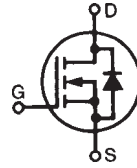


# TrenchMV™ Power MOSFET

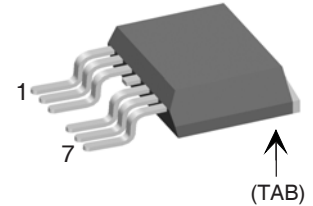
## IXTA180N085T7

$V_{DSS} = 85V$   
 $I_{D25} = 180A$   
 $R_{DS(on)} \leq 5.5m\Omega$

N-Channel Enhancement Mode  
 Avalanche Rated  
 Fast Intrinsic Rectifier



TO-263 (7-lead)



Pins: 1 - Gate  
 2, 3 - Source  
 5,6,7 - Source  
 TAB (8) - Drain

Symbol	Test Conditions	Maximum Ratings	
$V_{DSS}$	$T_J = 25^\circ C$ to $175^\circ C$	85	V
$V_{DGR}$	$T_J = 25^\circ C$ to $175^\circ C$ , $R_{GS} = 1M\Omega$	85	V
$V_{GSM}$	Transient	$\pm 20$	V
$I_{D25}$	$T_C = 25^\circ C$	180	A
$I_{LRMS}$	Lead Current Limit, RMS	160	A
$I_{DM}$	$T_C = 25^\circ C$ , Pulse Width Limited by $T_{JM}$	480	A
$I_A$	$T_C = 25^\circ C$	25	A
$E_{AS}$	$T_C = 25^\circ C$	1.0	J
$P_D$	$T_C = 25^\circ C$	430	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	$^\circ C$
<b>Weight</b>		3	g

### Features

- International Standard Package
- 175°C Operating Temperature
- Avalanche Rated
- Fast Intrinsic Rectifier
- Low  $R_{DS(on)}$

### Advantages

- Easy to Mount
- Space Savings
- High Power Density

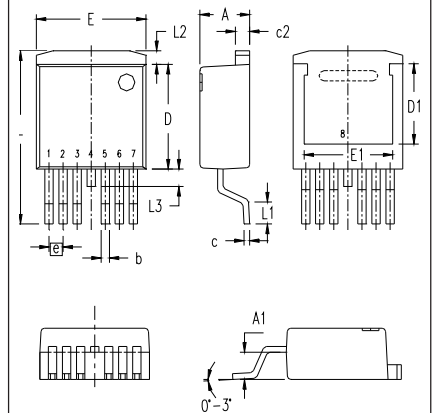
### Applications

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

Symbol	Test Conditions ( $T_J = 25^\circ C$ Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$BV_{DSS}$	$V_{GS} = 0V$ , $I_D = 250\mu A$	85		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = 250\mu A$	2.0		4.0 V
$I_{GSS}$	$V_{GS} = \pm 20V$ , $V_{DS} = 0V$			$\pm 200$ nA
$I_{DSS}$	$V_{DS} = V_{DSS}$ , $V_{GS} = 0V$ $T_J = 150^\circ C$			5 $\mu A$ 250 $\mu A$
$R_{DS(on)}$	$V_{GS} = 10V$ , $I_D = 25A$ , Notes 1, 2	4.5	5.5	m $\Omega$

Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ , Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$g_{fs}$	$V_{DS} = 10\text{V}$ , $I_D = 60\text{A}$ , Note 1	70	120	S
$C_{iss}$	$V_{GS} = 0\text{V}$ , $V_{DS} = 25\text{V}$ , $f = 1\text{MHz}$		8800	pF
$C_{oss}$			950	pF
$C_{rss}$			110	pF
$t_{d(on)}$	<b>Resistive Switching Times</b> $V_{GS} = 10\text{V}$ , $V_{DS} = 0.5 \cdot V_{DSS}$ , $I_D = 25\text{A}$ $R_G = 5\Omega$ (External)		32	ns
$t_r$			70	ns
$t_{d(off)}$			55	ns
$t_f$			65	ns
$Q_{g(on)}$	$V_{GS} = 10\text{V}$ , $V_{DS} = 0.5 \cdot V_{DSS}$ , $I_D = 25\text{A}$		170	nC
$Q_{gs}$			40	nC
$Q_{gd}$			46	nC
$R_{thJC}$			0.35	$^\circ\text{C/W}$

### TO-263 (7-lead) (IXTA..7) Outline



Pins: 1 - Gate  
 2, 3 - Source  
 4 - Drain  
 5,6,7 - Source  
 Tab (8) - Drain

SYM	INCHES		MILLIMETER	
	MIN	MAX	MIN	MAX
A	.170	.185	4.30	4.70
A1	.085	.104	2.15	2.65
b	.026	.035	0.65	0.90
c	.016	.024	0.40	0.60
c2	.049	.055	1.25	1.40
D	.355	.370	9.00	9.40
D1	.272	.280	6.90	7.10
E	.386	.402	9.80	10.20
E1	.311	.319	7.90	8.10
e	.050	BSC	1.27	BSC
L	.591	.614	15.00	15.60
L1	.091	.110	2.30	2.80
L2	.039	.059	1.00	1.50
L3	.000	.059	0.00	1.50

### Source-Drain Diode

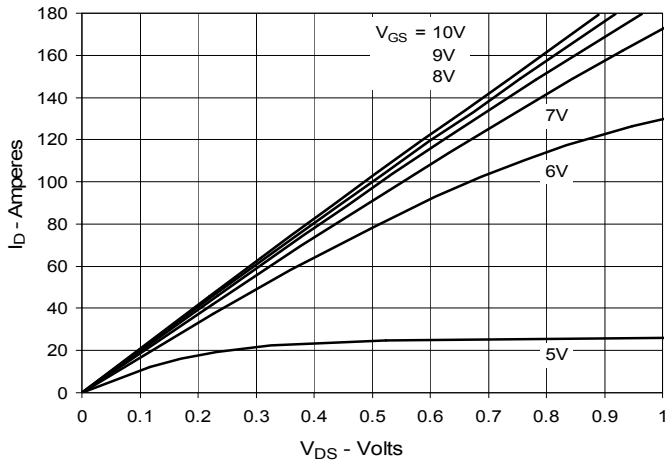
Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ , Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$I_S$	$V_{GS} = 0\text{V}$			180 A
$I_{SM}$	Repetitive, Pulse Width Limited by $T_{JM}$			480 A
$V_{SD}$	$I_F = 25\text{A}$ , $V_{GS} = 0\text{V}$ , Note 1			1.0 V
$t_{rr}$	$I_F = 90\text{A}$ , $V_{GS} = 0\text{V}$ , $-di/dt = 100\text{A}/\mu\text{s}$ $V_R = 40\text{V}$		63	ns
$I_{RM}$			4.1	A
$Q_{RM}$			129	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 5mm or Less from the Package Body.

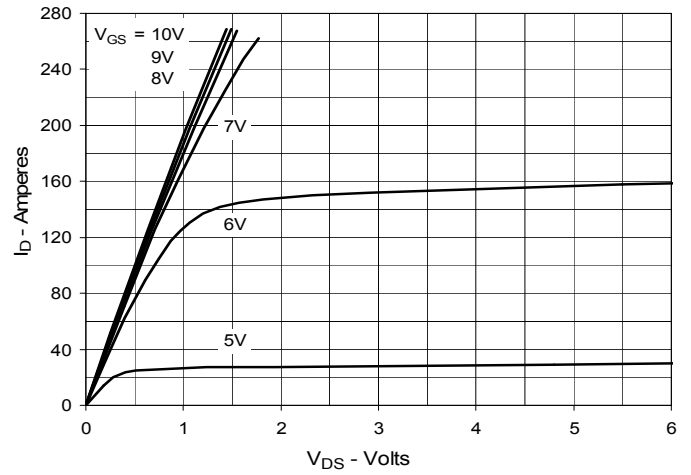
IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.

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	7,157,338B2
	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	

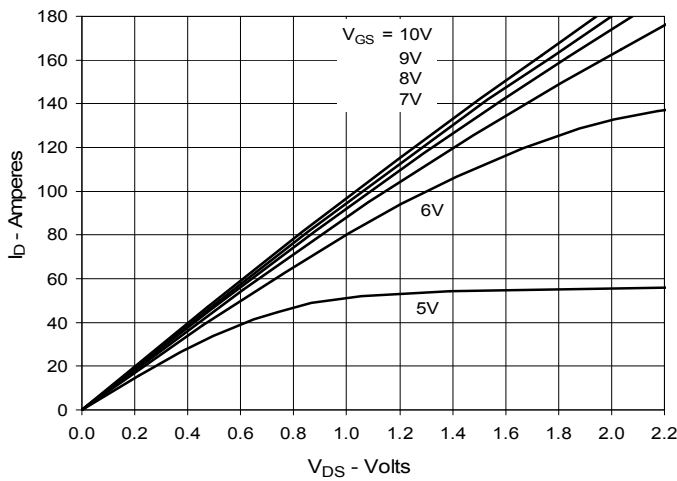
**Fig. 1. Output Characteristics @ 25°C**



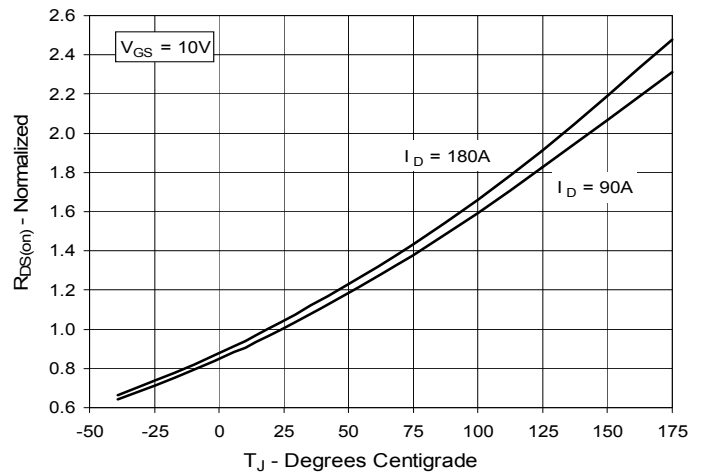
**Fig. 2. Extended Output Characteristics @ 25°C**



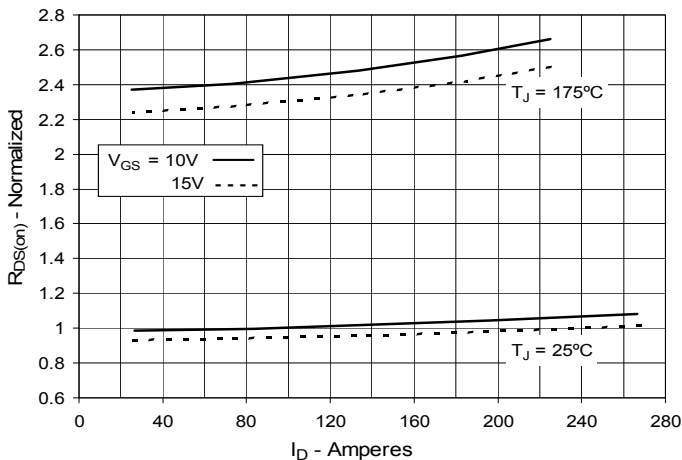
**Fig. 3. Output Characteristics @ 150°C**



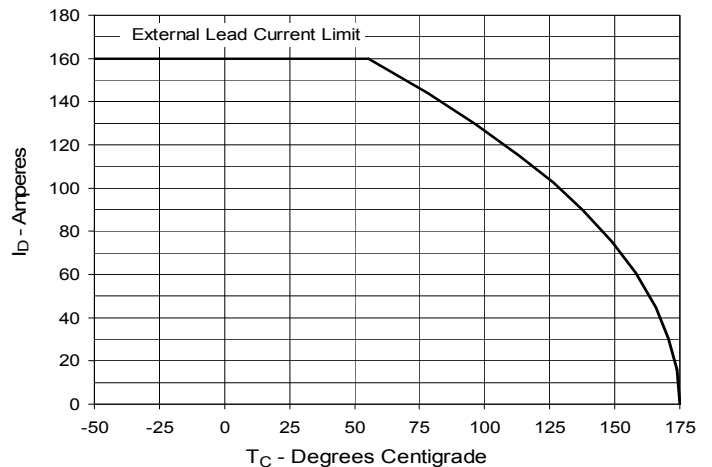
**Fig. 4.  $R_{DS(on)}$  Normalized to  $I_D = 90A$  Value vs. Junction Temperature**



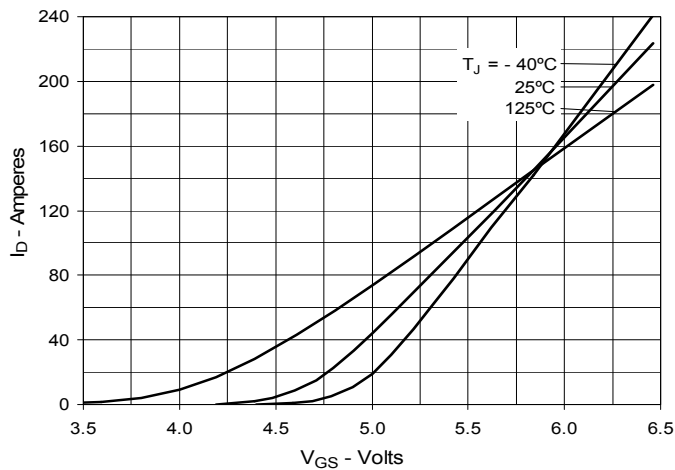
**Fig. 5.  $R_{DS(on)}$  Normalized to  $I_D = 90A$  Value vs. Drain Current**



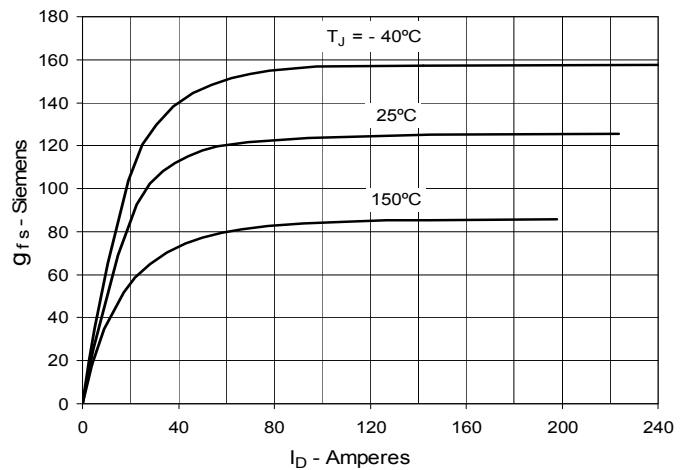
**Fig. 6. Drain Current vs. Case Temperature**



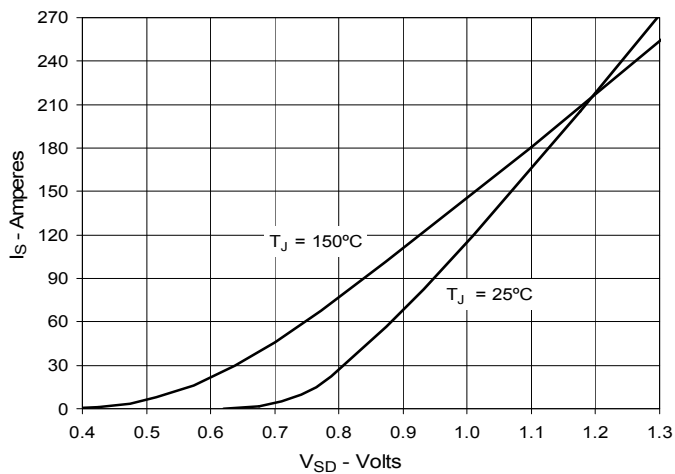
**Fig. 7. Input Admittance**



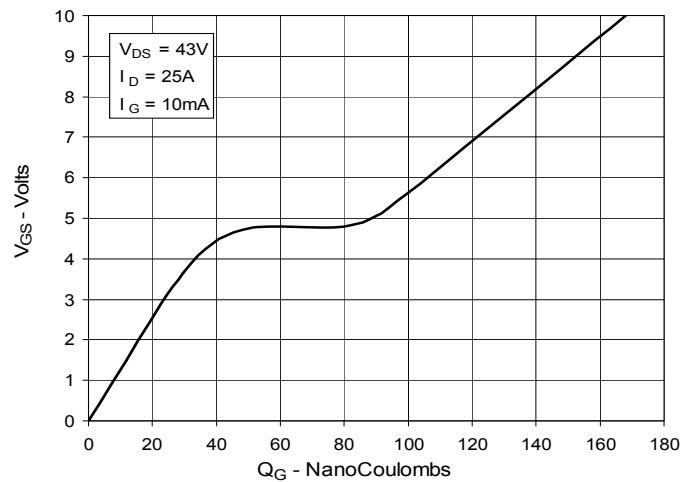
**Fig. 8. Transconductance**



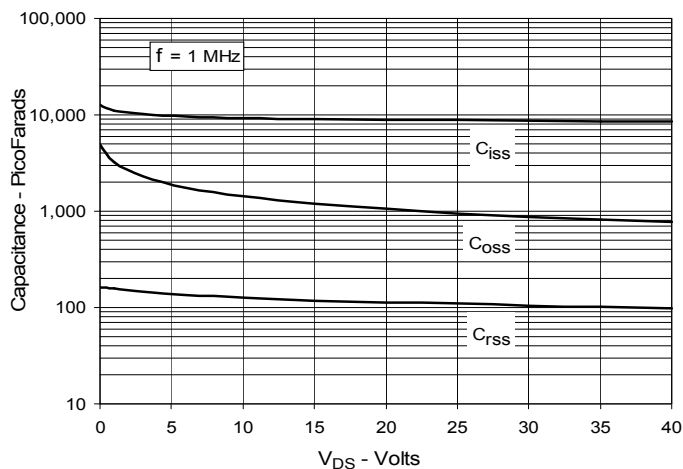
**Fig. 9. Forward Voltage Drop of Intrinsic Diode**



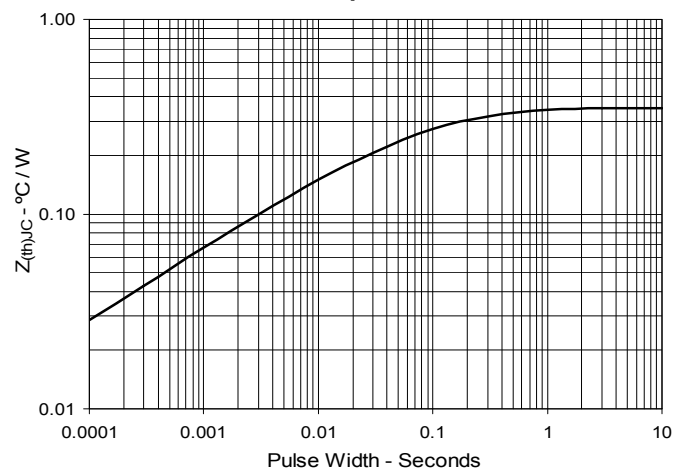
**Fig. 10. Gate Charge**



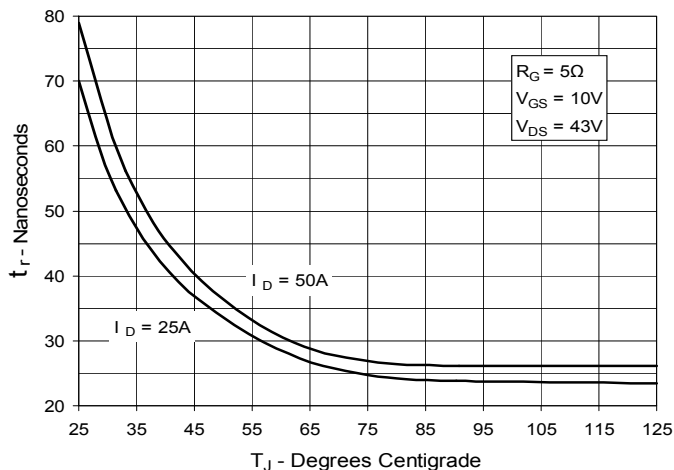
**Fig. 11. Capacitance**



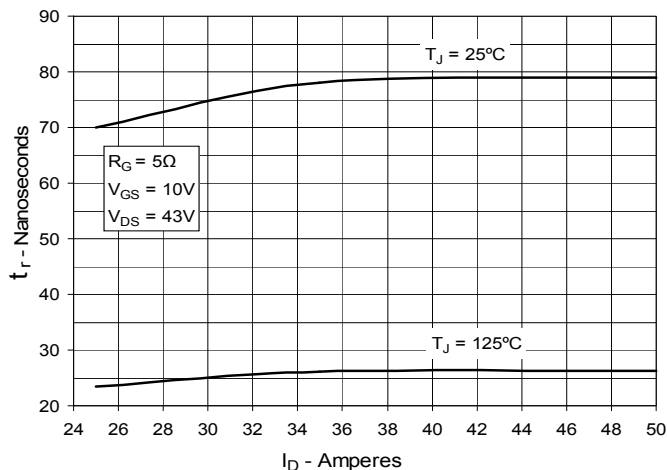
**Fig. 12. Maximum Transient Thermal Impedance**



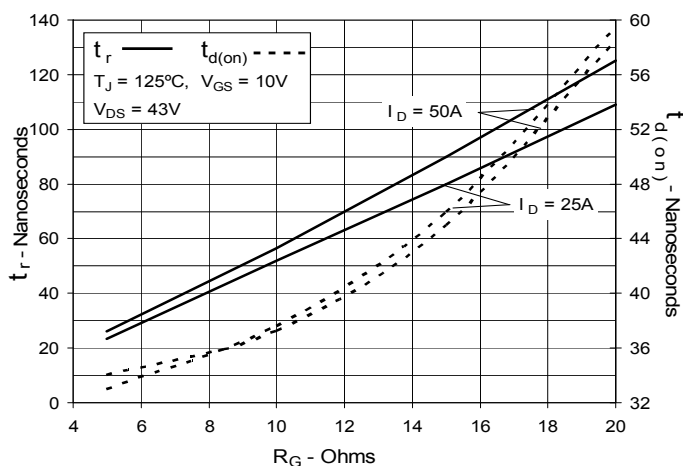
**Fig. 13. Resistive Turn-on Rise Time vs. Junction Temperature**



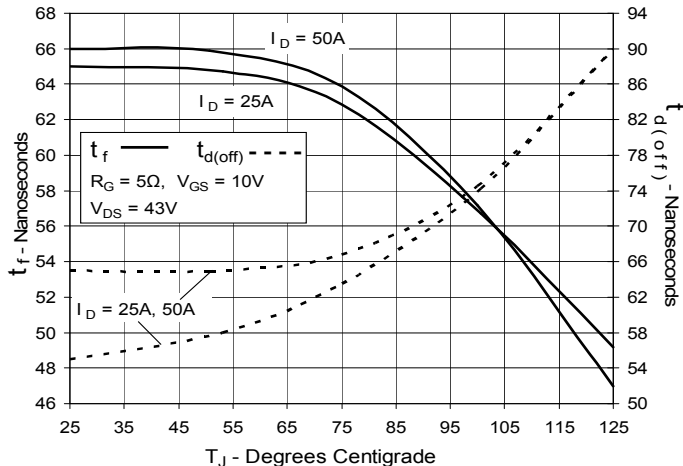
**Fig. 14. Resistive Turn-on Rise Time vs. Drain Current**



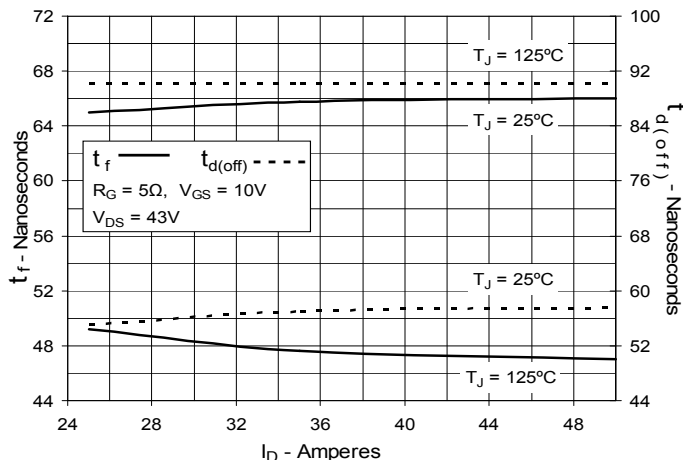
**Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance**



**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**

