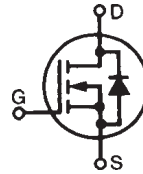


Trench Gate Power MOSFET HiperFET™

IXFA102N15T
IXFH102N15T
IXFP102N15T

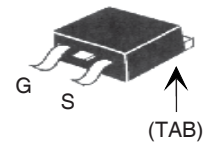
N-Channel Enhancement Mode
 Avalanche Rated



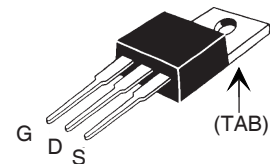
V_{DSS} = 150V
I_{D25} = 102A
R_{DS(on)} ≤ 18mΩ
t_{rr} ≤ 120ns

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	102	A
I _{LRMS}	Lead Current Limit, RMS	75	A
I _{DM}	T _C = 25°C, Pulse Width Limited by T _{JM}	300	A
I _A	T _C = 25°C	51	A
E _{AS}	T _C = 25°C	750	mJ
dV/dt	I _S ≤ I _{DM} , V _{DD} ≤ V _{DSS} , T _J ≤ 175°C	20	V/ns
P _D	T _C = 25°C	455	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 10 seconds	260	°C
M _d	Mounting Torque (TO-220 & TO-247)	1.13 / 10	Nmlb.in.
F _C	Mounting Force (TO-263)	10..65 / 2.2..14.6	N/lb.
Weight	TO-263	2.5	g
	TO-220	3.0	g
	TO-247	6.0	g

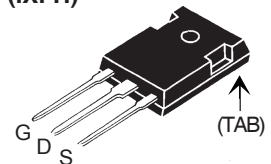
TO-263 (IXFA)



TO-220 (IXFP)



TO-247 (IXFH)



G = Gate D = Drain
 S = Source TAB = Drain

Features

- International Standard Packages
- Avalanche Rated

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 = 250μA	150		V
V _{GS(th)}	V _{DS} = V _{GS} , I _D = 1mA	2.5		5.0 V
I _{GSS}	V _{GS} = ± 20V, V _{DS} = 0V			± 200 nA
I _{DSS}	V _{DS} = V _{DSS} , V _{GS} = 0V T _J = 150°C			5 μA 750 μA
R _{DS(on)}	V _{GS} = 10V, I _D = 0.5 • I _{D25} , Note 1			18 mΩ

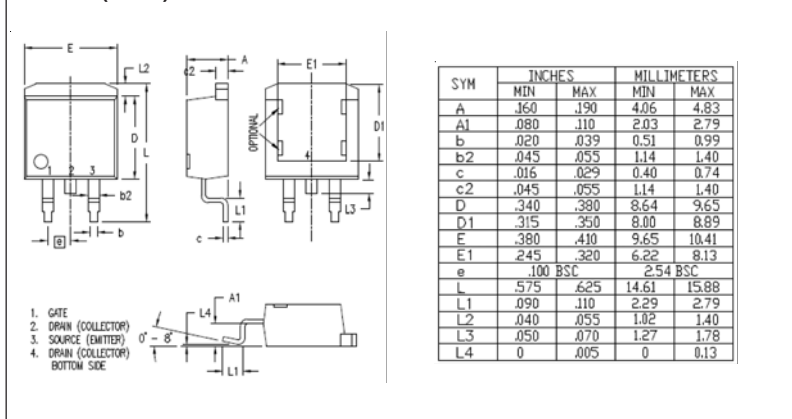
Symbol	Test Conditions ($T_J = 25^\circ\text{C}$ Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
g_{fs}	$V_{DS} = 10\text{V}, I_D = 0.5 \cdot I_{D25}$, Note 1	50	80	S
C_{iss}	$V_{GS} = 0\text{V}, V_{DS} = 25\text{V}, f = 1\text{MHz}$		5220	pF
C_{oss}			685	pF
C_{rss}			95	pF
$t_{d(on)}$	Resistive Switching Times $V_{GS} = 10\text{V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$ $R_G = 3.3\Omega$ (External)		20	ns
t_r			14	ns
$t_{d(off)}$			25	ns
t_f			22	ns
$Q_{g(on)}$	$V_{GS} = 10\text{V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 25\text{A}$		87	nC
Q_{gs}			23	nC
Q_{gd}			31	nC
R_{thJC}				0.33 $^\circ\text{C/W}$
R_{thCH}	(TO-220)	0.50		$^\circ\text{C/W}$
	(TO-247)	0.21		$^\circ\text{C/W}$

Source-Drain Diode

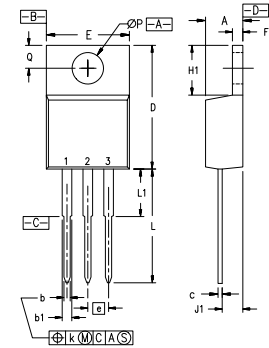
Symbol	Test Conditions ($T_J = 25^\circ\text{C}$ Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
I_s	$V_{GS} = 0\text{V}$			102 A
I_{SM}	Repetitive, Pulse Width Limited by T_{JM}			400 A
V_{SD}	$I_F = 100\text{A}, V_{GS} = 0\text{V}$, Note 1			1.3 V
t_{rr}	$I_F = 51\text{A}, -di/dt = 100\text{A}/\mu\text{s}$ $V_R = 75\text{V}, V_{GS} = 0\text{V}$			120 ns
I_{RM}			6.2	A
Q_{RM}			236	nC

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

TO-263 (IXFA) Outline



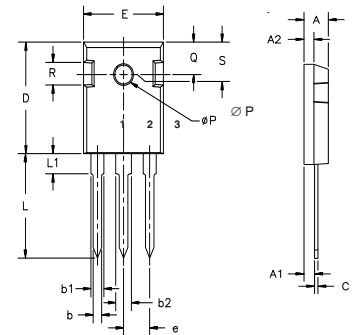
TO-220 (IXFP) Outline



Pins: 1 - Gate 2 - Drain

SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.170	.190	4.32	4.83
b	.025	.040	0.64	1.02
b1	.045	.065	1.15	1.65
c	.014	.022	0.35	0.56
D	.580	.630	14.73	16.00
E	.390	.420	9.91	10.66
e	.100 BSC		2.54 BSC	
F	.045	.055	1.14	1.40
H1	.230	.270	5.85	6.85
J1	.090	.110	2.29	2.79
k	0	.015	0	0.38
L	.500	.550	12.70	13.97
L1	.110	.230	2.79	5.84
ØP	.139	.161	3.53	4.08
Q	.100	.125	2.54	3.18

TO-247 (IXFH) Outline



Terminals: 1 - Gate 2 - Drain
3 - Source

Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.7	5.3	.185	.209
A1	2.2	2.54	.087	.102
A2	2.2	2.6	.059	.098
b	1.0	1.4	.040	.055
b1	1.65	2.13	.065	.084
b2	2.87	3.12	.113	.123
C	.4	.8	.016	.031
D	20.80	21.46	.819	.845
E	15.75	16.26	.610	.640
e	5.20	5.72	0.205	0.225
L	19.81	20.32	.780	.800
L1		4.50		.177
ØP	3.55	3.65	.140	.144
Q	5.89	6.40	0.232	0.252
R	4.32	5.49	.170	.216
S	6.15	BSC	242	BSC

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

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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 @ 25°C

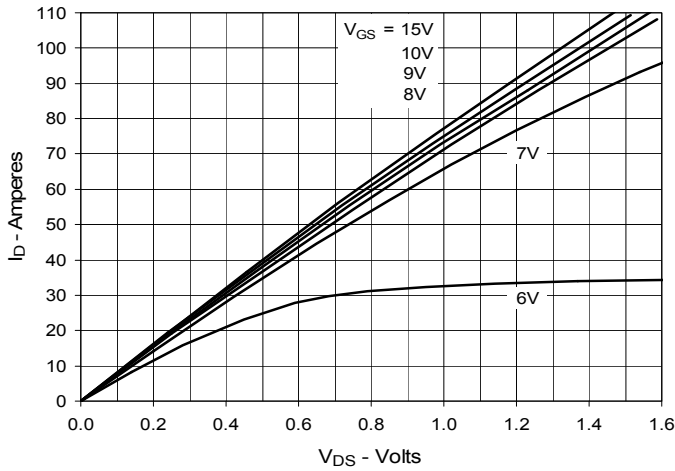


Fig. 2. Extended Output Characteristics @ 25°C

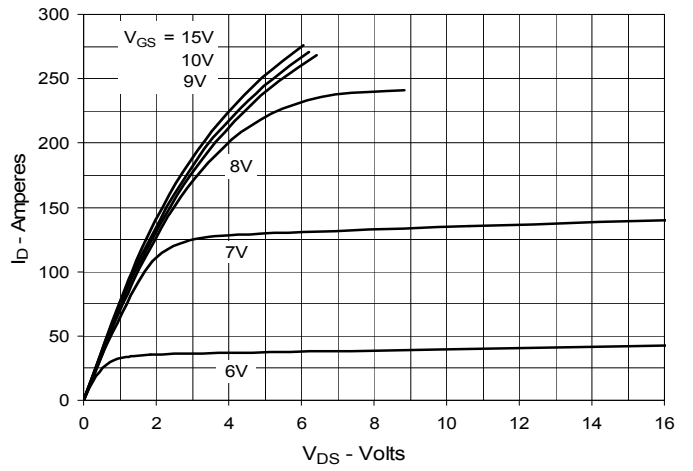


Fig. 3. Output Characteristics @ 150°C

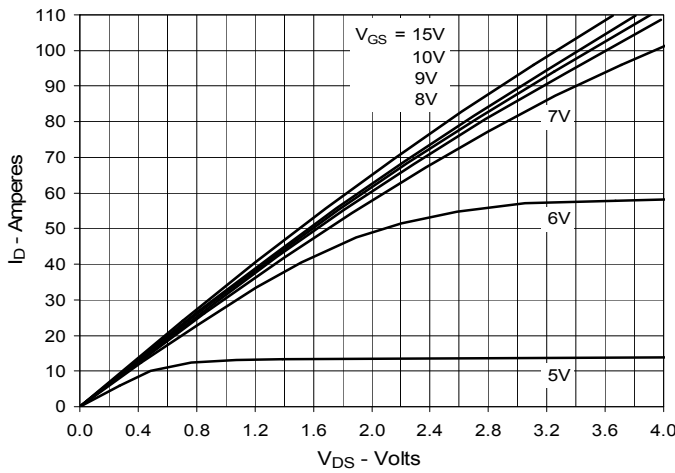


Fig. 4. $R_{DS(on)}$ Normalized to $I_D = 51A$ Value vs. Junction Temperature

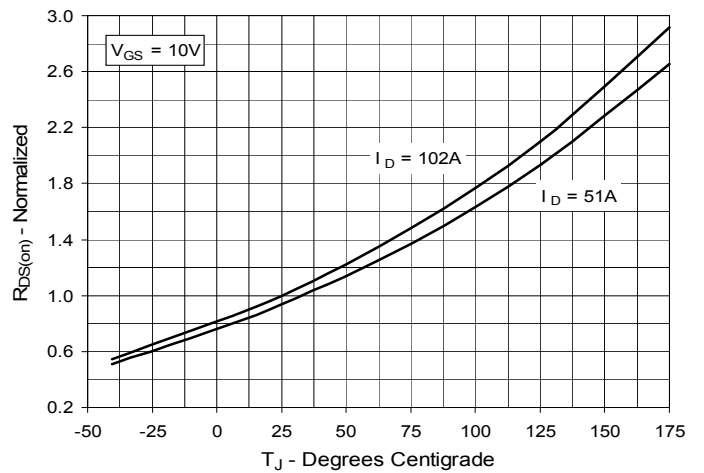


Fig. 5. $R_{DS(on)}$ Normalized to $I_D = 51A$ Value vs. Drain Current

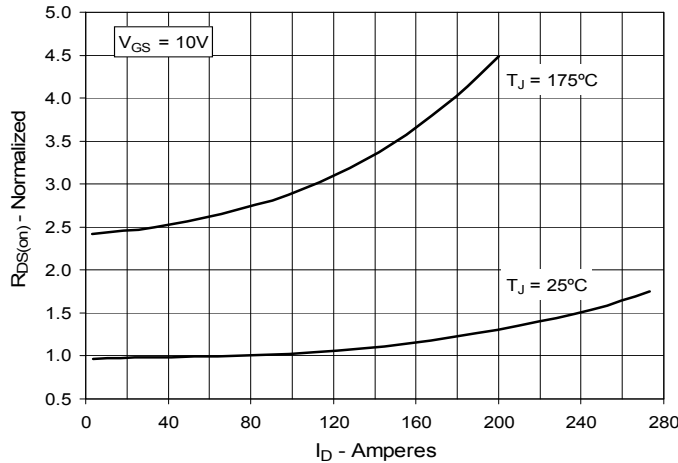


Fig. 6. Drain Current vs. Case Temperature

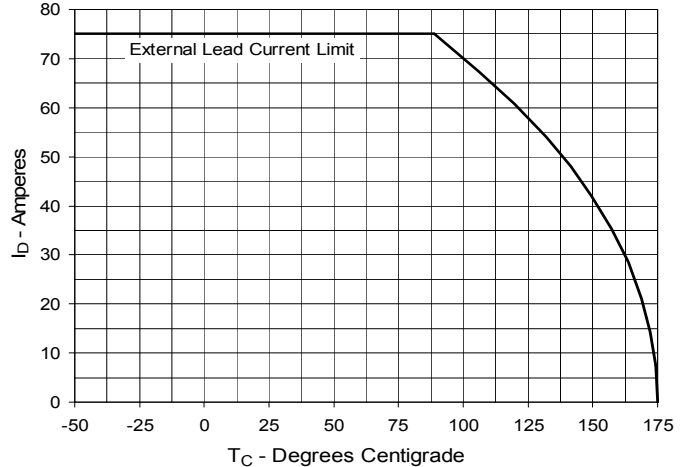


Fig. 7. Input Admittance

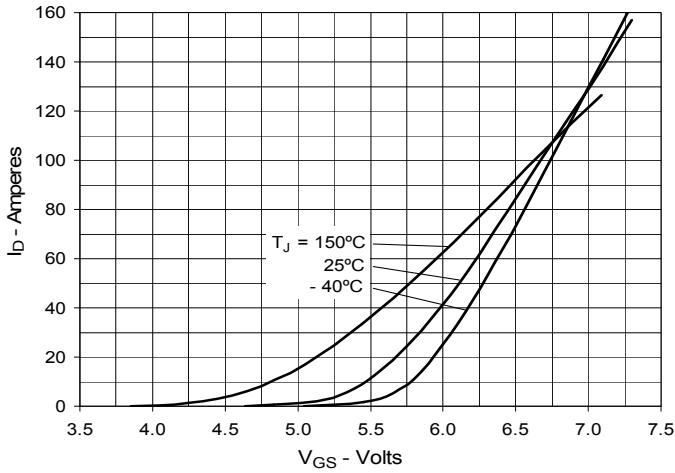


Fig. 8. Transconductance

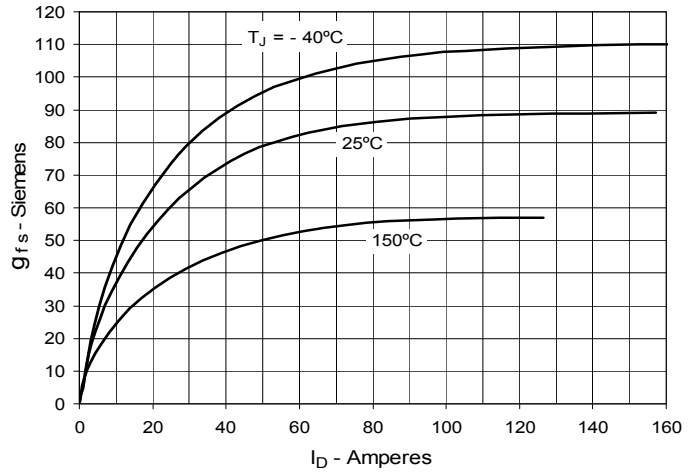


Fig. 9. Forward Voltage Drop of Intrinsic Diode

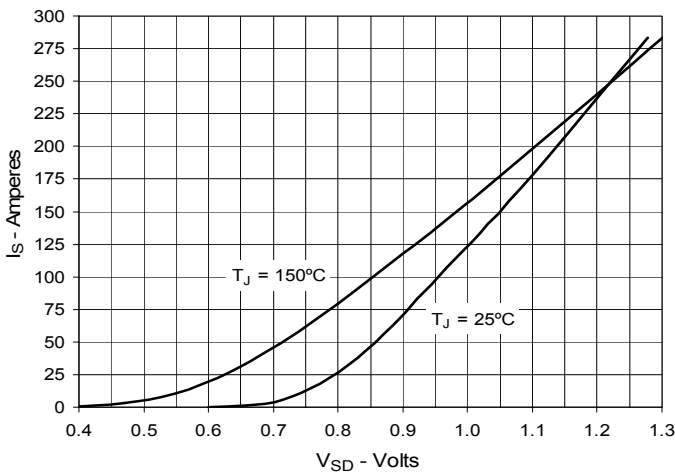


Fig. 10. Gate Charge

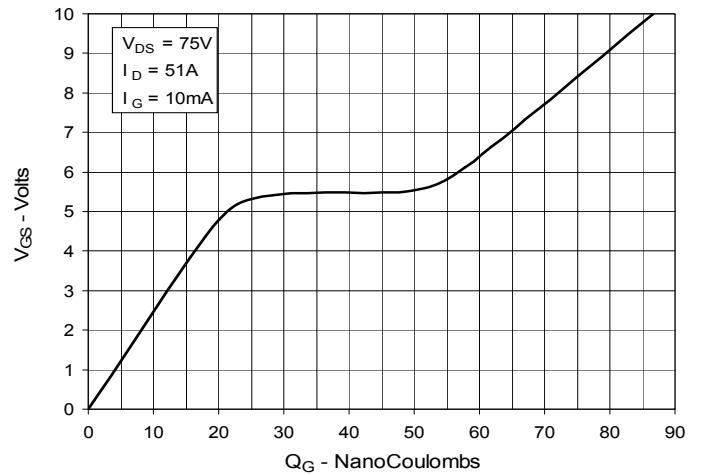


Fig. 11. Capacitance

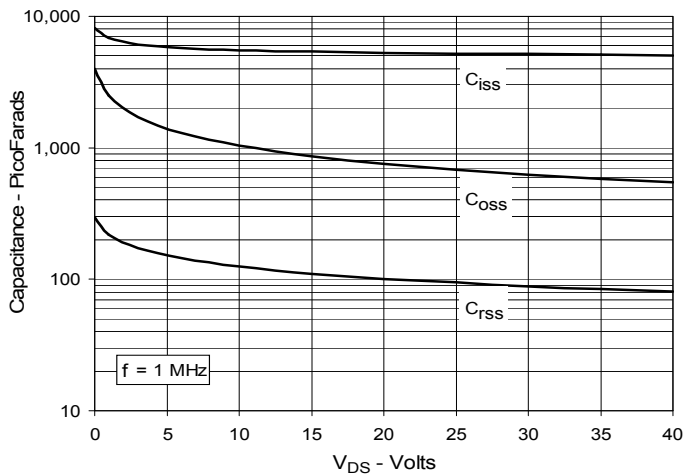
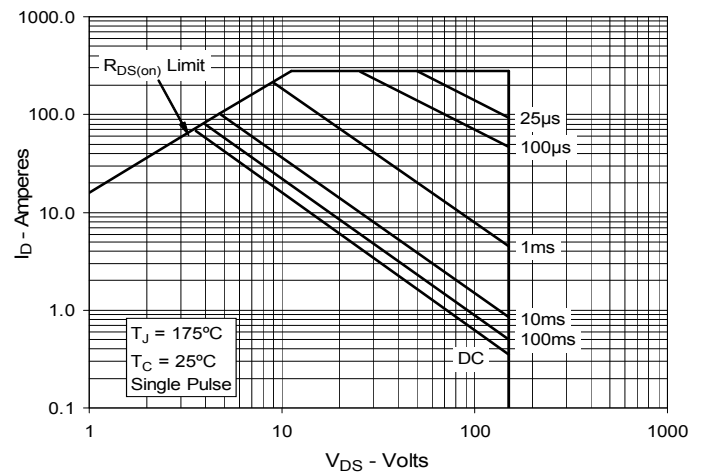
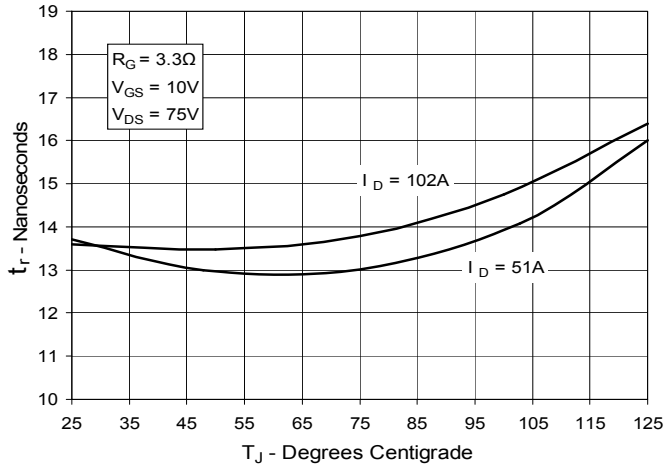


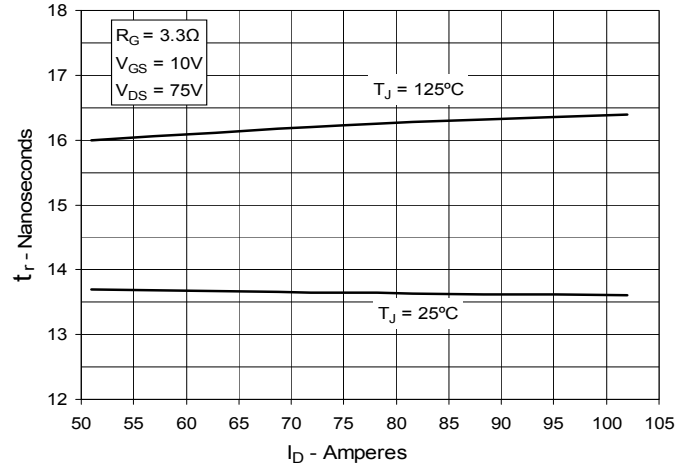
Fig. 12. Forward-Bias Safe Operating Area



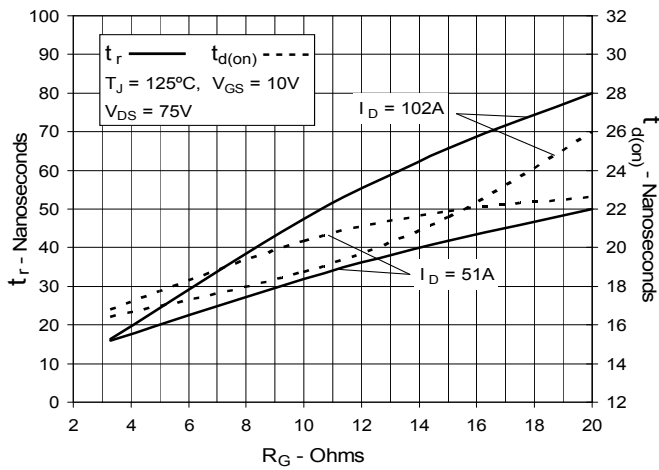
**Fig. 13. Resistive Turn-on
Rise Time vs. Junction Temperature**



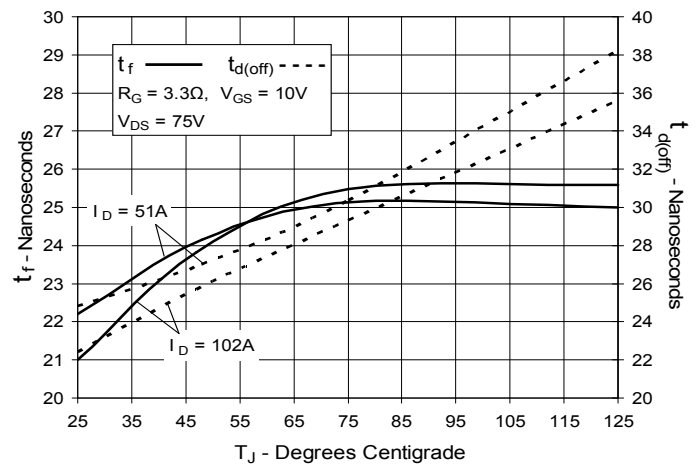
**Fig. 14. Resistive Turn-on
Rise Time vs. Drain Current**



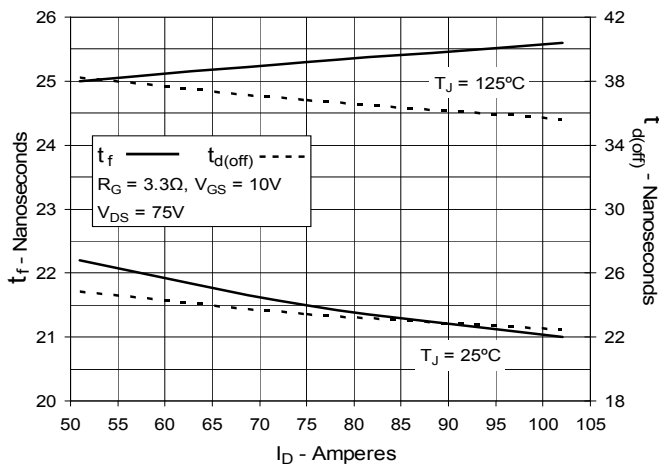
**Fig. 15. Resistive Turn-on
Switching Times vs. Gate Resistance**



**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**

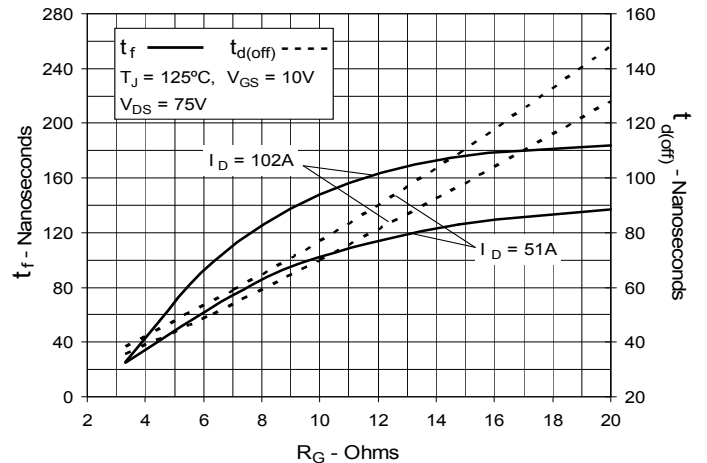
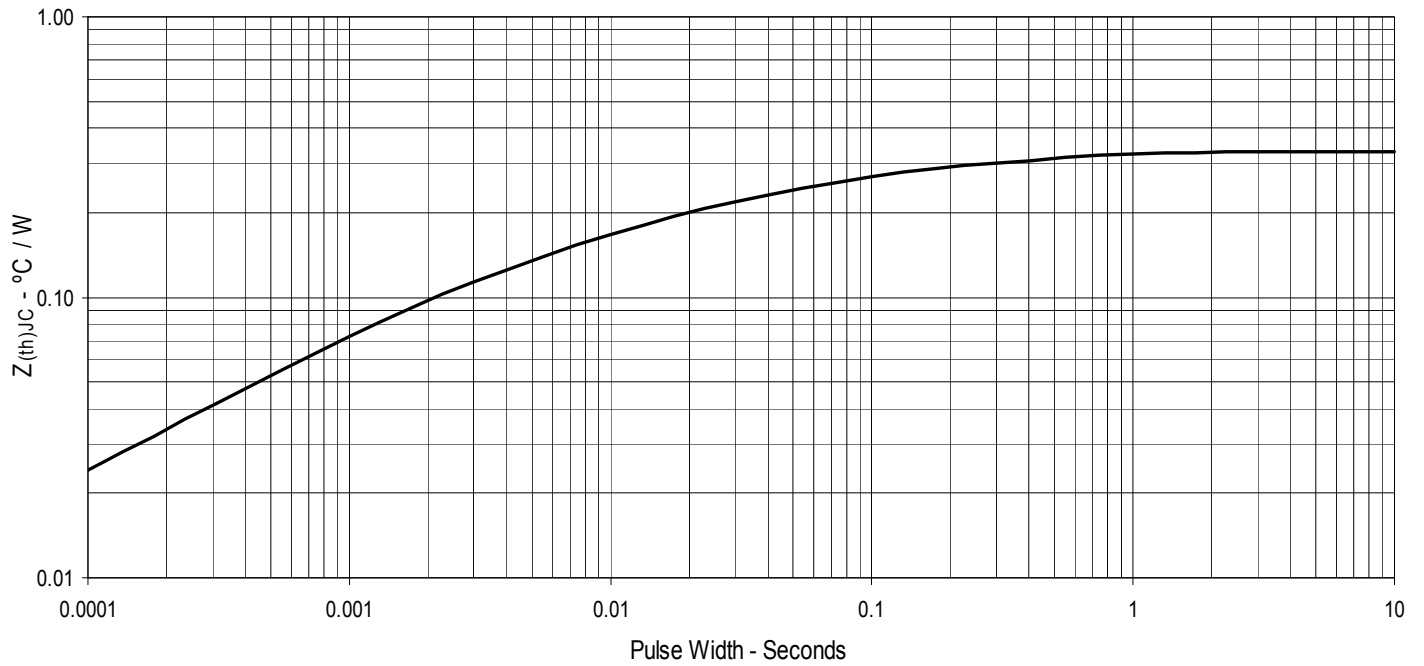


Fig. 19. Maximum Transient Thermal Impedance



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