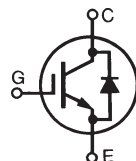


High Voltage, High Gain BIMOSFET™ Monolithic Bipolar MOS Transistor

IXBF55N300



$$V_{CES} = 3000V$$

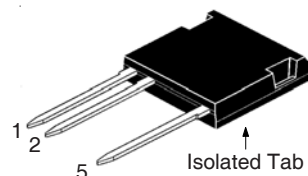
$$I_{C110} = 28A$$

$$V_{CE(sat)} \leq 3.2V$$

(Electrically Isolated Tab)

Symbol	Test Conditions	Maximum Ratings	
V_{CES}	$T_C = 25^\circ C$ to $150^\circ C$	3000	V
V_{CGR}	$T_J = 25^\circ C$ to $150^\circ C$, $R_{GE} = 1M\Omega$	3000	V
V_{GES}	Continuous	± 25	V
V_{GEM}	Transient	± 35	V
I_{C25}	$T_C = 25^\circ C$	73	A
I_{C110}	$T_C = 110^\circ C$	28	A
I_{CM}	$T_C = 25^\circ C$, 1ms	430	A
SSOA (RBSOA)	$V_{GE} = 15V$, $T_{VJ} = 125^\circ C$, $R_G = 2\Omega$ Clamped Inductive Load	$I_{CM} = 110$ $V_{CE} \leq 0.8 \cdot V_{CES}$	A
T_{SC} (SCSOA)	$V_{GE} = 15V$, $T_J = 125^\circ C$, $R_G = 10\Omega$, $V_{CE} = 1250V$, Non-Repetitive	10	μs
P_C	$T_C = 25^\circ C$	290	W
T_J		-55 ... +150	$^\circ C$
T_{JM}		150	$^\circ C$
T_{stg}		-55 ... +150	$^\circ C$
T_L	1.6mm (0.062 in.) from Case for 10s	300	$^\circ C$
T_{SOLD}	Plastic Body for 10 seconds	260	$^\circ C$
F_C	Mounting Force	20..120 / 4.5..27	Nm/lb.in.
V_{ISOL}	50/60Hz, 1 Minute	4000	V~
Weight		5	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 Peak Current Capability
- Low Saturation Voltage

Advantages

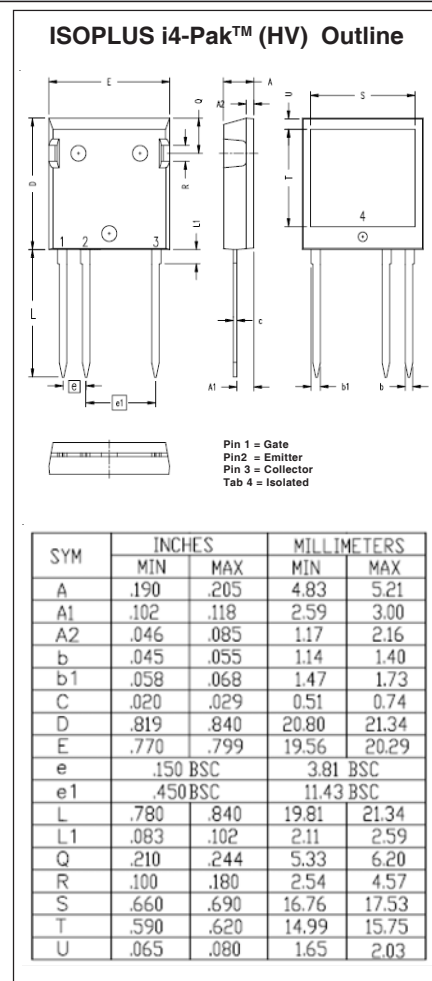
- Low Gate Drive Requirement
- High Power Density

Applications

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

Symbol	Test Conditions ($T_J = 25^\circ C$ 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}	$V_{CE} = V_{CES}$, $V_{GE} = 0V$ Note 2, $T_J = 125^\circ C$			50 μA 3 mA
I_{GES}	$V_{CE} = 0V$, $V_{GE} = \pm 25V$			± 200 nA
$V_{CE(sat)}$	$I_C = 55A$, $V_{GE} = 15V$, Note 1 $T_J = 125^\circ C$		2.7 3.3	3.2 V V

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$ Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
g_{fs}	$I_C = 55\text{A}, V_{CE} = 10\text{V}, \text{Note 1}$	32	50	S
C_{ies}	$V_{CE} = 25\text{V}, V_{GE} = 0\text{V}, f = 1\text{MHz}$		7300	pF
C_{oes}			275	pF
C_{res}			83	pF
Q_g	$I_C = 55\text{A}, V_{GE} = 15\text{V}, V_{CE} = 1000\text{V}$		335	nC
Q_{ge}			47	nC
Q_{gc}			130	nC
$t_{d(on)}$	Resistive Switching Times, $T_J = 25^\circ\text{C}$ $I_C = 110\text{A}, V_{GE} = 15\text{V}$ $V_{CE} = 1250\text{V}, R_G = 2\Omega$		54	ns
t_r			307	ns
$t_{d(off)}$			230	ns
t_f			268	ns
$t_{d(on)}$		Resistive Switching Times, $T_J = 125^\circ\text{C}$ $I_C = 110\text{A}, V_{GE} = 15\text{V}$ $V_{CE} = 1250\text{V}, R_G = 2\Omega$		52
t_r			585	ns
$t_{d(off)}$			215	ns
t_f			260	ns
R_{thJC}				0.43
R_{thCS}		0.15		$^\circ\text{C/W}$



Reverse Diode

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

Notes:

1. Pulse test, $t < 300\mu\text{s}$, 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 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
by one or more of the following U.S. patents: 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

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

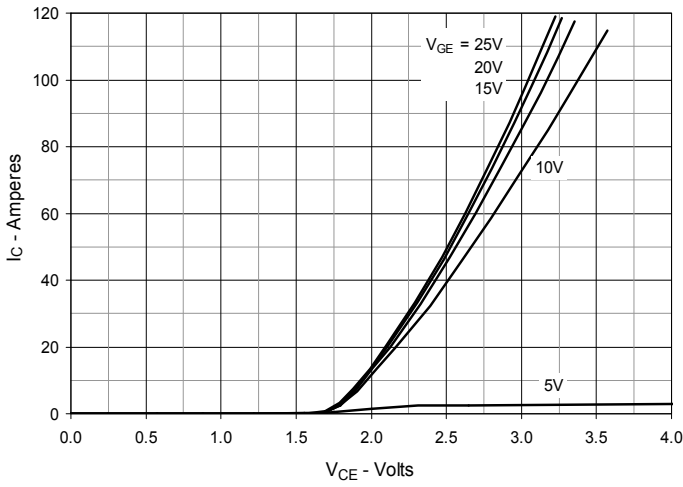


Fig. 2. Extended Output Characteristics @ $T_J = 25^\circ\text{C}$

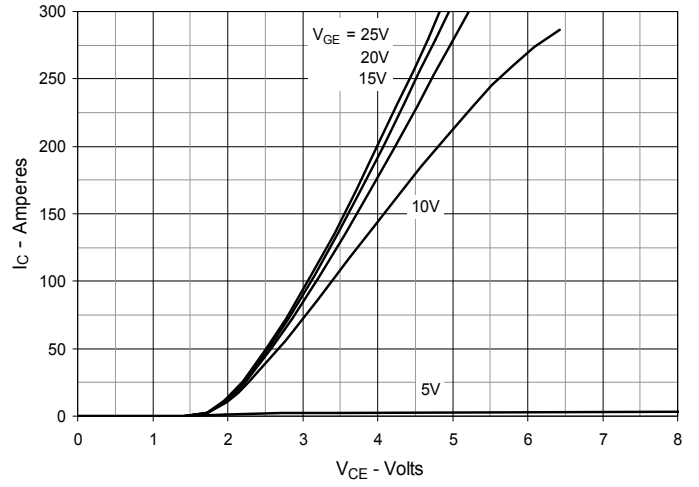


Fig. 3. Output Characteristics @ $T_J = 125^\circ\text{C}$

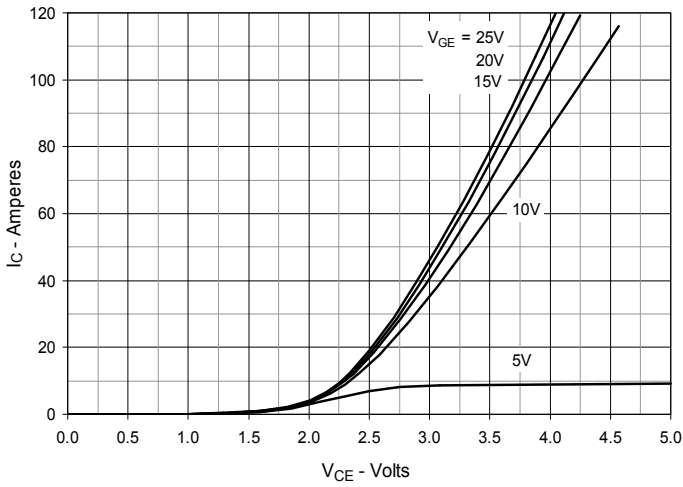


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

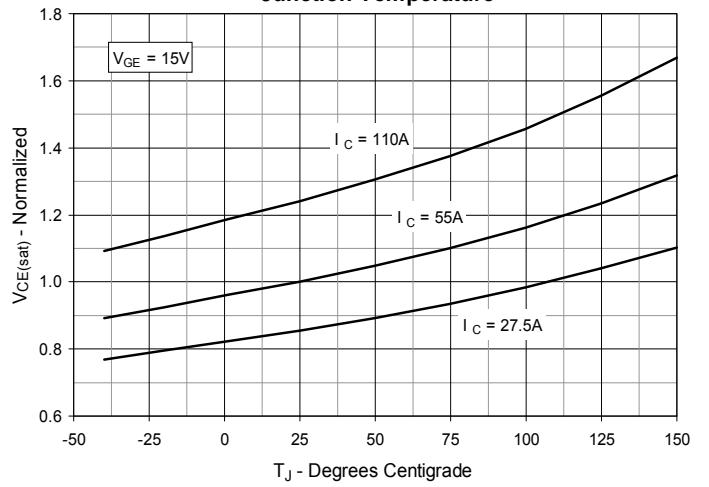


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

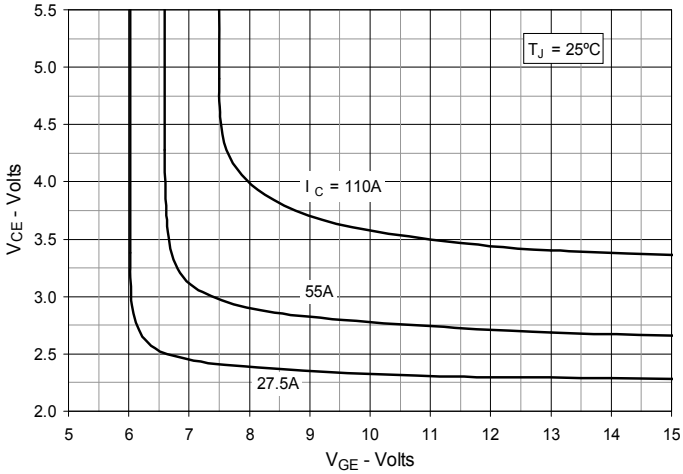


Fig. 6. Input Admittance

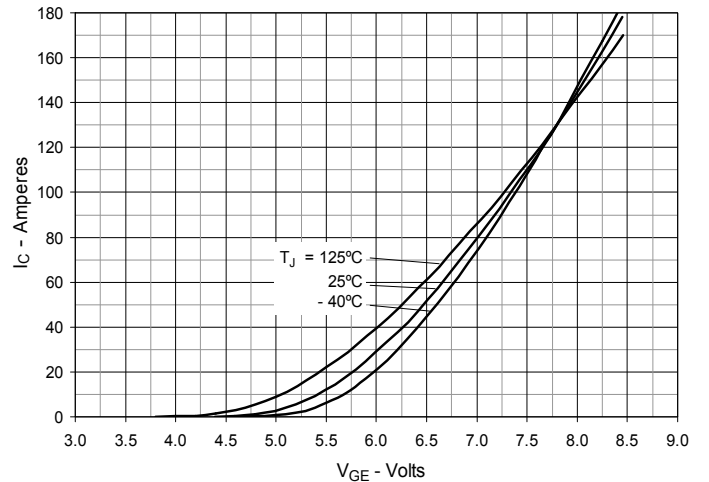


Fig. 7. Transconductance

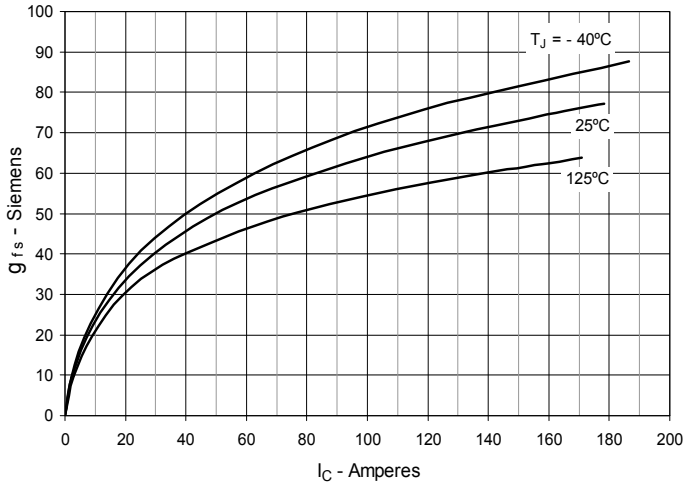


Fig. 8. Forward Voltage Drop of Intrinsic Diode

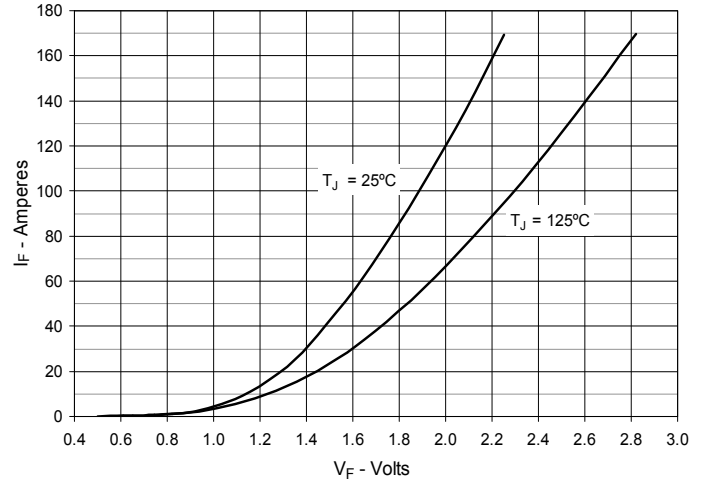


Fig. 9. Gate Charge

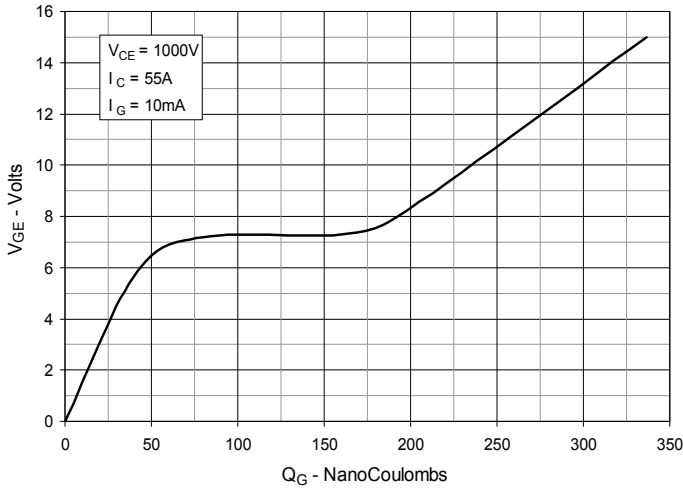


Fig. 10. Capacitance

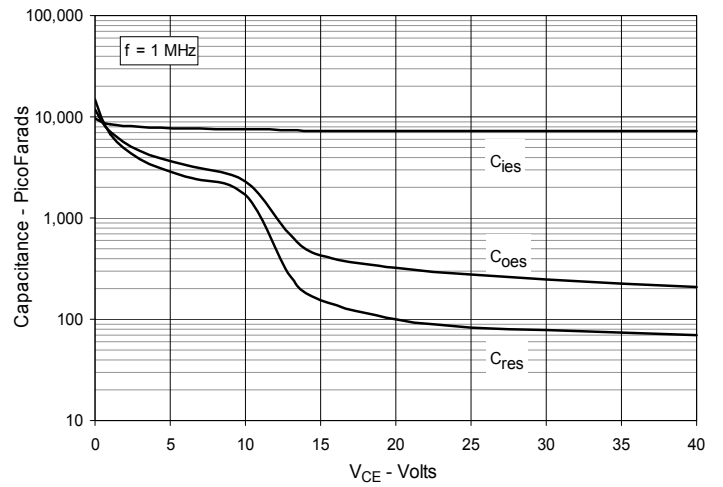


Fig. 11. Reverse-Bias Safe Operating Area

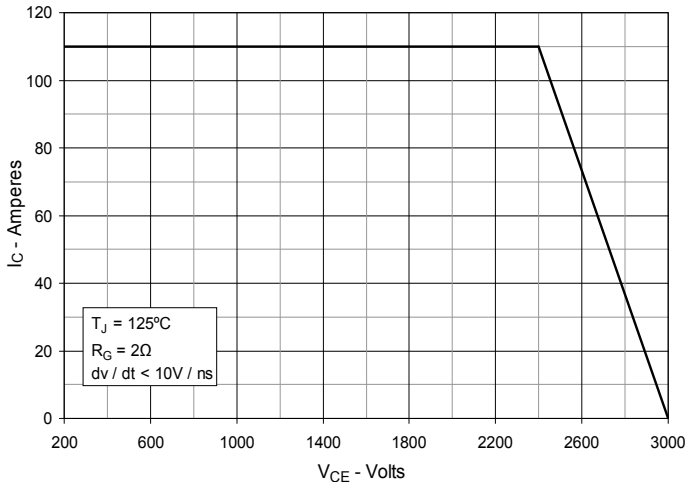
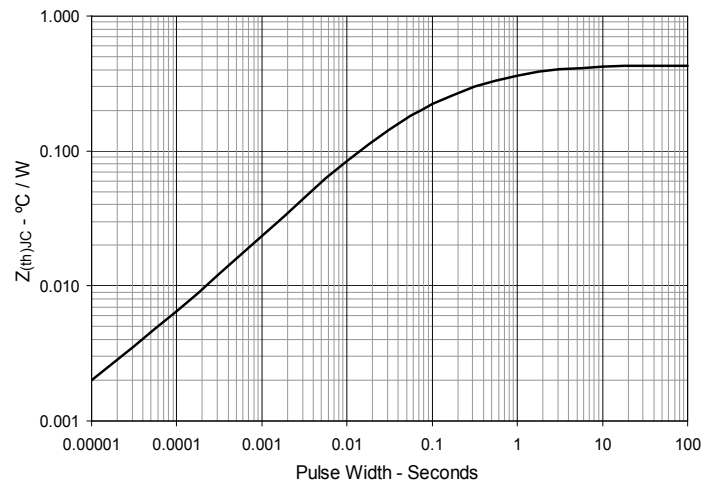
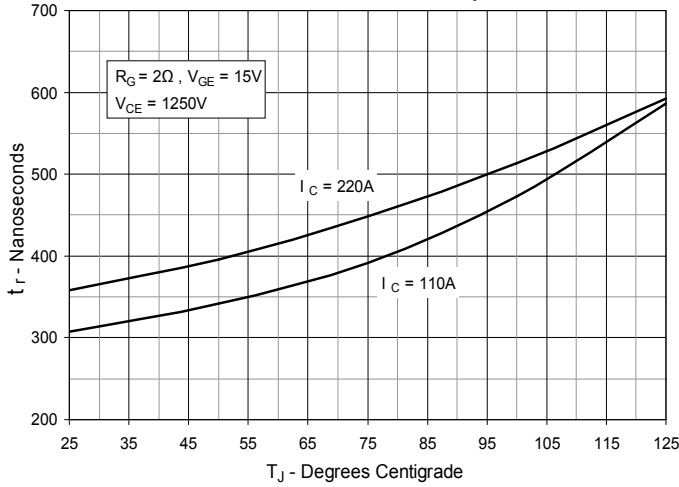
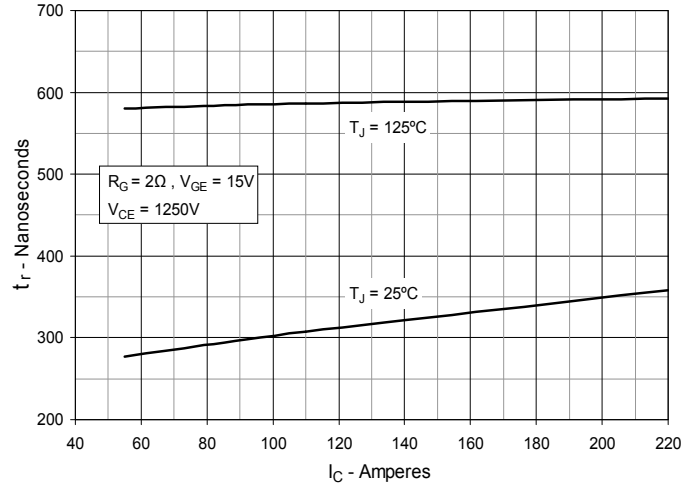
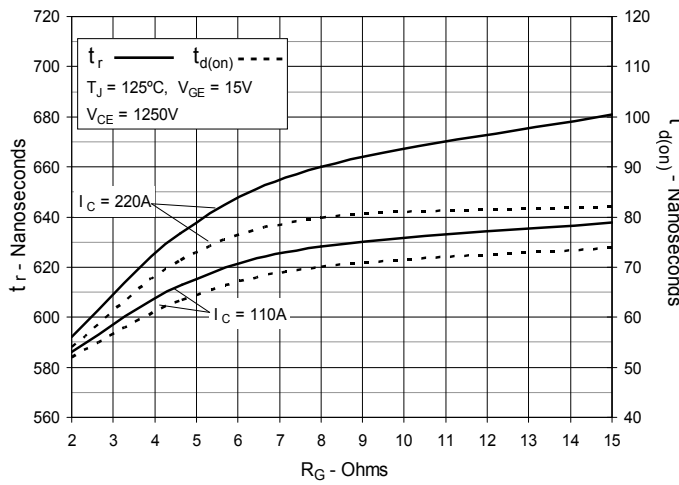
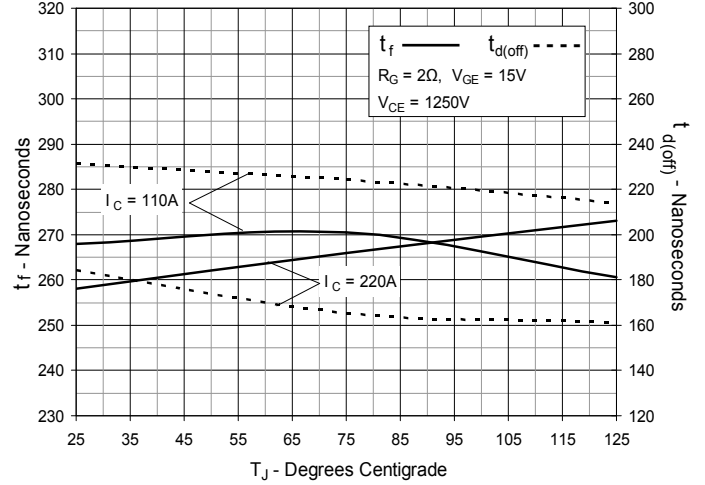
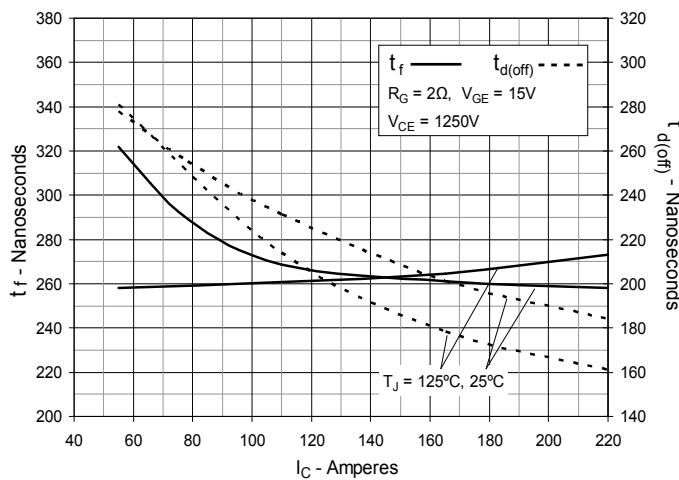


Fig. 12. Maximum Transient Thermal Impedance



**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**
