

SMPS MOSFET **IRFL4315PbF**
HEXFET® Power MOSFET

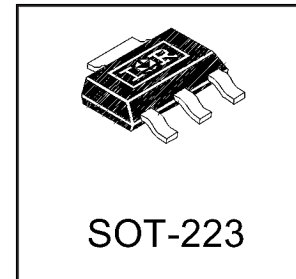
Applications

- High frequency DC-DC converters
- Lead-Free

V_{DSS}	R_{DS(on)} max	I_D
150V	185mΩ@V_{GS} = 10V	2.6A

Benefits

- Low Gate to Drain Charge to Reduce Switching Losses
- Fully Characterized Capacitance Including Effective C_{OSS} to Simplify Design, (See App. Note AN1001)
- Fully Characterized Avalanche Voltage and Current



Absolute Maximum Ratings

	Parameter	Max.	Units
I _D @ T _A = 25°C	Continuous Drain Current, V _{GS} @ 10V	2.6	A
I _D @ T _A = 70°C	Continuous Drain Current, V _{GS} @ 10V	2.1	
I _{DM}	Pulsed Drain Current ①	21	
P _D @ T _A = 25°C	Power Dissipation④	2.8	W
	Linear Derating Factor	0.02	W/°C
V _{GS}	Gate-to-Source Voltage	± 30	V
dv/dt	Peak Diode Recovery dv/dt ⑥	6.3	V/ns
T _J	Operating Junction and	-55 to + 150	°C
T _{STG}	Storage Temperature Range		
	Soldering Temperature, for 10 seconds	300 (1.6mm from case)	

Thermal Resistance

Symbol	Parameter	Typ.	Max.	Units
R _{θJA}	Junction-to-Ambient (PCB Mount, steady state)④	—	45	°C/W

Notes ① through ⑥ are on page 8

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

	Parameter	Min.	Typ.	Max.	Units	Conditions
V _{(BR)DSS}	Drain-to-Source Breakdown Voltage	150	—	—	V	V _{GS} = 0V, I _D = 250μA
ΔV _{(BR)DSS/ΔT_J}	Breakdown Voltage Temp. Coefficient	—	0.19	—	V/°C	Reference to 25°C, I _D = 1mA ③
R _{DS(on)}	Static Drain-to-Source On-Resistance	—	—	185	mΩ	V _{GS} = 10V, I _D = 1.6A ③
V _{GS(th)}	Gate Threshold Voltage	3.0	—	5.0	V	V _{DS} = V _{GS} , I _D = 250μA
I _{DSS}	Drain-to-Source Leakage Current	—	—	25	μA	V _{DS} = 150V, V _{GS} = 0V
		—	—	250		V _{DS} = 120V, V _{GS} = 0V, T _J = 125°C
I _{GSS}	Gate-to-Source Forward Leakage	—	—	100	nA	V _{GS} = 30V
	Gate-to-Source Reverse Leakage	—	—	-100		V _{GS} = -30V

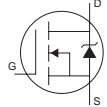
Dynamic @ T_J = 25°C (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
g _{fs}	Forward Transconductance	3.5	—	—	S	V _{DS} = 50V, I _D = 1.6A
Q _g	Total Gate Charge	—	12	19	nC	I _D = 1.6A
Q _{gs}	Gate-to-Source Charge	—	2.1	3.1		V _{DS} = 120V
Q _{gd}	Gate-to-Drain ("Miller") Charge	—	6.8	10		V _{GS} = 10V
t _{d(on)}	Turn-On Delay Time	—	8.4	—	ns	V _{DD} = 75V
t _r	Rise Time	—	21	—		I _D = 1.6A
t _{d(off)}	Turn-Off Delay Time	—	20	—		R _G = 15Ω
t _f	Fall Time	—	19	—		V _{GS} = 10V ③
C _{iss}	Input Capacitance	—	420	—	pF	V _{GS} = 0V
C _{oss}	Output Capacitance	—	100	—		V _{DS} = 25V
C _{rss}	Reverse Transfer Capacitance	—	25	—		f = 1.0MHz
C _{oss}	Output Capacitance	—	720	—		V _{GS} = 0V, V _{DS} = 1.0V, f = 1.0MHz
C _{oss}	Output Capacitance	—	48	—		V _{GS} = 0V, V _{DS} = 120V, f = 1.0MHz
C _{oss eff.}	Effective Output Capacitance	—	98	—		V _{GS} = 0V, V _{DS} = 0V to 120V ③

Avalanche Characteristics

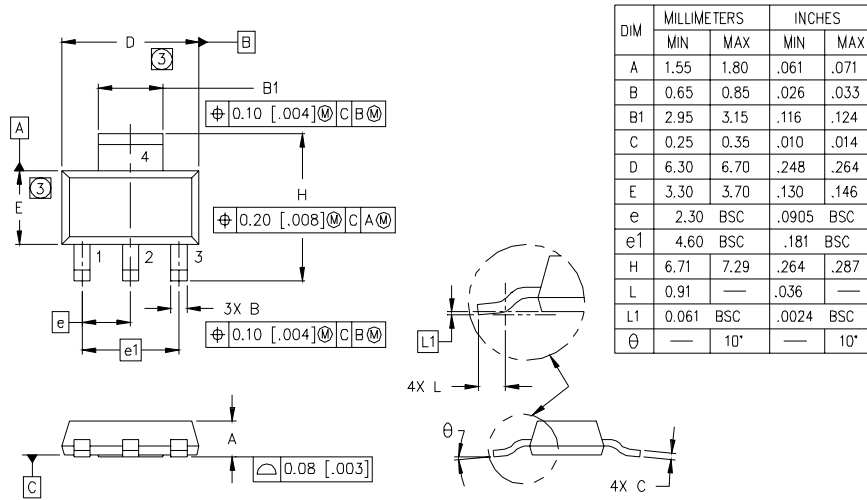
	Parameter	Typ.	Max.	Units
E _{AS}	Single Pulse Avalanche Energy②	—	38	mJ
I _{AR}	Avalanche Current①	—	3.1	A

Diode Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I _S	Continuous Source Current (Body Diode)	—	—	2.6	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I _{SM}	Pulsed Source Current (Body Diode) ①	—	—	21		
V _{SD}	Diode Forward Voltage	—	—	1.5	V	T _J = 25°C, I _S = 2.1A, V _{GS} = 0V ③
t _{rr}	Reverse Recovery Time	—	61	91	ns	T _J = 25°C, I _F = 1.6A
Q _{rr}	Reverse Recovery Charge	—	160	240	nC	di/dt = 100A/μs ③

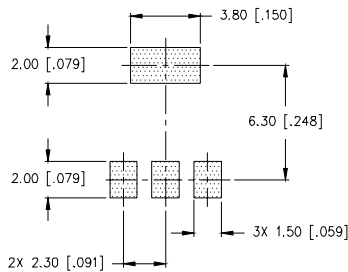
SOT-223 (TO-261AA) Package Outline

Dimensions are shown in millimeters (inches)



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.55	1.80	.061	.071
B	0.65	0.85	.026	.033
B1	2.95	3.15	.116	.124
C	0.25	0.35	.010	.014
D	6.30	6.70	.248	.264
E	3.30	3.70	.130	.146
e	2.30	BSC	.0905	BSC
e1	4.60	BSC	.181	BSC
H	6.71	7.29	.264	.287
L	0.91	—	.036	—
L1	0.061	BSC	.0024	BSC
θ	—	10°	—	10°

MINIMUM RECOMMENDED FOOTPRINT



LEAD ASSIGNMENTS

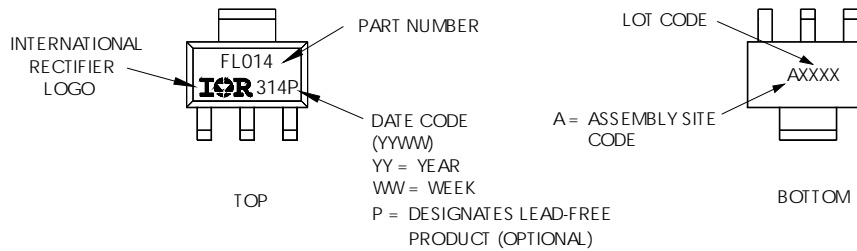
- 1 = GATE
- 2 = DRAIN
- 3 = SOURCE
- 4 = DRAIN

- NOTES:
1. DIMENSIONING & TOLERANCING PER ASME Y14.5M-1994.
 2. CONTROLLING DIMENSION: INCH.
 - ③ DIMENSIONS DO NOT INCLUDE MOLD FLASH.
 4. OUTLINE CONFORMS TO JEDEC OUTLINE TO-261AA.
 5. DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES].

SOT-223 (TO-261AA) Part Marking Information

HEXFET PRODUCT MARKING

EXAMPLE: THIS IS AN IRFL014

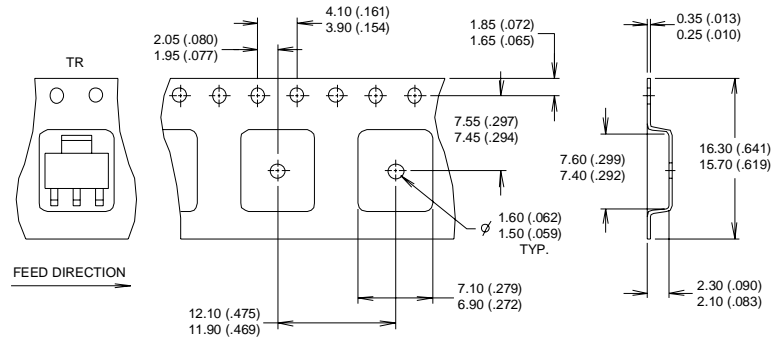


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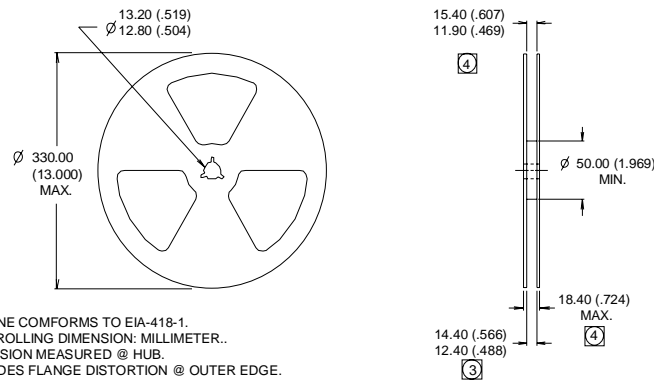
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SOT-223 (TO-261AA) Tape & Reel Information

Dimensions are shown in millimeters (inches)



- NOTES:
1. CONTROLLING DIMENSION: MILLIMETER.
 2. OUTLINE CONFORMS TO EIA-481 & EIA-541.
 3. EACH Ø330.00 (13.00) REEL CONTAINS 2,500 DEVICES.



- NOTES:
1. OUTLINE CONFORMS TO EIA-418-1.
 2. CONTROLLING DIMENSION: MILLIMETER..
 - ③ DIMENSION MEASURED @ HUB.
 - ④ INCLUDES FLANGE DISTORTION @ OUTER EDGE.

Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Starting $T_J = 25^\circ\text{C}$, $L = 7.8\text{mH}$
 $R_G = 25\Omega$, $I_{AS} = 3.1\text{A}$.
- ③ Pulse width $\leq 400\mu\text{s}$; duty cycle $\leq 2\%$.
- ④ When mounted on 1 inch square copper board.
- ⑤ C_{OSS} eff. is a fixed capacitance that gives the same charging time as C_{OSS} while V_{DS} is rising from 0 to 80% V_{DSS} .
- ⑥ $I_{SD} \leq 1.6\text{A}$, $di/dt \leq 230\text{A}/\mu\text{s}$, $V_{DD} \leq V_{(BR)DSS}$,
 $T_J \leq 150^\circ\text{C}$.

Data and specifications subject to change without notice.
 This product has been designed and qualified for the Automotive [Q101] market.
 Qualification Standards can be found on IR's Web site.

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