International
IOR Rectifier

SMPS MOSFET

IRF7456PbF

HEXFET® Power MOSFET

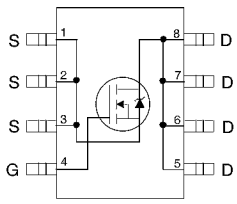
V_{DSS}	$R_{DS(on)}$ max	I_D
20V	0.0065Ω	16A

Applications

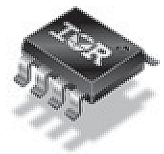
- High Frequency DC-DC Converters with Synchronous Rectification
- Lead-Free

Benefits

- Ultra-Low $R_{DS(on)}$ at 4.5V V_{GS}
- Low Charge and Low Gate Impedance to Reduce Switching Losses
- Fully Characterized Avalanche Voltage and Current



Top View


SO-8

Absolute Maximum Ratings

Symbol	Parameter	Max.	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-to-Source Voltage	± 12	V
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	13	
I_{DM}	Pulsed Drain Current①	130	
P_D @T_A = 25°C	Maximum Power Dissipation③	2.5	W
P_D @T_A = 70°C	Maximum Power Dissipation③	1.6	W
	Linear Derating Factor	0.02	W/°C
T_J , T_{STG}	Junction and Storage Temperature Range	-55 to + 150	°C

Thermal Resistance

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

Typical SMPS Topologies

- Telecom 48V Input Converters with Logic-Level Driven Synchronous Rectifiers

Notes ① through ④ are on page 8

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

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	20	—	—	V	V_{GS} = 0V, I_D = 250µA
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.024	—	V/°C	Reference to 25°C, I_D = 1mA
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	0.0047	0.0065	Ω	V_{GS} = 10V, I_D = 16A ③
		—	0.0057	0.0075		V_{GS} = 4.5V, I_D = 13A ③
		—	0.011	0.020		V_{GS} = 2.8V, I_D = 3.5A ③
$V_{GS(th)}$	Gate Threshold Voltage	0.6	—	2.0	V	V_{DS} = V_{GS}, I_D = 250µA
I_{DSS}	Drain-to-Source Leakage Current	—	—	20	µA	V_{DS} = 16V, V_{GS} = 0V
		—	—	100		V_{DS} = 16V, V_{GS} = 0V, T_J = 125°C
I_{GSS}	Gate-to-Source Forward Leakage	—	—	200	nA	V_{GS} = 12V
	Gate-to-Source Reverse Leakage	—	—	-200		V_{GS} = -12V

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

	Parameter	Min.	Typ.	Max.	Units	Conditions
g_{fs}	Forward Transconductance	44	—	—	S	V_{DS} = 10V, I_D = 16A
Q_g	Total Gate Charge	—	41	62	nC	I_D = 16A
Q_{gs}	Gate-to-Source Charge	—	9.7	15		V_{DS} = 16V
Q_{gd}	Gate-to-Drain ("Miller") Charge	—	18	27		V_{GS} = 5.0V, ③
$t_{d(on)}$	Turn-On Delay Time	—	20	—	ns	V_{DD} = 10V
t_r	Rise Time	—	25	—		I_D = 1.0A
$t_{d(off)}$	Turn-Off Delay Time	—	50	—		R_G = 6.0Ω
t_f	Fall Time	—	52	—		V_{GS} = 4.5V ③
C_{iss}	Input Capacitance	—	3640	—	pF	V_{GS} = 0V
C_{oss}	Output Capacitance	—	1570	—		V_{DS} = 15V
C_{rss}	Reverse Transfer Capacitance	—	330	—		f = 1.0MHz

Avalanche Characteristics

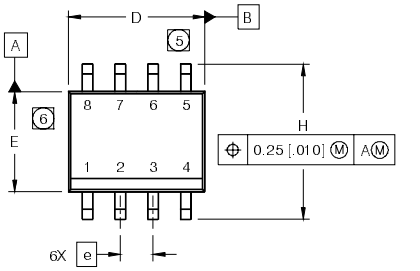
	Parameter	Typ.	Max.	Units
E_{AS}	Single Pulse Avalanche Energy②	—	250	mJ
I_{AR}	Avalanche Current①	—	16	A
E_{AR}	Repetitive Avalanche Energy①	—	0.25	mJ

Diode Characteristics

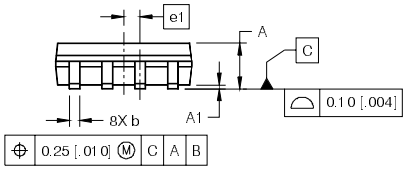
	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	2.5	A	MOSFET symbol showing the integral reverse p-n junction diode.
I_{SM}	Pulsed Source Current (Body Diode) ①	—	—	130		
V_{SD}	Diode Forward Voltage	—	—	1.2	V	T_J = 25°C, I_S = 2.5A, V_{GS} = 0V ③
t_{rr}	Reverse Recovery Time	—	48	72	ns	T_J = 25°C, I_F = 2.5A
Q_{rr}	Reverse RecoveryCharge	—	74	110	nC	di/dt = 100A/µs ③

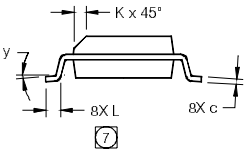
SO-8 Package Outline(Mosfet & Fetky)

Dimensions are shown in milimeters (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	
e1	.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°





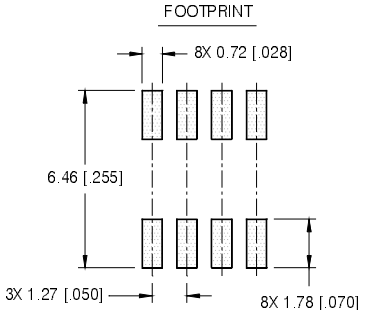
NOTES:

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].

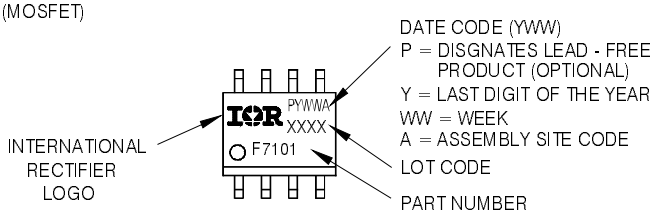
6 DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.25 [.010].

7 DIMENSION IS THE LENGTH OF LEAD FOR SOLDERING TO A SUBSTRATE.



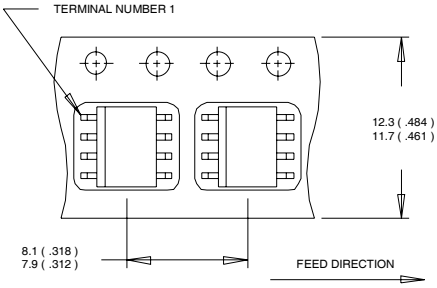
SO-8 Part Marking Information

EXAMPLE: THIS IS AN IRF7101 (MOSFET)

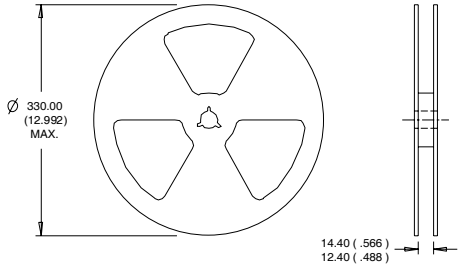


SO-8 Tape and Reel

Dimensions are shown in milimeters (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 = 2.0mH
R_G = 25Ω, I_{AS} = 16A.

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

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

Data and specifications subject to change without notice.
This product has been designed and qualified for the Consumer market.
Qualifications Standards can be found on IR's Web site.

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