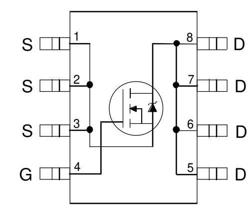
PD- 91746D

IRF7805

International
IOR Rectifier

HEXFET® Power MOSFET

- Low On-Resistance
- Low Gate Charge
- N-Channel MOSFET
- Ideal for mobile processor DC-DC converters
- Surface Mount
- 100% R_G Tested



Top View

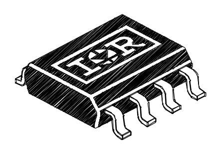
V_{DSS} = 30V

$R_{DS(on)}$ = 0.009Ω

Description

This advanced technology HEXFET Power MOSFET achieves an unprecedented balance in on-resistance and gate charge. The reduced conduction and switching loss of these devices make them ideal for high efficiency DC-DC converters that power the latest generation of mobile microprocessors.

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. Power dissipation of greater than 0.8W is possible in a typical PCB mount application.



SO-8

Absolute Maximum Ratings

Symbol	Parameter	Max	Units
V_{DS}	Drain-Source Voltage	30	V
I_D @ T_A = 25°C	Continuous Drain Current, V_{GS} @ 10V	13	A
I_D @ T_A = 70°C	Continuous Drain Current, V_{GS} @ 10V	10	
I_{DM}	Pulsed Drain Current ①	100	
P_D @Tc = 25°C	Power Dissipation	2.5	W
P_D @Tc = 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 Pluse tp<10µs	16	V
dv/dt	Peak Diode Recovery dv/dt ②	5.0	V/ns
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to + 150	°C

Thermal Resistance

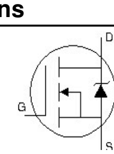
Symbol	Parameter	Typ	Max	Units
$R_{\theta JL}$	Junction-to-Drain Lead ⑤	—	20	°C/W
$R_{\theta JA}$	Junction-to-Ambient ④ ⑤	—	50	

11/12/03

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

Symbol	Parameter	Min	Typ	Max	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	30	——	——	V	V_{GS} = 0V, I_D = 250µA
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	——	0.029	——	V/°C	Reference to 25°C, I_D = 1mA
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	——	——	0.009	mΩ	V_{GS} = 10V, I_D = 13A ③
			——	0.012		V_{GS} = 4.5V, I_D = 11A ③
$V_{GS(th)}$	Gate Threshold Voltage	1.0	——	3.0	V	V_{DS} = V_{GS}, I_D = 250µA
g_{fs}	Forward Transconductance	38	——	——	S	V_{DS} = 10V, I_D = 13A
I_{DSS}	Drain-to-Source Leakage Current	——	——	50	µA	V_{DS} = 30V, V_{GS} = 0V
		——	——	1.0		V_{DS} = 24V, V_{GS} = 0V
		——	——	25		V_{DS} = 24V, V_{GS} = 0V, T_J = 55°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	——	27	41	nC	I_D = 13A
Q_{gs}	Gate-to-Source Charge	——	5.4	8.0		V_{DS} = 24V
Q_{gd}	Gate-to-Drain ("Miller") Charge	——	8.6	13		V_{GS} = 4.5V, See Fig. 9 ③
R_G	Gate Resistance	0.5	——	1.7	Ω	
$t_{d(on)}$	Turn-On Delay Time	——	11	——	ns	V_{DD} = 15V
t_r	Rise Time	——	10	——		I_D = 13A
$t_{d(off)}$	Turn-Off Delay Time	——	83	——		R_G = 6.2 Ω
t_f	Fall Time	——	43	——		R_G = 15 Ω ③
C_{iss}	Input Capacitance	——	2500	——		V_{GS} = 0V
C_{oss}	Output Capacitance	——	870	——	[redacted]	[redacted]
C_{rss}	Reverse Transfer Capacitance	——	73	——		f = 1.0MHz, See Fig. 8

Source-Drain Ratings and Characteristics

Symbol	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 = 13A, V_{GS} = 0V ③
t_{rr}	Reverse Recovery Time	——	92	140	ns	T_J = 25°C, I_F = 13A
Q_{rr}	Reverse Recovery Charge	——	150	230	nC	di/dt = 100A/µs ③

Notes:

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

② $I_{SD} \leq$ 13A, di/dt ≤ 110A/µs, $V_{DD} \leq V_{(BR)DSS}$, $T_J \leq$ 150°C

③ Pulse width ≤ 300µs; duty cycle ≤ 2%.

④ When mounted on 1 inch square copper board, t<10 sec

⑤ R_θ is measured at T_J approximately at 90°C

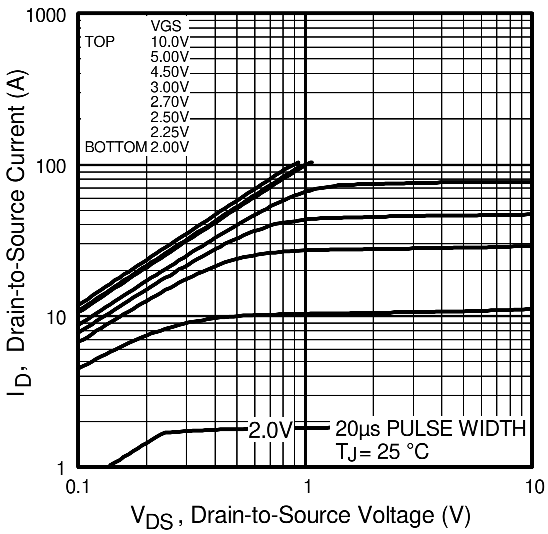


Fig 1. Typical Output Characteristics

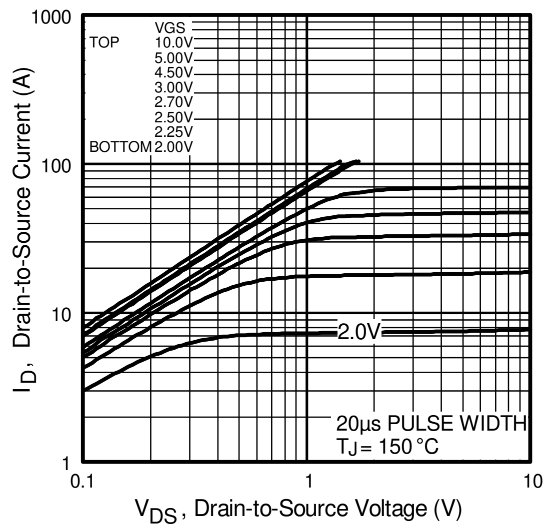


Fig 2. Typical Output Characteristics

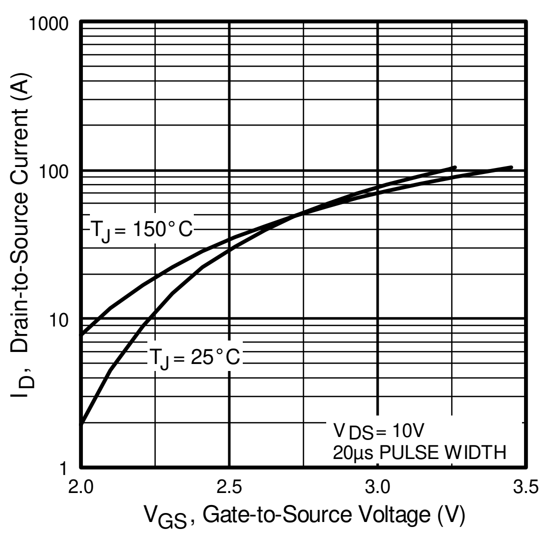


Fig 3. Typical Transfer Characteristics

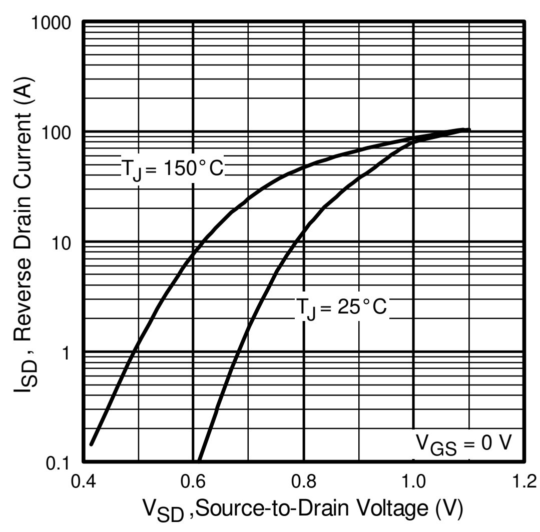


Fig 4. Typical Source-Drain Diode Forward Voltage

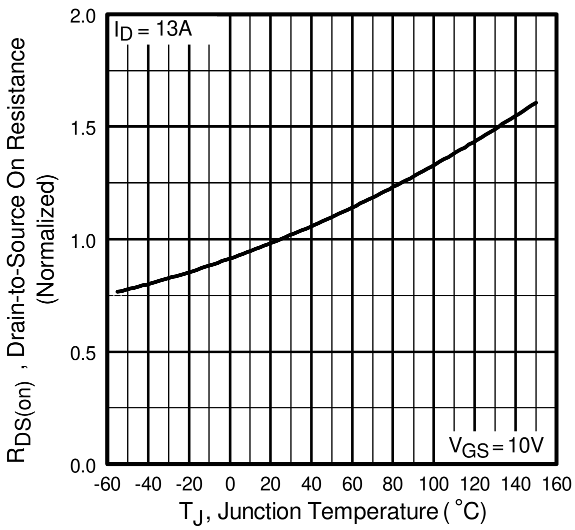


Fig 5. Normalized On-Resistance Vs. Temperature

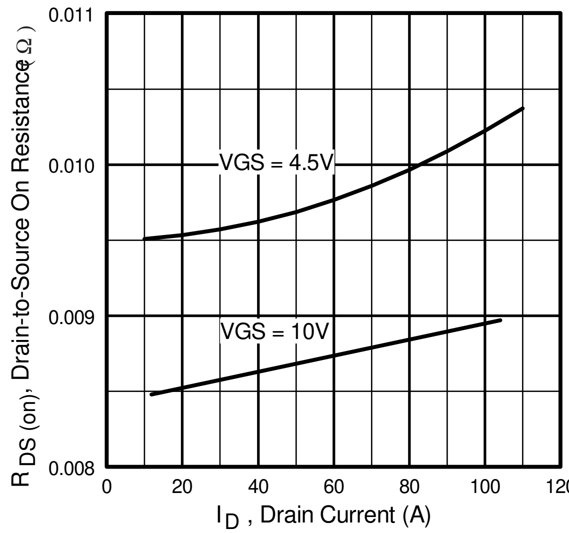


Fig 6. On-Resistance Vs. Drain Current

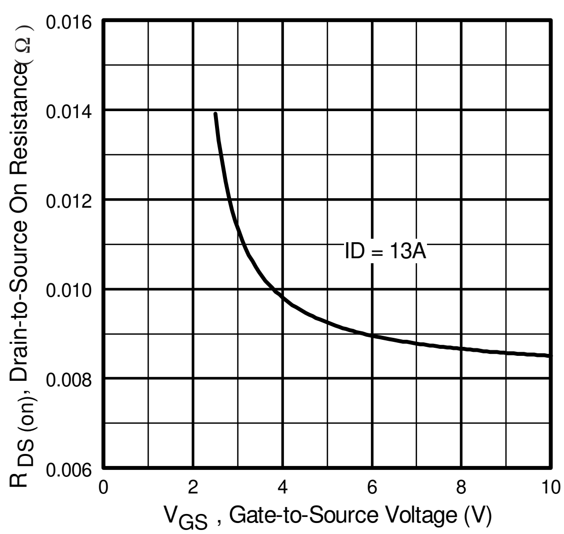


Fig 7. On-Resistance Vs. Gate Voltage

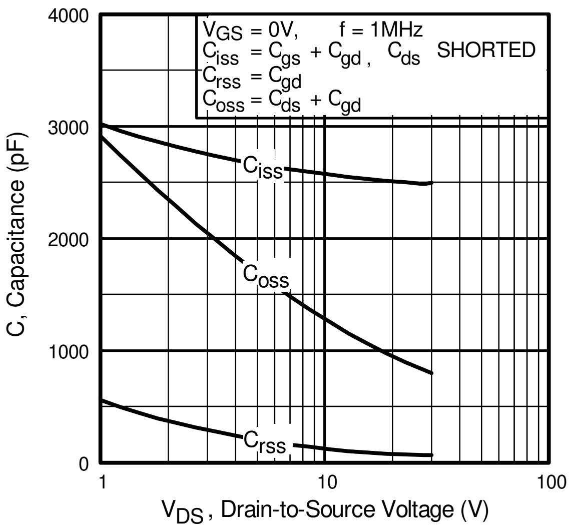


Fig 8. Typical Capacitance Vs. Drain-to-Source Voltage

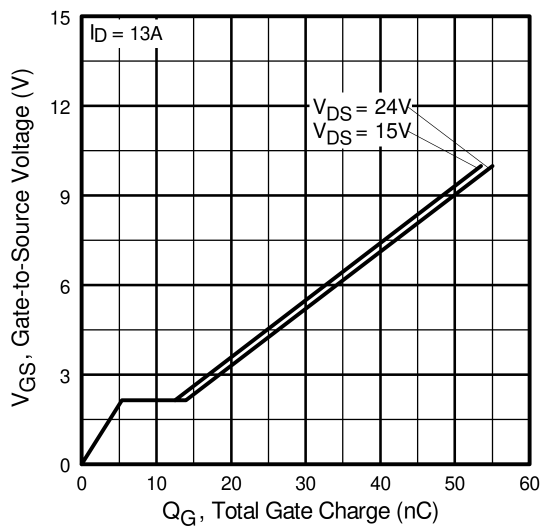


Fig 9. Typical Gate Charge Vs. Gate-to-Source Voltage

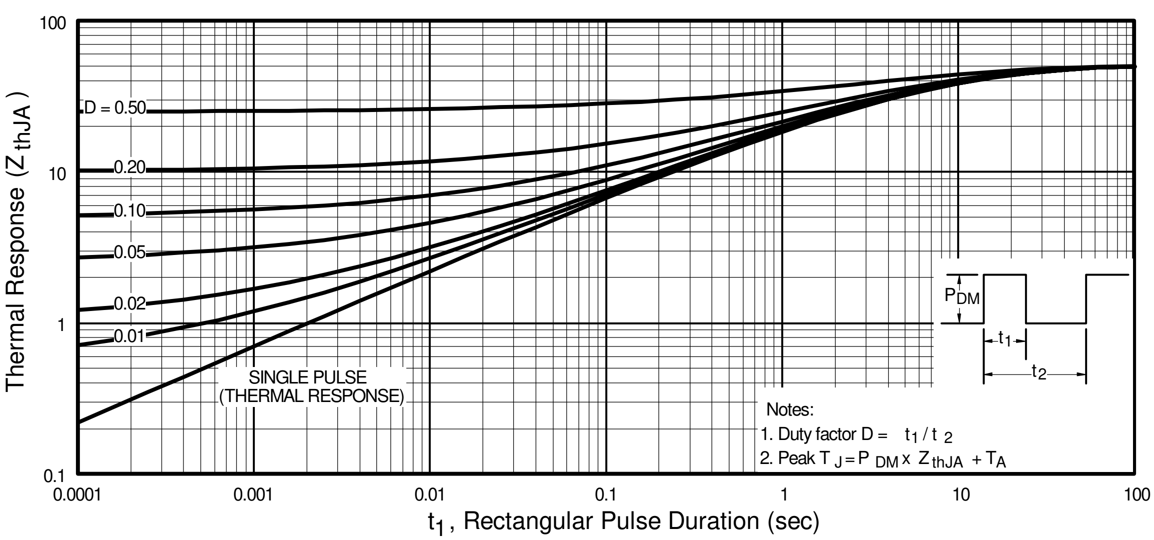
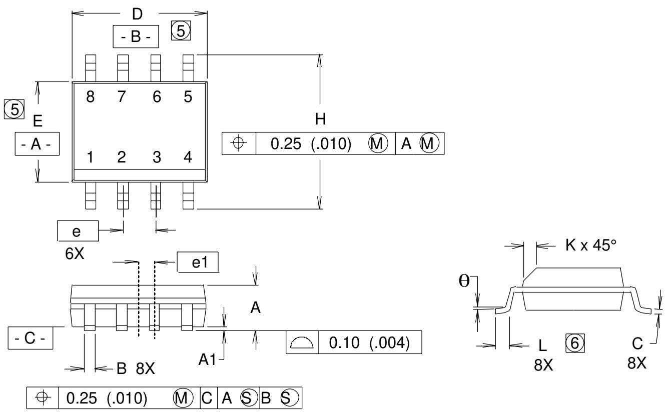


Fig 10. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

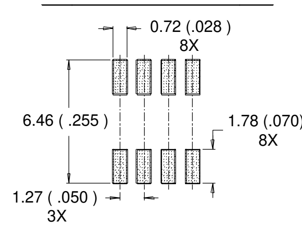
Package Outline

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



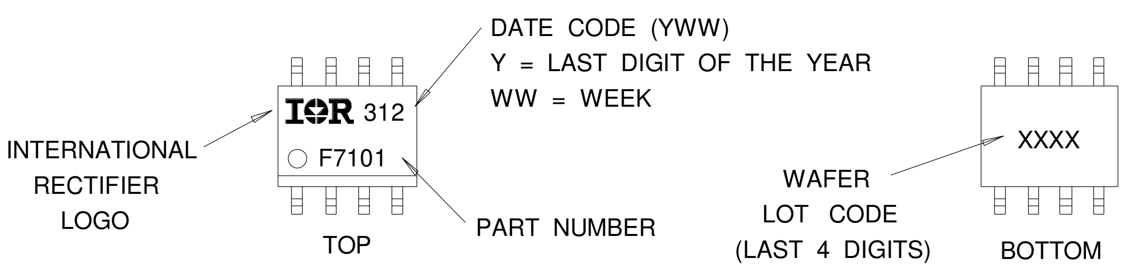
NOTES:

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

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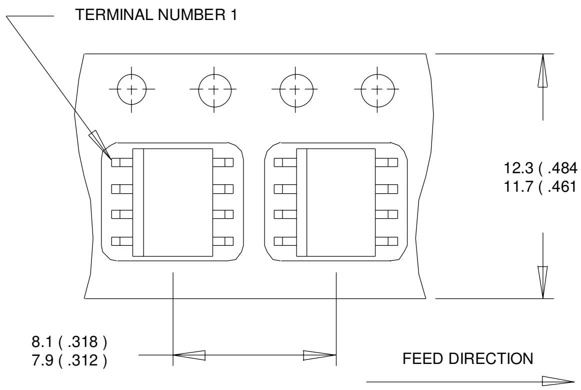
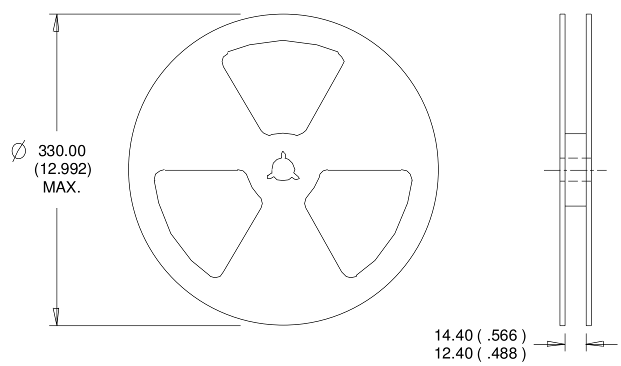
Dimensions are shown in millimeters (inches)



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



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