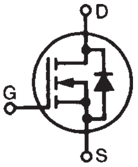
TrenchT2™ Power MOSFET

IXTA90N055T2
IXTP90N055T2

V_{DSS} = 55V
I_{D25} = 90A
$R_{DS(on)}$ ≤ 8.4mΩ

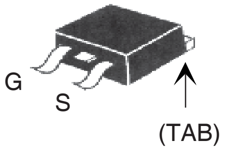
N-Channel Enhancement Mode
Avalanche Rated



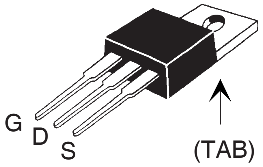
Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 175°C	55	V
V_{DGR}	T_J = 25°C to 175°C, R_{GS} = 1MΩ	55	V
V_{GSM}	Transient	± 20	V
I_{D25}	T_C = 25°C	90	A
I_{LRMS}	Lead Current Limit, RMS	75	A
I_{DM}	T_C = 25°C, pulse width limited by T_{JM}	230	A
I_{AR}	T_C = 25°C	50	A
E_{AS}	T_C = 25°C	300	mJ
P_D	T_C = 25°C	150	W
T_J		-55 ... +175	°C
T_{JM}		175	°C
T_{stg}		-55 ... +175	°C
T_L	1.6mm (0.062in.) from case for 10s	300	°C
	Plastic body for 10 seconds	260	°C
M_d	Mounting torque (TO-220)	1.13 / 10	Nm/lb.in.
Weight	TO-263	2.5	g
	TO-220	3.0	g

Symbol	Test Conditions (T_J = 25°C unless otherwise specified)	Characteristic Values Min.	 Typ.	 Max.	
BV_{DSS}	V_{GS} = 0V, I_D = 250μA	55			V
$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	2.0		4.0	V
I_{GSS}	V_{GS} = ± 20V, V_{DS} = 0V			±200	nA
I_{DSS}	V_{DS} = V_{DSS}			2	μA
	V_{GS} = 0V T_J = 150°C			200	μA
$R_{DS(on)}$	V_{GS} = 10V, I_D = 25A, Notes 1, 2		7.0	8.4	mΩ

TO-263 (IXTA)



TO-220 (IXTP)



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

Features

- International standard packages
- Unclamped Inductive Switching (UIS) rated
- Low package inductance
- 175°C Operating Temperature
- High current handling capability
- ROHS Compliant
- High performance Trench Technology for extremely low $R_{DS(on)}$

Advantages

- Easy to mount
- Space savings
- High power density
- Synchronous

Applications

- Automotive Engine Control
- Synchronous Buck Converter (for notebook systempower & General purpose point & load.)
- DC/DC Converters
- High Current Switching Applications
- Power Train Management
- Distributed Power Architecture

Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS} = 10V, I_D = 0.5 • I_{D25}, Note 1	25	43		S
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		2770		pF
C_{oss}			420		pF
C_{rss}			102		pF
$t_{d(on)}$	**Resistive Switching Times** V_{GS} = 10V, V_{DS} = 30V, I_D = 25A R_G = 5Ω (External)		19		ns
t_r			21		ns
$t_{d(off)}$			39		ns
t_f			19		ns
$Q_{g(on)}$	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 25A		42		nC
Q_{gs}			14		nC
Q_{gd}			8.5		nC
R_{thJC}				1.00	°C/W
R_{thCH}	TO-220		0.50		°C/W

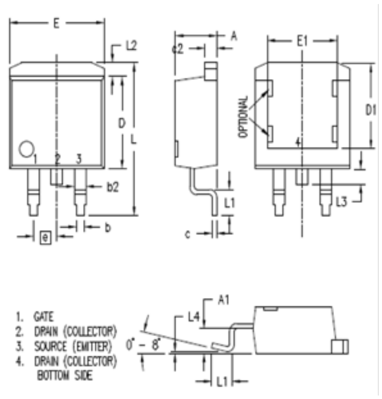
Source-Drain Diode

Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
I_S	V_{GS} = 0V			90	A
I_{SM}	Repetitive, Pulse width limited by T_{JM}			360	A
V_{SD}	I_F = 25A, V_{GS} = 0V, Note 1		0.85	1.0	V
t_{rr}	I_F = 45A, V_{GS} = 0V -di/dt = 100A/μs V_R = 27V		37		ns
I_{RM}			2.2		A
Q_{RM}			40		nC

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

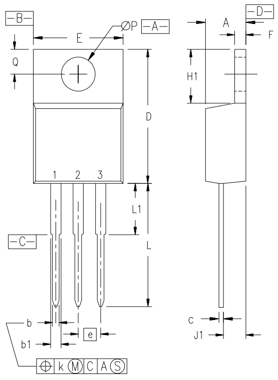
2. On through-hole packages, $R_{DS(on)}$ Kelvin test contact location must be 5mm or less from the package body.

TO-263 (IXTA) Outline



SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.160	.190	4.06	4.83
A1	.080	.110	2.03	2.79
b	.020	.039	0.51	0.99
b2	.045	.055	1.14	1.40
c	.016	.029	0.40	0.74
c2	.045	.055	1.14	1.40
D	.340	.380	8.64	9.65
D1	.315	.350	8.00	8.89
E	.380	.410	9.65	10.41
E1	.245	.320	6.22	8.13
e	.100 BSC		2.54 BSC	
L	.575	.625	14.61	15.88
L1	.090	.110	2.29	2.79
L2	.040	.055	1.02	1.40
L3	.050	.070	1.27	1.78
L4	0	.005	0	0.13

TO-220 (IXTP) Outline



Pins: 1 - Gate 2 - Drain
3 - Source 4 - Drain

SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS 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

Fig. 1. Output Characteristics @ 25ºC

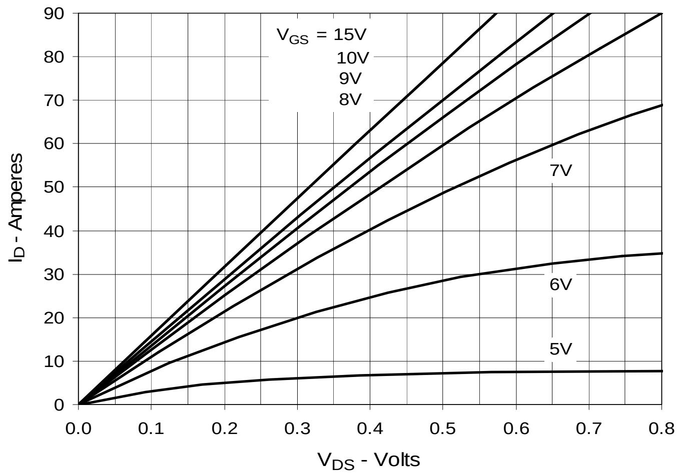


Fig. 2. Extended Output Characteristics @ 25ºC

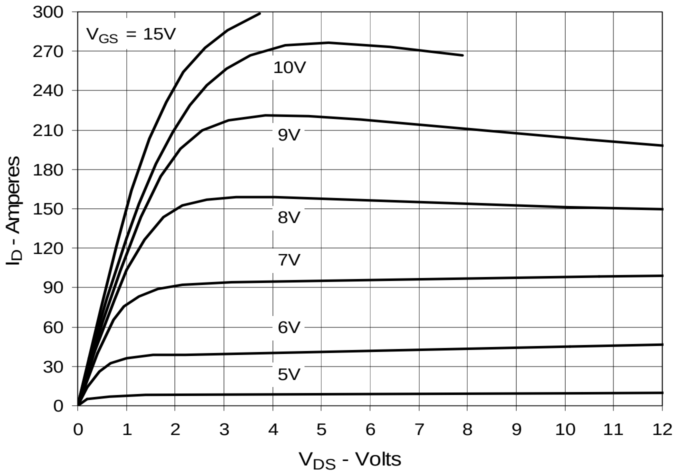


Fig. 3. Output Characteristics @ 150ºC

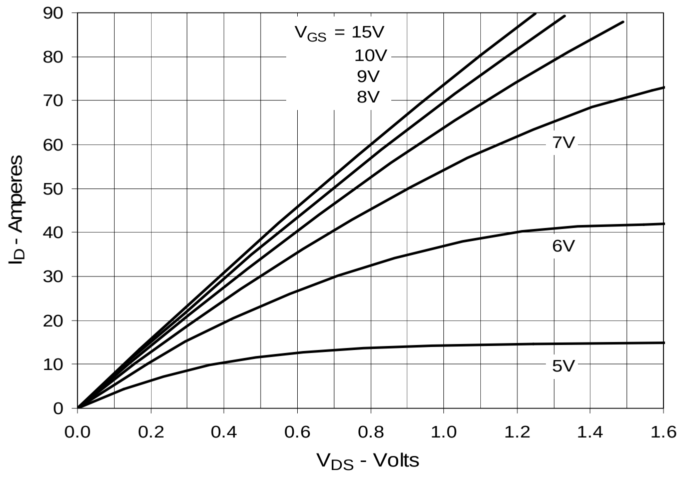


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 45A Value vs. Junction Temperature

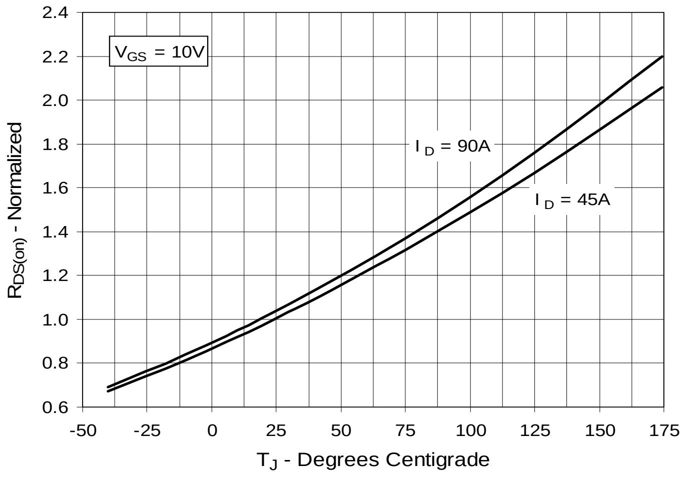


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 45A Value vs. Drain Current

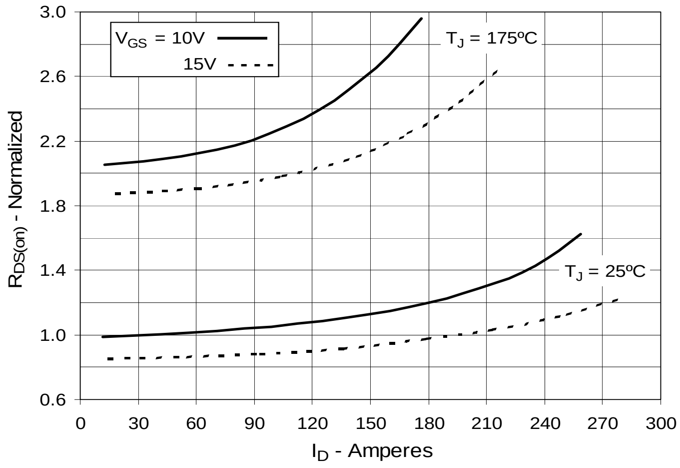


Fig. 6. Drain Current vs. Case Temperature

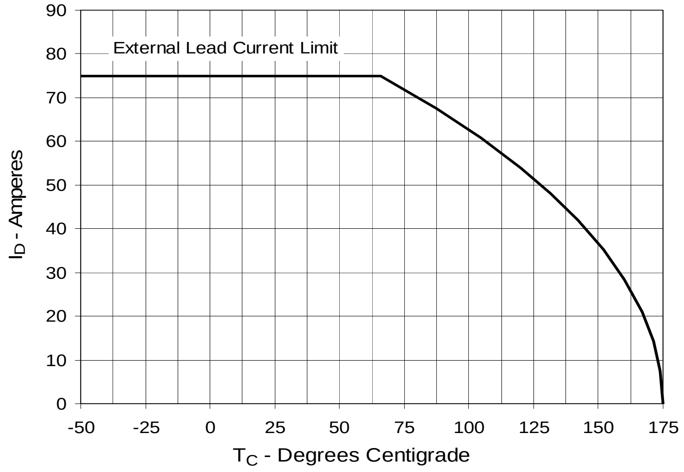


Fig. 7. Input Admittance

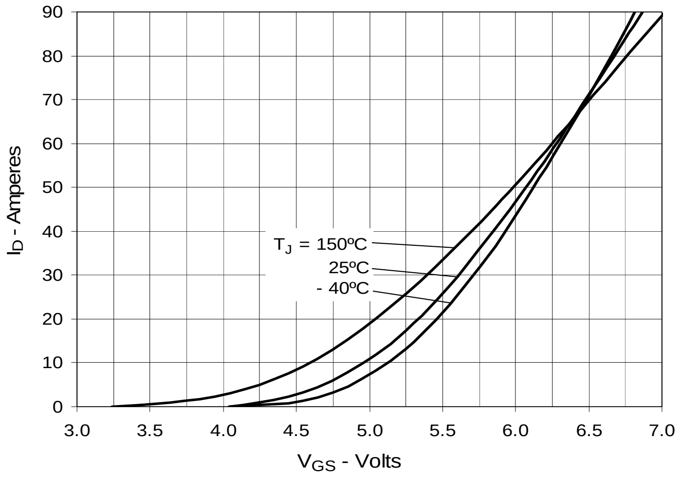


Fig. 8. Transconductance

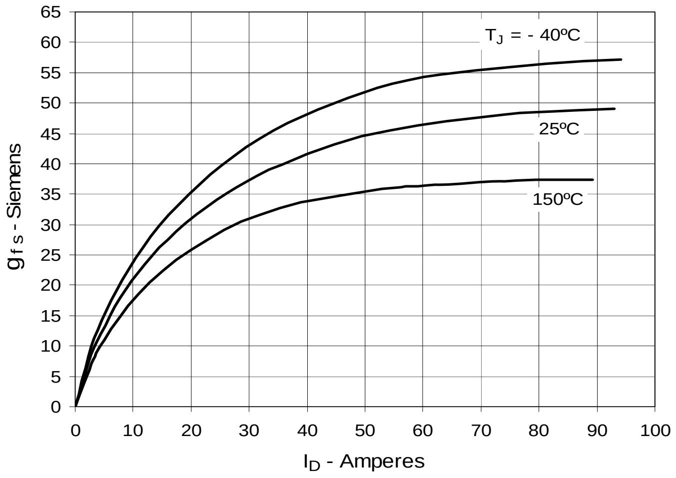


Fig. 9. Forward Voltage Drop of Intrinsic Diode

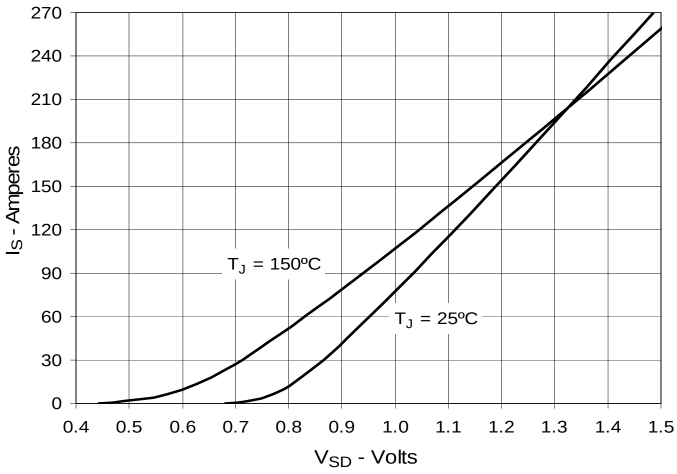


Fig. 10. Gate Charge

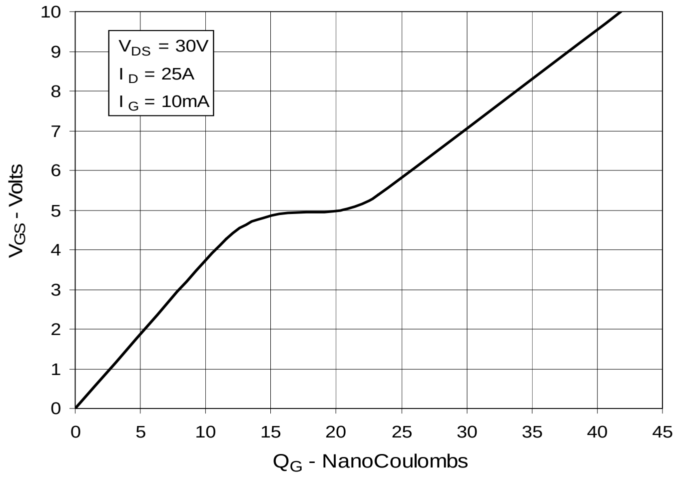


Fig. 11. Capacitance

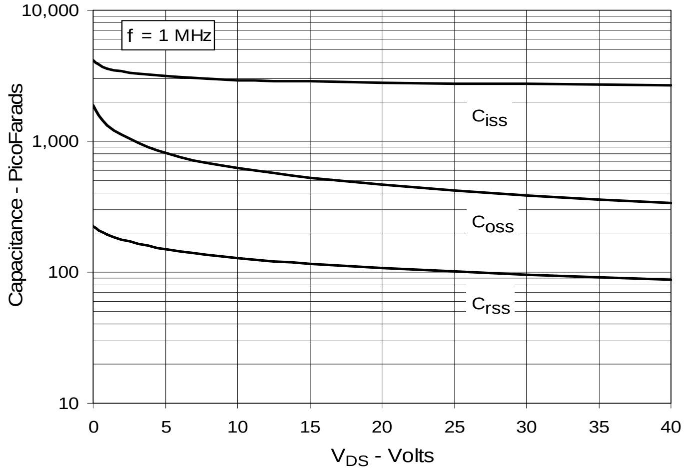


Fig. 12. Forward-Bias Safe Operating Area

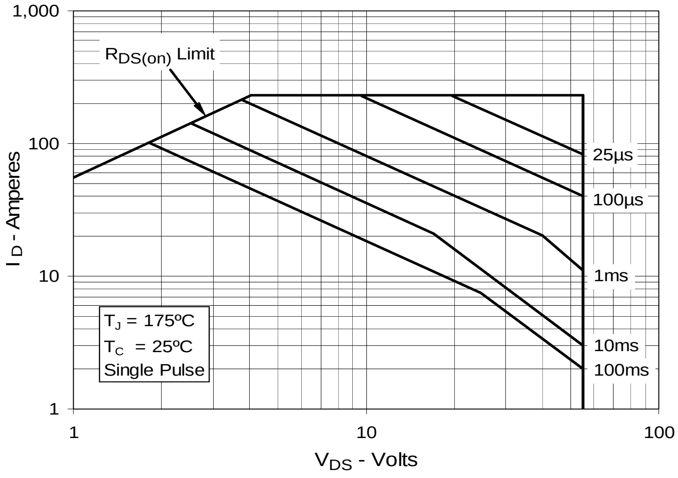


Fig. 13. Resistive Turn-on Rise Time vs. Junction Temperature

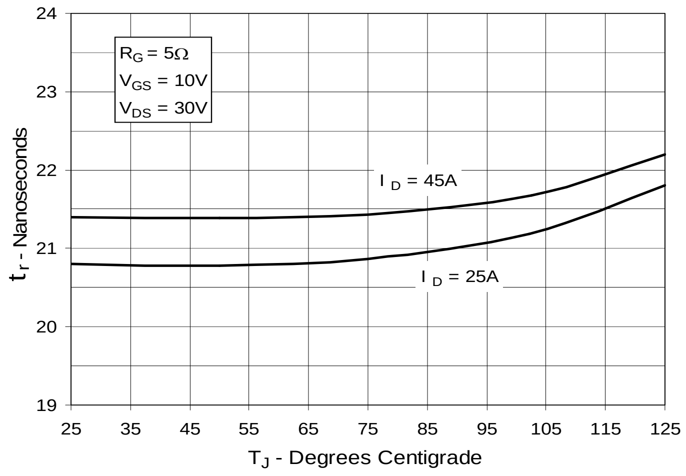


Fig. 14. Resistive Turn-on Rise Time vs. Drain Current

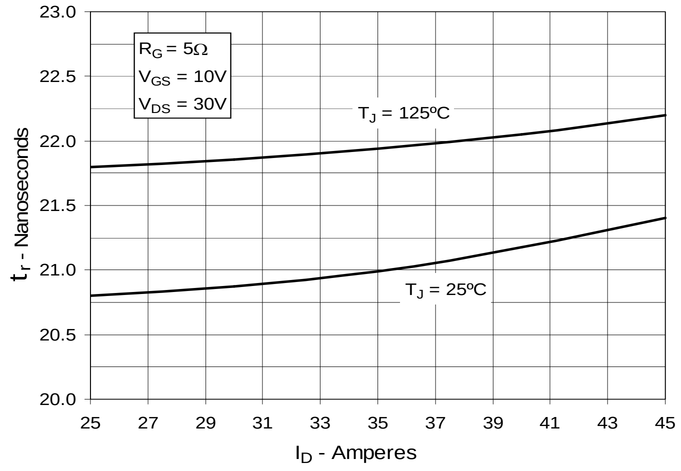


Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance

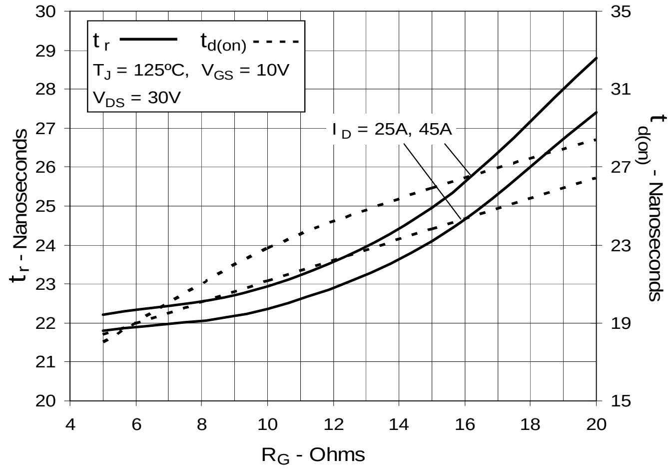


Fig. 16. Resistive Turn-off Switching Times vs. Junction Temperature

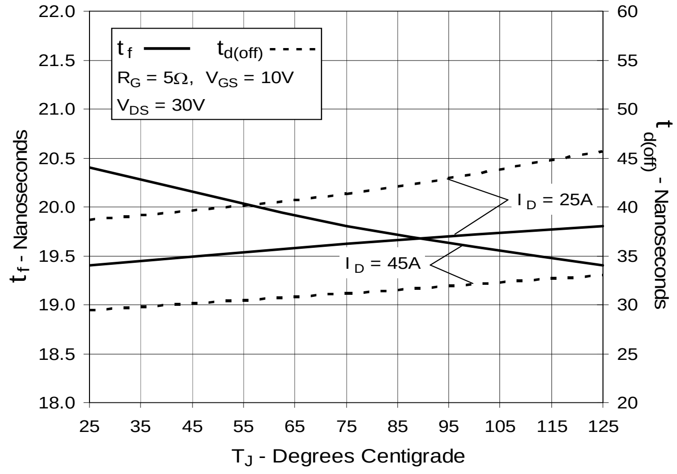


Fig. 17. Resistive Turn-off Switching Times vs. Drain Current

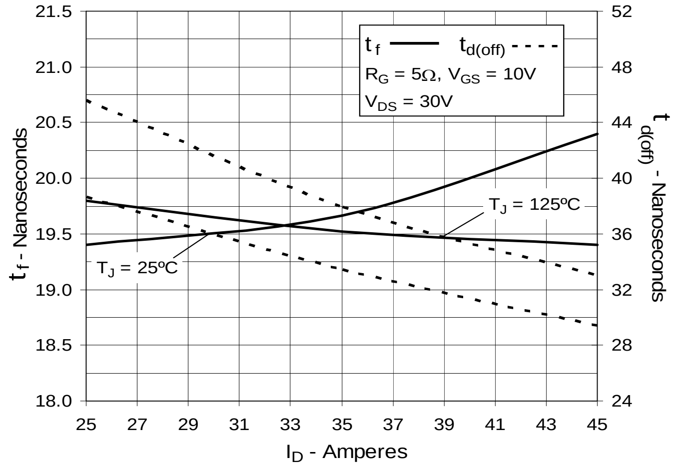


Fig. 18. Resistive Turn-off Switching Times vs. Gate Resistance

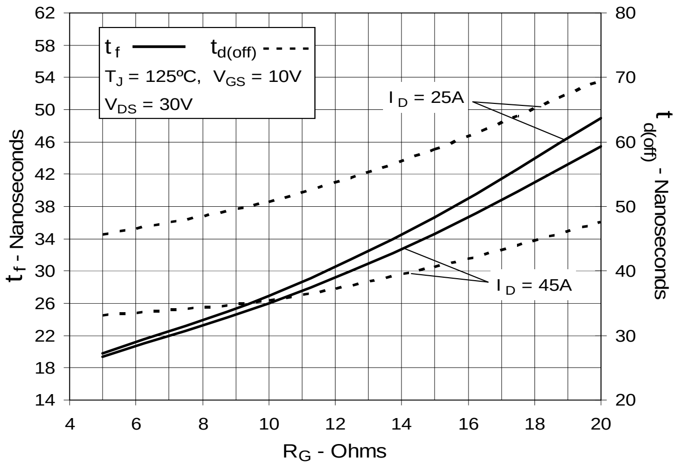
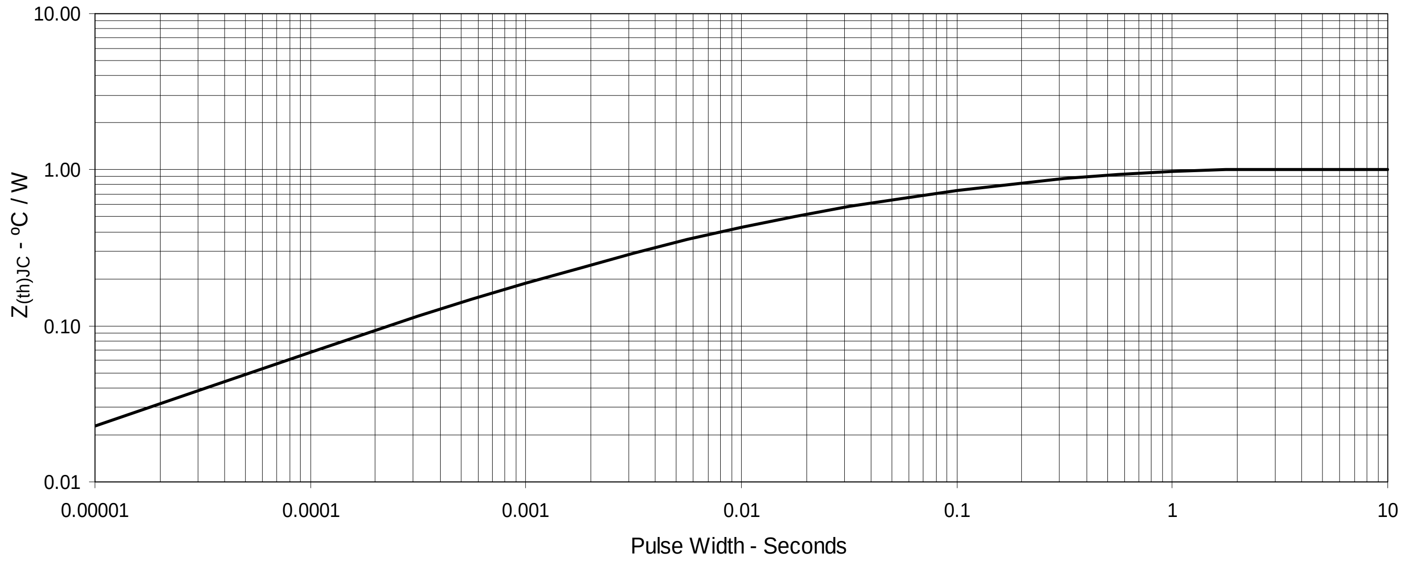


Fig. 19. Maximum Transient Thermal Impedance



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