

**Features**

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**Typical Applications**

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**MAXIMUM RATINGS** ( $T_J = 25^\circ\text{C}$  unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	$V_{DSS}$	650	V
Gate-to-Source Voltage	$V_{GS}$	-8/+22	V
Recommended Operation Values of Gate-to-Source Voltage	$T_C < 175^\circ\text{C}$ $V_{GSop}$	-5/+18	V
Continuous Drain Current (Note 1)	Steady State $T_C = 25^\circ\text{C}$ $I_D$	163	A
Power Dissipation (Note 1)	$P_D$	643	W
Continuous Drain Current (Note 1)	Steady State $T_C = 100^\circ\text{C}$ $I_D$	115	A
Power Dissipation (Note 1)	$P_D$	321	W
Pulsed Drain Current (Note 2)	$T_C = 25^\circ\text{C}$ $I_{DM}$	484	A
Single Pulse Surge Drain Current Capability	$T_A = 25^\circ\text{C}$ , $t_p = 10 \mu\text{s}$ , $R_G = 4.7 \Omega$ $I_{DSC}$	798	A
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 to +175	$^\circ\text{C}$
Source Current (Body Diode)	$I_S$	157	A
Single Pulse Drain-to-Source Avalanche Energy ( $I_{L(pk)} = 13 \text{ A}$ , $L = 1 \text{ mH}$ ) (Note 3)	$E_{AS}$	84	mJ

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**Table 1. THERMAL CHARACTERISTICS**

Parameter	Symbol	Max	Unit
Junction-to-Case – Steady State (Note 1)	$R_{\theta JC}$	0.24	°C/W
Junction-to-Ambient – Steady State (Note 1)	$R_{\theta JA}$	40	

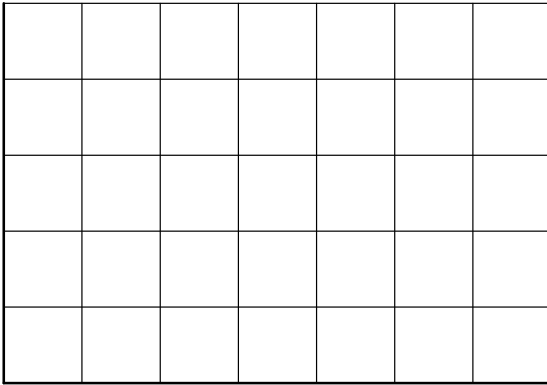
**Table 2. ELECTRICAL CHARACTERISTICS** ( $T_J = 25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit	
<b>OFF CHARACTERISTICS</b>							
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 1\text{ mA}$	650	-	-	V	
Drain-to-Source Breakdown Voltage Temperature Coefficient	$V_{(BR)DSS}/T_J$	$I_D = 20\text{ mA}$ , referenced to $25^\circ\text{C}$	-	0.12	-	V/°C	
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{GS} = 0\text{ V}, V_{DS} = 650\text{ V}$	$T_J = 25^\circ\text{C}$	-	-	10	$\mu\text{A}$
			$T_J = 175^\circ\text{C}$	-	-	1	mA
Gate-to-Source Leakage Current	$I_{GSS}$	$V_{GS} = +22/-8\text{ V}, V_{DS} = 0\text{ V}$	-	-	250	nAmA	



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TYPICAL CHARACTERISTICS (continued)



$Q_g$ , GATE CHARGE (nC)

Figure 7. Gate-to-Source Voltage vs. Total Charge

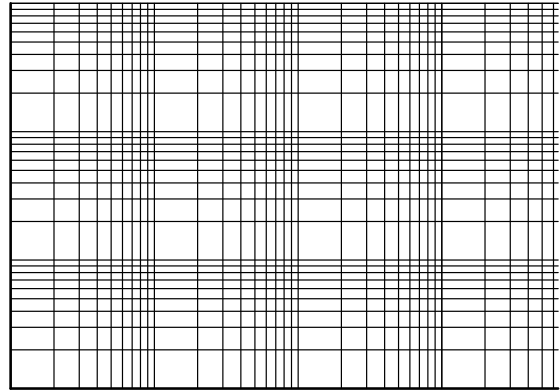
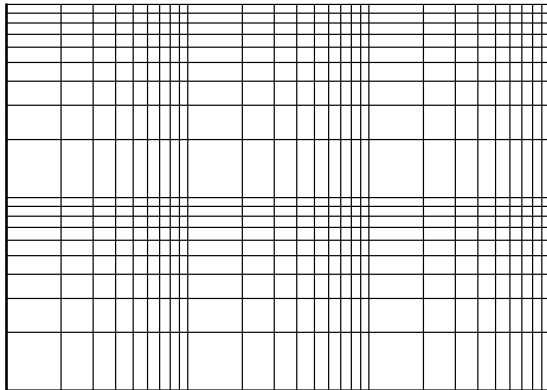
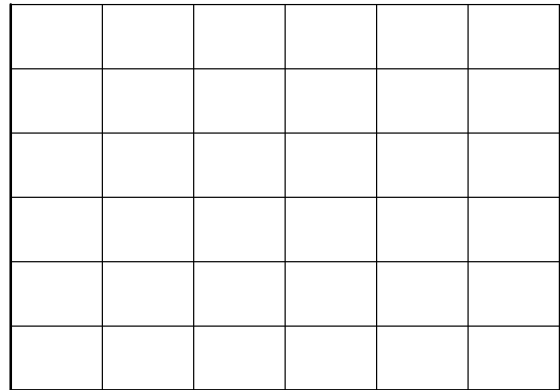


Figure 8. Capacitance vs. Drain-to-Source Voltage



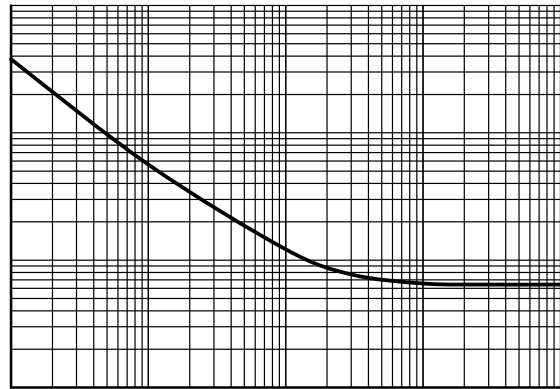
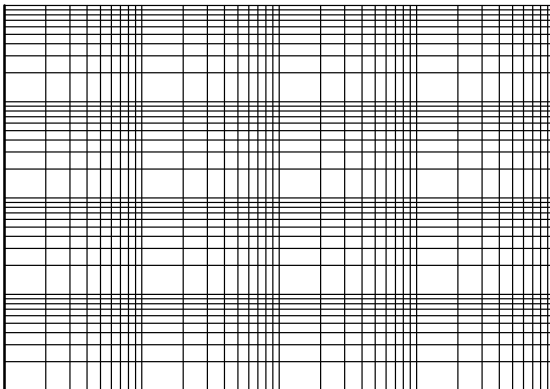
$t_{AV}$ , TIME IN AVALANCHE (ms)

Figure 9. Unclamped Inductive Switching Capability



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Figure 10. Maximum Continuous Drain Current vs. Case Temperature







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