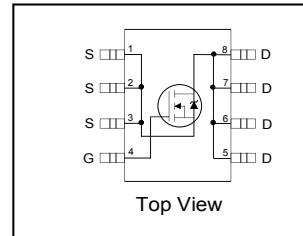


## HEXFET® Chip-Set for DC-DC Converters

- N Channel Application Specific MOSFETs
- Ideal for Mobile DC-DC Converters
- Low Conduction Losses
- Low Switching Losses
- Lead-Free



### Description

This new device employs advanced HEXFET Power MOSFET technology to achieve an unprecedented balance of on-resistance and gate charge. The reduced conduction and switching losses make this device ideal for high efficiency DC-DC Converters that power the latest generation of mobile microprocessors.

The IRF7805PbF offers maximum efficiency for mobile CPU core DC-DC converters.

### Devices Features

	<b>IRF7805PbF</b>
<b>V<sub>DSS</sub></b>	<b>30V</b>
<b>R<sub>DS(on)</sub></b>	<b>11mΩ</b>
<b>Q<sub>g</sub></b>	<b>31nC</b>
<b>Q<sub>sw</sub></b>	<b>11.5nC</b>
<b>Q<sub>oss</sub></b>	<b>36nC</b>

G	D	S
Gate	Drain	Source

Base part number	Package Type	Standard Pack		Orderable Part Number
		Form	Quantity	
IRF7805PbF	SO-8	Tape and Reel	4000	IRF7805PbF

Symbol	Parameter	Max.	Units
V <sub>DS</sub>	Drain-Source Voltage	30	V
V <sub>GS</sub>	Gate-to-Source Voltage	± 12	
I <sub>D</sub> @ T <sub>A</sub> = 25°C	Continuous Drain Current, V <sub>GS</sub> @ 10V ③	13	A
I <sub>D</sub> @ T <sub>A</sub> = 70°C	Continuous Drain Current, V <sub>GS</sub> @ 10V ③	10	
I <sub>DM</sub>	Pulsed Drain Current ①	100	
P <sub>D</sub> @ T <sub>A</sub> = 25°C	Maximum Power Dissipation ③	2.5	W
P <sub>D</sub> @ T <sub>A</sub> = 70°C	Maximum Power Dissipation ③	1.6	
	Linear Derating Factor	0.02	W/°C
T <sub>J</sub>	Operating Junction and	-55 to + 150	°C
T <sub>STG</sub>	Storage Temperature Range		

### Thermal Resistance

Symbol	Parameter	Typ.	Max.	Units
R <sub>θJL</sub>	Junction-to-Drain Lead ⑤	—	20	°C/W
R <sub>θJA</sub>	Junction-to-Ambient ③	—	50	

**Static @  $T_J = 25^\circ\text{C}$  (unless otherwise specified)**

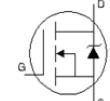
	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(\text{BR})\text{DSS}}$	Drain-to-Source Breakdown Voltage ⑥	30	—	—	V	$V_{\text{GS}} = 0\text{V}$ , $I_D = 250\mu\text{A}$
$R_{\text{DS}(\text{on})}$	Static Drain-to-Source On-Resistance ⑥	—	9.2	11	$\text{m}\Omega$	$V_{\text{GS}} = 4.5\text{V}$ , $I_D = 7.0\text{A}$ ②
$V_{\text{GS}(\text{th})}$	Gate Threshold Voltage ⑥	1.0	—	3.0	V	$V_{\text{DS}} = V_{\text{GS}}$ , $I_D = 250\mu\text{A}$
$I_{\text{DSS}}$	Drain-to-Source Leakage Current	—	—	70	$\mu\text{A}$	$V_{\text{DS}} = 30\text{V}$ , $V_{\text{GS}} = 0\text{V}$
		—	—	10		$V_{\text{DS}} = 24\text{V}$ , $V_{\text{GS}} = 0\text{V}$
		—	—	150		$V_{\text{DS}} = 24\text{V}$ , $V_{\text{GS}} = 0\text{V}$ , $T_J = 100^\circ\text{C}$
$I_{\text{GSS}}$	Gate-to-Source Forward Leakage	—	—	100	$\text{nA}$	$V_{\text{GS}} = 12\text{V}$
	Gate-to-Source Reverse Leakage	—	—	-100		$V_{\text{GS}} = -12\text{V}$

**Dynamic Electrical Characteristics @  $T_J = 25^\circ\text{C}$  (unless otherwise specified)**

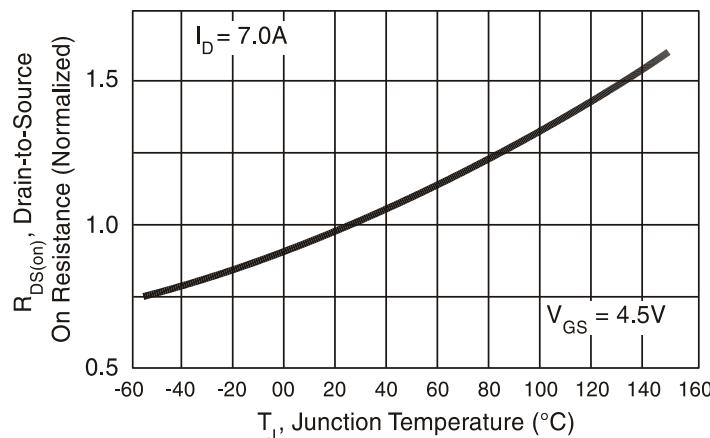
$Q_q$	Total Gate Charge ⑥	—	22	31	nC	$V_{\text{GS}} = 5.0\text{V}$ $V_{\text{DS}} = 16\text{V}$ $I_D = 7.0\text{A}$
$Q_{\text{gs}1}$	Pre-V <sub>th</sub> Gate-to-Source Charge	—	3.7	—		
$Q_{\text{gs}2}$	Post-V <sub>th</sub> Gate-to-Source Charge	—	1.4	—		
$Q_{\text{qd}}$	Gate-to-Drain Charge	—	6.8	—		
$Q_{\text{sw}}$	Switch Charge ( $Q_{\text{gs}2} + Q_{\text{qd}}$ ) ⑥	—	8.2	11.5	ns	$V_{\text{DD}} = 16\text{V}$ , $V_{\text{GS}} = 4.5\text{V}$ ② $I_D = 7.0\text{A}$ $R_G = 2\Omega$ Resistive Load
$Q_{\text{oss}}$	Output Charge ⑥	—	30	36		
$R_G$	Gate Resistance	0.5	—	1.7		
$t_{\text{d}(\text{on})}$	Turn-On Delay Time	—	16	—		
$t_r$	Rise Time	—	20	—		
$t_{\text{d}(\text{off})}$	Turn-Off Delay Time	—	38	—		$R_G = 2\Omega$
$t_f$	Fall Time	—	16	—		

**Diode Characteristics**

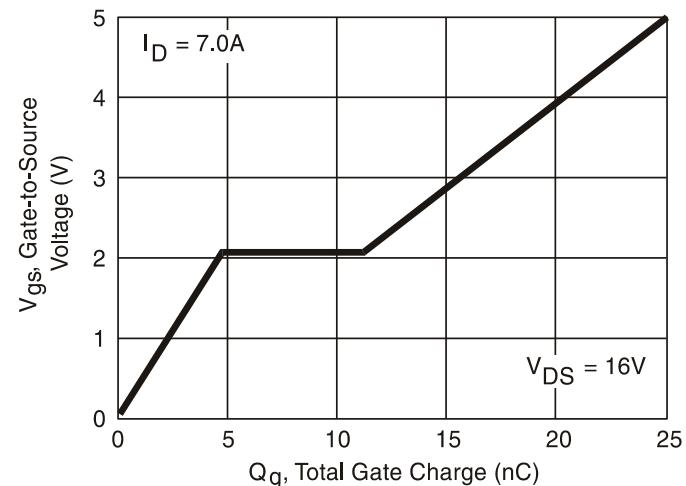
	Parameter	Min.	Typ.	Max.	Units	Conditions
$I_s$	Continuous Source Current (Body Diode) ①	—	—	2.5	A	MOSFET symbol showing the integral reverse p-n junction diode.
	Pulsed Source Current (Body Diode)	—	—	106		
$V_{\text{SD}}$	Diode Forward Voltage ⑥	—	—	1.2	V	$T_J = 25^\circ\text{C}$ , $I_s = 7.0\text{A}$ , $V_{\text{GS}} = 0\text{V}$
$Q_{\text{rr}}$	Reverse Recovery Charge ④	—	88	—	nC	di/dt = 700A/μs $V_{\text{DS}} = 16\text{V}$ , $V_{\text{GS}} = 0\text{V}$ , $I_s = 7.0\text{A}$
	Reverse Recovery Charge ④	—	55	—		di/dt = 700A/μs (with 10BQ040) $V_{\text{DS}} = 16\text{V}$ , $V_{\text{GS}} = 0\text{V}$ , $I_s = 7.0\text{A}$


**Notes:**

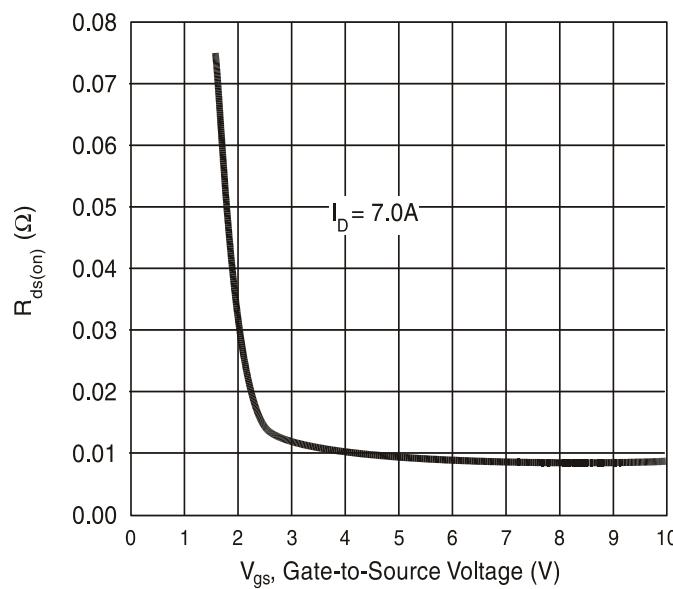
- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Pulse width  $\leq 300\mu\text{s}$ ; duty cycle  $\leq 2\%$ .
- ③ When mounted on 1" in square copper board,  $t < 10$  sec.
- ④ Typ = measured -  $Q_{\text{oss}}$
- ⑤  $R_\theta$  is measured at  $T_J$  of approximately  $90^\circ\text{C}$ .
- ⑥ Devices are 100% tested to these parameters.



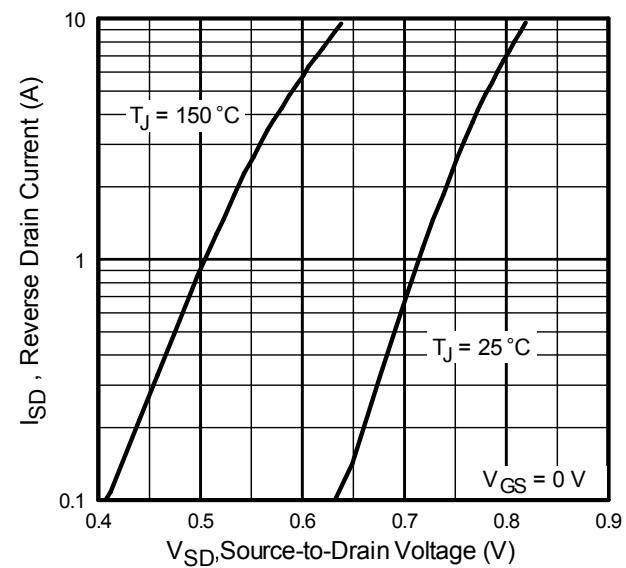
**Fig. 1** Normalized On-Resistance vs. Temperature



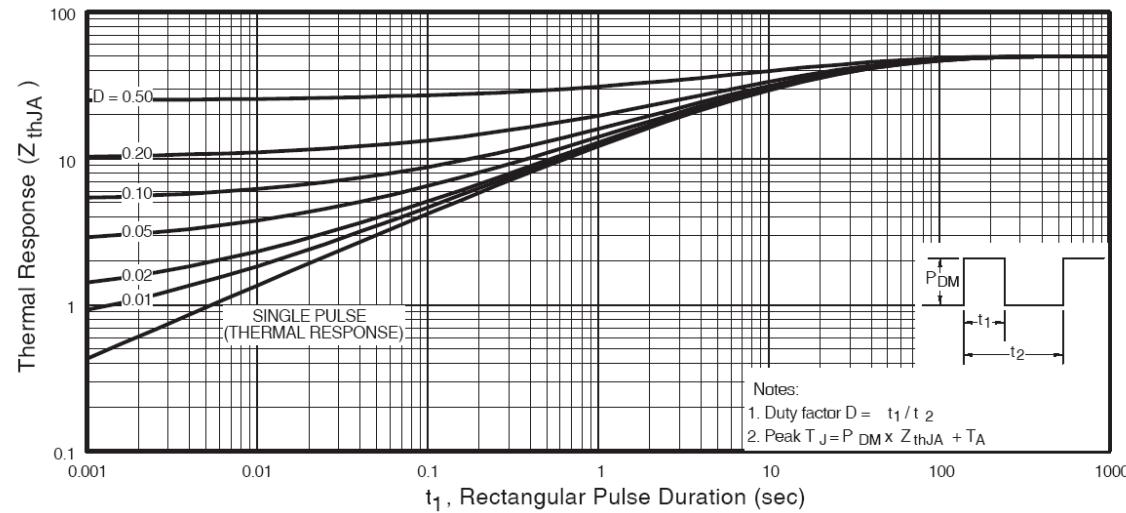
**Fig. 2** Typical Gate Charge vs. Gate-to-Source Voltage



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

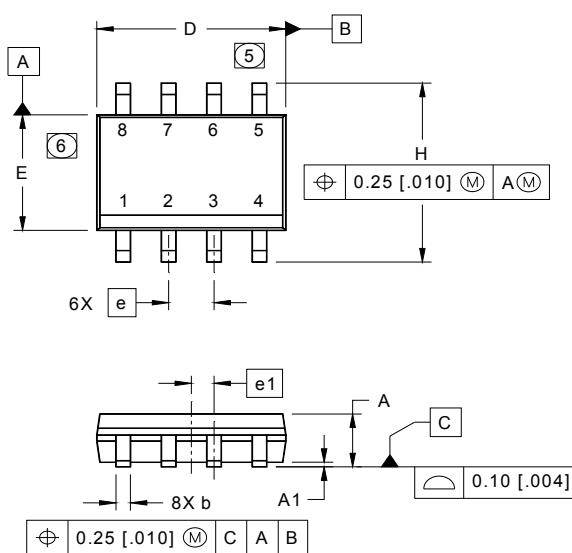


**Fig. 4** Typical Source-Drain Diode Forward Voltage

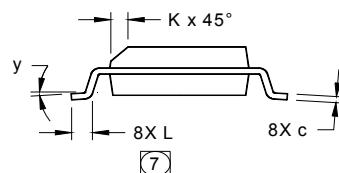


**Fig. 5.** Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

## SO-8 Package Outline (Dimensions are shown in millimeters (inches))

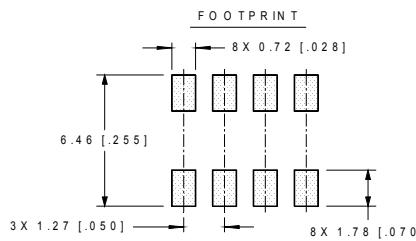


DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.0532	.0688	1.35	1.75
A1	.0040	.0098	0.10	0.25
b	.013	.020	0.33	0.51
c	.0075	.0098	0.19	0.25
D	.189	.1968	4.80	5.00
E	.1497	.1574	3.80	4.00
e	.050 BASIC		1.27	BASIC
e 1	.025 BASIC		0.635	BASIC
H	.2284	.2440	5.80	6.20
K	.0099	.0196	0.25	0.50
L	.016	.050	0.40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



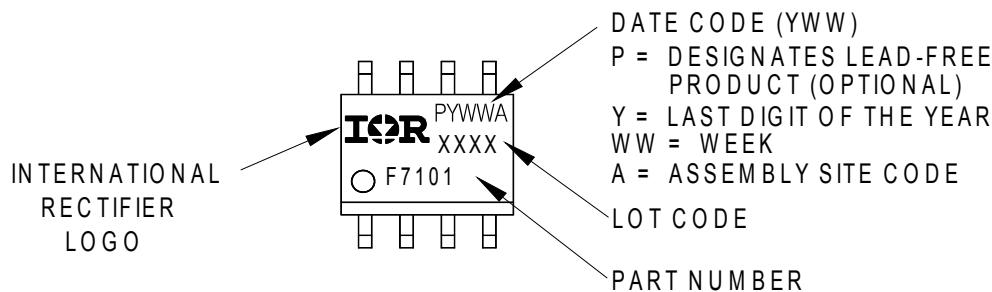
NOTES:

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 [0.006].
6. DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS.  
MOLD PROTRUSIONS NOT TO EXCEED 0.25 [0.10].
7. DIMENSION IS THE LENGTH OF LEAD FOR SOLDERING TO  
A SUBSTRATE.

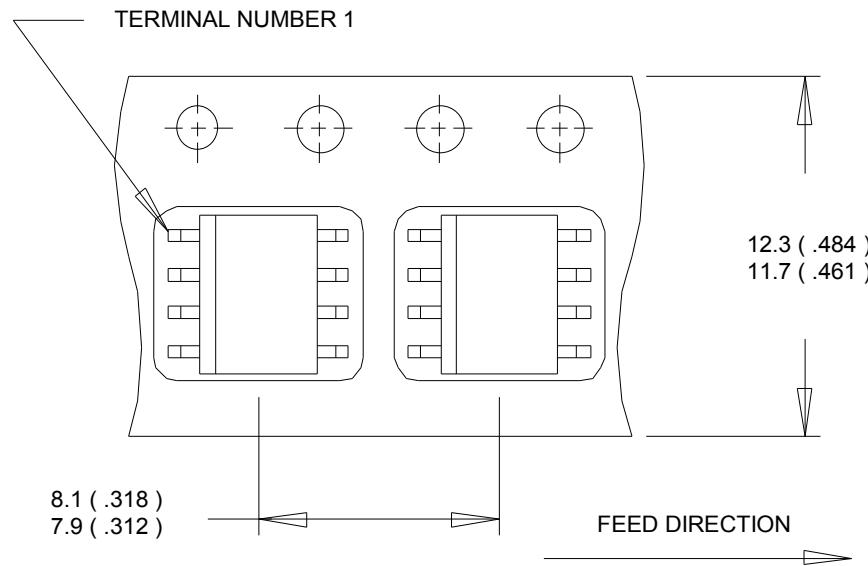


## SO-8 Part Marking Information

EXAMPLE: THIS IS AN IRF7101 (MOSFET)

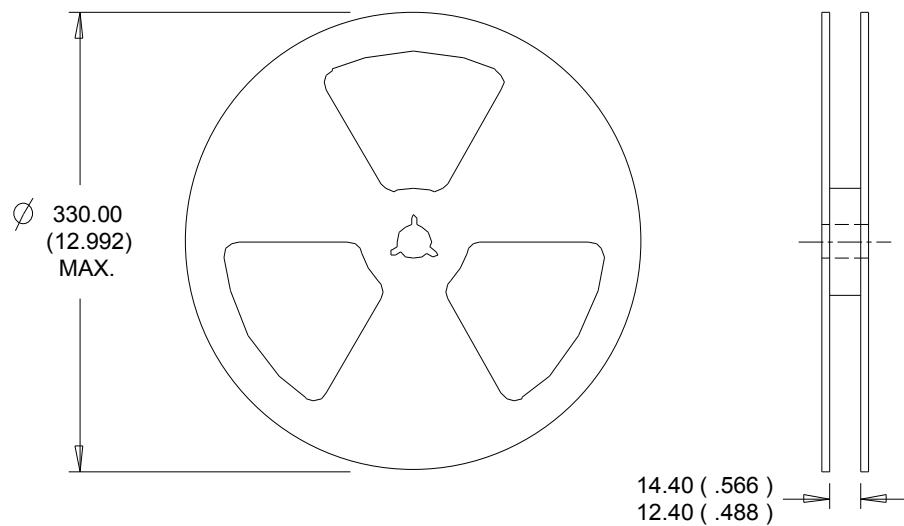


**SO-8 Tape and Reel** (Dimensions are shown in millimeters (inches))



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.

## Qualification Information

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

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

## Revision History

Date	Comments
08/23/2016	<ul style="list-style-type: none"> <li>Changed datasheet with Infineon logo - all pages.</li> <li>Corrected typo Qoss from typ/max "3.0nC/3.6nC" to "30nC/36nC" on page 2.</li> <li>Added disclaimer on last page.</li> </ul>

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