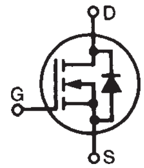
![IXYS] Advance Technical Information

GigaMOS™ TrenchT2 HiperFET™ Power MOSFET

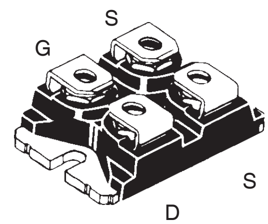
IXFN240N15T2

V_{DSS}	=	150V
I_{D25}	=	240A
$R_{DS(on)}$	≤	5.2mΩ
t_{rr}	≤	140ns

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°C to 175°C		150	V
V_{DGR}	T_J = 25°C to 175°C, R_{GS} = 1MΩ		150	V
V_{GSS}	Continuous		±20	V
V_{GSM}	Transient		±30	V
I_{D25}	T_C = 25°C (Chip Capability)		240	A
$I_{L(RMS)}$	External Lead Current Limit		200	A
I_{DM}	T_C = 25°C, Pulse Width Limited by T_{JM}		600	A
I_A	T_C = 25°C		120	A
E_{AS}	T_C = 25°C		2	J
dV/dt	$I_S \le I_{DM}$, $V_{DD} \le V_{DSS}$, $T_J \le$ 175°C		20	V/ns
P_D	T_C = 25°C		830	W
T_J			-55 ... +175	°C
T_{JM}			175	°C
T_{stg}			-55 ... +175	°C
T_L	1.6mm (0.062 in.) from Case for 10s		300	°C
T_{SOLD}	Plastic Body for 10s		260	°C
V_{ISOL}	50/60 Hz, RMS	t = 1 minute	2500	V~
	$I_{ISOL} \le$ 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

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
BV_{DSS}	V_{GS} = 0V, I_D = 3mA	150			V
$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 8mA	2.5		5.0	V
I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V			±200	nA
I_{DSS}	V_{DS} = V_{DSS}, V_{GS} = 0V			25	μA
	T_J = 150°C			3	mA
$R_{DS(on)}$	V_{GS} = 10V, I_D = 60A, Note 1		4.1	5.2	mΩ

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

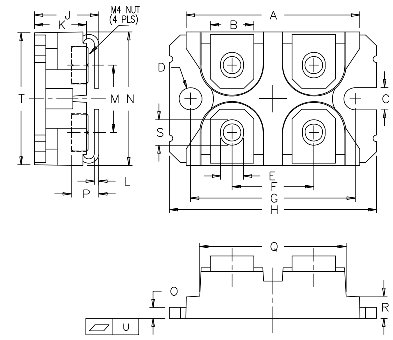
- Easy to Mount
- Space Savings
- High Power Density

Applications

- Synchronous Recification
- 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.	
g_{fs}	$V_{DS} = 10V$, $I_D = 60A$, Note 1	125	210		S
C_{iss}	$V_{GS} = 0V$, $V_{DS} = 25V$, f = 1MHz		32		nF
C_{oss}			2280		pF
C_{rss}			270		pF
R_{Gi}	Gate Input Resistance		1.50		Ω
$t_{d(on)}$	**Resistive Switching Times** $V_{GS} = 10V$, $V_{DS} = 0.5 \bullet V_{DSS}$, $I_D = 0.5 \bullet I_{D25}$ $R_G = 1\Omega$ (External)		48		ns
t_r			125		ns
$t_{d(off)}$			77		ns
t_f			145		ns
$Q_{g(on)}$	$V_{GS} = 10V$, $V_{DS} = 0.5 \bullet V_{DSS}$, $I_D = 0.5 \bullet I_{D25}$		460		nC
Q_{gs}			125		nC
Q_{gd}			130		nC
R_{thJC}				0.18	°C/W
R_{thCS}			0.05		°C/W

SOT-227B (IXFN) Outline



(M4 screws (4x) supplied)

SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS 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

Source-Drain Diode

Symbol	Test Conditions ($T_J = 25°C$, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
I_S	$V_{GS} = 0V$			240	A
I_{SM}	Repetitive, Pulse Width Limited by T_{JM}			960	A
V_{SD}	$I_F = 100A$, $V_{GS} = 0V$, Note 1			1.2	V
t_{rr}	$I_F = 120A$, -di/dt = 100A/μs $V_R = 75V$, $V_{GS} = 0V$			140	ns
Q_{RM}			410		nC
I_{RM}			8.2		A

Note 1. Pulse test, t ≤ 300μs; duty cycle, d ≤ 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.

Fig. 1. Output Characteristics @ T_J = 25ºC

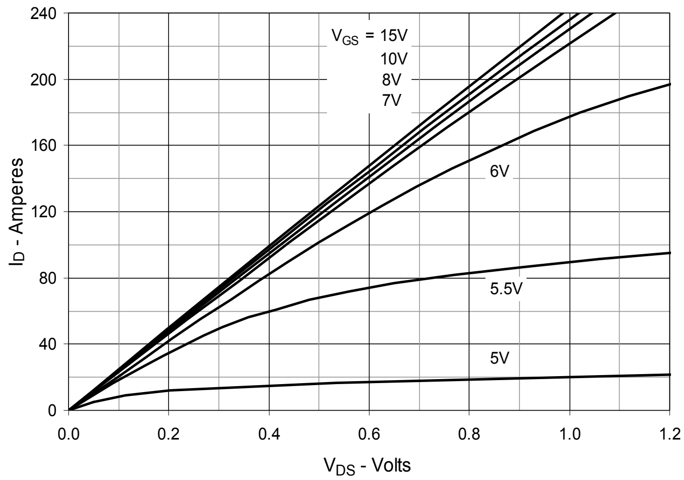


Fig. 2. Extended Output Characteristics @ T_J = 25ºC

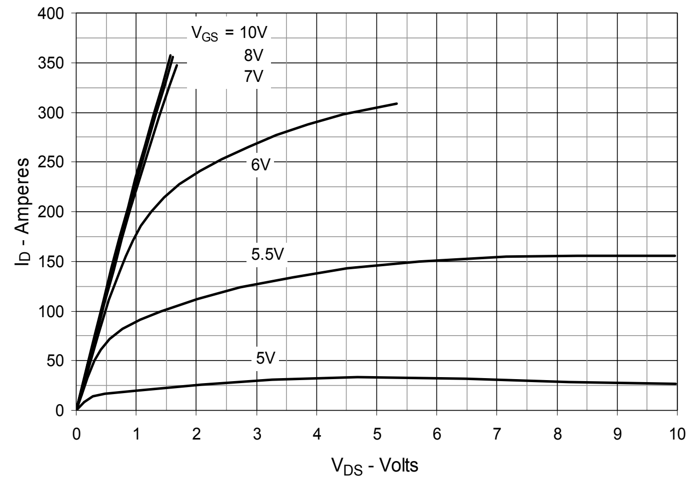


Fig. 3. Output Characteristics @ T_J = 150ºC

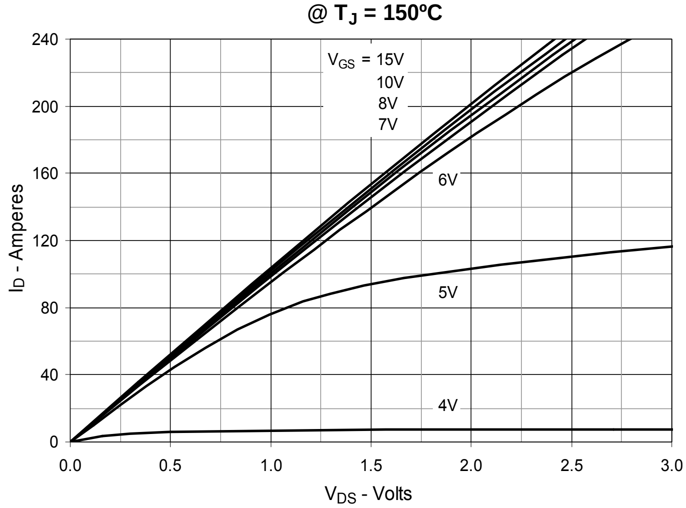


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 120A Value vs. Junction Temperature

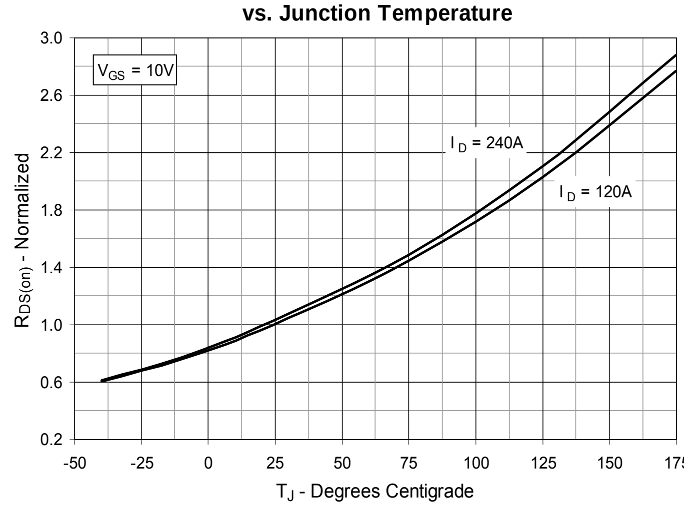


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 120A Value vs. Drain Current

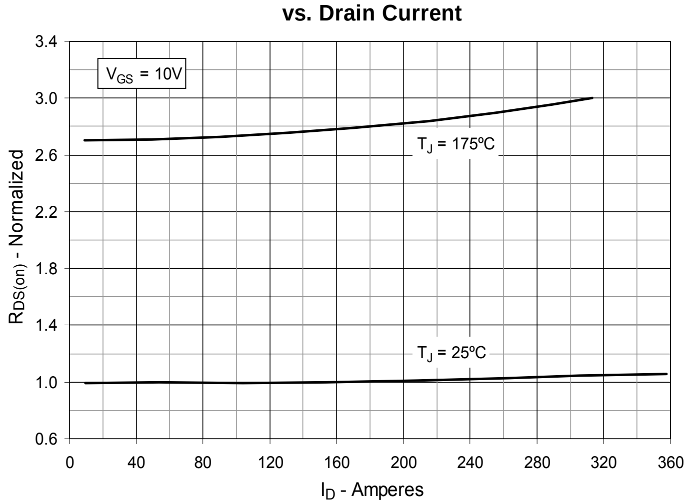
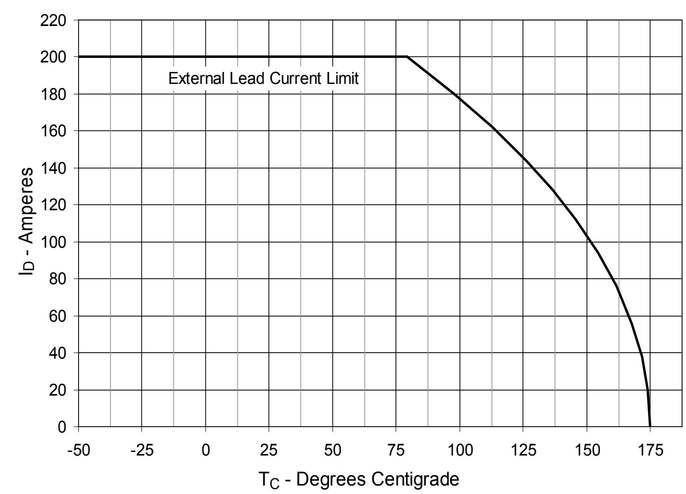
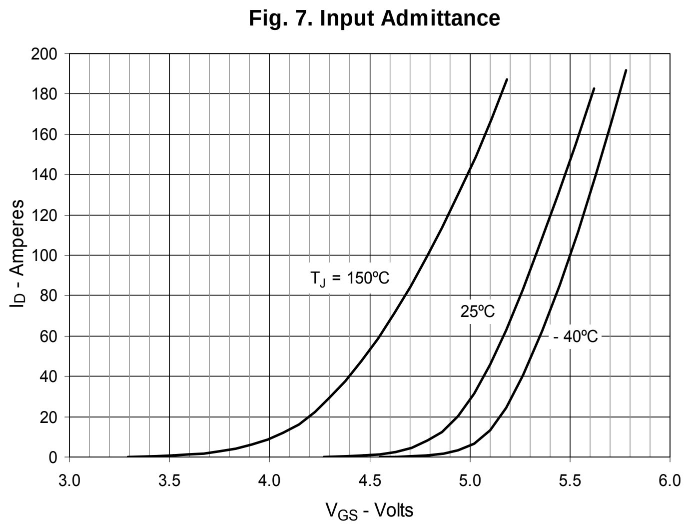
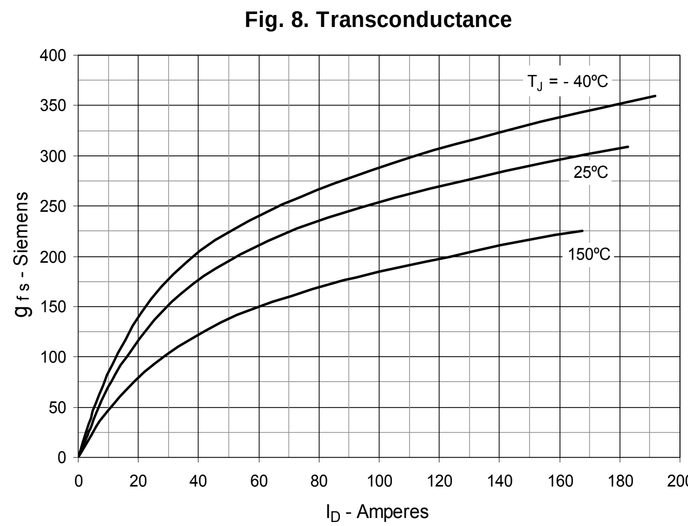
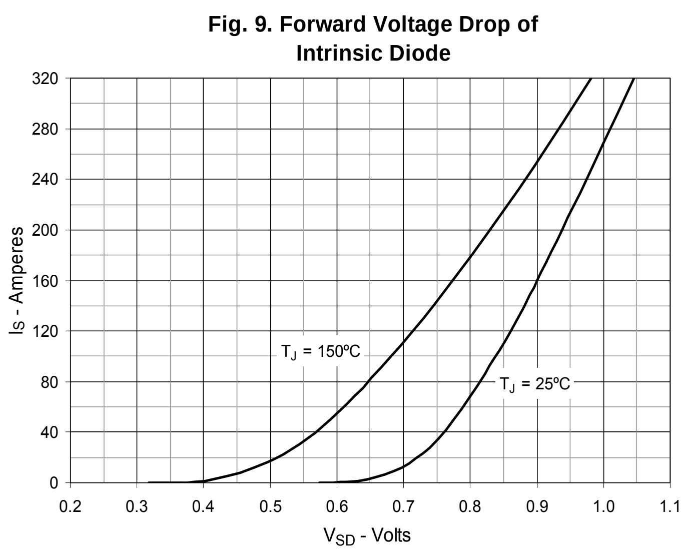


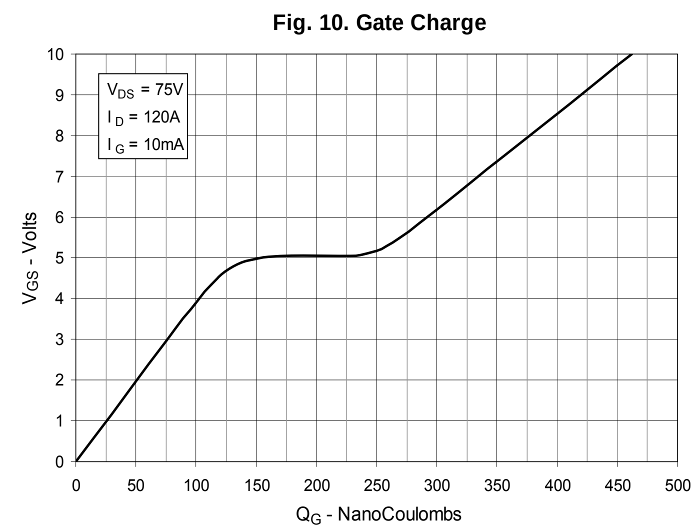
Fig. 6. Drain Current vs. Case Temperature

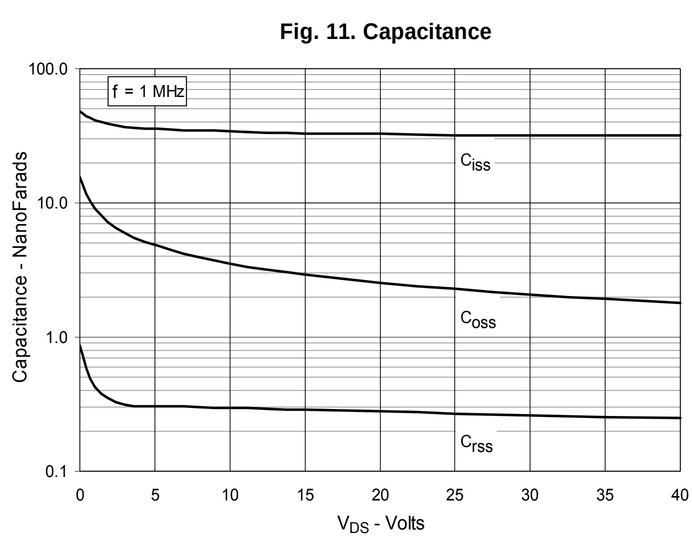


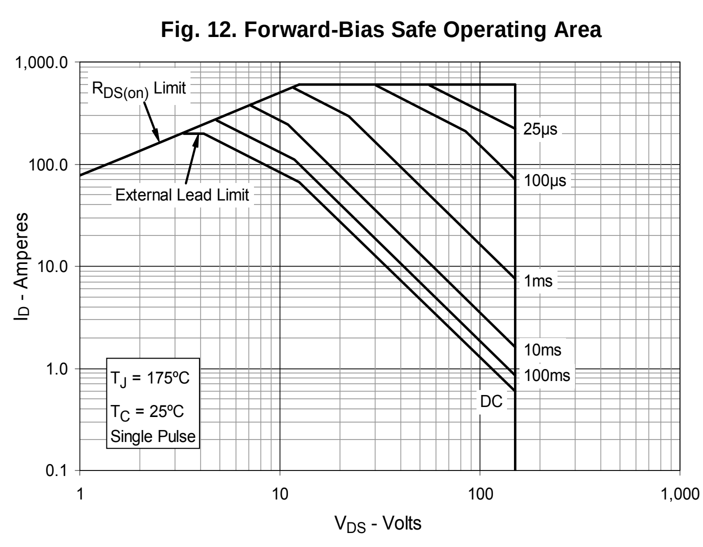












IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.

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

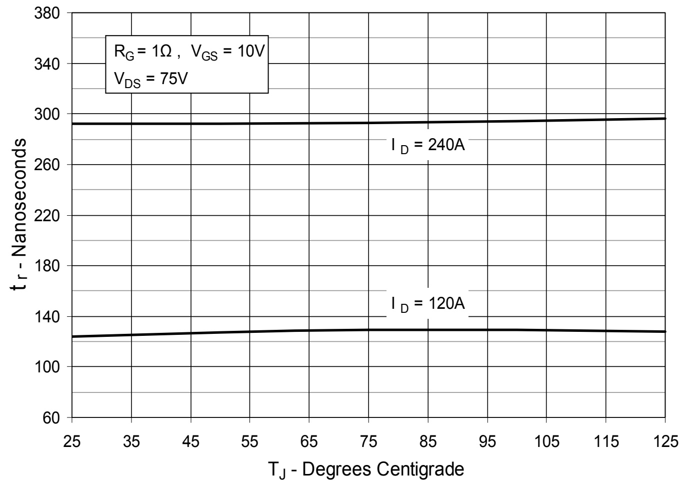


Fig. 14. Resistive Turn-on Rise Time vs. Drain Current

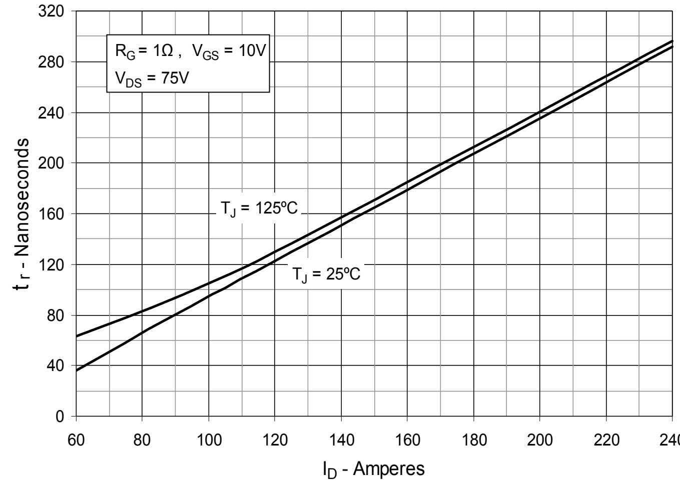


Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance

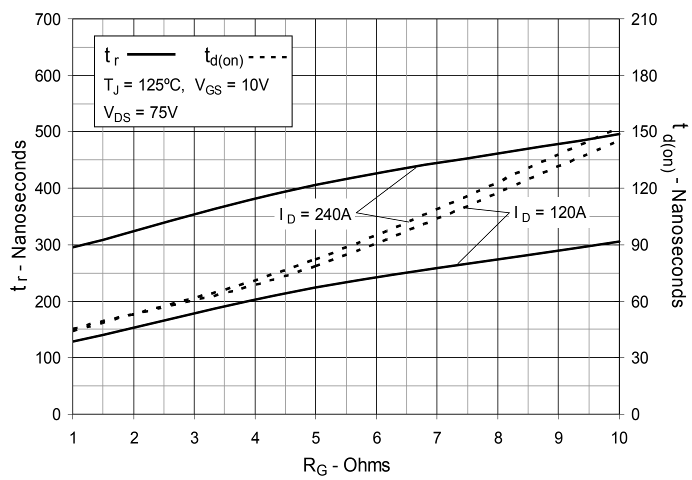


Fig. 16. Resistive Turn-off Switching Times vs. Junction Temperature

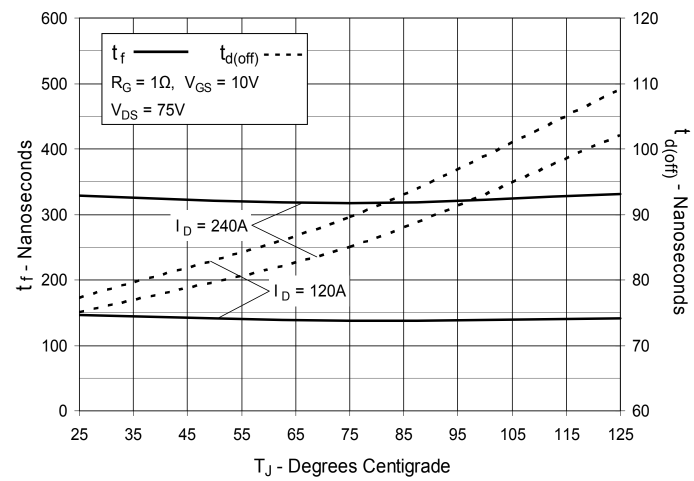


Fig. 17. Resistive Turn-off Switching Times vs. Drain Current

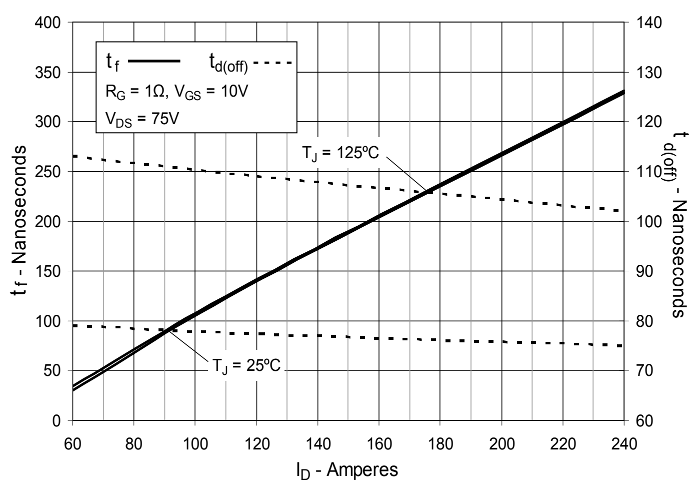


Fig. 18. Resistive Turn-off Switching Times vs. Gate Resistance

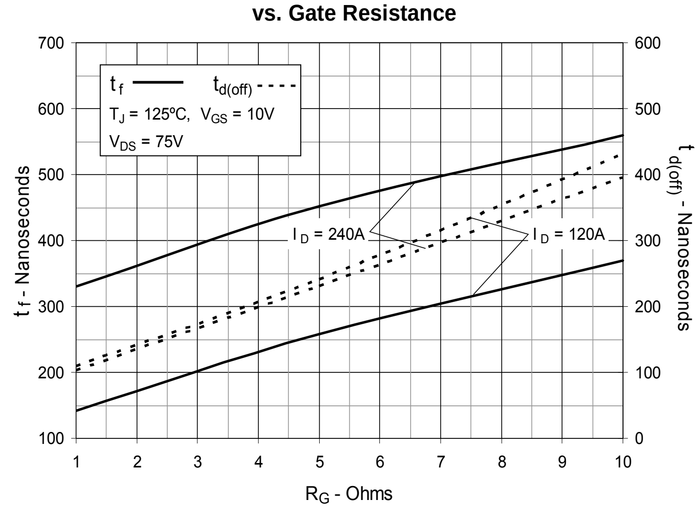


Fig. 19. Maximium Transient Thermal Impedance