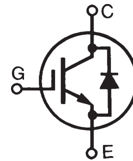
IXYS **Preliminary Technical Information**

High Voltage, BiMOSFET™ Monolithic Bipolar MOS Transistor

IXBF42N300

V_{CES} = 3000V
I_{C110} = 24A
$V_{CE(sat)}$ ≤ 3.0V

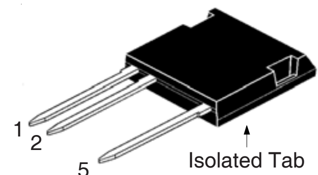


(Electrically Isolated Tab)

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	60	A
I_{C110}	T_C = 110°C	24	A
I_{CM}	T_C = 25°C, 1ms	380	A
SSOA (RBSOA)	V_{GE} = 15V, T_{VJ} = 125°C, R_G = 20Ω Clamped Inductive Load	I_{CM} = 84 V_{CE} ≤ 0.8 • V_{CES}	A
T_{SC} (SCSOA)	V_{GE} = 15V, T_J = 125°C, R_G = 82Ω, V_{CE} = 1500V, Non-Repetitive	10	µs
P_C	T_C = 25°C	240	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
T_L	1.6mm (0.062 in.) from Case for 10s	300	°C
T_{SOLD}	Plastic Body for 10 seconds	260	°C
F_C	Mounting Force	20..120 / 4.5..27	Nm/lb.in.
V_{ISOL}	50/60Hz, 1 Minute	3000	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 = 1mA, 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 = 125°C		250		µA
I_{GES}	V_{CE} = 0V, V_{GE} = ± 25V			±200	nA
$V_{CE(sat)}$	I_C = 42A, V_{GE} = 15V, Note 1		2.5	3.0	V
	T_J = 125°C		3.1		V

ISOPLUS i4-Pak™



1 = Gate 5 = Collector
2 = Emitter

Features

- Silicon Chip on Direct-Copper Bond (DCB) Substrate
- Isolated Mounting Surface
- 3000V~ Electrical Isolation
- High Blocking Voltage
- High Peak Current Capability
- Low Saturation Voltage
- FBSOA Rated
- SCSOA Rated

Advantages

- Low Gate Drive Requirement
- High Power Density

Applications

- Laser Generators
- Capacitor Discharge Circuits
- AC Switches
- Protection Circuits

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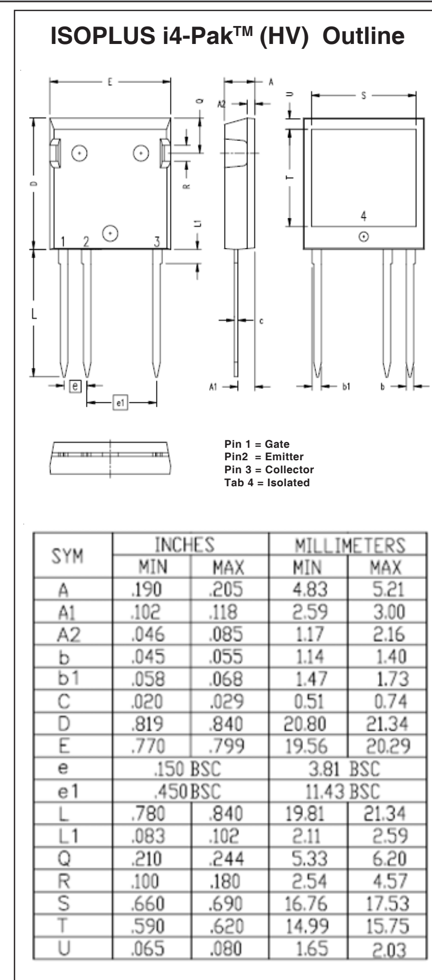
Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.
g_{fS}	I_C = 42A, V_{CE} = 10V, Note 1	28	45	S
C_{ies}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz		4780	pF
C_{oes}			170	pF
C_{res}			56	pF
R_{Gi}	Gate Input Resistance		3.0	Ω
Q_g	I_C = 42A, V_{GE} = 15V, V_{CE} = 1000V		200	nC
Q_{ge}			28	nC
Q_{gc}			75	nC
$t_{d(on)}$	**Resistive Switching Times, T_J = 25°C**		72	ns
t_r	I_C = 42, V_{GE} = 15V		330	ns
$t_{d(off)}$	V_{CE} = 1500V, R_G = 20Ω		445	ns
t_f			610	ns
$t_{d(on)}$	**Resistive Switching Times, T_J = 125°C**		72	ns
t_r	I_C = 42, V_{GE} = 15V		580	ns
$t_{d(off)}$	V_{CE} = 1500V, R_G = 20Ω		460	ns
t_f			490	ns
R_{thJC}				0.52 °C/W
R_{thCS}			0.15	°C/W



SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS 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	.450BSC		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

Reverse Diode

Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max
V_F	I_F = 42A, V_{GE} = 0V, Note 1			2.5 V
t_{rr}	I_F = 21A, V_{GE} = 0V, $-di_F/dt$ = 100A/μs		1.7	μs
I_{RM}	V_R = 100V, V_{GE} = 0V		43	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.

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.

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IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents: 4,835,592 4,850,072 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

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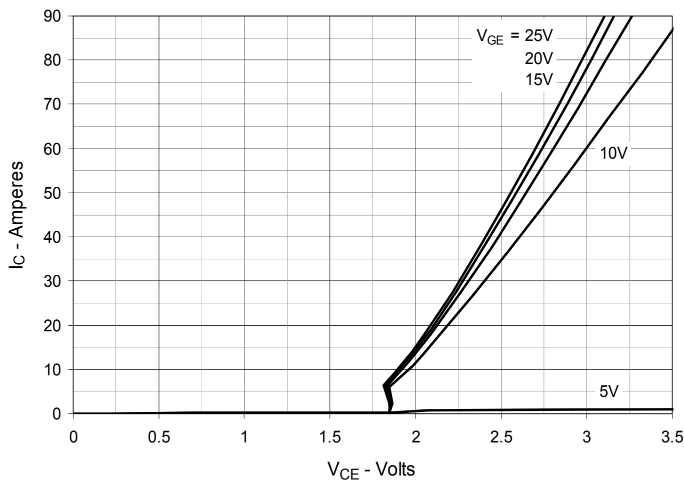

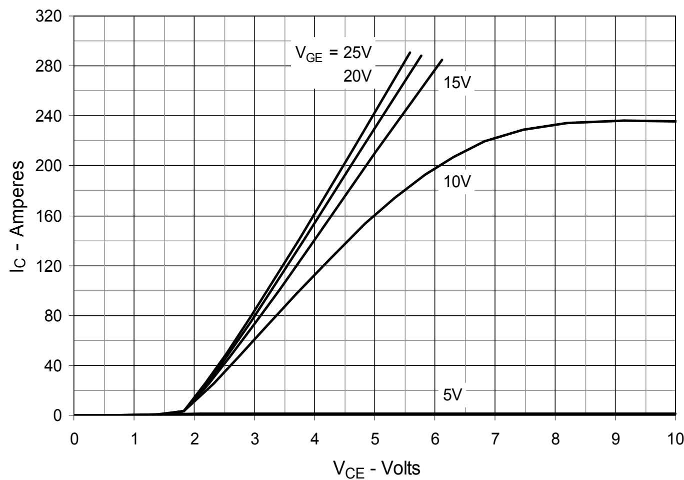

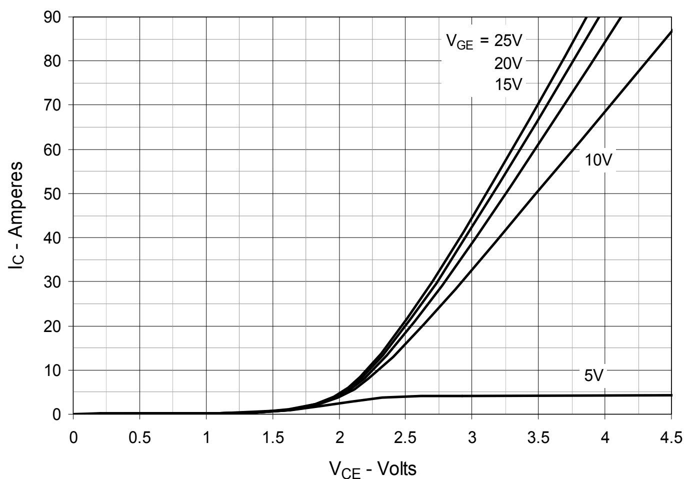

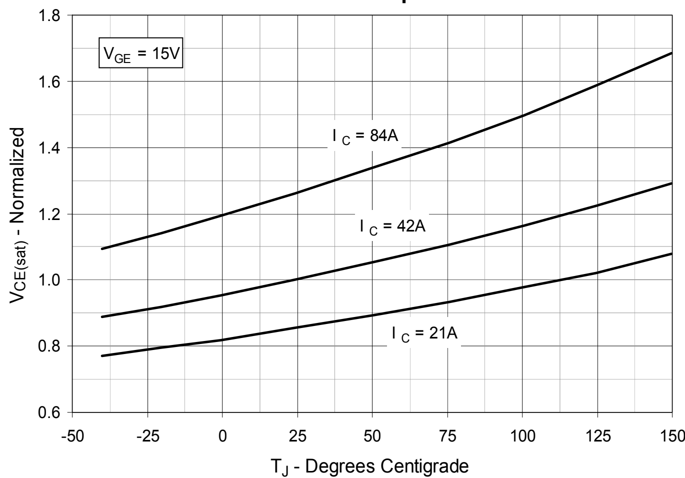

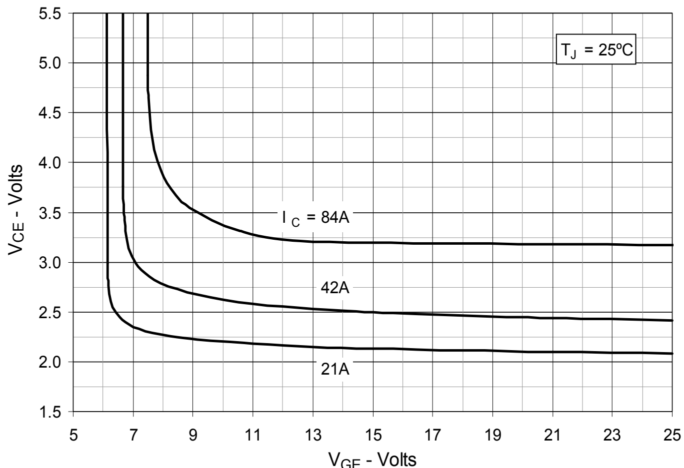

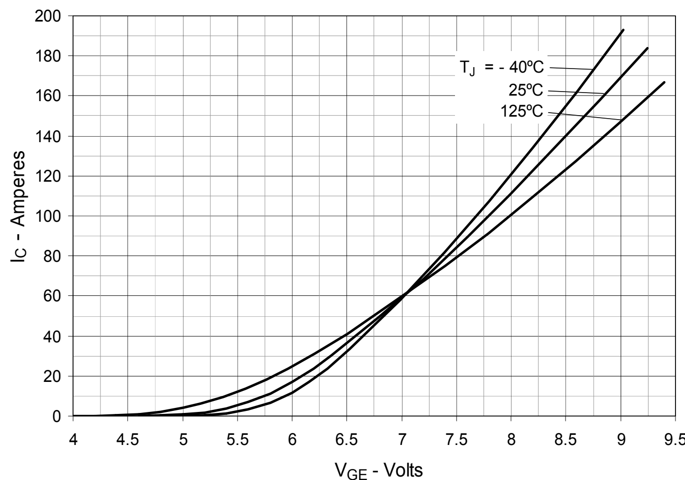

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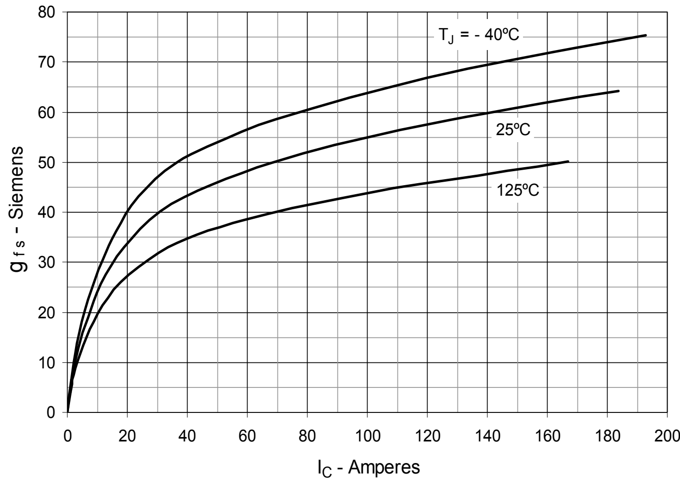

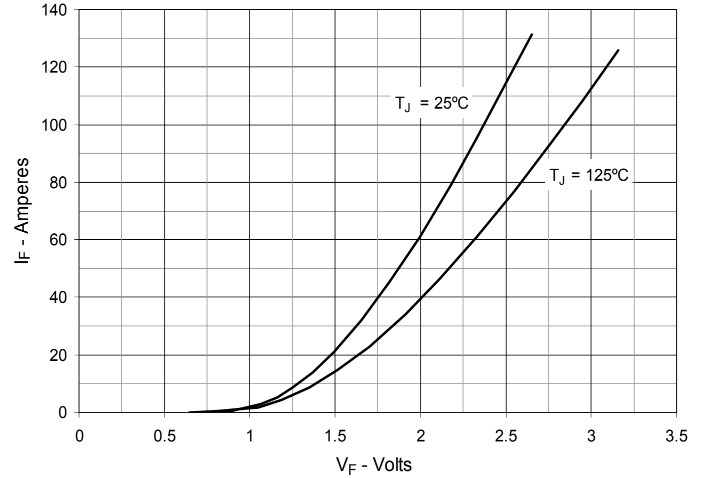

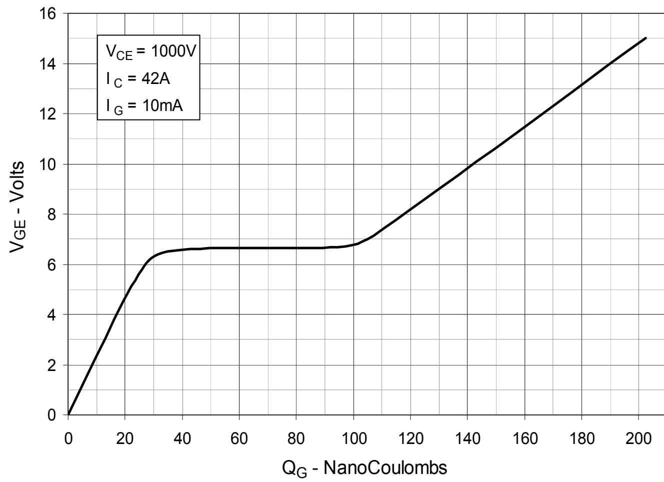

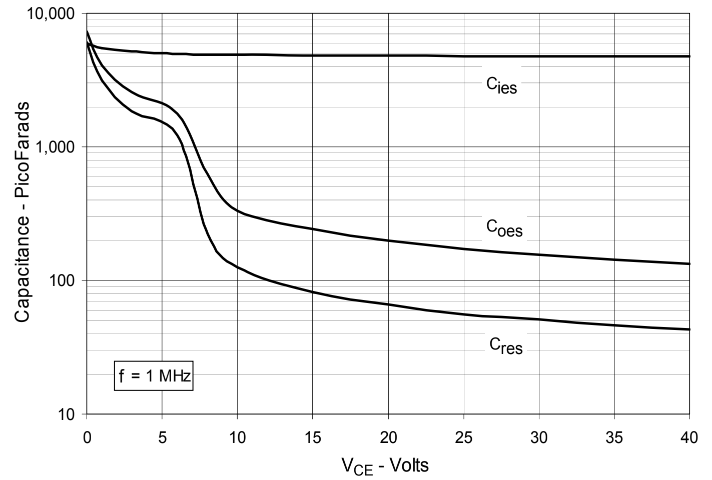

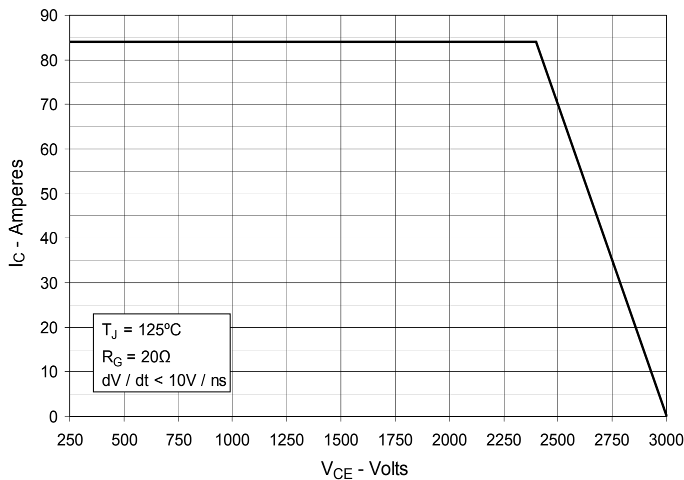

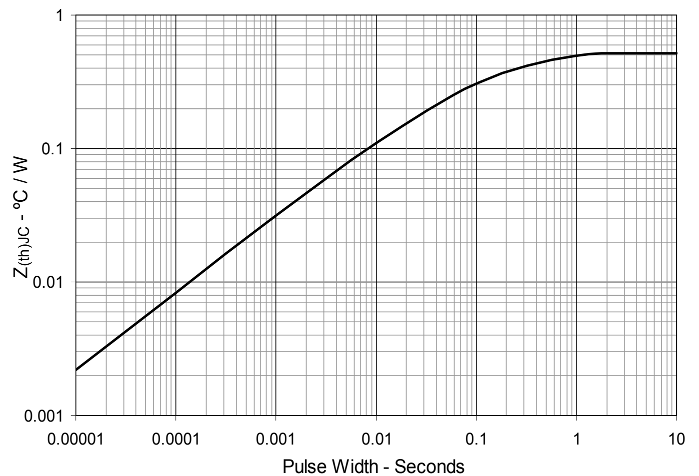

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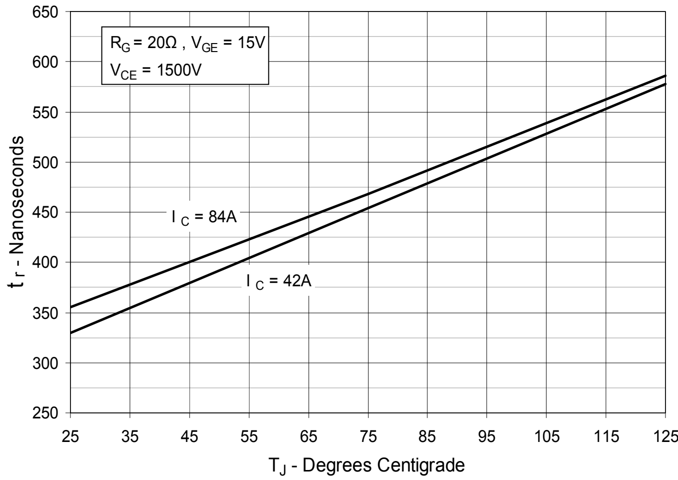

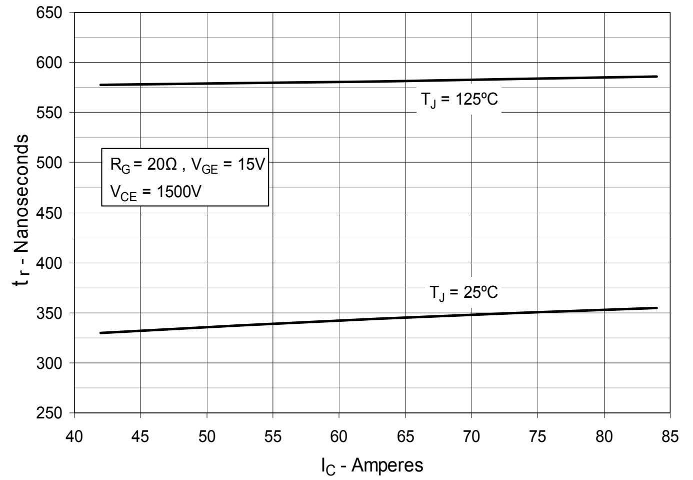

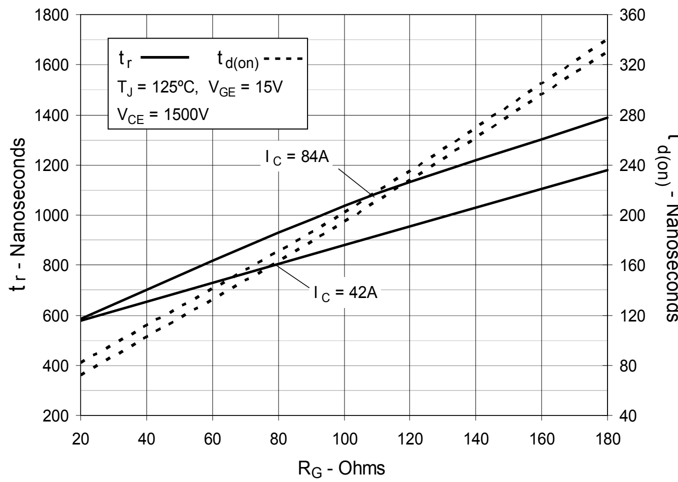

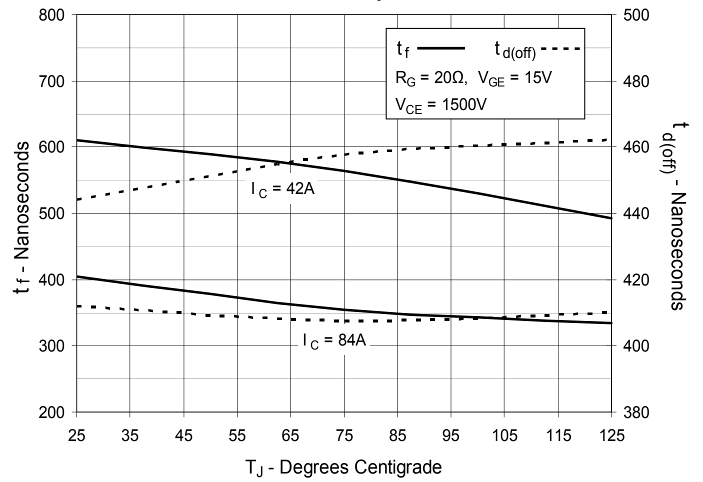

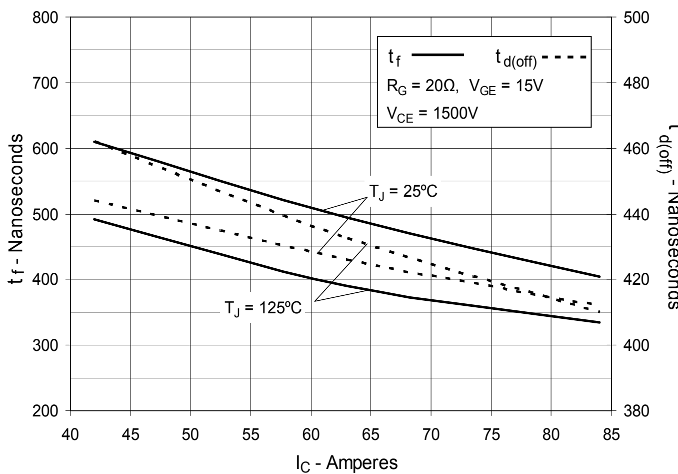

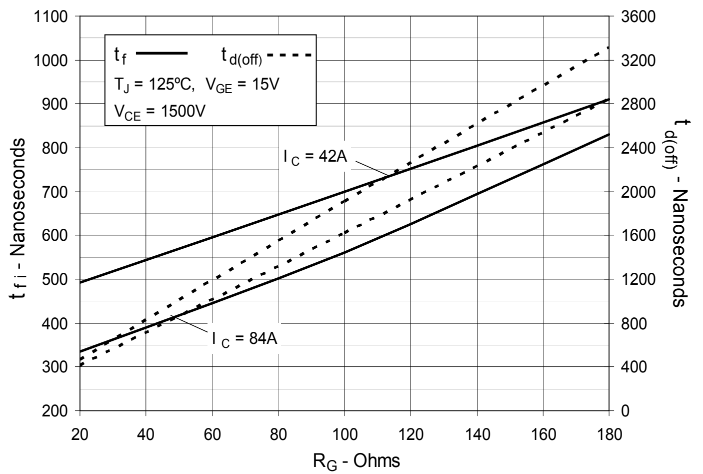

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Fig. 19. Forward-Bias Safe Operating Area @ T_C = 25ºC

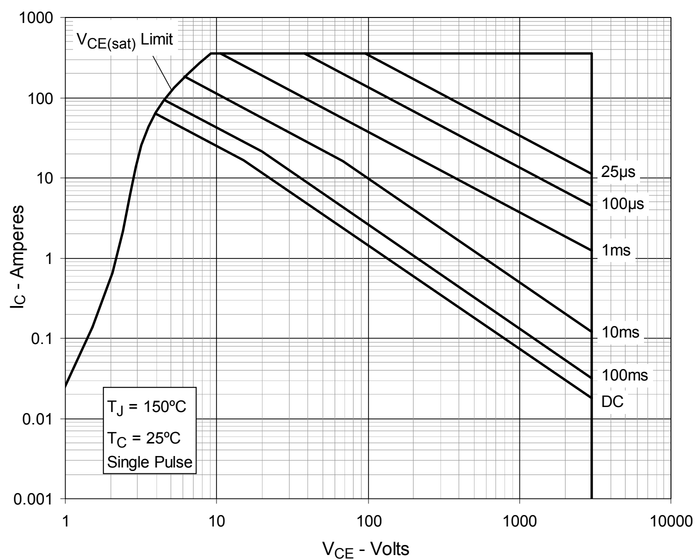
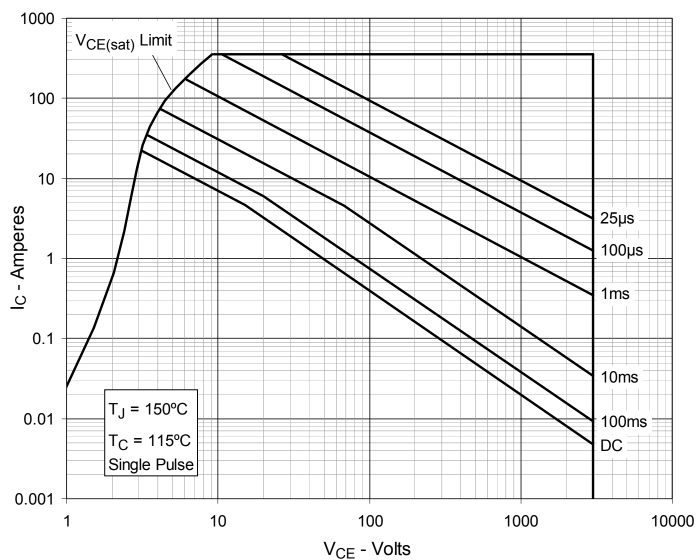


Fig. 20. Forward-Bias Safe Operating Area @ T_C = 115ºC



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