

TrenchT2™ Power MOSFET

IXTA200N055T2
IXTP200N055T2

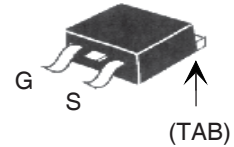
$V_{DSS} = 55V$
 $I_{D25} = 200A$
 $R_{DS(on)} \leq 4.2m\Omega$

N-Channel Enhancement Mode
Avalanche Rated

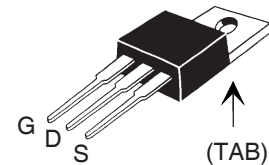


Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ C$ to $175^\circ C$	55	V
V_{DGR}	$T_J = 25^\circ C$ to $175^\circ C$, $R_{GS} = 1M\Omega$	55	V
V_{GSM}	Transient	± 20	V
I_{D25}	$T_C = 25^\circ C$	200	A
I_{LRMS}	Lead Current Limit, RMS	75	A
I_{DM}	$T_C = 25^\circ C$, pulse width limited by T_{JM}	500	A
I_{AR}	$T_C = 25^\circ C$	100	A
E_{AS}	$T_C = 25^\circ C$	600	mJ
P_D	$T_C = 25^\circ C$	360	W
T_J		-55 ... +175	$^\circ C$
T_{JM}		175	$^\circ C$
T_{stg}		-55 ... +175	$^\circ C$
T_L	1.6mm (0.062in.) from case for 10s	300	$^\circ C$
T_{sold}	Plastic body for 10 seconds	260	$^\circ C$
M_d	Mounting torque (TO-220)	1.13 / 10	Nm/lb.in.
Weight	TO-263	2.5	g
	TO-220	3.0	g

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 system power & General purpose point & load.)
- DC/DC Converters
- High Current Switching Applications
- Power Train Management
- Distributed Power Architecture

Symbol	Test Conditions ($T_J = 25^\circ C$ unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
BV_{DSS}	$V_{GS} = 0V$, $I_D = 250\mu A$	55		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\mu A$	2.0		4.0 V
I_{GSS}	$V_{GS} = \pm 20V$, $V_{DS} = 0V$			± 200 nA
I_{DSS}	$V_{DS} = V_{DSS}$			5 μA
	$V_{GS} = 0V$ $T_J = 150^\circ C$			50 μA
$R_{DS(on)}$	$V_{GS} = 10V$, $I_D = 50A$, Notes 1, 2	3.3	4.2	m Ω

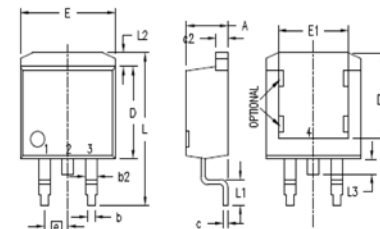
Symbol	Test Conditions	Characteristic Values		
		Min.	Typ.	Max.
g_{fs}	$V_{DS} = 10V, I_D = 60A$, Note 1	50	80	S
C_{iss}	$V_{GS} = 0V, V_{DS} = 25V, f = 1MHz$		6970	pF
C_{oss}			1026	pF
C_{rss}			228	pF
$t_{d(on)}$	Resistive Switching Times $V_{GS} = 10V, V_{DS} = 30V, I_D = 50A$ $R_G = 3.3\Omega$ (External)		26	ns
t_r			22	ns
$t_{d(off)}$			49	ns
t_f			27	ns
$Q_{g(on)}$	$V_{GS} = 10V, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$		109	nC
Q_{gs}			35	nC
Q_{gd}			24	nC
R_{thJC}				0.42 °C/W
R_{thCH}	TO-220	0.50		°C/W

Source-Drain Diode

Symbol	Test Conditions	Characteristic Values		
		Min.	Typ.	Max.
I_S	$V_{GS} = 0V$			200 A
I_{SM}	Repetitive, Pulse width limited by T_{JM}			600 A
V_{SD}	$I_F = 50A, V_{GS} = 0V$, Note 1			1.0 V
t_{rr}	$I_F = 100A, V_{GS} = 0V$ $-di/dt = 100A/\mu s$ $V_R = 27V$		49	ns
I_{RM}			2.6	A
Q_{RM}			64	nC

- Notes: 1. Pulse test, $t \leq 300\mu s$; duty cycle, $d \leq 2\%$.
2. On through-hole packages, $R_{DS(on)}$ Kelvin test contact location must be 5mm or less from the package body.

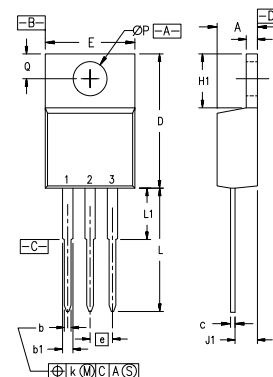
TO-263 (IXTA) Outline



1. GATE
2. DRAIN (COLLECTOR)
3. SOURCE (EMITTER)
4. DRAIN (COLLECTOR)
BOTTOM SIDE

SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	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		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

IXYS reserves the right to change limits, test conditions, and dimensions.

Fig. 1. Output Characteristics @ 25°C

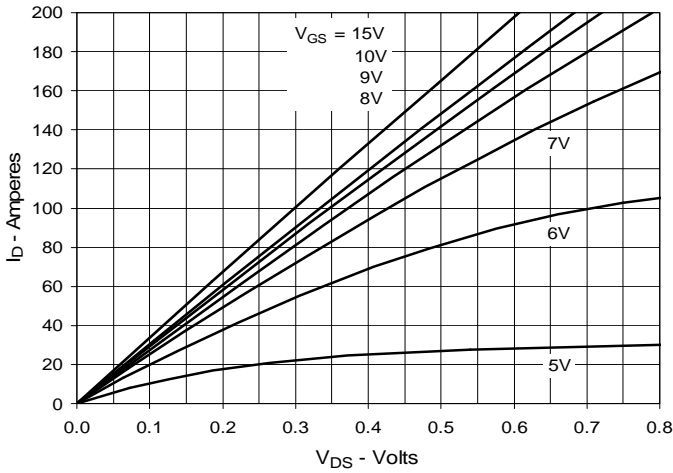


Fig. 2. Extended Output Characteristics @ 25°C

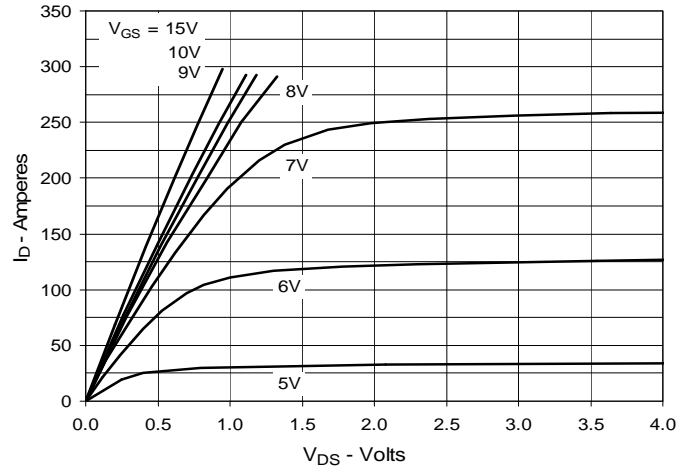


Fig. 3. Output Characteristics @ 150°C

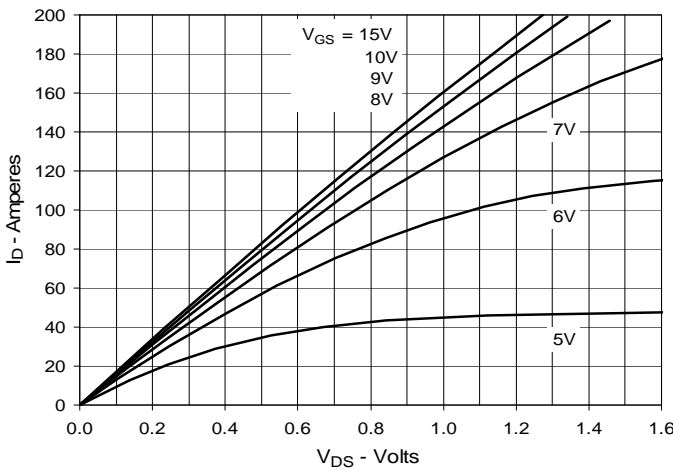


Fig. 4. $R_{DS(on)}$ Normalized to $I_D = 100A$ Value vs. Junction Temperature

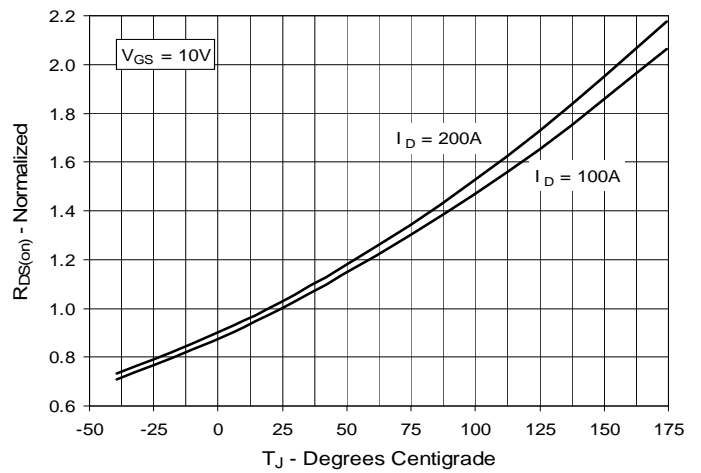


Fig. 5. $R_{DS(on)}$ Normalized to $I_D = 100A$ Value vs. Drain Current

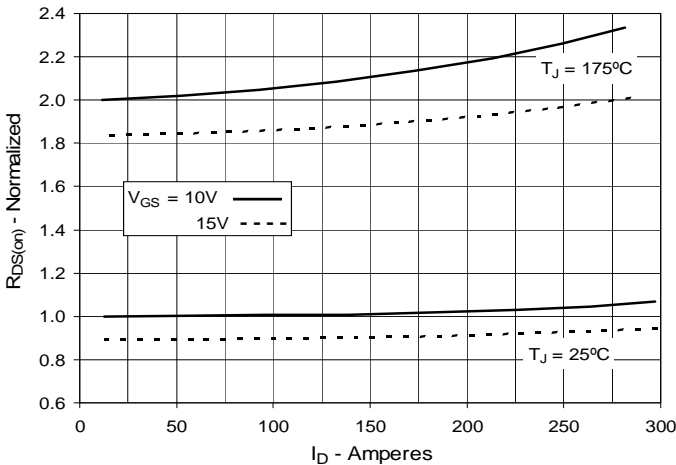


Fig. 6. Drain Current vs. Case Temperature

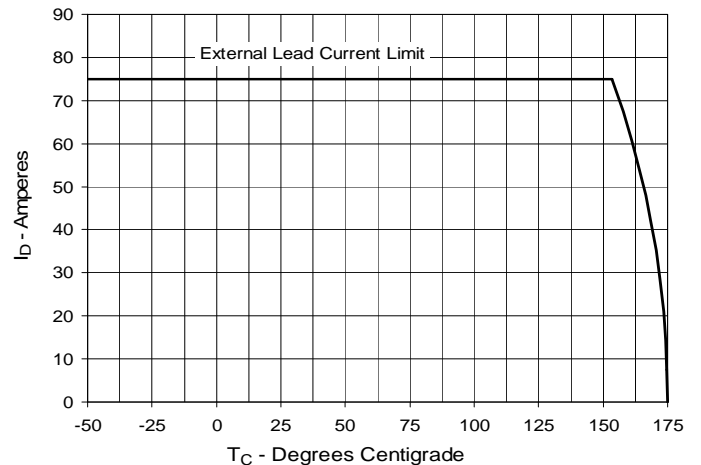


Fig. 7. Input Admittance

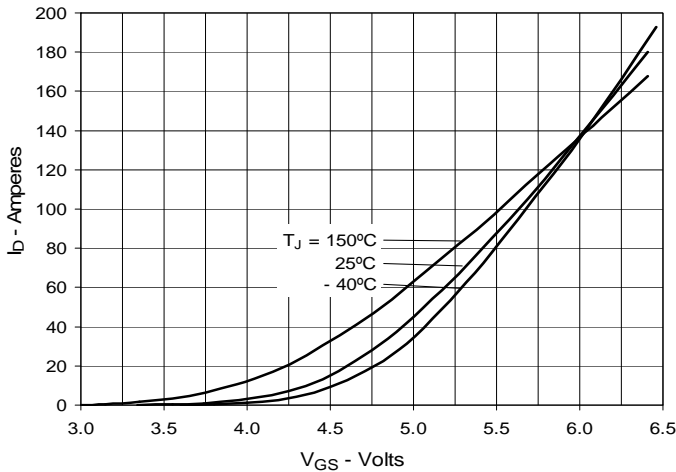


Fig. 8. Transconductance

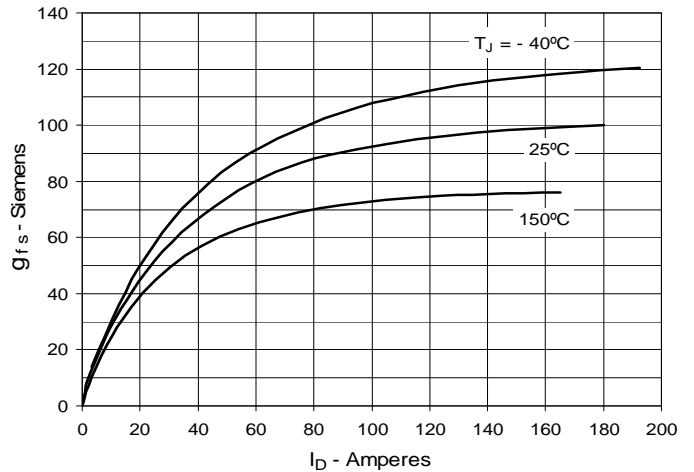


Fig. 9. Forward Voltage Drop of Intrinsic Diode

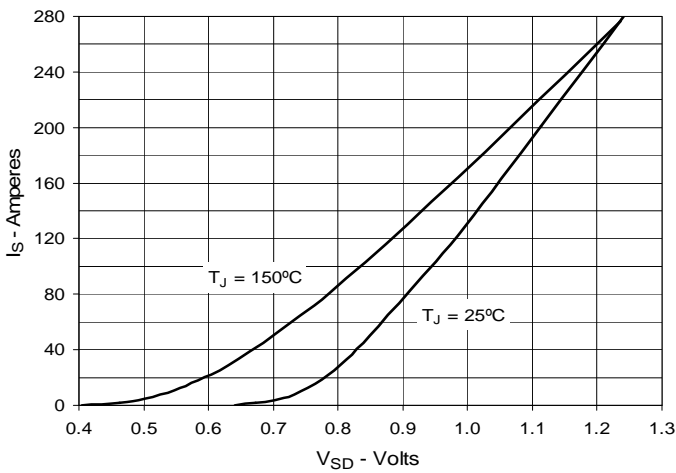


Fig. 10. Gate Charge

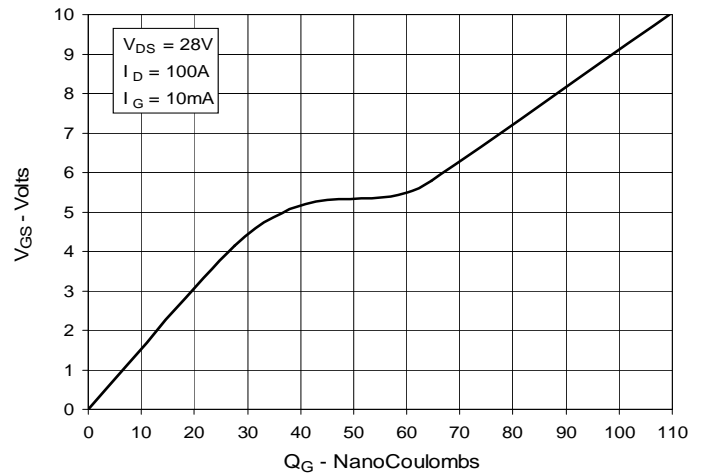


Fig. 11. Capacitance

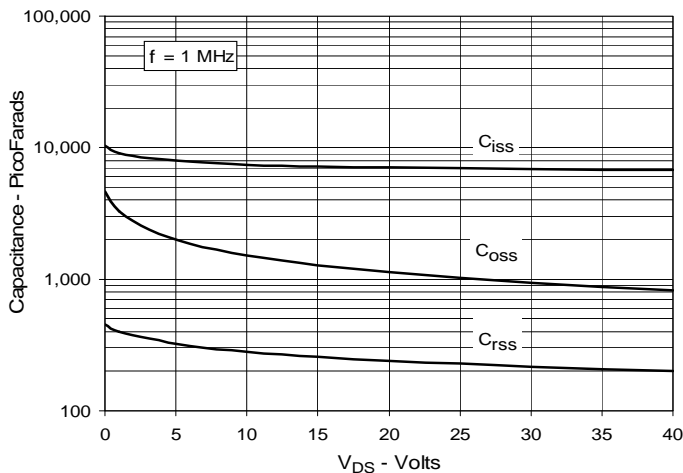


Fig. 12. Forward-Bias Safe Operating Area

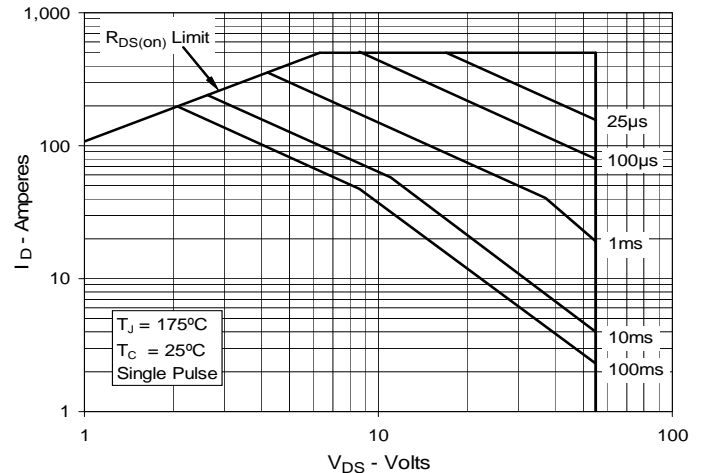


Fig. 13. Resistive Turn-on Rise Time vs. Junction Temperature

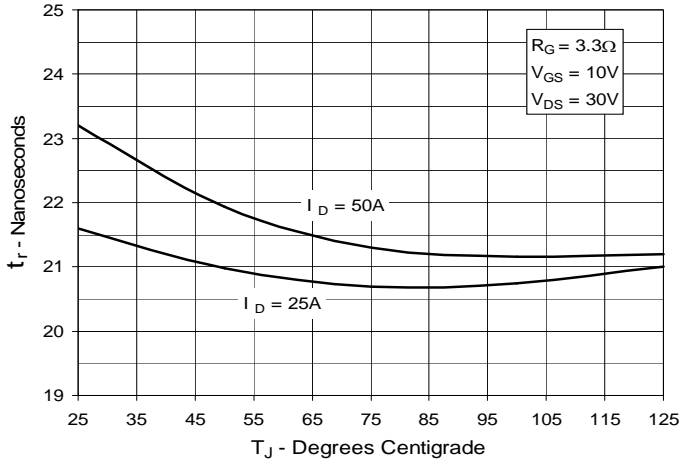


Fig. 14. Resistive Turn-on Rise Time vs. Drain Current

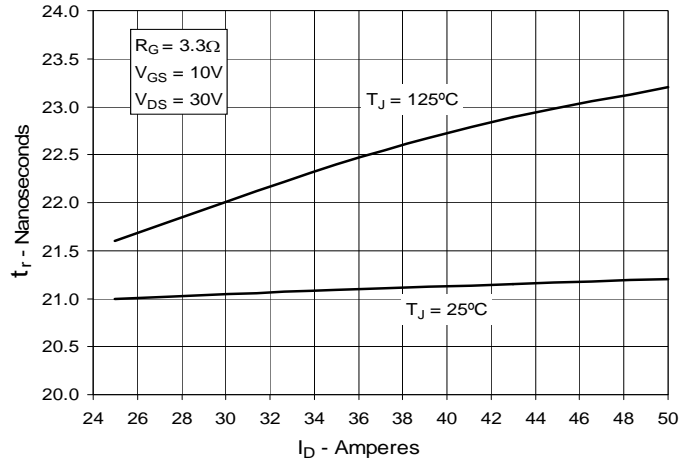


Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance

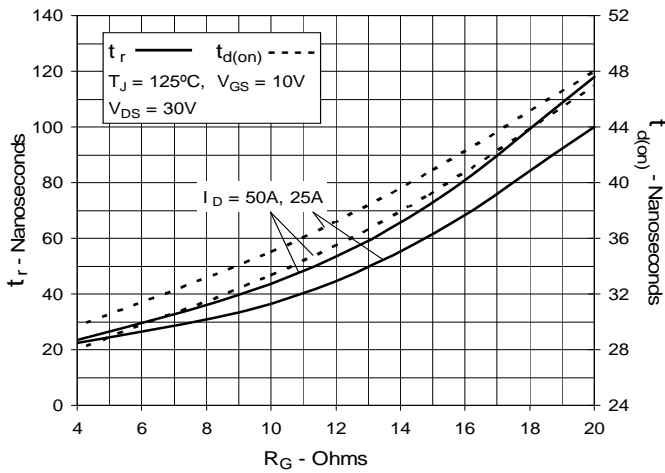


Fig. 16. Resistive Turn-off Switching Times vs. Junction Temperature

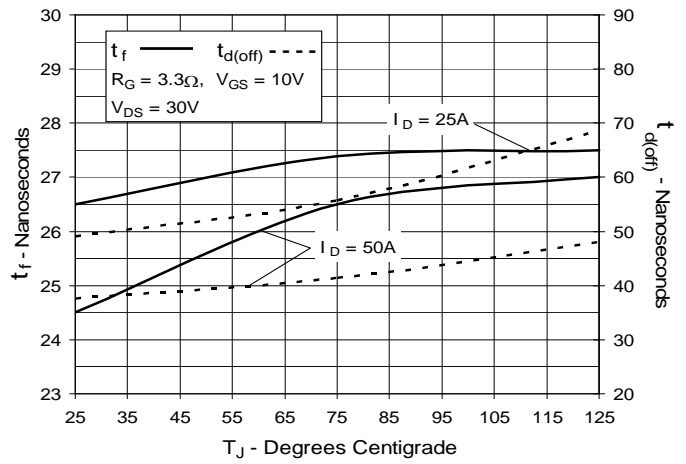


Fig. 17. Resistive Turn-off Switching Times vs. Drain Current

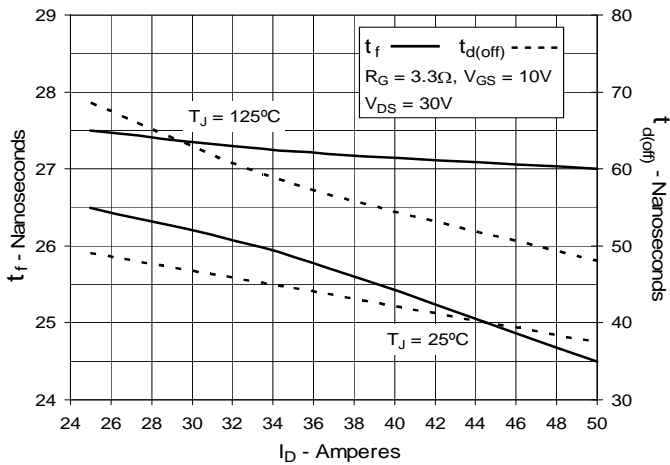


Fig. 18. Resistive Turn-off Switching Times vs. Gate Resistance

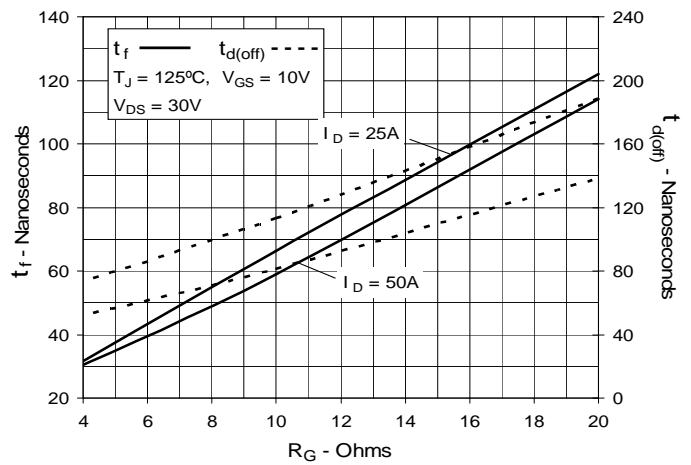
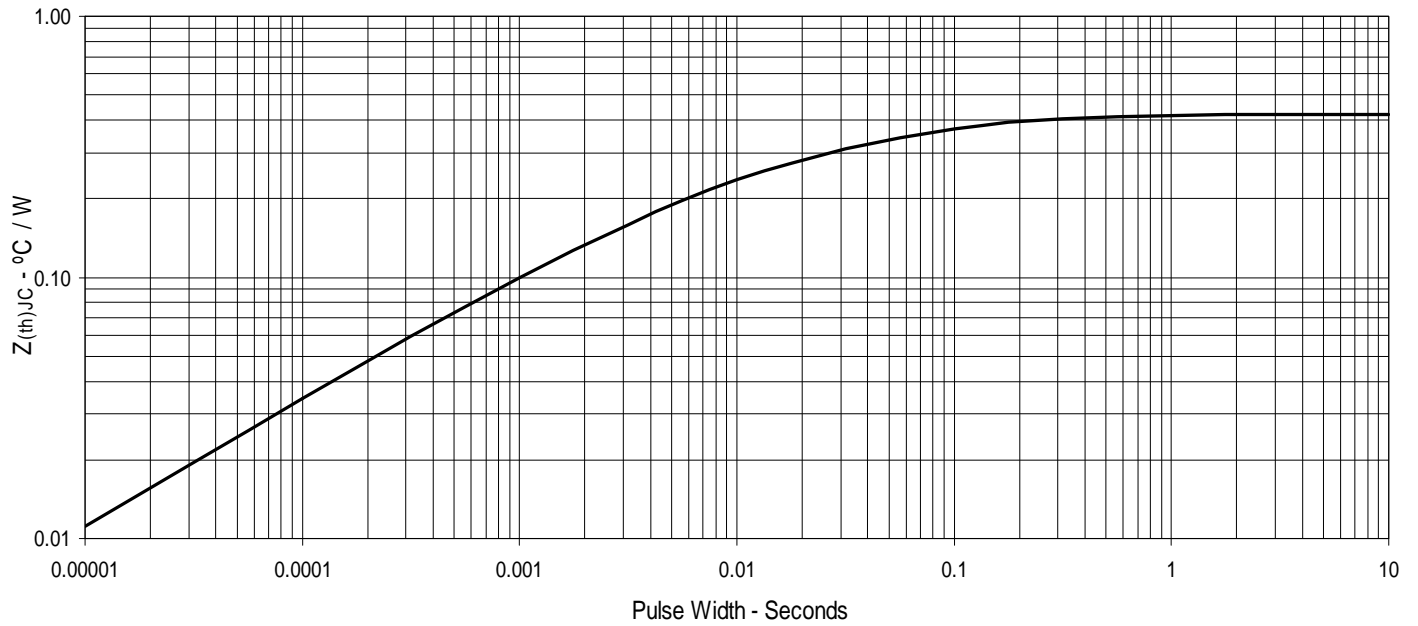


Fig. 19. Maximum Transient Thermal Impedance



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