

**TrenchT4™**  
**Power MOSFET**
**IXTN660N04T4**

$$V_{DSS} = 40V$$

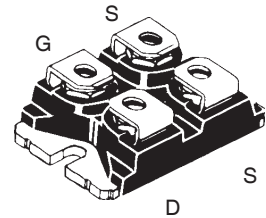
$$I_{D25} = 660A$$

$$R_{DS(on)} \leq 0.85m\Omega$$

N-Channel Enhancement Mode  
 Avalanche Rated  
 Fast Intrinsic Diode



miniBLOC, SOT-227  
 E153432



G = Gate      D = Drain  
 S = Source

Either Source Terminal S can be used as the Source Terminal or the Kelvin Source ( Gate Return ) Terminal.

Symbol	Test Conditions	Maximum Ratings	
$V_{DSS}$	$T_J = 25^\circ C$ to $175^\circ C$	40	V
$V_{DGR}$	$T_J = 25^\circ C$ to $175^\circ C$ , $R_{GS} = 1M\Omega$	40	V
$V_{GSM}$	Transient	$\pm 15$	V
$I_{D25}$	$T_C = 25^\circ C$ (Chip Capability)	660	A
$I_{L(RMS)}$	External Lead Current Limit	200	A
$I_{DM}$	$T_C = 25^\circ C$ , Pulse Width Limited by $T_{JM}$	1800	A
$I_A$	$T_C = 25^\circ C$	330	A
$E_{AS}$	$T_C = 25^\circ C$	5	J
$P_D$	$T_C = 25^\circ C$	1040	W
$T_J$		-55 ... +175	$^\circ C$
$T_{JM}$		175	$^\circ C$
$T_{stg}$		-55 ... +175	$^\circ C$
$V_{ISOL}$	50/60 Hz, RMS $t = 1$ minute	2500	V~
	$I_{ISOL} \leq 1mA$ $t = 1$ second	3000	V~
$M_d$	Mounting Torque	1.5/13	Nm/lb.in
	Terminal Connection Torque	1.3/11.5	Nm/lb.in
<b>Weight</b>		30	g

**Features**

- International Standard Package
- miniBLOC, with Aluminium Nitride Isolation
- $175^\circ C$  Operating Temperature
- Isolation Voltage 2500 V~
- High Current Handling Capability
- Fast Intrinsic Diode
- Avalanche Rated
- Low  $R_{DS(on)}$

**Advantages**

- Easy to Mount
- Space Savings
- High Power Density

**Applications**

- DC-DC Converters and Off-Line UPS
- Primary-Side Switch
- High Speed Power Switching Applications

Symbol	Test Conditions ( $T_J = 25^\circ C$ , Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$BV_{DSS}$	$V_{GS} = 0V$ , $I_D = 250\mu A$	40		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = 250\mu A$	2.0		V
$I_{GSS}$	$V_{GS} = \pm 15V$ , $V_{DS} = 0V$			$\pm 200$ nA
$I_{DSS}$	$V_{DS} = V_{DSS}$ , $V_{GS} = 0V$ $T_J = 150^\circ C$			10 $\mu A$
				1.5 mA
$R_{DS(on)}$	$V_{GS} = 10V$ , $I_D = 100A$ , Note 1			0.85 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	110	180	S
$C_{iss}$	$V_{GS} = 0\text{V}$ , $V_{DS} = 25\text{V}$ , $f = 1\text{MHz}$		44.0	nF
$C_{oss}$			6.5	nF
$C_{rss}$			3.5	nF
$R_{GI}$	Gate Input Resistance		2.5	$\Omega$
$t_{d(on)}$	<b>Resistive Switching Times</b> $V_{GS} = 10\text{V}$ , $V_{DS} = 0.5 \cdot V_{DSS}$ , $I_D = 0.5 \cdot I_{DSS}$ $R_G = 1\Omega$ (External)		40	ns
$t_r$			430	ns
$t_{d(off)}$			386	ns
$t_f$			260	ns
$Q_{g(on)}$	$V_{GS} = 10\text{V}$ , $V_{DS} = 0.5 \cdot V_{DSS}$ , $I_D = 0.5 \cdot I_{DSS}$		860	nC
$Q_{gs}$			240	nC
$Q_{gd}$			290	nC
$R_{thJC}$			0.144	$^\circ\text{C/W}$
$R_{thCS}$		0.05		$^\circ\text{C/W}$

### Source-Drain Diode

Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ , Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$I_S$	$V_{GS} = 0\text{V}$			660 A
$I_{SM}$	Repetitive, Pulse Width Limited by $T_{JM}$			2640 A
$V_{SD}$	$I_F = 100\text{A}$ , $V_{GS} = 0\text{V}$ , Note 1			1.4 V
$t_{rr}$	$I_F = 150\text{A}$ , $V_{GS} = 0\text{V}$ $-di/dt = 100\text{A}/\mu\text{s}$ $V_R = 30\text{V}$		60	ns
$I_{RM}$			2.1	A
$Q_{RM}$			63	nC

Note 1. Pulse test,  $t \leq 300\mu\text{s}$ , duty cycle,  $d \leq 2\%$ .

### SOT-227B (IXTN) Outline



(M4 screws (4x) supplied)

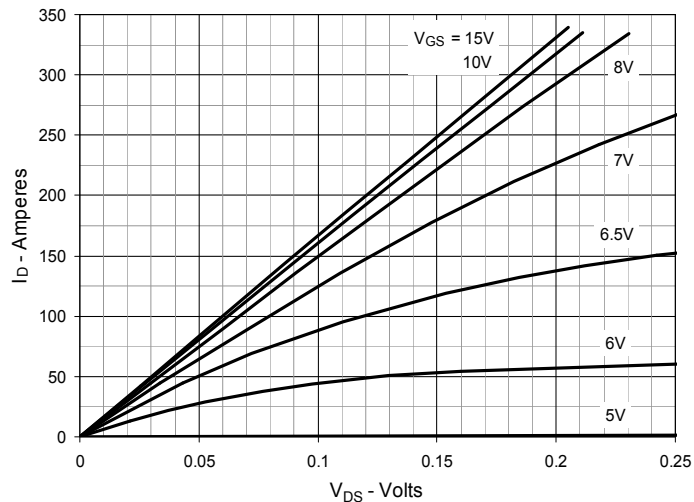
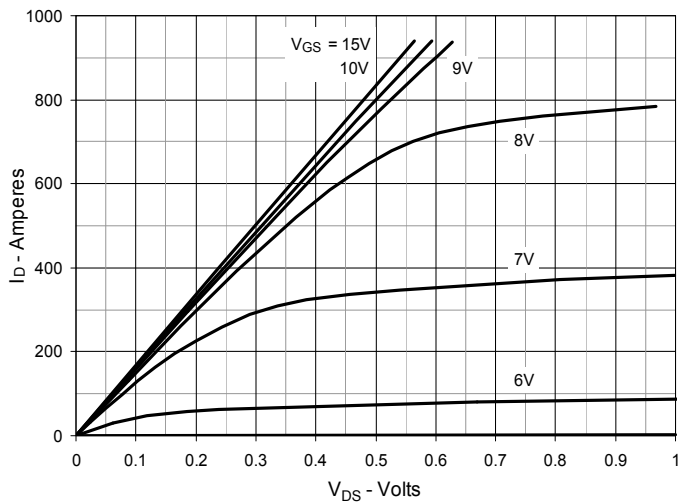
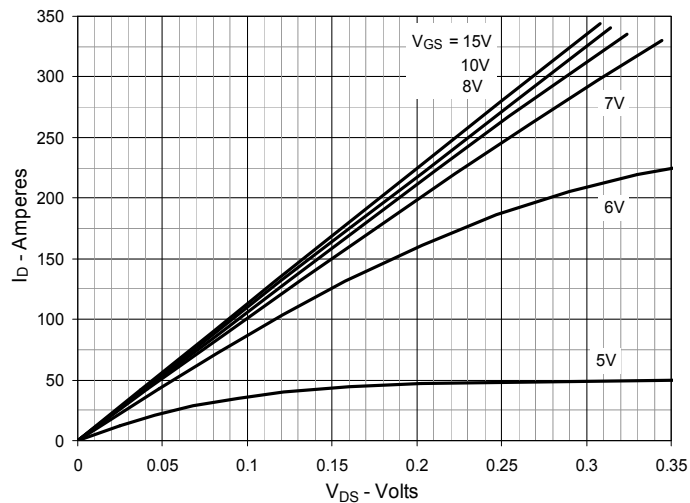
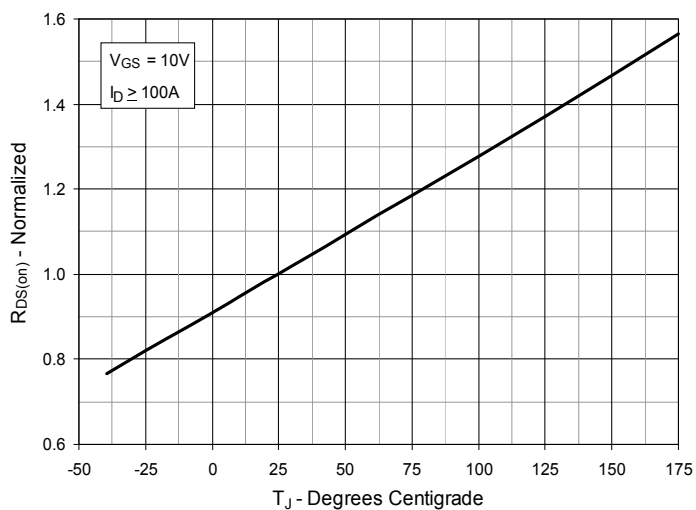
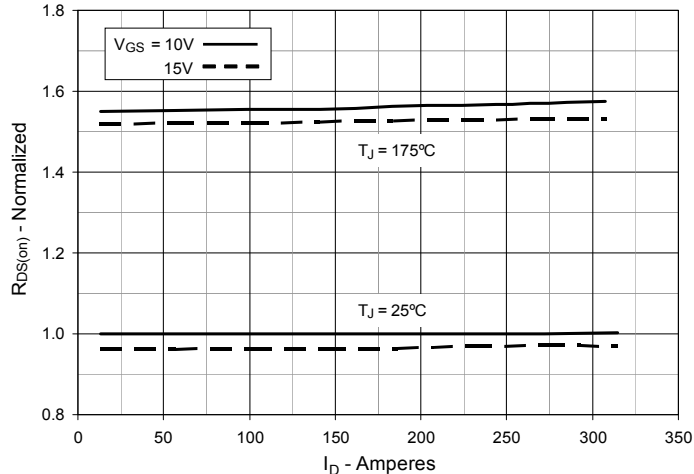
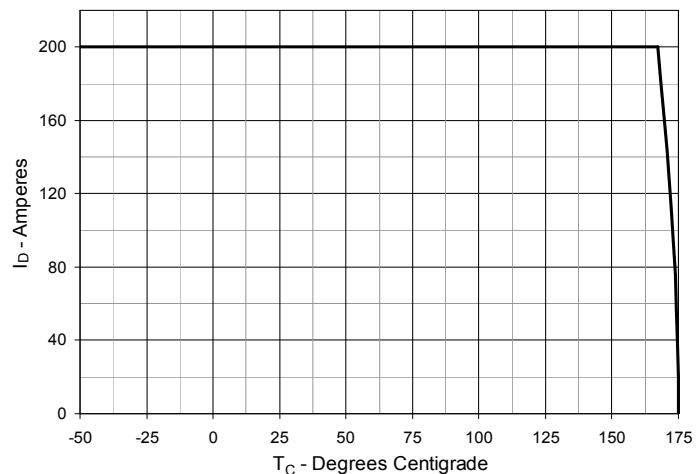
SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	1.240	1.255	31.50	31.88
B	.307	.323	7.80	8.20
C	.161	.169	4.09	4.29
D	.161	.169	4.09	4.29
E	.161	.169	4.09	4.29
F	.587	.595	14.91	15.11
G	1.186	1.193	30.12	30.30
H	1.496	1.505	38.00	38.23
J	.460	.481	11.68	12.22
K	.351	.378	8.92	9.60
L	.030	.033	0.76	0.84
M	.496	.506	12.60	12.85
N	.990	1.001	25.15	25.42
O	.078	.084	1.98	2.13
P	.195	.235	4.95	5.97
Q	1.045	1.059	26.54	26.90
R	.155	.174	3.94	4.42
S	.186	.191	4.72	4.85
T	.968	.987	24.59	25.07
U	-.002	.004	-0.05	0.1

### ADVANCE TECHNICAL INFORMATION

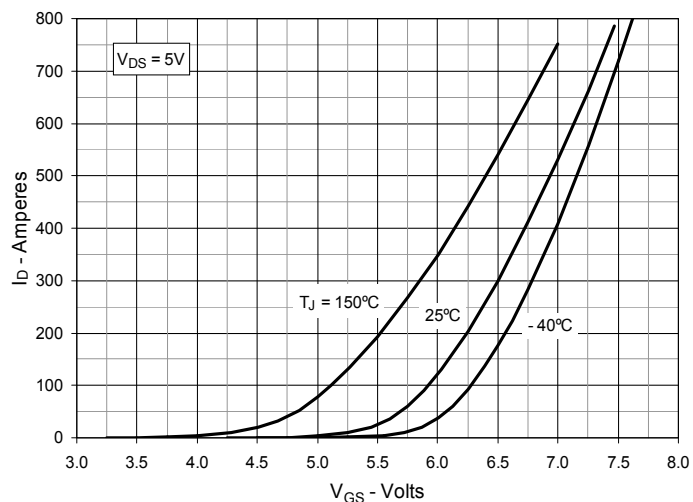
The product presented herein is under development. The Technical Specifications offered are derived from a subjective evaluation of the design, based upon prior knowledge and experience, and constitute a "considered reflection" of the anticipated result. IXYS reserves the right to change limits, test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

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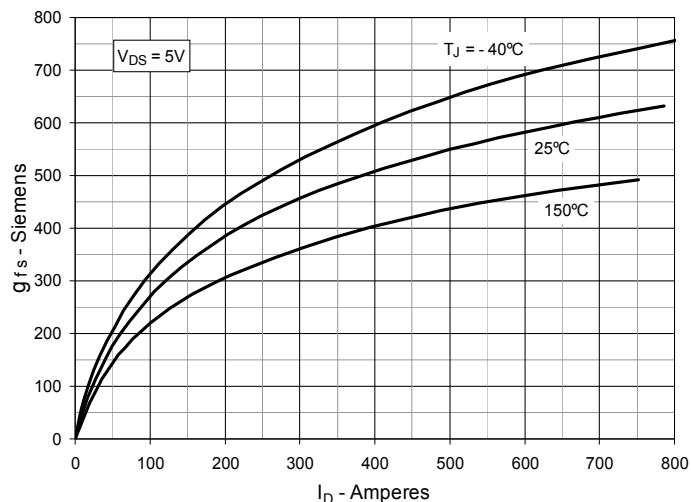
IXYS MOSFETs and IGBTs are covered 4,835,592 4,931,844 5,049,961 5,237,481 6,162,665 6,404,065 B1 6,683,344 6,727,585 7,005,734 B2 7,157,338B2  
by one or more of the following U.S. patents: 4,860,072 5,017,508 5,063,307 5,381,025 6,259,123 B1 6,534,343 6,710,405 B2 6,759,692 7,063,975 B2  
4,881,106 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  $R_{DS(on)}$  vs. Junction Temperature**

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

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


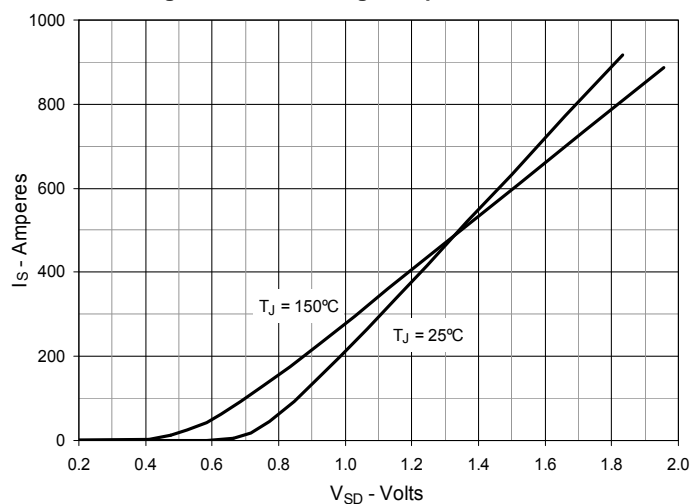
**Fig. 7. Input Admittance**



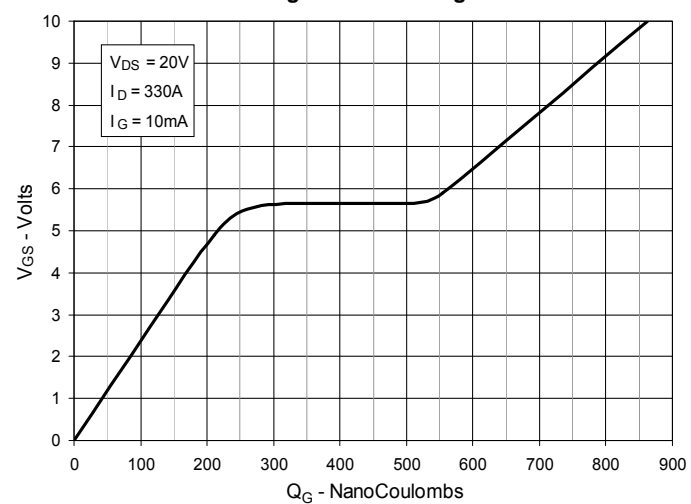
**Fig. 8. Transconductance**



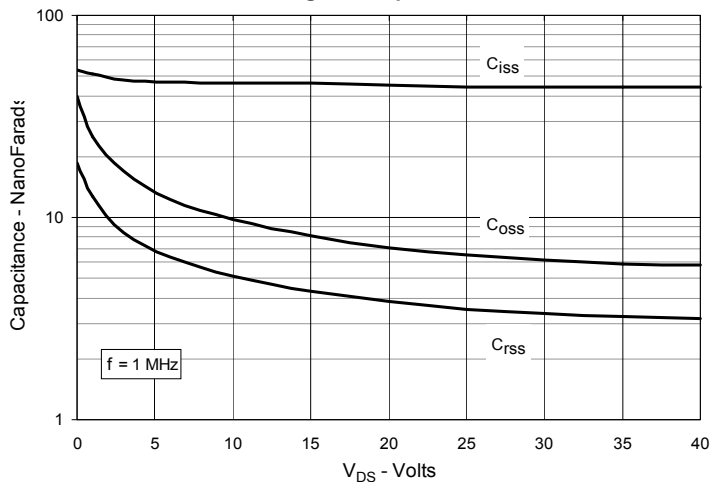
**Fig. 9. Forward Voltage Drop of Intrinsic Diode**



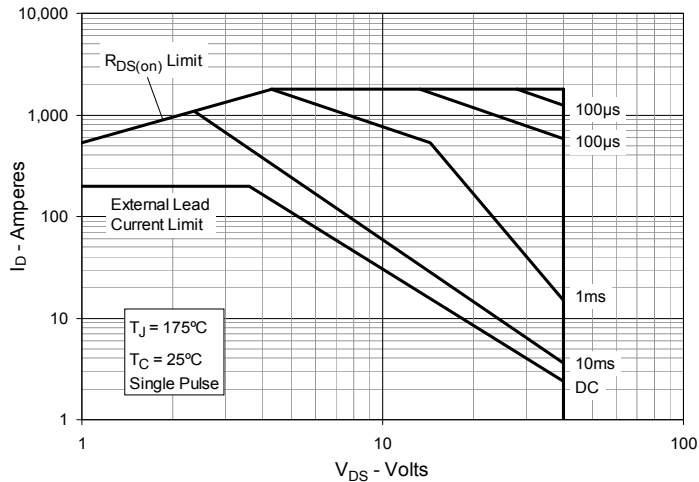
**Fig. 10. Gate Charge**



**Fig. 11. Capacitance**



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



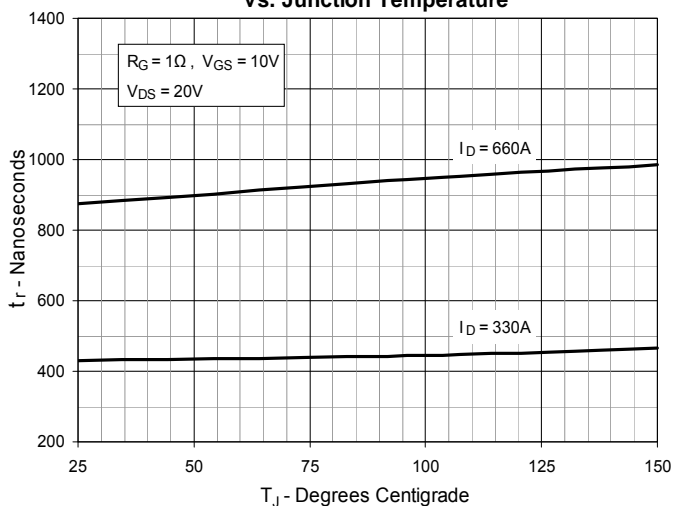
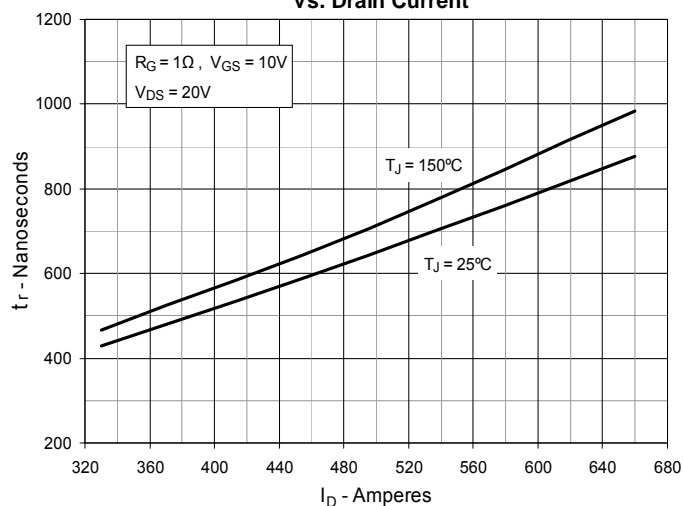
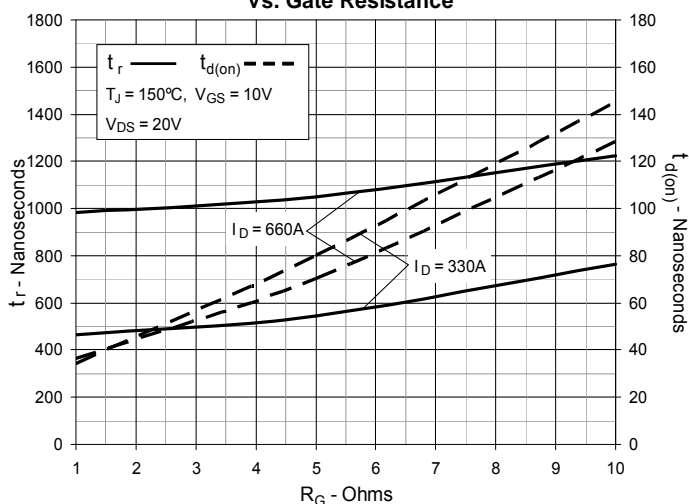
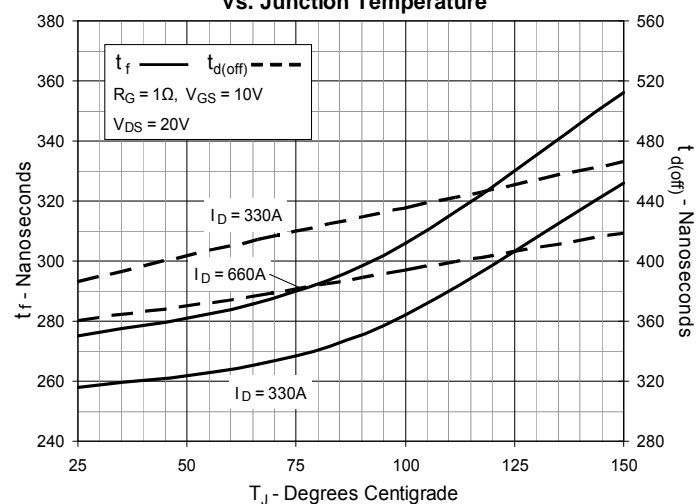
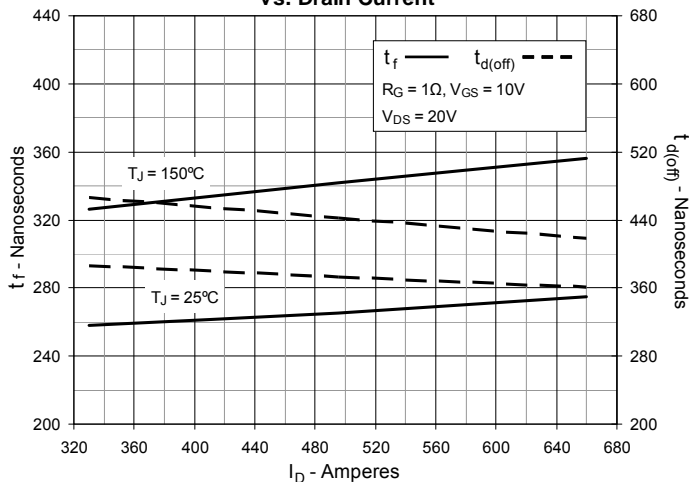
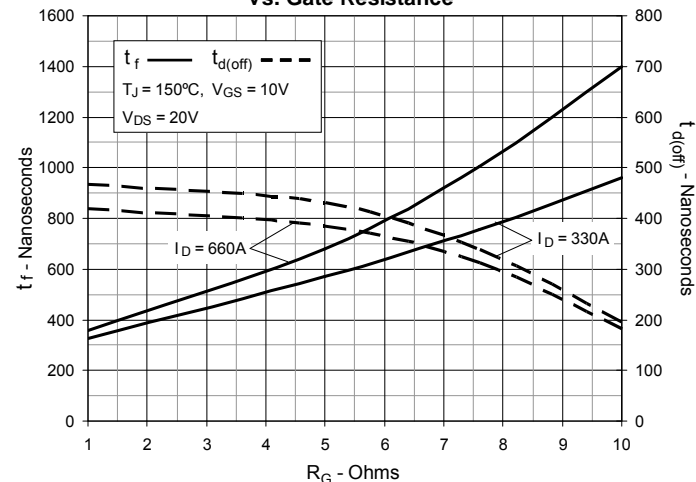
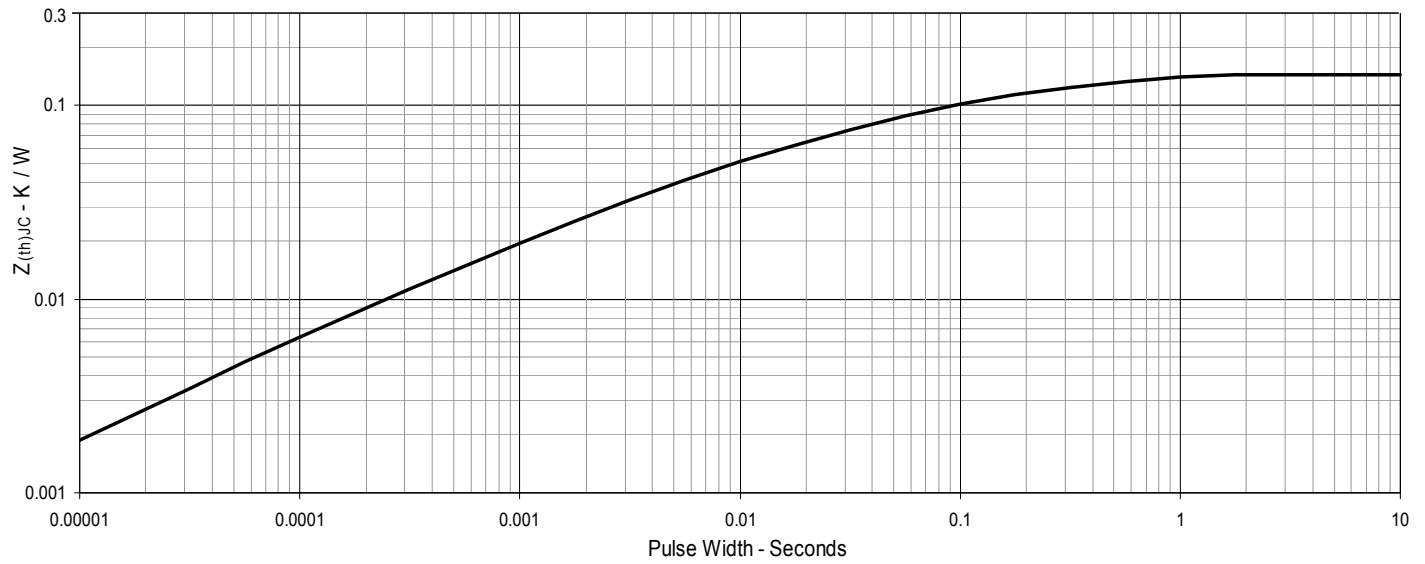
**Fig. 13. Resistive Turn-on Rise Time vs. Junction Temperature**

**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





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