International
IOR Rectifier

IRF7805ZPbF

HEXFET® Power MOSFET

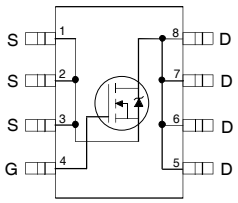
V_{DSS}	$R_{DS(on)}$ max	Qg (typ.)
30V	6.8mΩ@V_{GS} = 10V	18nC

Applications

- High Frequency Point-of-Load Synchronous Buck Converter for Applications in Networking & Computing Systems.
- Lead-Free

Benefits

- Very Low $R_{DS(on)}$ at 4.5V V_{GS}
- Ultra-Low Gate Impedance
- Fully Characterized Avalanche Voltage and Current
- 100% tested for Rg



Top View


SO-8

Absolute Maximum Ratings

	Parameter	Max.	Units
V_{DS}	Drain-to-Source Voltage	30	V
V_{GS}	Gate-to-Source Voltage	± 20	
I_D @ T_A = 25°C	Continuous Drain Current, V_{GS} @ 10V	16	A
I_D @ T_A = 70°C	Continuous Drain Current, V_{GS} @ 10V	12	
I_{DM}	Pulsed Drain Current ①	120	
P_D @T_A = 25°C	Power Dissipation ④	2.5	W
P_D @T_A = 70°C	Power Dissipation ④	1.6	
	Linear Derating Factor	0.02	W/°C
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to + 150	°C

Thermal Resistance

	Parameter	Typ.	Max.	Units
$R_{\theta JL}$	Junction-to-Drain Lead ⑤	–––	20	°C/W
$R_{\theta JA}$	Junction-to-Ambient ④⑤	–––	50	

Notes ① through ⑤ are on page 10

Static @ T_J = 25°C (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
BV_{DSS}	Drain-to-Source Breakdown Voltage	30	—	—	V	V_{GS} = 0V, I_D = 250µA
$\Delta BV_{DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.023	—	V/°C	Reference to 25°C, I_D = 1mA
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	5.5	6.8	mΩ	V_{GS} = 10V, I_D = 16A ③
		—	7.0	8.7		V_{GS} = 4.5V, I_D = 13A ③
$V_{GS(th)}$	Gate Threshold Voltage	1.35	—	2.25	V	V_{DS} = V_{GS}, I_D = 250µA
$\Delta V_{GS(th)}$	Gate Threshold Voltage Coefficient	—	- 4.7	—	mV/°C	
I_{DSS}	Drain-to-Source Leakage Current	—	—	1.0	µA	V_{DS} = 24V, V_{GS} = 0V
		—	—	150		V_{DS} = 24V, V_{GS} = 0V, T_J = 125°C
I_{GSS}	Gate-to-Source Forward Leakage	—	—	100	nA	V_{GS} = 20V
	Gate-to-Source Reverse Leakage	—	—	-100		V_{GS} = -20V
gfs	Forward Transconductance	64	—	—	S	V_{DS} = 15V, I_D = 12A
Q_g	Total Gate Charge	—	18	27		
Q_{gs1}	Pre-Vth Gate-to-Source Charge	—	4.7	—		V_{DS} = 15V
Q_{gs2}	Post-Vth Gate-to-Source Charge	—	1.6	—	nC	V_{GS} = 4.5V
Q_{gd}	Gate-to-Drain Charge	—	6.2	—		I_D = 12A
Q_{godr}	Gate Charge Overdrive	—	5.5	—		See Fig. 16
Q_{sw}	Switch Charge (Q_{gs2} + Q_{gd})	—	7.8	—		
Q_{oss}	Output Charge	—	10	—	nC	V_{DS} = 16V, V_{GS} = 0V
R_G	Gate Resistance	—	1.0	2.1	Ω	
$t_{d(on)}$	Turn-On Delay Time	—	11	—		V_{DD} = 15V, V_{GS} = 4.5V ③
t_r	Rise Time	—	10	—		I_D = 12A
$t_{d(off)}$	Turn-Off Delay Time	—	14	—	ns	Clamped Inductive Load
t_f	Fall Time	—	3.7	—		
C_{iss}	Input Capacitance	—	2080	—		V_{GS} = 0V
C_{oss}	Output Capacitance	—	480	—	pF	V_{DS} = 15V
C_{rss}	Reverse Transfer Capacitance	—	220	—		f = 1.0MHz

Avalanche Characteristics

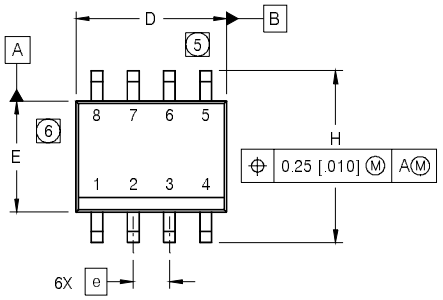
	Parameter	Typ.	Max.	Units
E_{AS}	Single Pulse Avalanche Energy ②	—	72	mJ
I_{AR}	Avalanche Current ①	—	12	A

Diode Characteristics

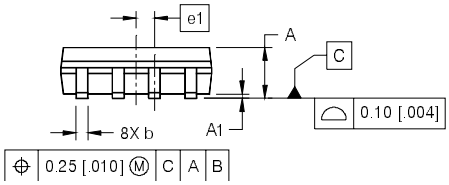
	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	3.1	A	MOSFET symbol showing the integral reverse p-n junction diode.
I_{SM}	Pulsed Source Current (Body Diode) ①	—	—	120		
V_{SD}	Diode Forward Voltage	—	—	1.0	V	T_J = 25°C, I_S = 12A, V_{GS} = 0V ③
t_{rr}	Reverse Recovery Time	—	29	44	ns	T_J = 25°C, I_F = 12A, V_{DD} = 15V
Q_{rr}	Reverse Recovery Charge	—	20	30	nC	di/dt = 100A/µs ③
t_{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by L_S+L_D)				

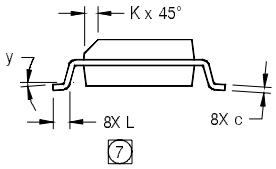
SO-8 Package Outline

Dimensions are shown in millimeters (inches)



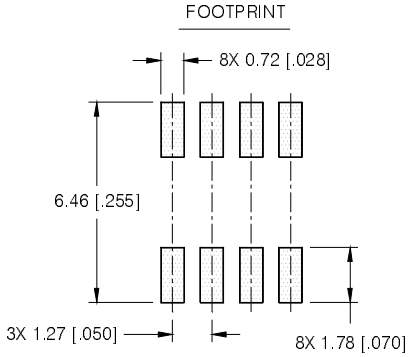
DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.0532	.0688	1.35	1.75
A1	.0040	.0098	0.10	0.25
b	.013	.020	0.33	0.51
c	.0075	.0098	0.19	0.25
D	.189	.1968	4.80	5.00
E	.1497	.1574	3.80	4.00
e	.050 BASIC		1.27 BASIC	
e 1	.025 BASIC		0.635 BASIC	
H	.2284	.2440	5.80	6.20
K	.0099	.0196	0.25	0.50
L	.016	.050	0.40	1.27
y	0°	8°	0°	8°





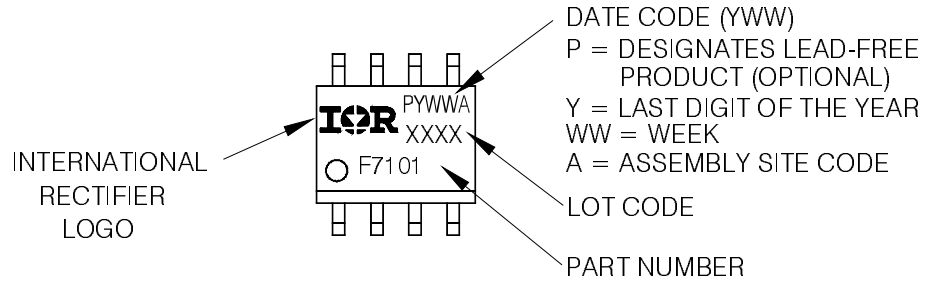
NOTES:

1. DIMENSIONING & TOLERANCING PER ASME Y14.5M-1994.
2. CONTROLLING DIMENSION: MILLIMETER
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 0.15 [.006].
6. DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.25 [.010].
7. DIMENSION IS THE LENGTH OF LEAD FOR SOLDERING TO A SUBSTRATE.



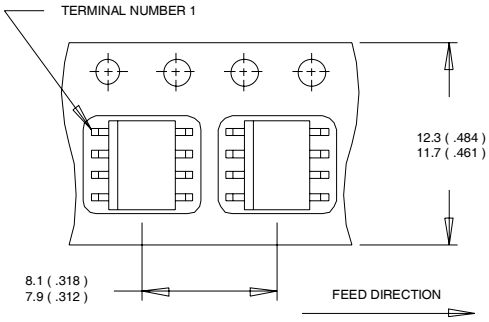
SO-8 Part Marking

EXAMPLE: THIS IS AN IRF7101 (MOSFET)

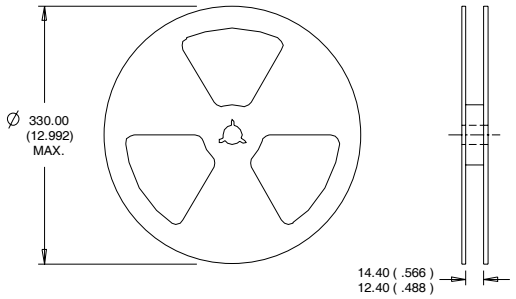


SO-8 Tape and Reel

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.

Notes:

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

② Starting T_J = 25°C, L = 0.94mH R_G = 25Ω, I_{AS} = 12A.

③ Pulse width ≤ 400µs; duty cycle ≤ 2%.

④ When mounted on 1 inch square copper board

⑤ R_θ is measured at T_J approximately 90°C

Data and specifications subject to change without notice.
This product has been designed and qualified for the Consumer market.

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