

# GigaMOS™ TrenchT2

## HiperFET™

### Power MOSFET

# IXFN320N17T2

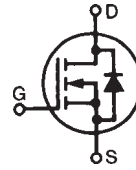
$$V_{DSS} = 170V$$

$$I_{D25} = 260A$$

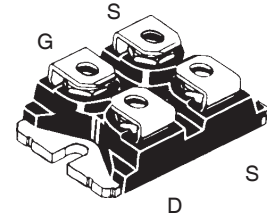
$$R_{DS(on)} \leq 5.2m\Omega$$

$$t_{rr} \leq 150ns$$

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	
$V_{DSS}$	$T_J = 25^\circ\text{C}$ to $175^\circ\text{C}$	170	V
$V_{DGR}$	$T_J = 25^\circ\text{C}$ to $175^\circ\text{C}$ , $R_{GS} = 1M\Omega$	170	V
$V_{GSS}$	Continuous	$\pm 20$	V
$V_{GSM}$	Transient	$\pm 30$	V
$I_{D25}$	$T_C = 25^\circ\text{C}$ (Chip Capability)	260	A
$I_{L(RMS)}$	External Lead Current Limit	200	A
$I_{DM}$	$T_C = 25^\circ\text{C}$ , Pulse Width Limited by $T_{JM}$	800	A
$I_A$	$T_C = 25^\circ\text{C}$	100	A
$E_{AS}$	$T_C = 25^\circ\text{C}$	5	J
$dV/dt$	$I_S \leq I_{DM}$ , $V_{DD} \leq V_{DSS}$ , $T_J \leq 175^\circ\text{C}$	20	V/ns
$P_D$	$T_C = 25^\circ\text{C}$	1070	W
$T_J$		-55 ... +175	$^\circ\text{C}$
$T_{JM}$		175	$^\circ\text{C}$
$T_{stg}$		-55 ... +175	$^\circ\text{C}$
$T_L$	1.6mm (0.062 in.) from Case for 10s	300	$^\circ\text{C}$
$T_{SOLD}$	Plastic Body for 10s	260	$^\circ\text{C}$
$V_{ISOL}$	50/60 Hz, RMS $t = 1$ minute	2500	V~
	$I_{ISOL} \leq 1\text{mA}$ $t = 1$ second	3000	V~
$M_d$	Mounting Torque	1.5/13	Nm/lb.in.
	Terminal Connection Torque	1.3/11.5	Nm/lb.in.
<b>Weight</b>		30	g

### Features

- International Standard Package
- miniBLOC, with Aluminium Nitride Isolation
- Isolation Voltage 2500 V~
- High Current Handling Capability
- Fast Intrinsic Diode
- Avalanche Rated
- Low  $R_{DS(on)}$

### Advantages

- Easy to Mount
- Space Savings
- High Power Density

### Applications

- Synchronous Rectification
- DC-DC Converters
- Battery Chargers
- Switched-Mode and Resonant-Mode Power Supplies
- DC Choppers
- AC Motor Drives
- Uninterruptible Power Supplies
- High Speed Power Switching Applications

Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ , Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$BV_{DSS}$	$V_{GS} = 0V$ , $I_D = 3\text{mA}$	170		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = 8\text{mA}$	2.5		5.0 V
$I_{GSS}$	$V_{GS} = \pm 20V$ , $V_{DS} = 0V$			$\pm 200$ nA
$I_{DSS}$	$V_{DS} = V_{DSS}$ , $V_{GS} = 0V$ $T_J = 150^\circ\text{C}$			50 $\mu\text{A}$ 5 mA
$R_{DS(on)}$	$V_{GS} = 10V$ , $I_D = 60A$ , Note 1			5.2 m $\Omega$

Symbol	Test Conditions	Characteristic Values		
		Min.	Typ.	Max.
$g_{fs}$	$V_{DS} = 10V, I_D = 60A$ , Note 1	120	190	S
$C_{iss}$	$V_{GS} = 0V, V_{DS} = 25V, f = 1MHz$		45	nF
$C_{oss}$			2890	pF
$C_{rss}$			410	pF
$R_{Gi}$	Gate Input Resistance		1.96	$\Omega$
$t_{d(on)}$	<b>Resistive Switching Times</b> $V_{GS} = 10V, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 100A$ $R_G = 1\Omega$ (External)		46	ns
$t_r$			170	ns
$t_{d(off)}$			115	ns
$t_f$			230	ns
$Q_{g(on)}$	$V_{GS} = 10V, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 160A$		640	nC
$Q_{gs}$			185	nC
$Q_{gd}$			175	nC
$R_{thJC}$			0.14	$^{\circ}C/W$
$R_{thCS}$		0.05		$^{\circ}C/W$

### Source-Drain Diode

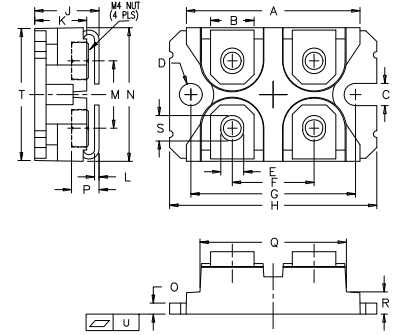
Symbol	Test Conditions	Characteristic Values		
		Min.	Typ.	Max.
$I_S$	$V_{GS} = 0V$			320 A
$I_{SM}$	Repetitive, Pulse Width Limited by $T_{JM}$			1280 A
$V_{SD}$	$I_F = 100A, V_{GS} = 0V$ , Note 1			1.25 V
$t_{rr}$	$I_F = 160A, -di/dt = 100A/\mu s$ $V_R = 60V, V_{GS} = 0V$			150 ns
$Q_{RM}$			0.53	$\mu C$
$I_{RM}$			9.00	A

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

### 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.

### SOT-227B (IXFN) Outline

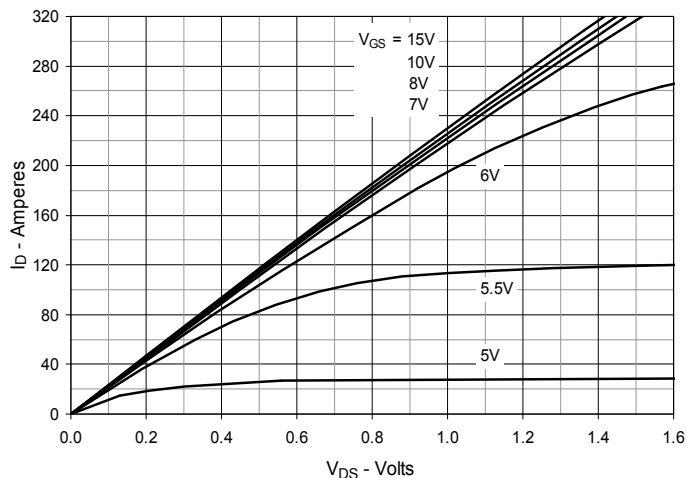


(M4 screws (4x) supplied)

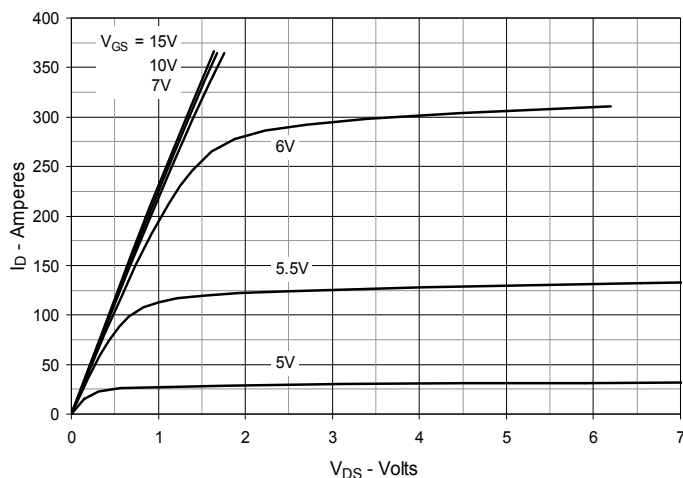
SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	1.240	1.255	31.50	31.88
B	.307	.323	7.80	8.20
C	.161	.169	4.09	4.29
D	.161	.169	4.09	4.29
E	.161	.169	4.09	4.29
F	.587	.595	14.91	15.11
G	1.186	1.193	30.12	30.30
H	1.496	1.505	38.00	38.23
J	.460	.481	11.68	12.22
K	.351	.378	8.92	9.60
L	.030	.033	0.76	0.84
M	.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

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

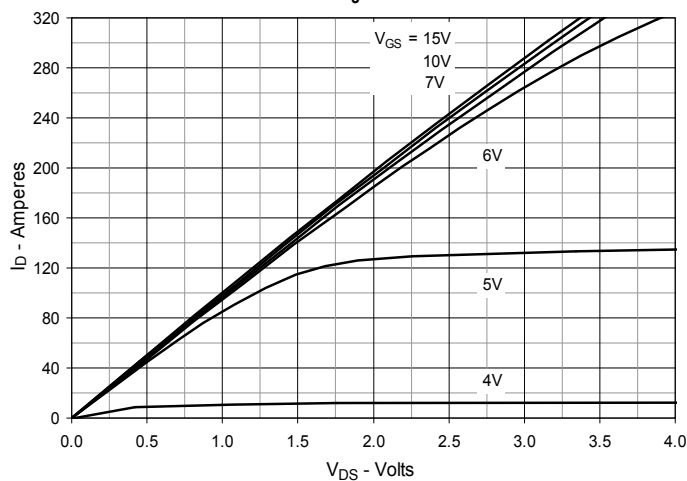
**Fig. 1. Output Characteristics**  
@  $T_J = 25^\circ\text{C}$



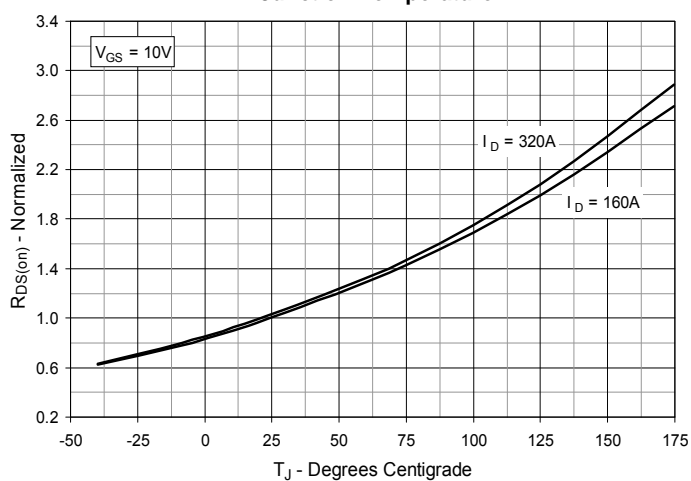
**Fig. 2. Extended Output Characteristics**  
@  $T_J = 25^\circ\text{C}$



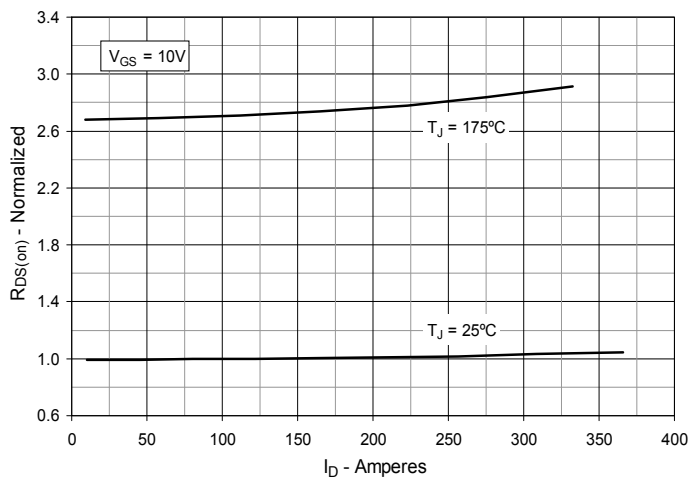
**Fig. 3. Output Characteristics**  
@  $T_J = 150^\circ\text{C}$



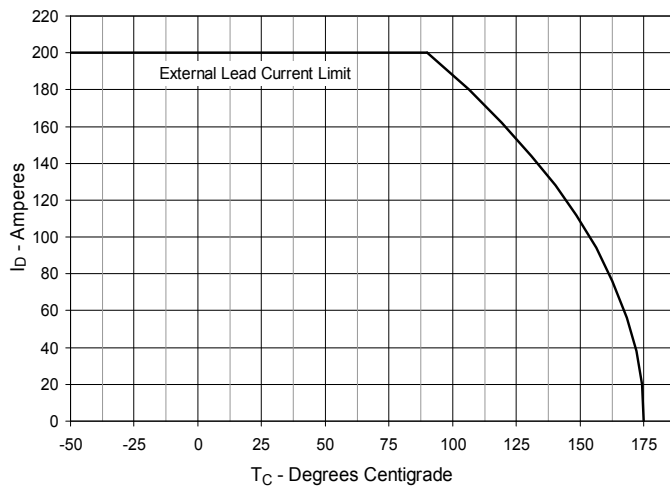
**Fig. 4.  $R_{DS(on)}$  Normalized to  $I_D = 160\text{A}$  Value vs. Junction Temperature**



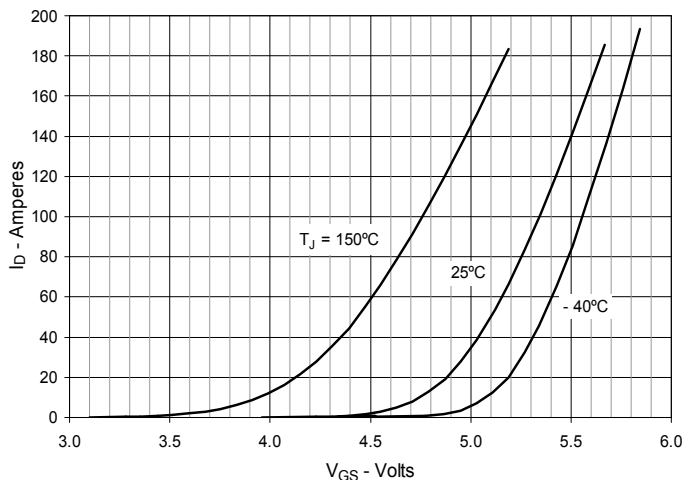
**Fig. 5.  $R_{DS(on)}$  Normalized to  $I_D = 160\text{A}$  Value vs. Drain Current**



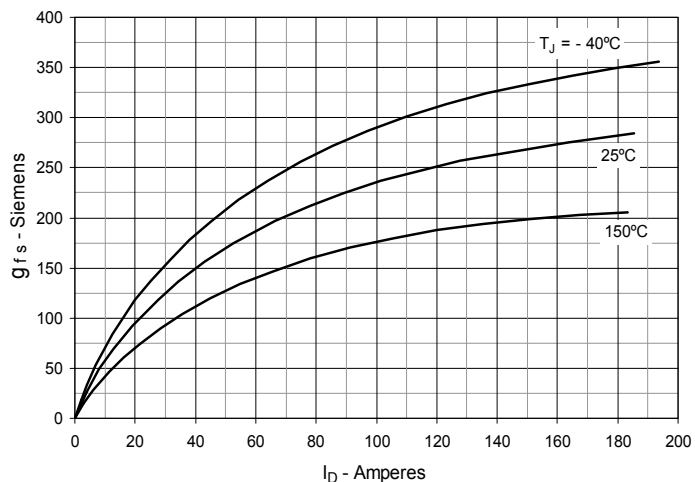
**Fig. 6. Drain Current vs. Case Temperature**



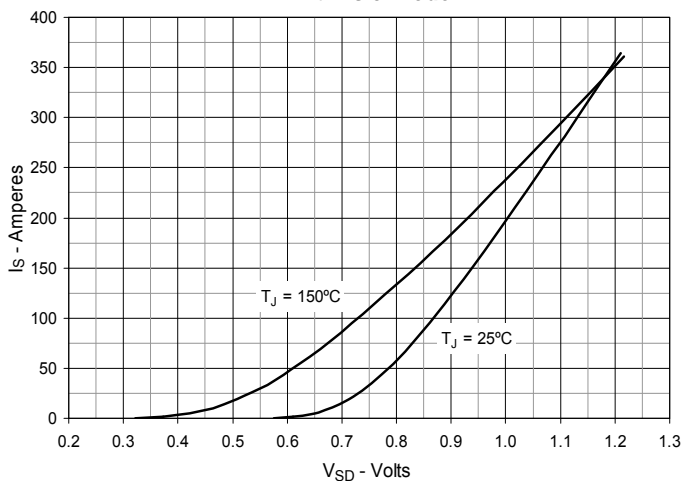
**Fig. 7. Input Admittance**



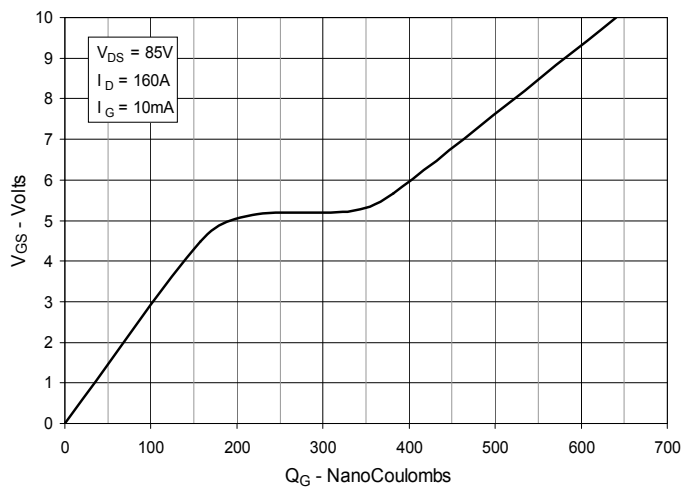
**Fig. 8. Transconductance**



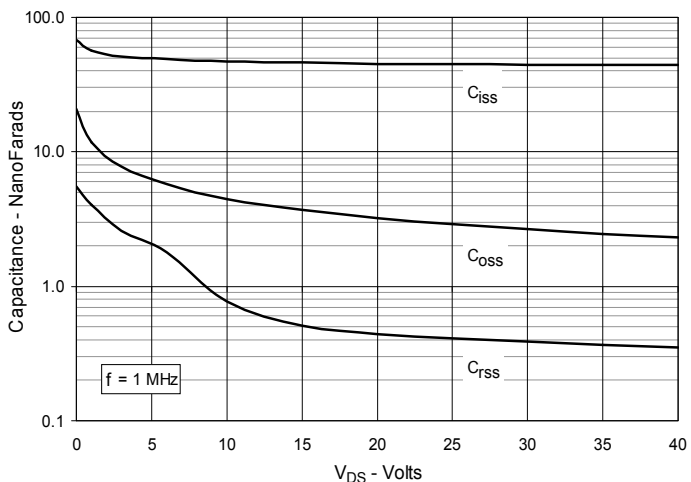
**Fig. 9. Forward Voltage Drop of Intrinsic Diode**



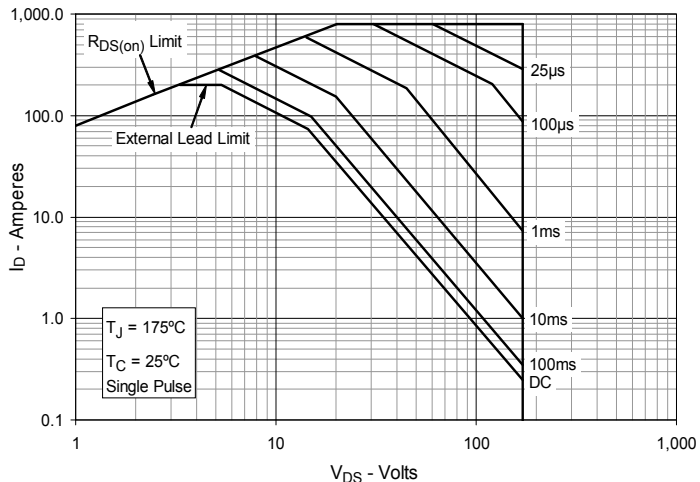
**Fig. 10. Gate Charge**



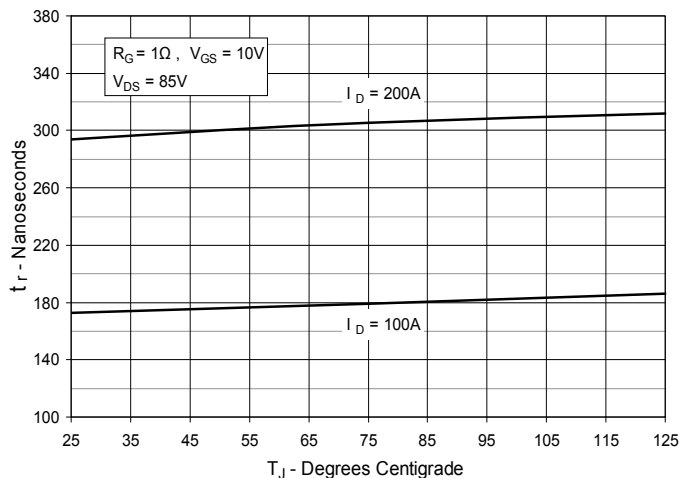
**Fig. 11. Capacitance**



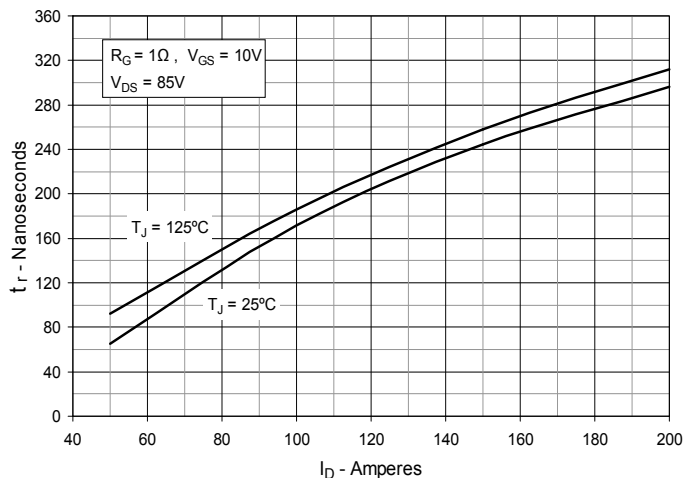
**Fig. 12. Forward-Bias Safe Operating Area**



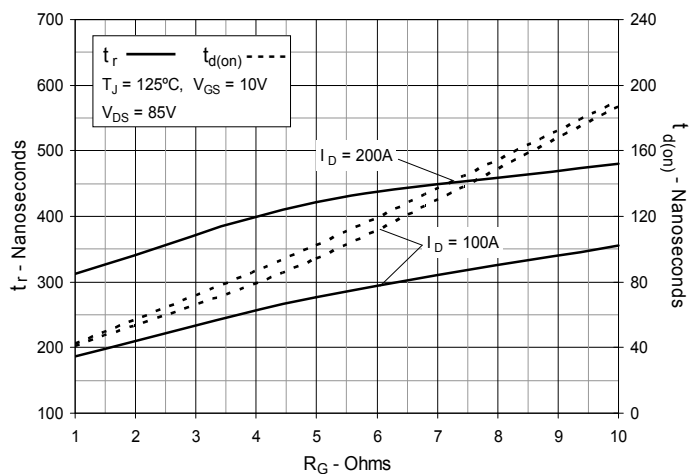
**Fig. 13. Resistive Turn-on Rise Time vs. Junction Temperature**



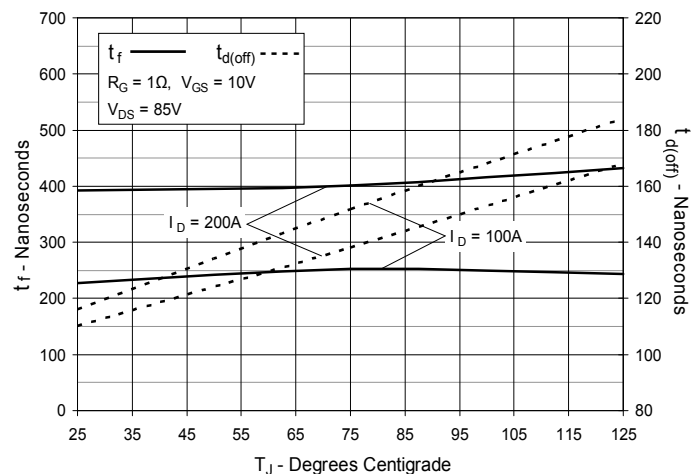
**Fig. 14. Resistive Turn-on Rise Time vs. Drain Current**



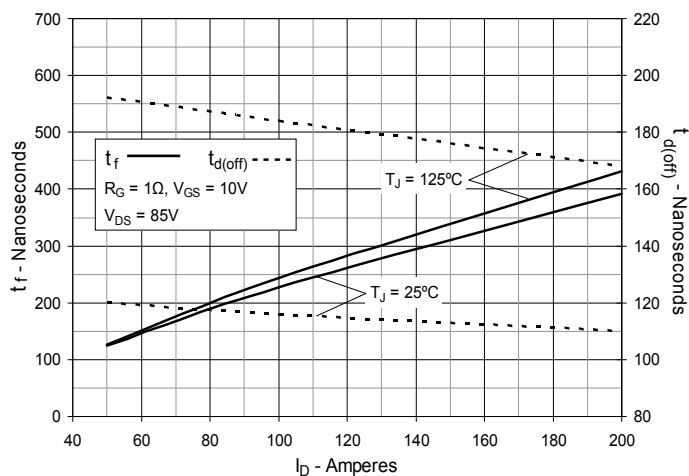
**Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance**



**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**

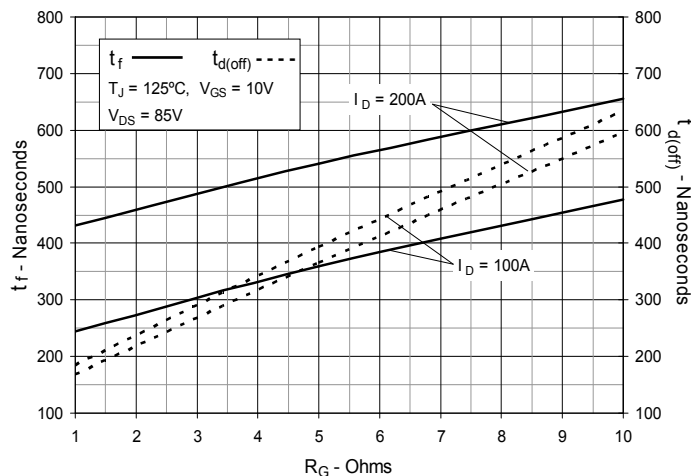


Fig. 19. Maximum Transient Thermal Impedance

