

END OF LIFE

International  
**IR** Rectifier

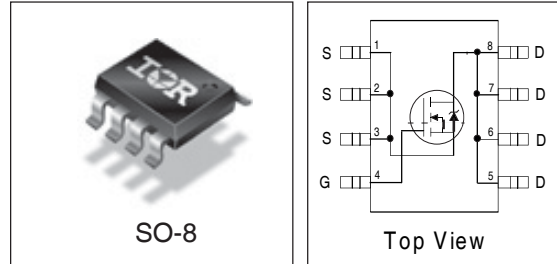
PD – 96114C

# IRF7805QPbF

- Advanced Process Technology
- Ultra Low On-Resistance
- N Channel MOSFET
- Surface Mount
- Available in Tape & Reel
- 150°C Operating Temperature
- Lead-Free

## Description

These HEXFET® Power MOSFET's in package utilize the latest processing techniques to achieve extremely low on-resistance per silicon area. Additional features of these HEXFET Power MOSFET's are a 150°C junction operating temperature, fast switching speed and improved repetitive avalanche rating. These benefits combine to make this design an extremely efficient and reliable device for use in a wide variety of applications. The efficient SO-8 package provides enhanced thermal characteristics making it ideal in a variety of power applications. This surface mount SO-8 can dramatically reduce board space and is also available in Tape & Reel.



## Device Features

	IRF7805Q
$V_{DS}$	30V
$R_{DS(on)}$	11mΩ
Qg	31nC
Qsw	11.5nC
Qoss	36nC

Base part number	Orderable part number	Package Type	Standard Pack		EOL Notice	Replacement Part Number
			Form	Quantity		
IRF7805QPbF	IRF7805QTRPbF	SO-8	Tape and Reel	4000	EOL 527	<a href="#">Please search the EOL part number on IR's website for guidance</a>
	IRF7805QPbF	SO-8	Tube	95	EOL 529	

## Absolute Maximum Ratings

	Parameter	Max.	Units
$V_{DS}$	Drain-to-Source Voltage	30	V
$V_{GS}$	Gate-to-Source Voltage	± 12	
$I_D @ T_A = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	13	A
$I_D @ T_A = 70^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	10	
$I_{DM}$	Pulsed Drain Current <sup>①</sup>	100	
$P_D @ T_A = 25^\circ C$	Power Dissipation <sup>②</sup>	2.5	W
$P_D @ T_A = 70^\circ C$	Power Dissipation <sup>②</sup>	1.6	
	Linear Derating Factor	0.02	W/°C
$T_J$	Operating Junction and	-55 to + 150	°C
$T_{STG}$	Storage Temperature Range		

## Thermal Resistance

	Parameter	Typ.	Max.	Units
$R_{\theta JL}$	Junction-to-Drain Lead <sup>③</sup>	—	20	°C/W
$R_{\theta JA}$	Junction-to-Ambient <sup>③④</sup>	—	50	

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### Static @ T<sub>J</sub> = 25°C (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
BV <sub>DSS</sub>	Drain-to-Source Breakdown Voltage <sup>⑥</sup>	30	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA
R <sub>DS(on)</sub>	Static Drain-to-Source On-Resistance <sup>⑥</sup>	—	9.2	11	mΩ	V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 7.0A <sup>②</sup>
V <sub>GS(th)</sub>	Gate Threshold Voltage <sup>⑥</sup>	1.0	—	3.0	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA
I <sub>DSS</sub>	Drain-to-Source Leakage Current	—	—	70	μA	V <sub>DS</sub> = 30V, V <sub>GS</sub> = 0V
		—	—	10		V <sub>DS</sub> = 24V, V <sub>GS</sub> = 0V
		—	—	150		V <sub>DS</sub> = 24V, V <sub>GS</sub> = 0V, T <sub>J</sub> = 100°C
I <sub>GSS</sub>	Gate-to-Source Forward Leakage	—	—	100	nA	V <sub>GS</sub> = 12V
	Gate-to-Source Reverse Leakage	—	—	-100		V <sub>GS</sub> = -12V
Q <sub>g</sub>	Total Gate Charge	—	22	31	nC	V <sub>GS</sub> = 5.0V
Q <sub>gs1</sub>	Pre-V <sub>th</sub> Gate-to-Source Charge	—	3.7	—		V <sub>DS</sub> = 16V
Q <sub>gs2</sub>	Post-V <sub>th</sub> Gate-to-Source Charge	—	1.4	—		I <sub>D</sub> = 7.0A
Q <sub>gd</sub>	Gate-to-Drain Charge	—	6.8	—		
Q <sub>sw</sub>	Switch Charge (Q <sub>gs2</sub> + Q <sub>gd</sub> )	—	8.2	11.5		
Q <sub>oss</sub>	Output Charge	—	3.0	3.6	nC	V <sub>DS</sub> = 16V, V <sub>GS</sub> = 0V
R <sub>G</sub>	Gate Resistance	0.5	—	1.7	Ω	
t <sub>d(on)</sub>	Turn-On Delay Time	—	16	—	ns	V <sub>DD</sub> = 16V, V <sub>GS</sub> = 4.5V <sup>③</sup>
t <sub>r</sub>	Rise Time	—	20	—		I <sub>D</sub> = 7.0A
t <sub>d(off)</sub>	Turn-Off Delay Time	—	38	—		R <sub>G</sub> = 2Ω
t <sub>f</sub>	Fall Time	—	16	—		Resistive Load

### Diode Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I <sub>S</sub>	Continuous Source Current (Body Diode) <sup>①</sup>	—	—	2.5	A	MOSFET symbol showing the integral reverse p-n junction diode.
I <sub>SM</sub>	Pulsed Source Current (Body Diode)	—	—	106		
V <sub>SD</sub>	Diode Forward Voltage <sup>⑥</sup>	—	—	1.2	V	T <sub>J</sub> = 25°C, I <sub>S</sub> = 7.0A, V <sub>GS</sub> = 0V
Q <sub>rr</sub>	Reverse Recovery Charge <sup>④</sup>	—	88	—	ns	di/dt = 700A/μs V <sub>DS</sub> = 16V, V <sub>GS</sub> = 0V, I <sub>S</sub> = 7.0A
Q <sub>rr(s)</sub>	Reverse Recovery Charge (with Parallel Schottky) <sup>④</sup>	—	55	—	nC	di/dt = 700A/μs (with 10BQ040) V <sub>DS</sub> = 16V, V <sub>GS</sub> = 0V, I <sub>S</sub> = 7.0A

#### Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Pulse width ≤ 300 μs; duty cycle ≤ 2%.
- ③ When mounted on 1 inch square copper board, t < 10 sec.
- ④ Typ = measured - Q<sub>oss</sub>.
- ⑤ R<sub>g</sub> is measured at T<sub>J</sub> of approximately 90°C.
- ⑥ Devices are 100% tested to these parameters.

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**Typical Characteristics**

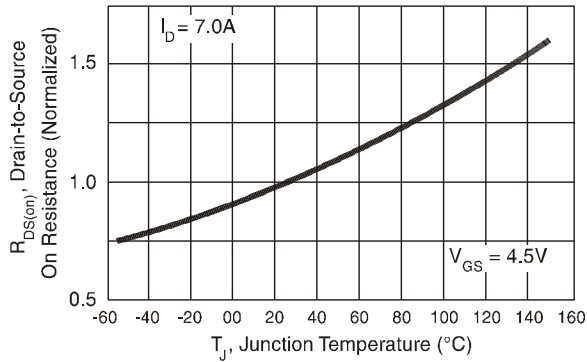


Fig 1. Normalized On-Resistance vs. Temperature

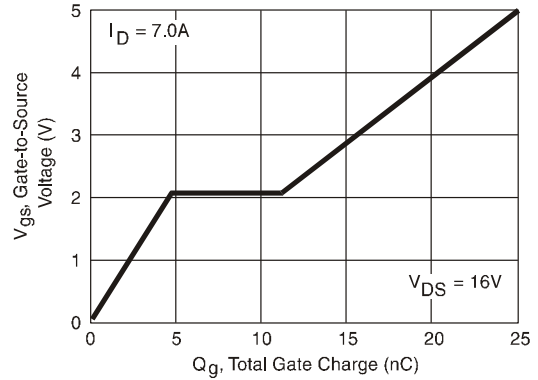


Fig 2. Typical Gate Charge vs. Gate-to-Source Voltage

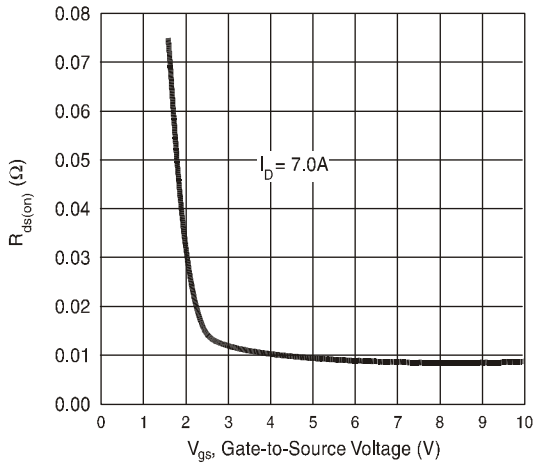


Fig 3. Typical  $R_{DS(on)}$  vs. Gate-to-Source Voltage

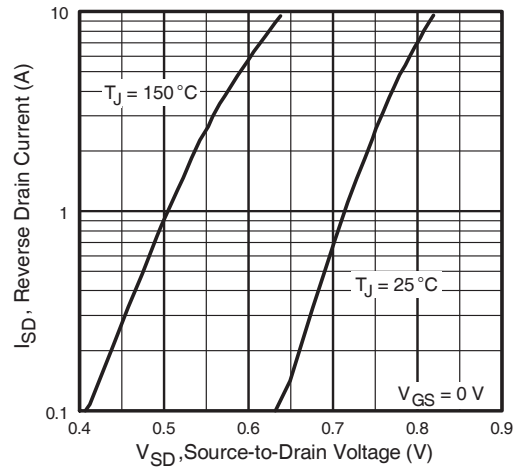


Fig 4. Typical Source-Drain Diode Forward Voltage

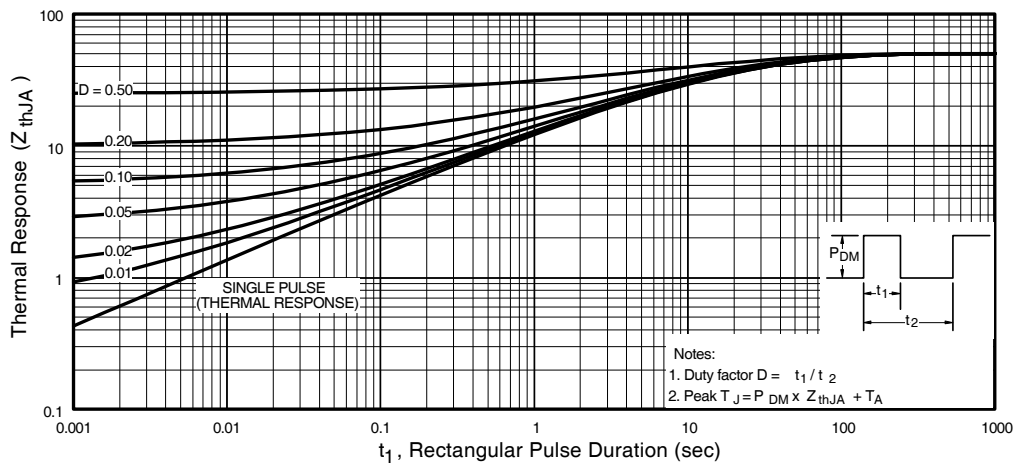


Figure 5. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

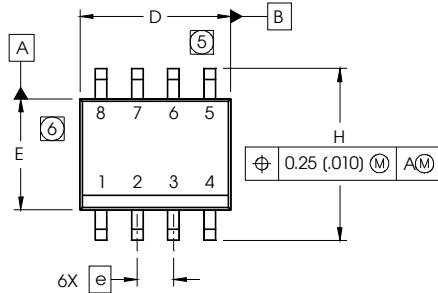
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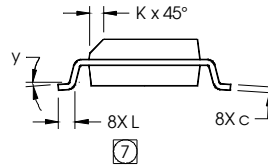
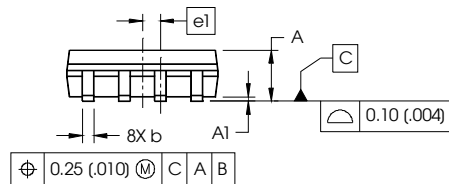
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## SO-8 Package Outline

Dimensions are shown in millimeters (inches)



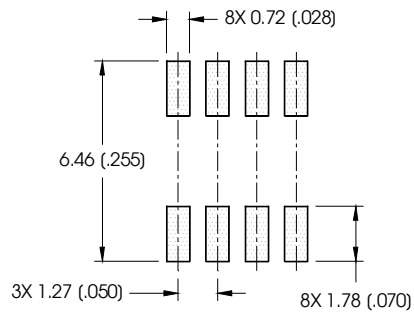
DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.0532	.0688	1.35	1.75
A1	.0040	.0098	0.10	0.25
b	.013	.020	0.33	0.51
c	.0075	.0098	0.19	0.25
D	.189	.1968	4.80	5.00
E	.1497	.1574	3.80	4.00
e	.050 BASIC		1.27 BASIC	
e1	.025 BASIC		0.635 BASIC	
H	.2284	.2440	5.80	6.20
K	.0099	.0196	0.25	0.50
L	.016	.050	0.40	1.27
y	0°	8°	0°	8°



**NOTES:**

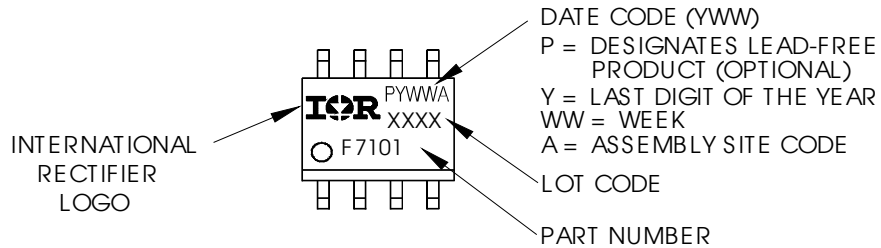
1. DIMENSIONING & TOLERANCING PER ASME Y14.5M-1994.
2. CONTROLLING DIMENSION: MILLIMETER
3. DIMENSIONS ARE SHOWN IN MILLIMETERS (INCHES).
4. OUTLINE CONFORMS TO JEDEC OUTLINE MS-012AA.
- ⑤ DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.15 (.006).
- ⑥ DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.25 (.010).
- ⑦ DIMENSION IS THE LENGTH OF LEAD FOR SOLDERING TO A SUBSTRATE.

**FOOTPRINT**



## SO-8 Part Marking

EXAMPLE: THIS IS AN IRF7101 (MOSFET)



**Notes:**

1. For an Automotive Qualified version of this part please see : <http://www.irf.com/product-info/autof/>
2. For the most current drawing please refer to IR website at <http://www.irf.com/package/>

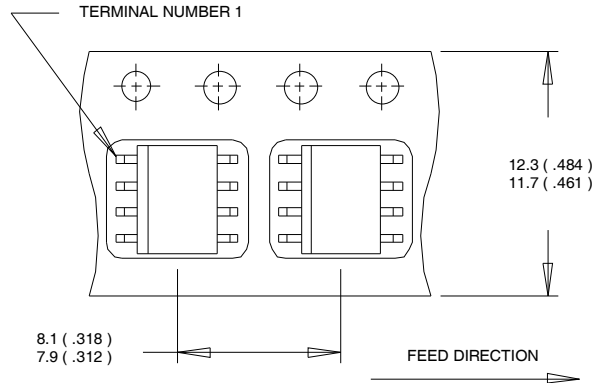
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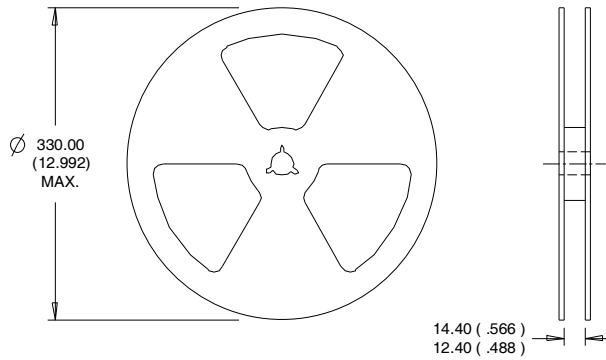
**IRF7805QPbF**

**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.

For the most current drawing please refer to IR website at <http://www.irf.com/package/>

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### Qualification Information<sup>†</sup>

Qualification level	Industrial <sup>†</sup>	
	(per JEDEC JESD47F <sup>††</sup> guidelines)	
Moisture Sensitivity Level	SO-8	MSL1 (per JEDEC J-STD-020D <sup>††</sup> )
RoHS Compliant	Yes	

<sup>†</sup> Qualification standards can be found at International Rectifier's web site  
<http://www.irf.com/product-info/reliability>

<sup>††</sup> Applicable version of JEDEC standard at the time of product release.

### Revision History

Date	Comments
8/19/2014	• Added ordering information to reflect the End-Of-life

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**IR WORLD HEADQUARTERS:** 101 N. Sepulveda Blvd., El Segundo, California 90245, USA  
To contact International Rectifier, please visit <http://www.irf.com/whoto-call/>

[www.irf.com](http://www.irf.com)