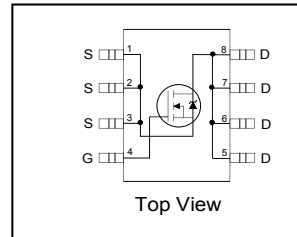


HEXFET® Chip-Set for DC-DC Converters

- 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

	IRF7805PbF
V_{DS}	30V
R_{DS(on)}	11mΩ
Q_g	31nC
Q_{sw}	11.5nC
Q_{oss}	36nC

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 _{DS}	Drain-Source Voltage	30	V
V _{GS}	Gate-to-Source Voltage	± 12	
I _D @ T _A = 25°C	Continuous Drain Current, V _{GS} @ 10V ③	13	A
I _D @ T _A = 70°C	Continuous Drain Current, V _{GS} @ 10V ③	10	
I _{DM}	Pulsed Drain Current ①	100	
P _D @ T _A = 25°C	Maximum Power Dissipation ③	2.5	W
P _D @ T _A = 70°C	Maximum Power Dissipation ③	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

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

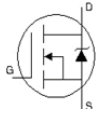
Static @ T_J = 25°C (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
V _{(BR)DSS}	Drain-to-Source Breakdown Voltage ⑥	30	—	—	V	V _{GS} = 0V, I _D = 250μA
R _{DS(on)}	Static Drain-to-Source On-Resistance ⑥	—	9.2	11	mΩ	V _{GS} = 4.5V, I _D = 7.0A ②
V _{GS(th)}	Gate Threshold Voltage ⑥	1.0	—	3.0	V	V _{DS} = V _{GS} , I _D = 250μA
I _{DSS}	Drain-to-Source Leakage Current	—	—	70	μA	V _{DS} = 30V, V _{GS} = 0V
		—	—	10		V _{DS} = 24V, V _{GS} = 0V
		—	—	150		V _{DS} = 24V, V _{GS} = 0V, T _J = 100°C
I _{GSS}	Gate-to-Source Forward Leakage	—	—	100	nA	V _{GS} = 12V
	Gate-to-Source Reverse Leakage	—	—	-100		V _{GS} = -12V

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

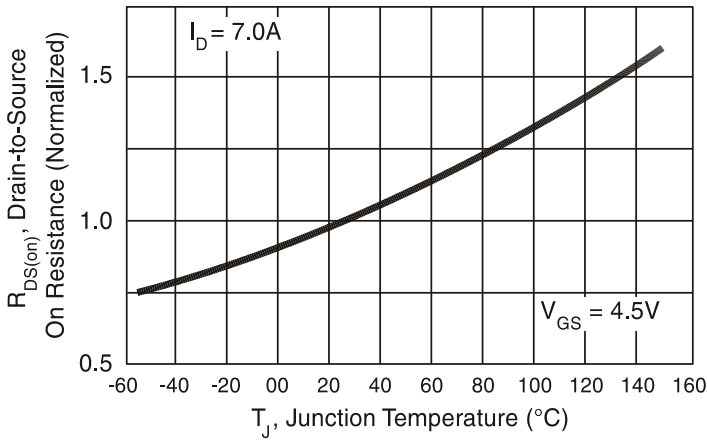
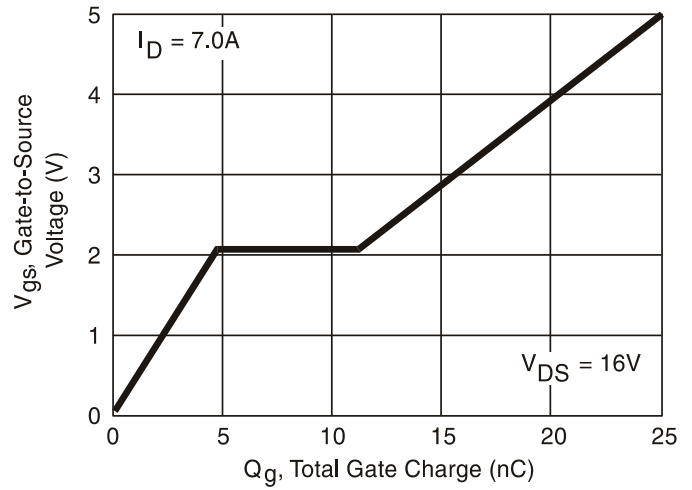
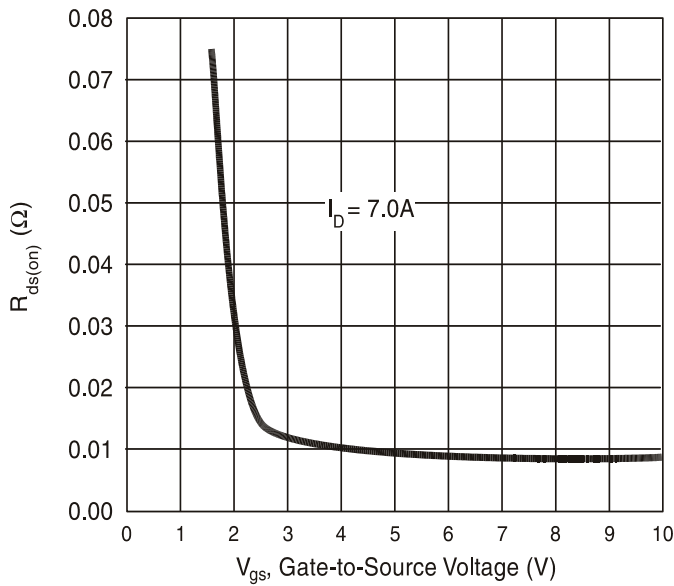
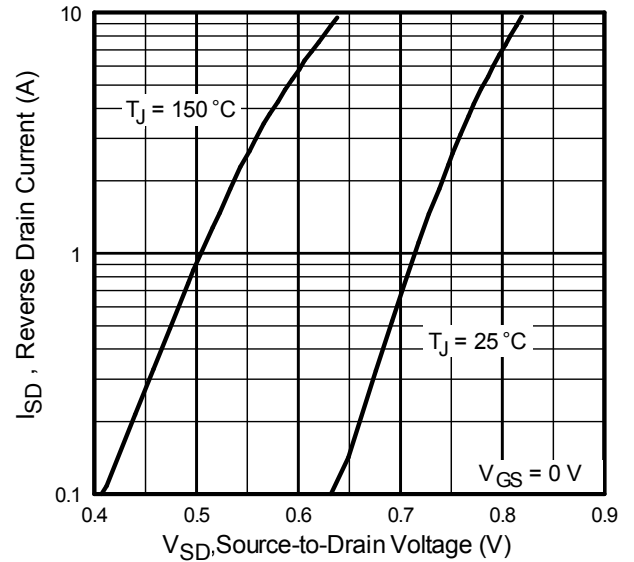
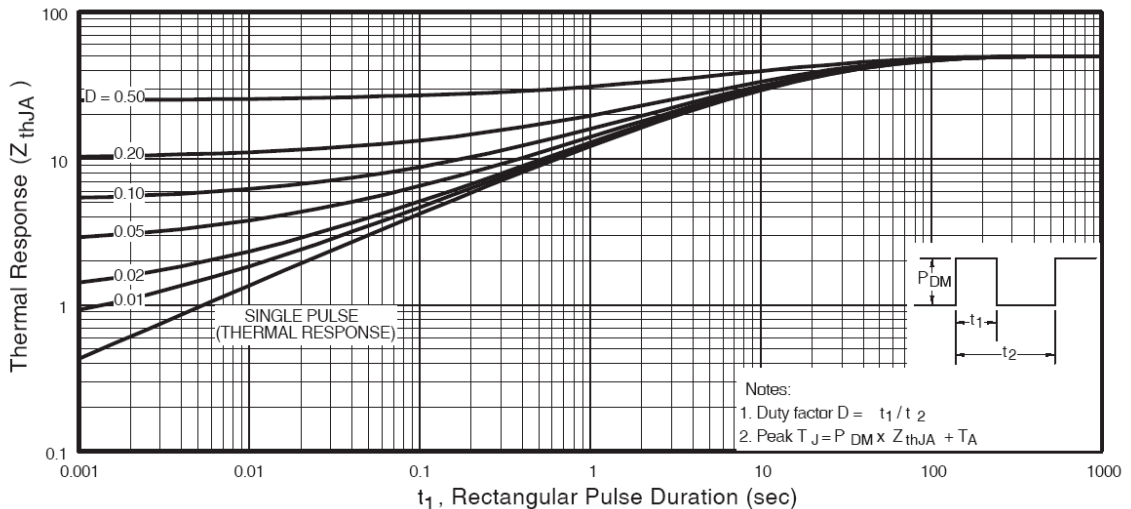
Q _g	Total Gate Charge ⑥	—	22	31	nC	V _{GS} = 5.0V V _{DS} = 16V I _D = 7.0A
Q _{gs1}	Pre -V _{th} Gate-to-Source Charge	—	3.7	—		
Q _{gs2}	Post-V _{th} Gate-to-Source Charge	—	1.4	—		
Q _{gd}	Gate-to-Drain Charge	—	6.8	—		
Q _{sw}	Switch Charge (Q _{gs2} + Q _{gd}) ⑥	—	8.2	11.5		
Q _{oss}	Output Charge ⑥	—	30	36	nC	V _{DS} = 16V, V _{GS} = 0V
R _G	Gate Resistance	0.5	—	1.7	Ω	
t _{d(on)}	Turn-On Delay Time	—	16	—	ns	V _{DD} = 16V, V _{GS} = 4.5V ② I _D = 7.0A R _G = 2Ω Resistive Load
t _r	Rise Time	—	20	—		
t _{d(off)}	Turn-Off Delay Time	—	38	—		
t _f	Fall Time	—	16	—		

Diode Characteristics

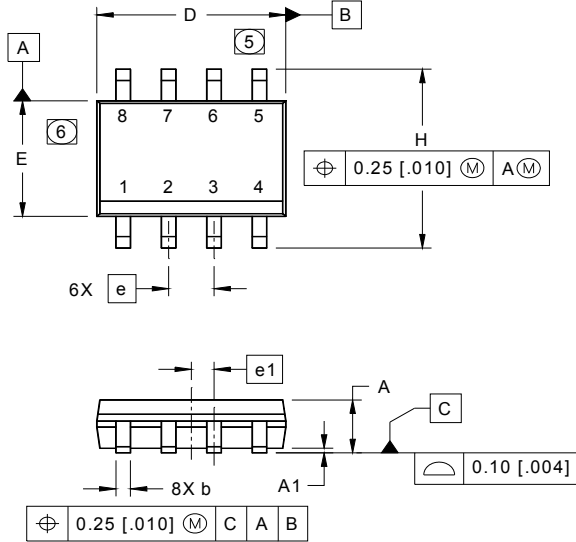
	Parameter	Min.	Typ.	Max.	Units	Conditions
I _S	Continuous Source Current (Body Diode)①	—	—	2.5	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I _{SM}	Pulsed Source Current (Body Diode)	—	—	106		
V _{SD}	Diode Forward Voltage⑥	—	—	1.2	V	T _J = 25°C, I _S = 7.0A, V _{GS} = 0V
Q _{rr}	Reverse Recovery Charge ④	—	88	—	nC	di/dt = 700A/μs V _{DS} = 16V, V _{GS} = 0V, I _S = 7.0A
Q _{rr}	Reverse Recovery Charge ④	—	55	—		di/dt = 700A/μs (with 10BQ040) V _{DS} = 16V, V _{GS} = 0V, I _S = 7.0A

Notes:

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

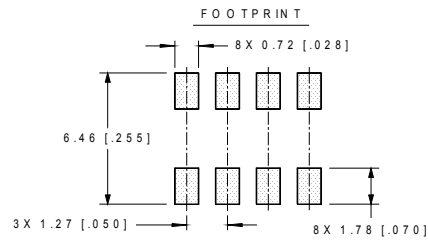

Fig. 1 Normalized On-Resistance vs. Temperature

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))



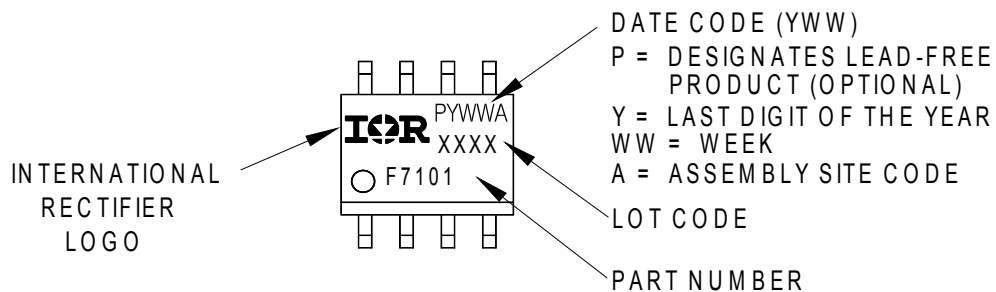
DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.0532	.0688	1.35	1.75
A1	.0040	.0098	0.10	0.25
b	.013	.020	0.33	0.51
c	.0075	.0098	0.19	0.25
D	.189	.1968	4.80	5.00
E	.1497	.1574	3.80	4.00
e	.050 BASIC		1.27 BASIC	
e 1	.025 BASIC		0.635 BASIC	
H	.2284	.2440	5.80	6.20
K	.0099	.0196	0.25	0.50
L	.016	.050	0.40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

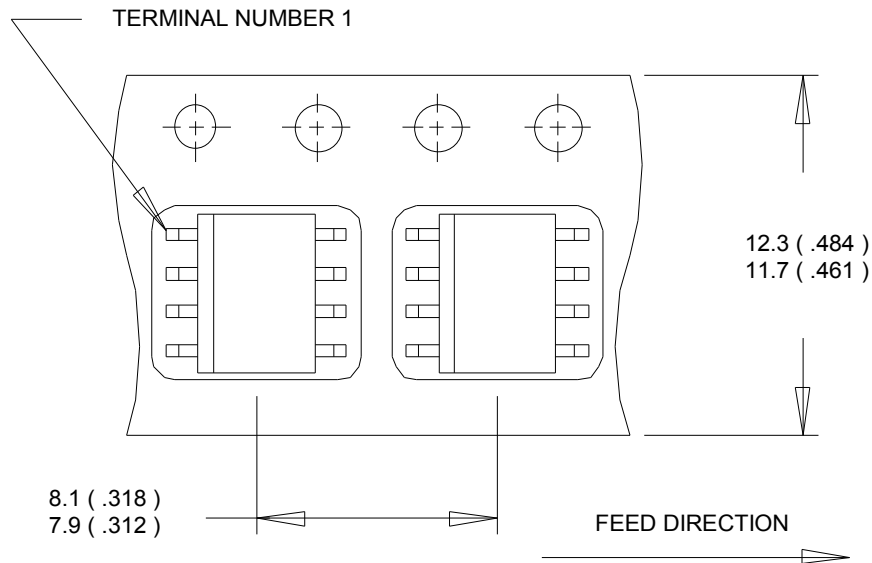
- NOTES:
1. DIMENSIONING & TOLERANCING PER ASME Y14.5M-1994.
 2. CONTROLLING DIMENSION: MILLIMETER
 3. DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES].
 4. OUTLINE CONFORMS TO JEDEC OUTLINE MS-012AA.
 5. DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.15 [.006].
 6. DIMENSION 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.



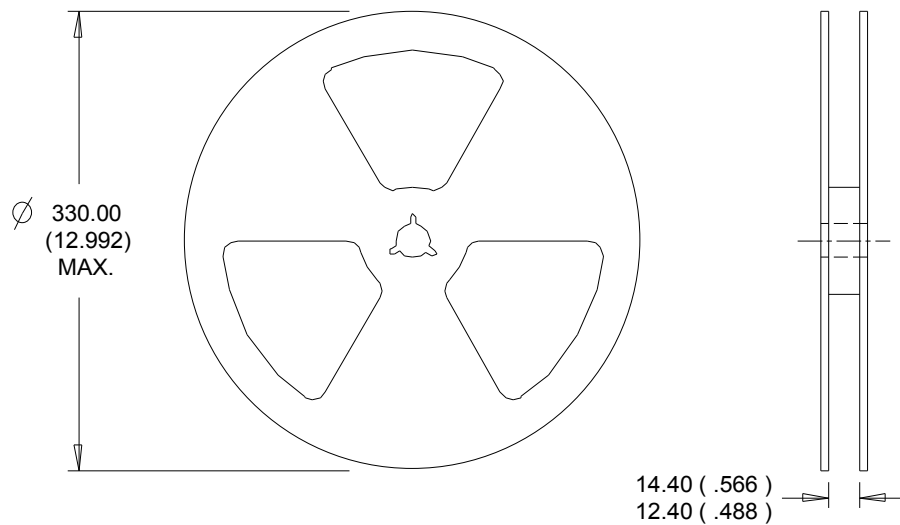
SO-8 Part Marking Information

EXAMPLE: THIS IS AN IRF7101 (MOSFET)



SO-8 Tape and Reel (Dimensions are shown in 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)†
RoHS Compliant	Yes	

† Applicable version of JEDEC standard at the time of product release.

Revision History

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

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