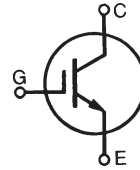


# High Voltage IGBT

## For Capacitor Discharge Applications

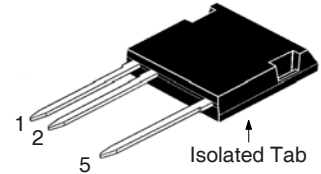
# IXGF36N300

$V_{CES} = 3000V$   
 $I_{C25} = 36A$   
 $V_{CE(sat)} \leq 2.7V$



( Electrically Isolated Tab )

### ISOPLUS i4-Pak™



1 = Gate  
 2 = Emitter  
 5 = Collector

Symbol	Test Conditions	Maximum Ratings	
$V_{CES}$	$T_J = 25^\circ C$ to $150^\circ C$	3000	V
$V_{GES}$	Continuous	$\pm 20$	V
$V_{GEM}$	Transient	$\pm 30$	V
$I_{C25}$	$T_C = 25^\circ C$	36	A
$I_{C110}$	$T_C = 110^\circ C$	18	A
$I_{CM}$	$T_C = 25^\circ C, V_{GE} = 20V, 1ms$	400	A
<b>SSOA</b>	$V_{GE} = 20V, T_{VJ} = 125^\circ C, R_G = 2\Omega$	$I_{CM} = 300$	A
<b>(RBSOA)</b>	Clamped Inductive Load	$V_{CE} \leq 0.8 \cdot V_{CES}$	
$P_C$	$T_C = 25^\circ C$	160	W
$T_J$		-55 ... +150	$^\circ C$
$T_{JM}$		150	$^\circ C$
$T_{stg}$		-55 ... +150	$^\circ C$
$T_L$	1.6 mm (0.062 in.) from Case for 10s	300	$^\circ C$
$T_{SOLD}$	Plastic Body for 10s	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

### Features

- Silicon Chip on Direct-Copper Bond (DCB) Substrate
- Isolated Mounting Surface
- 4000V Electrical Isolation
- High Peak Current Capability
- Low Saturation Voltage
- Molding Epoxies Meet UL 94 V-0 Flammability Classification

### Applications

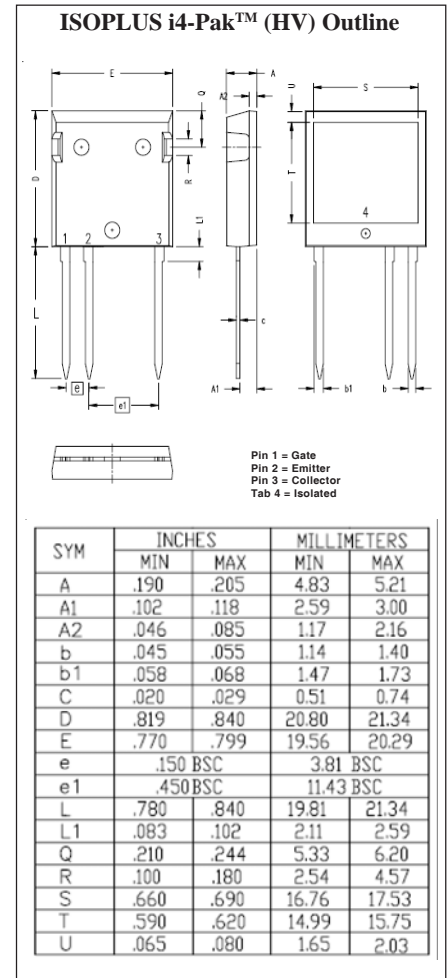
- Capacitor Discharge
- Pulser Circuits

### Advantages

- High Power Density
- Easy to Mount

Symbol	Test Conditions ( $T_J = 25^\circ C$ , Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$BV_{CES}$	$I_C = 250\mu A, V_{GE} = 0V$	3000		V
$V_{GE(th)}$	$I_C = 250\mu A, V_{CE} = V_{GE}$	3.0		5.0 V
$I_{CES}$	$V_{CE} = 0.8 \cdot V_{CES}, V_{GE} = 0V$ Note 2, $T_J = 125^\circ C$			50 $\mu A$ 2 mA
$I_{GES}$	$V_{CE} = 0V, V_{GE} = \pm 20V$			$\pm 200$ nA
$V_{CE(sat)}$	$I_C = 36A, V_{GE} = 15V, \text{Note 1}$ $I_C = 100A$			2.7 V 5.2 V

Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ , Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$g_{fs}$	$I_C = 36\text{A}$ , $V_{CE} = 10\text{V}$ , Note 1	15	25	S
$I_{C(ON)}$	$V_{GE} = 15\text{V}$ , $V_{CE} = 20\text{V}$ , Note 1		360	A
$C_{ies}$	$V_{CE} = 25\text{V}$ , $V_{GE} = 0\text{V}$ , $f = 1\text{MHz}$		2690	pF
$C_{oes}$			123	pF
$C_{res}$			34	pF
$Q_g$	$I_C = 30\text{A}$ , $V_{GE} = 15\text{V}$ , $V_{CE} = 600\text{V}$		136	nC
$Q_{ge}$			21	nC
$Q_{gc}$			52	nC
$t_{d(on)}$	<b>Resistive Switching Times</b> $I_C = 36\text{A}$ , $V_{GE} = 15\text{V}$ $V_{CE} = 1500\text{V}$ , $R_G = 2\Omega$		36	ns
$t_r$			185	ns
$t_{d(off)}$			215	ns
$t_f$			540	ns
$R_{thJC}$				0.78 $^\circ\text{C/W}$
$R_{thCS}$		0.15		$^\circ\text{C/W}$
$R_{thJA}$		30		$^\circ\text{C/W}$

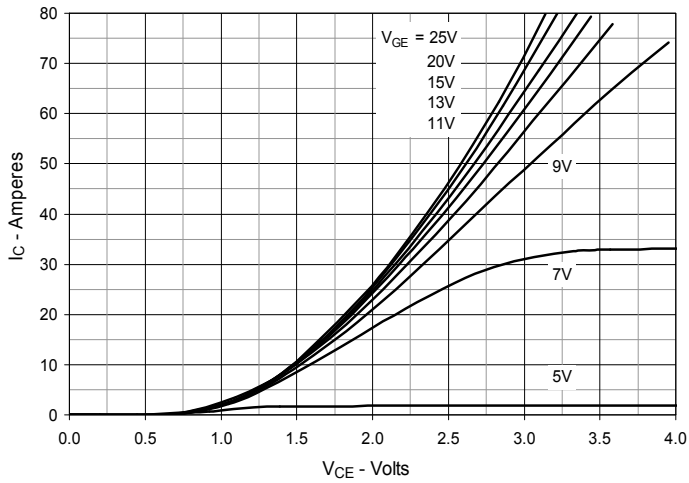
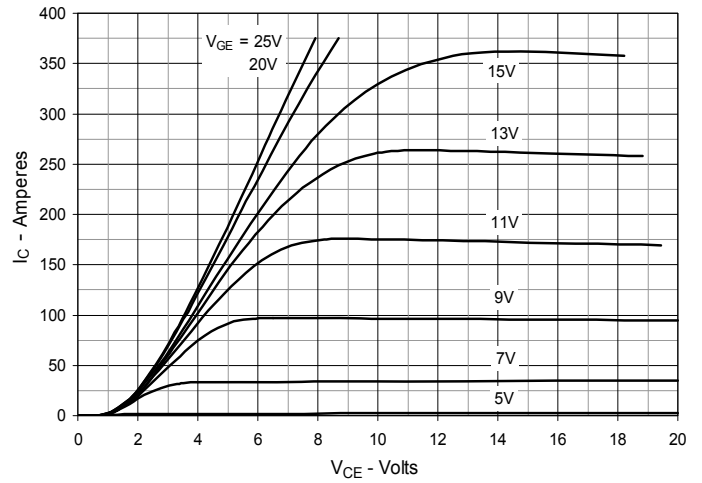
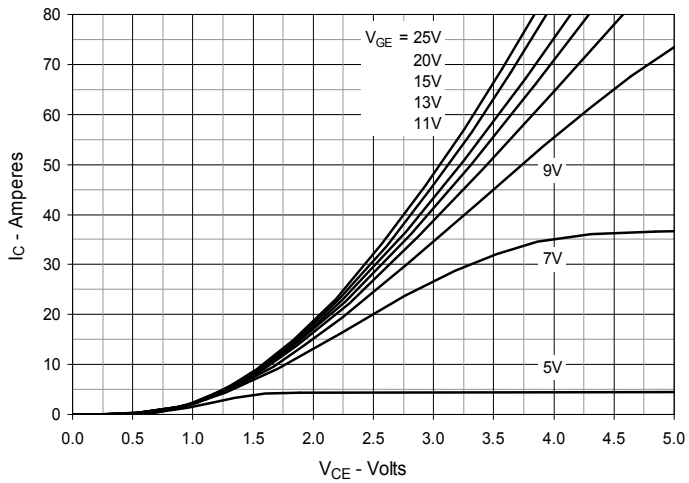
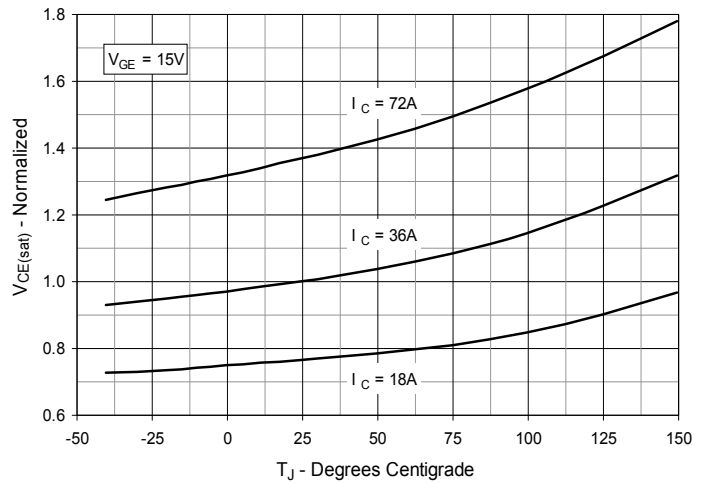
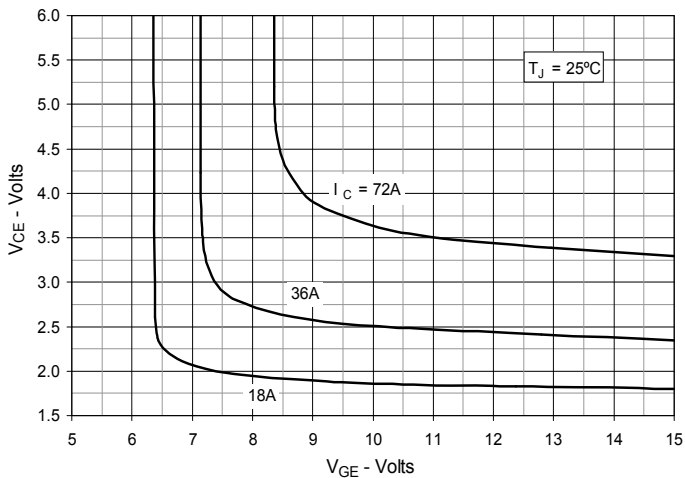
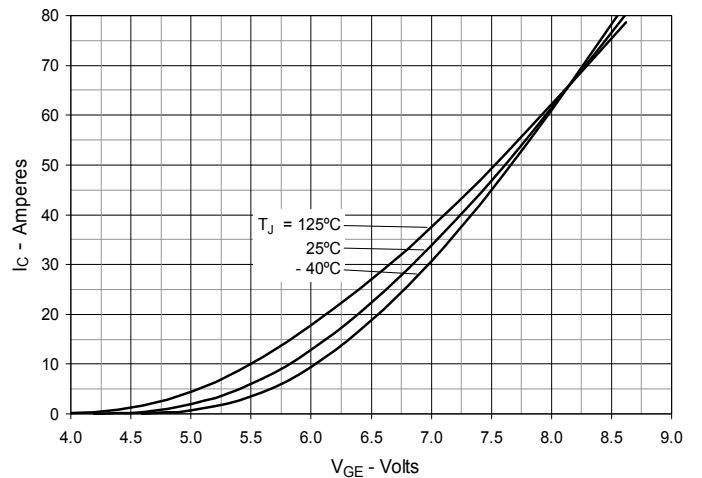


**Notes:**

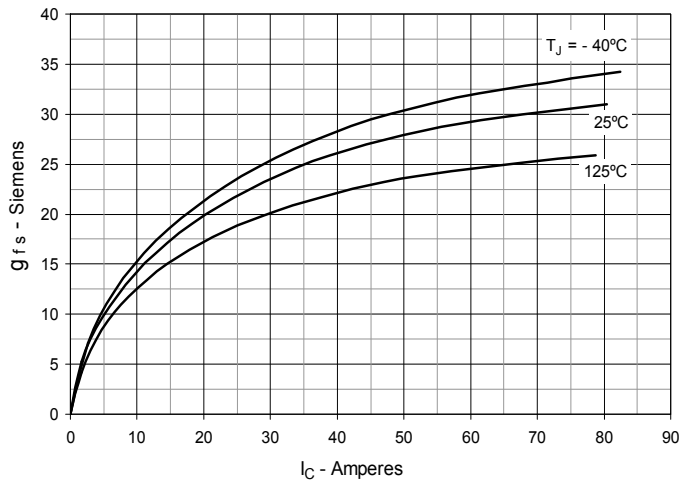
1. Pulse test,  $t < 300\mu\text{s}$ , duty cycle,  $d < 2\%$ .
2. Device must be heatsunk for high-temperature leakage current measurements to avoid thermal runaway.

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

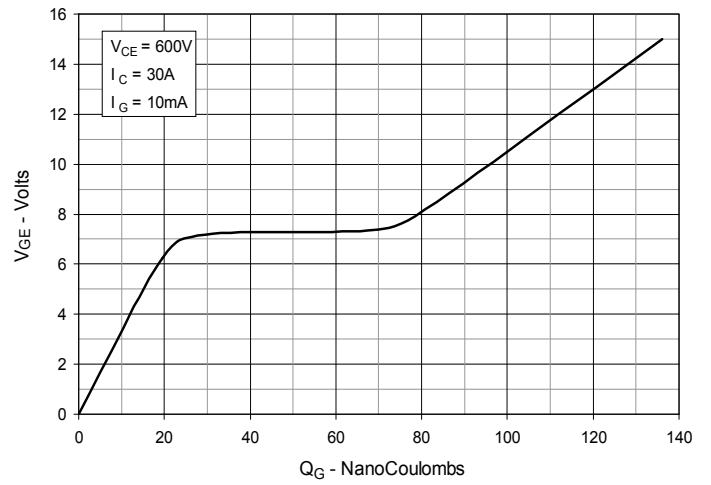
IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents:	4,835,592	4,931,844	5,049,961	5,237,481	6,162,665	6,404,065 B1	6,683,344	6,727,585	7,005,734 B2	7,157,338B2
	4,850,072	5,017,508	5,063,307	5,381,025	6,259,123 B1	6,534,343	6,710,405 B2	6,759,692	7,063,975 B2	
	4,881,106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


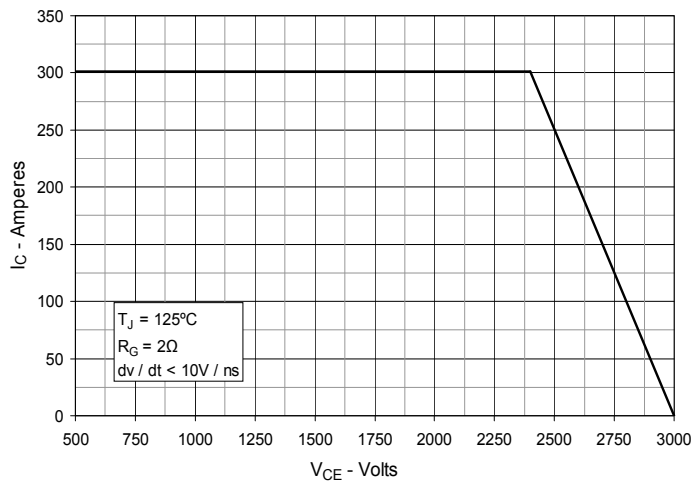
**Fig. 7. Transconductance**



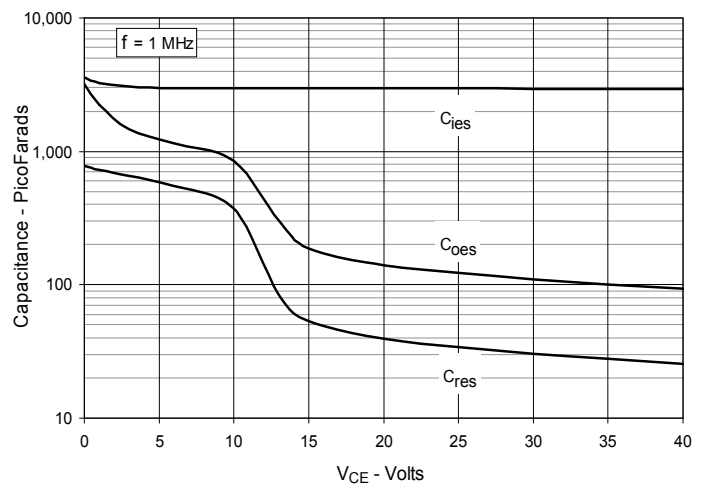
**Fig. 8. Gate Charge**



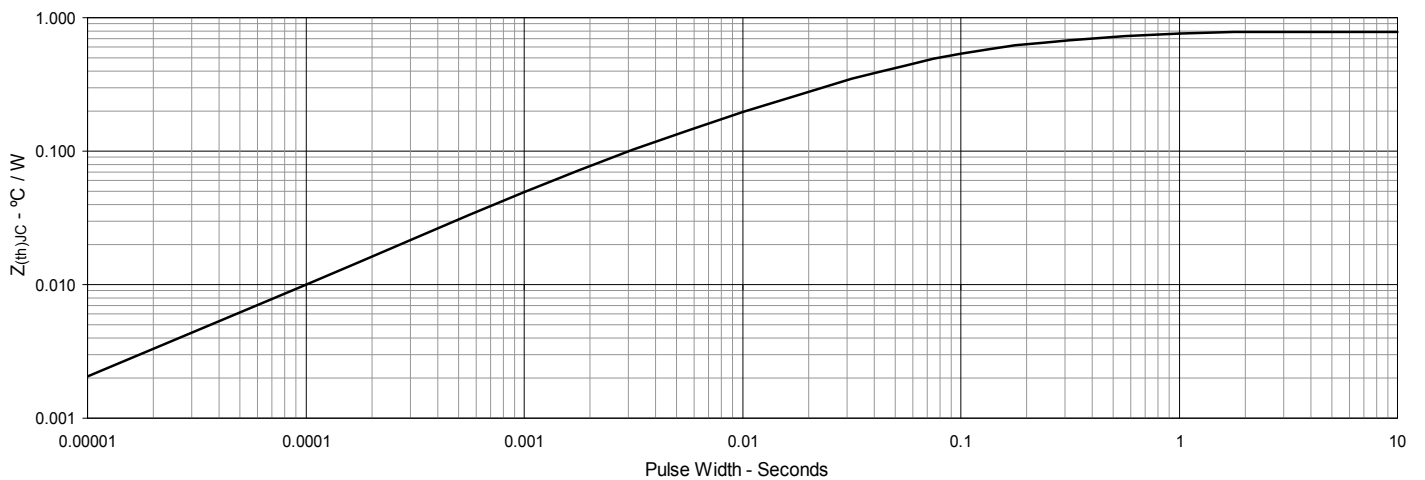
**Fig. 9. Reverse-Bias Safe Operating Area**



**Fig. 10. Capacitance**

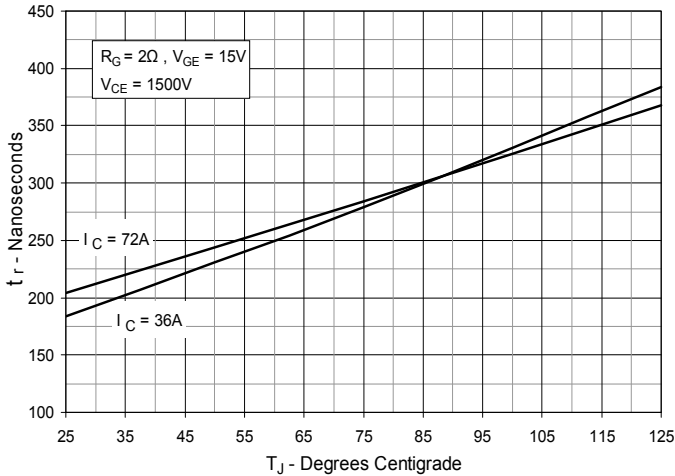


**Fig. 11. Maximum Transient Thermal Impedance**

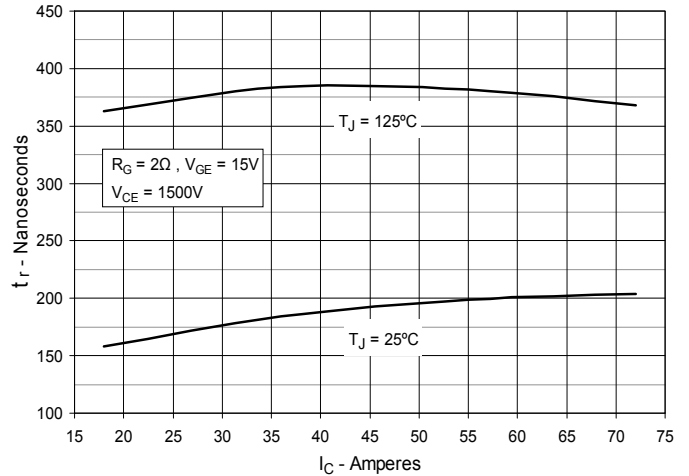


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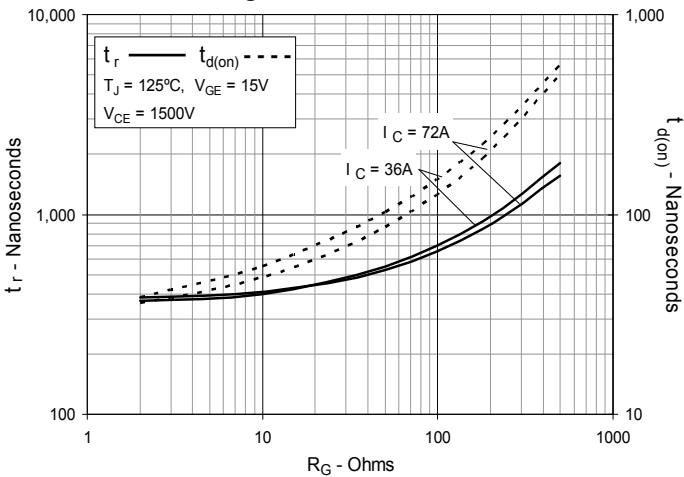
**Fig. 12. Resistive Turn-on Rise Time vs. Junction Temperature**



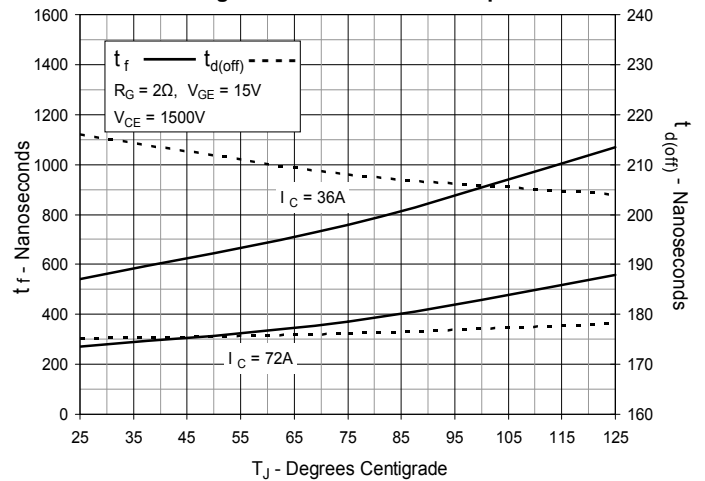
**Fig. 13. Resistive Turn-on Rise Time vs. Drain Current**



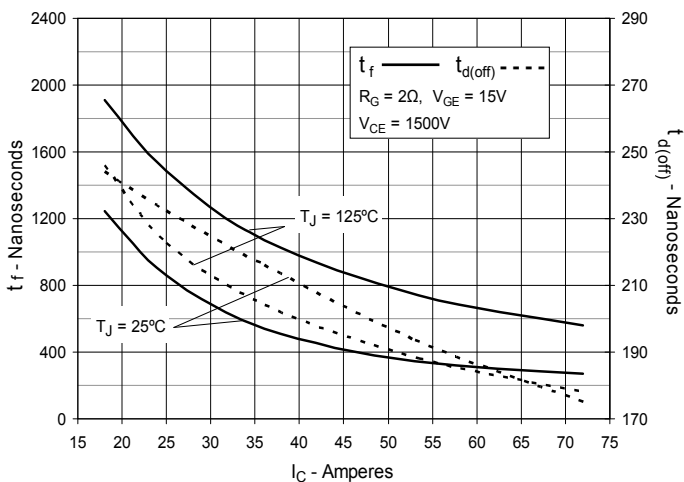
**Fig. 14. Resistive Turn-on Switching Times vs. Gate Resistance**



**Fig. 15. Resistive Turn-off Switching Times vs. Junction Temperature**



**Fig. 16. Resistive Turn-off Switching Times vs. Drain Current**



**Fig. 17. Resistive Turn-off Switching Times vs. Gate Resistance**

