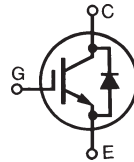


# High Voltage, High Gain BIMOSFET™

## IXBF55N300

### Monolithic Bipolar MOS Transistor

(Electrically Isolated Tab)



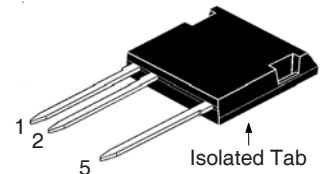
$$V_{CES} = 3000V$$

$$I_{C110} = 34A$$

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

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	$\pm 25$	V
$V_{GEM}$	Transient	$\pm 35$	V
$I_{C25}$	$T_C = 25^\circ C$	86	A
$I_{C110}$	$T_C = 110^\circ C$	34	A
$I_{CM}$	$T_C = 25^\circ C$ , 1ms	600	A
<b>SSOA</b> <b>(RBSOA)</b>	$V_{GE} = 15V$ , $T_{VJ} = 125^\circ C$ , $R_G = 2\Omega$ Clamped Inductive Load	$I_{CM} = 110$ $V_{CE} \leq 0.8 \cdot V_{CES}$	A
<b><math>T_{SC}</math></b> <b>(SCSOA)</b>	$V_{GE} = 15V$ , $T_J = 125^\circ C$ , $R_G = 10\Omega$ , $V_{CE} = 1250V$ , Non-Repetitive	10	$\mu s$
$P_C$	$T_C = 25^\circ C$	357	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~
<b>Weight</b>		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

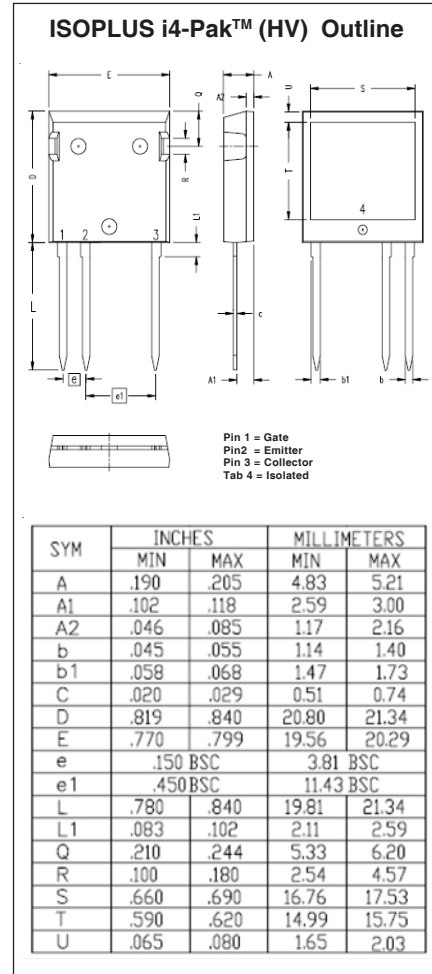
- Low Gate Drive Requirement
- High Power Density

### 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 $\mu A$ 3 mA
$I_{GES}$	$V_{CE} = 0V$ , $V_{GE} = \pm 25V$			$\pm 200$ 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
$t_{d(on)}$	<b>Resistive Switching Times, <math>T_J = 25^\circ\text{C}</math></b> $I_C = 110\text{A}, V_{GE} = 15\text{V}$ $V_{CE} = 1250\text{V}, R_G = 2\Omega$		54	ns
$t_r$			307	ns
$t_{d(off)}$			230	ns
$t_f$			268	ns
$R_{thJC}$				0.35 $^\circ\text{C/W}$
$R_{thCS}$		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	$\mu\text{s}$
$I_{RM}$		$V_R = 100\text{V}, V_{GE} = 0\text{V}$		54

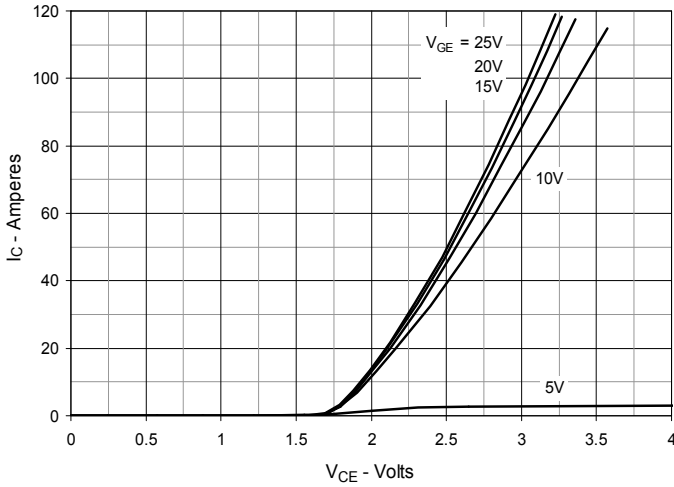
## Notes:

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.

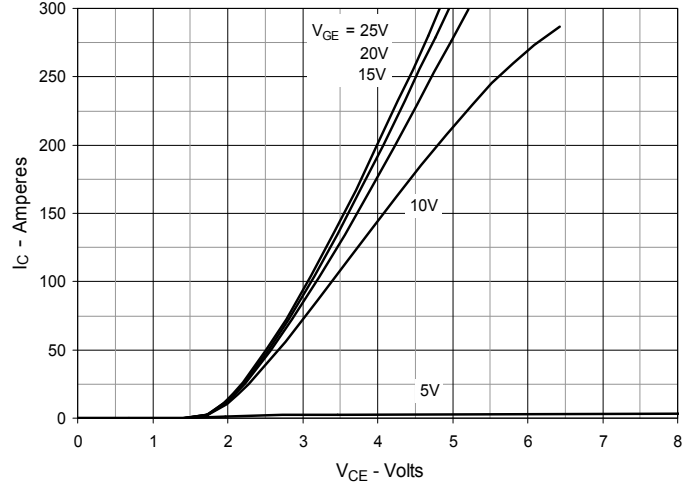
IXYS Reserves the Right to Change Limits, Test Conditions and Dimensions.

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	

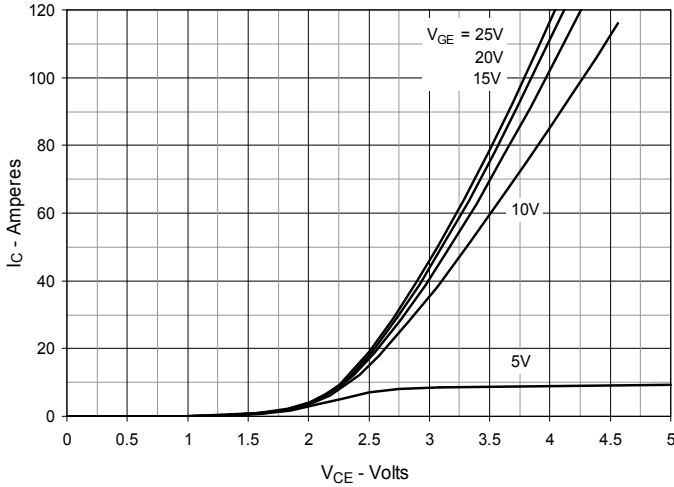
**Fig. 1. Output Characteristics @  $T_J = 25^\circ\text{C}$**



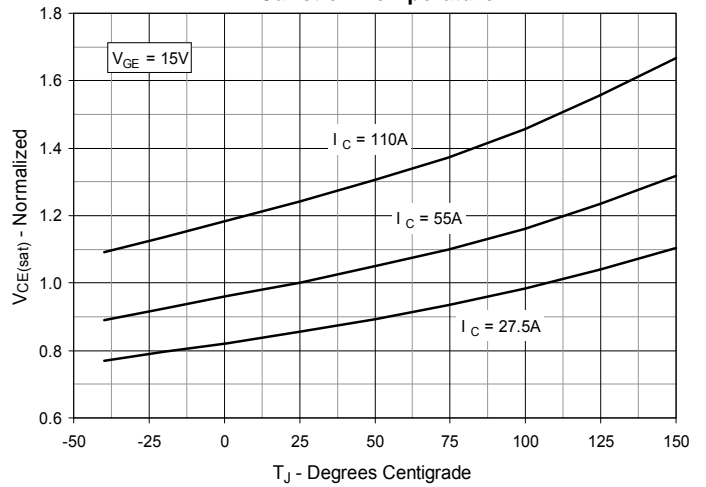
**Fig. 2. Extended Output Characteristics @  $T_J = 25^\circ\text{C}$**



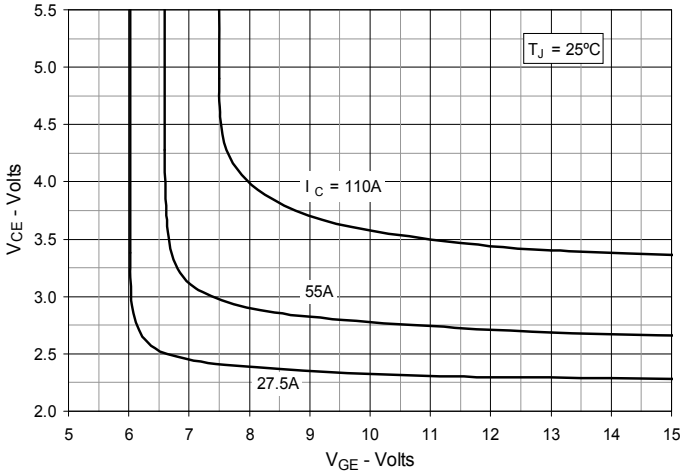
**Fig. 3. Output Characteristics @  $T_J = 125^\circ\text{C}$**



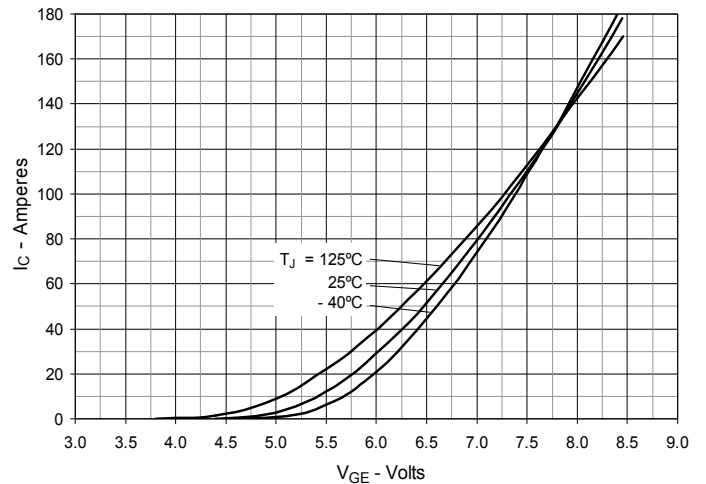
**Fig. 4. Dependence of  $V_{CE(sat)}$  on Junction Temperature**

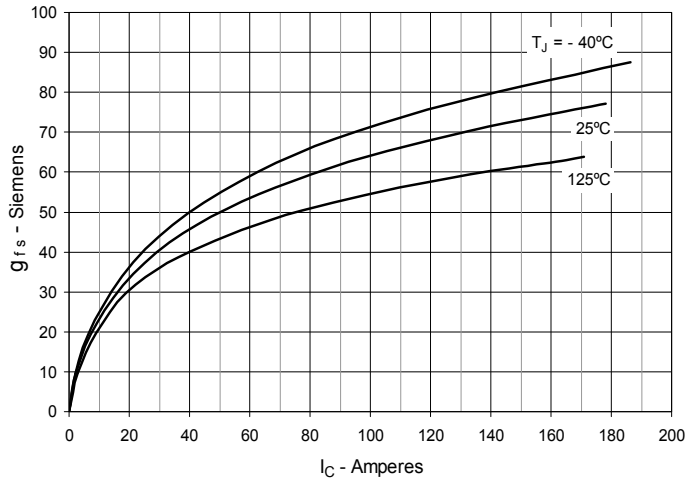
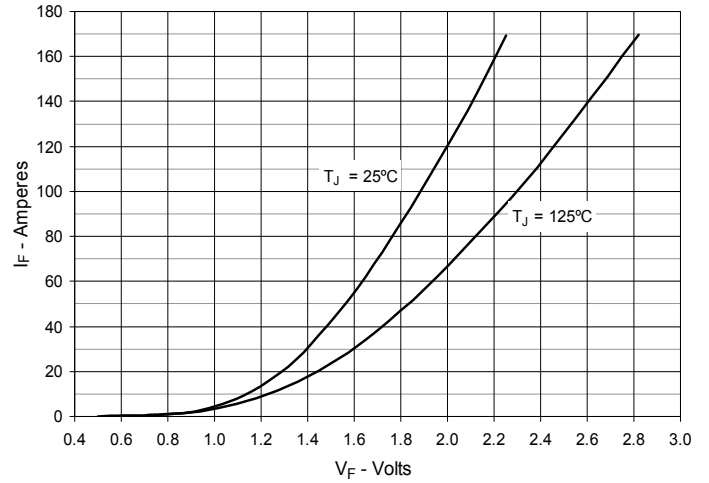
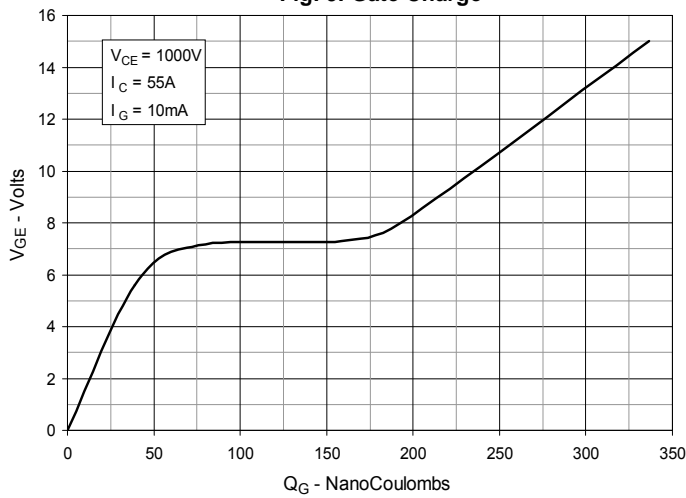
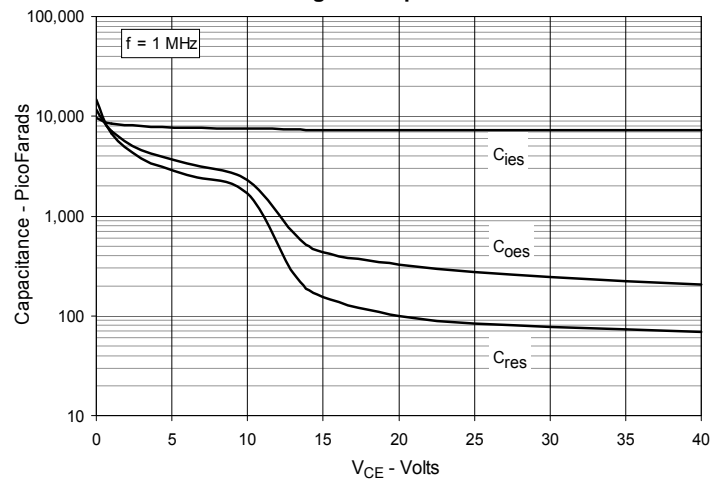
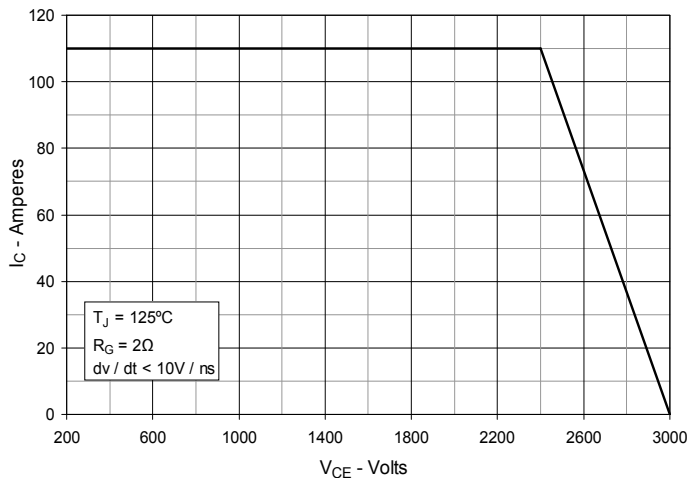
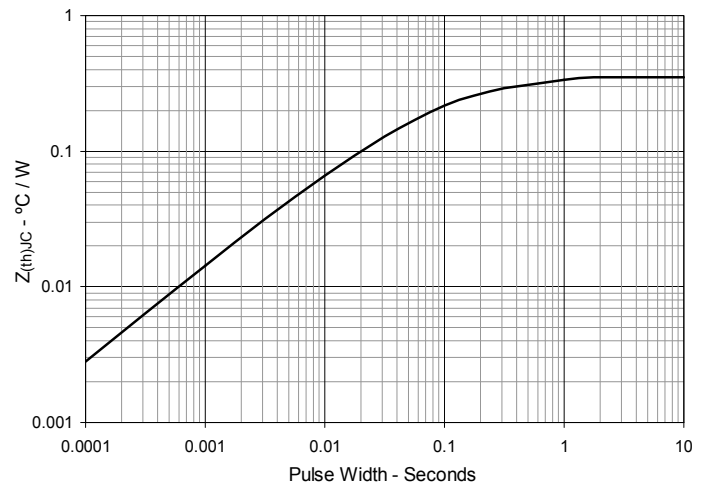


**Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage**

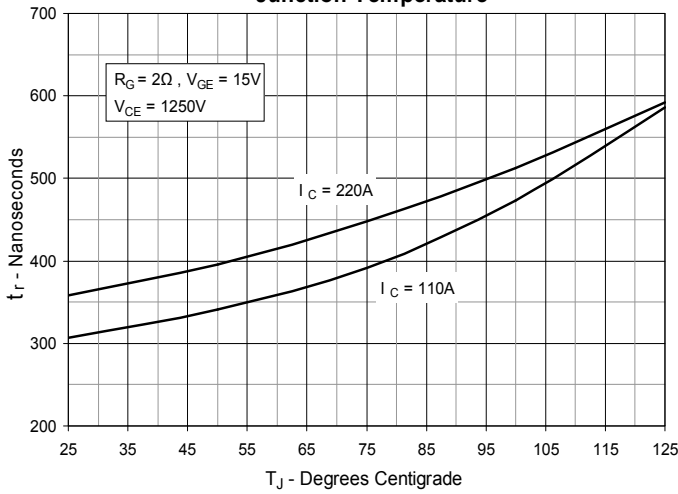


**Fig. 6. Input Admittance**

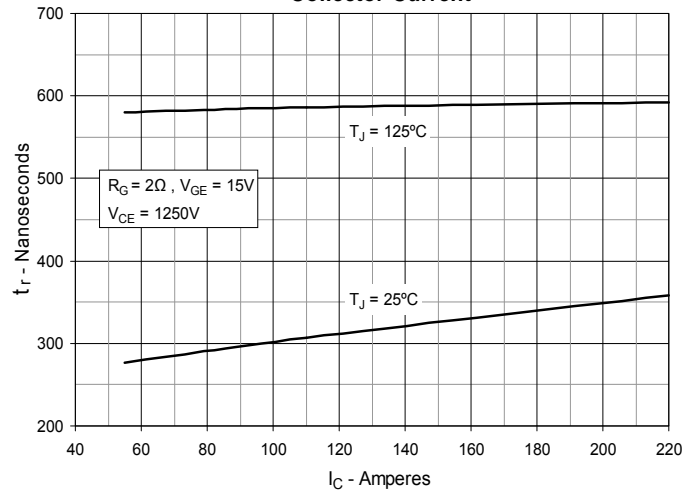


**Fig. 7. Transconductance**

**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**


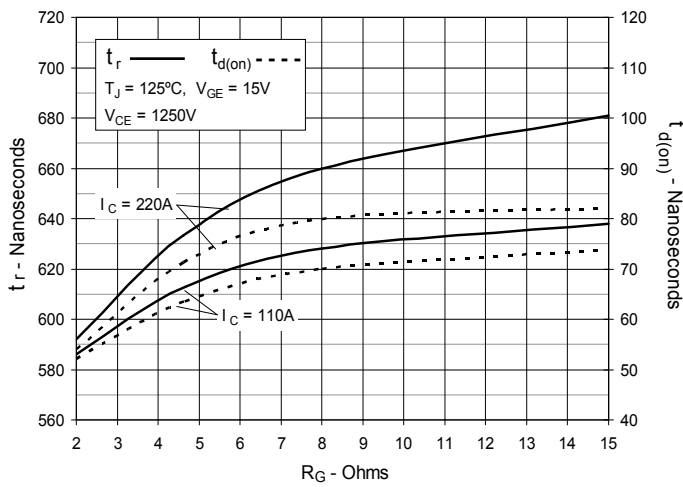
**Fig. 13. Resistive Turn-on Rise Time vs. Junction Temperature**



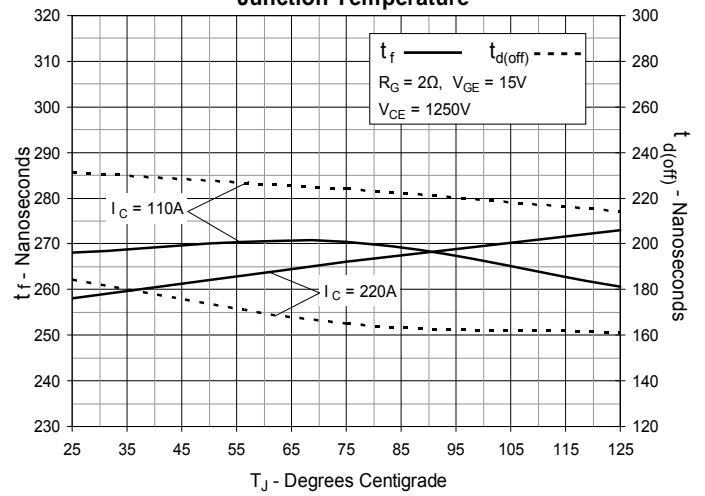
**Fig. 14. Resistive Turn-on Rise Time vs. Collector Current**



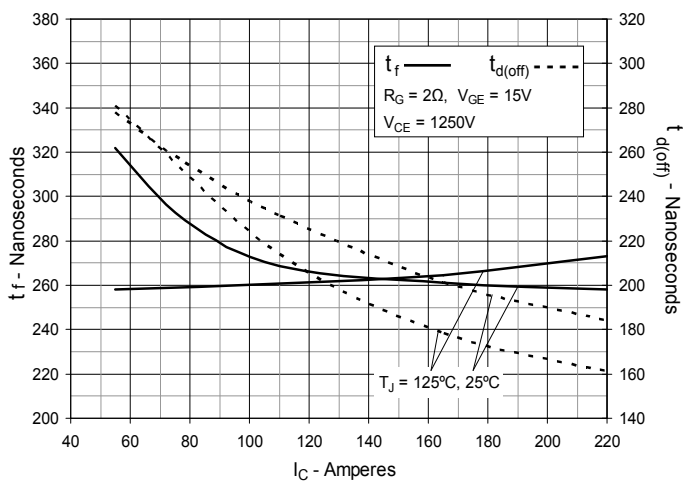
**Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance**



**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**

