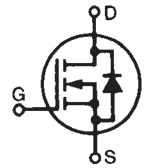
IXYS

TrenchT2™
Power MOSFET

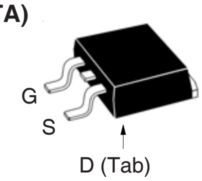
IXTA200N055T2
IXTP200N055T2

V_{DSS} = 55V
I_{D25} = 200A
$R_{DS(on)}$ ≤ 4.2mΩ

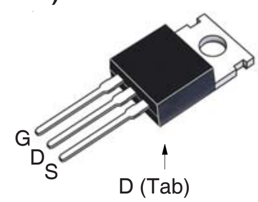
N-Channel Enhancement Mode
Avalanche Rated



TO-263 (IXTA)



TO-220 (IXTP)



G = Gate D = Drain
S = Source Tab = Drain

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	200	A
$I_{L(RMS)}$	External Lead Current Limit	120	A
I_{DM}	T_C = 25°C, Pulse Width Limited by T_{JM}	500	A
I_A	T_C = 25°C	100	A
E_{AS}	T_C = 25°C	600	mJ
P_D	T_C = 25°C	360	W
T_J		-55 ... +175	°C
T_{JM}		175	°C
T_{stg}		-55 ... +175	°C
T_L	Maximum Lead Temperature for Soldering	300	°C
T_{SOLD}	1.6 mm (0.062in.) from Case for 10s	260	°C
F_C	Mounting Force (TO-263)	10..65 / 2.2..14.6	N/lb
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}, V_{GS} = 0V			5	μA
	T_J = 150°C			50	μA
$R_{DS(on)}$	V_{GS} = 10V, I_D = 50A, Notes 1 & 2		3.3	4.2	mΩ

Features

- International Standard Packages
- Avalanche Rated
- Low Package Inductance
- Fast Intrinsic Rectifier
  175°C Operating Temperature
- High Current Handling Capability
- ROHS Compliant
- High Performance Trench
  Technology for extremely low $R_{DS(on)}$

Advantages

- High Power Density
- Easy to Mount
- Space Savings

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

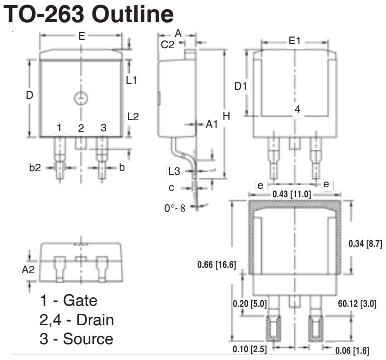
Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS} = 10V, I_D = 60A, Note 1	50	80		S
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		6970		pF
C_{oss}			1026		pF
C_{rss}			228		pF
$t_{d(on)}$	**Resistive Switching Times**		26		ns
t_r	V_{GS} = 10V, V_{DS} = 30V, I_D = 50A		22		ns
$t_{d(off)}$	R_G = 3.3Ω (External)		49		ns
t_f			27		ns
$Q_{g(on)}$	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, 0.5 • I_{DSS}		109		nC
Q_{gs}			35		nC
Q_{gd}			24		nC
R_{thJC}				0.42	°C/W
R_{thCS}	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			200	A
I_{SM}	Repetitive, Pulse Width Limited by T_{JM}			600	A
V_{SD}	I_F = 50A, V_{GS} = 0V, Note 1			1.1	V
t_{rr}	I_F = 100A, V_{GS} = 0V,		49		ns
I_{RM}	-di/dt = 100A/μs, V_R = 27V		2.6		A
Q_{RM}			64		nC

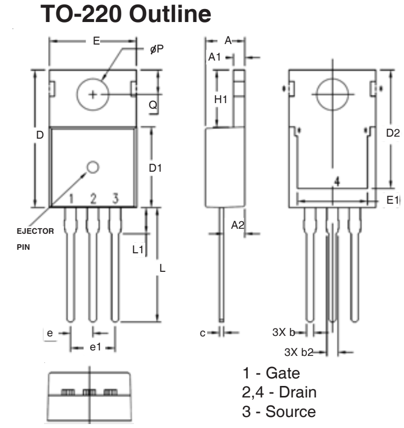
Notes: 1. Pulse test, t ≤ 300μs; duty cycle, d ≤ 2%.
2. On through-hole packages, $R_{DS(on)}$ Kelvin test contact location must be 5mm or less from the package body.

TO-263 Outline



SYM	INCHES MIN	MAX	MILLIMETER MIN	MAX
A	.170	.185	4.30	4.70
A1	.000	.008	0.00	0.20
A2	.091	.098	2.30	2.50
b	.028	.035	0.70	0.90
b2	.046	.060	1.18	1.52
C	.018	.024	0.45	0.60
C2	.049	.060	1.25	1.52
D	.340	.370	8.63	9.40
D1	.300	.327	7.62	8.30
E	.380	.410	9.65	10.41
E1	.270	.330	6.86	8.38
e	.100 BSC		2.54 BSC	
H	.580	.620	14.73	15.75
L	.075	.105	1.91	2.67
L1	.039	.060	1.00	1.52
L2	—	.070	—	1.77
L3	.010 BSC		0.254 BSC	

TO-220 Outline



SYM	INCHES MIN	MAX	MILLIMETERS MIN	MAX
A	.169	.185	4.30	4.70
A1	.047	.055	1.20	1.40
A2	.079	.106	2.00	2.70
b	.024	.039	0.60	1.00
b2	.045	.057	1.15	1.45
c	.014	.026	0.35	0.65
D	.587	.626	14.90	15.90
D1	.335	.370	8.50	9.40
(D2)	.500	.531	12.70	13.50
E	.382	.406	9.70	10.30
(E1)	.283	.323	7.20	8.20
e	.100 BSC		2.54 BSC	
e1	.200 BSC		5.08 BSC	
H1	.244	.268	6.20	6.80
L	.492	.547	12.50	13.90
L1	.110	.154	2.80	3.90
ØP	.134	.150	3.40	3.80
Q	.106	.126	2.70	3.20

7V

Fig. 1. Output Characteristics @ $T_J = 25^oC$

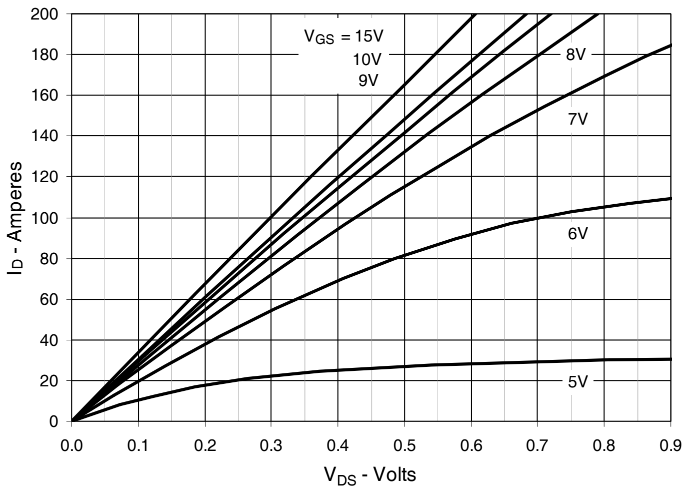


Fig. 2. Extended Output Characteristics @ $T_J = 25^oC$

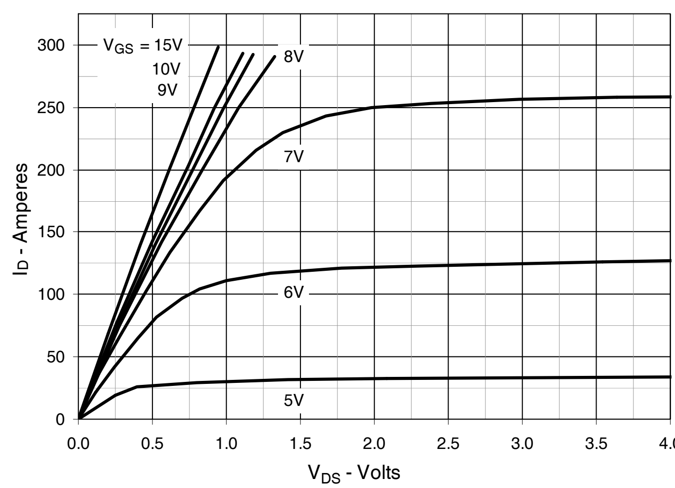


Fig. 3. Output Characteristics @ $T_J = 150^oC$

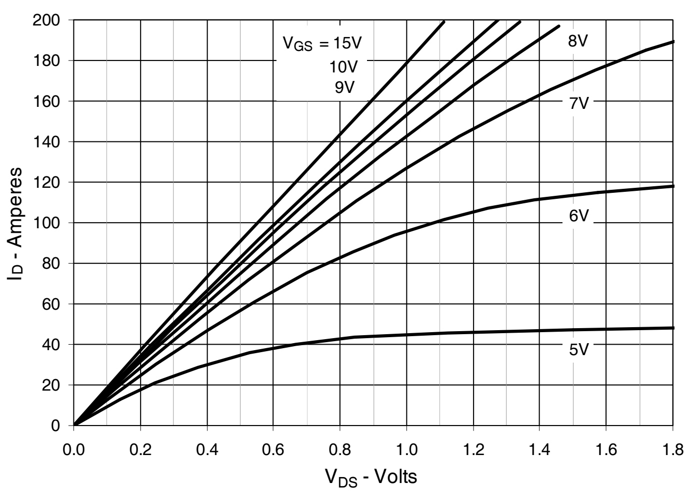


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 100A Value vs. Junction Temperature

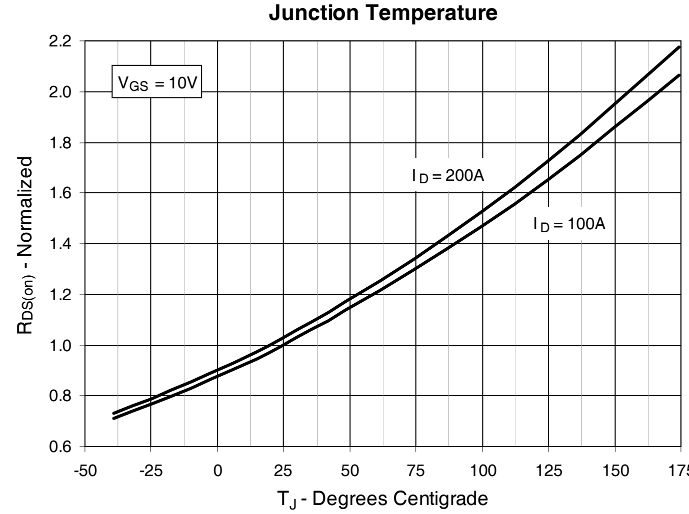


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 100A Value vs. Drain Current

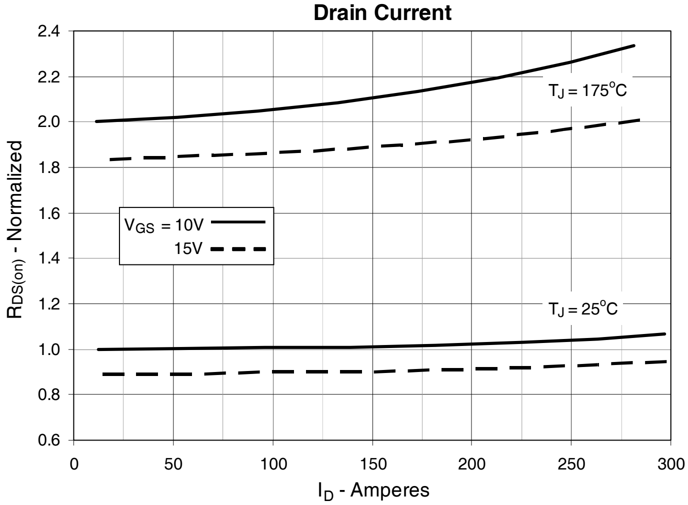


Fig. 6. Drain Current vs. Case Temperature

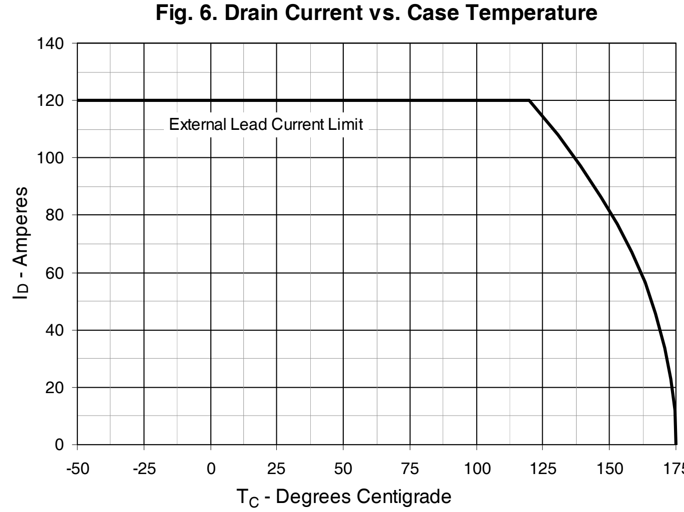


Fig. 7. Input Admittance

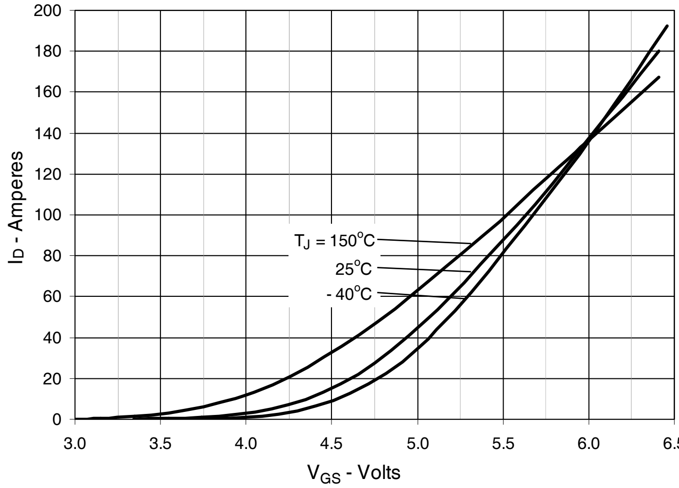


Fig. 8. Transconductance

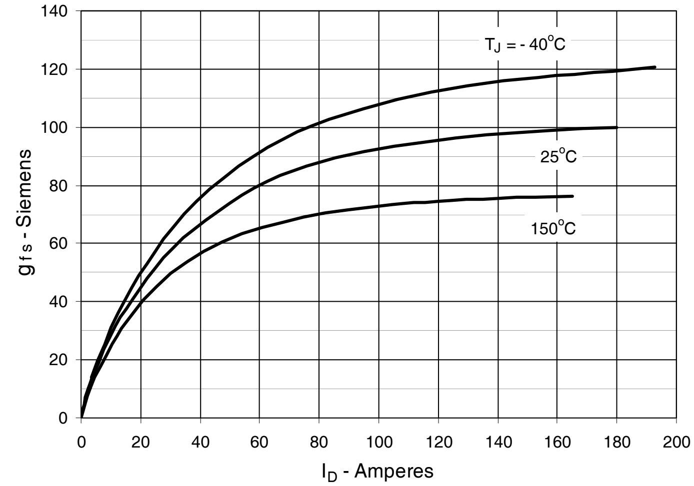


Fig. 9. Forward Voltage Drop of Intrinsic Diode

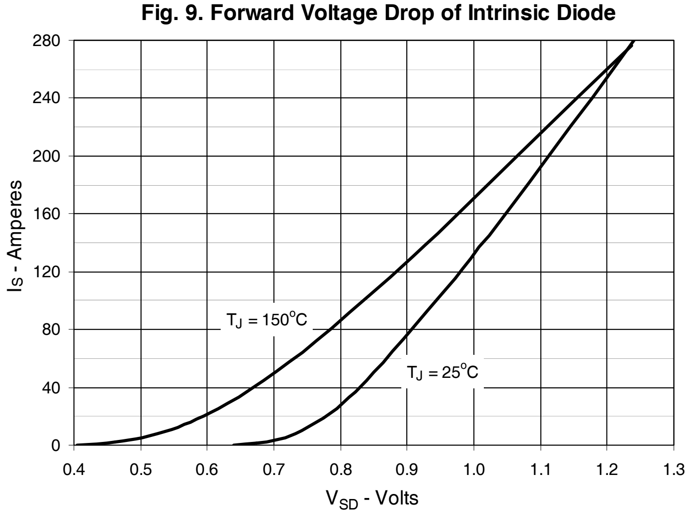


Fig. 10. Gate Charge

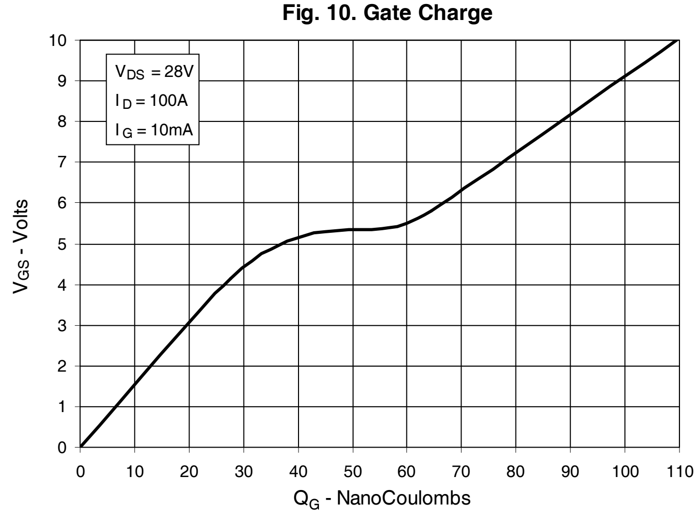


Fig. 11. Capacitance

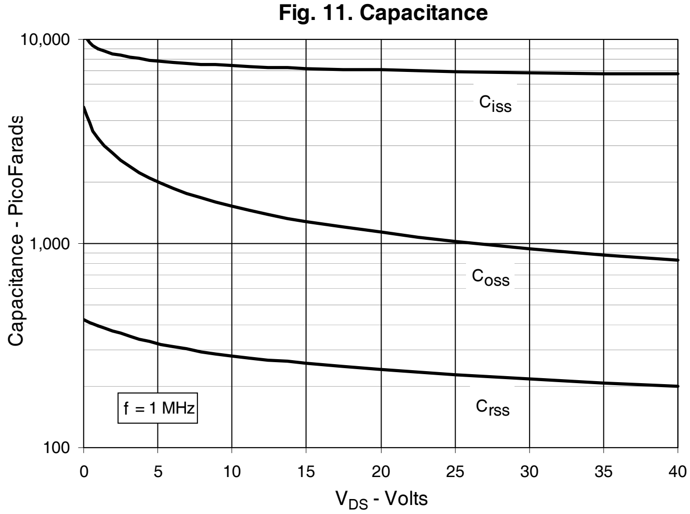


Fig. 12. Forward-Bias Safe Operating Area

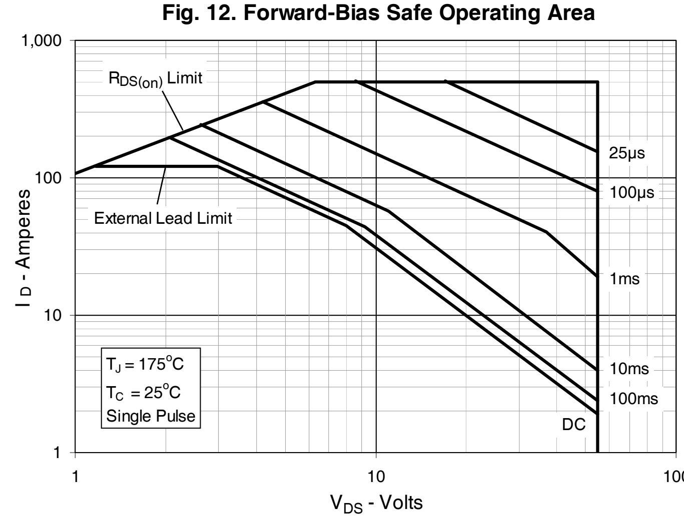


Fig. 13. Resistive Turn-on Rise Time vs. Junction Temperature

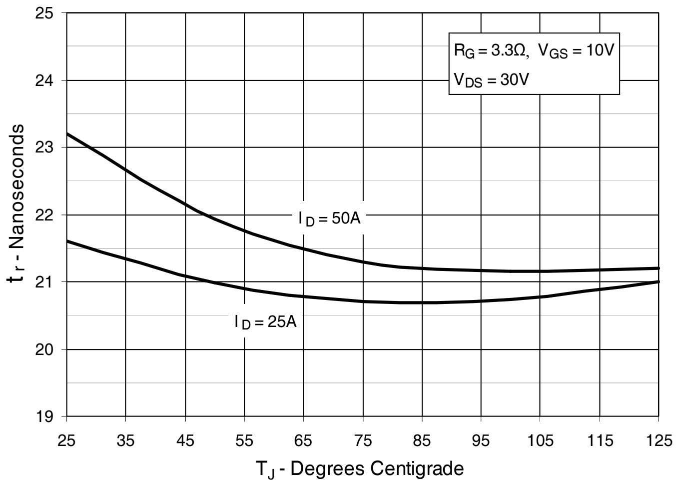


Fig. 14. Resistive Turn-on Rise Time vs. Drain Current

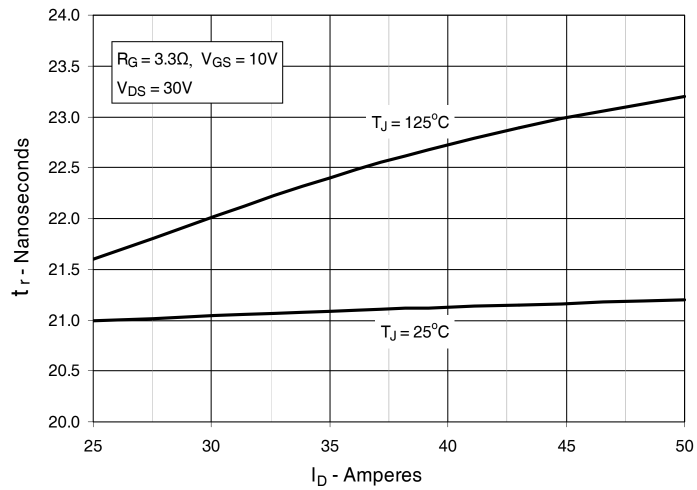


Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance

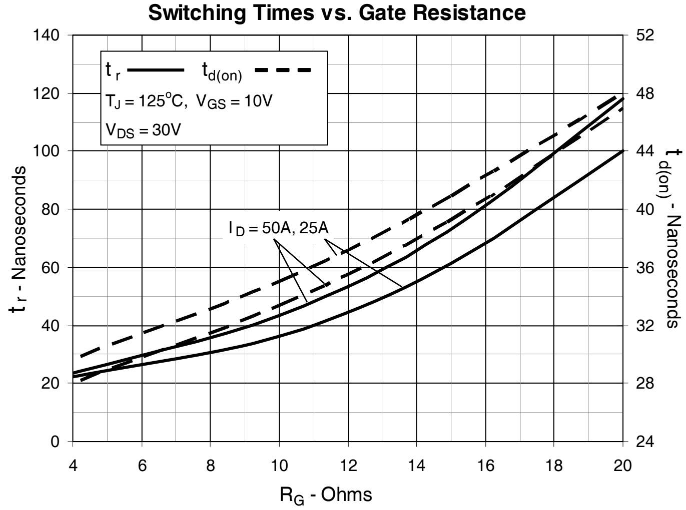


Fig. 16. Resistive Turn-off Switching Times vs. Junction Temperature

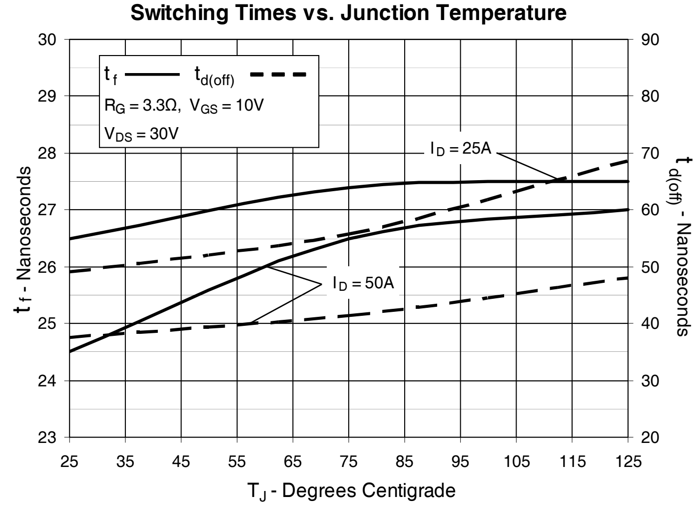


Fig. 17. Resistive Turn-off Switching Times vs. Drain Current

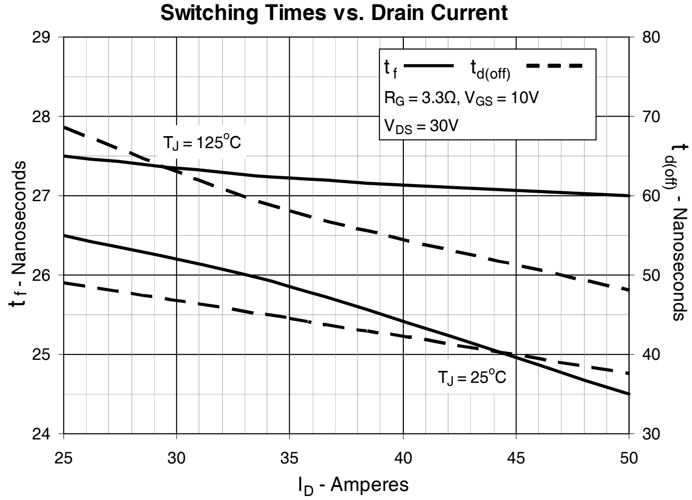


Fig. 18. Resistive Turn-off Switching Times vs. Gate Resistance

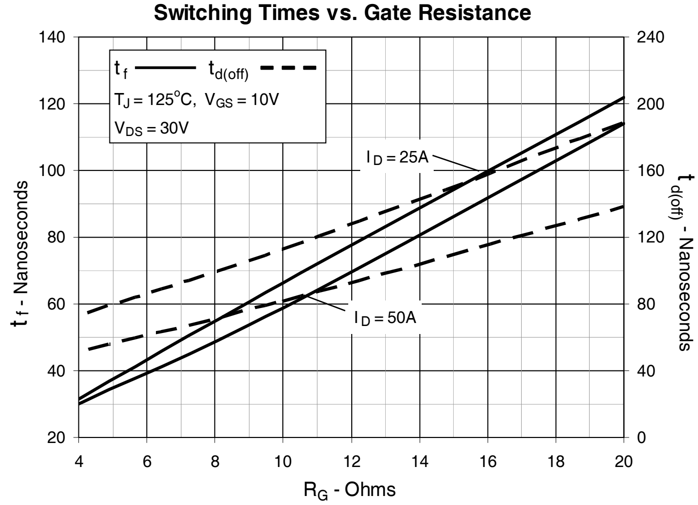


Fig. 19. Maximum Transient Thermal Impedance