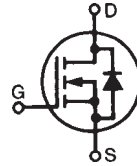


TrenchMV™ Power MOSFET HiperFET™

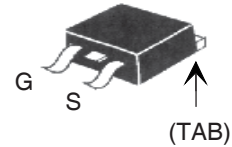
IXFA130N10T
IXFP130N10T

N-Channel Enhancement Mode
Avalanche Rated
Fast intrinsic diode

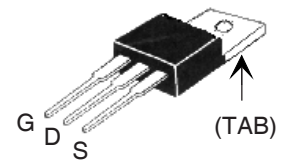


$$\begin{aligned} V_{DSS} &= 100V \\ I_{D25} &= 130A \\ R_{DS(on)} &\leq 9.1m\Omega \end{aligned}$$

TO-263 (IXFA)



TO-220 (IXFP)



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

Features

- Ultra-low On Resistance
- Unclamped Inductive Switching (UIS) rated
- Low package inductance
 - easy to drive and to protect
- 175 °C Operating Temperature
- Fast intrinsic diode

Advantages

- Easy to mount
- Space savings
- High power density

Applications

- Automotive
 - Motor Drives
 - 42V Power Bus
 - ABS Systems
- DC/DC Converters and Off-line UPS
- Primary Switch for 24V and 48V Systems
- Distributed Power Architectures and VRMs
- Electronic Valve Train Systems
- High Current Switching Applications
- High Voltage Synchronous Rectifier

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ\text{C to } 175^\circ\text{C}$	100	V
V_{GSM}	Transient	± 30	V
I_{D25}	$T_C = 25^\circ\text{C}$	130	A
I_{LRMS}	Lead Current Limit, RMS	75	A
I_{DM}	$T_C = 25^\circ\text{C}$, pulse width limited by T_{JM}	350	A
I_A	$T_C = 25^\circ\text{C}$	65	A
E_{AS}	$T_C = 25^\circ\text{C}$	750	mJ
P_D	$T_C = 25^\circ\text{C}$	360	W
T_J		-55 ... +175	$^\circ\text{C}$
T_{JM}		175	$^\circ\text{C}$
T_{stg}		-55 ... +175	$^\circ\text{C}$
T_L	1.6mm (0.062 in.) from case for 10s	300	$^\circ\text{C}$
T_{SOLD}	Plastic body for 10 seconds	260	$^\circ\text{C}$
M_d	Mounting torque (TO-220)	1.13 / 10	Nm/lb.in.
Weight	TO-220	3.0	g
	TO-263	2.5	g

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$ unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
BV_{DSS}	$V_{GS} = 0V, I_D = 250\mu A$	100		V
$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 1mA$	2.5		4.5 V
I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 200 nA
I_{DSS}	$V_{DS} = V_{DSS}$			10 μA
	$V_{GS} = 0V$ $T_J = 150^\circ\text{C}$			500 μA
$R_{DS(on)}$	$V_{GS} = 10V, I_D = 25A$, Notes 1, 2			9.1 m Ω

Symbol	Test Conditions	Characteristic Values		
$(T_J = 25^{\circ}\text{C unless otherwise specified})$		Min.	Typ.	Max.
g_{fs}	$V_{DS} = 10\text{V}, I_D = 60\text{A}, \text{Note 1}$	55	93	S
C_{iss}	$V_{GS} = 0\text{V}, V_{DS} = 25\text{V}, f = 1\text{MHz}$		5080	pF
C_{oss}			630	pF
C_{rss}			95	pF
$t_{d(on)}$	Resistive Switching Times $V_{GS} = 10\text{V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 25\text{A}$ $R_G = 5\Omega \text{ (External)}$		30	ns
t_r			47	ns
$t_{d(off)}$			44	ns
t_f			28	ns
$Q_{g(on)}$	$V_{GS} = 10\text{V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 25\text{A}$		104	nC
Q_{gs}			30	nC
Q_{gd}			29	nC
R_{thJC}	TO-220	0.50		0.42 $^{\circ}\text{C/W}$
R_{thCH}				$^{\circ}\text{C/W}$

Source-Drain Diode

Symbol	Test Conditions	Characteristic Values		
$T_J = 25^{\circ}\text{C unless otherwise specified}$		Min.	Typ.	Max.
I_S	$V_{GS} = 0\text{V}$			130 A
I_{SM}	Repetitive, pulse width limited by T_{JM}			350 A
V_{SD}	$I_F = 25\text{A}, V_{GS} = 0\text{V}, \text{Note 1}$			1.0 V
t_{rr}	$I_F = 65\text{A}, -di/dt = 100\text{A}/\mu\text{s}$ $V_R = 0.5 \cdot V_{DSS}, V_{GS} = 0\text{V}$		67	ns
I_{RM}			4.7	A
Q_{rr}			160	nC

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

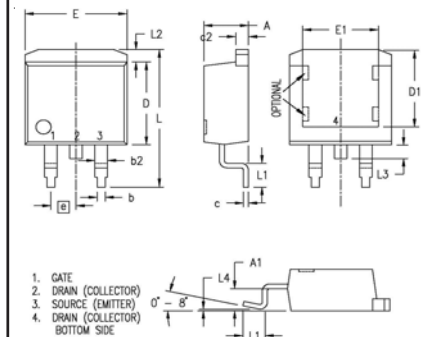
PRELIMINARY TECHNICAL INFORMATION

The product presented herein is under development. The Technical Specifications offered are derived from data gathered during objective characterizations of preliminary engineering lots; but also may yet contain some information supplied during a pre-production design evaluation. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

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

IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents:	4,835,592	4,931,844	5,049,961	5,237,481	6,162,665	6,404,065 B1	6,683,344	6,727,585	7,005,734 B2	7,157,338 B2
	4,850,072	5,017,508	5,063,307	5,381,025	6,259,123 B1	6,534,343	6,710,405 B2	6,759,692	7,063,975 B2	
	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	

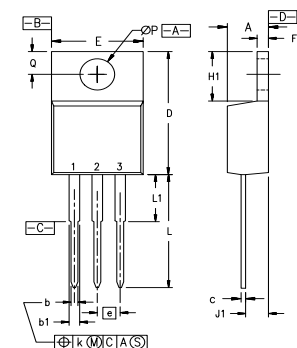
TO-263 (IXFA) Outline



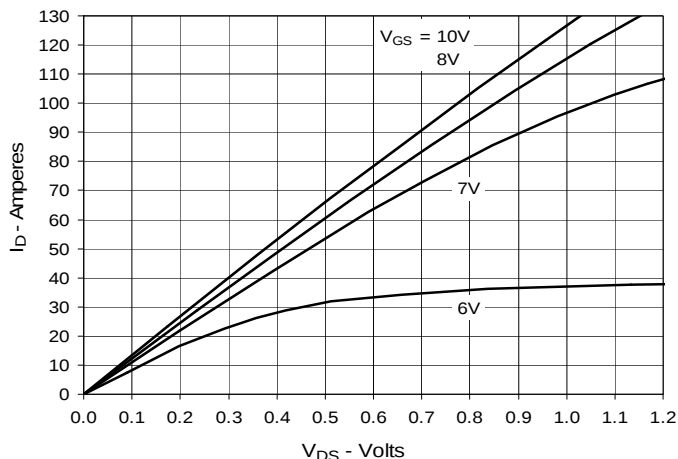
Pins: 1 - Gate 2 - Drain
3 - Source 4, TAB - Drain

Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.06	4.83	.160	.190
A1	2.03	2.79	.080	.110
b	0.51	0.99	.020	.039
b2	1.14	1.40	.045	.055
c	0.46	0.74	.018	.029
c2	1.14	1.40	.045	.055
D	8.64	9.65	.340	.380
D1	7.11	8.13	.280	.320
E	9.65	10.29	.380	.405
E1	6.86	8.13	.270	.320
e	2.54	BSC	.100	BSC
L	14.61	15.88	.575	.625
L1	2.29	2.79	.090	.110
L2	1.02	1.40	.040	.055
L3	1.27	1.78	.050	.070
L4	0	0.38	0	.015
R	0.46	0.74	.018	.029

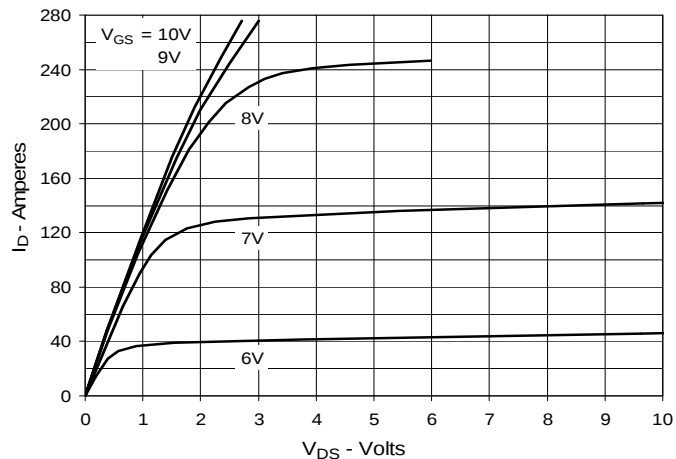
TO-220 (IXFP) Outline



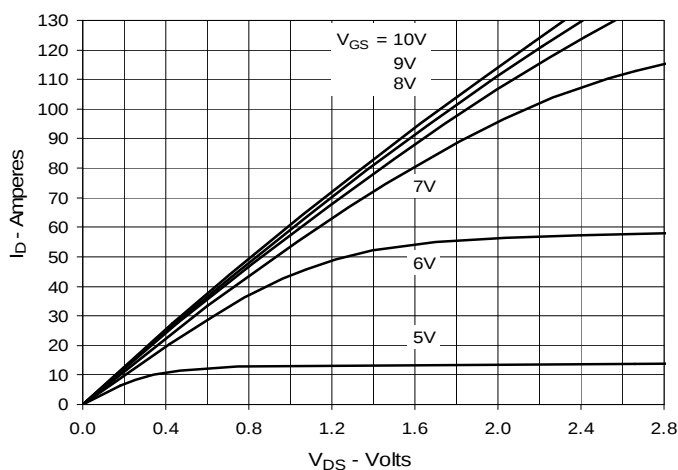
**Fig. 1. Output Characteristics
@ 25°C**



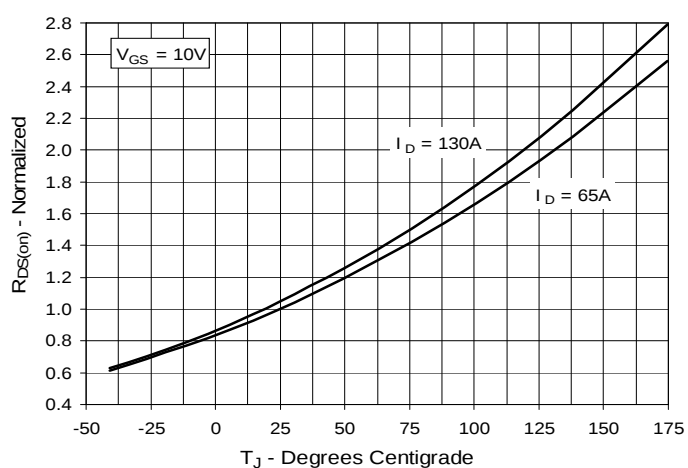
**Fig. 2. Extended Output Characteristics
@ 25°C**



**Fig. 3. Output Characteristics
@ 150°C**



**Fig. 4. $R_{DS(on)}$ Normalized to $I_D = 65A$ Value
vs. Junction Temperature**



**Fig. 5. $R_{DS(on)}$ Normalized to $I_D = 65A$ Value
vs. Drain Current**

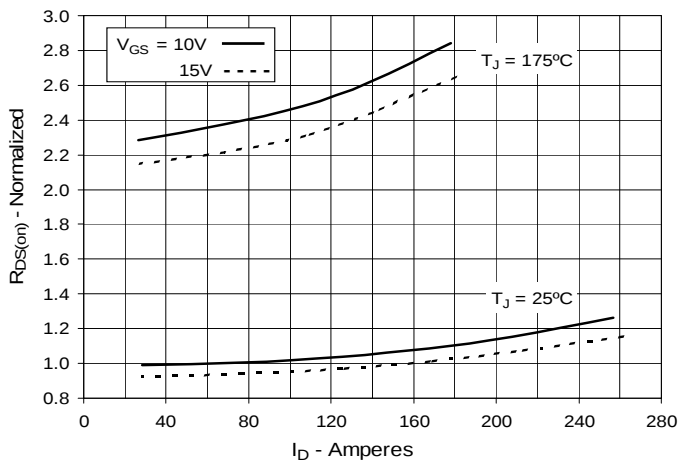


Fig. 6. Drain Current vs. Case Temperature

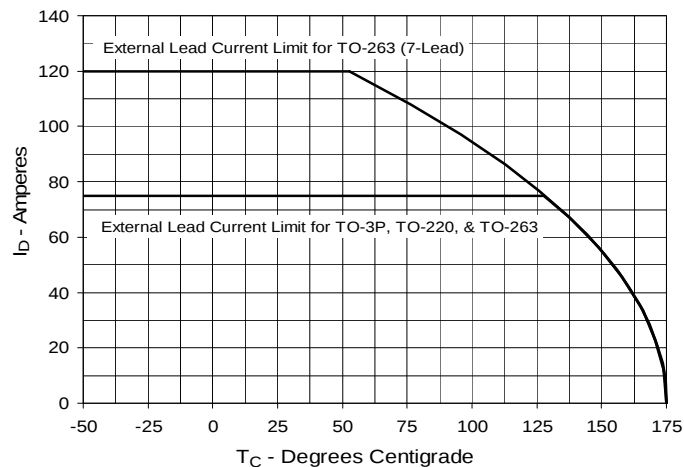


Fig. 7. Input Admittance

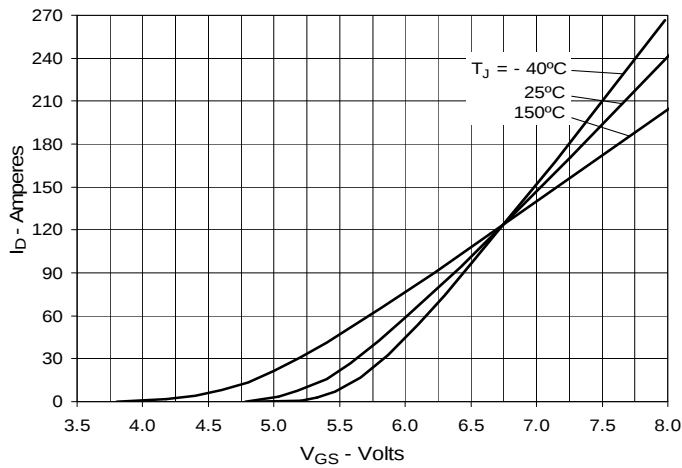


Fig. 8. Transconductance

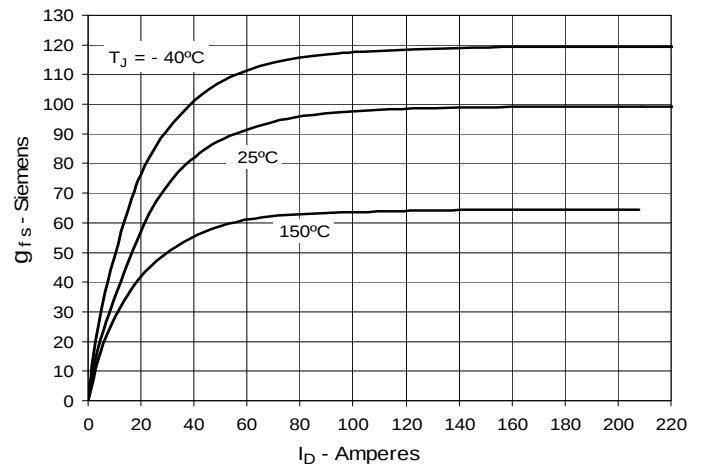


Fig. 9. Forward Voltage Drop of Intrinsic Diode

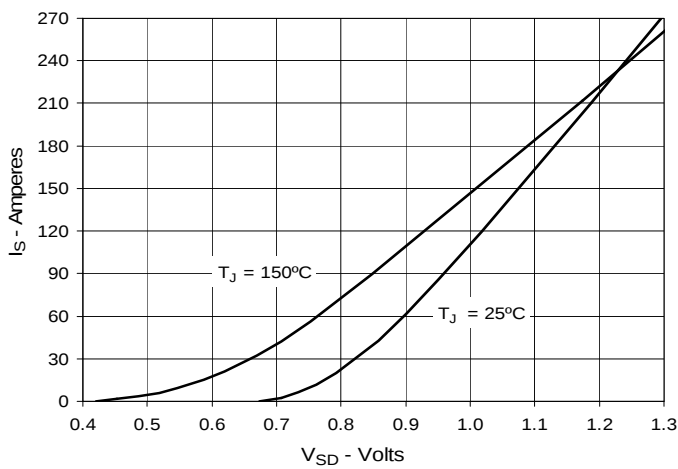


Fig. 10. Gate Charge

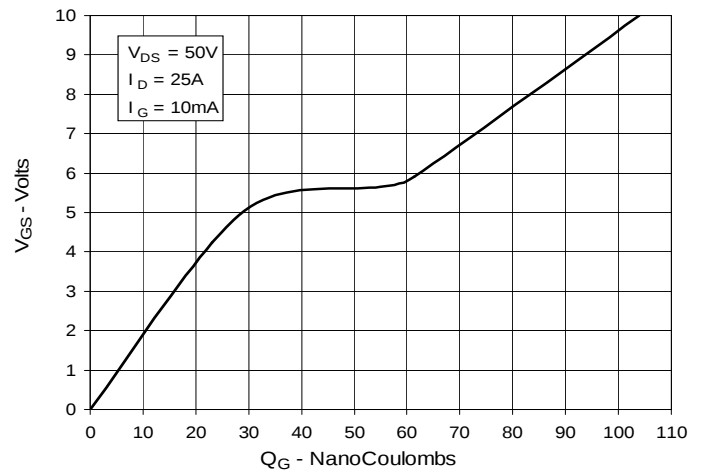


Fig. 11. Capacitance

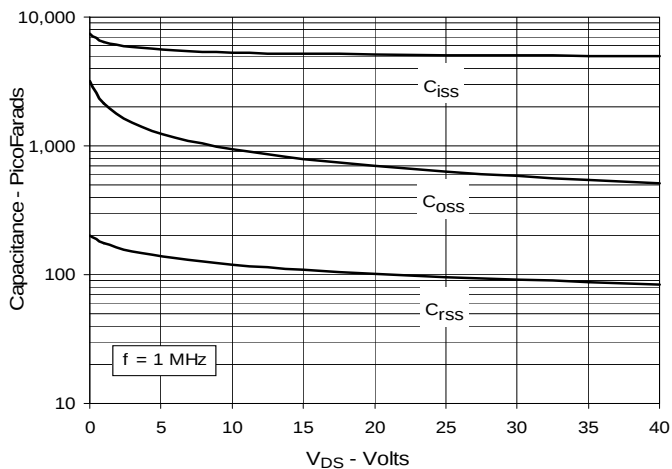
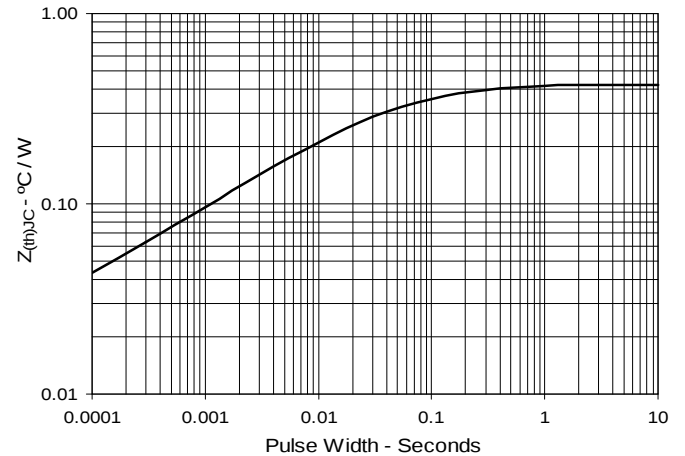
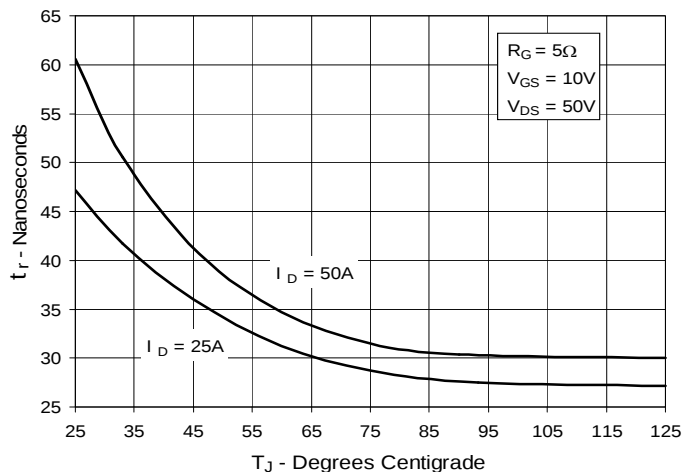


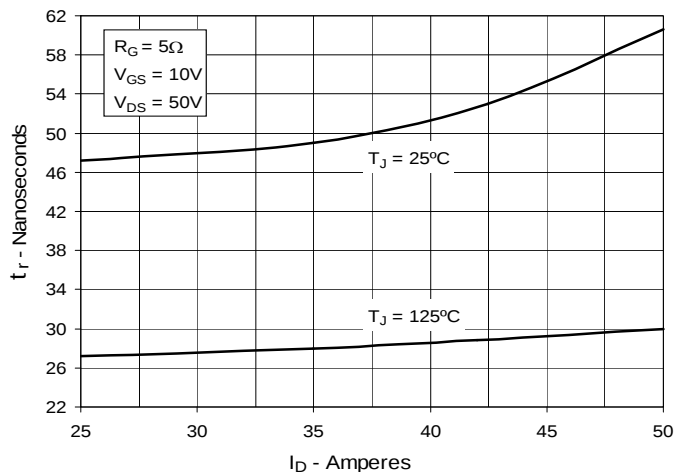
Fig. 12. Maximum Transient Thermal Impedance



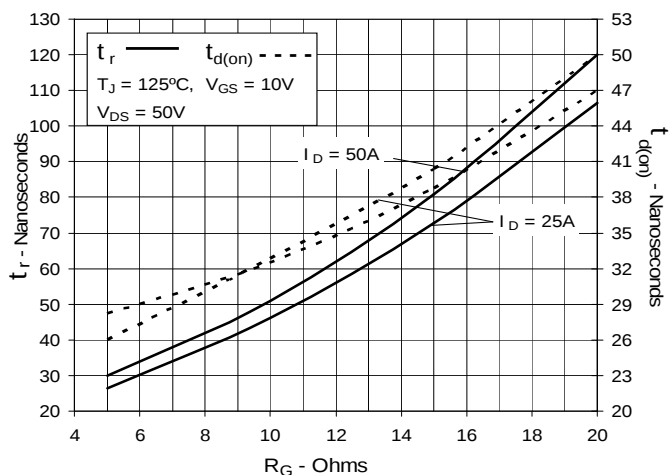
**Fig. 13. Resistive Turn-on
Rise Time vs. Junction Temperature**



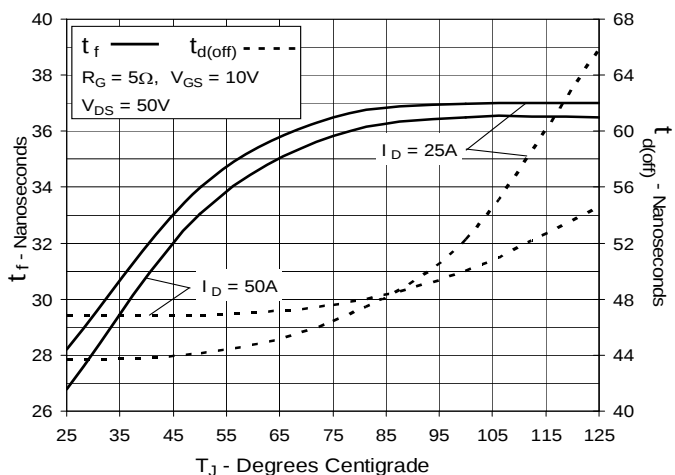
**Fig. 14. Resistive Turn-on
Rise Time vs. Drain Current**



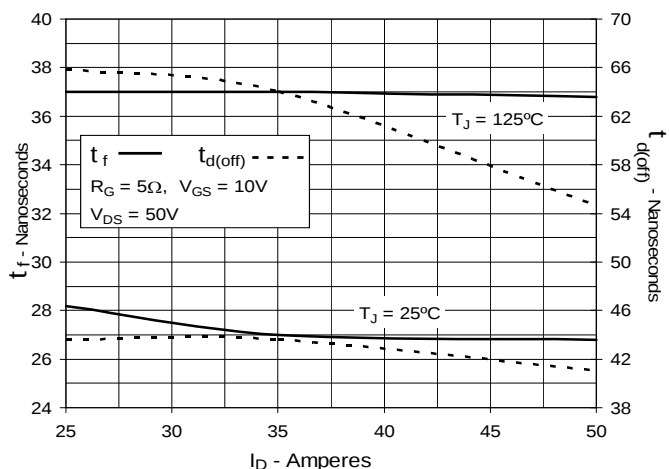
**Fig. 15. Resistive Turn-on
Switching Times vs. Gate Resistance**



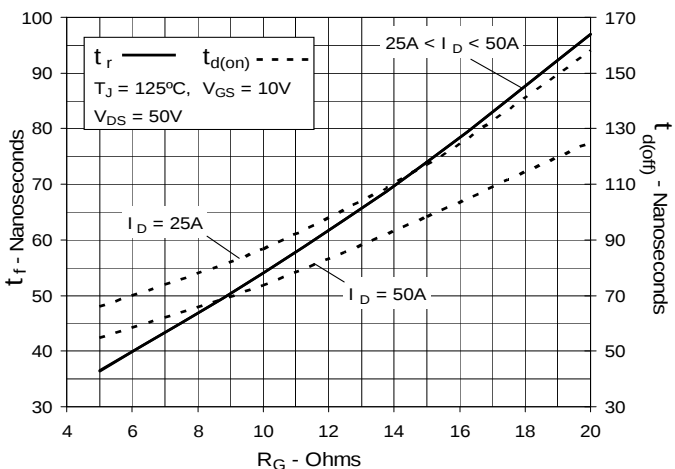
**Fig. 16. Resistive Turn-off
Switching Times vs. Junction Temperature**



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



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



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