

International I^{OR} Rectifier

- Generation V Technology
- Ultra Low On-Resistance
- Dual N and P Channel MOSFET
- Surface Mount
- Fully Avalanche Rated

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.

Absolute Maximum Ratings

	Parameter	Max.		Units
		N-Channel	P-Channel	
V_{DS}	Drain-Source Voltage	55	-55	V
$I_D @ T_A = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	4.7	-3.4	
$I_D @ T_A = 70^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	3.8	-2.7	A
I_{DM}	Pulsed Drain Current ①	38	-27	
$P_D @ T_A = 25^\circ C$	Maximum Power Dissipation ⑤	2.0		W
$P_D @ T_A = 70^\circ C$	Maximum Power Dissipation ⑤	1.3		W
E_{AS}	Single Pulse Avalanche Energy ③	72	114	mJ
I_{AR}	Avalanche Current	4.7	-3.4	A
E_{AR}	Repetitive Avalanche Energy	0.20		mJ
V_{GS}	Gate-to-Source Voltage	± 20		V
dv/dt	Peak Diode Recovery dv/dt ②	5.0	-5.0	V/ns
T_J, T_{STG}	Junction and Storage Temperature Range	-55 to + 150		°C

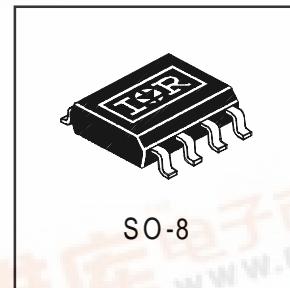
Thermal Resistance

	Parameter	Typ.	Max.	Units
R_{JA}	Maximum Junction-to-Ambient ⑤	—	62.5	°C/W

IRF7343

HEXFET® Power MOSFET

	N-Ch	P-Ch
V_{DSS}	55V	-55V
$R_{DS(on)}$	0.050Ω	0.105Ω



SO-8

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

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(\text{BR})\text{DSS}}$	Drain-to-Source Breakdown Voltage	N-Ch 55	—	—	V	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$
		P-Ch -55	—	—		$V_{GS} = 0\text{V}, I_D = -250\mu\text{A}$
$\Delta V_{(\text{BR})\text{DSS}}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	N-Ch —	0.059	—	$\text{V}/^\circ\text{C}$	Reference to 25°C , $I_D = 1\text{mA}$
		P-Ch —	0.054	—		Reference to 25°C , $I_D = -1\text{mA}$
$R_{DS(\text{ON})}$	Static Drain-to-Source On-Resistance	N-Ch —	0.043	0.050	Ω	$V_{GS} = 10\text{V}, I_D = 4.7\text{A}$ ④
		—	0.056	0.065		$V_{GS} = 4.5\text{V}, I_D = 3.8\text{A}$ ④
		P-Ch —	0.095	0.105		$V_{GS} = -10\text{V}, I_D = -3.4\text{A}$ ④
		—	0.150	0.170		$V_{GS} = -4.5\text{V}, I_D = -2.7\text{A}$ ④
		N-Ch 1.0	—	—		$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
$V_{GS(\text{th})}$	Gate Threshold Voltage	P-Ch -1.0	—	—	V	$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$
		N-Ch 7.9	—	—		$V_{DS} = 10\text{V}, I_D = 4.5\text{A}$ ④
g_{fs}	Forward Transconductance	P-Ch 3.3	—	—	S	$V_{DS} = -10\text{V}, I_D = -3.1\text{A}$ ④
		N-Ch —	—	—		$V_{DS} = 55\text{V}, V_{GS} = 0\text{V}$
I_{DSS}	Drain-to-Source Leakage Current	P-Ch —	—	-2.0	μA	$V_{DS} = -55\text{V}, V_{GS} = 0\text{V}$
		N-Ch —	—	25		$V_{DS} = 55\text{V}, V_{GS} = 0\text{V}, T_J = 55^\circ\text{C}$
		P-Ch —	—	-25		$V_{DS} = -55\text{V}, V_{GS} = 0\text{V}, T_J = 55^\circ\text{C}$
		N-P —	—	± 100		$V_{GS} = \pm 20\text{V}$
Q_g	Total Gate Charge	N-Ch —	24	36	nC	N-Channel
		P-Ch —	26	38		$I_D = 4.5\text{A}, V_{DS} = 44\text{V}, V_{GS} = 10\text{V}$ ④
Q_{gs}	Gate-to-Source Charge	N-Ch —	2.3	3.4	nC	P-Channel
		P-Ch —	3.0	4.5		$I_D = -3.1\text{A}, V_{DS} = -44\text{V}, V_{GS} = -10\text{V}$
Q_{gd}	Gate-to-Drain ("Miller") Charge	N-Ch —	7.0	10	nC	
		P-Ch —	8.4	13		
$t_{d(on)}$	Turn-On Delay Time	N-Ch —	8.3	12	ns	N-Channel
		P-Ch —	14	22		$V_{DD} = 28\text{V}, I_D = 1.0\text{A}, R_G = 6.0\Omega, R_D = 16\Omega$
t_r	Rise Time	N-Ch —	3.2	4.8	ns	
		P-Ch —	10	15		
$t_{d(off)}$	Turn-Off Delay Time	N-Ch —	32	48	ns	P-Channel
		P-Ch —	43	64		$V_{DD} = -28\text{V}, I_D = -1.0\text{A}, R_G = 6.0\Omega, R_D = 16\Omega$
t_f	Fall Time	N-Ch —	13	20	ns	
		P-Ch —	22	32		
C_{iss}	Input Capacitance	N-Ch —	740	—	pF	N-Channel
		P-Ch —	690	—		$V_{GS} = 0\text{V}, V_{DS} = 25\text{V}, f = 1.0\text{MHz}$
C_{oss}	Output Capacitance	N-Ch —	190	—	pF	P-Channel
		P-Ch —	210	—		$V_{GS} = 0\text{V}, V_{DS} = -25\text{V}, f = 1.0\text{MHz}$
C_{rss}	Reverse Transfer Capacitance	N-Ch —	71	—		
		P-Ch —	86	—		

Source-Drain Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_s	Continuous Source Current (Body Diode)	N-Ch —	—	2.0	A	
		P-Ch —	—	-2.0		
I_{SM}	Pulsed Source Current (Body Diode) ①	N-Ch —	—	38		
		P-Ch —	—	-27		
V_{SD}	Diode Forward Voltage	N-Ch —	0.70	1.2	V	$T_J = 25^\circ\text{C}, I_S = 2.0\text{A}, V_{GS} = 0\text{V}$ ③
		P-Ch —	-0.80	-1.2		$T_J = 25^\circ\text{C}, I_S = -2.0\text{A}, V_{GS} = 0\text{V}$ ③
t_{rr}	Reverse Recovery Time	N-Ch —	60	90	ns	N-Channel
		P-Ch —	54	80		$T_J = 25^\circ\text{C}, I_F = 2.0\text{A}, di/dt = 100\text{A}/\mu\text{s}$
Q_{rr}	Reverse Recovery Charge	N-Ch —	120	170	nC	P-Channel
		P-Ch —	85	130		$T_J = 25^\circ\text{C}, I_F = -2.0\text{A}, di/dt = 100\text{A}/\mu\text{s}$ ④

Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature. (See fig. 22)
- ② N-Channel $I_{SD} \leq 4.7\text{A}$, $di/dt \leq 220\text{A}/\mu\text{s}$, $V_{DD} \leq V_{(\text{BR})\text{DSS}}$, $T_J \leq 150^\circ\text{C}$
- ③ N-Channel Starting $T_J = 25^\circ\text{C}$, $L = 6.5\text{mH}$ $R_G = 25\Omega$, $I_{AS} = 4.7\text{A}$.
- ④ Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.
- ⑤ Surface mounted on FR-4 board, $t \leq 10\text{sec}$.
- P-Channel $I_{SD} \leq -3.4\text{A}$, $di/dt \leq -150\text{A}/\mu\text{s}$, $V_{DD} \leq V_{(\text{BR})\text{DSS}}$, $T_J \leq 150^\circ\text{C}$
- P-Channel Starting $T_J = 25^\circ\text{C}$, $L = 20\text{mH}$ $R_G = 25\Omega$, $I_{AS} = -3.4\text{A}$.

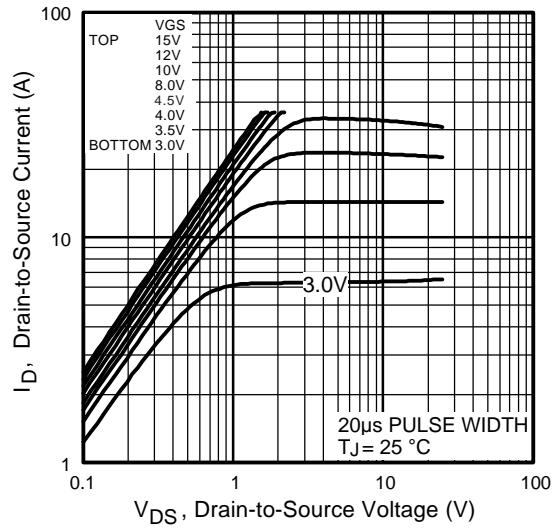


Fig 1. Typical Output Characteristics

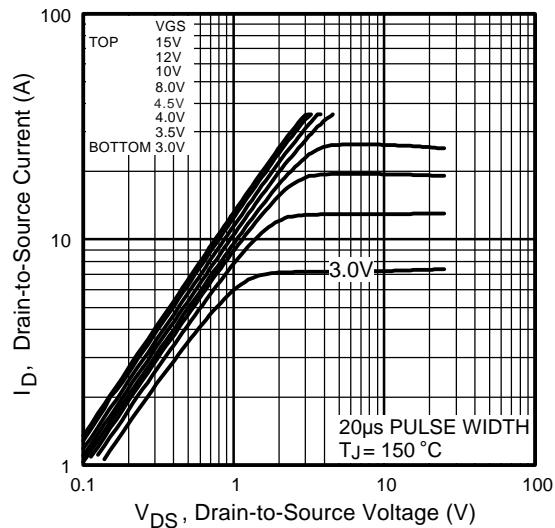


Fig 2. Typical Output Characteristics

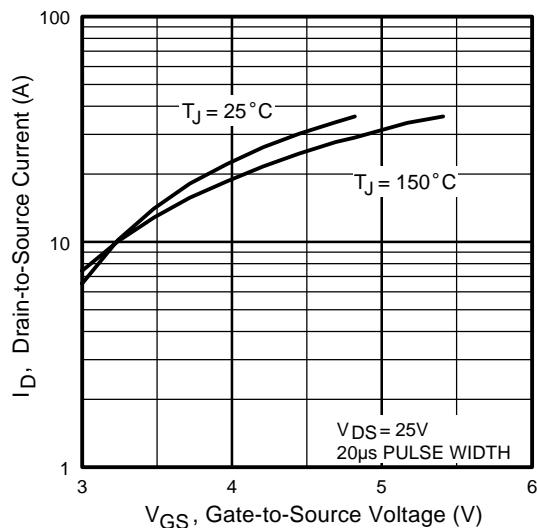


Fig 3. Typical Transfer Characteristics

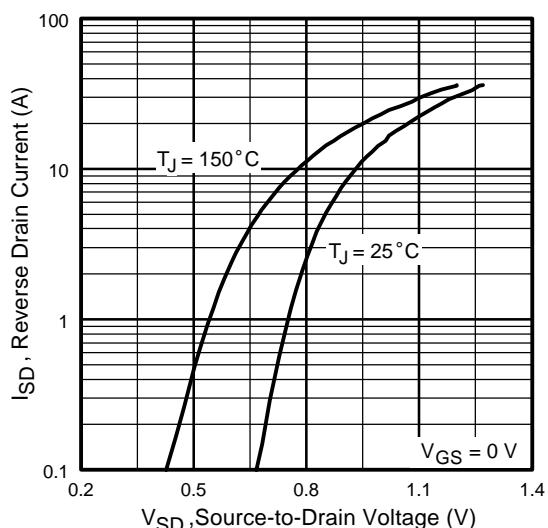


Fig 4. Typical Source-Drain Diode Forward Voltage

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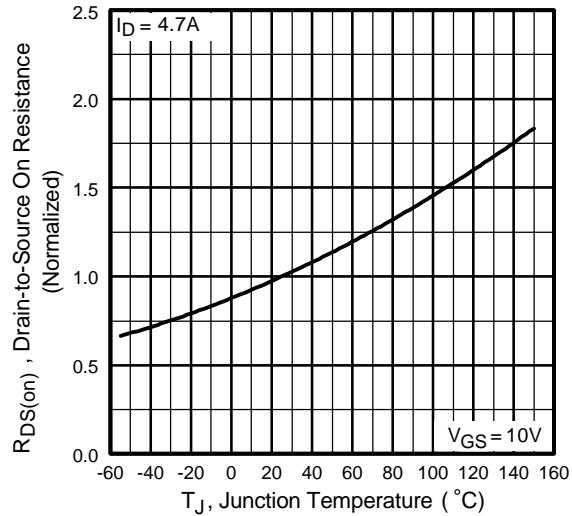


Fig 5. Normalized On-Resistance Vs. Temperature

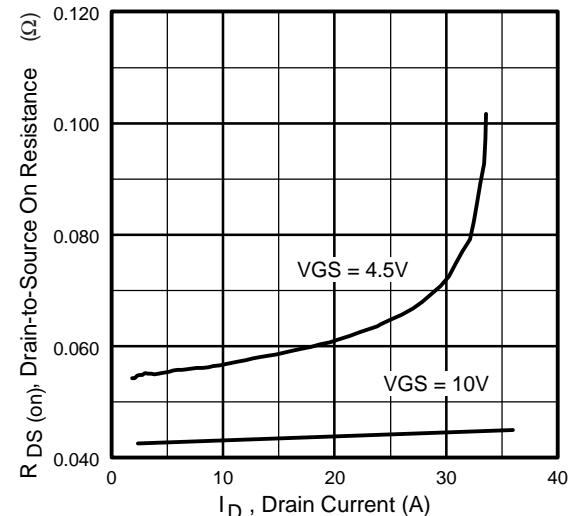


Fig 6. Typical On-Resistance Vs. Drain Current

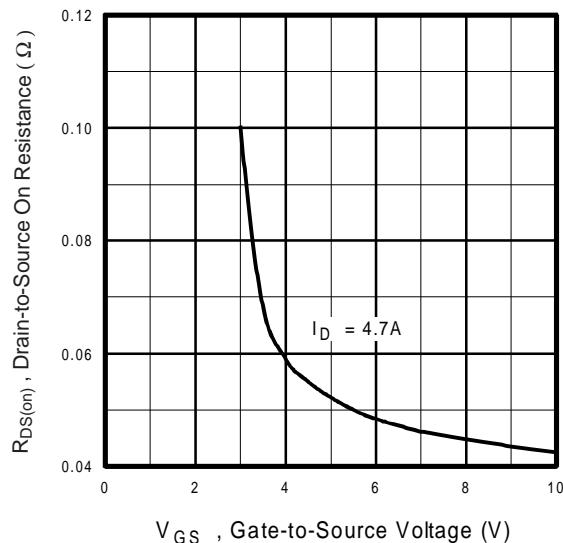


Fig 7. Typical On-Resistance Vs. Gate Voltage

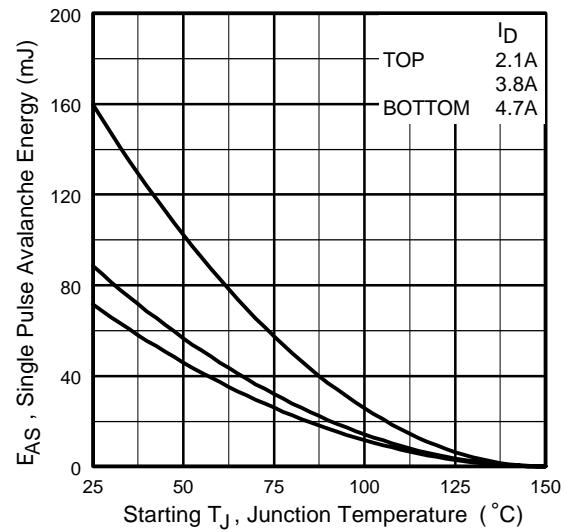


Fig 8. Maximum Avalanche Energy Vs. Drain Current

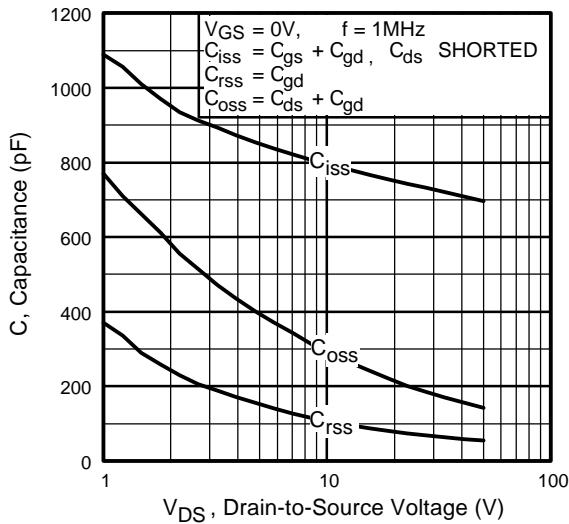


Fig 9. Typical Capacitance Vs.
Drain-to-Source Voltage

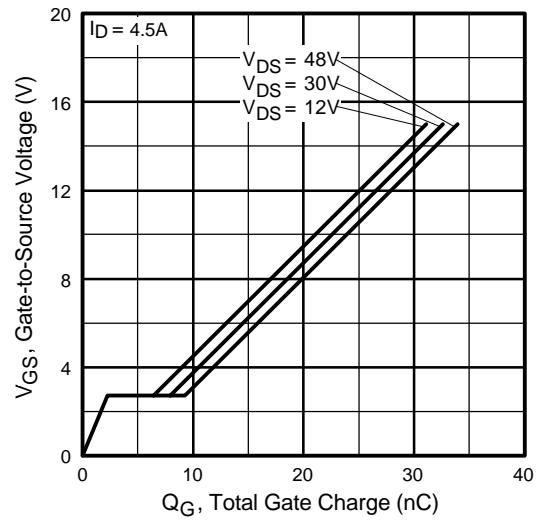


Fig 10. Typical Gate Charge Vs.
Gate-to-Source Voltage

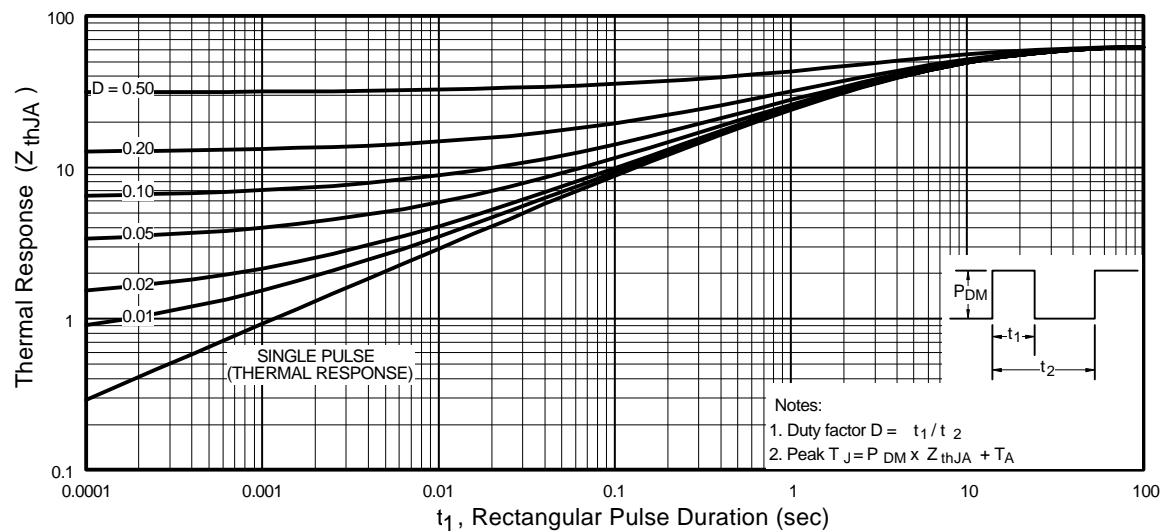


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

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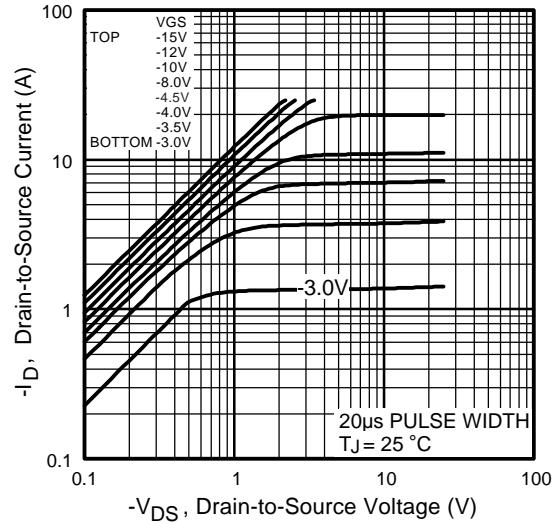


Fig 12. Typical Output Characteristics

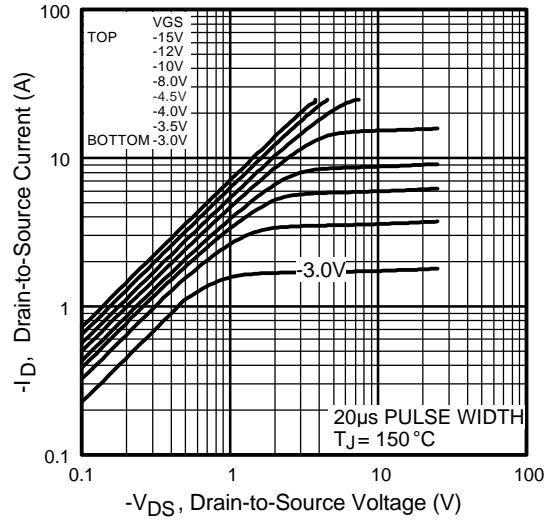


Fig 13. Typical Output Characteristics

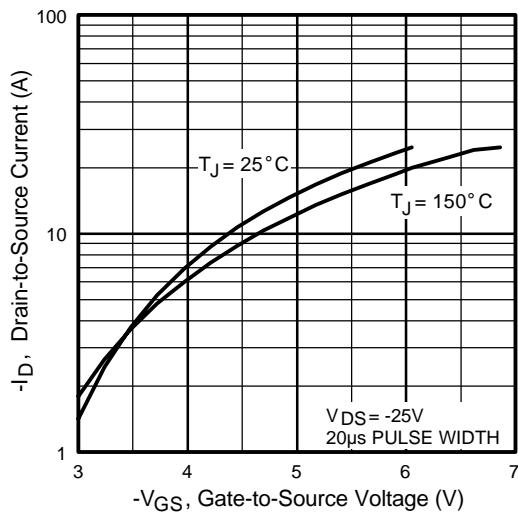


Fig 14. Typical Transfer Characteristics

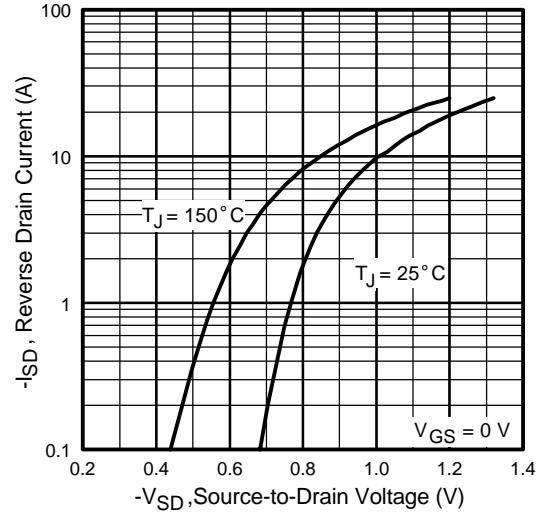


Fig 15. Typical Source-Drain Diode Forward Voltage

P-Channel

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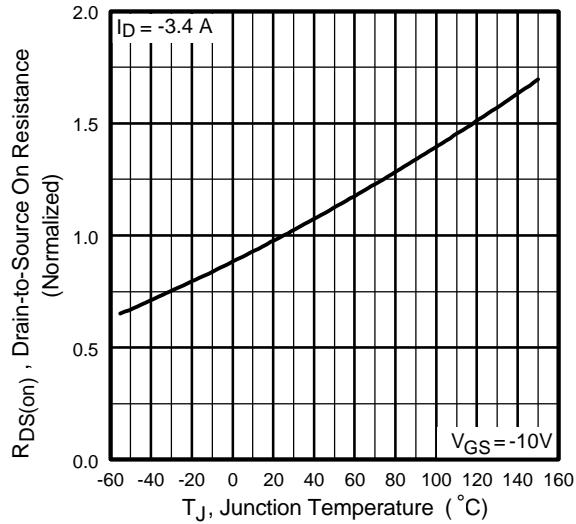


Fig 16. Normalized On-Resistance Vs. Temperature

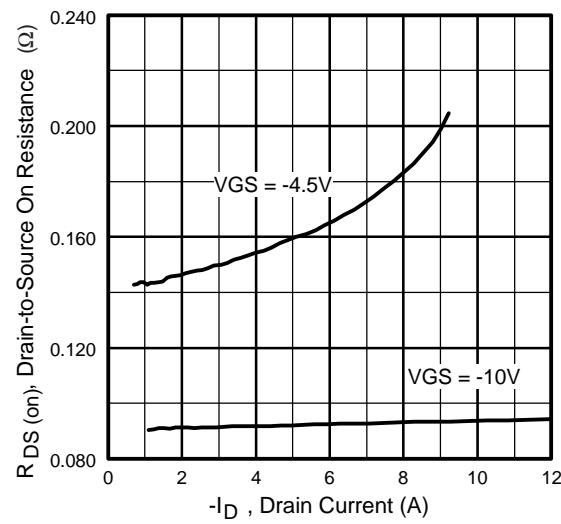


Fig 17. Typical On-Resistance Vs. Drain Current

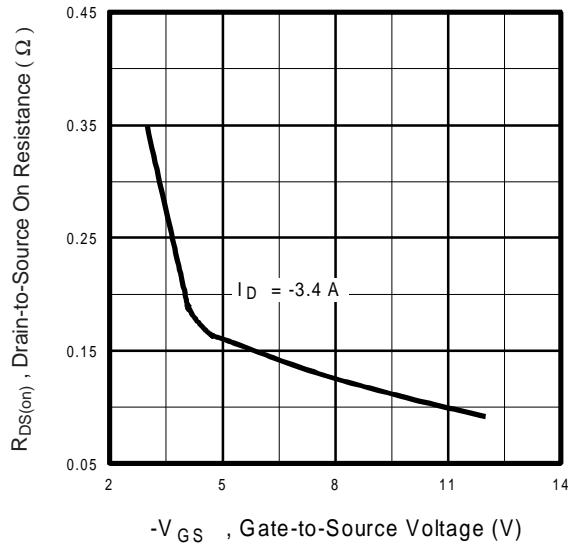


Fig 18. Typical On-Resistance Vs. Gate Voltage

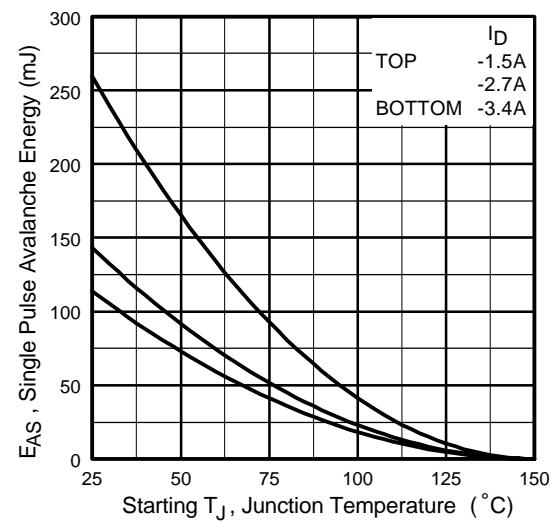


Fig 19. Maximum Avalanche Energy Vs. Drain Current

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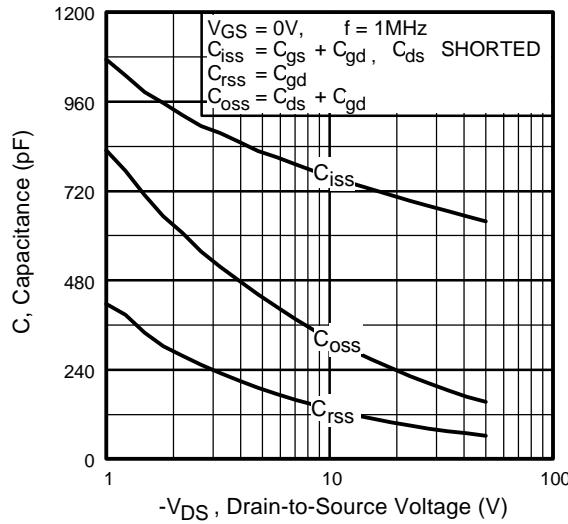


Fig 20. Typical Capacitance Vs.
Drain-to-Source Voltage

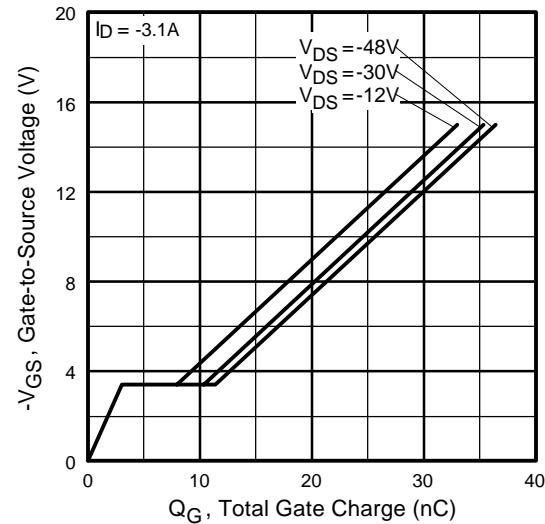


Fig 21. Typical Gate Charge Vs.
Gate-to-Source Voltage

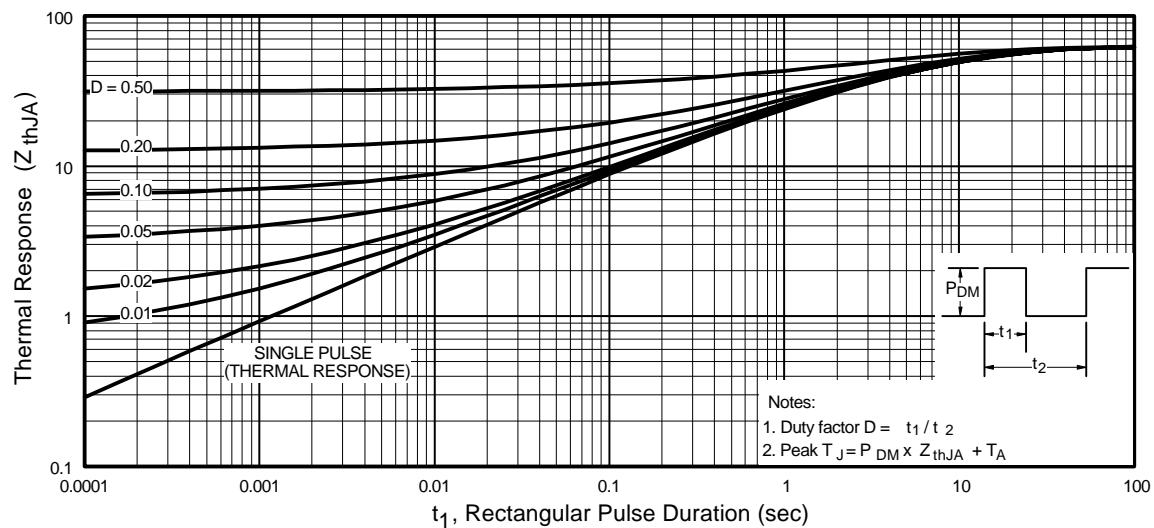
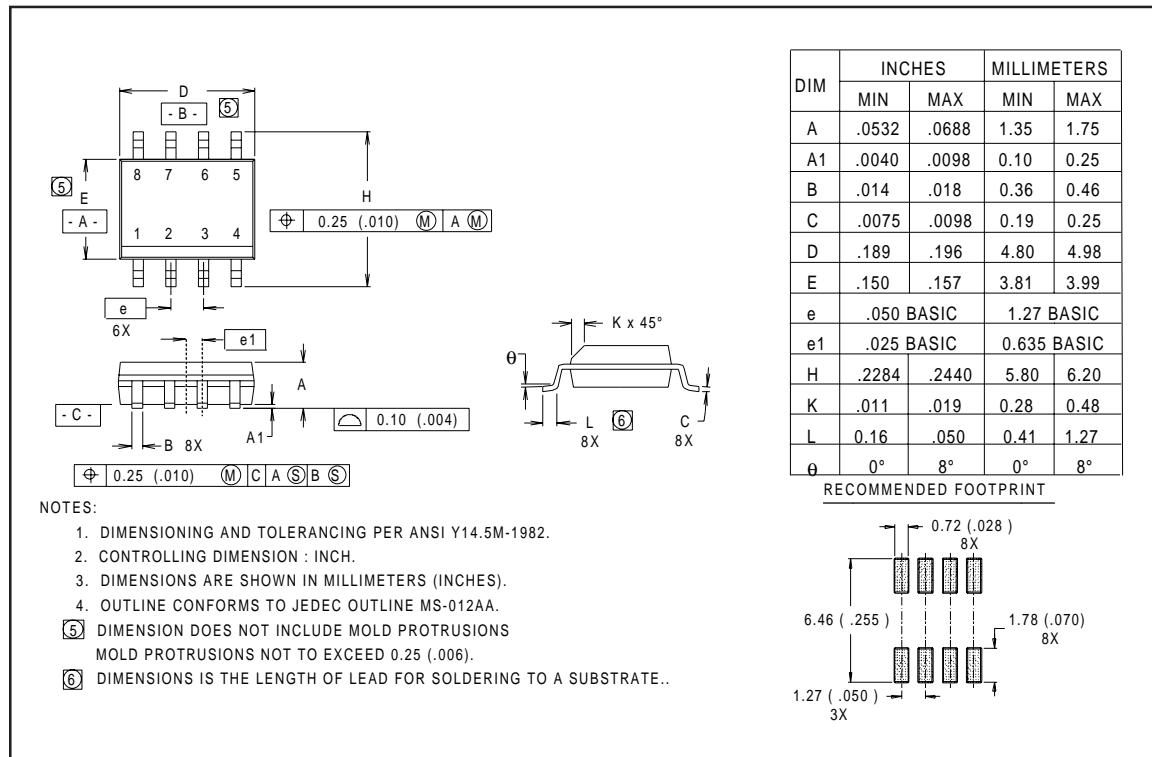


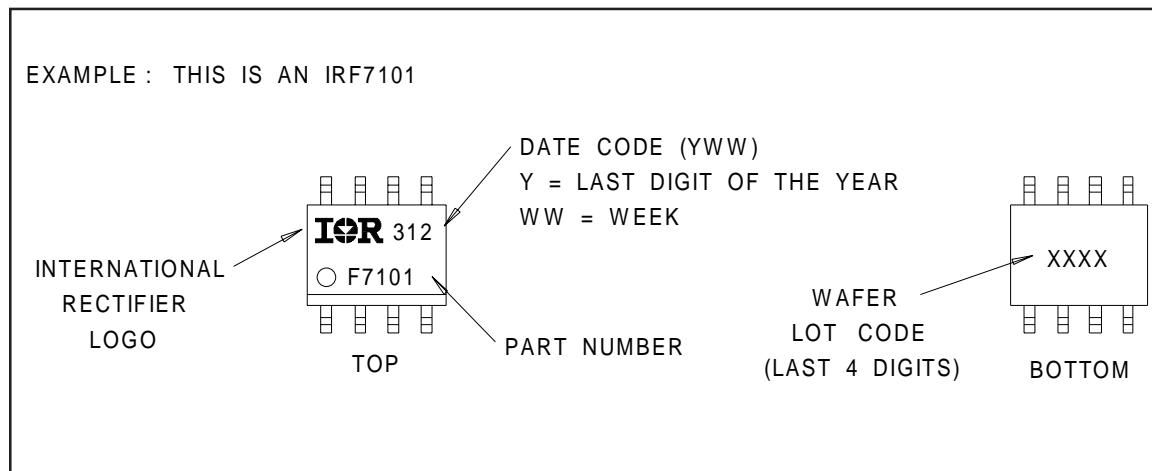
Fig 22. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

Package Outline SO8 Outline



Part Marking Information

SO8

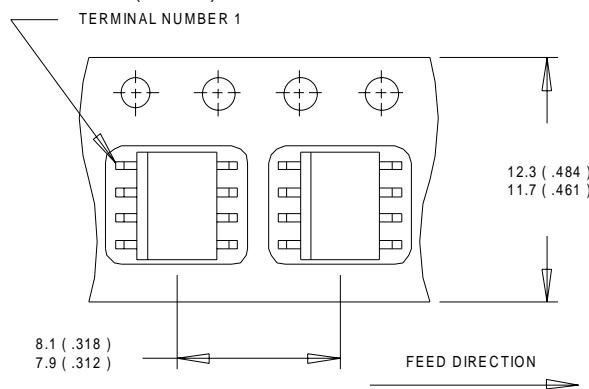


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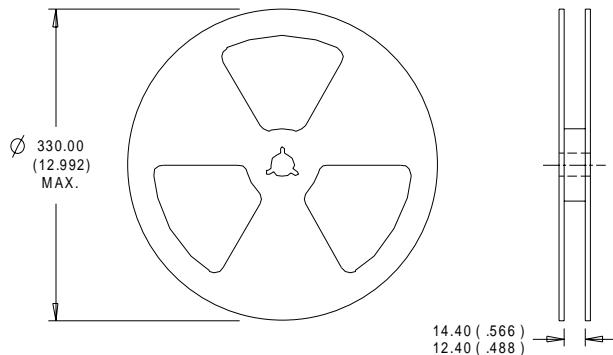
Tape & Reel Information SO8

Dimensions are shown in millimeters (inches)



NOTES:

1. CONTROLLING DIMENSION : MILLIMETER.
2. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS(INCHES).
3. OUTLINE CONFORMS TO EIA-481 & EIA-541.



NOTES :

1. CONTROLLING DIMENSION : MILLIMETER.
2. OUTLINE CONFORMS TO EIA-481 & EIA-541.

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