IXYS

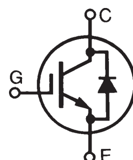
Preliminary Technical Information

High Voltage, BiMOSFET™ Monolithic Bipolar MOS Transistor

IXBF42N300

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

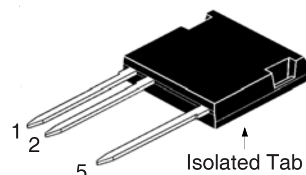
(Electrically Isolated Tab)



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
2 = Emitter
5 = Collector

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

© 2011 IXYS CORPORATION, All Rights Reserved

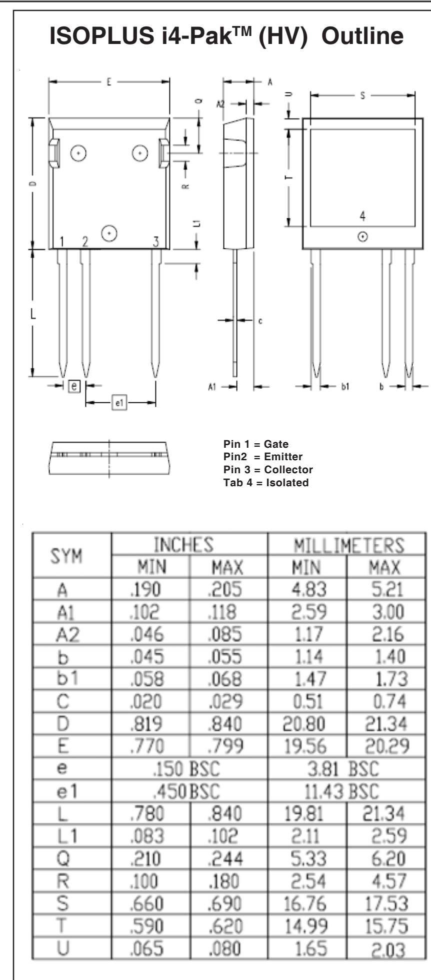
Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Min.	Typ.	Max.	Unit
g_{fS}	I_C = 42A, V_{CE} = 10V, Note 1	28	45		S
C_{ies}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz		4780		pF
C_{oes}			170		pF
C_{res}			56		pF
R_{Gi}	Gate Input Resistance		3.0		Ω
Q_g	I_C = 42A, V_{GE} = 15V, V_{CE} = 1000V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

Reverse Diode

Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Min.	Typ.	Max	Unit
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 V_R = 100V, V_{GE} = 0V		1.7		μs
I_{RM}			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.



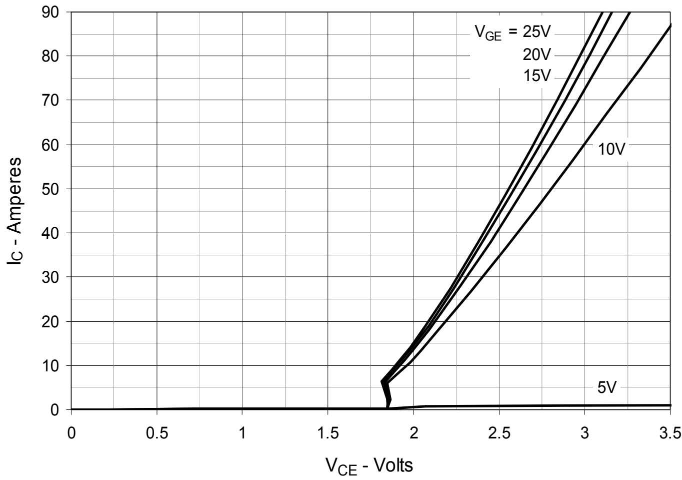
SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.190	.205	4.83	5.21
A1	.102	.118	2.59	3.00
A2	.046	.085	1.17	2.16
b	.045	.055	1.14	1.40
b1	.058	.068	1.47	1.73
C	.020	.029	0.51	0.74
D	.819	.840	20.80	21.34
E	.770	.799	19.56	20.29
e	.150 BSC		3.81 BSC	
e1	.450 BSC		11.43 BSC	
L	.780	.840	19.81	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

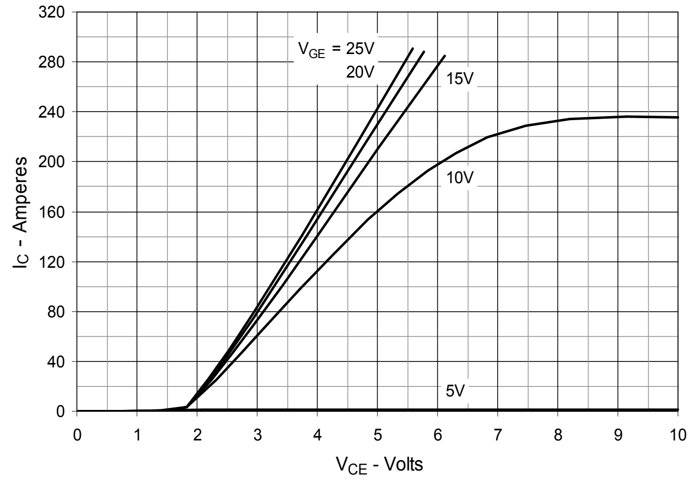
PRELIMINARY TECHNICAL INFORMATION

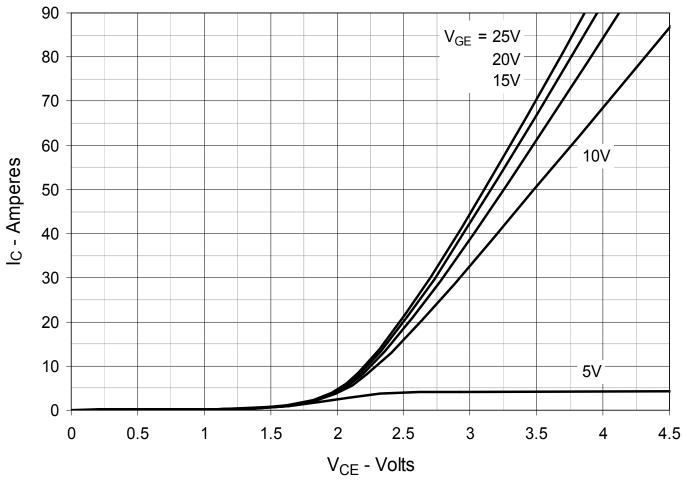
The product presented herein is under development. The Technical Specifications offered are derived from data gathered during objective characterizations of preliminary engineering lots; but also may yet contain some information supplied during a pre-production design evaluation. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

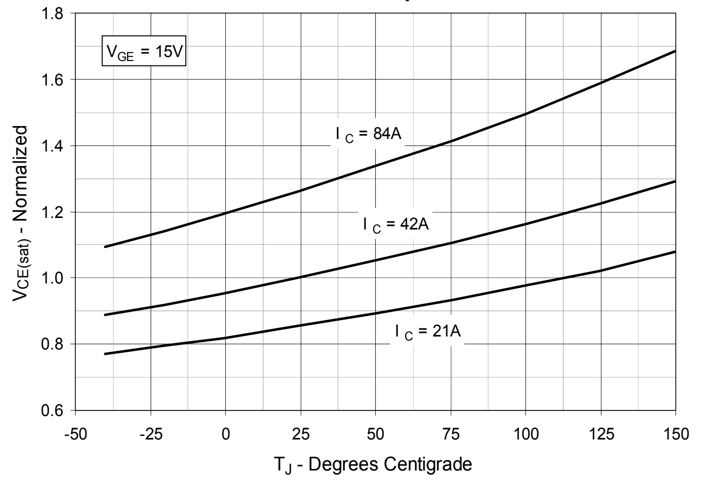
IXYS Reserves the Right to Change Limits, Test Conditions and Dimensions.

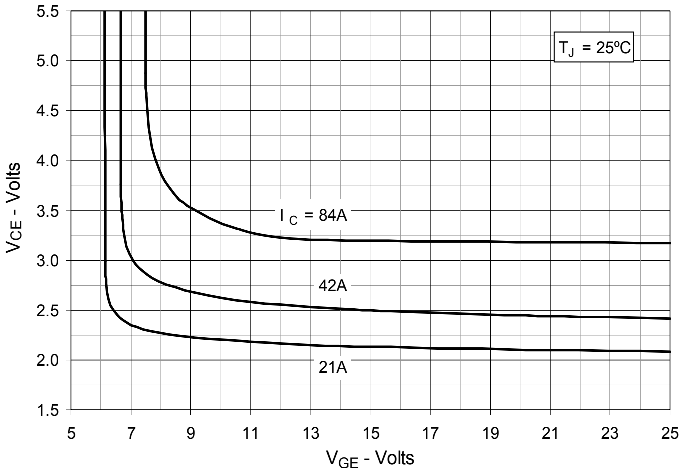
IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents: 4,835,592 4,931,844 5,049,961 5,237,481 6,162,665 6,404,065 B1 6,683,344 6,727,585 7,005,734 B2 7,157,338B2 4,850,072 5,017,508 5,063,307 5,381,025 6,259,123 B1 6,534,343 6,710,405 B2 6,759,692 7,063,975 B2 4,881,106 5,034,796 5,187,117 5,486,715 6,306,728 B1 6,583,505 6,710,463 6,771,478 B2 7,071,537

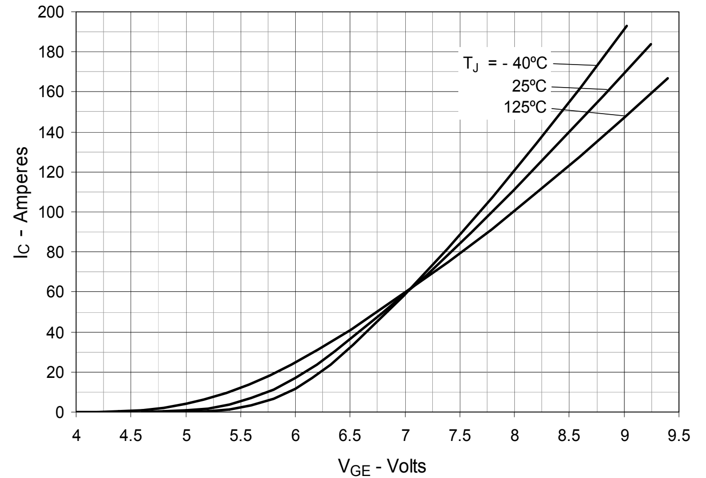




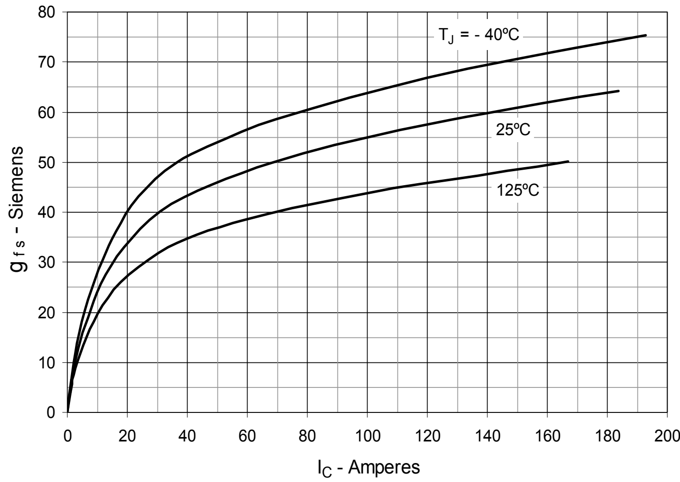


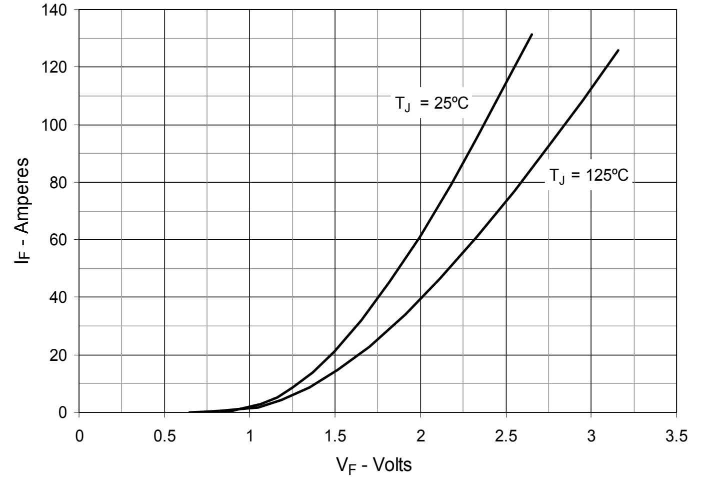


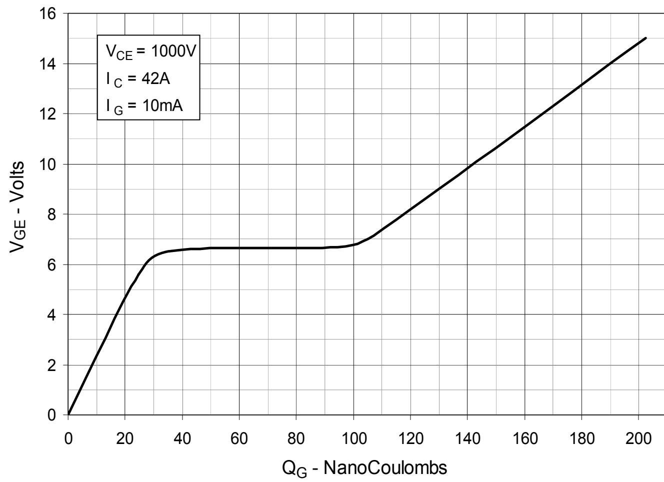


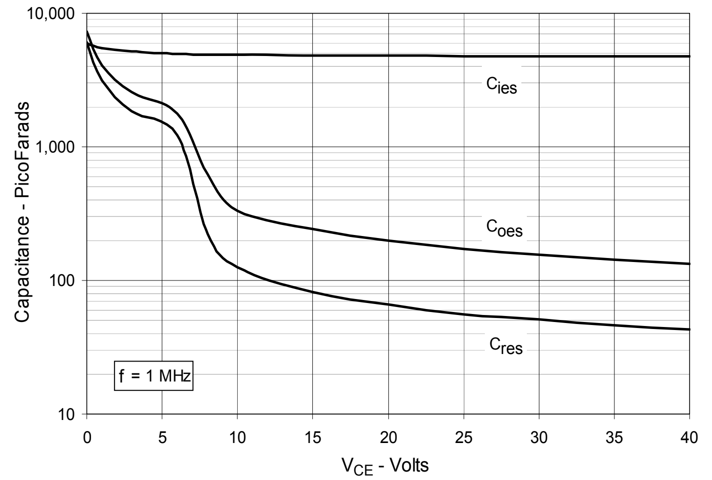


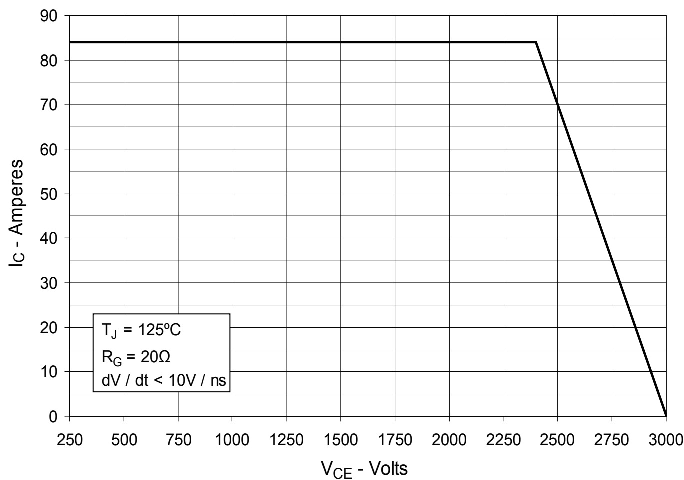
© 2011 IXYS CORPORATION, All Rights Reserved

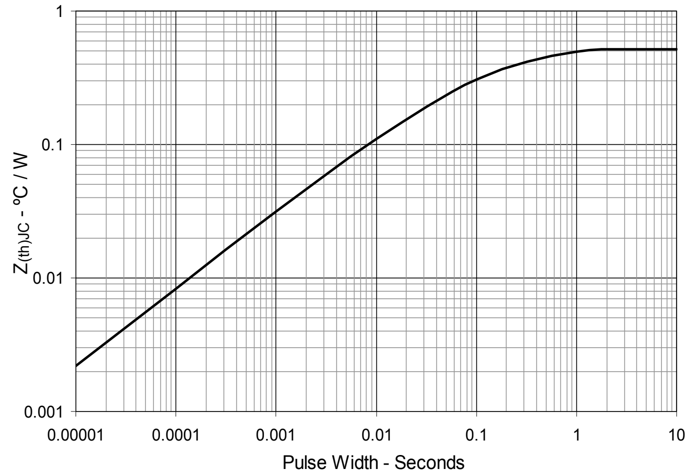




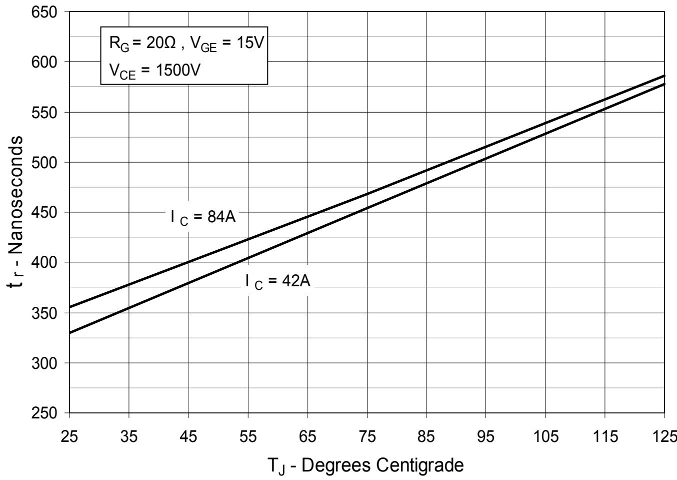


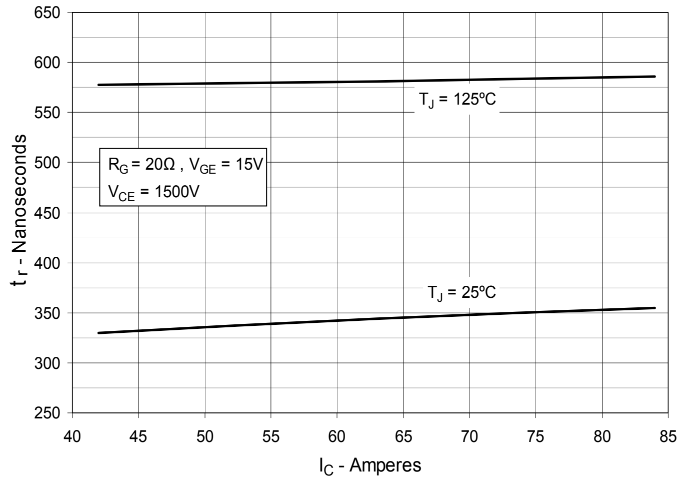


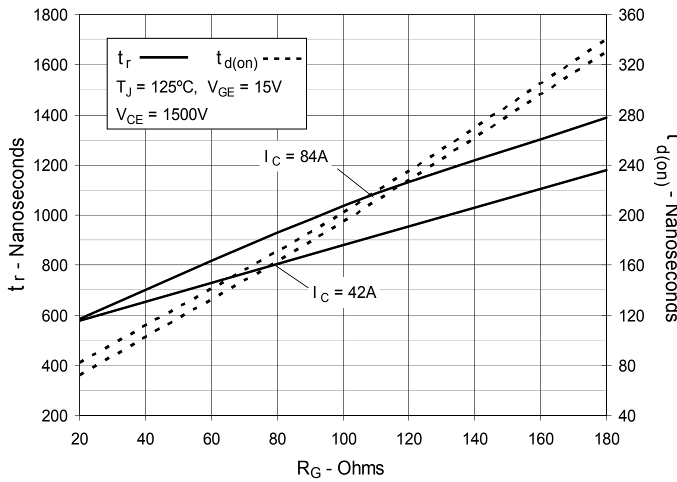


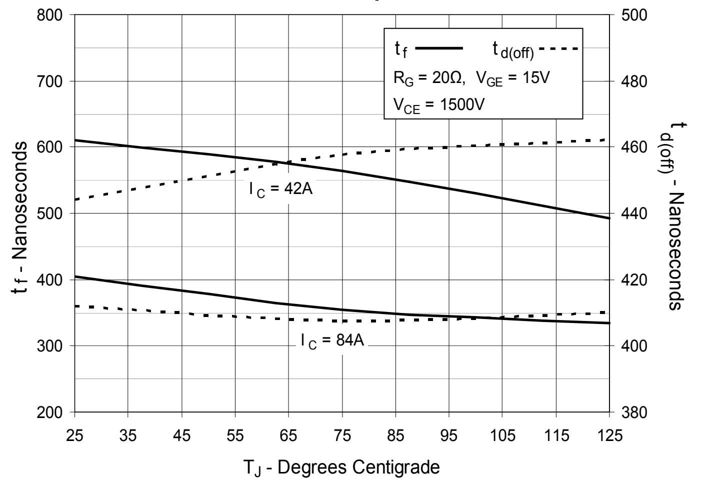


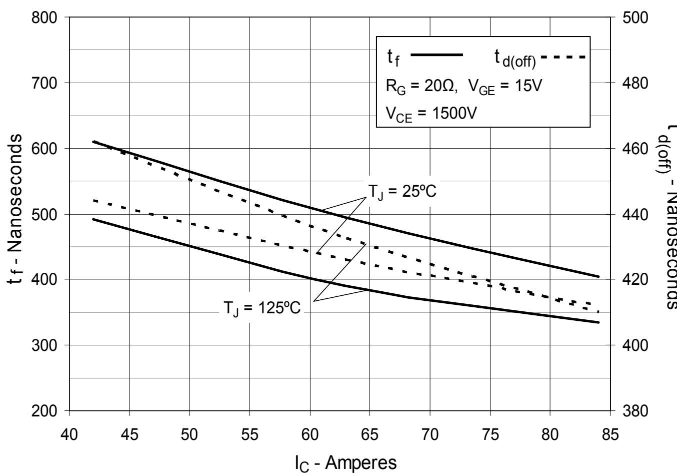
IXYS Reserves the Right to Change Limits, Test Conditions and Dimensions.

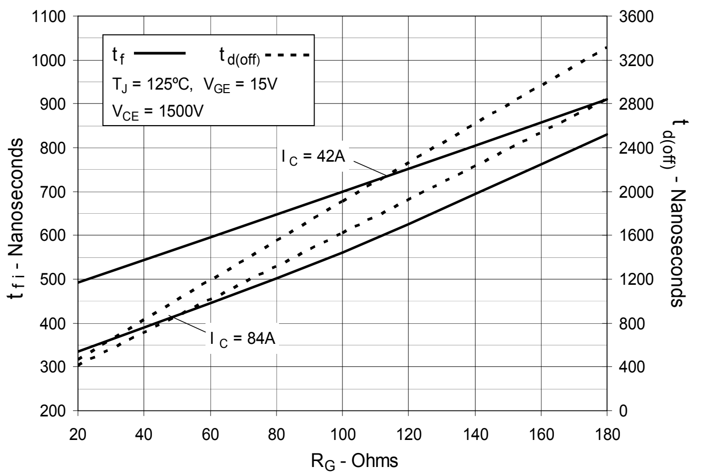












© 2011 IXYS CORPORATION, All Rights Reserved

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

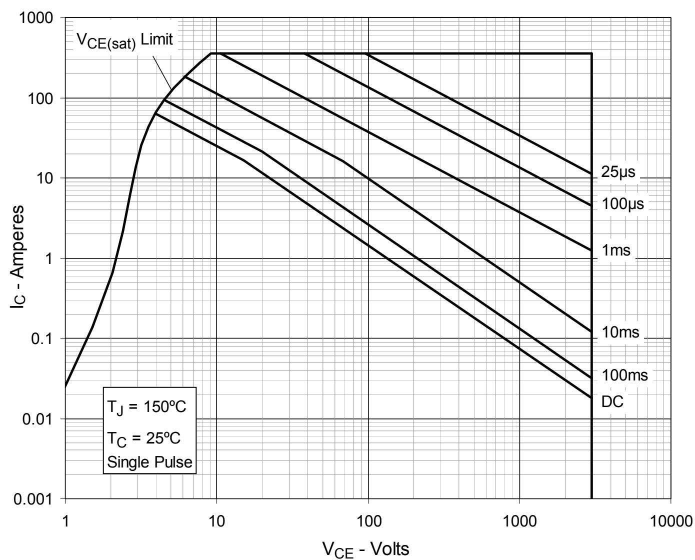
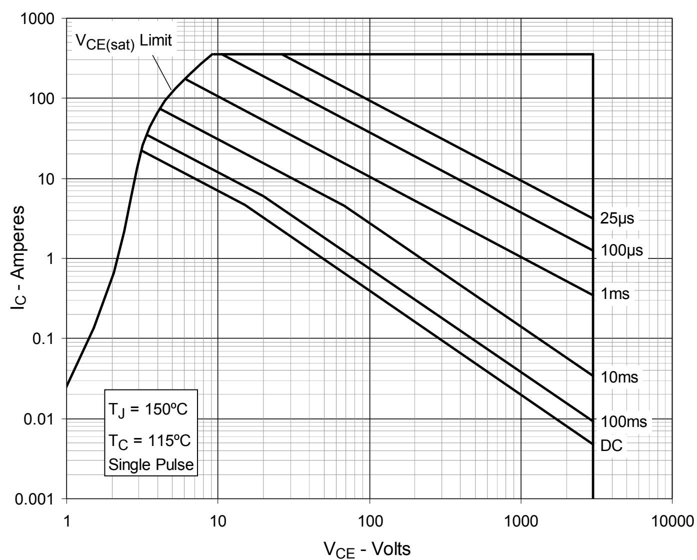


Fig. 20. Forward-Bias Safe Operating Area @ T_C = 115ºC



IXYS Reserves the Right to Change Limits, Test Conditions and Dimensions.