IXYS

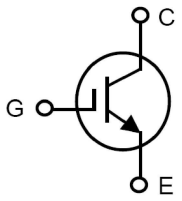
Not For New Designs

High Voltage IGBT For Capacitor Discharge Applications

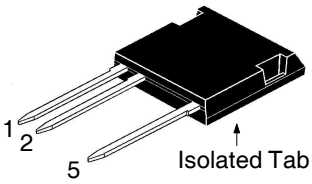
(Electrically Isolated Tab)

IXGF30N400

V_{CES} = 4000V
I_{C25} = 30A
$V_{CE(sat)}$ ≤ 3.1V



ISOPLUS i4-Pak™



1 = Gate 5 = Collector
2 = Emitter

Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_J = 25°C to 150°C	4000	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	T_C = 25°C	30	A
I_{C110}	T_C = 110°C	15	A
I_{CM}	T_C = 25°C, V_{GE} = 20V, 1ms	360	A
SSOA	V_{GE} = 20V, T_{VJ} = 125°C, R_G = 2Ω	I_{CM} = 300	A
(RBSOA)	Clamped Inductive Load	$V_{CE} \leq 0.8 \bullet V_{CES}$	
P_C	T_C = 25°C	160	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
T_L	Maximum Lead Temperature for Soldering	300	°C
T_{SOLD}	1.6 mm (0.062in.) from Case for 10s	260	°C
F_C	Mounting Force	20..120 / 4.5..27	Nm/lb.in.
V_{ISOL}	50/60Hz, 1 minute	4000	V~
Weight		5	g

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
BV_{CES}	I_C = 250μA, V_{GE} = 0V	4000			V
$V_{GE(th)}$	I_C = 250μA, V_{CE} = V_{GE}	3.0		5.0	V
I_{CES}	V_{CE} = 0.8 • V_{CES}, V_{GE} = 0V			50	μA
	Note 2, T_J = 100°C			3	mA
I_{GES}	V_{CE} = 0V, V_{GE} = ±20V			±200	nA
$V_{CE(sat)}$	I_C = 30A, V_{GE} = 15V, Note 1			3.1	V
	I_C = 90A			5.2	V

Features

- Silicon Chip on Direct-Copper Bond (DCB) Substrate
- Isolated Mounting Surface
- 4000V Electrical Isolation
- High Peak Current Capability
- Low Saturation Voltage
- Molding Epoxies Meet UL 94 V-0 Flammability Classification

Advantages

- High Power Density
- Easy to Mount

Applications

- Capacitor Discharge
- Pulser Circuits

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Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.
g_{fs}	I_C = 30A, V_{CE} = 10V, Note 1	14	23	S
$I_{C(ON)}$	V_{GE} = 15V, V_{CE} = 20V, Note 1		360	A
C_{ies}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz		3040	pF
C_{oes}			95	pF
C_{res}			30	pF
Q_g	I_C = 30A, V_{GE} = 15V, V_{CE} = 600V		135	nC
Q_{ge}			22	nC
Q_{gc}			50	nC
$t_{d(on)}$	**Resistive Switching Times**		55	ns
t_r	I_C = 30A, V_{GE} = 15V,		146	ns
$t_{d(off)}$	V_{CE} = 1250V, R_G = 2Ω		210	ns
t_f			514	ns
R_{thJC}				0.78 °C/W
R_{thCS}			0.15	°C/W
R_{thJA}			30	°C/W

Notes:

1. Pulse test, t < 300μs, duty cycle, d < 2%.
2. Device must be heatsunk for high-temperature leakage current measurements to avoid thermal runaway.

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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

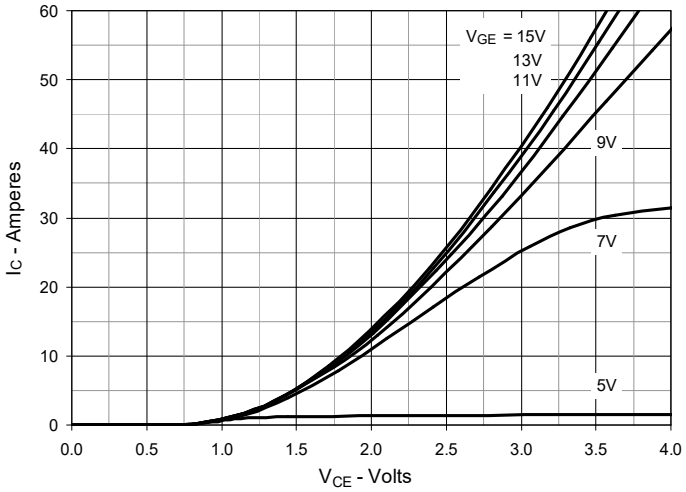


Fig. 2. Extended Output Characteristics @ T_J = 25ºC

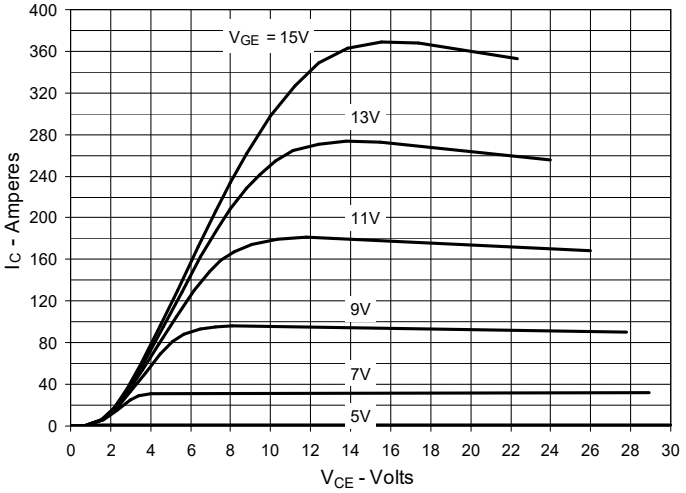


Fig. 3. Output Characteristics @ T_J = 125ºC

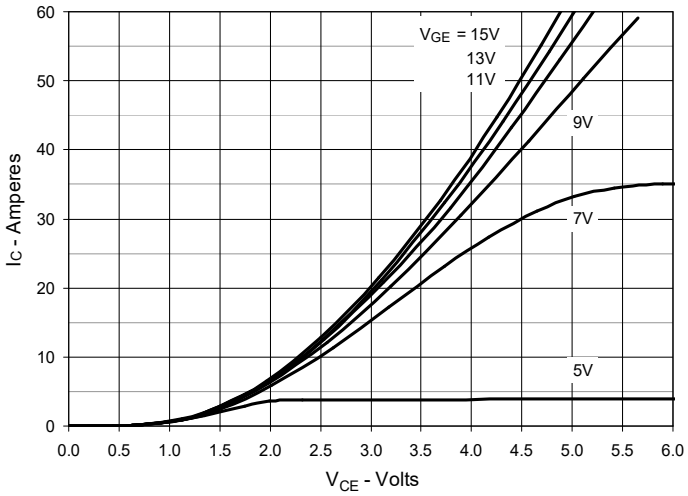


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

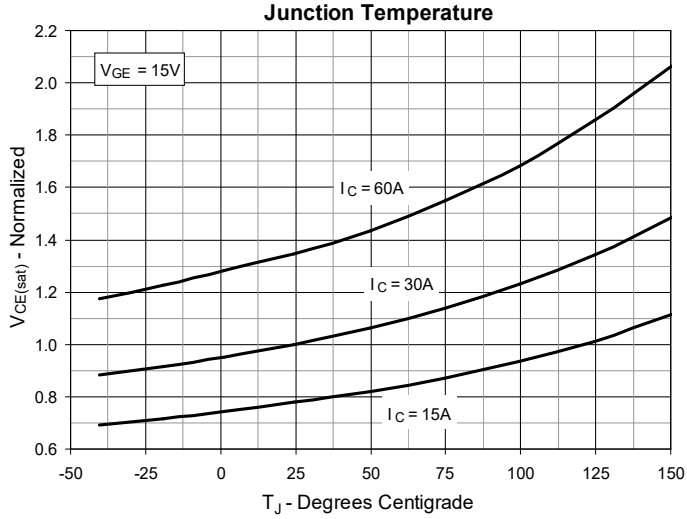


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

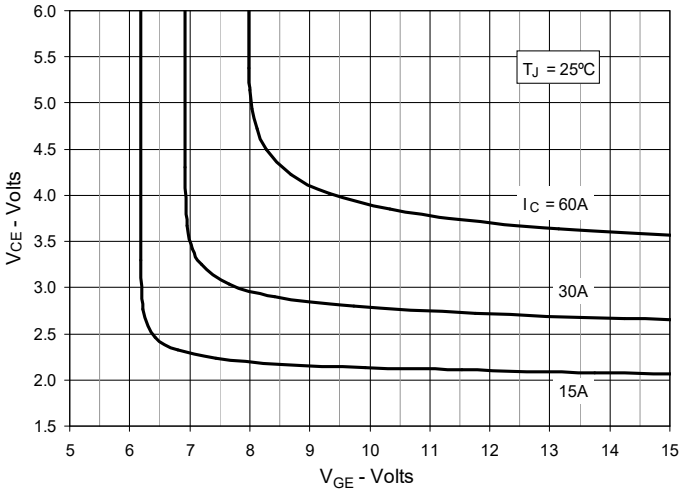
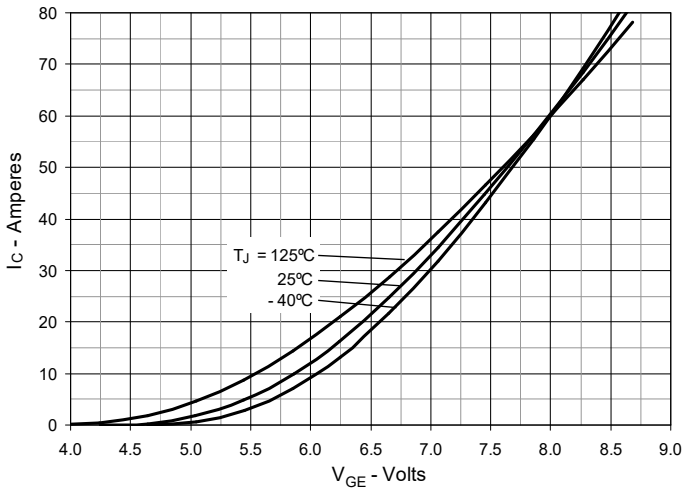


Fig. 6. Input Admittance



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Fig. 7. Transconductance

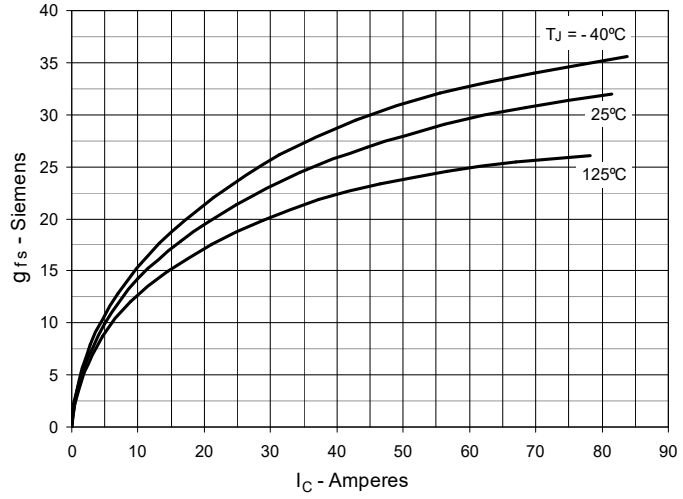


Fig. 8. Gate Charge

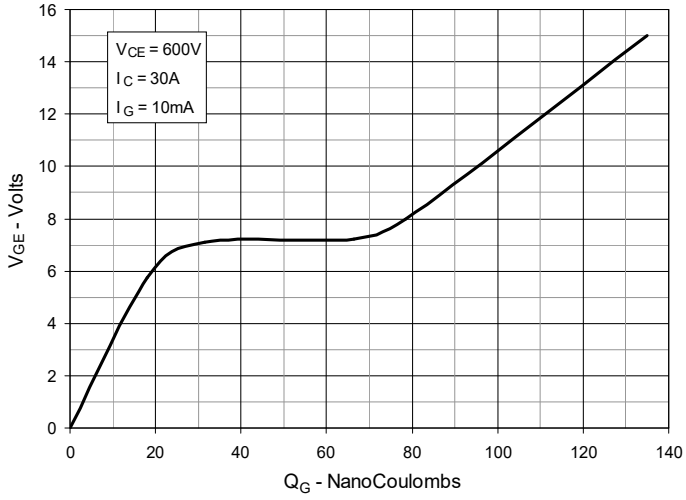


Fig. 9. Reverse-Bias Safe Operating Area

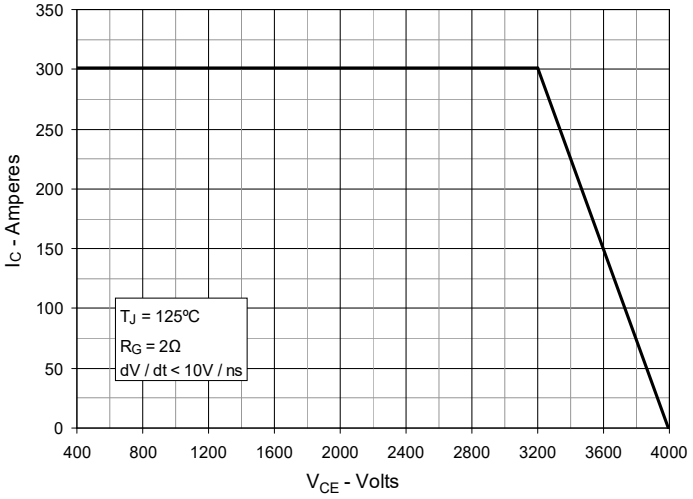


Fig. 10. Capacitance

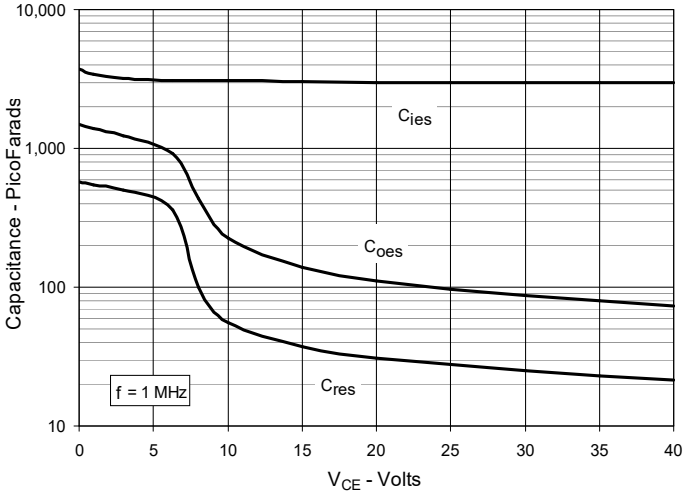
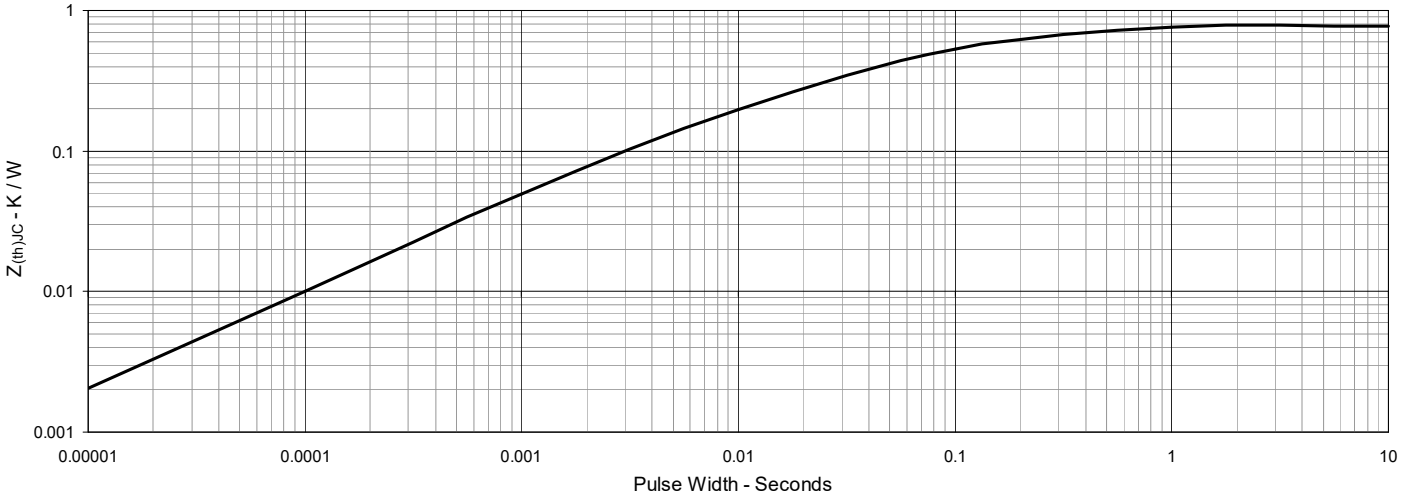


Fig. 11. Maximum Transient Thermal Impedance



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Fig. 12. Resistive Turn-on Rise Time vs. Junction Temperature

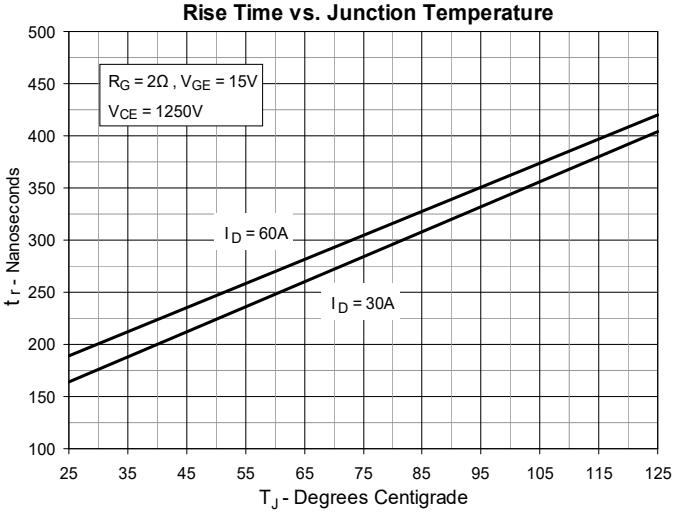


Fig. 13. Resistive Turn-on Rise Time vs. Drain Current

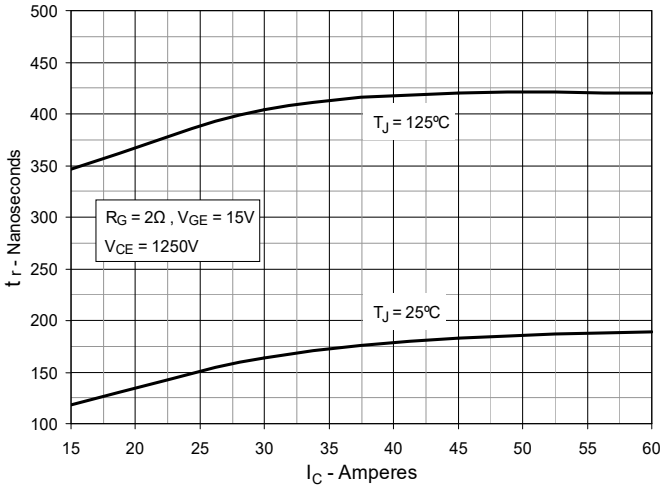


Fig. 14. Resistive Turn-on Switching Times vs. Gate Resistance

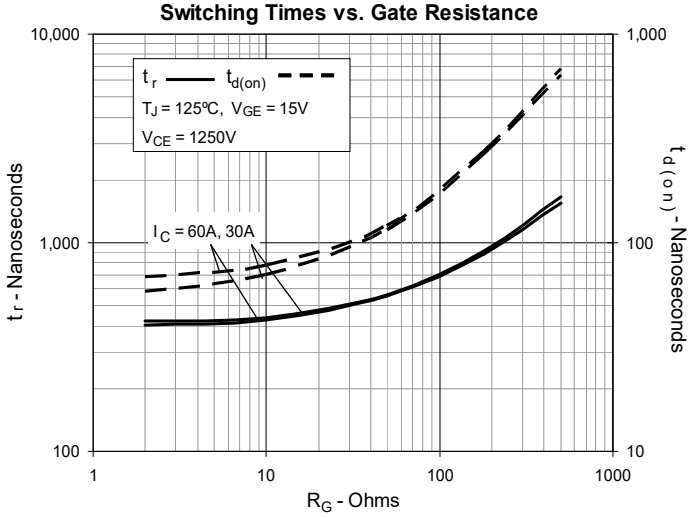


Fig. 15. Resistive Turn-off Switching Times vs. Junction Temperature

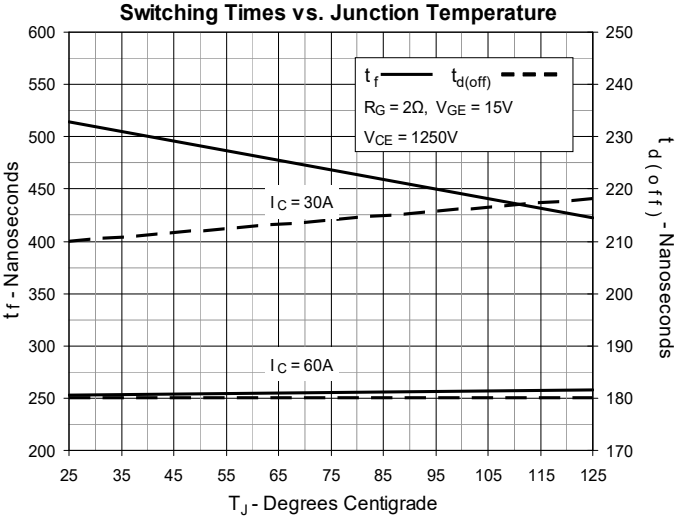


Fig. 16. Resistive Turn-off Switching Times vs. Drain Current

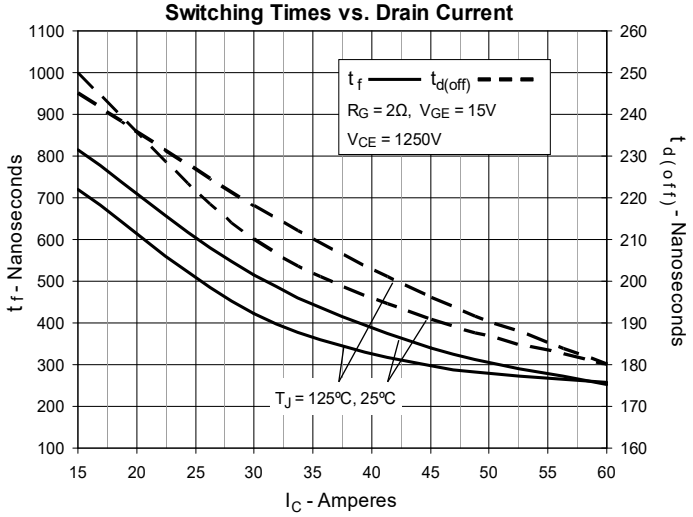
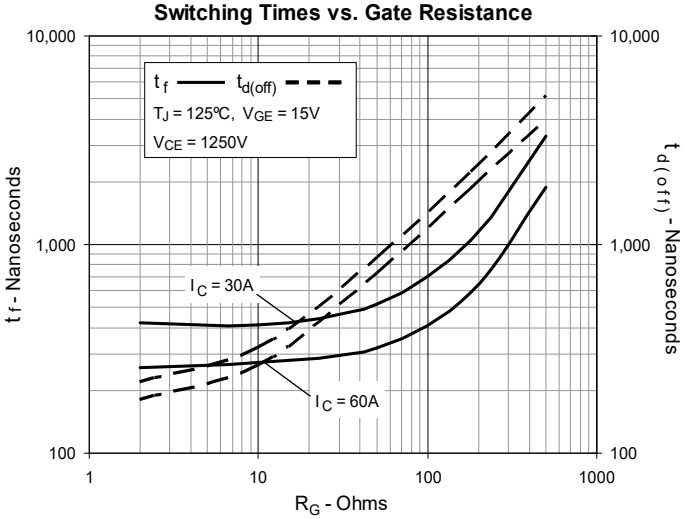
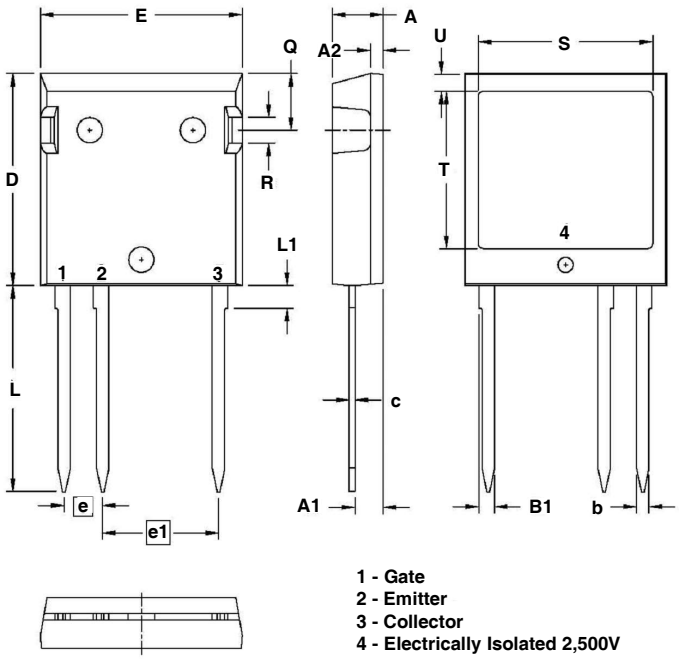


Fig. 17. Resistive Turn-off Switching Times vs. Gate Resistance



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ISOPLUS I4-Pak™ (HV) Outline



1 - Gate
2 - Emitter
3 - Collector
4 - Electrically Isolated 2,500V

SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.190	.205	4.83	5.21
A1	.102	.118	2.59	3.00
A2	.046	.085	1.17	2.16
b	.045	.055	1.14	1.40
b1	.058	.068	1.47	1.73
C	.020	.029	0.51	0.74
D	.819	.840	20.80	21.34
E	.770	.799	19.56	20.29
e	.150 BSC		3.81 BSC	
e1	.450 BSC		11.43 BSC	
L	.780	.840	19.81	21.34
L1	.083	.102	2.11	2.59
Q	.210	.244	5.33	6.20
R	.100	.180	2.54	4.57
S	.660	.690	16.76	17.53
T	.590	.620	14.99	15.75
U	.065	.080	1.65	2.03

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