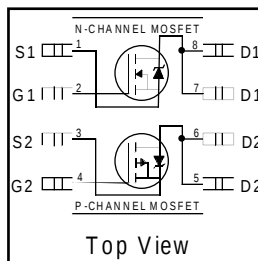


- Generation V Technology
- Ultra Low On-Resistance
- Dual N and P Channel MOSFET
- Surface Mount
- Very Low Gate Charge and Switching Losses
- Fully Avalanche Rated



	N-Ch	P-Ch
V_{DS}	30V	-30V
$R_{DS(on)}$	0.10 Ω	0.25 Ω

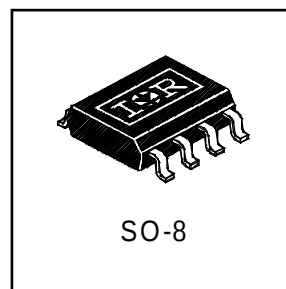
Description

Fifth Generation HEXFETs from International Rectifier utilize advanced processing techniques to achieve extremely low on-resistance per silicon area. This benefit, combined with the fast switching speed and ruggedized device design that HEXFET Power MOSFETs are well known for, provides the designer with an extremely efficient and reliable device for use in a wide variety of applications.

The SO-8 has been modified through a customized leadframe for enhanced thermal characteristics and multiple-die capability making it ideal in a variety of power applications. With these improvements, multiple devices can be used in an application with dramatically reduced board space. The package is designed for vapor phase, infra red, or wave soldering techniques.

Recommended upgrade: IRF7309 or IRF7319

Lower profile/smaller equivalent: IRF7509



SO-8

		Symbol	Maximum		Units
			N-Channel	P-Channel	
Drain-Source Voltage		V_{DS}	30		V
Gate-Source Voltage		V_{GS}	± 20		
Continuous Drain Current⑤	$T_A = 25^{\circ}C$	I_D	3.5	-2.3	A
	$T_A = 70^{\circ}C$		2.8	-1.8	
Pulsed Drain Current		I_{DM}	16	-10	
Continuous Source Current (Diode Conduction)		I_S	1.7	-1.3	
Maximum Power Dissipation ⑤	$T_A = 25^{\circ}C$	P_D	2.0		W
	$T_A = 70^{\circ}C$		1.3		
Single Pulse Avalanche Energy		E_{AS}	44	57	mJ
Avalanche Current		I_{AR}	2.0	-1.3	A
Repetitive Avalanche Energy		E_{AR}	0.25		mJ
Peak Diode Recovery dv/dt ②		dv/dt	5.0	-5.0	V/ ns
Junction and Storage Temperature Range		T_J, T_{STG}	-55 to + 150 °C		

Thermal Resistance Ratings

Parameter	Symbol	Limit	Units
Maximum Junction-to-Ambient ⑤	$R_{\theta JA}$	62.5	°C/W

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

	Parameter		Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	N-Ch	30	—	—	V	$V_{GS} = 0V, I_D = 250\mu A$
		P-Ch	-30	—	—		$V_{GS} = 0V, I_D = -250\mu A$
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	N-Ch	—	0.015	—	V/ $^\circ\text{C}$	Reference to 25°C , $I_D = 1mA$
		P-Ch	—	0.015	—		Reference to 25°C , $I_D = -1mA$
$R_{DS(ON)}$	Static Drain-to-Source On-Resistance	N-Ch	—	0.08	0.10	Ω	$V_{GS} = 10V, I_D = 2.2A$ ④
			—	0.12	0.15		$V_{GS} = 4.5V, I_D = 1.0A$ ④
		P-Ch	—	0.165	0.250		$V_{GS} = -10V, I_D = -1.0A$ ④
			—	0.290	0.400		$V_{GS} = -4.5V, I_D = -0.50A$ ④
$V_{GS(th)}$	Gate Threshold Voltage	N-Ch	1.0	—	—	V	$V_{DS} = V_{GS}, I_D = 250\mu A$
		P-Ch	-1.0	—	—		$V_{DS} = V_{GS}, I_D = -250\mu A$
g_{fs}	Forward Transconductance	N-Ch	—	12	—	S	$V_{DS} = 15V, I_D = 3.5A$ ④
		P-Ch	—	2.4	—		$V_{DS} = -15V, I_D = -2.3A$ ④
I_{DSS}	Drain-to-Source Leakage Current	N-Ch	—	—	2.0	μA	$V_{DS} = 24V, V_{GS} = 0V$
		P-Ch	—	—	-2.0		$V_{DS} = -24V, V_{GS} = 0V$
		N-Ch	—	—	25		$V_{DS} = 24V, V_{GS} = 0V, T_J = 125^\circ\text{C}$
		P-Ch	—	—	-25		$V_{DS} = -24V, V_{GS} = 0V, T_J = 125^\circ\text{C}$
I_{GSS}	Gate-to-Source Forward Leakage	N-P	—	—	± 100	nA	$V_{GS} = \pm 20V$
Q_g	Total Gate Charge	N-Ch	—	6.9	14		N-Channel $I_D = 1.8A, V_{DS} = 10V, V_{GS} = 10V$ ④
		P-Ch	—	6.1	12		
Q_{gs}	Gate-to-Source Charge	N-Ch	—	1.0	2.0	nC	
		P-Ch	—	1.7	3.4		
Q_{gd}	Gate-to-Drain ("Miller") Charge	N-Ch	—	1.8	3.5		P-Channel $I_D = -2.3A, V_{DS} = -10V, V_{GS} = -10V$
		P-Ch	—	1.1	2.2		
$t_{d(on)}$	Turn-On Delay Time	N-Ch	—	6.2	12		N-Channel $V_{DD} = 10V, I_D = 1.0A, R_G = 6.0\Omega, R_D = 10\Omega$ ④
		P-Ch	—	9.7	19		
t_r	Rise Time	N-Ch	—	8.8	18		
		P-Ch	—	14	28		
$t_{d(off)}$	Turn-Off Delay Time	N-Ch	—	13	26	ns	
		P-Ch	—	20	40		
t_f	Fall Time	N-Ch	—	3.0	6.0		P-Channel $V_{DD} = -10V, I_D = -1.0A, R_G = 6.0\Omega, R_D = 10\Omega$
		P-Ch	—	6.9	14		
C_{iss}	Input Capacitance	N-Ch	—	190	—		N-Channel $V_{GS} = 0V, V_{DS} = 15V, f = 1.0MHz$
		P-Ch	—	190	—		
C_{oss}	Output Capacitance	N-Ch	—	120	—	pF	
		P-Ch	—	110	—		
C_{rss}	Reverse Transfer Capacitance	N-Ch	—	61	—		P-Channel $V_{GS} = 0V, V_{DS} = -15V, f = 1.0MHz$
		P-Ch	—	54	—		

Source-Drain Ratings and Characteristics

	Parameter		Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	N-Ch	—	—	1.7		A
		P-Ch	—	—	-1.3		
I_{SM}	Pulsed Source Current (Body Diode) ①	N-Ch	—	—	16		A
		P-Ch	—	—	-16		
V_{SD}	Diode Forward Voltage	N-Ch	—	0.82	1.2	V	$T_J = 25^\circ\text{C}, I_S = 1.25A, V_{GS} = 0V$ ③
		P-Ch	—	-0.82	-1.2		$T_J = 25^\circ\text{C}, I_S = -1.25A, V_{GS} = 0V$ ③
t_{rr}	Reverse Recovery Time	N-Ch	—	27	53	ns	N-Channel $T_J = 25^\circ\text{C}, I_F = 1.25A, di/dt = 100A/\mu s$ ④
		P-Ch	—	27	54		
Q_{rr}	Reverse Recovery Charge	N-Ch	—	28	57	nC	
		P-Ch	—	31	62		

Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature. (See fig. 23)
- ② N-Channel $I_{SD} \leq 2.0A, di/dt \leq 100A/\mu s, V_{DD} \leq V_{(BR)DSS}, T_J \leq 150^\circ\text{C}$
P-Channel $I_{SD} \leq -1.3A, di/dt \leq 84A/\mu s, V_{DD} \leq V_{(BR)DSS}, T_J \leq 150^\circ\text{C}$
- ③ N-Channel Starting $T_J = 25^\circ\text{C}, L = 22mH, R_G = 25\Omega, I_{AS} = 2.0A$. (See Figure 12)
P-Channel Starting $T_J = 25^\circ\text{C}, L = 67mH, R_G = 25\Omega, I_{AS} = -1.3A$.
- ④ Pulse width $\leq 300\mu s$; duty cycle $\leq 2\%$.
- ⑤ Surface mounted on FR-4 board, $t \leq 10sec$.

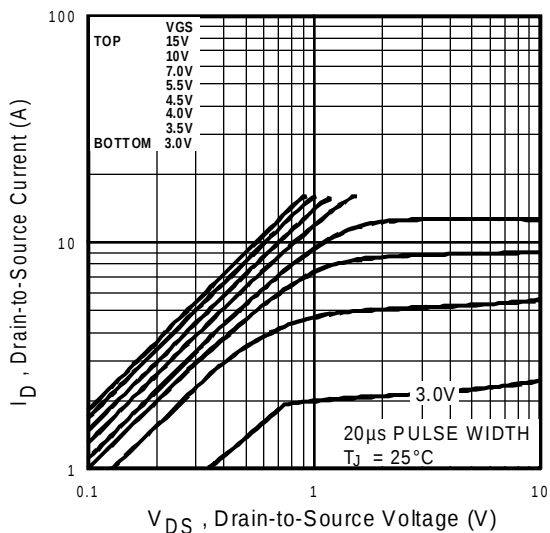


Fig 1. Typical Output Characteristics

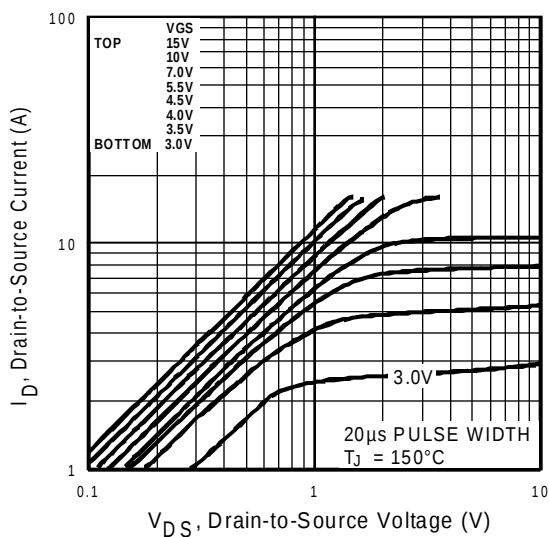


Fig 2. Typical Output Characteristics

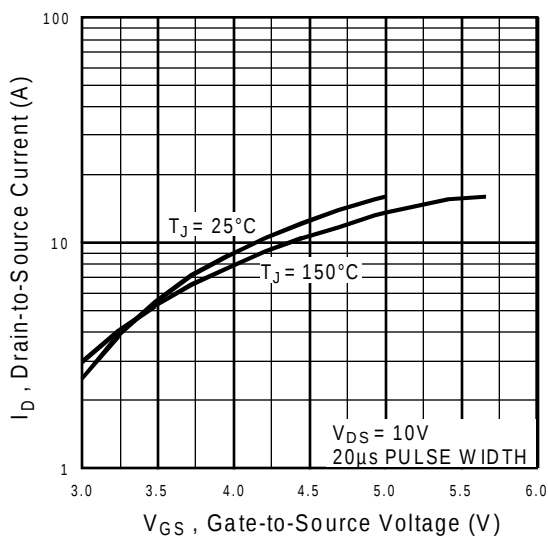


Fig 3. Typical Transfer Characteristics

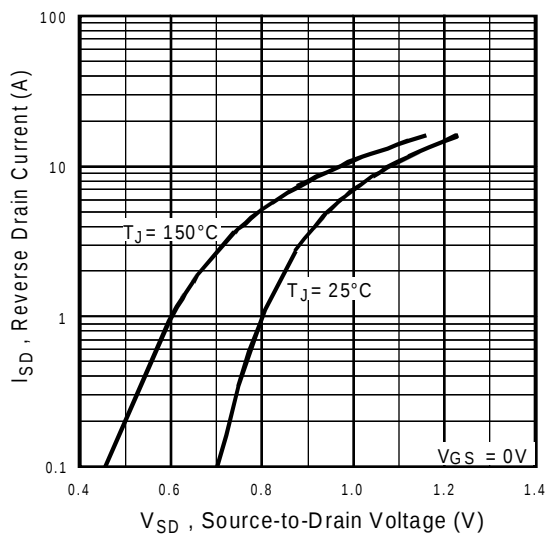


Fig 4. Typical Source-Drain Diode Forward Voltage

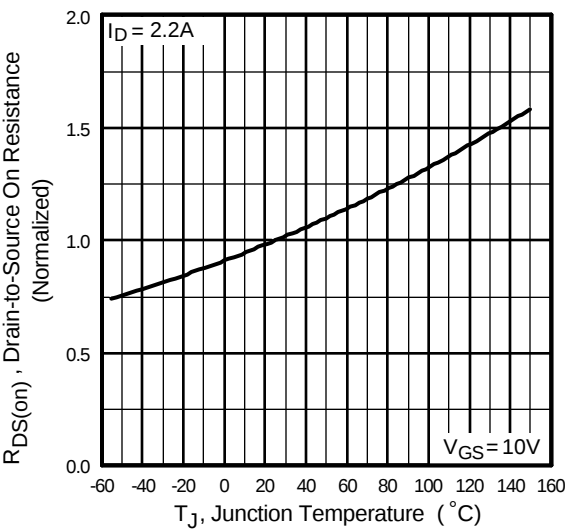


Fig 5. Normalized On-Resistance Vs. Temperature

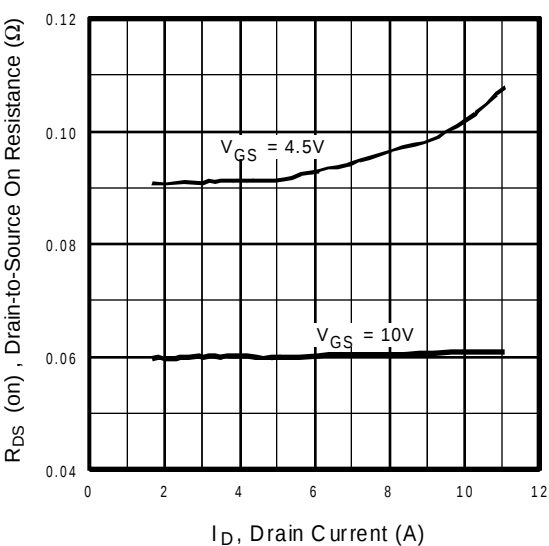


Fig 6. Typical On-Resistance Vs. Drain Current

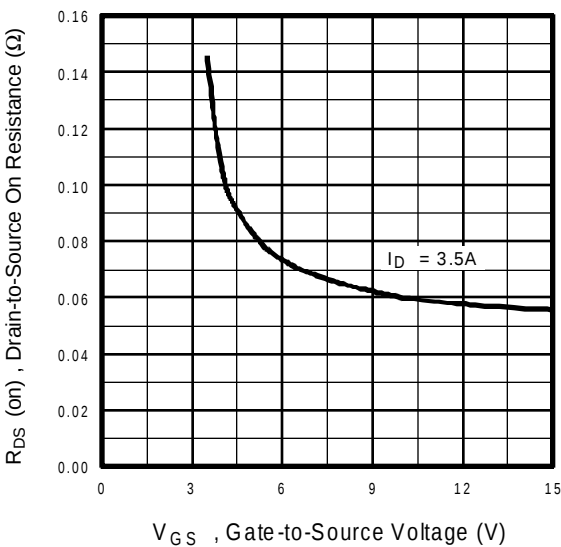


Fig 7. Typical On-Resistance Vs. Gate Voltage

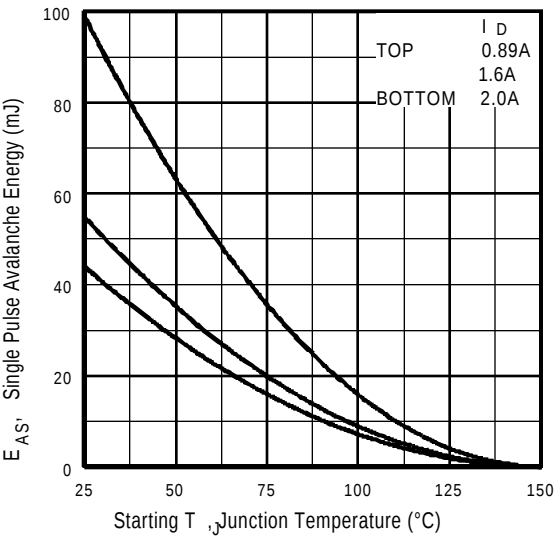


Fig 8. Maximum Avalanche Energy Vs. Drain Current

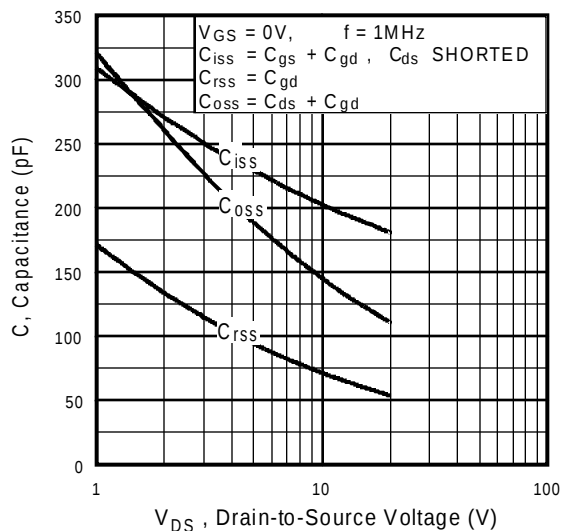


Fig 9. Typical Capacitance Vs. Drain-to-Source Voltage

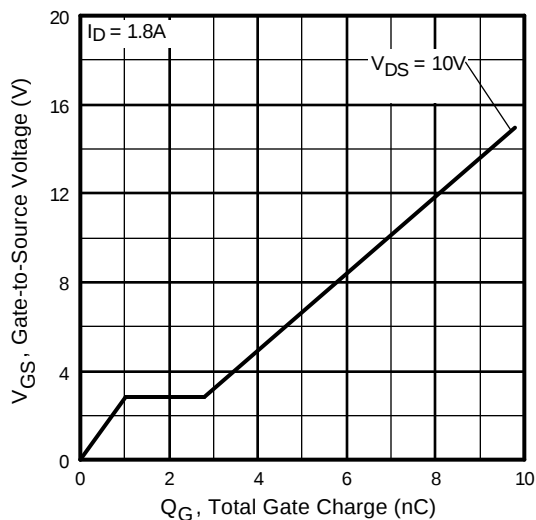


Fig 10. Typical Gate Charge Vs. Gate-to-Source Voltage

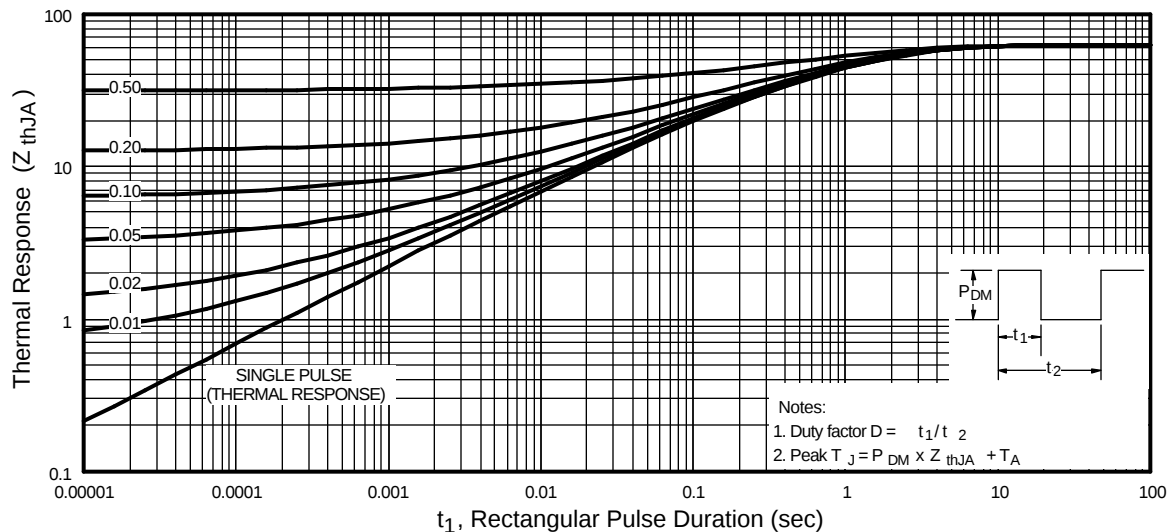


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

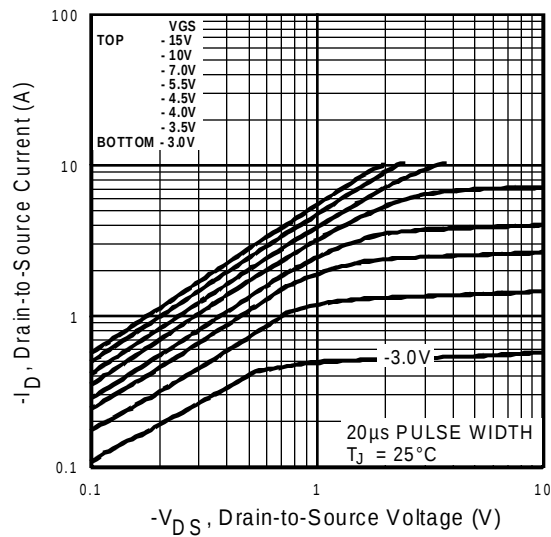


Fig 12. Typical Output Characteristics

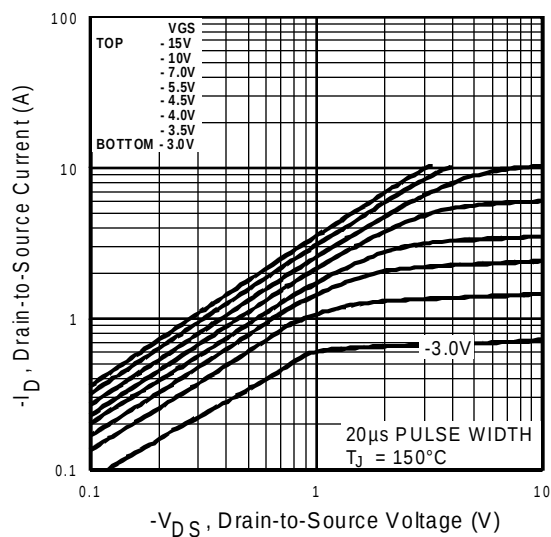


Fig 13. Typical Output Characteristics

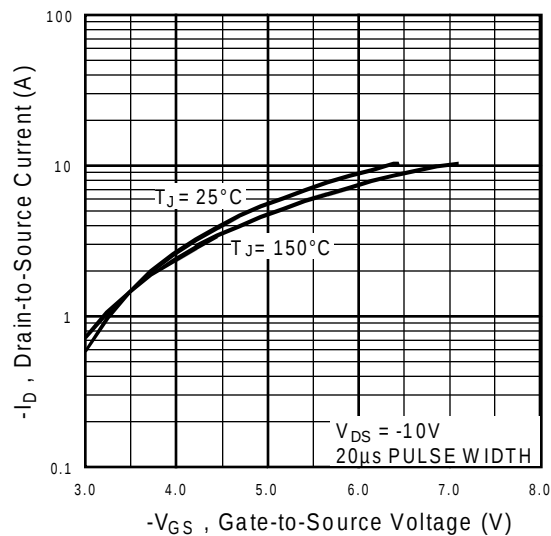


Fig 14. Typical Transfer Characteristics

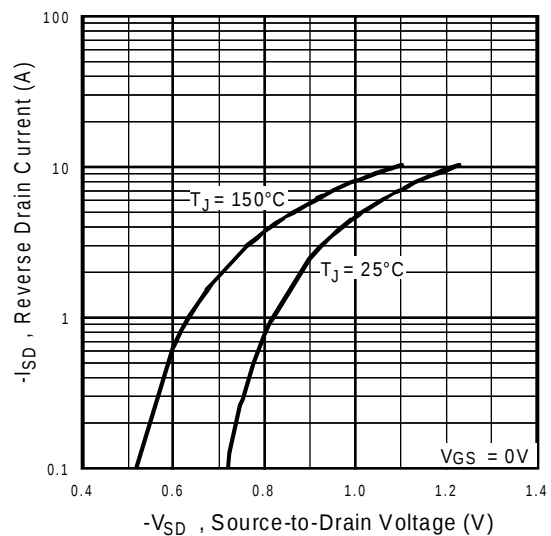


Fig 15. Typical Source-Drain Diode Forward Voltage

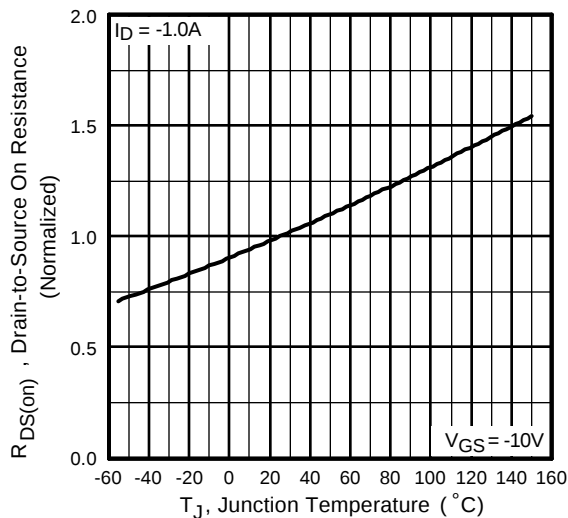


Fig 16. Normalized On-Resistance Vs. Temperature

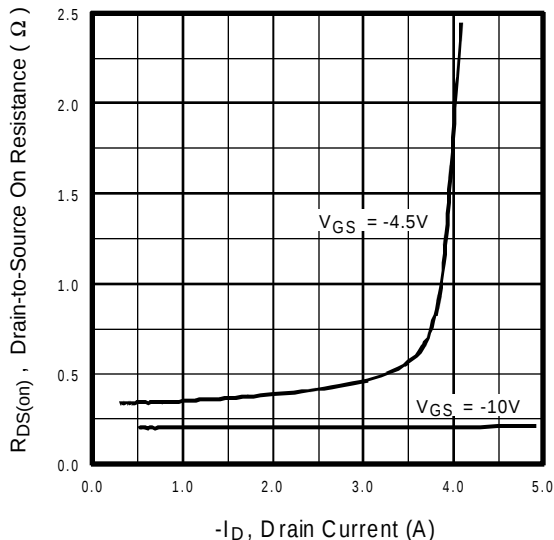


Fig 17. Typical On-Resistance Vs. Drain Current

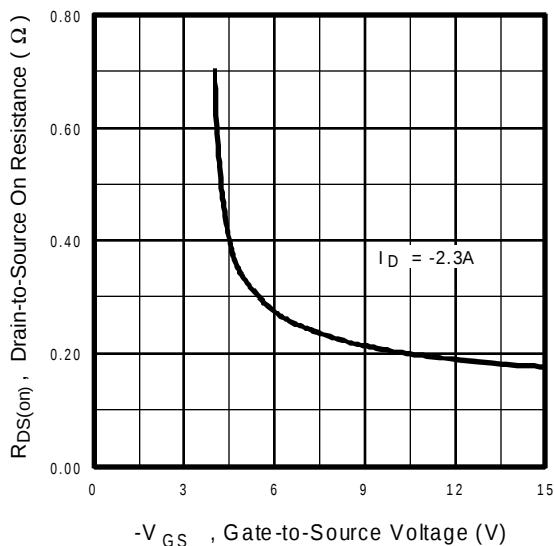


Fig 18. Typical On-Resistance Vs. Gate Voltage

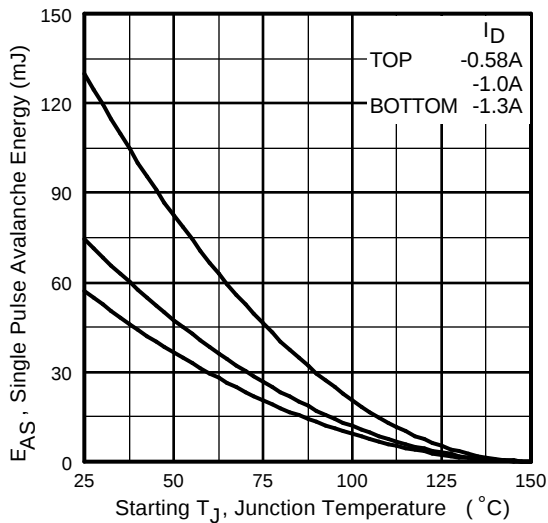


Fig 19. Maximum Avalanche Energy Vs. Drain Current

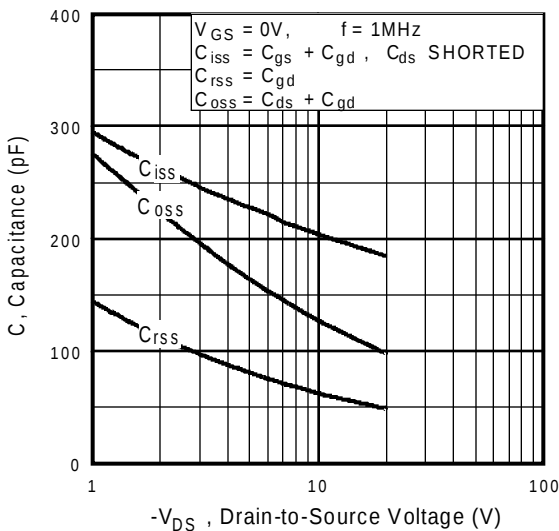


Fig 20. Typical Capacitance
Vs.
Drain-to-Source Voltage

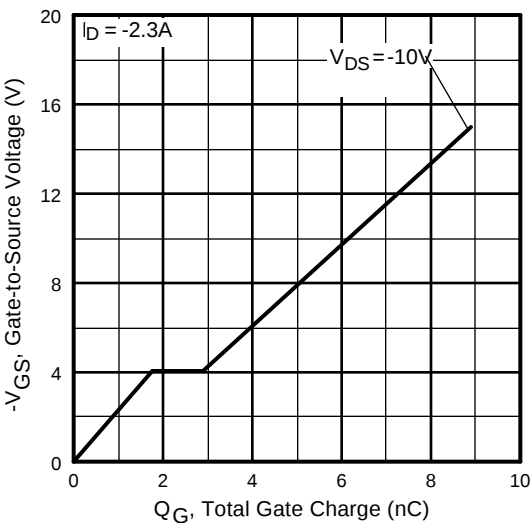


Fig 21. Typical Gate Charge Vs.
Gate-to-Source Voltage

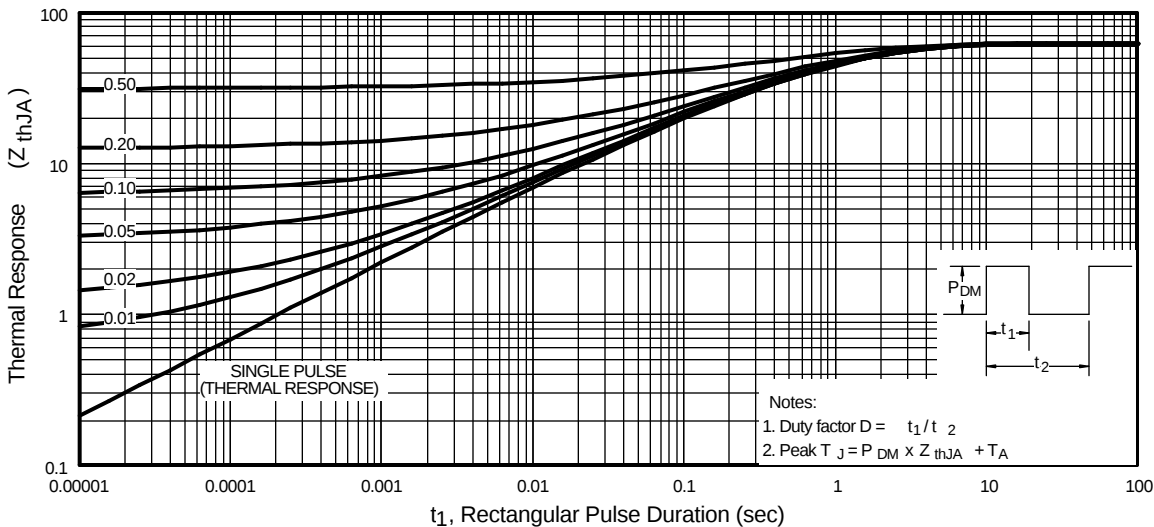
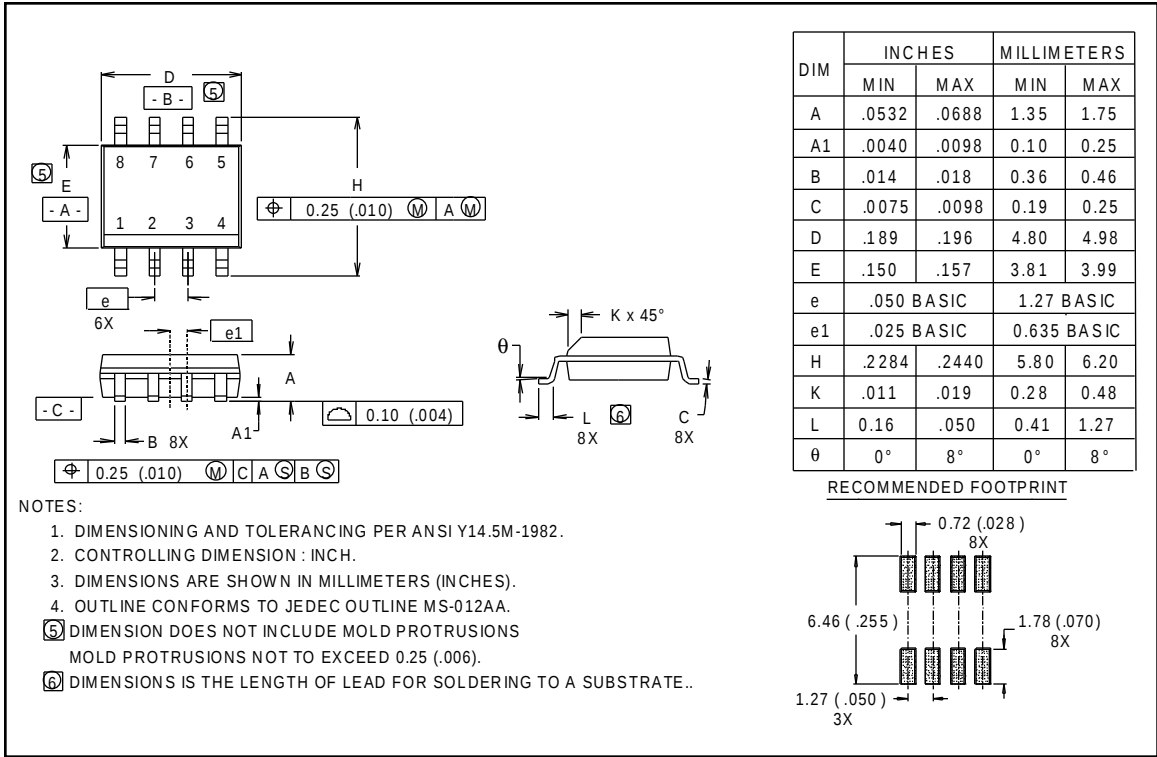


Fig 22. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

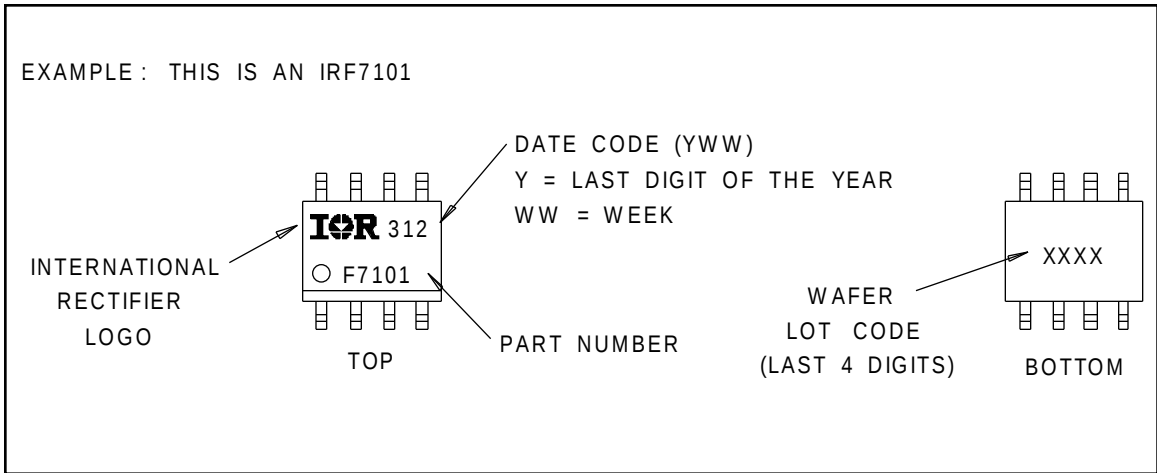
Package Outline

SO8 Outline



Part Marking Information

SO8



Tape & Reel Information

S08

Dimensions are shown in millimeters (inches)

