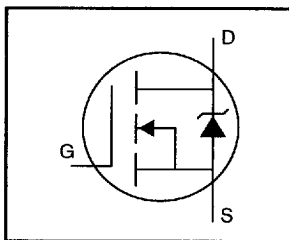


- Dynamic dv/dt Rating
- Repetitive Avalanche Rated
- Surface Mount
- Available in Tape & Reel
- Fast Switching
- Ease of Paralleling
- Simple Drive Requirements

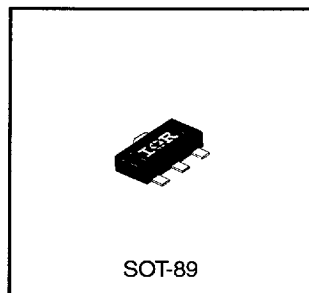


$V_{DSS} = 100V$
$R_{DS(on)} = 2.4\Omega$
$I_D = 0.82A$

Description

The HEXFET technology is the key to International Rectifier's advanced line of power MOSFET transistors. The efficient geometry and unique processing of the HEXFET design achieve very low on-state resistance combined with high transconductance and extreme device ruggedness.

The SOT-89 package is a sub-compact surface mount case style designed for vapor phase, infrared, or wave soldering production processes. Power dissipation of greater than 1.0W is possible in a typical surface mount application.



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Absolute Maximum Ratings

	Parameter	Max.	Units
$I_D @ T_C = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10 V$	0.82	A
$I_D @ T_C = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 10 V$	0.52	
I_{DM}	Pulsed Drain Current ①	3.3	
$P_D @ T_C = 25^\circ C$	Power Dissipation	3.6	W
$P_D @ T_A = 25^\circ C$	Power Dissipation (PCB Mount)**	2.0	
	Linear Derating Factor	0.29	W/°C
	Linear Derating Factor (PCB Mount)**	0.014	
V_{GS}	Gate-to-Source Voltage	± 20	V
I_{LM}	Inductive Current, Clamped	3.3	A
I_{AR}	Avalanche Current ①	0.82	A
E_{AR}	Repetitive Avalanche Energy ①	0.36	mJ
dv/dt	Peak Diode Recovery dv/dt ③	5.5	V/ns
T_J, T_{STG}	Junction and Storage Temperature Range	-55 to +150	°C
	Soldering Temperature, for 10 seconds	260 (1.6mm from case)	

Thermal Resistance

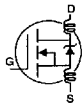
	Parameter	Min.	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-PCB	—	—	35	°C/W
$R_{\theta JA}$	Junction-to-Ambient (PCB mount)**	—	—	70	

** When mounted on 1" square PCB (FR-4 or G-10 Material).

For recommended footprint and soldering techniques refer to application note #AN-994.

Electrical Characteristics @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	100	—	—	V	$V_{GS}=0V, I_D=250\mu A$
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.12	—	$V/^\circ\text{C}$	Reference to $25^\circ\text{C}, I_D=1\text{mA}$
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	—	2.4	Ω	$V_{GS}=10V, I_D=0.49A$ ④
$V_{GS(th)}$	Gate Threshold Voltage	2.0	—	4.0	V	$V_{DS}=V_{GS}, I_D=250\mu A$
g_{fs}	Forward Transconductance	0.40	—	—	S	$V_{DS}=50V, I_D=0.49A$ ④
I_{DSS}	Drain-to-Source Leakage Current	—	—	25	μA	$V_{DS}=100V, V_{GS}=0V$
		—	—	250		$V_{DS}=80V, V_{GS}=0V, T_J=125^\circ\text{C}$
I_{GSS}	Gate-to-Source Forward Leakage	—	—	100	nA	$V_{GS}=20V$
	Gate-to-Source Reverse Leakage	—	—	-100		$V_{GS}=-20V$
Q_g	Total Gate Charge	—	—	1.6	nC	$I_D=0.90A$
Q_{gs}	Gate-to-Source Charge	—	—	0.68		$V_{DS}=80V$
Q_{gd}	Gate-to-Drain ("Miller") Charge	—	—	0.95		$V_{GS}=10V$ See Fig. 6 and 12 ④
$t_{d(on)}$	Turn-On Delay Time	—	7.8	—	ns	$V_{DD}=50V$
t_r	Rise Time	—	4.5	—		$I_D=0.90A$
$t_{d(off)}$	Turn-Off Delay Time	—	11	—		$R_G=50\Omega$
t_f	Fall Time	—	4.7	—		$R_D=55\Omega$ See Figure 10 ④
L_D	Internal Drain Inductance	—	2.0	—	nH	Between lead, 6 mm (0.25in.) from package and center of die contact
L_S	Internal Source Inductance	—	3.0	—		
C_{iss}	Input Capacitance	—	39	—	pF	$V_{GS}=0V$
C_{oss}	Output Capacitance	—	18	—		$V_{DS}=25V$
C_{riss}	Reverse Transfer Capacitance	—	2.8	—		$f=1.0\text{MHz}$ See Figure 5



Source-Drain Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
I_S	Continuous Source Current (Body Diode)	—	—	0.82	A	MOSFET symbol showing the integral reverse p-n junction diode.
I_{SM}	Pulsed Source Current (Body Diode) ①	—	—	3.3		
V_{SD}	Diode Forward Voltage	—	—	1.4	V	$T_J=25^\circ\text{C}, I_S=0.82A, V_{GS}=0V$ ④
t_{rr}	Reverse Recovery Time	—	57	71	ns	$T_J=25^\circ\text{C}, I_F=0.90A$
Q_{rr}	Reverse Recovery Charge	—	0.27	0.41	μC	$di/dt=100A/\mu s$ ④
t_{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by L_S+L_D)				

Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature (See Figure 11)
- ② $I_{SD} \leq 0.90A, di/dt \leq 25A/\mu s, V_{DD} \leq V_{(BR)DSS}, T_J \leq 150^\circ\text{C}$
- ④ Pulse width $\leq 300 \mu s$; duty cycle $\leq 2\%$.

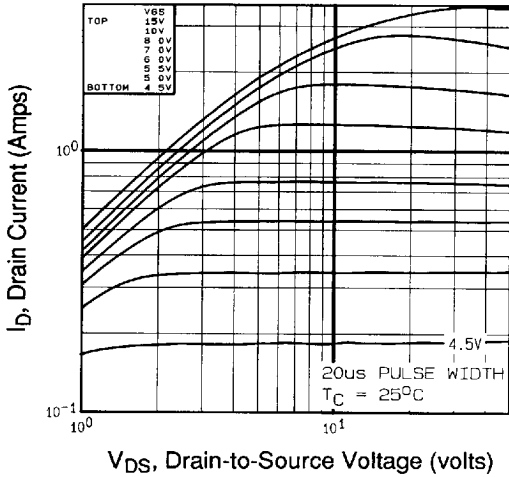


Fig 1. Typical Output Characteristics,
 $T_C=25^\circ\text{C}$

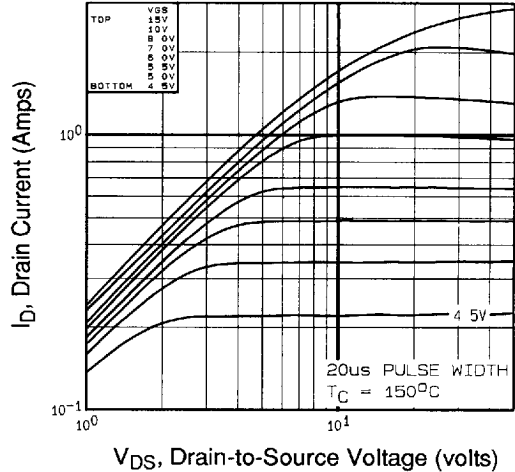


Fig 2. Typical Output Characteristics,
 $T_C=150^\circ\text{C}$

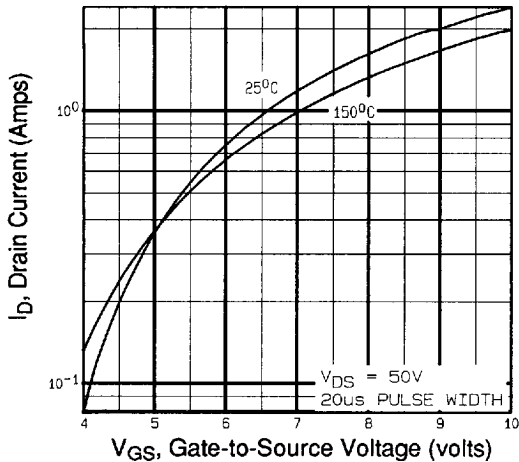


Fig 3. Typical Transfer Characteristics

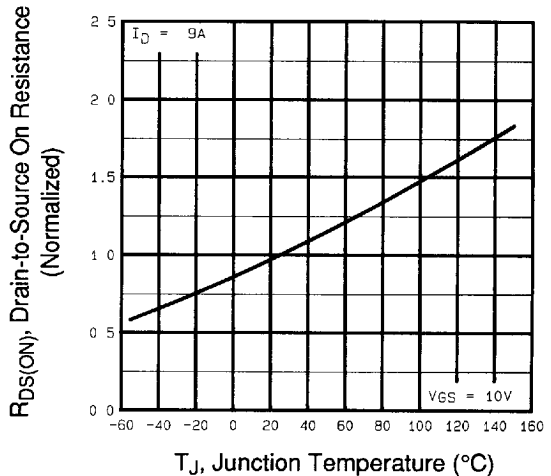


Fig 4. Normalized On-Resistance
Vs. Temperature

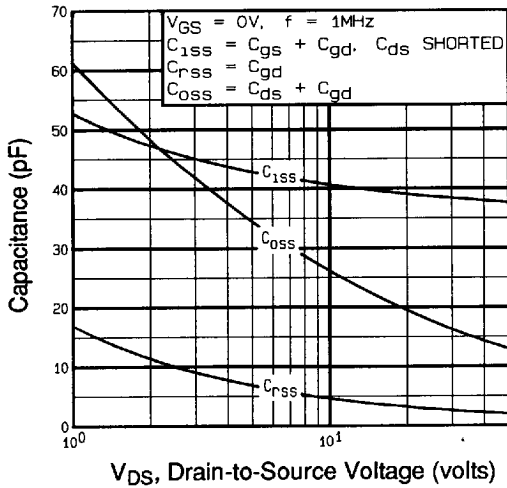


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

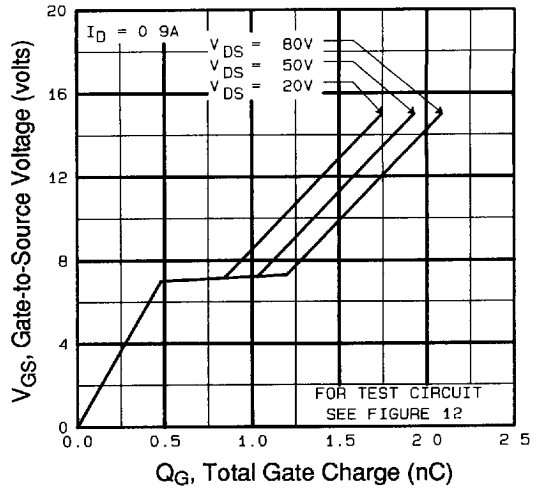


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

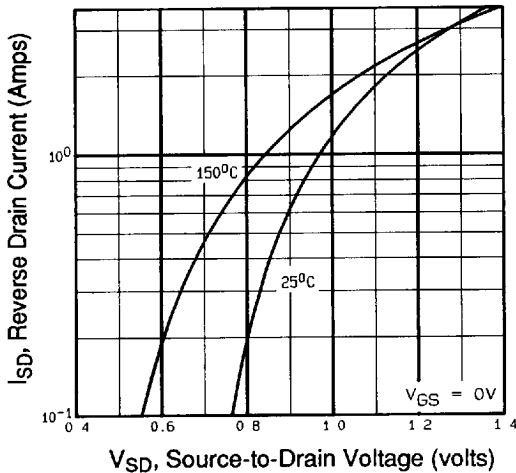


Fig 7. Typical Source-Drain Diode Forward Voltage

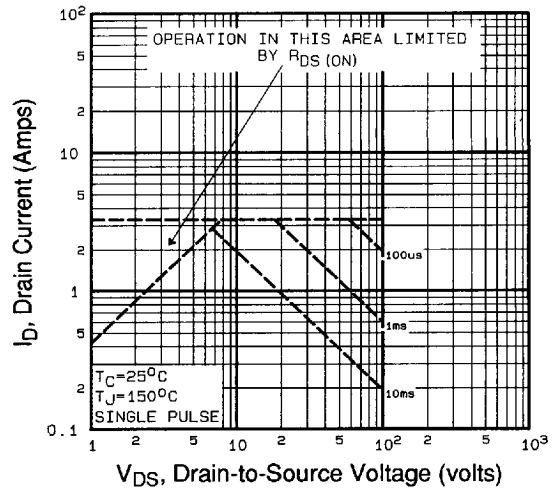


Fig 8. Maximum Safe Operating Area

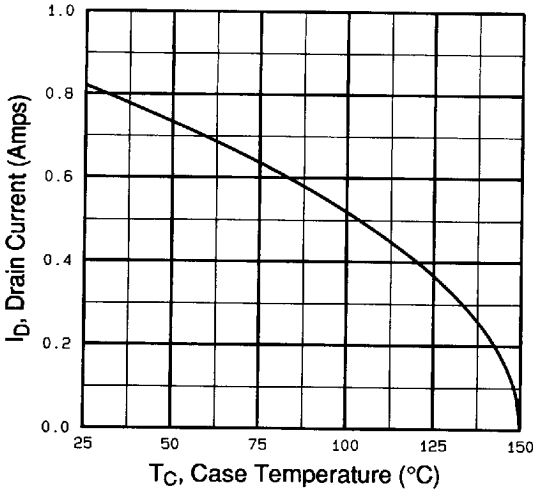


Fig 9. Maximum Drain Current Vs. Case Temperature

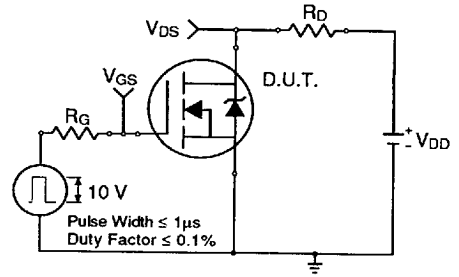


Fig 10a. Switching Time Test Circuit

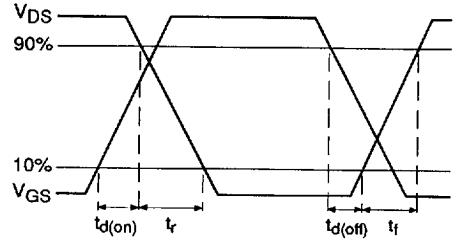


Fig 10b. Switching Time Waveforms

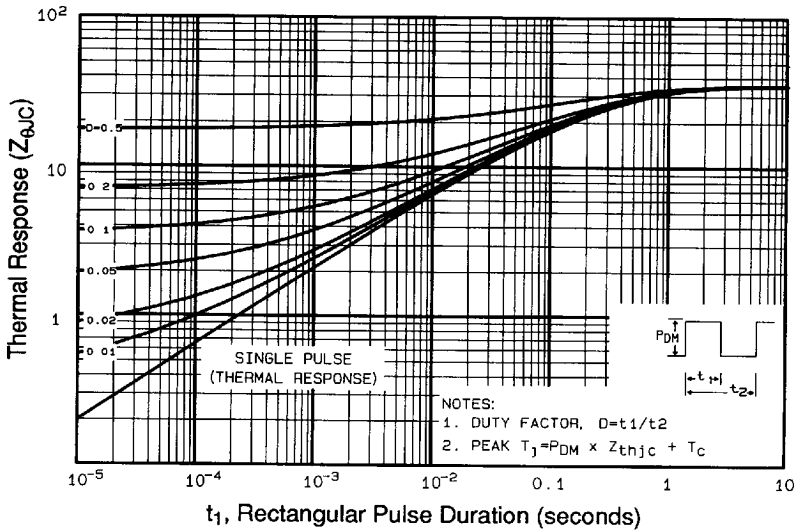


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Case

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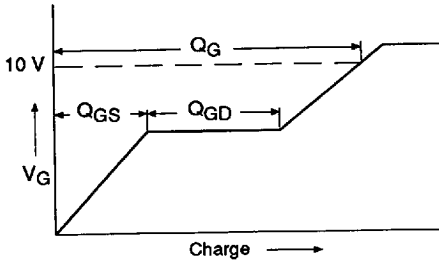


Fig 12a. Basic Gate Charge Waveform

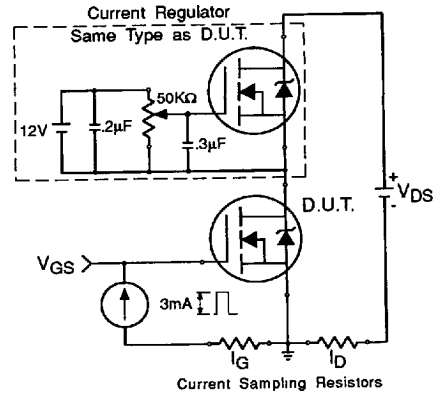


Fig 12b. Gate Charge Test Circuit

Appendix A: Figure 14, Peak Diode Recovery dv/dt Test Circuit – See page 1505

Appendix B: Package Outline Mechanical Drawing – See page 1509

Appendix C: Part Marking Information – See page 1516

Appendix D: Tape & Reel Information – See page 1521