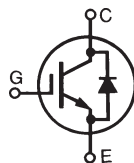


High Voltage, High Frequency, BiMOSFET™ Monolithic Bipolar MOS Transistor

IXBF16N360



$$V_{CES} = 3600V$$

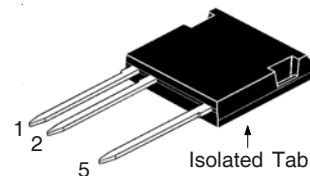
$$I_{C90} = 16A$$

$$V_{CE(sat)} \leq 3.0V$$

(Electrically Isolated Tab)

Symbol	Test Conditions	Maximum Ratings	
V_{CES}	$T_J = 25^\circ C$ to $150^\circ C$	3600	V
V_{CGR}	$T_J = 25^\circ C$ to $150^\circ C$, $R_{GE} = 1M\Omega$	3600	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	$T_C = 25^\circ C$	26	A
I_{C90}	$T_C = 90^\circ C$	16	A
I_{CM}	$T_C = 25^\circ C$, 1ms	72	A
SSOA (RBSOA)	$V_{GE} = 15V$, $T_{VJ} = 125^\circ C$, $R_G = 25\Omega$ Clamped Inductive Load	$I_{CM} = 60$	A
		$V_{CES} \leq 1500$	V
T_{SC} (SCSOA)	$V_{GE} = 15V$, $T_J = 125^\circ C$, $R_G = 82\Omega$, $V_{CE} = 1500V$, Non-Repetitive	10	μs
P_C	$T_C = 25^\circ C$	125	W
T_J		-55 ... +150	$^\circ C$
T_{JM}		150	$^\circ C$
T_{stg}		-55 ... +150	$^\circ C$
T_L	Maximum Lead Temperature for Soldering	300	$^\circ C$
T_{SOLD}	Plastic Body for 10s	260	$^\circ C$
F_C	Mounting Force with Clip	20..120 / 4.5..27	N/lb
V_{ISOL}	50/60Hz, 5 Seconds	4000	V~
Weight		8	g

ISOPLUS i4-Pak™



1 = Gate
2 = Emitter

5 = Collector

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

Symbol	Test Conditions ($T_J = 25^\circ C$ Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
BV_{CES}	$I_C = 250\mu A$, $V_{GE} = 0V$	3600		V
$V_{GE(th)}$	$I_C = 250\mu A$, $V_{CE} = V_{GE}$	3.0		5.0 V
I_{CES}	$V_{CE} = V_{CES}$, $V_{GE} = 0V$ Note 2, $T_J = 125^\circ C$			25 μA 1 mA
I_{GES}	$V_{CE} = 0V$, $V_{GE} = \pm 20V$			± 200 nA
$V_{CE(SAT)}$	$I_C = 16A$, $V_{GE} = 15V$, Note 1 $T_J = 125^\circ C$		2.5	3.0 V
			3.1	V

Symbol Test Conditions

($T_J = 25^\circ\text{C}$ Unless Otherwise Specified)

Characteristic Values

Min. Typ. Max.

g_{fs}	$I_C = 16\text{A}, V_{CE} = 20\text{V}, \text{Note 1}$	7	12	S
C_{ies}	$V_{CE} = 25\text{V}, V_{GE} = 0\text{V}, f = 1\text{MHz}$		1116	pF
C_{oes}			60	pF
C_{res}			25	pF
$Q_{g(on)}$	$I_C = 16\text{A}, V_{GE} = 15\text{V}, V_{CE} = 1.5\text{KV}$		65	nC
Q_{ge}			7	nC
Q_{gc}			30	nC
$t_{d(on)}$	Resistive load, $T_J = 25^\circ\text{C}$		30	ns
t_r			260	ns
$t_{d(off)}$	$I_C = 16\text{A}, V_{GE} = 15\text{V}$ $V_{CE} = 1.5\text{KV}, R_G = 25\Omega$		184	ns
t_f			110	ns
$t_{d(on)}$	Resistive load, $T_J = 125^\circ\text{C}$		36	ns
t_r			385	ns
$t_{d(off)}$	$I_C = 16\text{A}, V_{GE} = 15\text{V}$ $V_{CE} = 1.5\text{KV}, R_G = 25\Omega$		190	ns
t_f			115	ns
R_{thJC}		0.15		1.0 $^\circ\text{C/W}$
R_{thCS}				$^\circ\text{C/W}$

Reverse Diode

Symbol Test Conditions

($T_J = 25^\circ\text{C}$ Unless Otherwise Specified)

Characteristic Values

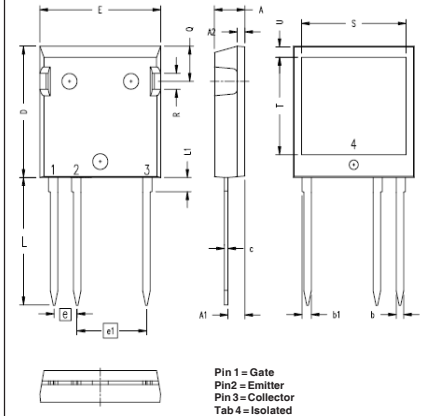
Min. Typ. Max

V_F	$I_F = 16\text{A}, V_{GE} = 0\text{V}, \text{Note 1}$		3.5	V
t_{rr}	$I_F = 16\text{A}, V_{GE} = 0\text{V}, -di_F/dt = 100\text{A}/\mu\text{s}$		620	ns
I_{RM}			21.5	A
Q_{RM}	$V_R = 100\text{V}, V_{GE} = 0\text{V}$		6.7	μC

Notes:

1. Pulse test, $t \leq 300\mu\text{s}$, duty cycle, $d \leq 2\%$.
2. Device must be heatsunk for high-temperature leakage current measurements to avoid thermal runaway.

ISOPLUS i4-Pak™ (HV) Outline



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

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	7,157,338 B2
	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	

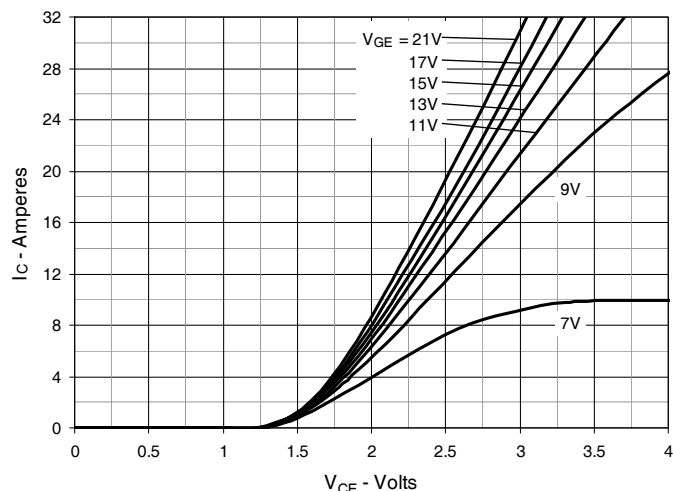
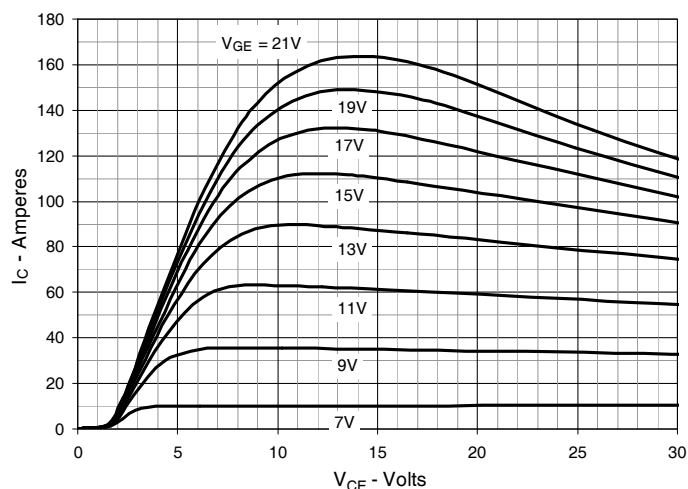
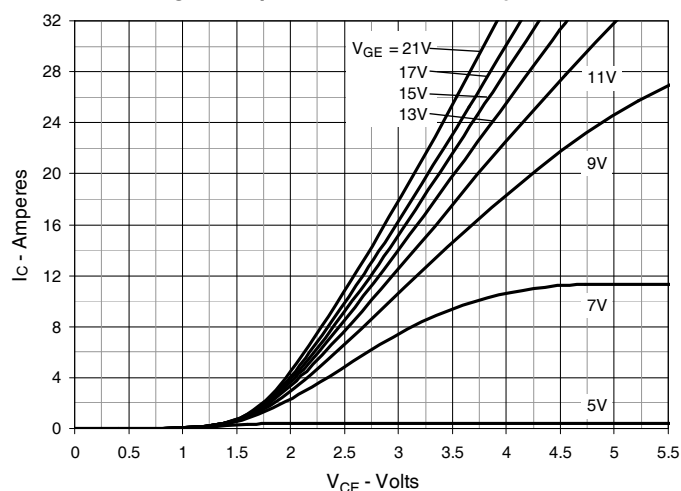
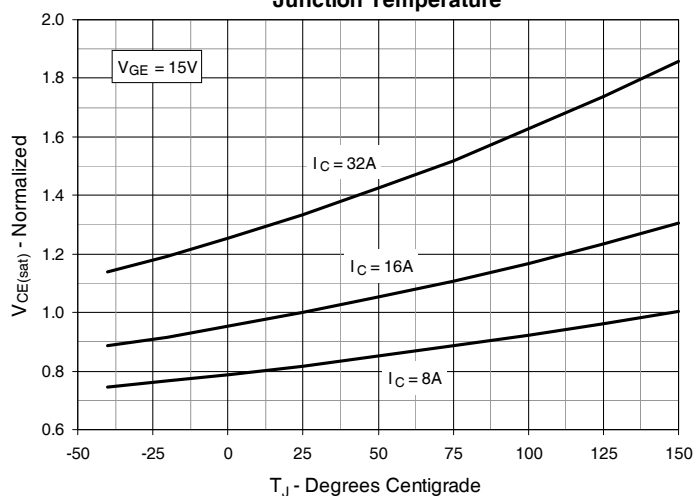
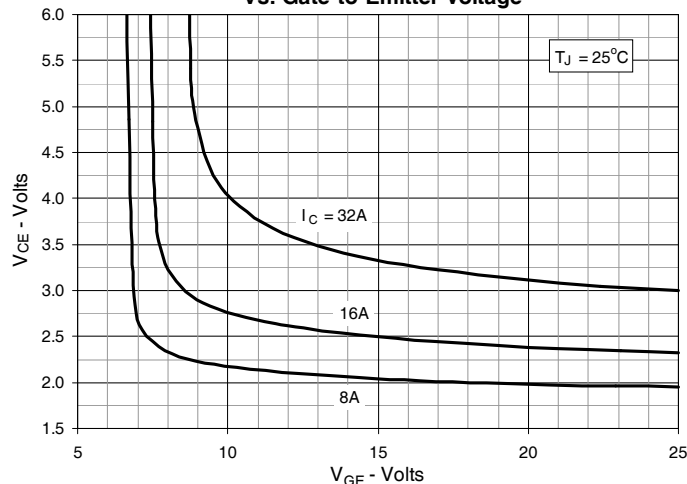
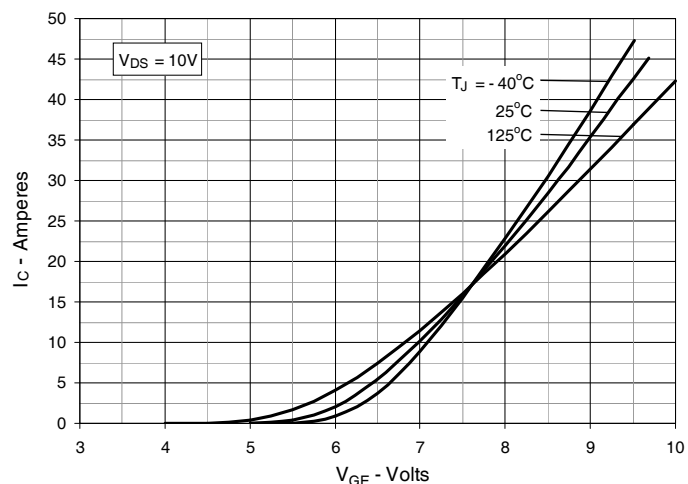
Fig. 1. Output Characteristics @ $T_J = 25^\circ\text{C}$

Fig. 2. Extended Output Characteristics @ $T_J = 25^\circ\text{C}$

Fig. 3. Output Characteristics @ $T_J = 125^\circ\text{C}$

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


Fig. 7. Transconductance

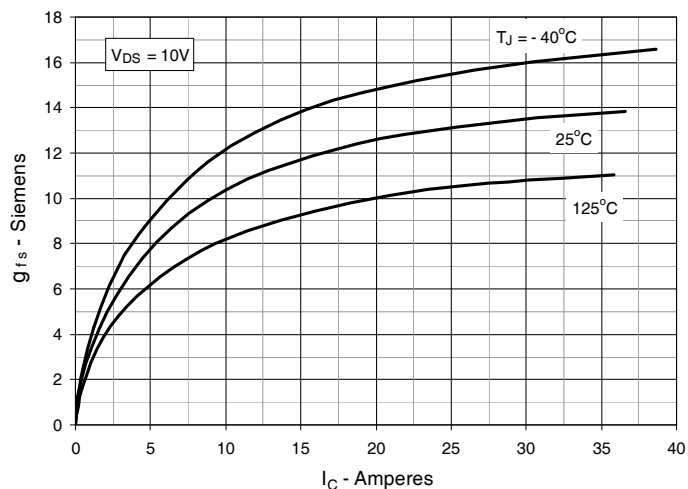


Fig. 8. Forward Voltage Drop of Intrinsic Diode

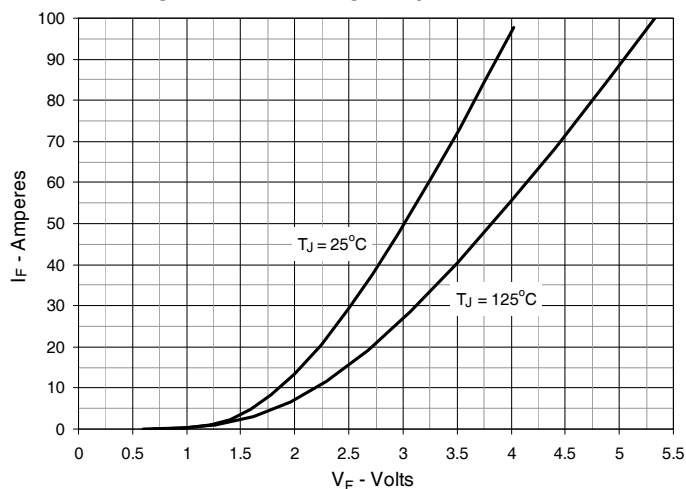


Fig. 9. Gate Charge

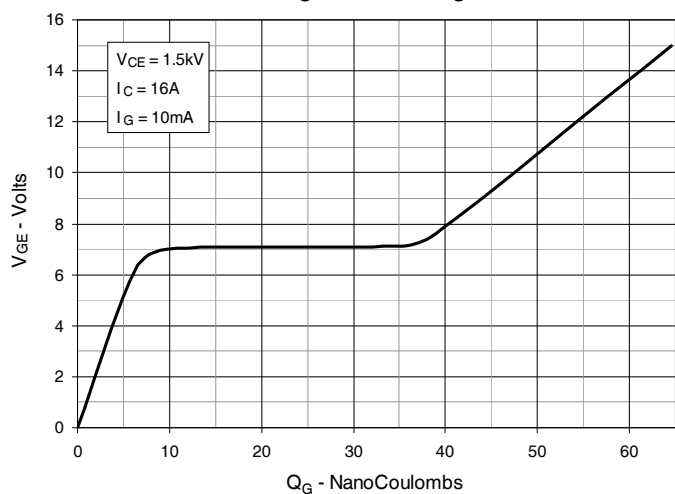


Fig. 10. Capacitance

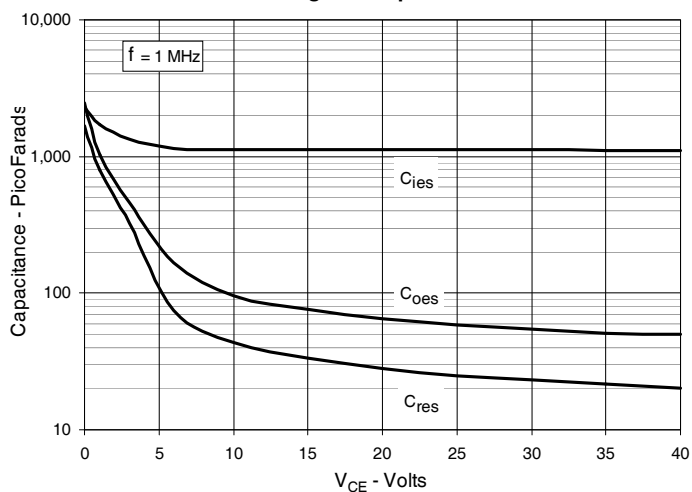


Fig. 11. Reverse-Bias Safe Operating Area

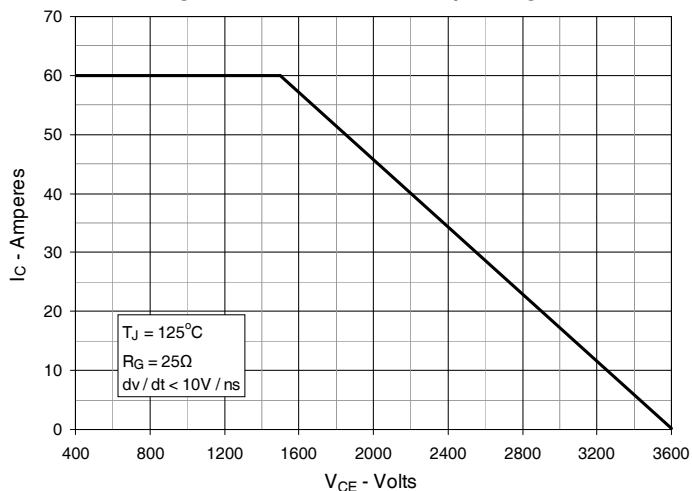


Fig. 12. Maximum Transient Thermal Impedance

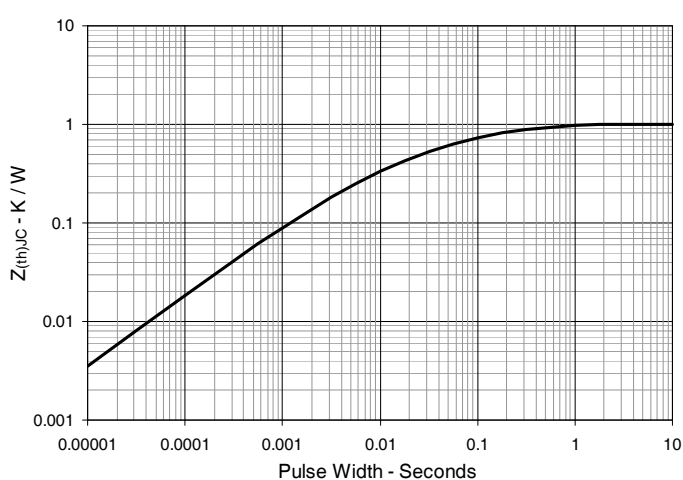


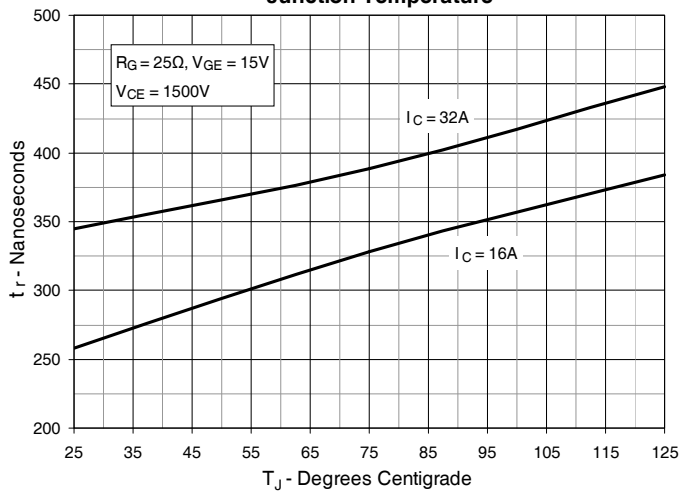
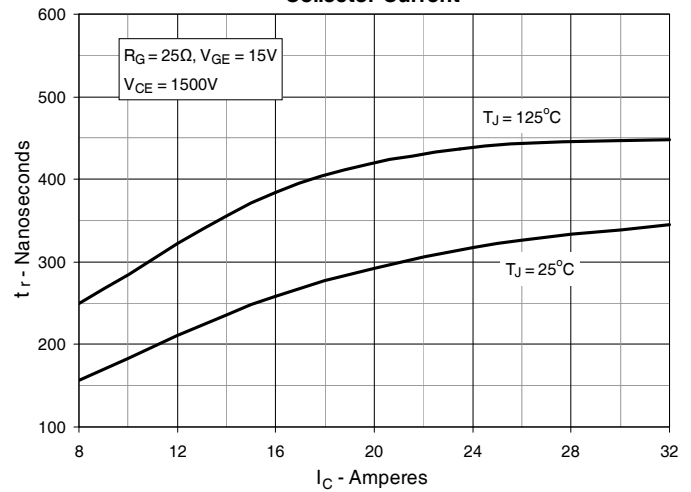
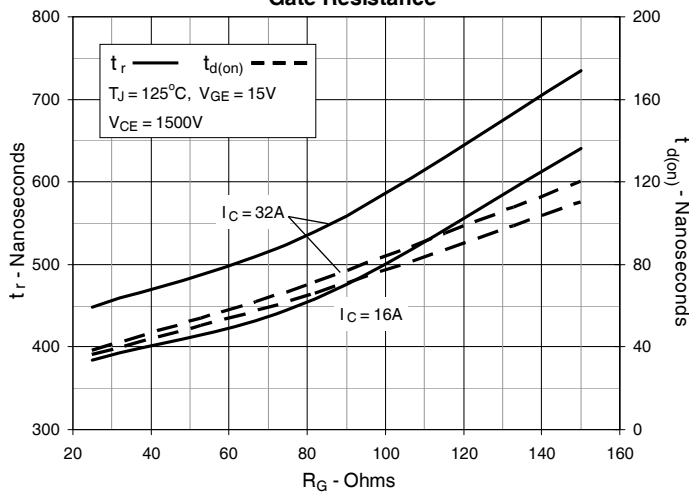
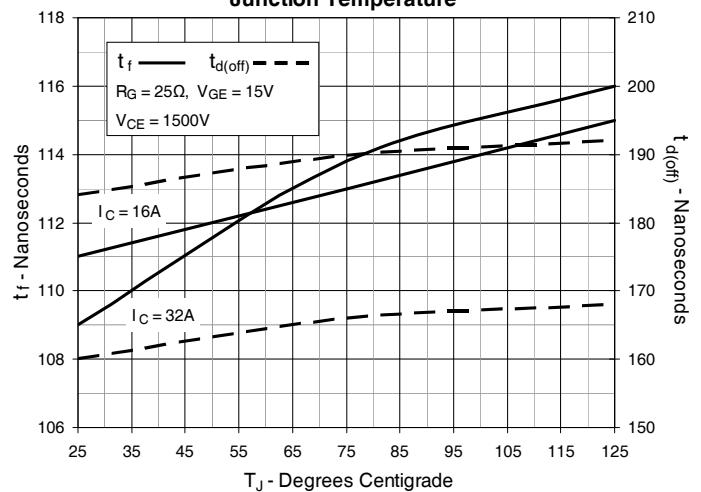
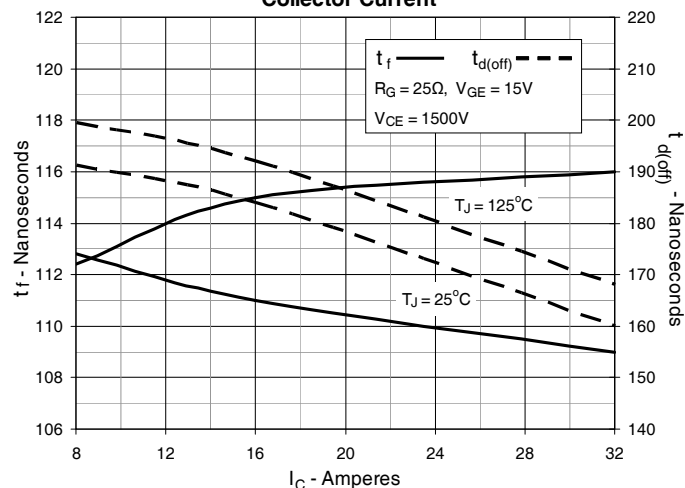
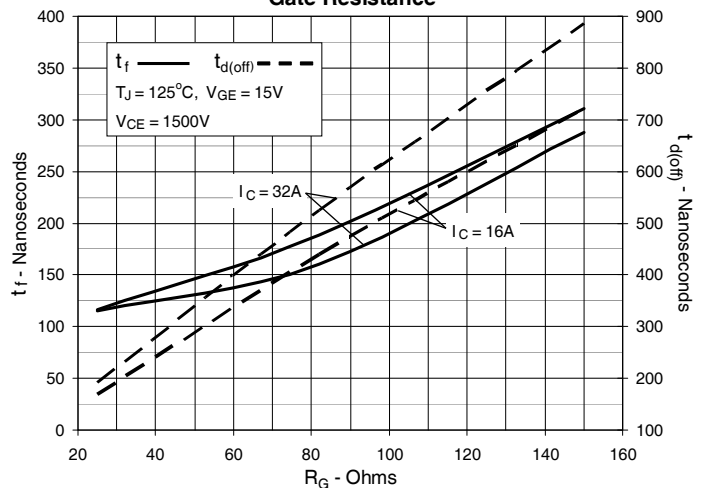
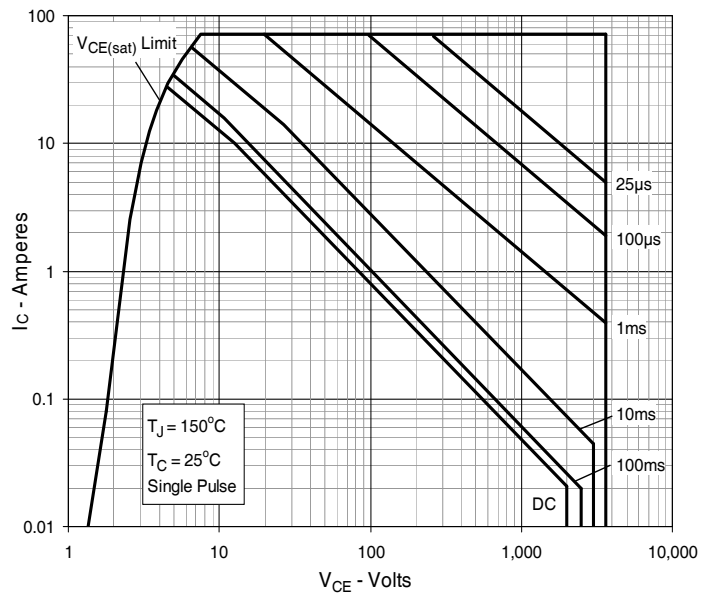
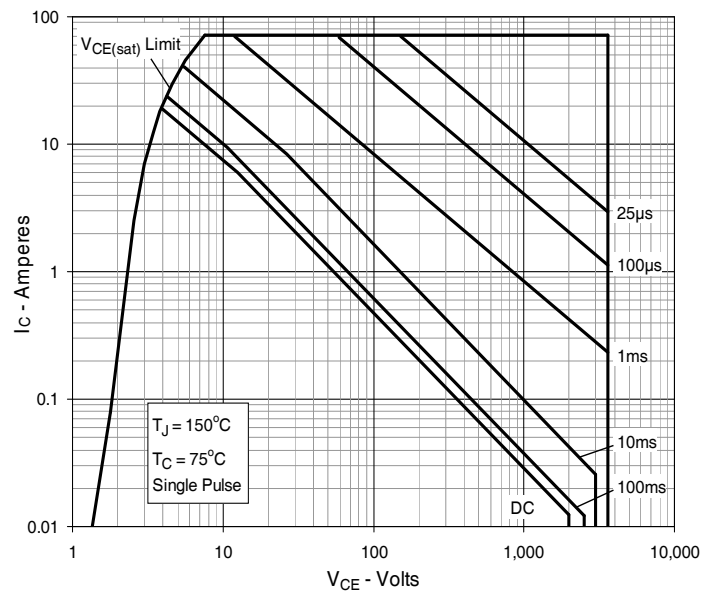
Fig. 13. Resistive Turn-on Rise Time vs. Junction Temperature

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


Fig. 19. Forward-Bias Safe Operating Area @ $T_C = 25^\circ\text{C}$

Fig. 20. Forward-Bias Safe Operating Area @ $T_C = 75^\circ\text{C}$




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