

IRF7379

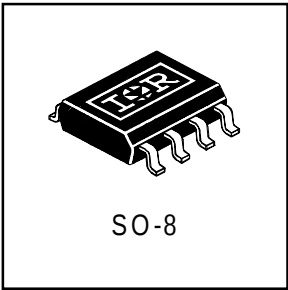
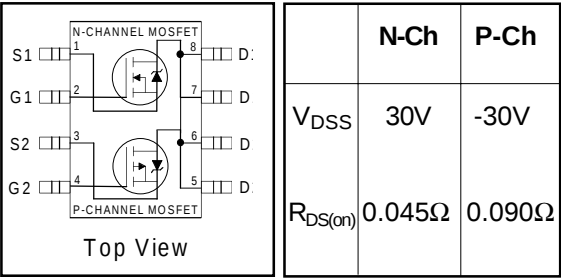
HEXFET® Power MOSFET

- Generation V Technology
- Ultra Low On-Resistance
- Complimentary Half Bridge
- 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_{SD}	Drain-to-Source Voltage	30	-30	A
$I_D @ T_A = 25^{\circ}C$	Continuous Drain Current, $V_{GS} @ 10V$	5.8	-4.3	
$I_D @ T_A = 70^{\circ}C$	Continuous Drain Current, $V_{GS} @ 10V$	4.6	-3.4	
I_{DM}	Pulsed Drain Current ①	46	-34	
$P_D @ T_A = 25^{\circ}C$	Power Dissipation	2.5		W
	Linear Derating Factor	0.02		W/ $^{\circ}C$
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		$^{\circ}C$

Thermal Resistance Ratings

	Parameter	Max.	Units
$R_{\theta JA}$	Maximum Junction-to-Ambient④	50	$^{\circ}C/W$

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	30	—	—	V	V _{GS} = 0V, I _D = 250μA
		P-Ch	-30	—	—		V _{GS} = 0V, I _D = -250μA
ΔV _{(BR)DSS} /ΔT _J	Breakdown Voltage Temp. Coefficient	N-Ch	—	0.032	—	V/°C	Reference to 25°C, I _D = 1mA
		P-Ch	—	-0.037	—		Reference to 25°C, I _D = -1mA
R _{DS(ON)}	Static Drain-to-Source On-Resistance	N-Ch	—	0.038	0.045	Ω	V _{GS} = 10V, I _D = 5.8A ③
			—	0.055	0.075		V _{GS} = 4.5V, I _D = 4.9A ③
		P-Ch	—	0.070	0.090		V _{GS} = -10V, I _D = -4.3A ③
			—	0.130	0.180		V _{GS} = -4.5V, I _D = -3.7A ③
V _{GS(th)}	Gate Threshold Voltage	N-Ch	1.0	—	—	V	V _{DS} = V _{GS} , I _D = 250μA
		P-Ch	-1.0	—	—		V _{DS} = V _{GS} , I _D = -250μA
g _{fs}	Forward Transconductance	N-Ch	5.2	—	—	S	V _{DS} = 15V, I _D = 2.4A ③
		P-Ch	2.5	—	—		V _{DS} = -24V, I _D = -1.8A ③
I _{DSS}	Drain-to-Source Leakage Current	N-Ch	—	—	1.0	μA	V _{DS} = 24V, V _{GS} = 0V
		P-Ch	—	—	-1.0		V _{DS} = -24V, V _{GS} = 0V
		N-Ch	—	—	25		V _{DS} = 24V, V _{GS} = 0V, T _J = 125°C
		P-Ch	—	—	-25		V _{DS} = -24V, V _{GS} = 0V, T _J = 125°C
I _{GSS}	Gate-to-Source Forward Leakage	N-P	—	—	±100		V _{GS} = ±20V
Q _g	Total Gate Charge	N-Ch	—	—	25		
		P-Ch	—	—	25		
Q _{gs}	Gate-to-Source Charge	N-Ch	—	—	2.9	nC	N-Channel I _D = 2.4A, V _{DS} = 24V, V _{GS} = 10V ③
		P-Ch	—	—	2.9		
Q _{gd}	Gate-to-Drain ("Miller") Charge	N-Ch	—	—	7.9		P-Channel I _D = -1.8A, V _{DS} = -24V, V _{GS} = -10V
		P-Ch	—	—	9.0		
t _{d(on)}	Turn-On Delay Time	N-Ch	—	6.8	—		
		P-Ch	—	11	—		
t _r	Rise Time	N-Ch	—	21	—	ns	N-Channel V _{DD} = 15V, I _D = 2.4A, R _G = 6.0Ω, R _D = 6.2Ω ③
		P-Ch	—	17	—		
t _{d(off)}	Turn-Off Delay Time	N-Ch	—	22	—		
		P-Ch	—	25	—		
t _f	Fall Time	N-Ch	—	7.7	—		P-Channel V _{DD} = -15V, I _D = -1.8A, R _G = 6.0Ω, R _D = 8.2Ω ③
		P-Ch	—	18	—		
L _D	Internal Drain Inductance	N-P	—	4.0	—	nH	Between lead, 6mm (0.25in.) from package and center of die contact
L _S	Internal Source Inductance	N-P	—	6.0	—		
C _{iss}	Input Capacitance	N-Ch	—	520	—		
		P-Ch	—	440	—		
C _{oss}	Output Capacitance	N-Ch	—	180	—	pF	N-Channel V _{GS} = 0V, V _{DS} = 25V, f = 1.0MHz ③
		P-Ch	—	200	—		
C _{rss}	Reverse Transfer Capacitance	N-Ch	—	72	—		P-Channel V _{GS} = 0V, V _{DS} = -25V, f = 1.0MHz
		P-Ch	—	93	—		

Source-Drain Ratings and Characteristics

	Parameter		Min.	Typ.	Max.	Units	Conditions
I _S	Continuous Source Current (Body Diode)	N-Ch	—	—	3.1		
		P-Ch	—	—	-3.1	A	
I _{SM}	Pulsed Source Current (Body Diode) ①	N-Ch	—	—	46		
		P-Ch	—	—	-34		
V _{SD}	Diode Forward Voltage	N-Ch	—	—	1.0	V	T _J = 25°C, I _S = 1.8A, V _{GS} = 0V ③
		P-Ch	—	—	-1.0		T _J = 25°C, I _S = -1.8A, V _{GS} = 0V ③
t _{rr}	Reverse Recovery Time	N-Ch	—	47	71	ns	
		P-Ch	—	53	80		
Q _{rr}	Reverse Recovery Charge	N-Ch	—	56	84	nC	N-Channel T _J = 25°C, I _F = 2.4A, di/dt = 100A/μs ③
		P-Ch	—	66	99		P-Channel T _J = 25°C, I _F = -1.8A, di/dt = -100A/μs

Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature. (See fig. 10)
- ② N-Channel I_{SD} ≤ 2.4A, di/dt ≤ 73A/μs, V_{DD} ≤ V_{(BR)DSS}, T_J ≤ 150°C
P-Channel I_{SD} ≤ -1.8A, di/dt ≤ 90A/μs, V_{DD} ≤ V_{(BR)DSS}, T_J ≤ 150°C
- ③ Pulse width ≤ 300μs; duty cycle ≤ 2%.
- ④ Surface mounted on FR-4 board, t ≤ 10sec.

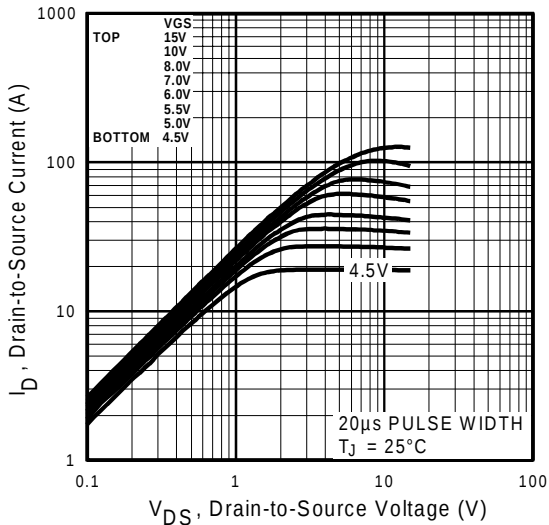


Fig 1. Typical Output Characteristics

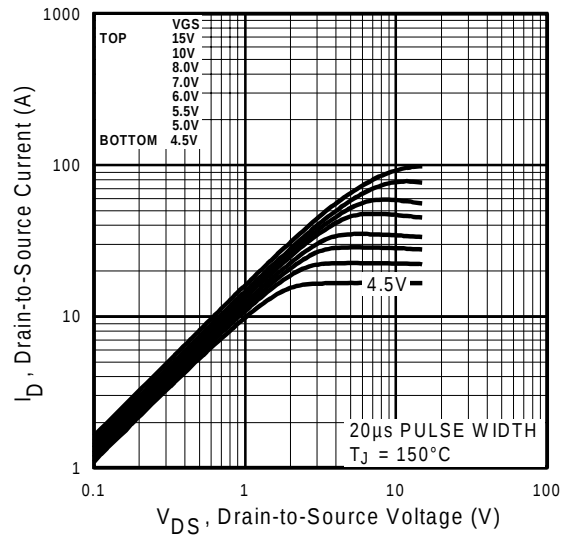


Fig 2. Typical Output Characteristics

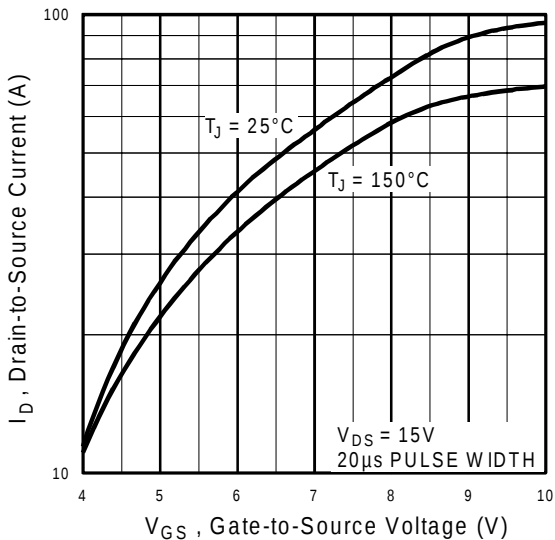


Fig 3. Typical Transfer Characteristics

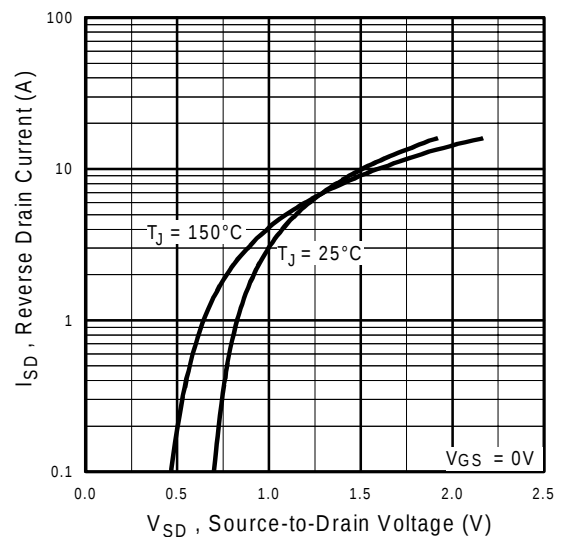


Fig 4. Typical Source-Drain Diode Forward Voltage

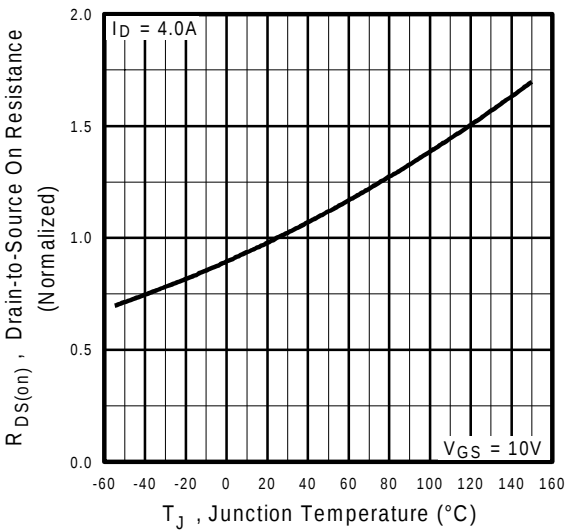


Fig 5. Normalized On-Resistance Vs. Temperature

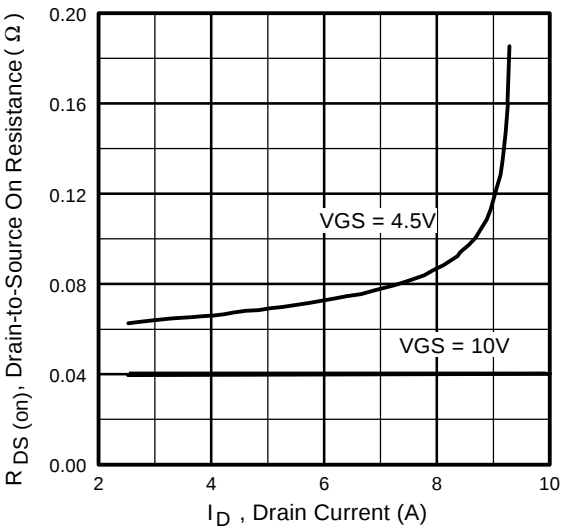


Fig 6. Typical On-Resistance Vs. Drain Current

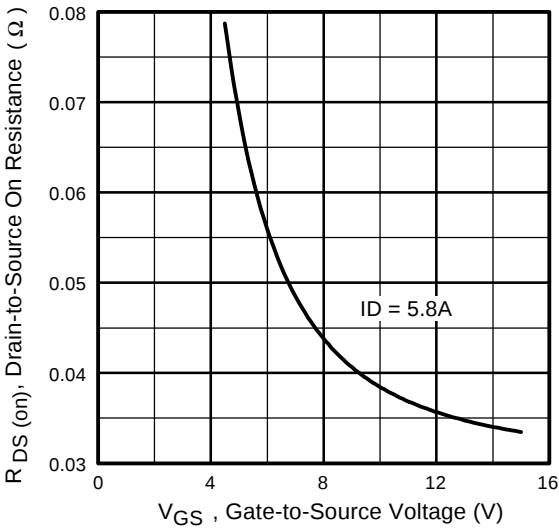


Fig 7. Typical On-Resistance Vs. Gate Voltage

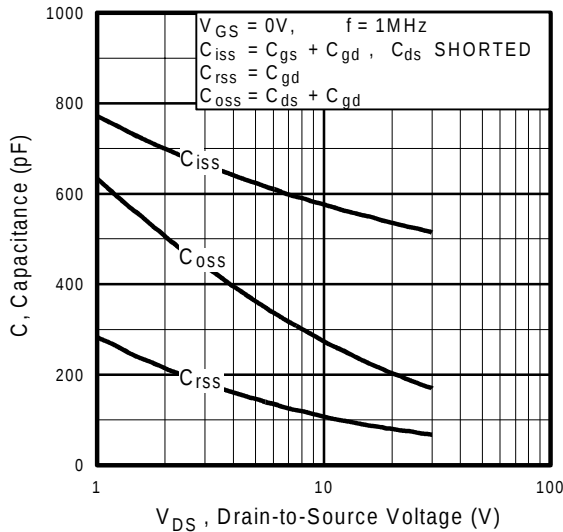


Fig 8. Typical Capacitance Vs. Drain-to-Source Voltage

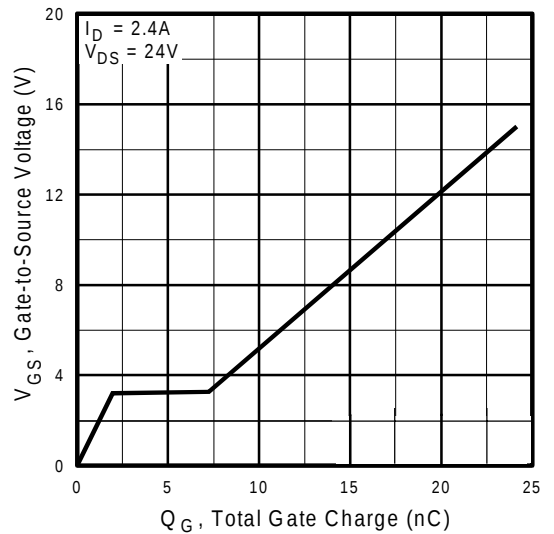


Fig 9. Typical Gate Charge Vs. Gate-to-Source Voltage

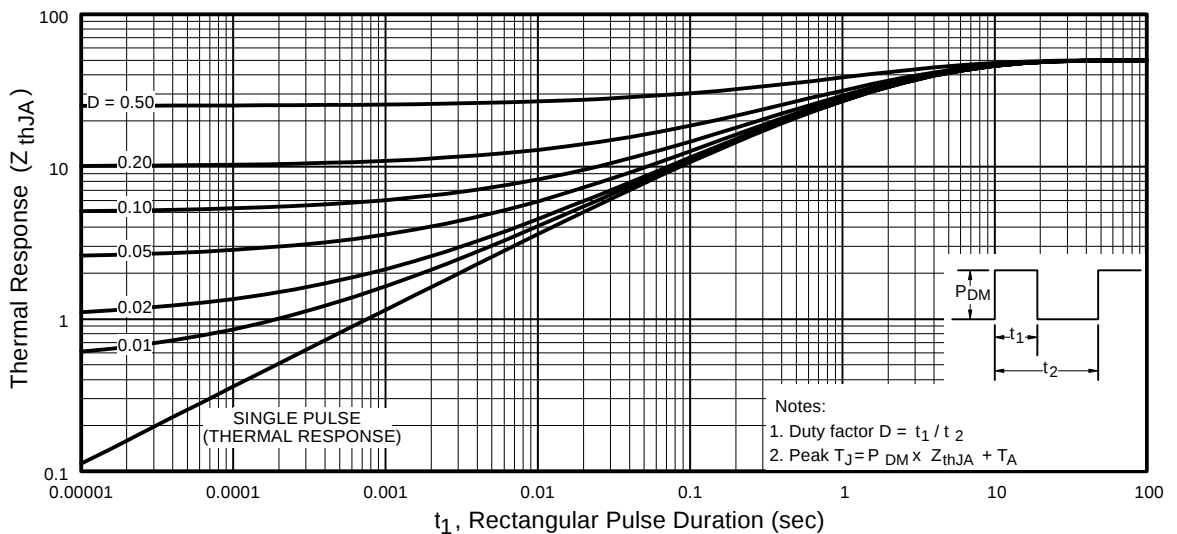


Fig 10. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

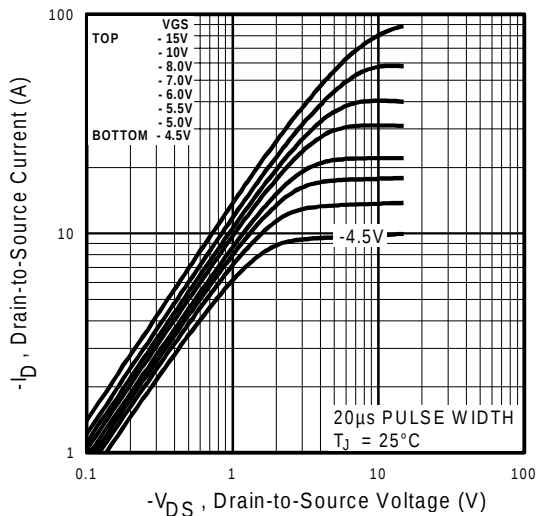


Fig 11. Typical Output Characteristics

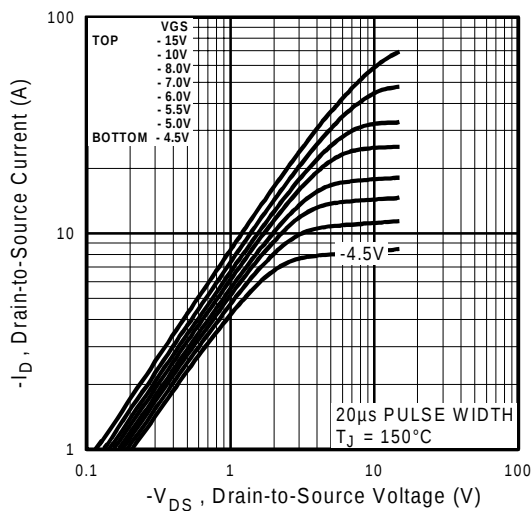


Fig 12. Typical Output Characteristics

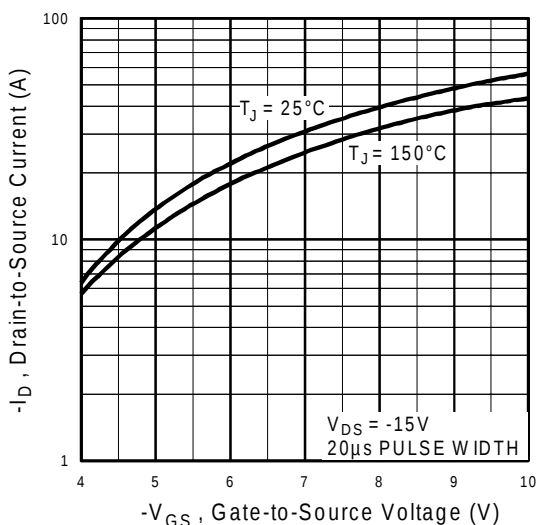


Fig 13. Typical Transfer Characteristics

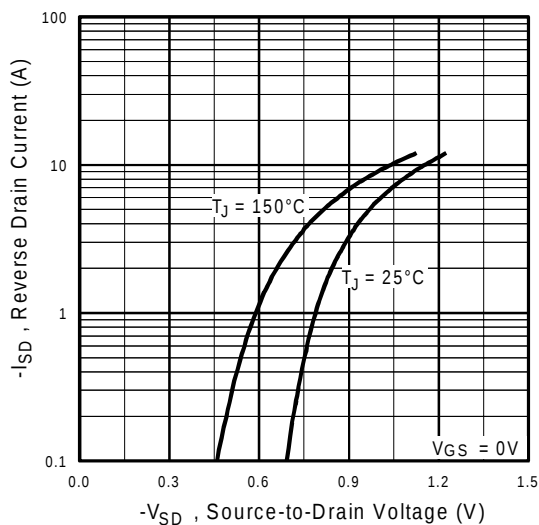


Fig 14. Typical Source-Drain Diode Forward Voltage

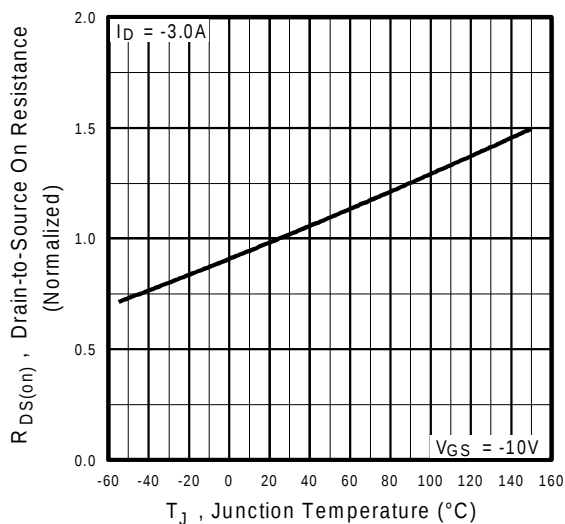


Fig 15. Normalized On-Resistance Vs. Temperature

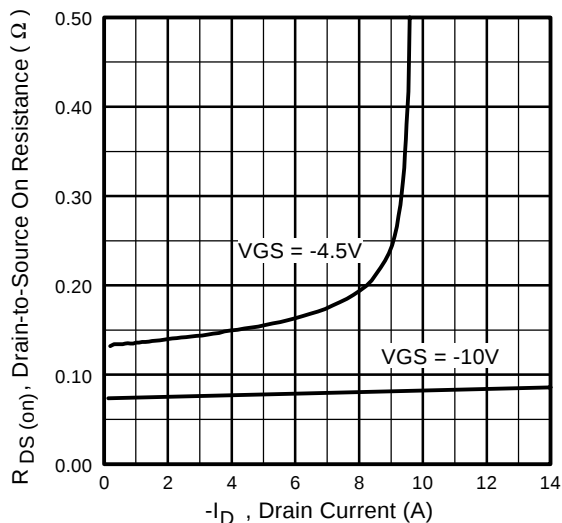


Fig 16. Typical On-Resistance Vs. Drain Current

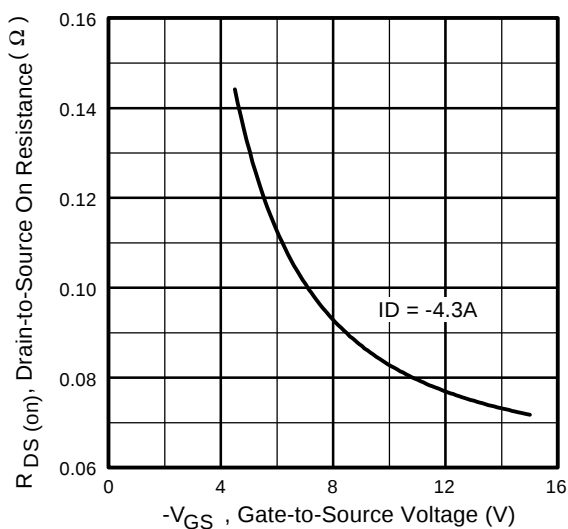


Fig 17. Typical On-Resistance Vs. Gate Voltage

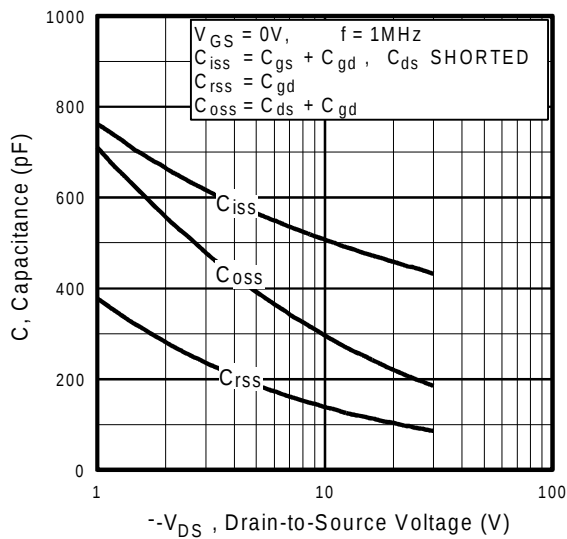


Fig 18. Typical Capacitance Vs. Drain-to-Source Voltage

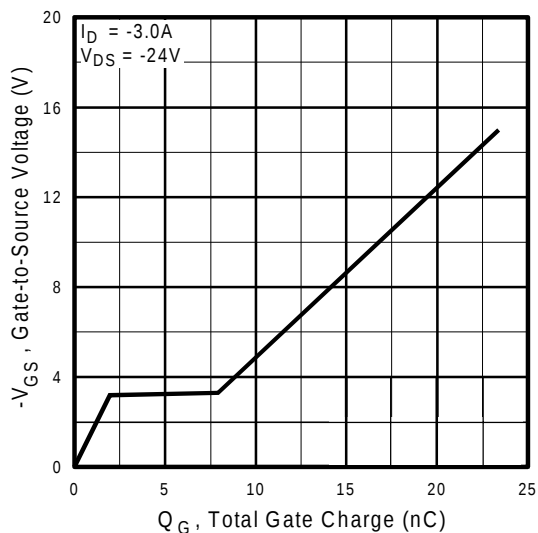


Fig 19. Typical Gate Charge Vs. Gate-to-Source Voltage

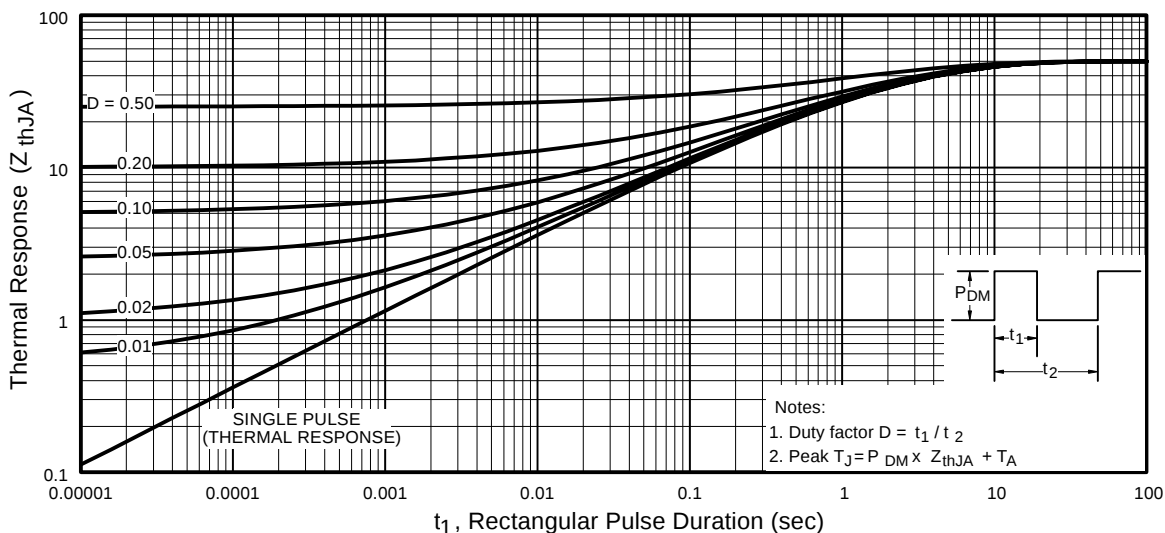
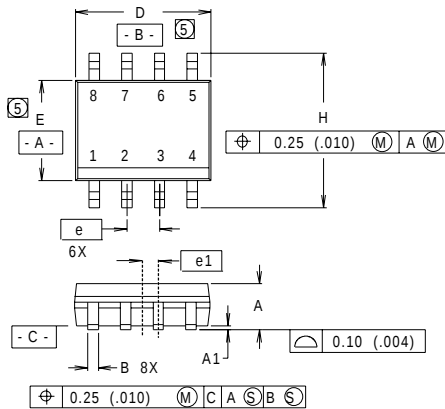


Fig 20. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

Package Outline

SO8 Outline

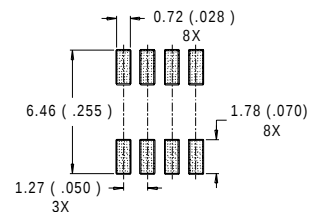


NOTES:

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..

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°

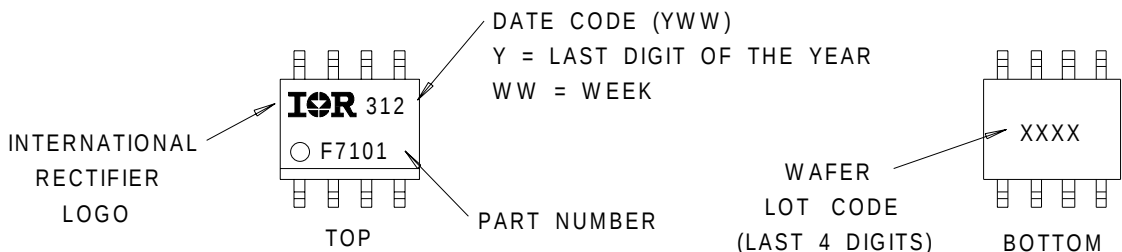
RECOMMENDED FOOTPRINT



Part Marking Information

SO8

EXAMPLE : THIS IS AN IRF7101



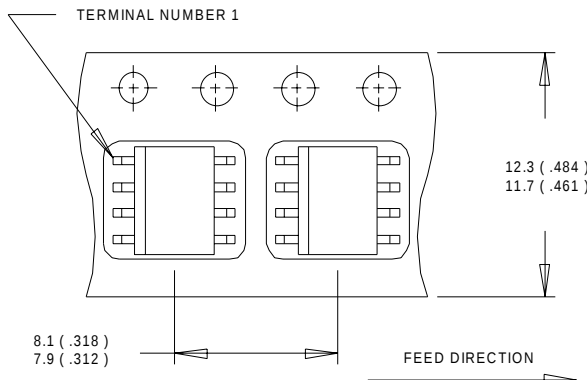
IRF7379

International
IR Rectifier

Tape & Reel Information

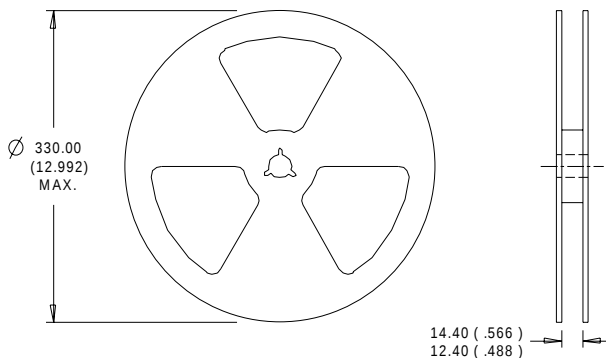
S08

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
IR Rectifier

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IR ITALY: Via Liguria 49, 10071 Borgaro, Torino Tel: ++ 39 11 451 0111

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<http://www.irf.com/>

Data and specifications subject to change without notice.

12/98