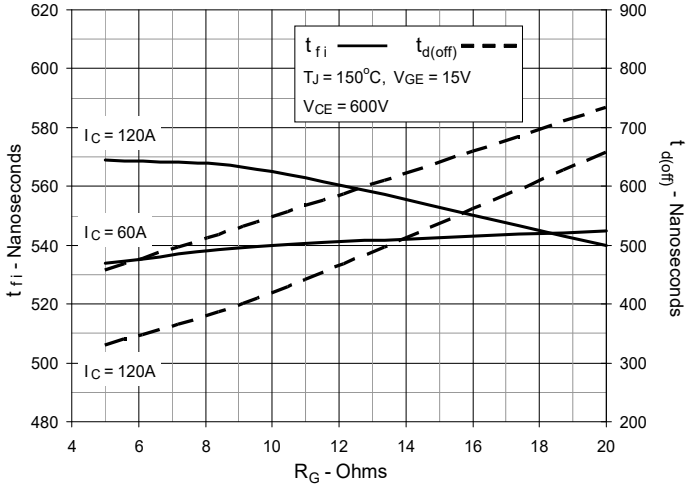
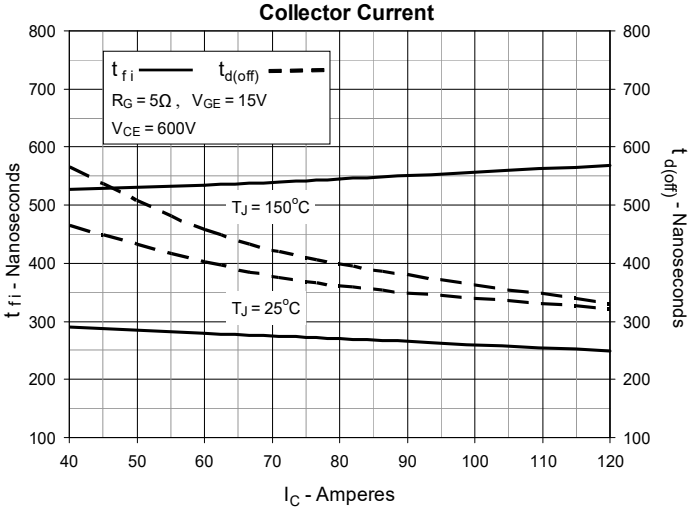


Fig. 17. Inductive Turn-off Switching Times vs. Collector Current



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

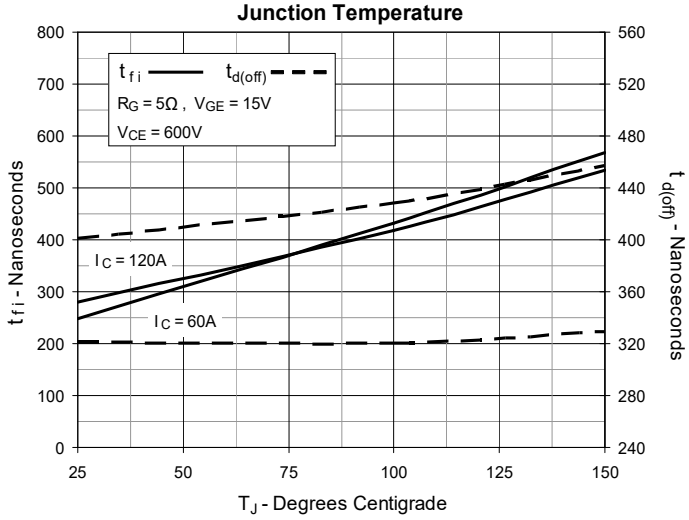


Fig. 19. Inductive Turn-on Switching Times vs. Gate Resistance

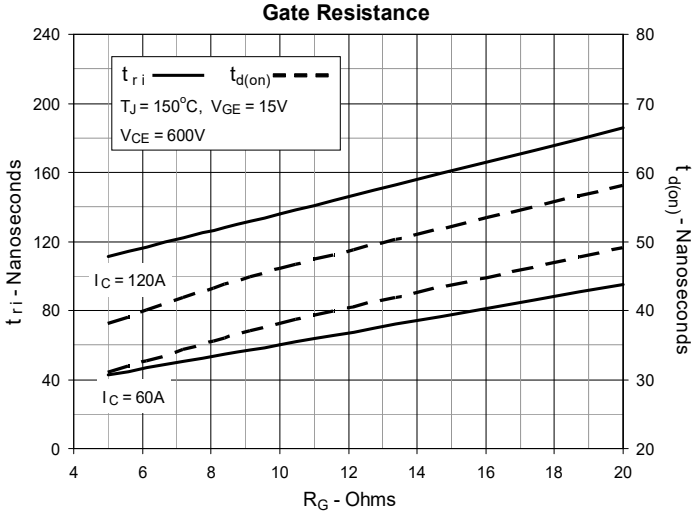


Fig. 20. Inductive Turn-on Switching Times vs. Collector Current

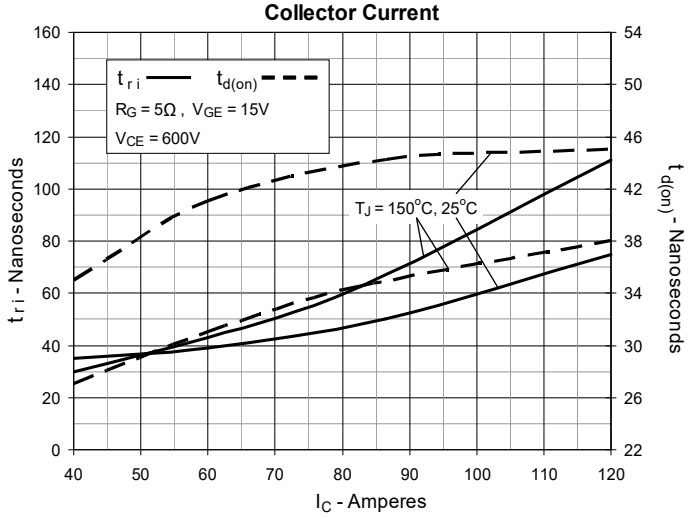
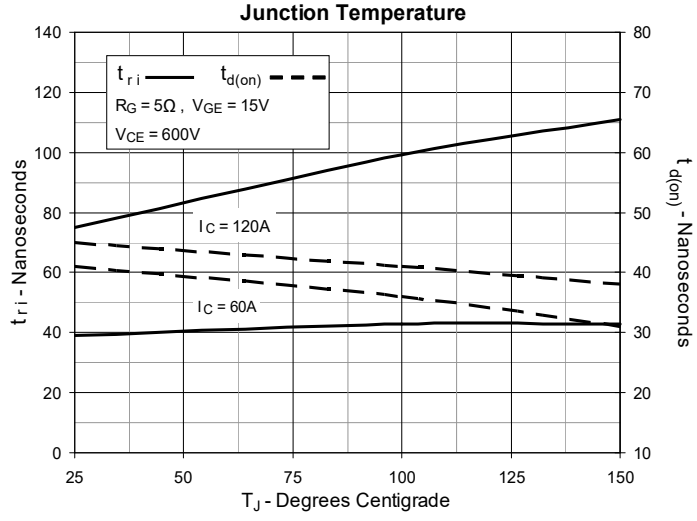
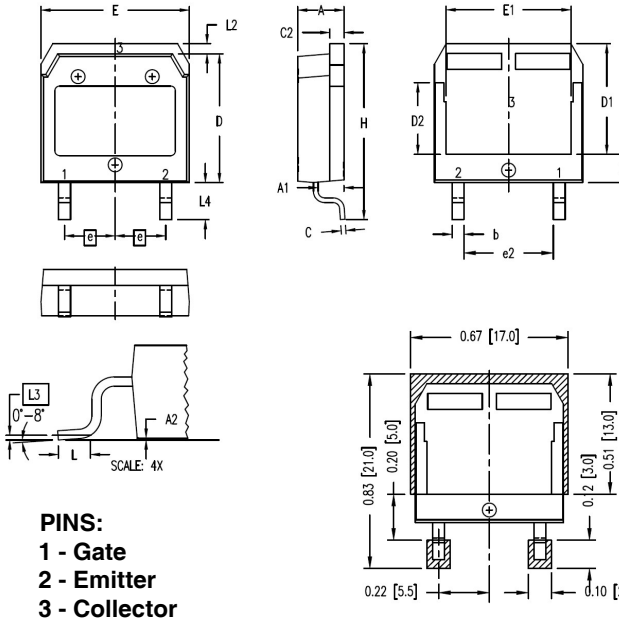


Fig. 21. Inductive Turn-on Switching Times vs. Junction Temperature



TO-268HV Outline



PINS:
1 - Gate
2 - Emitter
3 - Collector

SYM	INCHES		MILLIMETER	
	MIN	MAX	MIN	MAX
A	.193	.201	4.90	5.10
A1	.106	.114	2.70	2.90
A2	.001	.010	0.02	0.25
b	.045	.057	1.15	1.45
C	.016	.026	0.40	0.65
C2	.057	.063	1.45	1.60
D	.543	.551	13.80	14.00
D1	.465	.476	11.80	12.10
D2	.295	.307	7.50	7.80
D3	.114	.126	2.90	3.20
E	.624	.632	15.85	16.05
E1	.524	.535	13.30	13.60
[e]	.215 BSC		5.45 BSC	
(e2)	.374	.386	9.50	9.80
H	.736	.752	18.70	19.10
L	.067	.079	1.70	2.00
L2	.039	.045	1.00	1.15
[L3]	.010 BSC		0.25 BSC	
L4	.150	.161	3.80	4.10

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