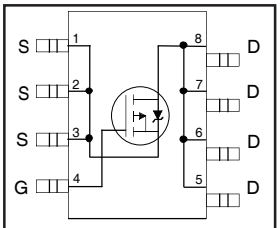
International
IOR Rectifier

PD- 91844B

IRF7210

HEXFET® Power MOSFET

- Ultra Low On-Resistance
- P-Channel MOSFET
- Surface Mount
- Available in Tape & Reel



Top View

V_{DSS} = -12V

$R_{DS(on)}$ = 0.007Ω

Description

These P-Channel MOSFETs from International Rectifier utilize advanced processing techniques to achieve the extremely low on-resistance per silicon area. This benefit provides the designer with an extremely efficient device for use in battery and load management 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

	Parameter	Max.	Units
V_{DS}	Drain- Source Voltage	-12	V
I_D @ T_A = 25°C	Continuous Drain Current, V_{GS} @ -4.5V	±16	A
I_D @ T_A= 70°C	Continuous Drain Current, V_{GS} @ -4.5V	±12	
I_{DM}	Pulsed Drain Current ①	±100	
P_D @T_A = 25°C	Power Dissipation	2.5	W
P_D @T_A = 70°C	Power Dissipation	1.6	
	Linear Derating Factor	0.02	W/°C
V_{GS}	Gate-to-Source Voltage	± 12	V
V_{GSM}	Gate-to-Source Voltage Single Pulse tp<10µs	16	V
T_J, T_{STG}	Junction and Storage Temperature Range	-55 to + 150	°C

Thermal Resistance

	Parameter	Max.	Units
$R_{\theta JA}$	Maximum Junction-to-Ambient③	50	°C/W

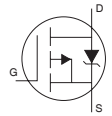
10/19/04

Electrical Characteristics @ T_J = 25°C (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	-14	——	——	V	V_{GS} = 0V, I_D = -5.0mA
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	-12	——	——	V	V_{GS} = 0V, I_D = -250µA
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	——	0.011	——	V/°C	Reference to 25°C, I_D = -1mA
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	——	.005	.007	Ω	V_{GS} = -4.5V, I_D = -16A ②
		——	.007	.010		V_{GS} = -2.5V, I_D = -12A ②
$V_{GS(th)}$	Gate Threshold Voltage	-0.6	——	——	V	V_{DS} = V_{GS}, I_D = -500µA
g_{fs}	Forward Transconductance	16	——	——	S	V_{DS} = -10V, I_D = -16A
I_{DSS}	Drain-to-Source Leakage Current	——	——	-10	µA	V_{DS} = -12V, V_{GS} = 0V
		——	——	-1.0		V_{DS} = -9.6V, V_{GS} = 0V
		——	——	-100		V_{DS} = -12V, V_{GS} = 0V, T_J = 70°C
I_{GSS}	Gate-to-Source Forward Leakage	——	——	-100	nA	V_{GS} = -12V
	Gate-to-Source Reverse Leakage	——	——	100		V_{GS} = 12V
Q_g	Total Gate Charge	——	212	——	nC	I_D = -10A
Q_{gs}	Gate-to-Source Charge	——	27	——		V_{DS} = -10V
Q_{gd}	Gate-to-Drain ("Miller") Charge	——	52	——		V_{GS} = -5.0V②
$t_{d(on)}$	Turn-On Delay Time	——	50	——	ns	V_{DD} = -10V
t_r	Rise Time	——	3.0	——	µs	I_D = -10A
$t_{d(off)}$	Turn-Off Delay Time	——	6.5	——		R_D = 1.0Ω
t_f	Fall Time	——	30	——		R_G = 6.2Ω ②
C_{iss}	Input Capacitance	——	17179	——	pF	V_{GS} = 0V
C_{oss}	Output Capacitance	——	9455	——		V_{DS} = -10V
C_{rss}	Reverse Transfer Capacitance	——	8986	——		f = 1.0kHz

Source-Drain Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	——	——	-2.5	A	MOSFET symbol showing the integral reverse p-n junction diode.
I_{SM}	Pulsed Source Current (Body Diode) ①	——	——	-100		
V_{SD}	Diode Forward Voltage	——	——	-1.2	V	T_J = 25°C, I_S = -2.5A, V_{GS} = 0V ②
t_{rr}	Reverse Recovery Time	——	165	247	ns	T_J = 25°C, I_F = -2.5A
Q_{rr}	Reverse RecoveryCharge	——	296	444	nC	di/dt = 85A/µs ②



Notes:

① Repetitive rating; pulse width limited by max. junction temperature.

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

③ When mounted on 1 inch square copper board, t<10 sec

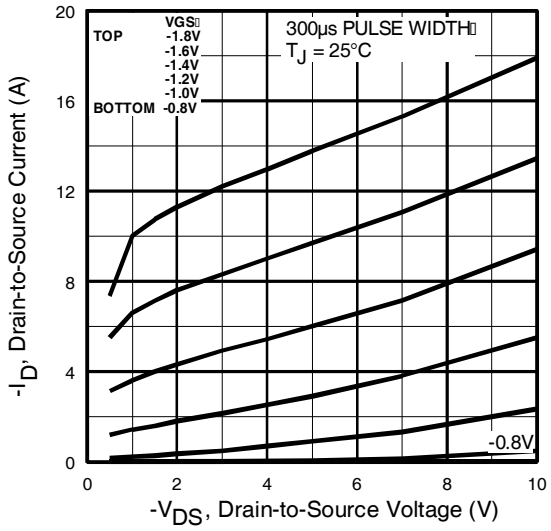


Fig 1. Typical Output Characteristics

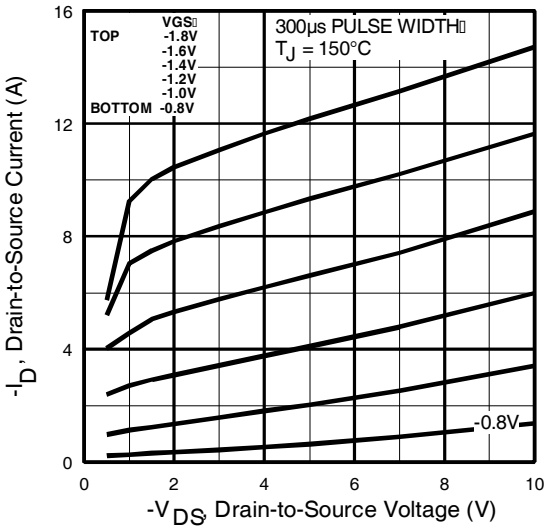


Fig 2. Typical Output Characteristics

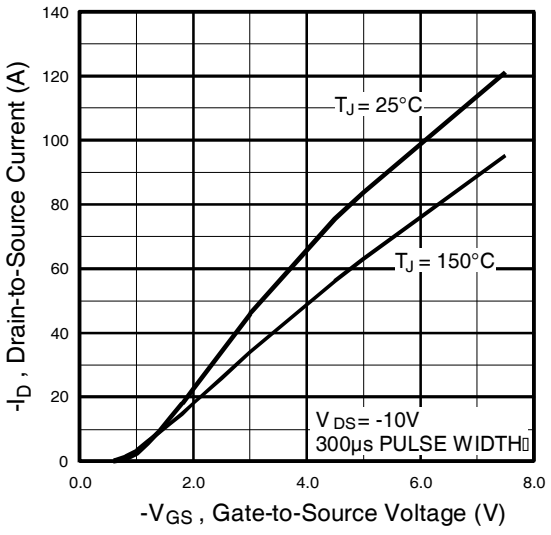


Fig 3. Typical Transfer Characteristics

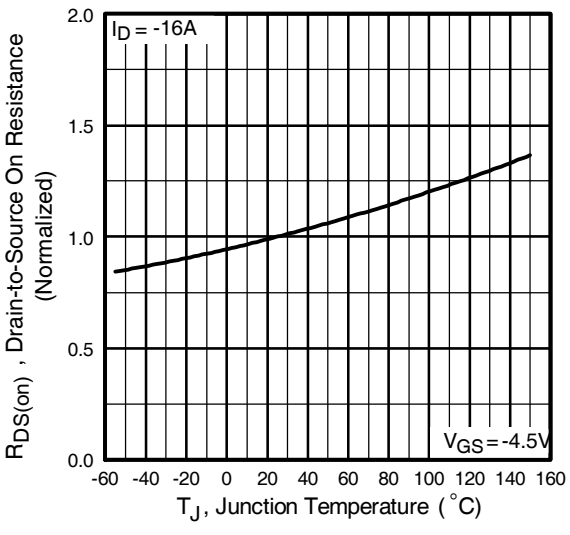


Fig 4. Normalized On-Resistance
Vs. Temperature

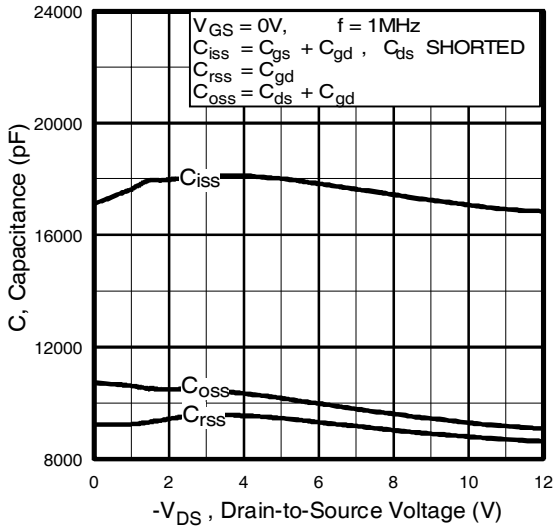


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

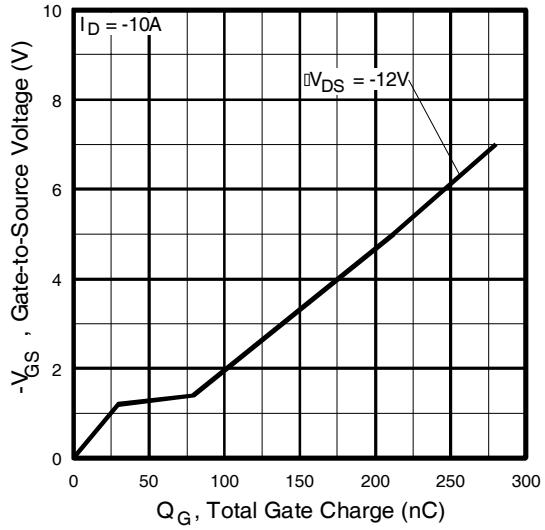


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

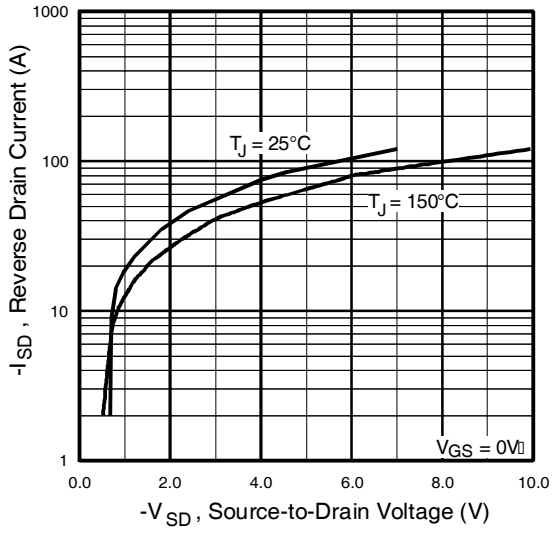


Fig 7. Typical Source-Drain Diode Forward Voltage

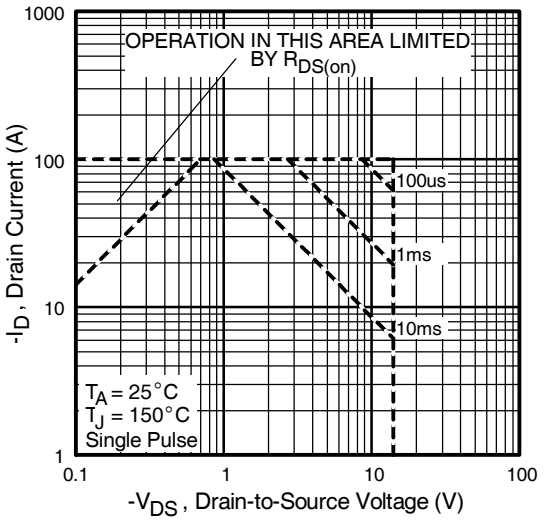


Fig 8. Maximum Safe Operating Area.

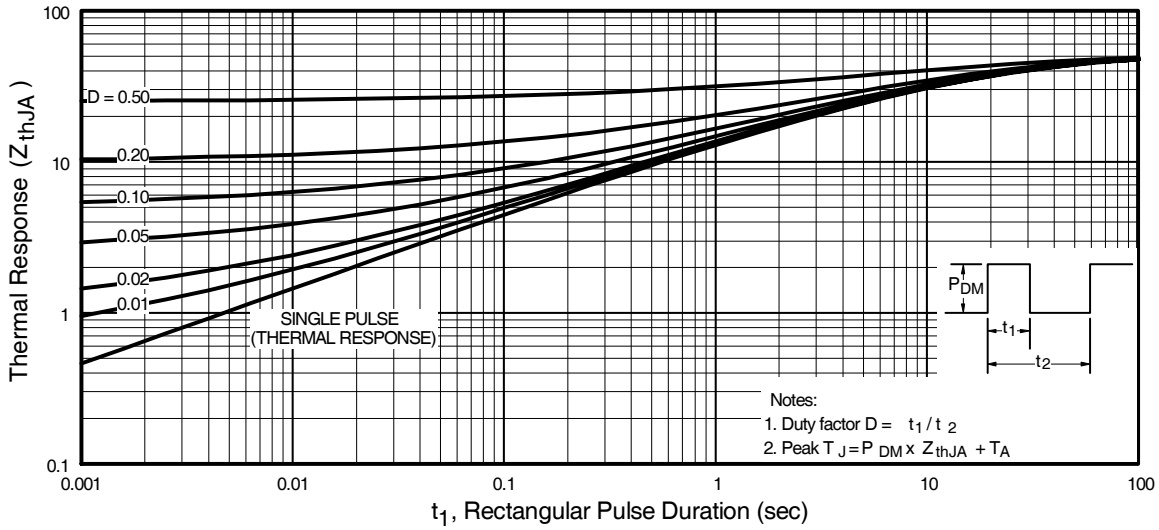
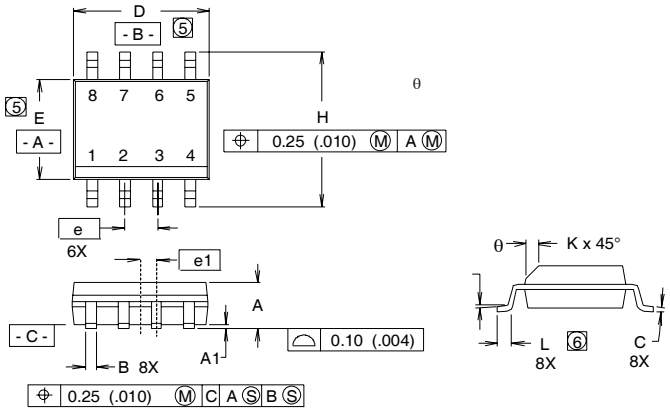


Fig 9. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

SO-8 Package Details



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°

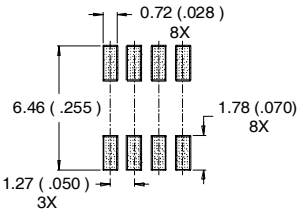
NOTES:

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).

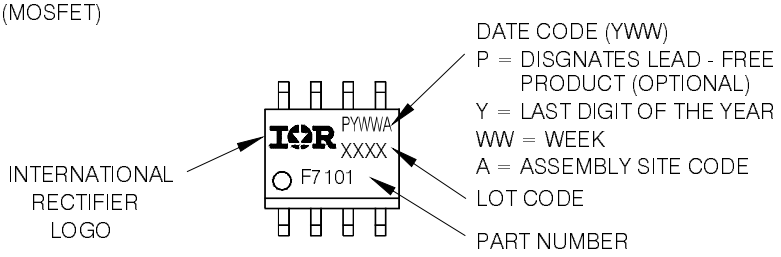
6 DIMENSIONS IS THE LENGTH OF LEAD FOR SOLDERING TO A SUBSTRATE..

RECOMMENDED FOOTPRINT

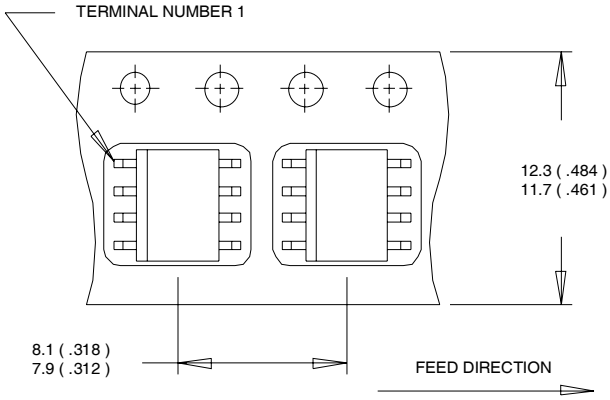


Part Marking

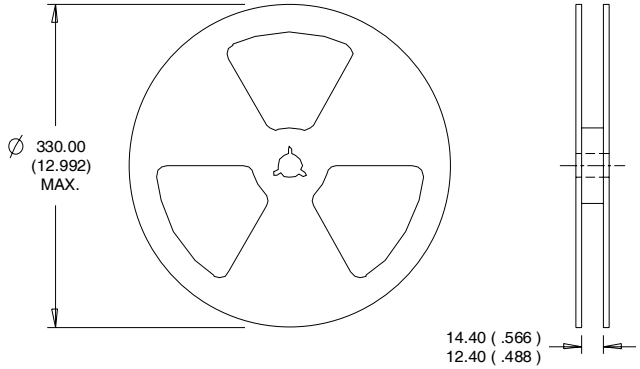
EXAMPLE: THIS IS AN IRF7101 (MOSFET)



SO-8 Tape and Reel



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.

Data and specifications subject to change without notice.

International
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