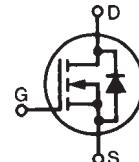


# TrenchT2™ GigaMOS™ Power MOSFET

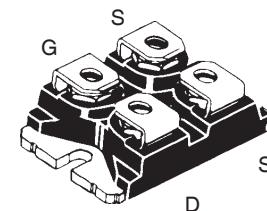
## IXTN600N04T2

**V<sub>DSS</sub>** = 40V  
**I<sub>D25</sub>** = 600A  
**R<sub>DS(on)</sub>** ≤ 1.3mΩ



N-Channel Enhancement Mode  
 Avalanche Rated  
 Fast Intrinsic Diode

miniBLOC, SOT-227  
 E153432



G = Gate      D = Drain  
 S = Source

Either Source Terminal S can be used as the Source Terminal or the Kelvin Source (Gate Return) Terminal.

Symbol	Test Conditions	Maximum Ratings	
V <sub>DSS</sub>	T <sub>J</sub> = 25°C to 175°C	40	V
V <sub>DGR</sub>	T <sub>J</sub> = 25°C to 175°C, R <sub>GS</sub> = 1MΩ	40	V
V <sub>GSM</sub>	Transient	±20	V
I <sub>D25</sub>	T <sub>C</sub> = 25°C (Chip Capability)	600	A
I <sub>L(RMS)</sub>	External Lead Current Limit	200	A
I <sub>DM</sub>	T <sub>C</sub> = 25°C, Pulse Width Limited by T <sub>JM</sub>	1800	A
I <sub>A</sub>	T <sub>C</sub> = 25°C	200	A
E <sub>AS</sub>	T <sub>C</sub> = 25°C	3	J
P <sub>D</sub>	T <sub>C</sub> = 25°C	940	W
T <sub>J</sub>		-55 ... +175	°C
T <sub>JM</sub>		175	°C
T <sub>stg</sub>		-55 ... +175	°C
T <sub>L</sub>	1.6mm (0.062 in.) from Case for 10s	300	°C
T <sub>SOLD</sub>	Plastic Body for 10s	260	°C
V <sub>ISOL</sub>	50/60 Hz, RMS      t = 1 minute	2500	V~
	I <sub>ISOL</sub> ≤ 1mA      t = 1 second	3000	V~
M <sub>d</sub>	Mounting Torque	1.5/13	Nm/lb.in.
	Terminal Connection Torque	1.3/11.5	Nm/lb.in.
Weight		30	g

Symbol	Test Conditions (T <sub>J</sub> = 25°C, Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
BV <sub>DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	40		V
V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	1.5		V
I <sub>GS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V			±200 nA
I <sub>DSS</sub>	V <sub>DS</sub> = V <sub>DSS</sub> , V <sub>GS</sub> = 0V T <sub>J</sub> = 150°C			10 μA 1 mA
R <sub>DS(on)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 100A, Note 1			1.3 mΩ

### Features

- International Standard Package
- miniBLOC, with Aluminium Nitride Isolation
- 175°C Operating Temperature
- Isolation Voltage 2500 V~
- High Current Handling Capability
- Fast Intrinsic Diode
- Avalanche Rated
- Low R<sub>DS(on)</sub>

### Advantages

- Easy to Mount
- Space Savings
- High Power Density

### Applications

- DC-DC Converters and Off-Line UPS
- Primary-Side Switch
- High Speed Power Switching Applications

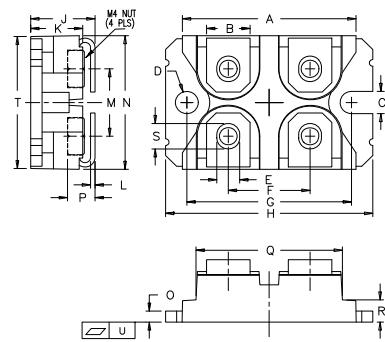
Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ , Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$g_{fs}$	$V_{DS} = 10\text{V}$ , $I_D = 60\text{A}$ , Note 1	90	150	S
$C_{iss}$			40	nF
$C_{oss}$			6400	pF
$C_{rss}$			1470	pF
$R_{GI}$	Gate Input Resistance	1.32		$\Omega$
$t_{d(on)}$	<b>Resistive Switching Times</b> $V_{GS} = 10\text{V}$ , $V_{DS} = 0.5 \cdot V_{DSS}$ , $I_D = 200\text{A}$ $R_G = 1\Omega$ (External)	40		ns
$t_r$		20		ns
$t_{d(off)}$		90		ns
$t_f$		250		ns
$Q_{g(on)}$		590		nC
$Q_{gs}$		127		nC
$Q_{gd}$		163		nC
$R_{thJC}$			0.16	$^\circ\text{C}/\text{W}$
$R_{thCS}$		0.05		$^\circ\text{C}/\text{W}$

### Source-Drain Diode

Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ , Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$I_s$	$V_{GS} = 0\text{V}$		600	A
$I_{SM}$	Repetitive, Pulse Width Limited by $T_{JM}$		1800	A
$V_{SD}$	$I_F = 100\text{A}$ , $V_{GS} = 0\text{V}$ , Note 1		1.2	V
$t_{rr}$	$I_F = 150\text{A}$ , $V_{GS} = 0\text{V}$ -di/dt = $100\text{A}/\mu\text{s}$ $V_R = 20\text{V}$	100		ns
$I_{RM}$		3.3		A
$Q_{RM}$		165		nC

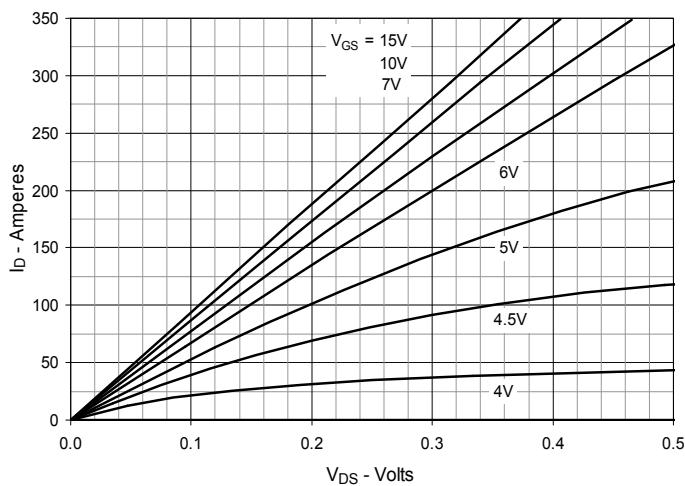
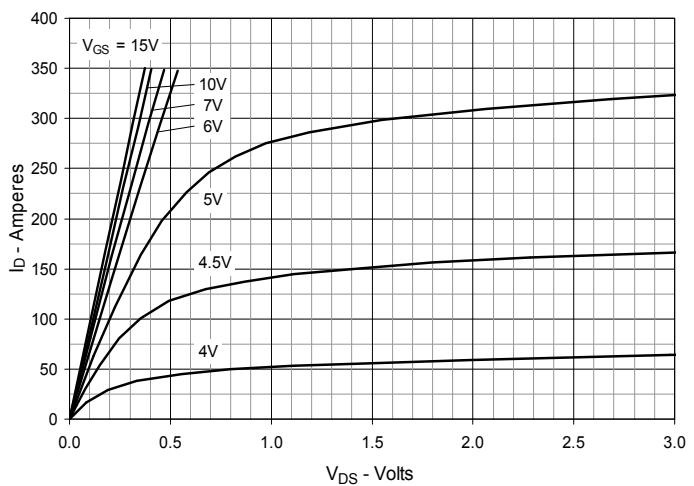
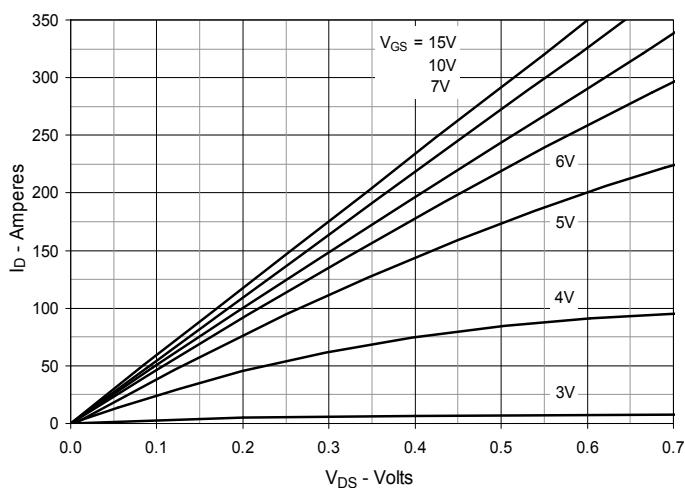
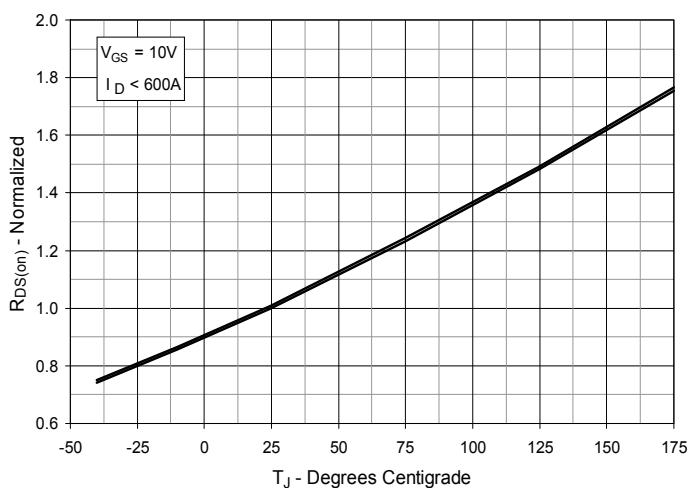
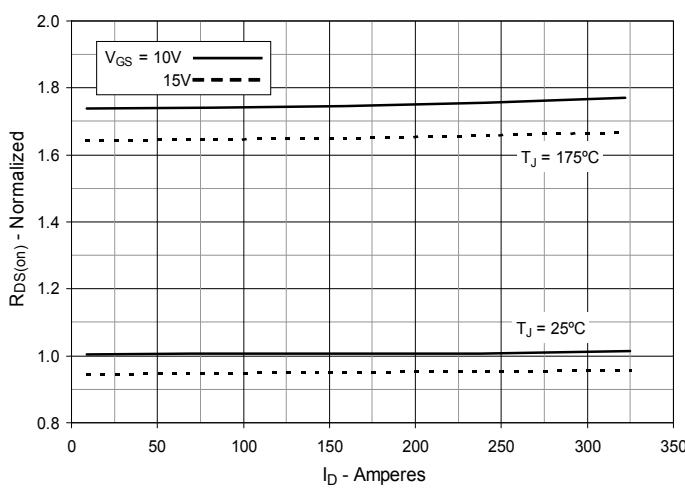
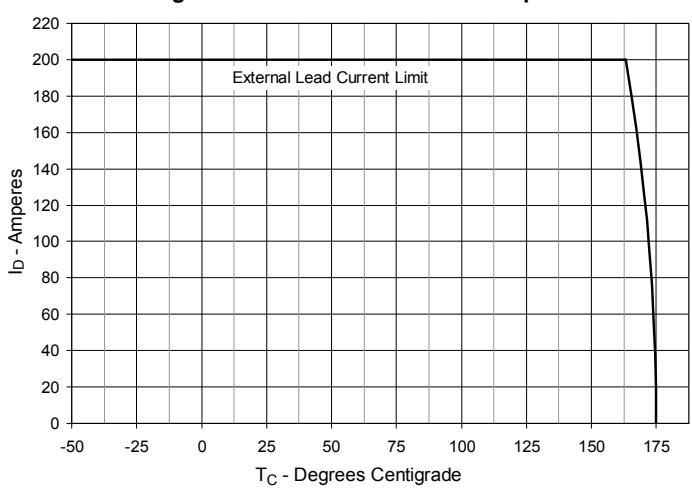
Note 1. Pulse test,  $t \leq 300\mu\text{s}$ , duty cycle,  $d \leq 2\%$ .

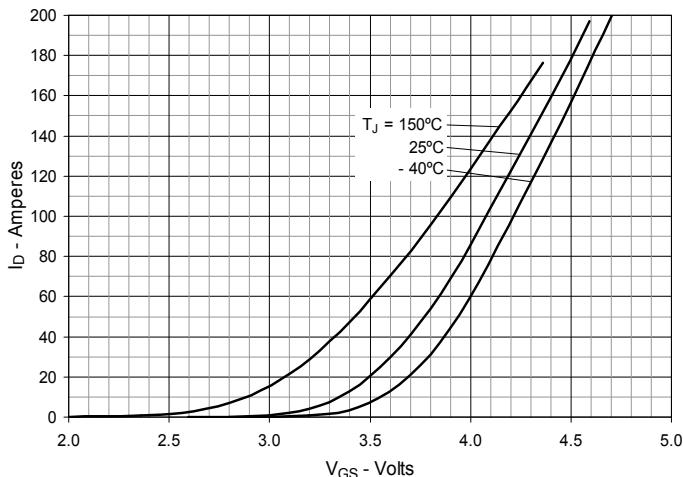
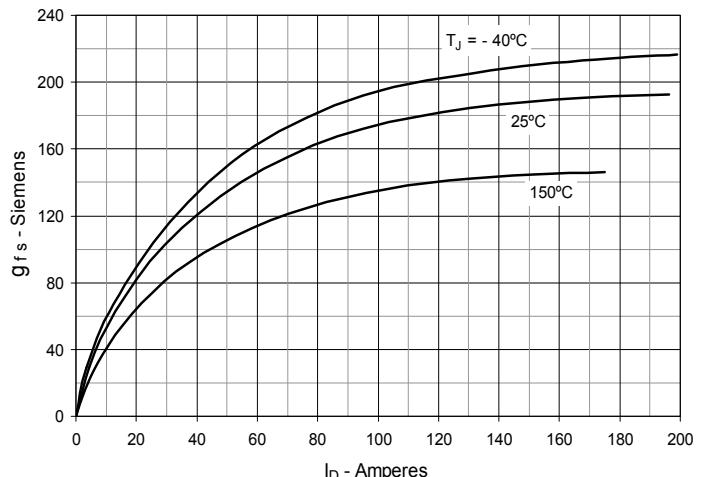
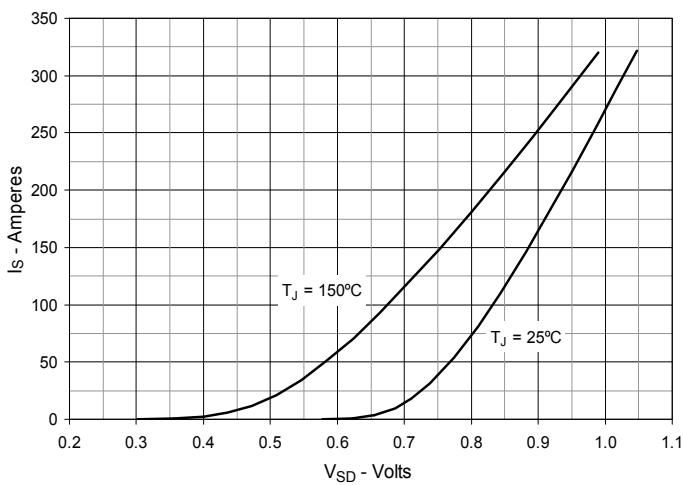
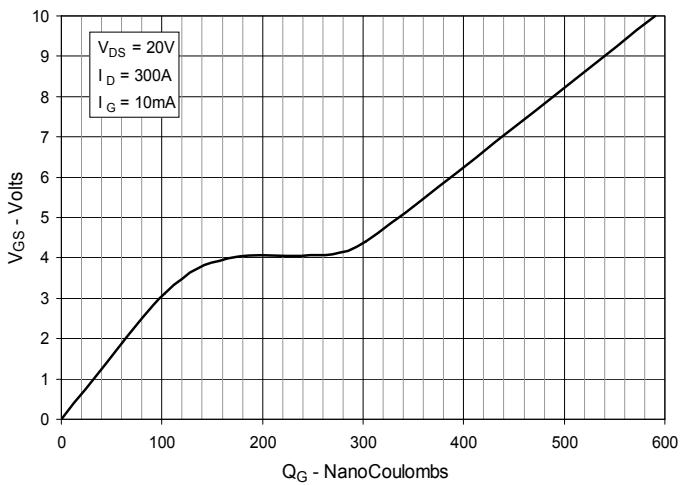
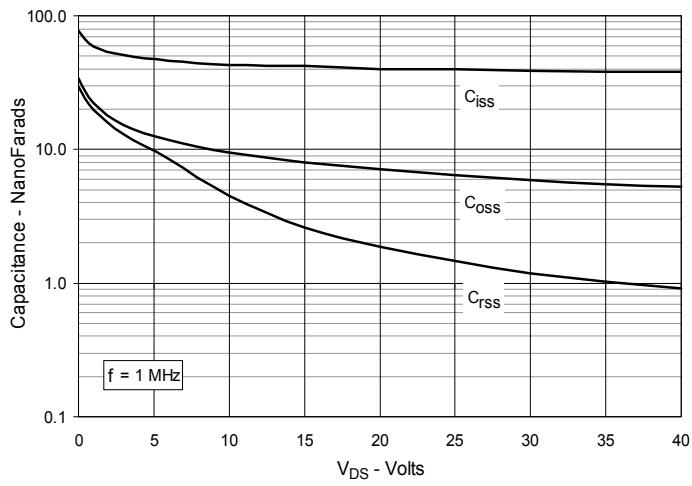
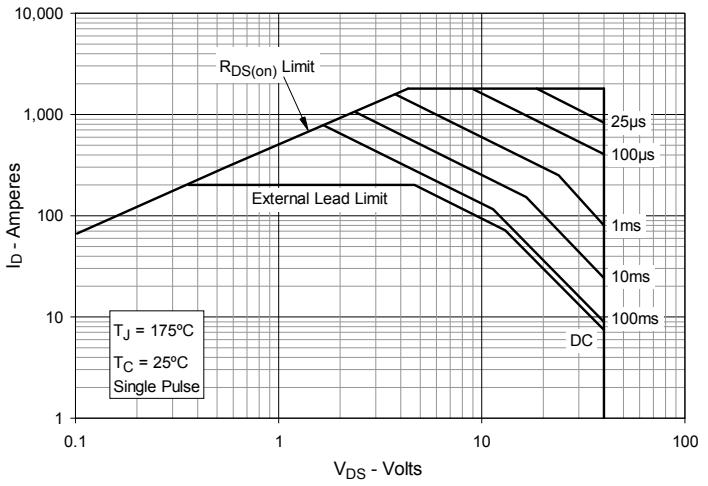
### SOT-227B (IXTN) Outline



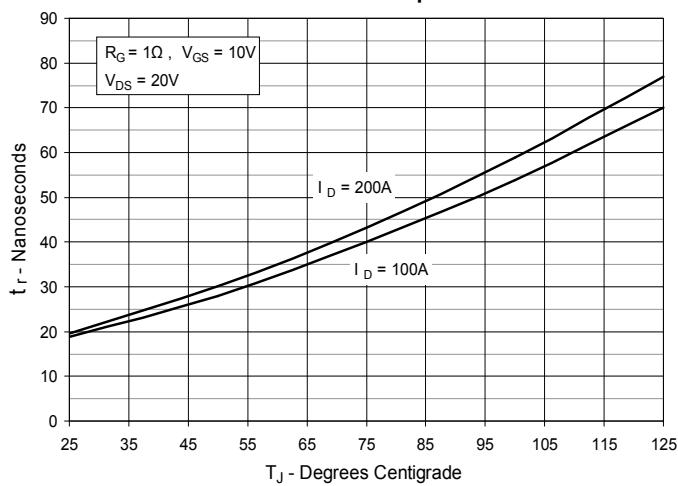
(M4 screws (4x) supplied)

SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	1.240	1.255	31.50	31.88
B	.307	.323	7.80	8.20
C	.161	.169	4.09	4.29
D	.161	.169	4.09	4.29
E	.161	.169	4.09	4.29
F	.587	.595	14.91	15.11
G	1.186	1.193	30.12	30.30
H	1.496	1.505	38.00	38.23
J	.460	.481	11.68	12.22
K	.351	.378	8.92	9.60
L	.030	.033	.76	0.84
M	.496	.506	12.60	12.85
N	.990	1.001	25.15	25.42
O	.078	.084	1.98	2.13
P	.195	.235	4.95	5.97
Q	1.045	1.059	26.54	26.90
R	.155	.174	3.94	4.42
S	.186	.191	4.72	4.85
T	.968	.987	24.59	25.07
U	-.002	.004	-0.05	0.1

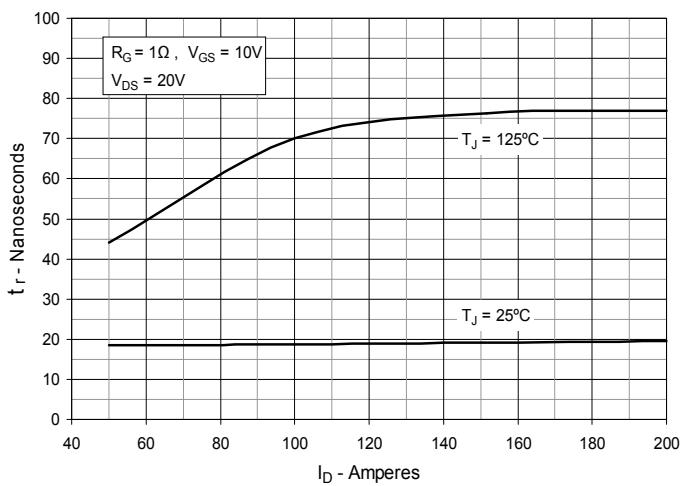
**Fig. 1. Output Characteristics @  $T_J = 25^\circ\text{C}$** **Fig. 2. Extended Output Characteristics @  $T_J = 25^\circ\text{C}$** **Fig. 3. Output Characteristics @  $T_J = 150^\circ\text{C}$** **Fig. 4. Normalized  $R_{DS(on)}$  vs. Junction Temperature****Fig. 5. Normalized  $R_{DS(on)}$  vs. Drain Current****Fig. 6. Drain Current vs. Case Temperature**

**Fig. 7. Input Admittance****Fig. 8. Transconductance****Fig. 9. Forward Voltage Drop of Intrinsic Diode****Fig. 10. Gate Charge****Fig. 11. Capacitance****Fig. 12. Forward-Bias Safe Operating Area**

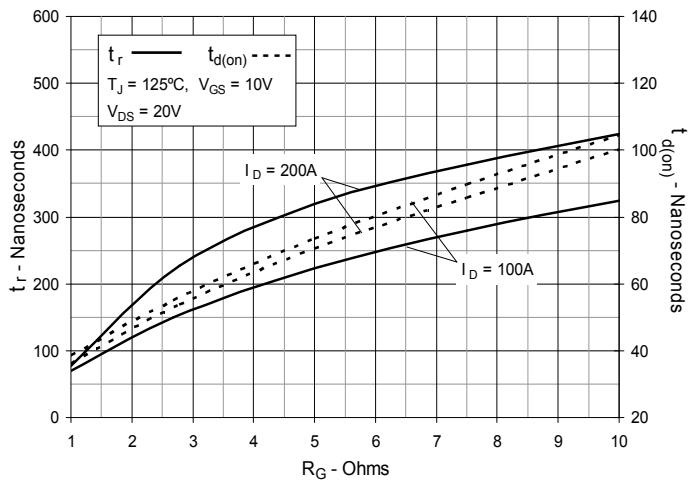
**Fig. 13. Resistive Turn-on Rise Time vs. Junction Temperature**



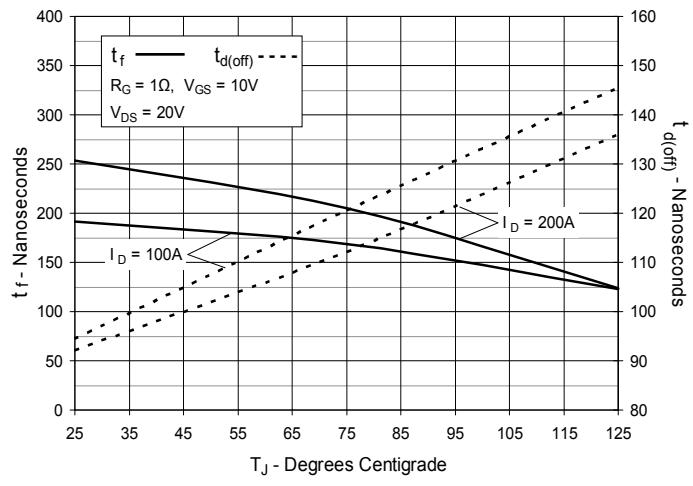
**Fig. 14. Resistive Turn-on Rise Time vs. Drain Current**



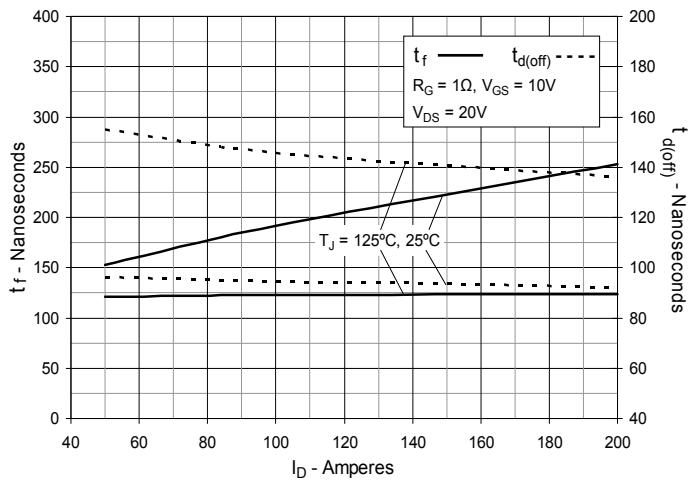
**Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance**



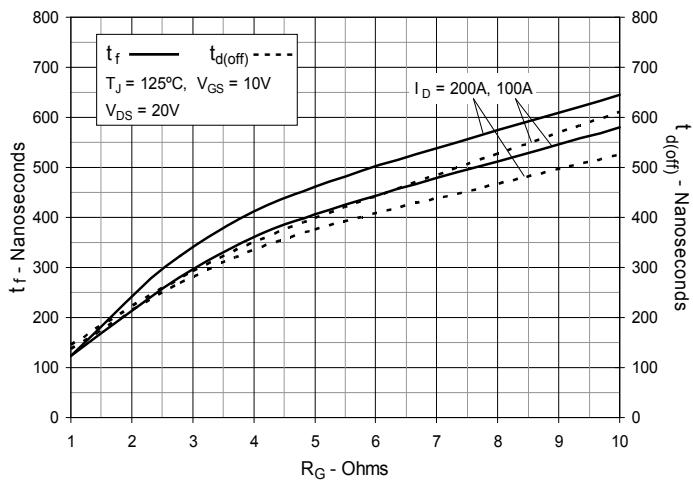
**Fig. 16. Resistive Turn-off Switching Times vs. Junction Temperature**



**Fig. 17. Resistive Turn-off Switching Times vs. Drain Current**



**Fig. 18. Resistive Turn-off Switching Times vs. Gate Resistance**



**Fig. 19. Maximum Transient Thermal Impedance**