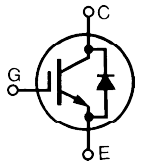
IXYS

High Voltage, High Gain BIMOSFET™

IXBF55N300

V_{CES} = 3000V
I_{C110} = 34A
$V_{CE(sat)} \leq$ 3.2V

Monolithic Bipolar MOS Transistor

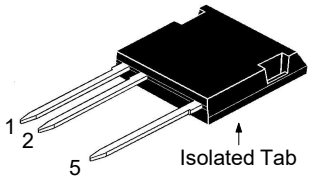


(Electrically Isolated Tab)

Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_C = 25°C to 150°C	3000	V
V_{CGR}	T_J = 25°C to 150°C, R_{GE} = 1MΩ	3000	V
V_{GES}	Continuous	± 25	V
V_{GEM}	Transient	± 35	V
I_{C25}	T_C = 25°C	86	A
I_{C110}	T_C = 110°C	34	A
I_{CM}	T_C = 25°C, 1ms	600	A
SSOA (RBSOA)	V_{GE} = 15V, T_{VJ} = 125°C, R_G = 2Ω Clamped Inductive Load	I_{CM} = 110 1500	A V
T_{SC} **(SCSOA)**	V_{GE} = 15V, T_J = 125°C, R_G = 10Ω, V_{CE} = 1250V, Non-Repetitive	10	µs
P_C	T_C = 25°C	357	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
T_L	Maximum Lead Temperature for Soldering 1.6 mm (0.062 in.) from Case for 10s	300	°C
F_C	Mounting Force	20..120 / 4.5..27	N/lb
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 = 1mA, V_{GE} = 0V	3000			V
$V_{GE(th)}$	I_C = 4mA, V_{CE} = V_{GE}	3.0		5.0	V
I_{CES}	V_{CE} = V_{CES}, V_{GE} = 0V			50	µA
	Note 2, T_J = 125°C			3	mA
I_{GES}	V_{CE} = 0V, V_{GE} = ± 25V			±200	nA
$V_{CE(sat)}$	I_C = 55A, V_{GE} = 15V, Note 1		2.7	3.2	V
	T_J = 125°C		3.3		V

ISOPLUS i4-Pak™



1 = Gate 5 = Collector
2 = Emitter

Features

- Silicon Chip on Direct-Copper Bond (DCB) Substrate
- Isolated Mounting Surface
- 4000V~ Electrical Isolation
- High Blocking Voltage
- High Peak Current Capability
- Low Saturation Voltage

Advantages

- Low Gate Drive Requirement
- High Power Density

Applications

- Switch-Mode and Resonant-Mode Power Supplies
- Uninterruptible Power Supplies (UPS)
- Laser Generators
- Capacitor Discharge Circuits
- AC Switches

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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	32	50	S
C_{ies}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz		7300	pF
C_{oes}			275	pF
C_{res}			83	pF
Q_g	I_C = 55A, V_{GE} = 15V, V_{CE} = 1000V		335	nC
Q_{ge}			47	nC
Q_{gc}			130	nC
$t_{d(on)}$	**Resistive Switching Times, T_J = 25°C**		54	ns
t_r	I_C = 110A, V_{GE} = 15V		307	ns
$t_{d(off)}$	V_{CE} = 1250V, R_G = 2Ω		230	ns
t_f			268	ns
$t_{d(on)}$	**Resistive Switching Times, T_J = 125°C**		52	ns
t_r	I_C = 110A, V_{GE} = 15V		585	ns
$t_{d(off)}$	V_{CE} = 1250V, R_G = 2Ω		215	ns
t_f			260	ns
R_{thJC}				0.35 °C/W
R_{thCS}			0.15	°C/W

Reverse Diode

Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max	
V_F	I_F = 55A, V_{GE} = 0V, Note 1			2.5	V
t_{rr}	I_F = 28A, V_{GE} = 0V, $-di_F/dt$ = 100A/μs		1.9		μs
I_{RM}	V_R = 100V, V_{GE} = 0V		54		A

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.

Additional provisions for lead-to-lead isolation are required at V_{CE} > 1250V.

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 6,259,123B1 6,306,728B1 6,404,065B1 6,534,343 6,583,505 6,683,344 6,710,405B2 6,710,463 6,727,585 6,759,692 6,771,478B2 7,005,734B2 7,063,975B2 7,071,537 7,157,338B2

Fig. 1. Output Characteristics @ T_J = 25ºC

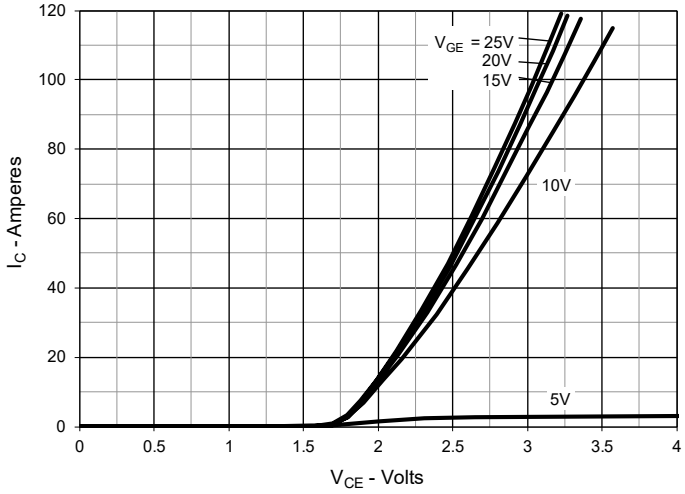

Fig. 2. Extended Output Characteristics @ T_J = 25ºC

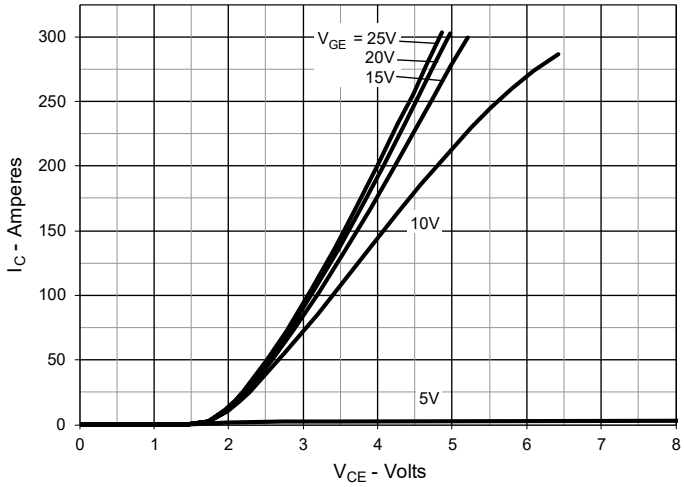

Fig. 3. Output Characteristics @ T_J = 125ºC

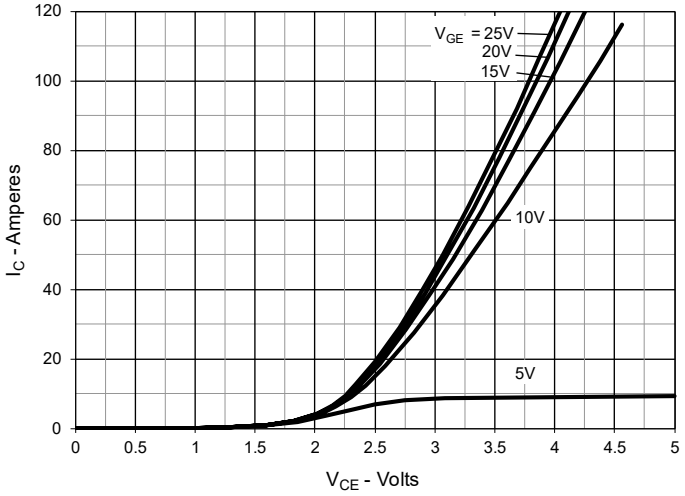

Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

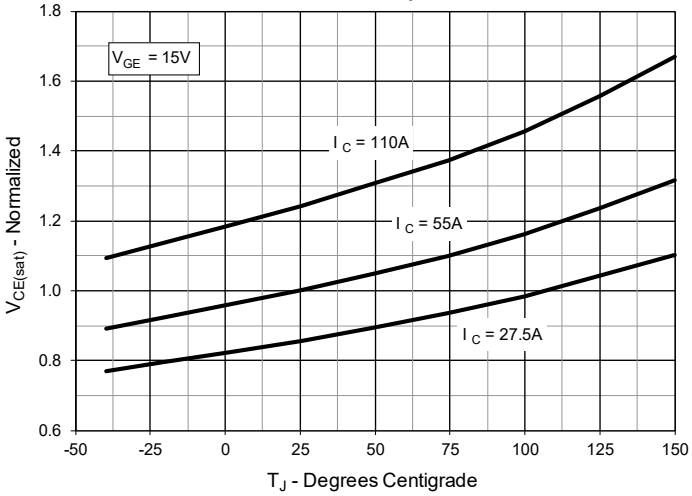

Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

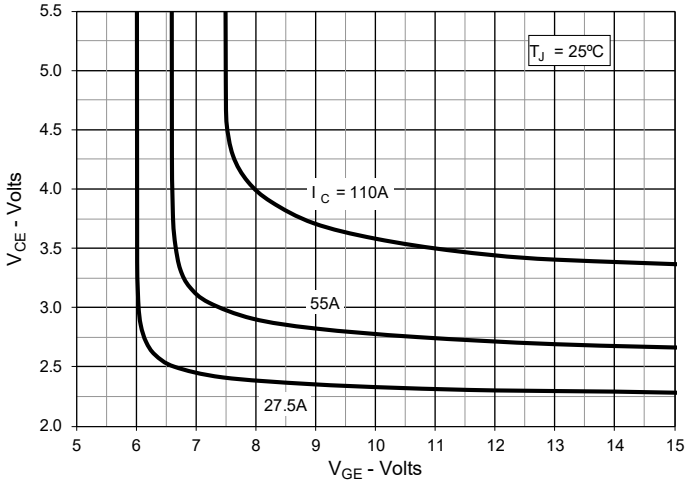

Fig. 6. Input Admittance

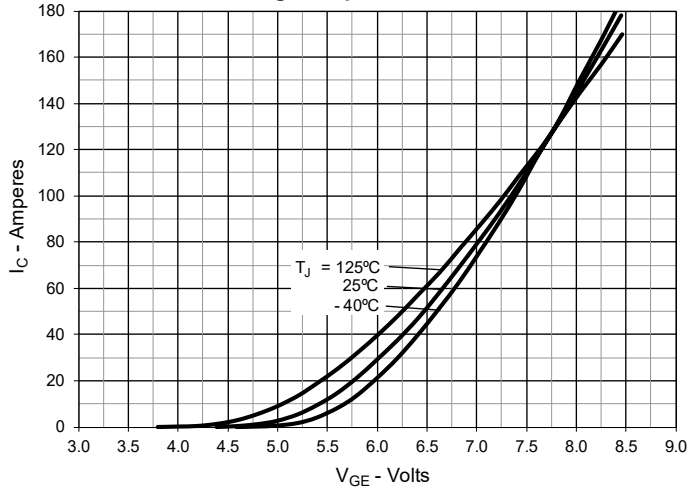

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Fig. 7. Transconductance

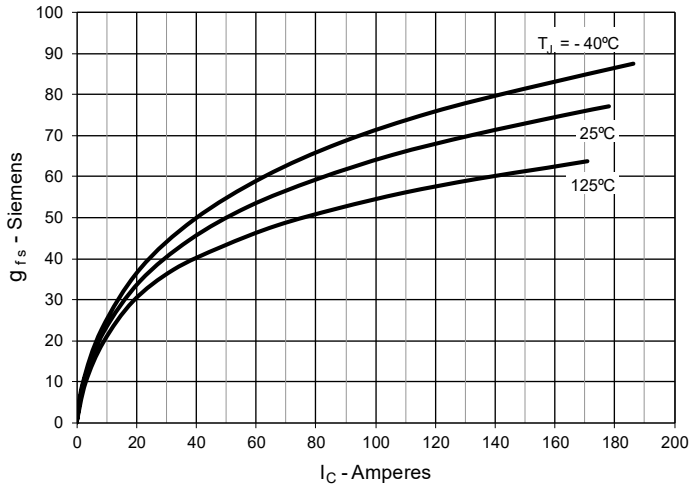

Fig. 8. Forward Voltage Drop of Intrinsic Diode

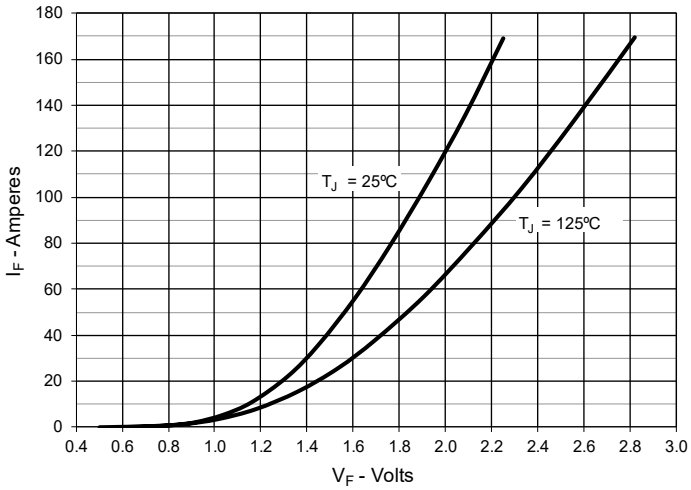

Fig. 9. Gate Charge

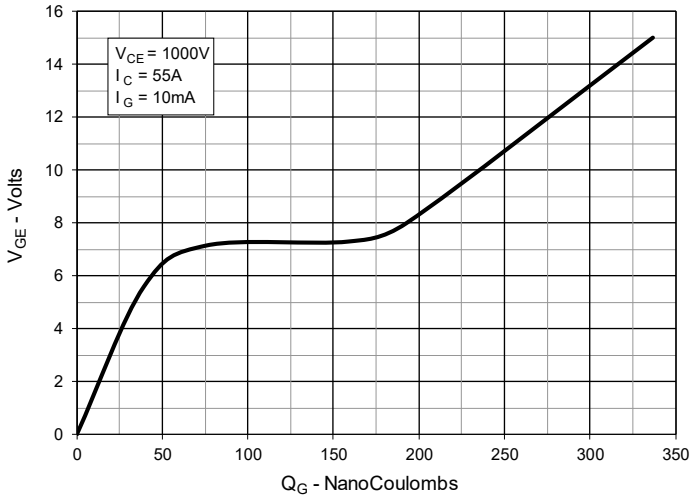

Fig. 10. Capacitance

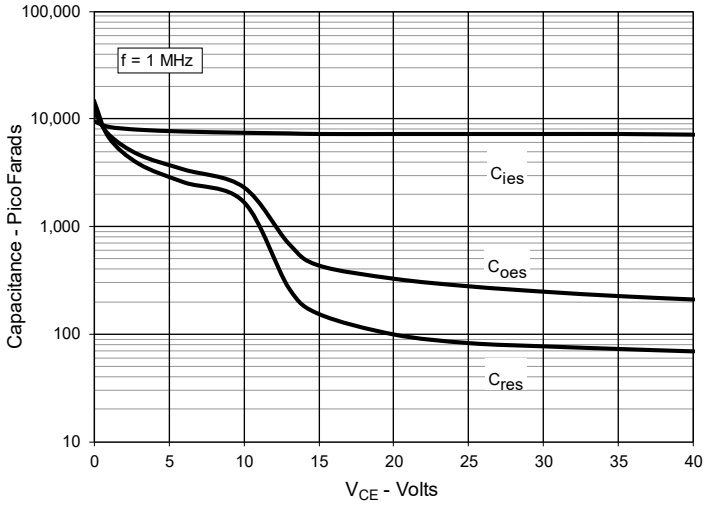

Fig. 11. Reverse-Bias Safe Operating Area

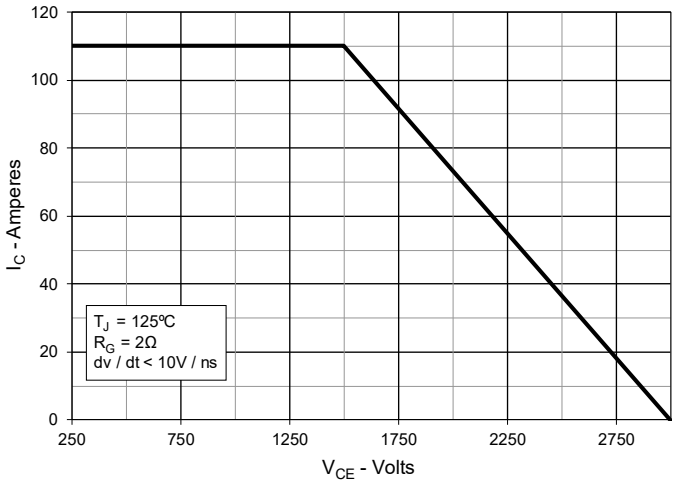

Fig. 12. Maximum Transient Thermal Impedance

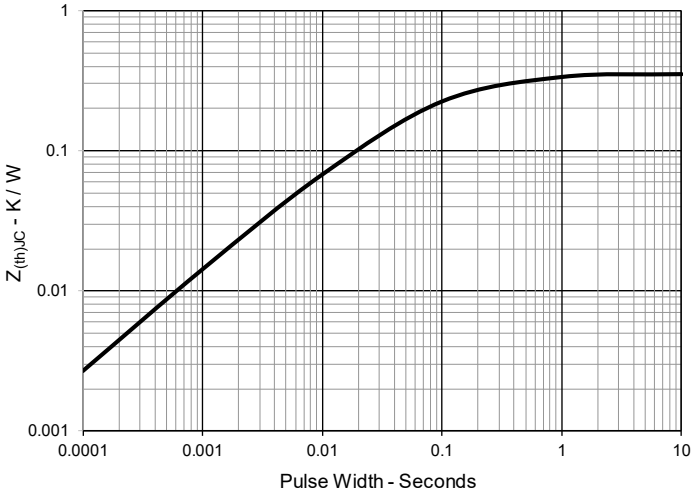

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Fig. 13. Resistive Turn-on Rise Time vs. Junction Temperature

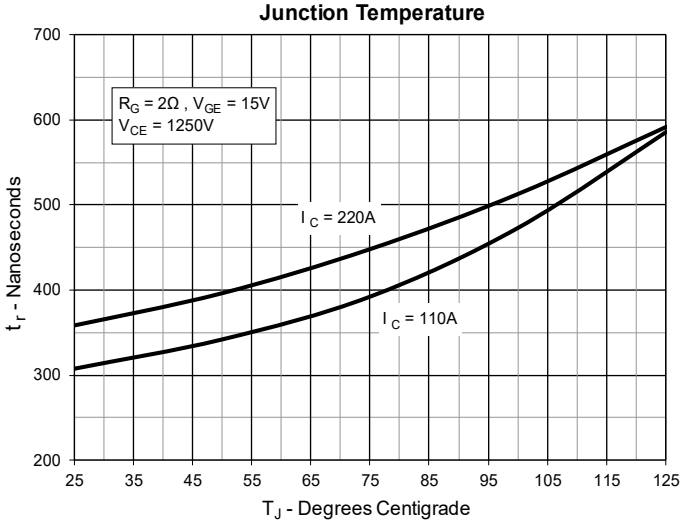

Fig. 14. Resistive Turn-on Rise Time vs. Collector Current

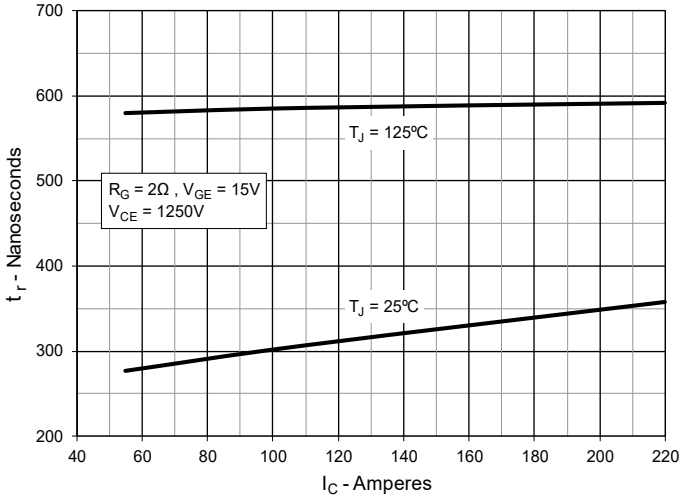

Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance

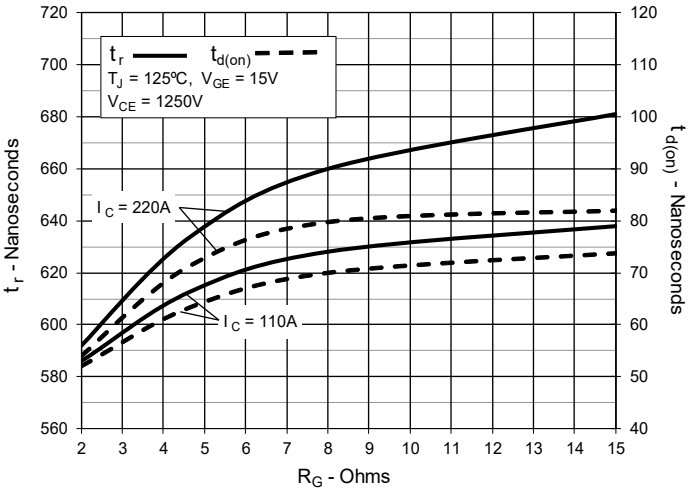

Fig. 16. Resistive Turn-off Switching Times vs. Junction Temperature

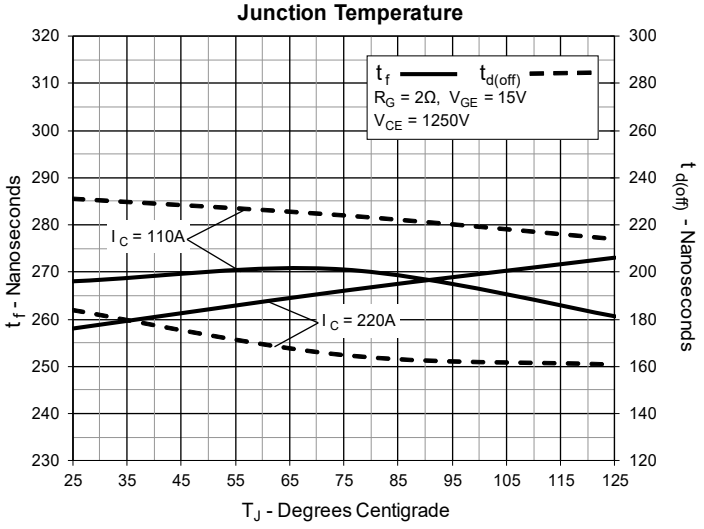

Fig. 17. Resistive Turn-off Switching Times vs. Collector Current

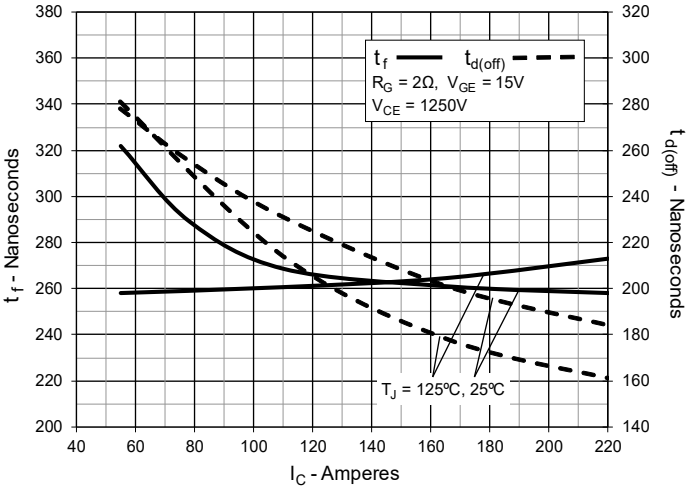

Fig. 18. Resistive Turn-off Switching Times vs. Gate Resistance

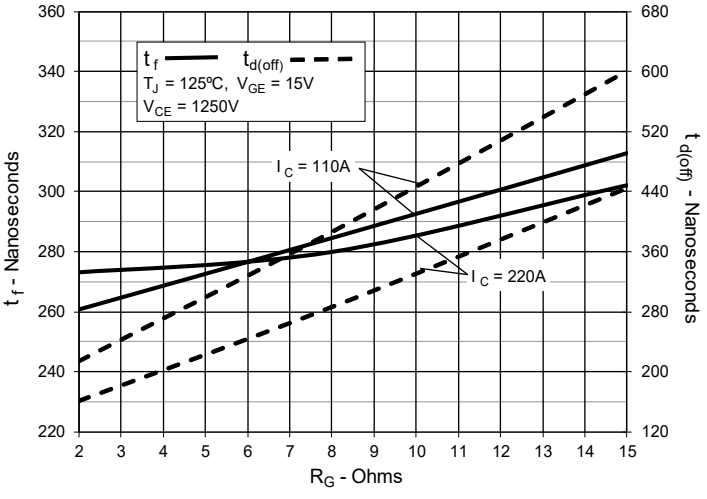

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Fig. 19. Forward-Bias Safe Operating Area @ T_C = 25ºC

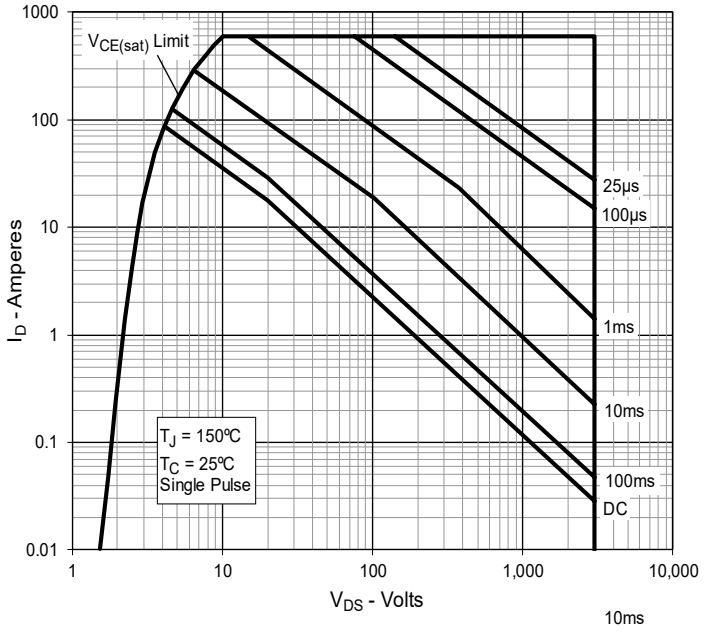
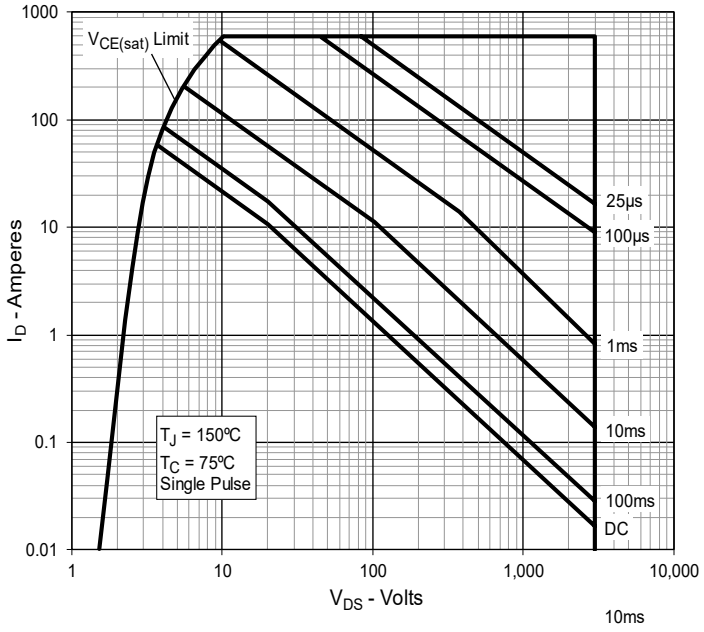


Fig. 20. Forward-Bias Safe Operating Area @ T_C = 75ºC



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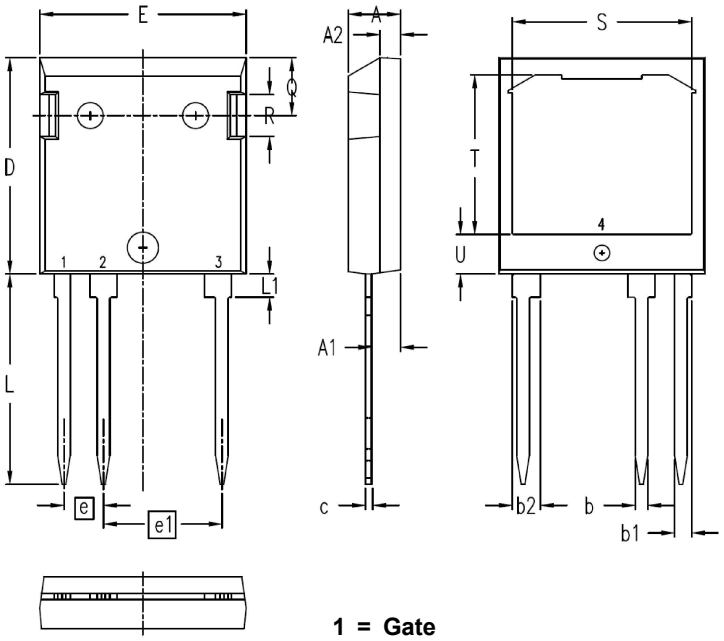
ISOPLUS i4-Pak Outline



1 = Gate
2 = Emitter
3,4 = Colector

SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.193	.201	4.90	5.10
A1	.106	.114	2.70	2.90
A2	.075	.083	1.90	2.10
b	.047	.055	1.20	1.40
b1	.061	.069	1.55	1.75
b2	.087	.094	2.20	2.40
c	.020	.029	0.51	0.74
D	.819	.846	20.80	21.50
E	.768	.799	19.50	20.30
e	.150 BSC		3.81 BSC	
e1	.450 BSC		11.43 BSC	
L	.780	.838	19.80	21.30
L1	.083	.094	2.10	2.40
Q	.213	.236	5.40	6.00
R	.157	.169	4.00	4.30
S	.673	.685	17.10	17.40
T	.602	.614	15.30	15.60
U	.142	.154	3.60	3.90

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