EN: This Datasheet/Document is presented by the manufacturer.

Please visit our website for pricing and availability at www.hestore.hu.

International
IOR Rectifier

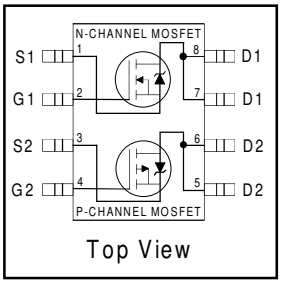
PD - 9.1568B

PRELIMINARY

IRF7317

HEXFET® Power MOSFET

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



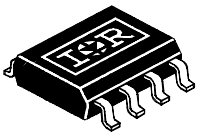
Top View

	N-Ch	P-Ch
V_{DSS}	20V	-20V
$R_{DS(on)}$	0.029Ω	0.058Ω

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.


SO-8

Absolute Maximum Ratings (T_A = 25°C Unless Otherwise Noted)

		Symbol	Maximum		Units
			N-Channel	P-Channel	
Drain-Source Voltage		V_{DS}	20	-20	V
Gate-Source Voltage		V_{GS}	± 12		
Continuous Drain Current⑤	T_A = 25°C	I_D	6.6	-5.3	A
	T_A = 70°C		5.3	-4.3	
Pulsed Drain Current		I_{DM}	26	-21	
Continuous Source Current (Diode Conduction)		I_S	2.5	-2.5	
Maximum Power Dissipation ⑤	T_A = 25°C	P_D	2.0		W
	T_A = 70°C		1.3		
Single Pulse Avalanche Energy		E_{AS}	100	150	mJ
Avalanche Current		I_{AR}	4.1	-2.9	A
Repetitive Avalanche Energy		E_{AR}	0.20		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°C (unless otherwise specified)

	Parameter		Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	N-Ch	20	—	—	V	V_{GS} = 0V, I_D = 250µA
		P-Ch	-20	—	—		V_{GS} = 0V, I_D = -250µA
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	N-Ch	—	0.027	—	V/°C	Reference to 25°C, I_D = 1mA
		P-Ch	—	0.031	—		Reference to 25°C, I_D = -1mA
$R_{DS(ON)}$	Static Drain-to-Source On-Resistance	N-Ch	—	0.023	0.029	Ω	V_{GS} = 4.5V, I_D = 6.0A ④
			—	0.030	0.046		V_{GS} = 2.7V, I_D = 5.2A ④
		P-Ch	—	0.049	0.058		V_{GS} = -4.5V, I_D = -2.9A ④
			—	0.082	0.098		V_{GS} = -2.7V, I_D = -1.5A ④
$V_{GS(th)}$	Gate Threshold Voltage	N-Ch	0.7	—	—	V	V_{DS} = V_{GS}, I_D = 250µA
		P-Ch	-0.7	—	—		V_{DS} = V_{GS}, I_D = -250µA
g_{fs}	Forward Transconductance	N-Ch	—	20	—	S	V_{DS} = 10V, I_D = 6.0A ④
		P-Ch	—	5.9	—		V_{DS} = -10V, I_D = -1.5A ④
I_{DSS}	Drain-to-Source Leakage Current	N-Ch	—	—	1.0	µA	V_{DS} = 16V, V_{GS} = 0V
		P-Ch	—	—	-1.0		V_{DS} = -16V, V_{GS} = 0V
		N-Ch	—	—	5.0		V_{DS} = 16V, V_{GS} = 0V, T_J = 55°C
		P-Ch	—	—	-25		V_{DS} = -16V, V_{GS} = 0V, T_J = 55°C
I_{GSS}	Gate-to-Source Forward Leakage	N-P	—	—	±100	nA	V_{GS} = ±12V
Q_g	Total Gate Charge	N-Ch	—	18	27	nC	N-Channel I_D = 6.0A, V_{DS} = 10V, V_{GS} = 4.5V ④ P-Channel I_D = -2.9A, V_{DS} = -16V, V_{GS} = -4.5V
		P-Ch	—	19	29		
Q_{gs}	Gate-to-Source Charge	N-Ch	—	2.2	3.3		
		P-Ch	—	4.0	6.1		
Q_{gd}	Gate-to-Drain ("Miller") Charge	N-Ch	—	6.2	9.3		
		P-Ch	—	7.7	12		
$t_{d(on)}$	Turn-On Delay Time	N-Ch	—	8.1	12	ns	N-Channel V_{DD} = 10V, I_D = 1.0A, R_G = 6.0Ω, R_D = 10Ω ④ P-Channel V_{DD} = -10V, I_D = -2.9A, R_G = 6.0Ω, R_D = 3.4Ω
		P-Ch	—	15	22		
t_r	Rise Time	N-Ch	—	17	25		
		P-Ch	—	40	60		
$t_{d(off)}$	Turn-Off Delay Time	N-Ch	—	38	57		
		P-Ch	—	42	63		
t_f	Fall Time	N-Ch	—	31	47		
		P-Ch	—	49	73		
C_{iss}	Input Capacitance	N-Ch	—	900	—	pF	N-Channel V_{GS} = 0V, V_{DS} = 15V, f = 1.0MHz P-Channel V_{GS} = 0V, V_{DS} = -15V, f = 1.0MHz
		P-Ch	—	780	—		
C_{oss}	Output Capacitance	N-Ch	—	430	—		
		P-Ch	—	470	—		
C_{rss}	Reverse Transfer Capacitance	N-Ch	—	200	—		
		P-Ch	—	240	—		

Source-Drain Ratings and Characteristics

	Parameter		Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	N-Ch	—	—	2.5	A	
		P-Ch	—	—	-2.5		
I_{SM}	Pulsed Source Current (Body Diode) ①	N-Ch	—	—	26		
		P-Ch	—	—	-21		
V_{SD}	Diode Forward Voltage	N-Ch	—	0.72	1.0	V	T_J = 25°C, I_S = 1.7A, V_{GS} = 0V ③
		P-Ch	—	-0.78	-1.0		T_J = 25°C, I_S = -2.9A, V_{GS} = 0V ③
t_{rr}	Reverse Recovery Time	N-Ch	—	52	77	ns	N-Channel T_J = 25°C, I_F =1.7A, di/dt = 100A/µs P-Channel ④ T_J = 25°C, I_F = -2.9A, di/dt = 100A/µs
		P-Ch	—	47	71		
Q_{rr}	Reverse Recovery Charge	N-Ch	—	58	86	nC	
		P-Ch	—	49	73		

Notes:

① Repetitive rating; pulse width limited by max. junction temperature. (See fig. 22)

② N-Channel I_{SD} ≤ 4.1A, di/dt ≤ 92A/µs, V_{DD} ≤ $V_{(BR)DSS}$, T_J ≤ 150°C
P-Channel I_{SD} ≤ -2.9A, di/dt ≤ -77A/µs, V_{DD} ≤ $V_{(BR)DSS}$, T_J ≤ 150°C

③ N-Channel Starting T_J = 25°C, L = 12mH R_G = 25Ω, I_{AS} = 4.1A. (See Figure 12)
P-Channel Starting T_J = 25°C, L = 35mH R_G = 25Ω, I_{AS} = -2.9A.

④ Pulse width ≤ 300µs; duty cycle ≤ 2%.

⑤ Surface mounted on FR-4 board, t ≤ 10sec.

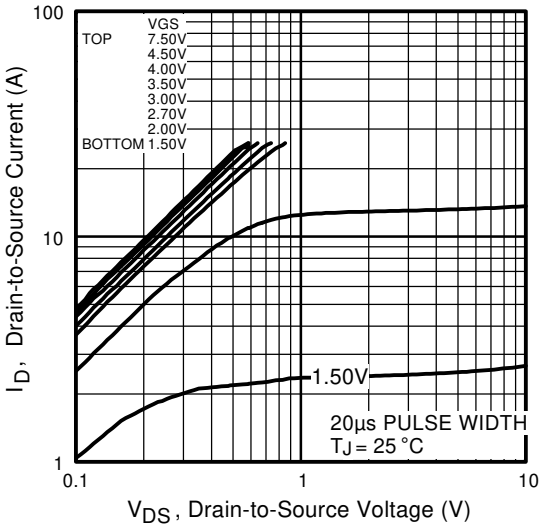


Fig 1. Typical Output Characteristics

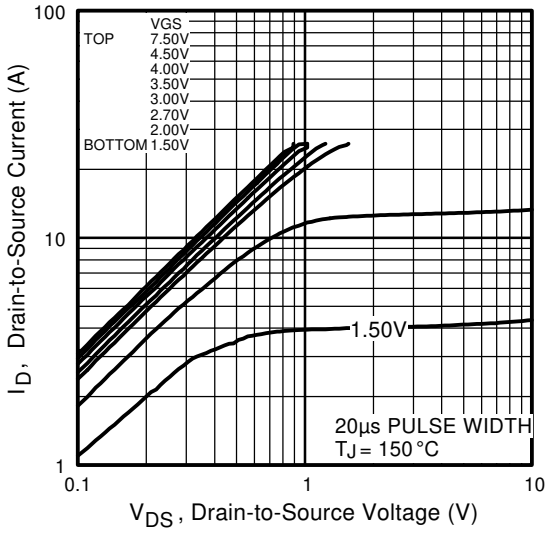


Fig 2. Typical Output Characteristics

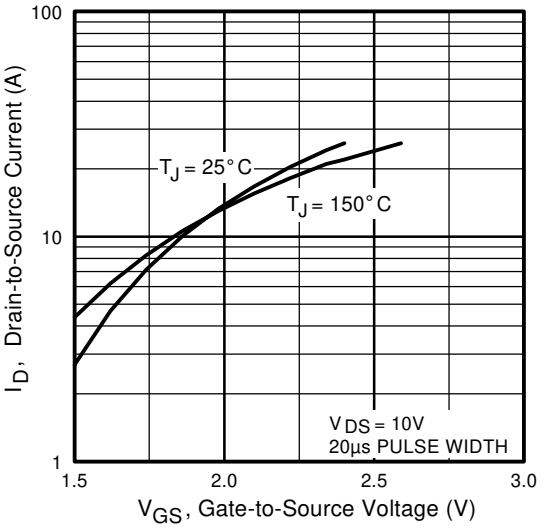


Fig 3. Typical Transfer Characteristics

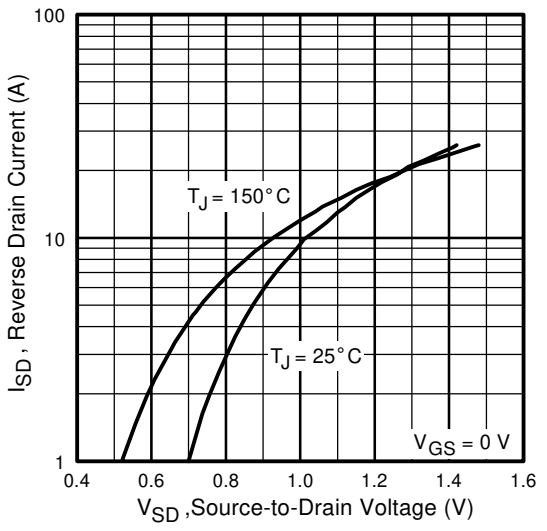


Fig 4. Typical Source-Drain Diode Forward Voltage

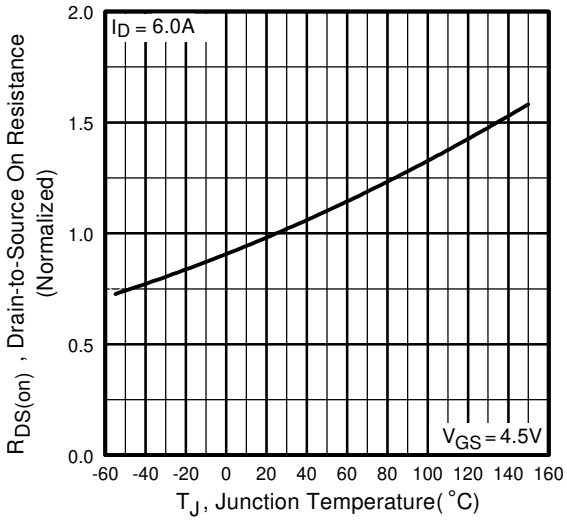


Fig 5. Normalized On-Resistance Vs. Temperature

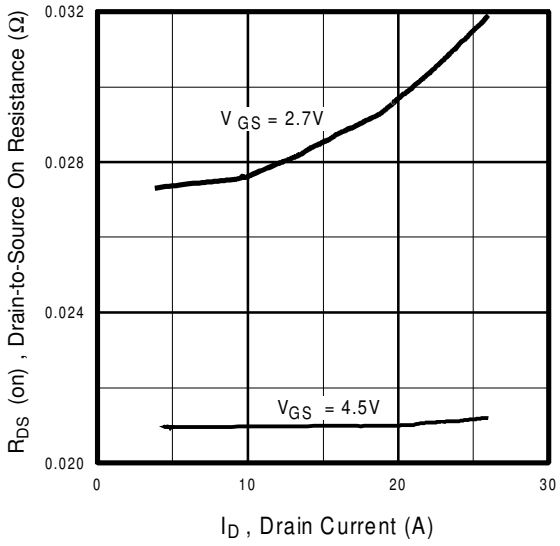


Fig 6. Typical On-Resistance Vs. Drain Current

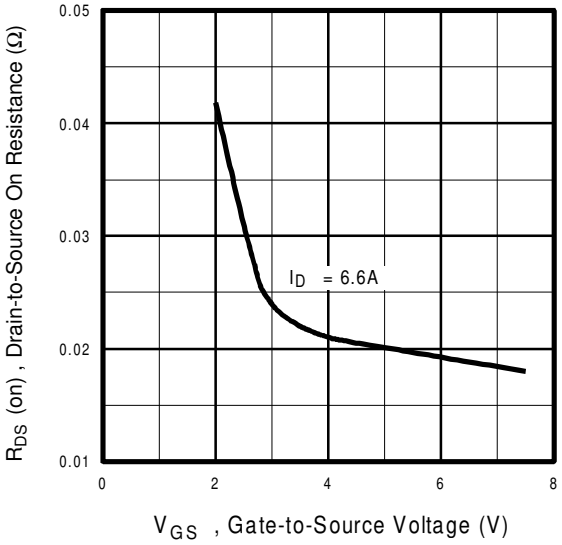


Fig 7. Typical On-Resistance Vs. Gate Voltage

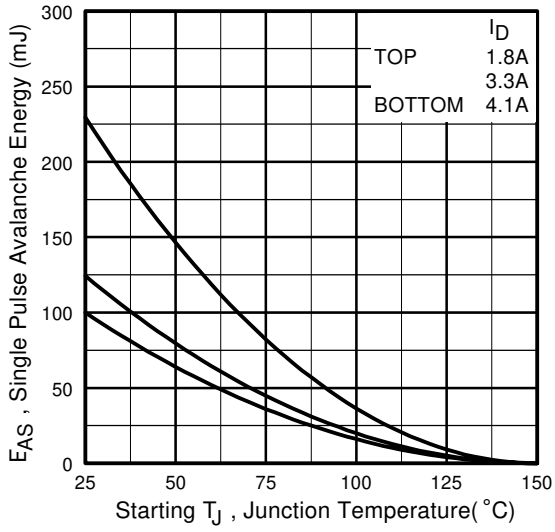


Fig 8. Maximum Avalanche Energy Vs. Drain Current

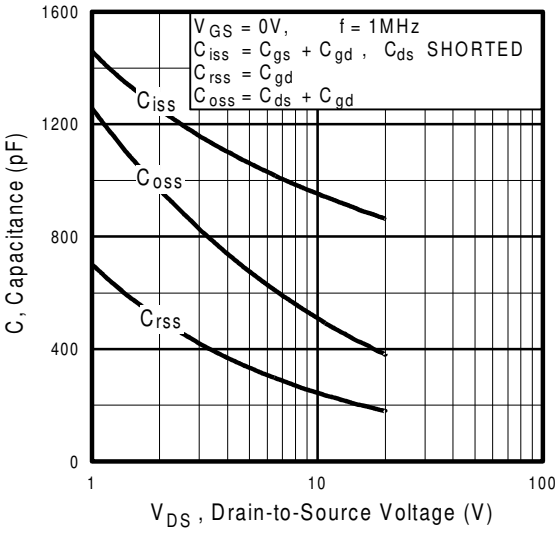


Fig 9. Typical Capacitance Vs. Drain-to-Source Voltage

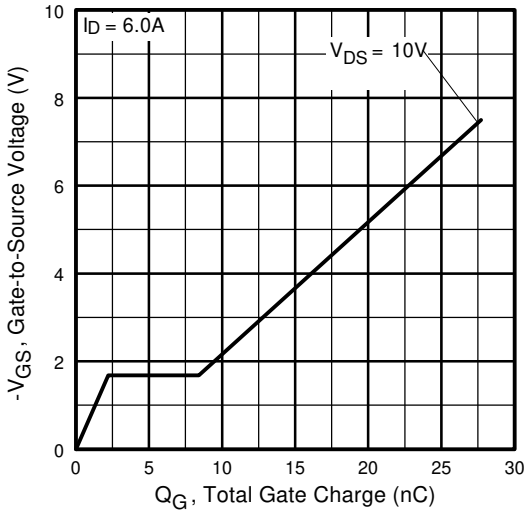


Fig 10. Typical Gate Charge Vs. Gate-to-Source Voltage

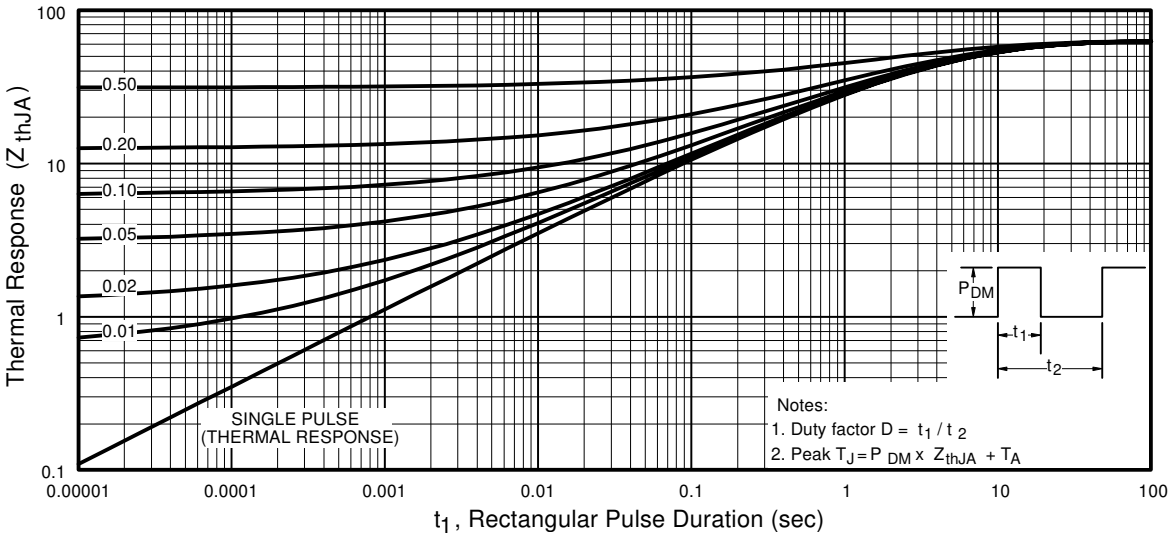


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

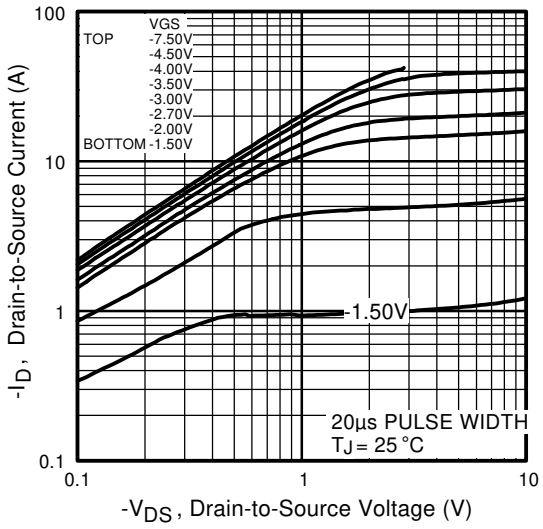


Fig 12. Typical Output Characteristics

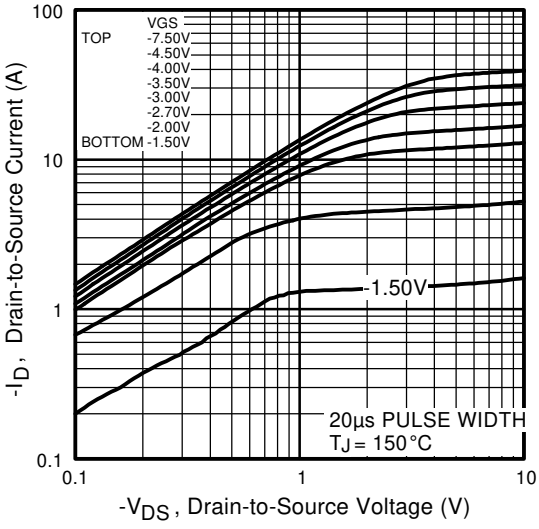


Fig 13. Typical Output Characteristics

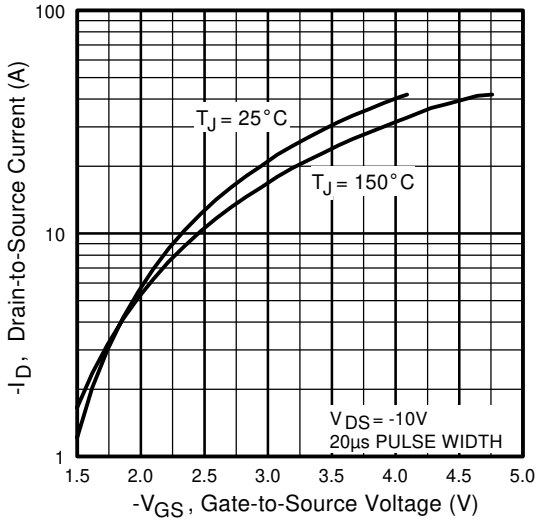


Fig 14. Typical Transfer Characteristics

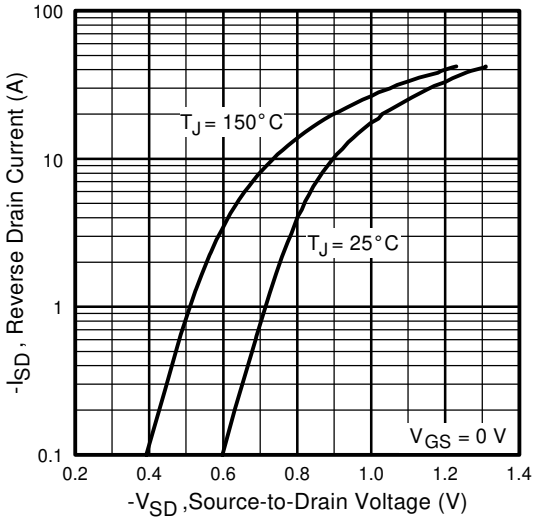


Fig 15. Typical Source-Drain Diode Forward Voltage

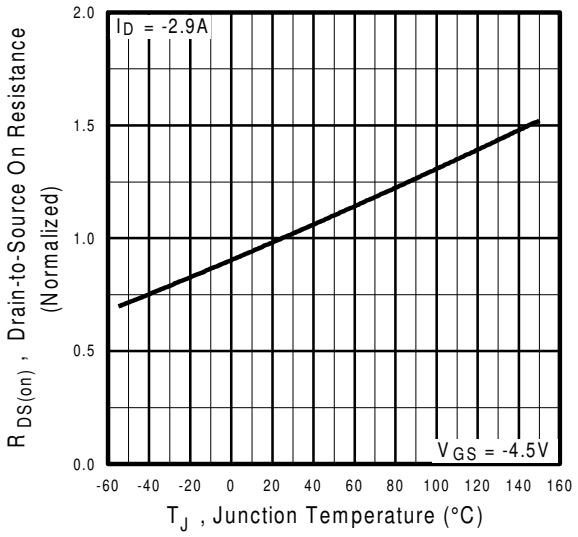


Fig 16. Normalized On-Resistance Vs. Temperature

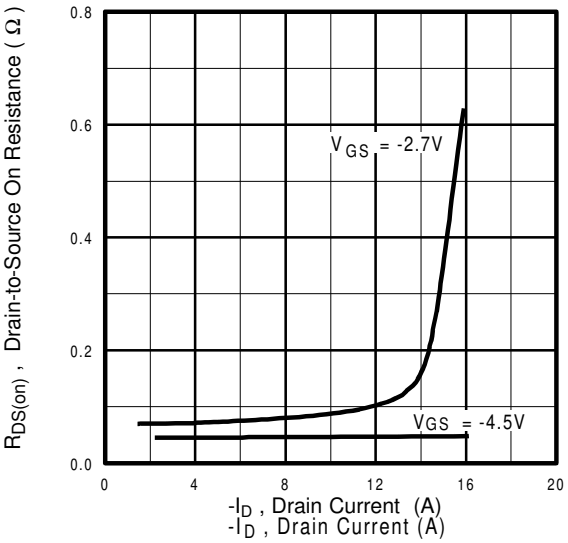


Fig 17. Typical On-Resistance Vs. Drain Current

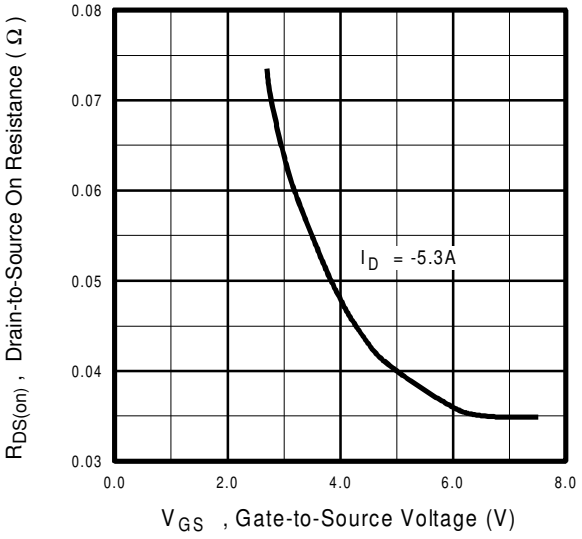


Fig 18. Typical On-Resistance Vs. Gate Voltage

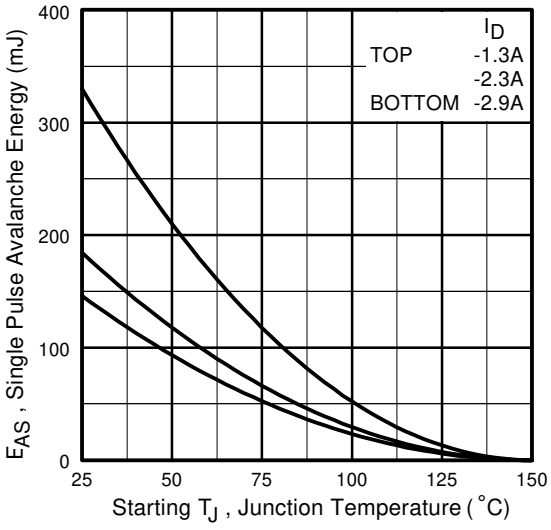


Fig 19. Maximum Avalanche Energy Vs. Drain Current

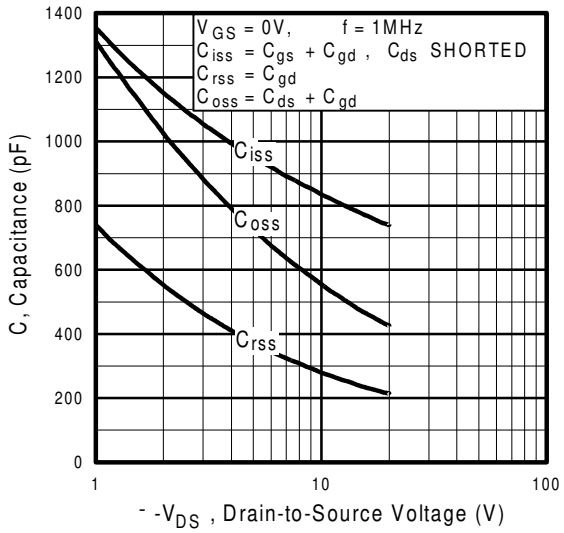


Fig 20. Typical Capacitance Vs. Drain-to-Source Voltage

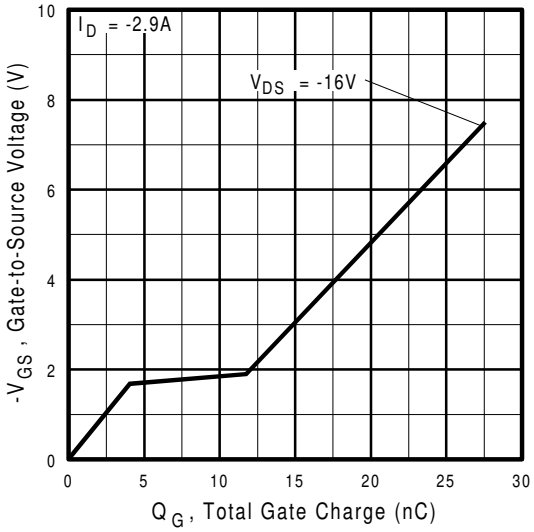


Fig 21. Typical Gate Charge Vs. Gate-to-Source Voltage

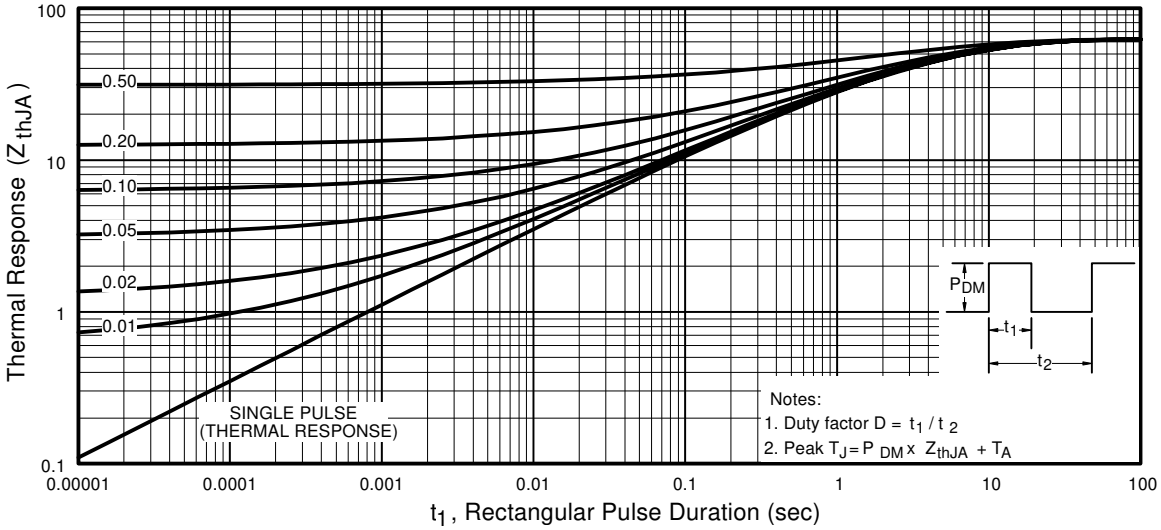
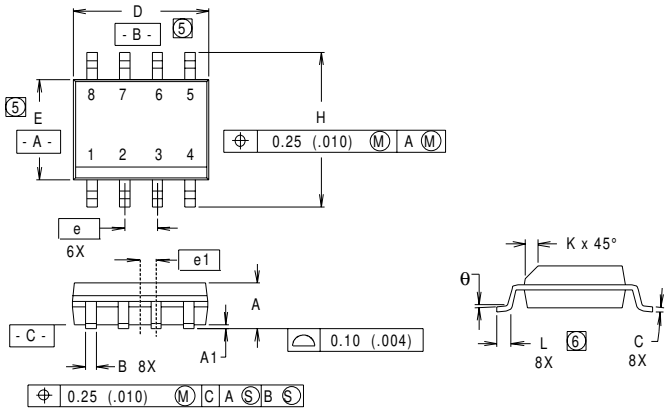


Fig 22. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

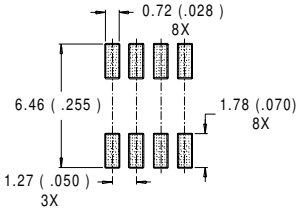
Package Outline

SO8 Outline



DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.0532	.0688	1.35	1.75
A1	.0040	.0098	0.10	0.25
B	.014	.018	0.36	0.46
C	.0075	.0098	0.19	0.25
D	.189	.196	4.80	4.98
E	.150	.157	3.81	3.99
e	.050 BASIC		1.27 BASIC	
e1	.025 BASIC		0.635 BASIC	
H	.2284	.2440	5.80	6.20
K	.011	.019	0.28	0.48
L	0.16	.050	0.41	1.27
θ	0°	8°	0°	8°

RECOMMENDED FOOTPRINT



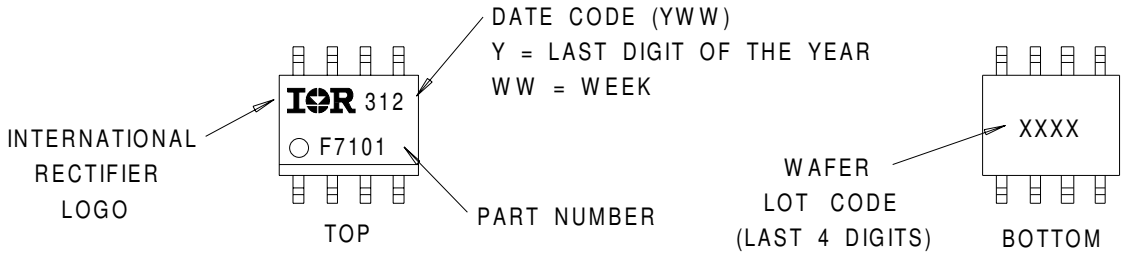
NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M-1982.
2. CONTROLLING DIMENSION : INCH.
3. DIMENSIONS ARE SHOWN IN MILLIMETERS (INCHES).
4. OUTLINE CONFORMS TO JEDEC OUTLINE MS-012AA.
5. DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS
   MOLD PROTRUSIONS NOT TO EXCEED 0.25 (.006).
6. DIMENSIONS IS THE LENGTH OF LEAD FOR SOLDERING TO A SUBSTRATE..

Part Marking Information

SO8

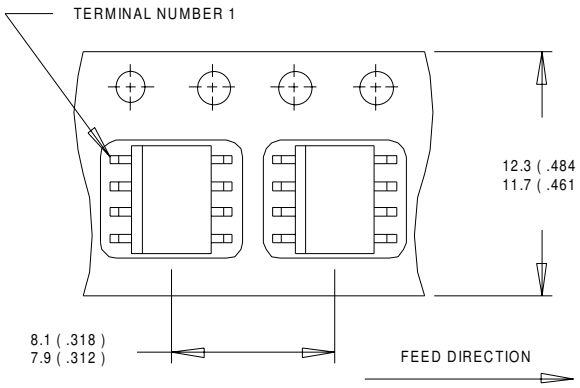
EXAMPLE : THIS IS AN IRF7101



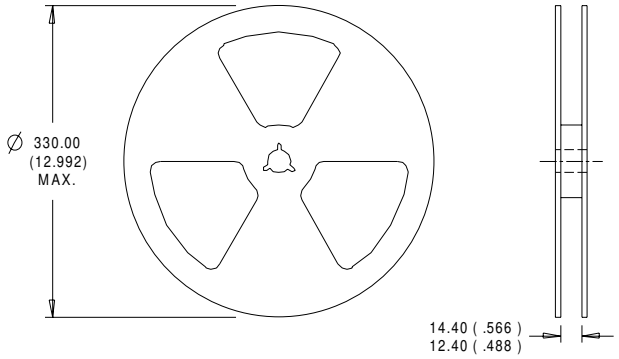
Tape & Reel Information

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.

International
IOR Rectifier

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IR CANADA: 7321 Victoria Park Ave., Suite 201, Markham, Ontario L3R 2Z8, Tel: (905) 475 1897
IR GERMANY: Saalburgstrasse 157, 61350 Bad Homburg Tel: ++ 49 6172 96590
IR ITALY: Via Liguria 49, 10071 Borgaro, Torino Tel: ++ 39 11 451 0111
IR FAR EAST: K&H Bldg., 2F, 30-4 Nishi-Ikebukuro 3-Chome, Toshima-Ku, Tokyo Japan 171 Tel: 81 3 3983 0086
IR SOUTHEAST ASIA: 315 Outram Road, #10-02 Tan Boon Liat Building, Singapore 0316 Tel: 65 221 8371