IXYS

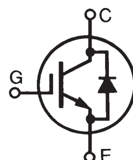
Advance Technical Information

BiMOSFET™ Monolithic Bipolar MOS Transistor High Voltage, High Frequency

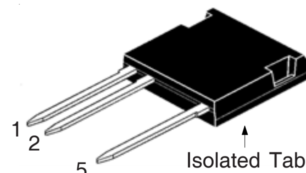
IXBF50N360

V_{CES} = 3600V
I_{C110} = 28A
$V_{CE(sat)}$ ≤ 2.9V

(Electrically Isolated Tab)



ISOPLUS i4-Pak™



1 = Gate
2 = Emitter
5 = Collector

Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_J = 25°C to 150°C	3600	V
V_{CGR}	T_J = 25°C to 150°C, R_{GE} = 1MΩ	3600	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	T_C = 25°C	70	A
I_{C110}	T_C = 110°C	28	A
I_{CM}	T_C = 25°C, 1ms	420	A
SSOA (RBSOA)	V_{GE} = 15V, T_{VJ} = 125°C, R_G = 5Ω Clamped Inductive Load	I_{CM} = 200 0.8 • V_{CES}	A V
T_{SC} (SCSOA)	V_{GE} = 15V, T_J = 125°C, R_G = 10Ω, V_{CE} = 1500V, Non-Repetitive	10	µs
P_C	T_C = 25°C	290	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}	Plastic Body for 10s	260	°C
F_C	Mounting Force with Clip	30..170 / 7..36	N/lb
V_{ISOL}	50/60Hz, 5 Seconds	4000	V~
Weight		8	g

Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
BV_{CES}	I_C = 250µA, V_{GE} = 0V	3600			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			25	µA
	Note 2, T_J = 100°C		50		µA
I_{GES}	V_{CE} = 0V, V_{GE} = ± 20V			±200	nA
$V_{CE(SAT)}$	I_C = 50A, V_{GE} = 15V, Note 1		2.4	2.9	V
	T_J = 125°C		3.0		V

Features

- Silicon Chip on Direct-Copper Bond (DCB) Substrate
- Isolated Mounting Surface
- 4000V~ Electrical Isolation
- High Blocking Voltage
- High Frequency Operation

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

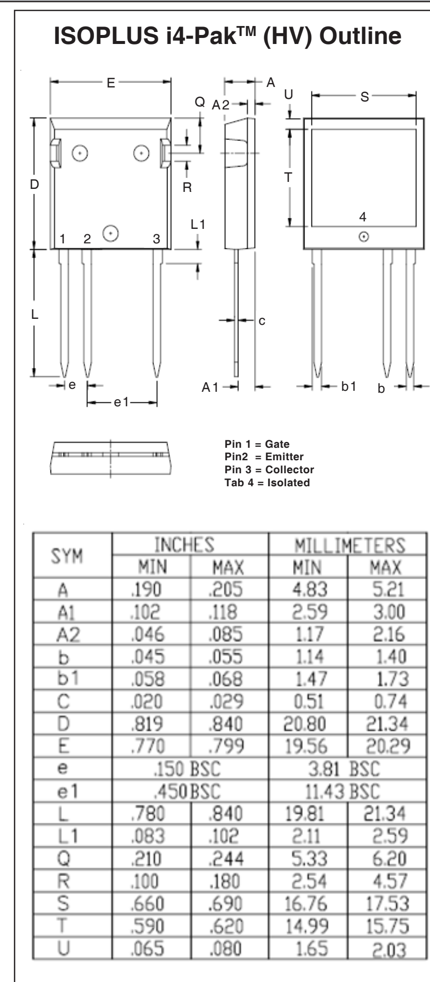
© 2014 IXYS CORPORATION, All Rights Reserved

Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	I_C = 50A, V_{CE} = 10V, Note 1	24	40		S
C_{ies}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz		3990		pF
C_{oes}			195		pF
C_{res}			100		pF
$Q_{g(on)}$	I_C = 50A, V_{GE} = 15V, V_{CE} = 1000V		210		nC
Q_{ge}			27		nC
Q_{gc}			77		nC
$t_{d(on)}$	**Resistive load, T_J = 25°C** I_C = 50A, V_{GE} = 15V V_{CE} = 960V, R_G = 5Ω		46		ns
t_r			420		ns
$t_{d(off)}$			205		ns
t_f			1750		ns
$t_{d(on)}$	**Resistive load, T_J = 125°C** I_C = 50A, V_{GE} = 15V V_{CE} = 960V, R_G = 5Ω		44		ns
t_r			845		ns
$t_{d(off)}$			210		ns
t_f			1670		ns
R_{thJC}				0.43	°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 = 50A, V_{GE} = 0V, Note 1			3.0	V
t_{rr}	I_F = 25A, V_{GE} = 0V, $-di_F/dt$ = 100A/μs V_R = 100V, V_{GE} = 0V		1.7		μs
I_{RM}			48		A
Q_{RM}			40		μC

ISOPLUS i4-Pak™ (HV) Outline



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

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.

ADVANCE TECHNICAL INFORMATION

The product presented herein is under development. The Technical Specifications offered are derived from a subjective evaluation of the design, based upon prior knowledge and experience, and constitute a "considered reflection" of the anticipated result. 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 4,860,072 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

Fig. 1. Output Characteristics @ T_J = 25ºC

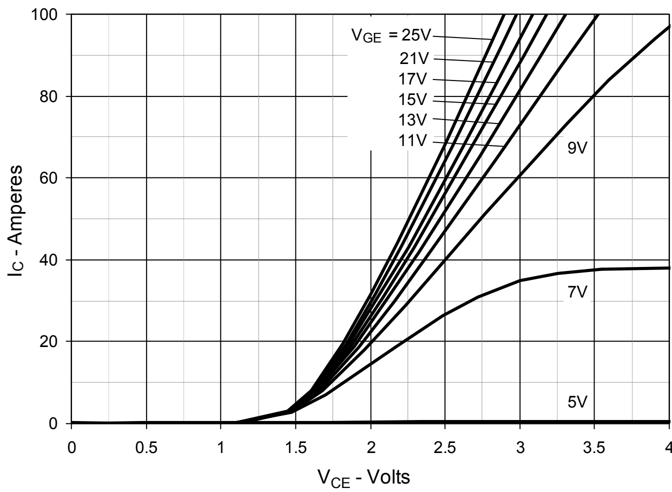


Fig. 2. Extended Output Characteristics @ T_J = 25ºC

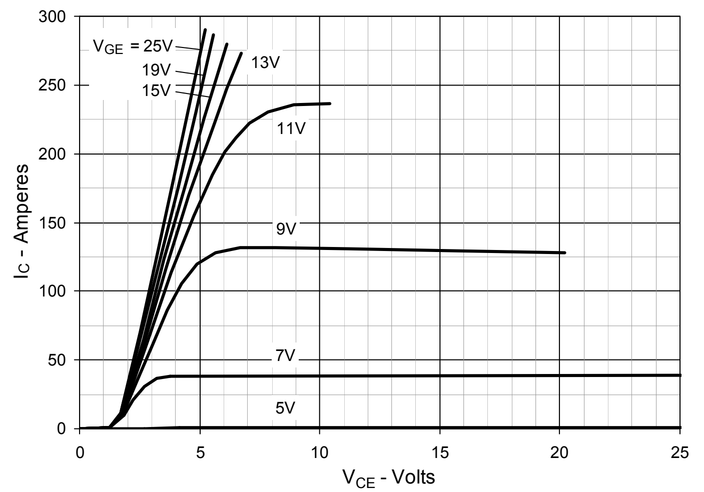


Fig. 3. Output Characteristics @ T_J = 125ºC

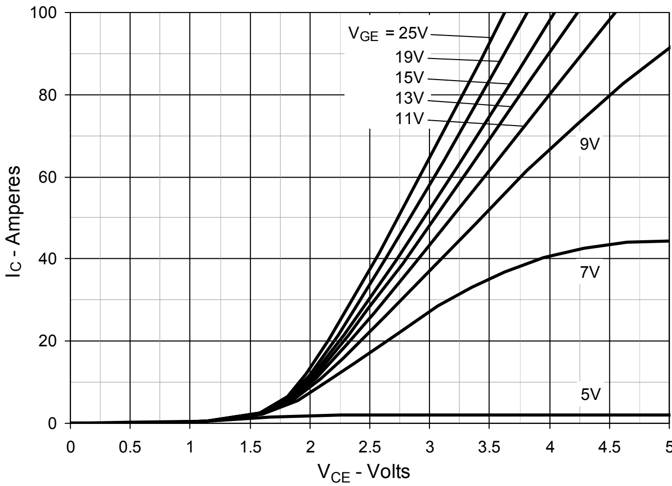


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

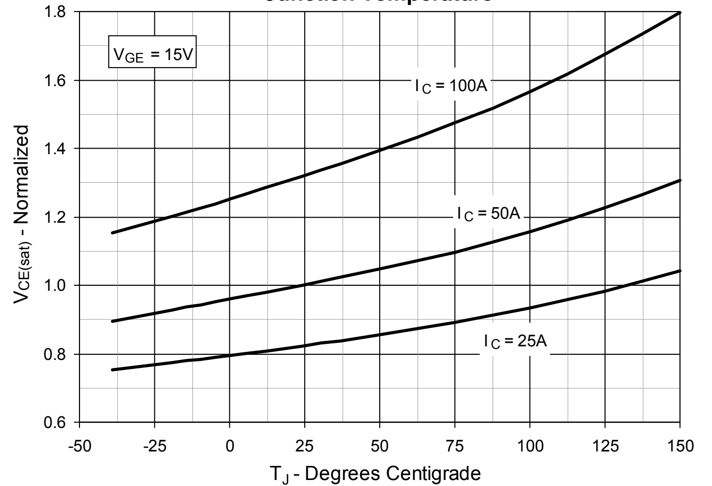


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

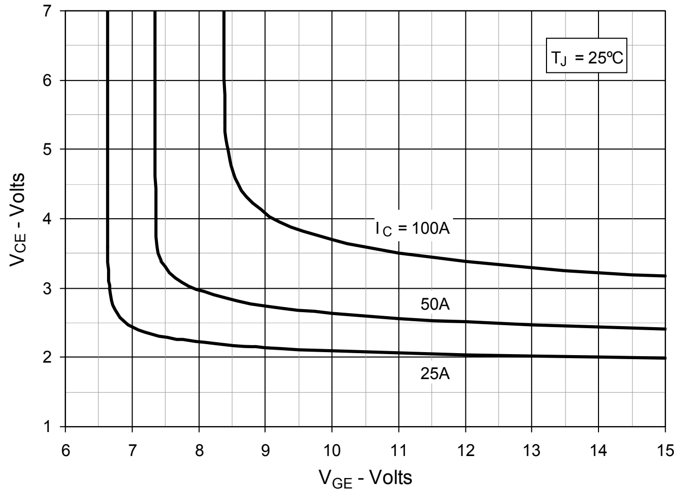
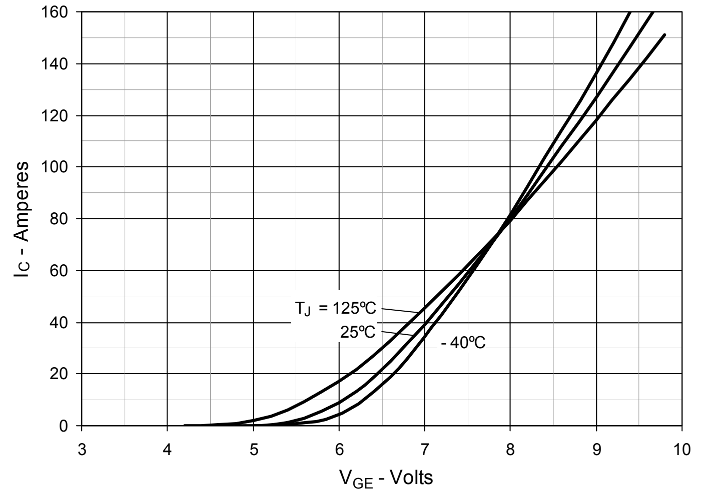
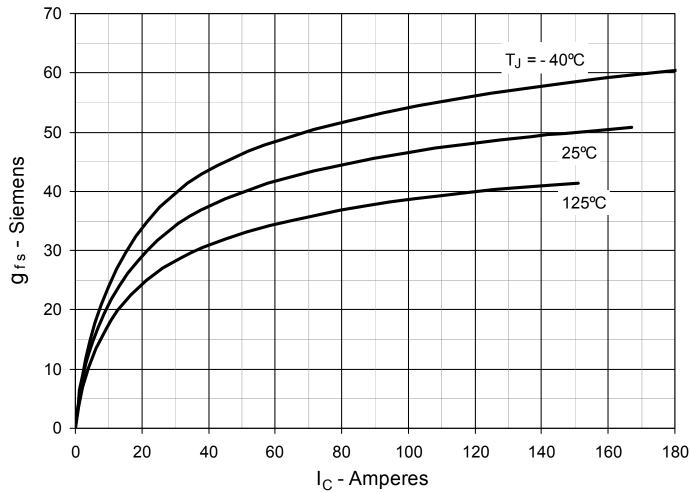
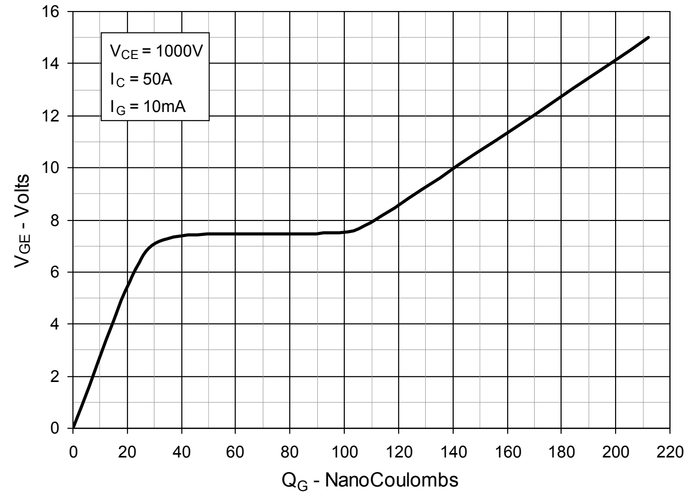


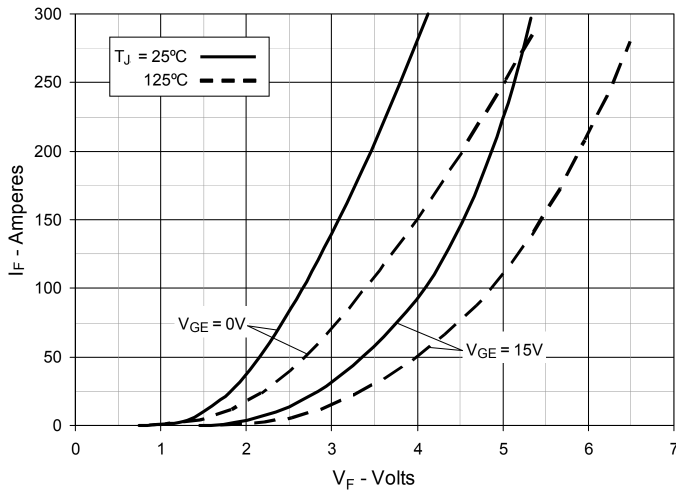
Fig. 6. Input Admittance

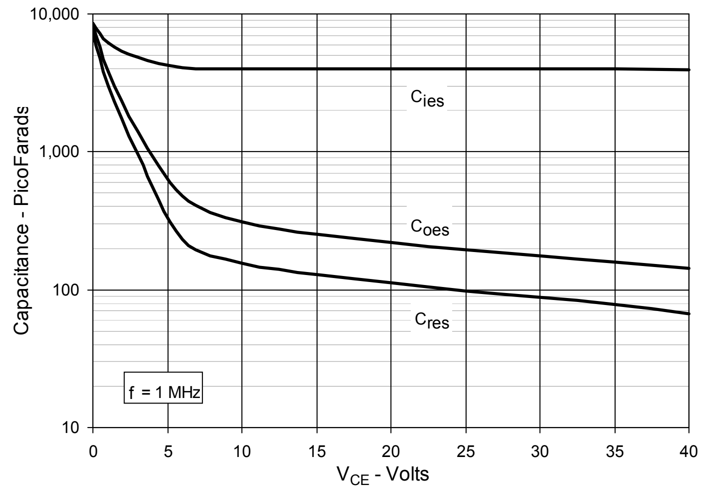


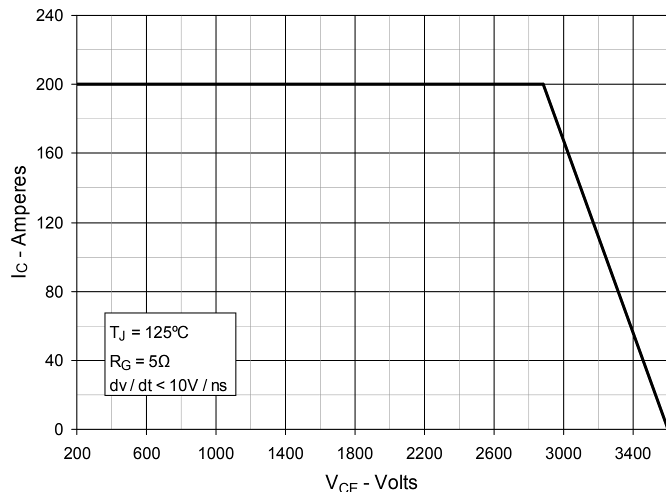
© 2014 IXYS CORPORATION, All Rights Reserved

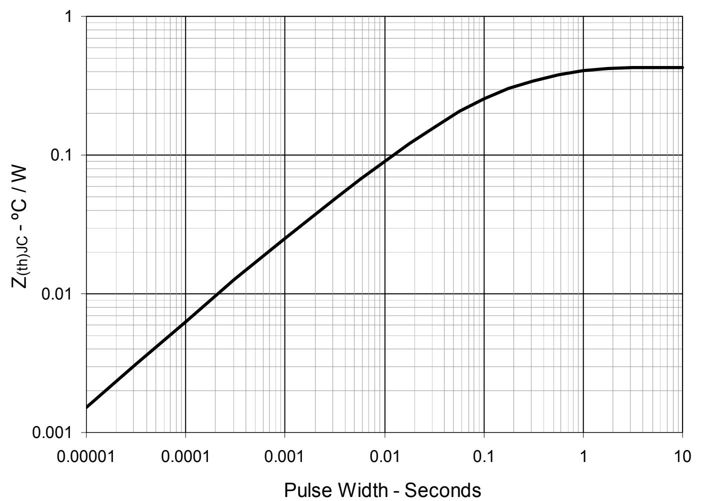




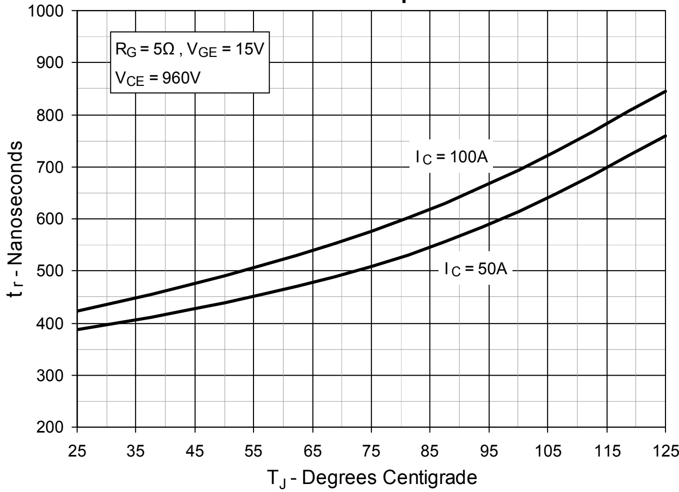


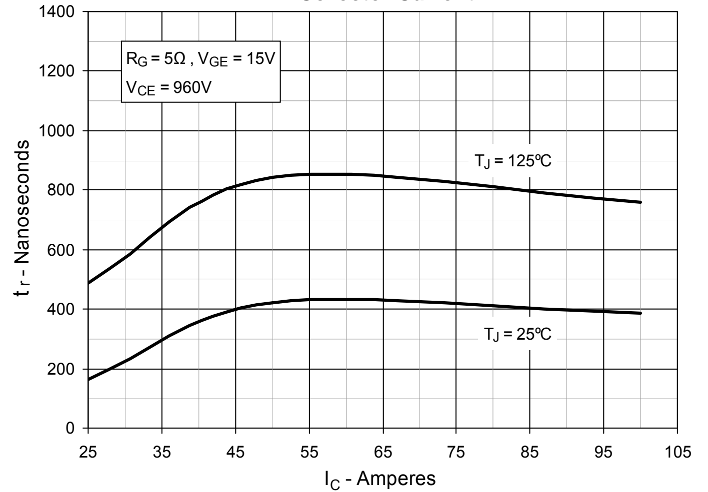


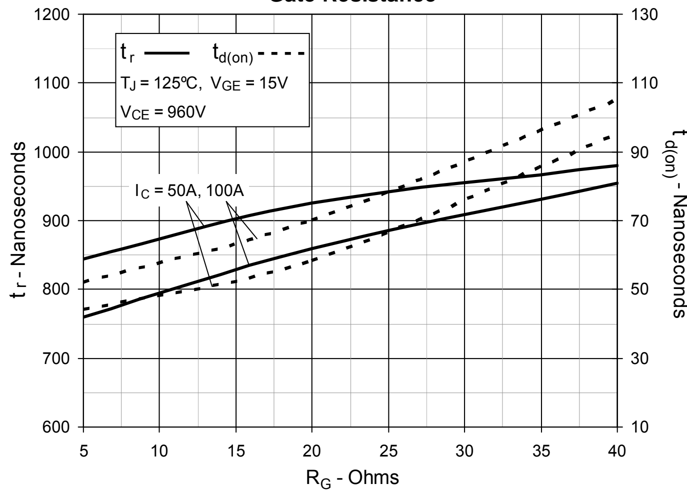


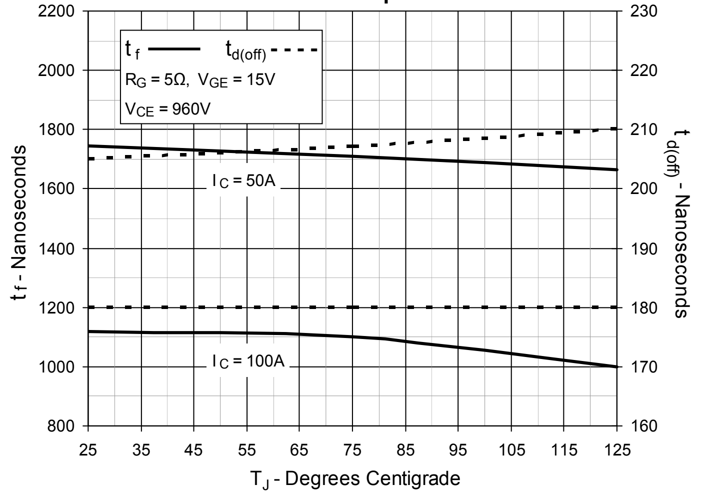


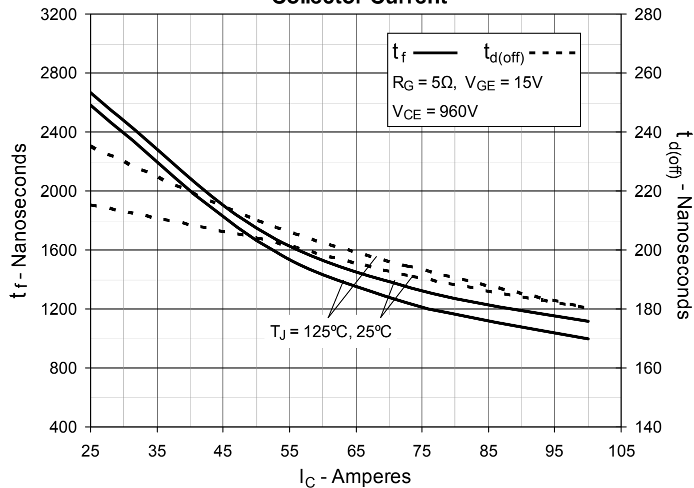
IXYS Reserves the Right to Change Limits, Test Conditions and Dimensions.

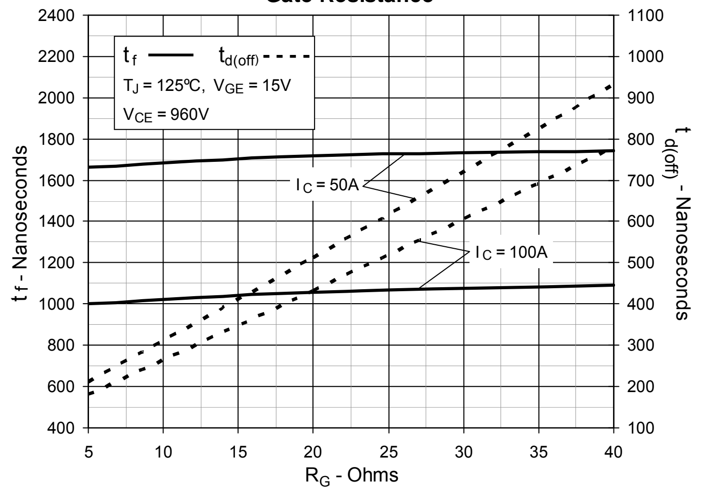




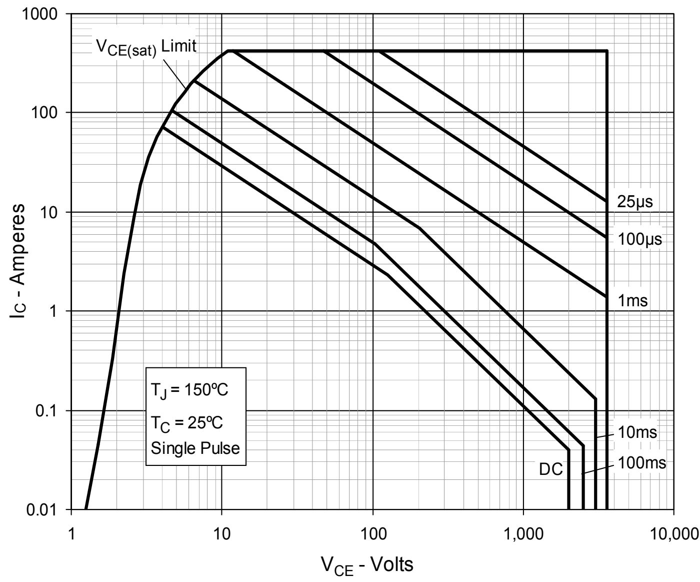


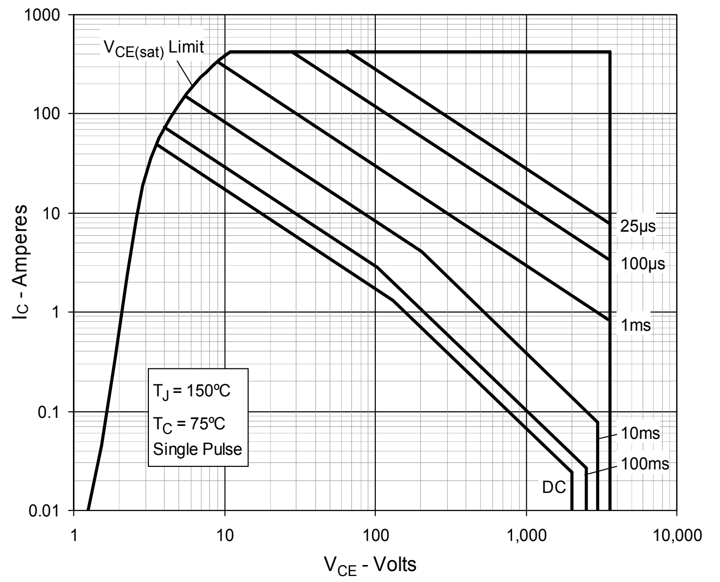






© 2014 IXYS CORPORATION, All Rights Reserved





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