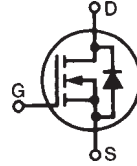


**TrenchT4™**  
**Power MOSFET**
**IXTA270N04T4**  
**IXTA270N04T4-7**

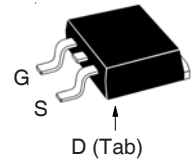
$$V_{DSS} = 40V$$

$$I_{D25} = 270A$$

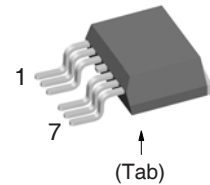
$$R_{DS(on)} \leq 2.2m\Omega$$

 N-Channel Enhancement Mode  
 Avalanche Rated


TO-263 AA


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

TO-263 (7-Leads)


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

Symbol	Test Conditions	Maximum Ratings	
$V_{DSS}$	$T_J = 25^\circ\text{C}$ to $175^\circ\text{C}$	40	V
$V_{DGR}$	$T_J = 25^\circ\text{C}$ to $175^\circ\text{C}$ , $R_{GS} = 1M\Omega$	40	V
$V_{GSM}$	Transient	$\pm 15$	V
$I_{D25}$	$T_C = 25^\circ\text{C}$	270	A
$I_{LRMS}$	Lead Current Limit, RMS	160	A
$I_{DM}$	$T_C = 25^\circ\text{C}$ , Pulse Width Limited by $T_{JM}$	800	A
$I_A$	$T_C = 25^\circ\text{C}$	135	A
$E_{AS}$	$T_C = 25^\circ\text{C}$	750	mJ
$I_A$	$T_C = 25^\circ\text{C}$	270	A
$E_{AS}$	$T_C = 25^\circ\text{C}$	350	mJ
$P_D$	$T_C = 25^\circ\text{C}$	375	W
$T_J$		-55 ... +175	$^\circ\text{C}$
$T_{JM}$		175	$^\circ\text{C}$
$T_{stg}$		-55 ... +175	$^\circ\text{C}$
$T_L$	Maximum Lead Temperature for Soldering	300	$^\circ\text{C}$
$T_{SOLD}$	1.6 mm (0.062in.) from Case for 10s	260	$^\circ\text{C}$
$F_C$	Mounting Force (TO-263)	10.65 / 2.2..14.6	N/lb
Weight	TO-263	2.5	g
	TO-263 (7Leads)	3.0	g

**Features**

- International Standard Packages
- $175^\circ\text{C}$  Operating Temperature
- High Current Handling Capability
- Avalanche Rated
- Low  $R_{DS(on)}$

**Advantages**

- Easy to Mount
- Space Savings
- High Power Density

**Applications**

- Synchronous Buck Converters
- High Current Switching Power Supplies
- Battery Powered Electric Motors
- Resonant-Mode Power Supplies
- Electronics Ballast Application
- Class D Audio Amplifiers

Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$BV_{DSS}$	$V_{GS} = 0V$ , $I_D = 250\mu\text{A}$	40		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = 250\mu\text{A}$	2.0		4.0 V
$I_{GSS}$	$V_{GS} = \pm 15V$ , $V_{DS} = 0V$			$\pm 200$ nA
$I_{DSS}$	$V_{DS} = V_{DSS}$ , $V_{GS} = 0V$ $T_J = 150^\circ\text{C}$			5 $\mu\text{A}$
				750 $\mu\text{A}$
$R_{DS(on)}$	$V_{GS} = 10V$ , $I_D = 50A$ , Note 1			2.2 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	90	150	S
$R_{Gi}$	Gate Input Resistance		1.4	$\Omega$
$C_{iss}$	$V_{GS} = 0\text{V}$ , $V_{DS} = 25\text{V}$ , $f = 1\text{MHz}$		9140	pF
$C_{oss}$			1450	pF
$C_{rss}$			980	pF
$t_{d(on)}$	<b>Resistive Switching Times</b> $V_{GS} = 10\text{V}$ , $V_{DS} = 0.5 \cdot V_{DSS}$ , $I_D = 135\text{A}$ $R_G = 2\Omega$ (External)		18	ns
$t_r$			28	ns
$t_{d(off)}$			72	ns
$t_f$			23	ns
$Q_{g(on)}$	$V_{GS} = 10\text{V}$ , $V_{DS} = 0.5 \cdot V_{DSS}$ , $I_D = 0.5 \cdot I_{D25}$		182	nC
$Q_{gs}$			45	nC
$Q_{gd}$			67	nC
$R_{thJC}$				0.40 $^\circ\text{C/W}$

**Source-Drain Diode**

Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ , Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$I_S$	$V_{GS} = 0\text{V}$			270 A
$I_{SM}$	Repetitive, Pulse width limited by $T_{JM}$			1080 A
$V_{SD}$	$I_F = 100\text{A}$ , $V_{GS} = 0\text{V}$ , Note 1			1.4 V
$t_{rr}$	$I_F = 150\text{A}$ , $V_{GS} = 0\text{V}$ $-di/dt = 100\text{A}/\mu\text{s}$ $V_R = 30\text{V}$		48	ns
$I_{RM}$			1.8	A
$Q_{RM}$			43	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.

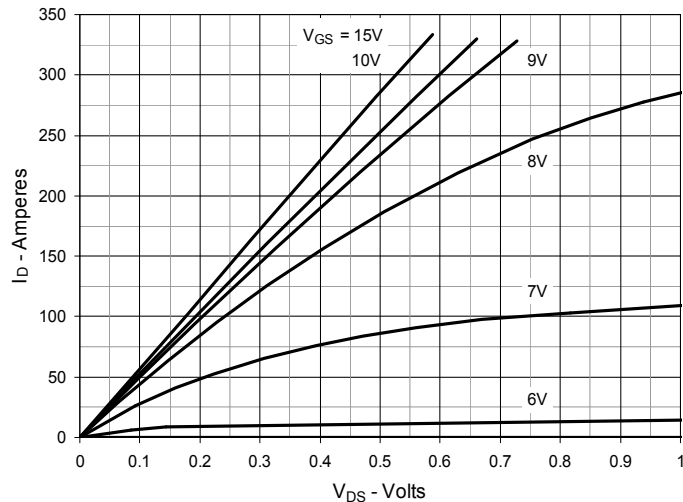
**PRELIMINARY TECHNICAL INFORMATION**

The product presented herein is under development. The Technical Specifications offered are derived from a subjective evaluation of the design, based upon prior knowledge and experience, and constitute a "considered reflection" of the anticipated result. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

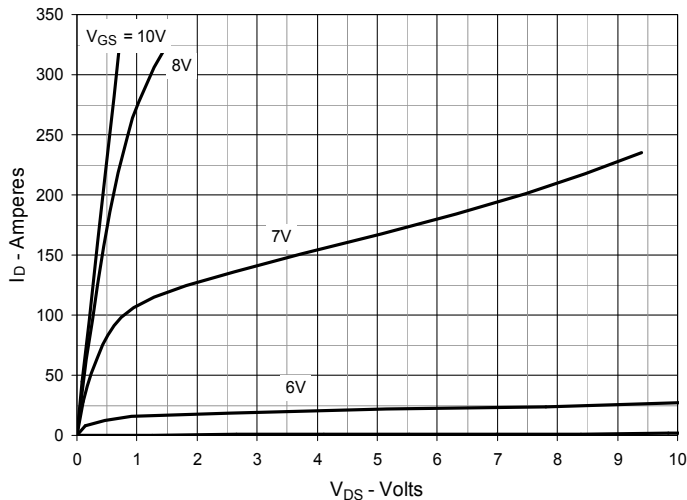
IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.

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	7,157,338B2
	4,860,072	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	

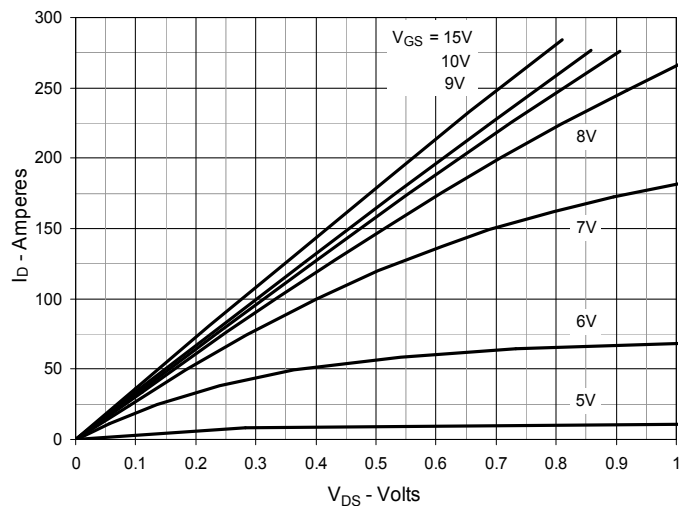
**Fig. 1. Output Characteristics @  $T_J = 25^\circ\text{C}$**



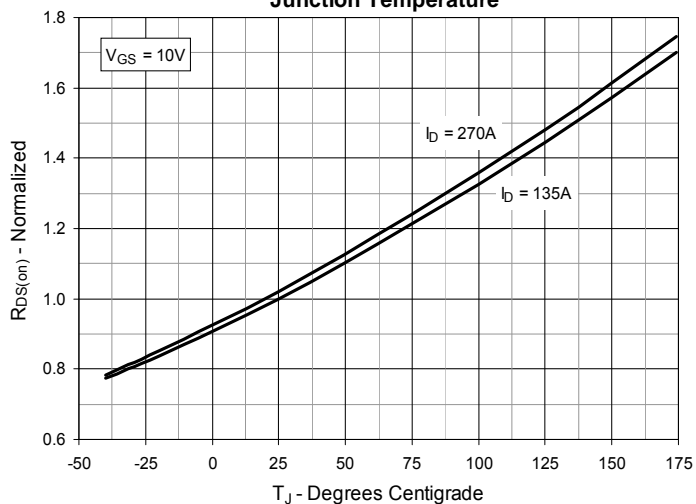
**Fig. 2. Extended Output Characteristics @  $T_J = 25^\circ\text{C}$**



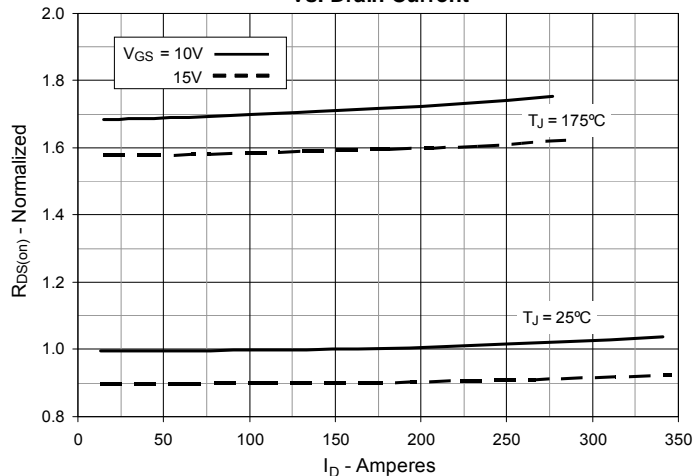
**Fig. 3. Output Characteristics @  $T_J = 150^\circ\text{C}$**



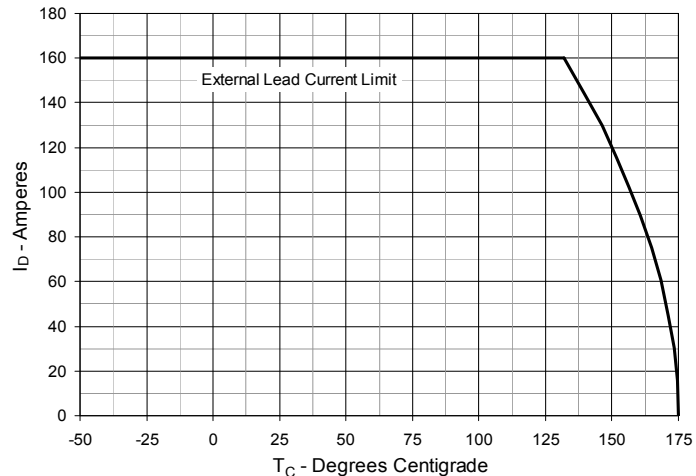
**Fig. 4. Normalized  $R_{DS(on)}$  to  $I_D = 135\text{A}$  Value vs. Junction Temperature**



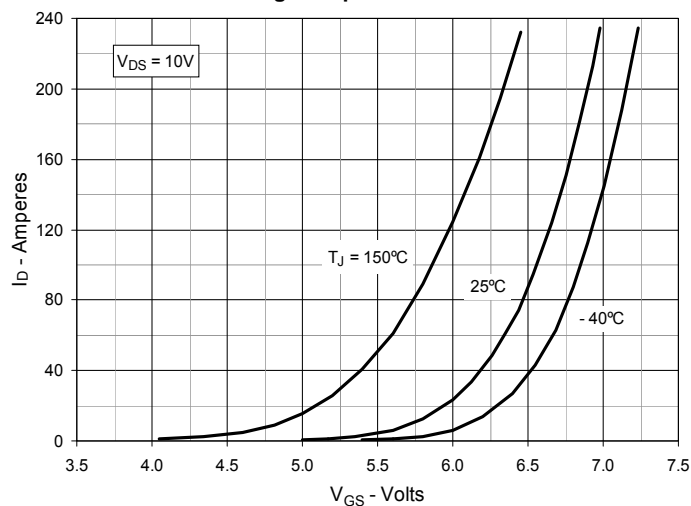
**Fig. 5. Normalized  $R_{DS(on)}$  to  $I_D = 135\text{A}$  vs. Drain Current**



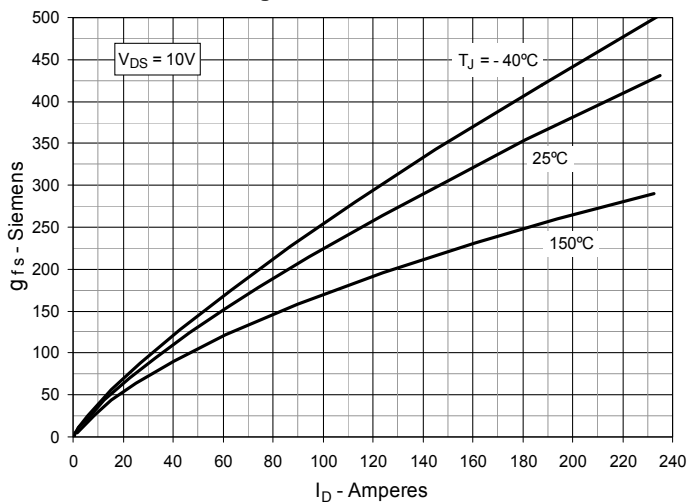
**Fig. 6. Drain Current vs. Case Temperature**



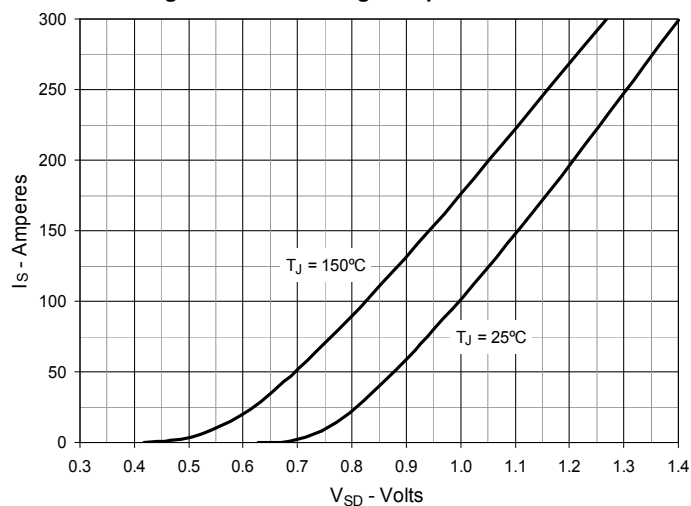
**Fig. 7. Input Admittance**



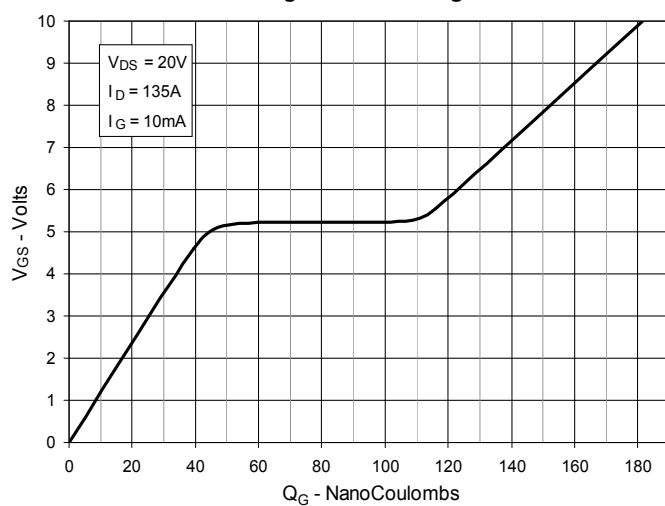
**Fig. 8. Transconductance**



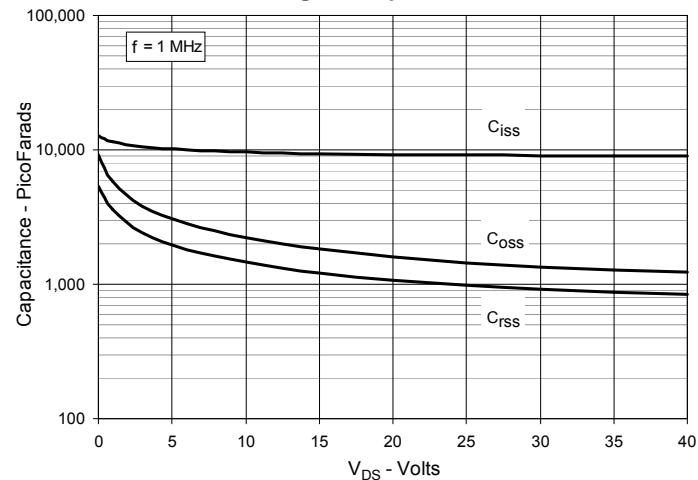
**Fig. 9. Forward Voltage Drop of Intrinsic Diode**



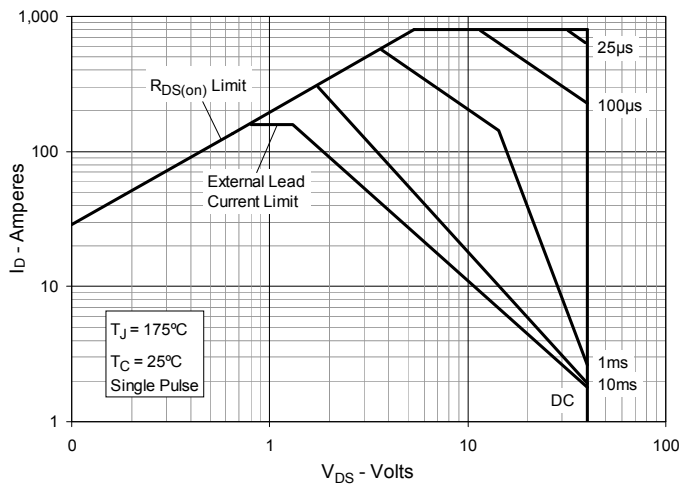
**Fig. 10. Gate Charge**



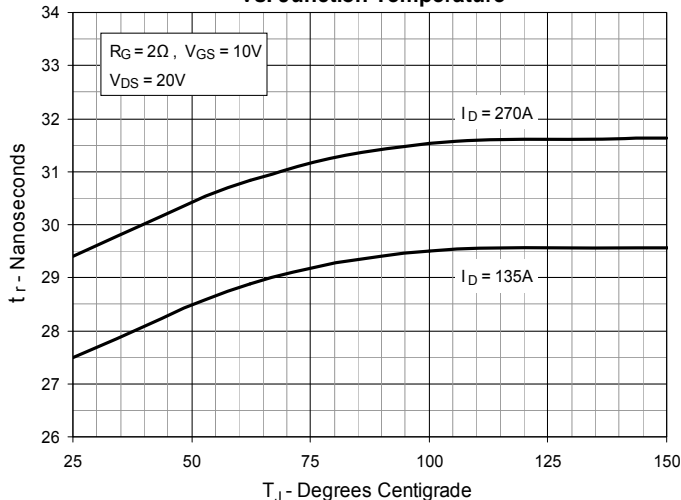
**Fig. 11. Capacitance**



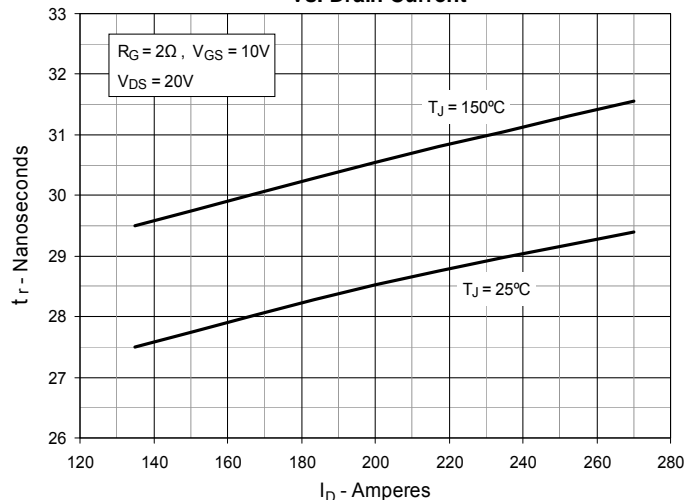
**Fig. 12. Forward-Bias Safe Operating Area**



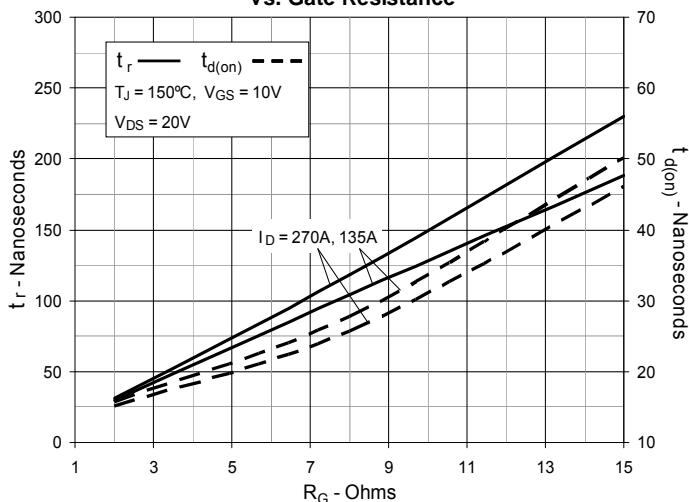
**Fig. 13. Resistive Turn-on Rise Time vs. Junction Temperature**



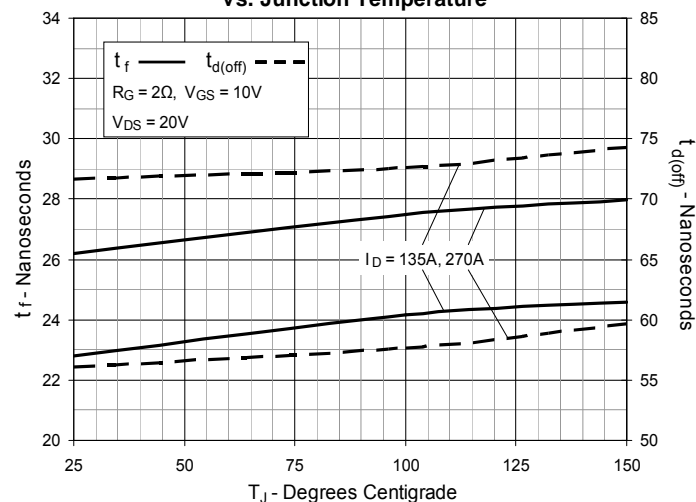
**Fig. 14. Resistive Turn-on Rise Time vs. Drain Current**



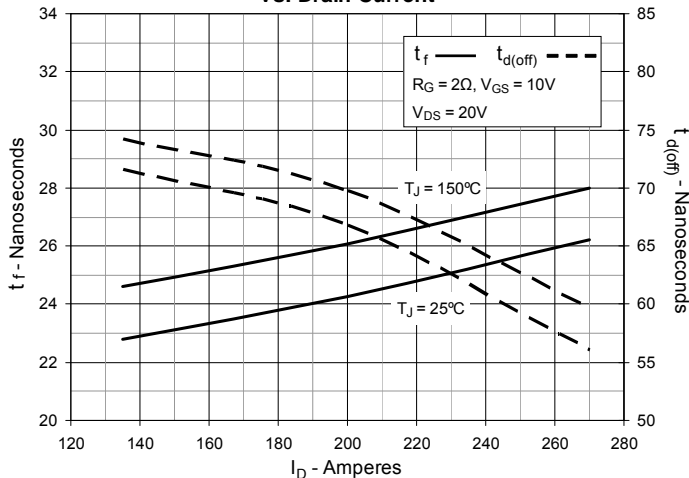
**Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance**



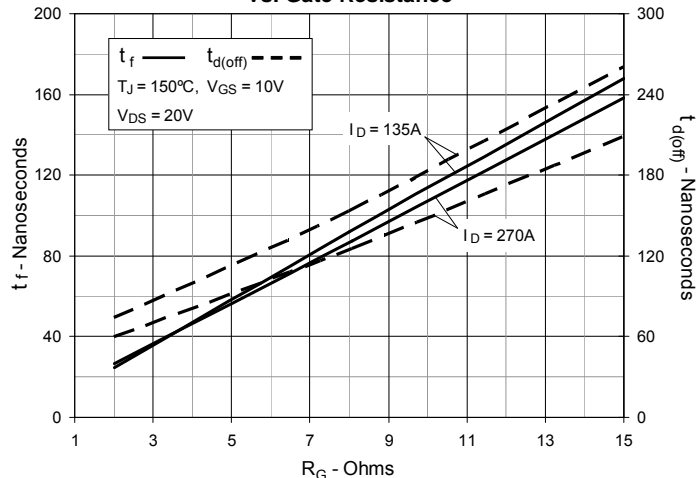
**Fig. 16. Resistive Turn-off Switching Times vs. Junction Temperature**



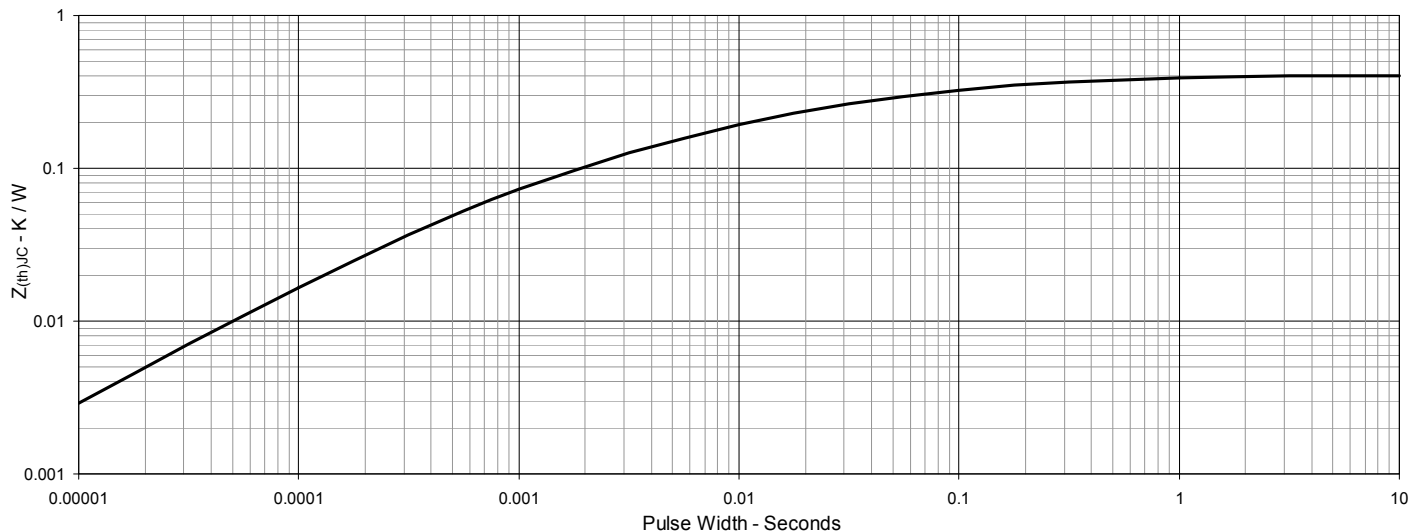
**Fig. 17. Resistive Turn-off Switching Times vs. Drain Current**



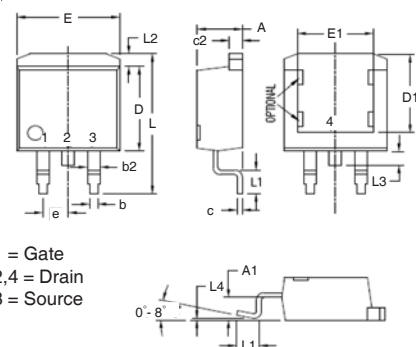
**Fig. 18. Resistive Turn-off Switching Times vs. Gate Resistance**



**Fig. 19. Maximum Transient Thermal Impedance**

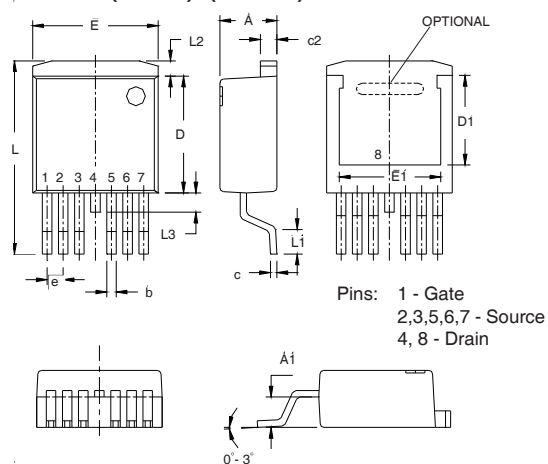


**TO-263 (IXTA) Outline**



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-263 (7-lead) (IXTA..7) Outline**



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