GigaMOS™
Power MOSFET

IXFN180N25T

V_{DSS}	=	250V
I_{D25}	=	168A
$R_{DS(on)}$	≤	12.9mΩ
t_{rr}	≤	200ns

N-Channel Enhancement Mode
Avalanche Rated
Fast Intrinsic Diode
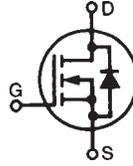
miniBLOC, SOT-227

⌷U E153432
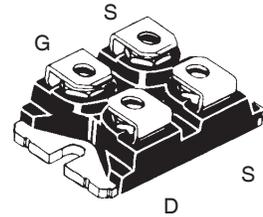
G = Gate   D = Drain
S = Source

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°C to 150°C	250	V
V_{DGR}	T_J = 25°C to 150°C, R_{GS} = 1MΩ	250	V
V_{GSS}	Continuous	±20	V
V_{GSM}	Transient	±30	V
I_{D25}	T_C = 25°C	168	A
I_{DM}	T_C = 25°C, Pulse Width Limited by T_{JM}	500	A
I_A	T_C = 25°C	90	A
E_{AS}	T_C = 25°C	5	J
dv/dt	I_S ≤ I_{DM}, V_{DD} ≤ V_{DSS}, T_J ≤ 150°C	20	V/ns
P_D	T_C = 25°C	900	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
T_L	Maximum Lead Temperature for Soldering	300	°C
T_{SOLD}	Plastic Body for 10s	260	°C
V_{ISOL}	50/60 Hz, RMS t = 1 minute	2500	V~
	I_{ISOL} ≤ 1mA 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
Weight		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

- 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°C, Unless Otherwise Specified)	Characteristic Values			
		Min.	Typ.	Max.	
BV_{DSS}	V_{GS} = 0V, I_D = 3mA	250			V
$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 8mA	3.0		5.0	V
I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V			±200	nA
I_{DSS}	V_{DS} = V_{DSS}, V_{GS} = 0V			50	μA
	T_J = 125°C			2.5	mA
$R_{DS(on)}$	V_{GS} = 10V, I_D = 90A, Note 1			12.9	mΩ

IXYS

Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Characteristic Values			
		Min.	Typ.	Max.	
g_{fs}	V_{DS} = 10V, I_D = 60A, Note 1	90	150		S
C_{iss}			23.8		nF
C_{oss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		2070		pF
C_{rss}			47		pF
R_{Gi}	Gate Input Resistance		1.1		Ω
$t_{d(on)}$	**Resistive Switching Times**		35		ns
t_r	V_{GS} = 15V, V_{DS} = 0.5 • V_{DSS}, I_D = 90A		52		ns
$t_{d(off)}$	R_G = 1Ω (External)		88		ns
t_f			20		ns
$Q_{g(on)}$			364		nC
Q_{gs}	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 90A		137		nC
Q_{gd}			60		nC
R_{thJC}				0.138	°C/W
R_{thCS}			0.05		°C/W

Source-Drain Diode

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values			
		Min.	Typ.	Max.	
I_S	V_{GS} = 0V			180	A
I_{SM}	Repetitive, Pulse Width Limited by T_{JM}			720	A
V_{SD}	I_F = 100A, V_{GS} = 0V, Note 1			1.4	V
t_{rr}				200	ns
Q_{RM}	I_F = 90A, -di/dt = 100A/µs		0.77		µC
I_{RM}	V_R = 75V, V_{GS} = 0V		11		A

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

Note 1: Pulse test, t ≤ 300µs, duty cycle, d ≤ 2%.

PRELIMINARY 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.

Fig. 1. Output Characteristics @ T_J = 25°C


Fig. 2. Extended Output Characteristics @ T_J = 25°C
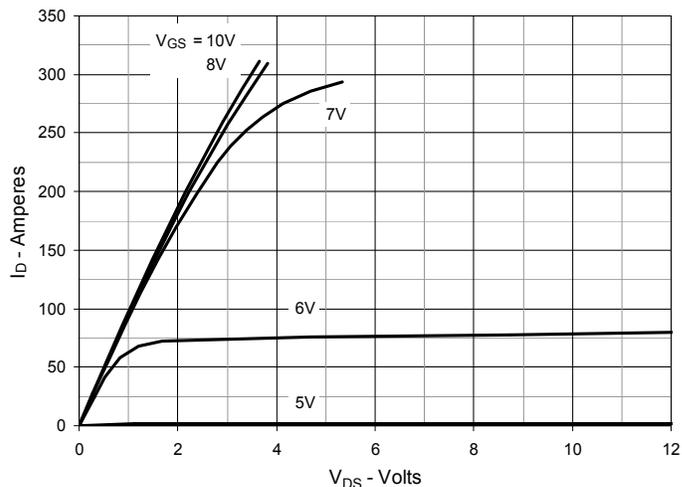

Fig. 3. Output Characteristics @ T_J = 125°C
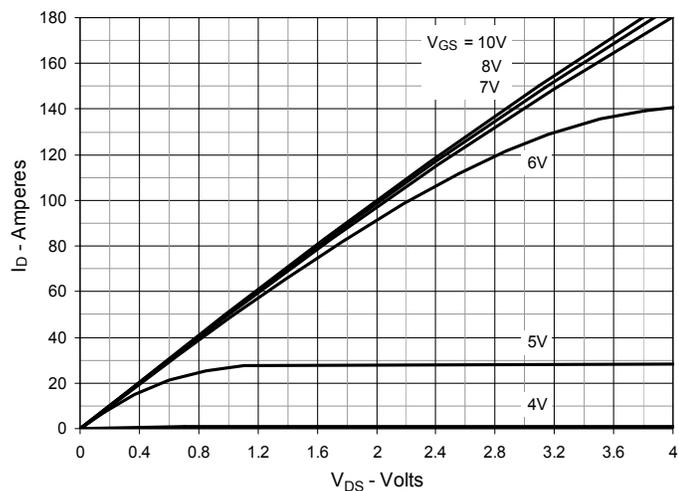
**Fig. 4. R_DS(on) Normalized to I_D = 90A Value vs. Junction Temperature**
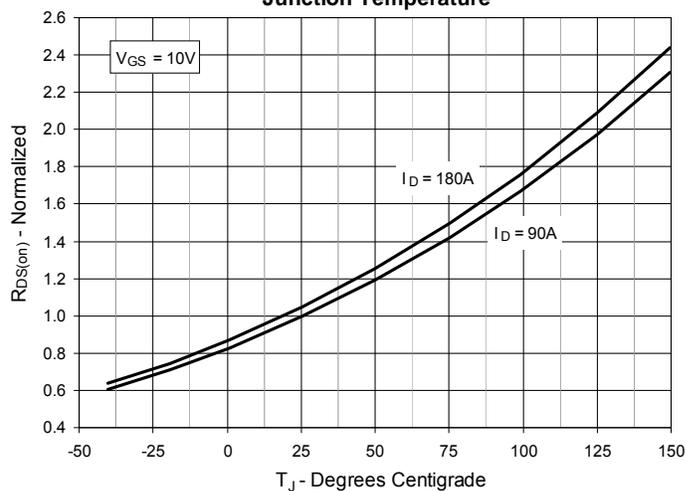
**Fig. 5. R_DS(on) Normalized to I_D = 90A Value vs. Drain Current**
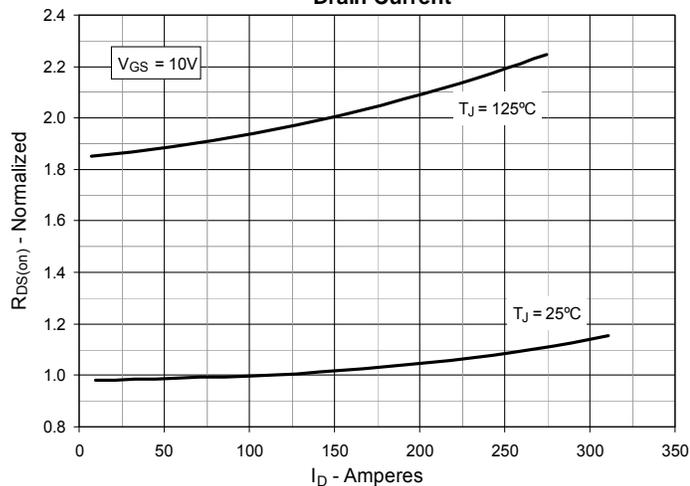
Fig. 6. Maximum Drain Current vs. Case Temperature
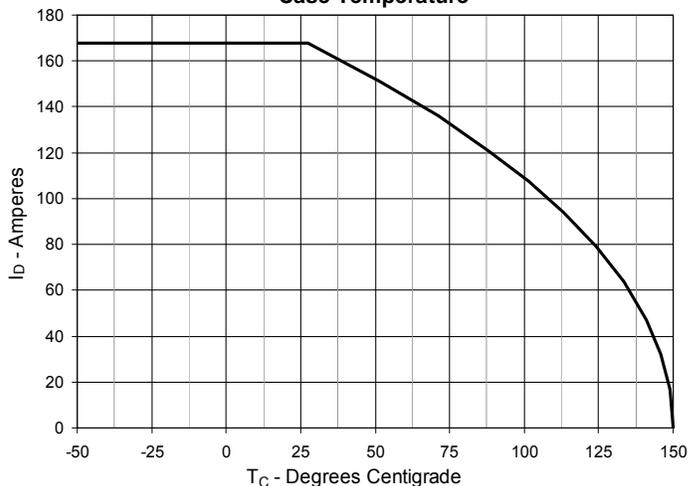
Fig. 7. Input Admittance
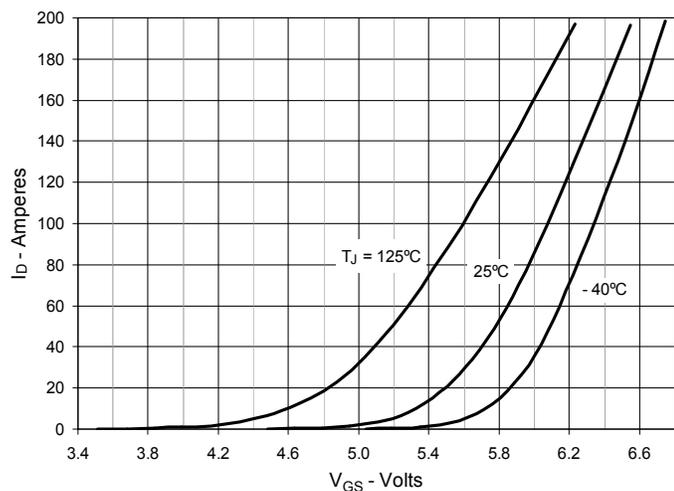
Fig. 8. Transconductance
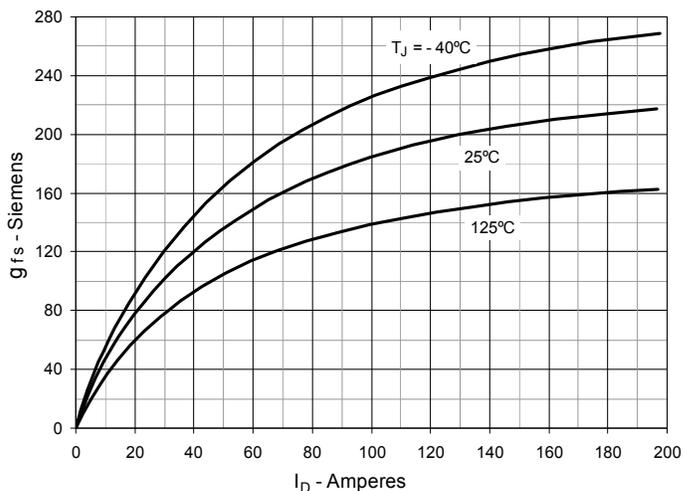
Fig. 9. Forward Voltage Drop of Intrinsic Diode
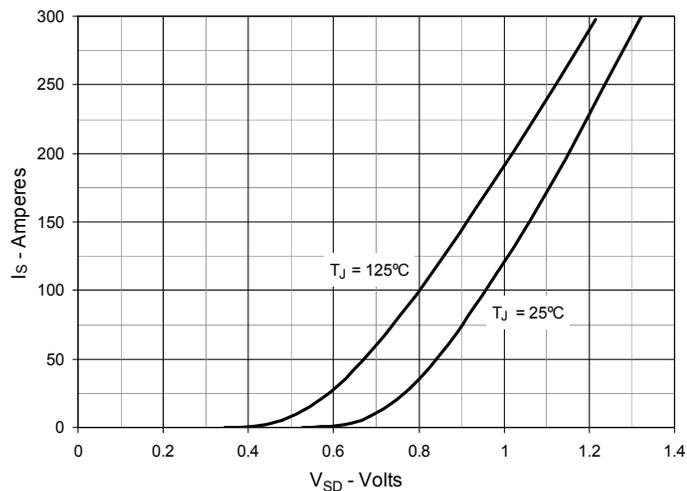
Fig. 10. Gate Charge
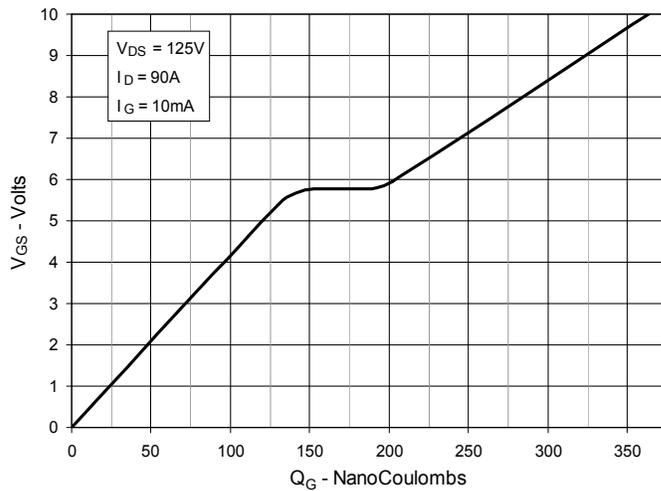
Fig. 11. Capacitance
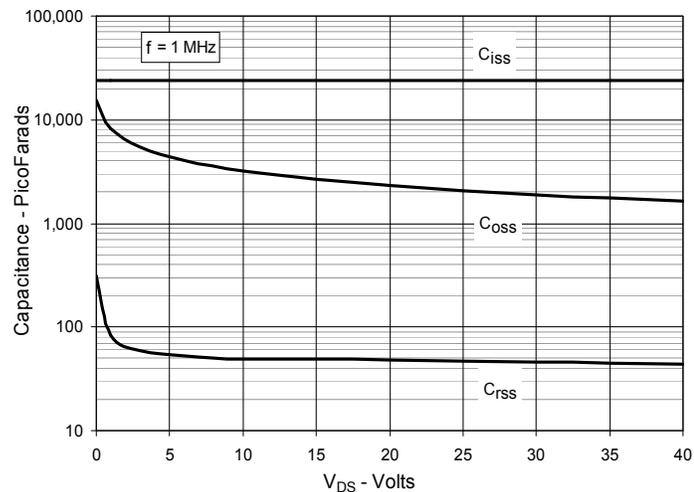
Fig. 12. Forward-Bias Safe Operating Area

IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.
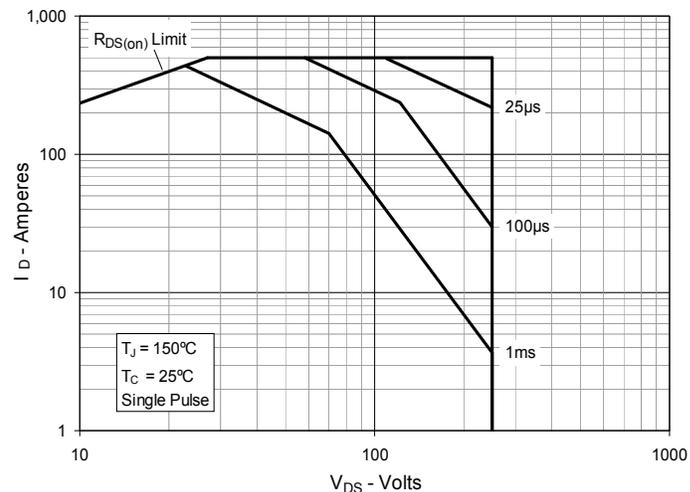
**Fig. 13. Resistive Turn-on Rise Time vs.
Junction Temperature**
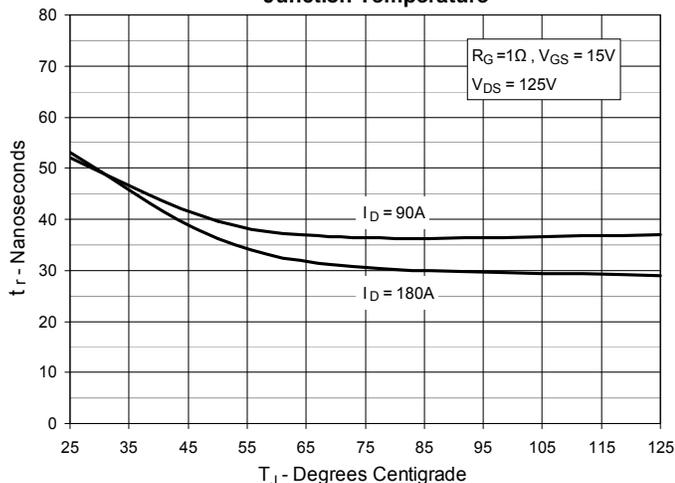
**Fig. 14. Resistive Turn-on Rise Time vs.
Drain Current**
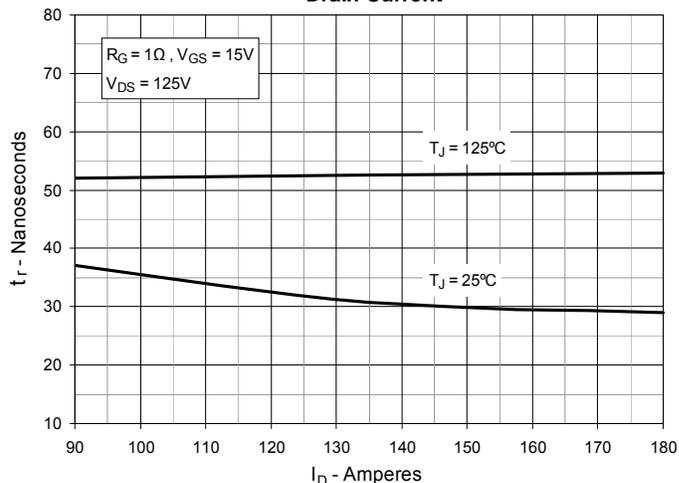
**Fig. 15. Resistive Turn-on Switching Times vs.
Gate Resistance**
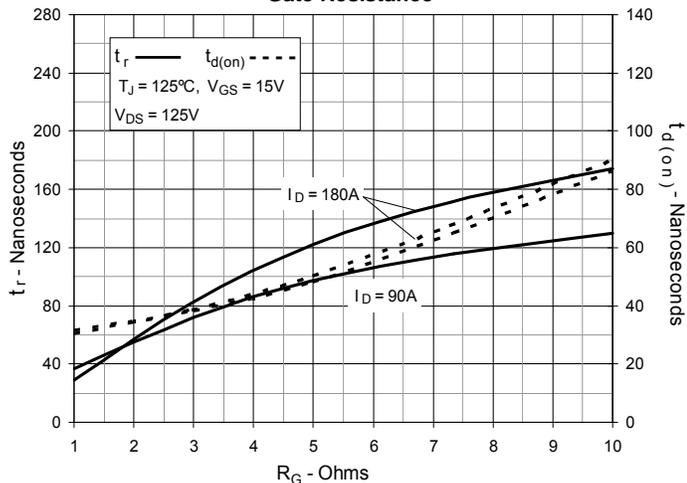
**Fig. 16. Resistive Turn-off Switching Times vs.
Junction Temperature**
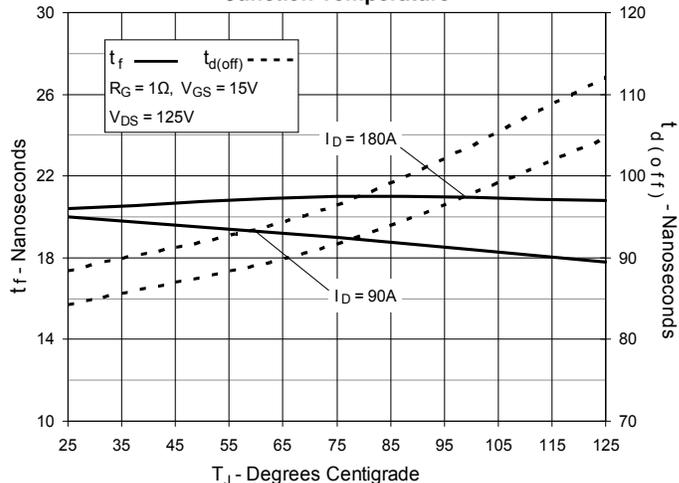
**Fig. 17. Resistive Turn-off Switching Times vs.
Drain Current**
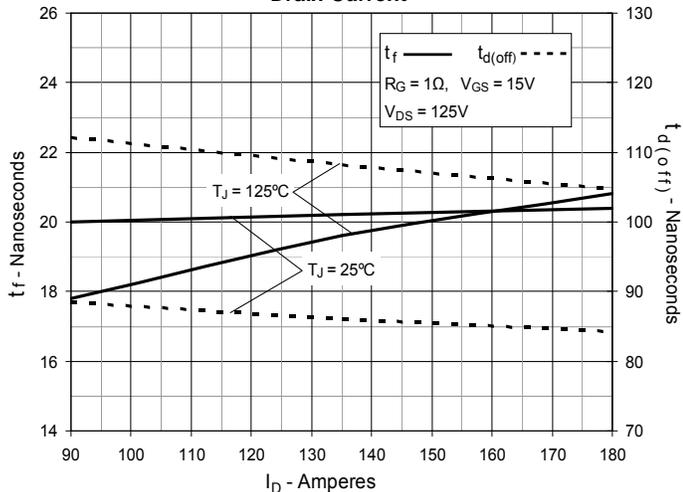
**Fig. 18. Resistive Turn-off Switching Times vs.
Gate Resistance**
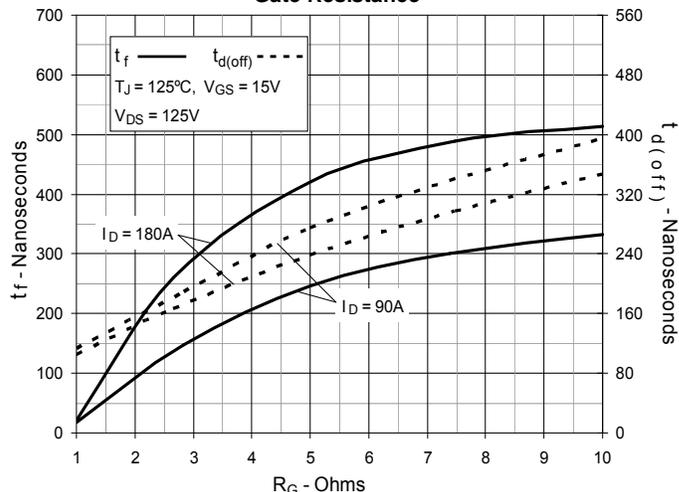
Fig. 19. Maximum Transient Thermal Impedance

Graph: X-axis "Pulse Width - Seconds" (0.00001 to 10), Y-axis "Z$_{(th)JC}$ - °C / W" (0.001 to 1)