

IRF7811AVPbF

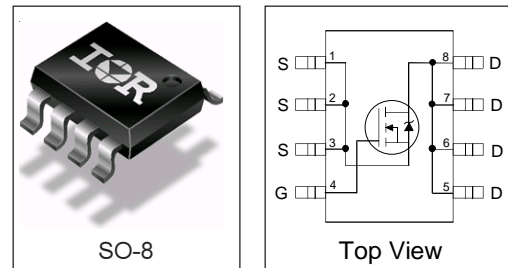
- N-Channel Application-Specific MOSFETs
- Ideal for CPU Core DC-DC Converters
- Low Conduction Losses
- Low Switching Losses
- Minimizes Parallel MOSFETs for high current applications
- 100% R_G Tested
- Lead-Free

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 it ideal for high efficiency DC-DC converters that power the latest generation of microprocessors.

The IRF7811AV has been optimized for all parameters that are critical in synchronous buck converters including R_{DS(on)}, gate charge and C_{dv/dt}-induced turn-on immunity. The IRF7811AV offers an extremely low combination of Q_{sw} & R_{DS(on)} for reduced losses in both control and synchronous FET applications.

The package is designed for vapor phase, infra-red, convection, or wave soldering techniques. Power dissipation of greater than 2W is possible in a typical PCB mount application.



DEVICE CHARACTERISTICS^⑤

	IRF7811AV
R _{DS(on)}	11 mΩ
Q _G	17 nC
Q _{sw}	6.7 nC
Q _{oss}	8.1 nC

Absolute Maximum Ratings

Parameter	Symbol	IRF7811AV	Units
Drain-to-Source Voltage	V _{DS}	30	V
Gate-to-Source Voltage	V _{GS}	±20	
Continuous Output Current (V _{GS} ≥ 4.5V)	I _D	T _A = 25°C	10.8
		T _L = 90°C	11.8
Pulsed Drain Current ^①	I _{DM}	100	
Power Dissipation ^③	P _D	T _A = 25°C	2.5
		T _L = 90°C	3.0
Junction & Storage Temperature Range	T _J , T _{STG}	-55 to 150	°C
Continuous Source Current (Body Diode)	I _S	2.5	A
Pulsed Source Current ^①	I _{SM}	50	

Thermal Resistance

Parameter	Symbol	Typ	Max	Units
Maximum Junction-to-Ambient ^{②⑥}	R _{θJA}	—	50	°C/W
Maximum Junction-to-Lead ^⑥	R _{θJL}	—	20	

Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Units	Conditions
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	30	—	—	V	$V_{GS} = 0V, I_D = 250\mu A$
Static Drain-to-Source On-Resistance	$R_{DS(on)}$	—	11	14	m Ω	$V_{GS} = 4.5V, I_D = 15A$ ②
Gate Threshold Voltage	$V_{GS(th)}$	1.0	—	3.0	V	$V_{DS} = V_{GS}, I_D = 250\mu A$
Drain-to-Source Leakage Current	I_{DSS}	—	—	50	μA	$V_{DS} = 30V, V_{GS} = 0V$
		—	—	20	μA	$V_{DS} = 24V, V_{GS} = 0V$
		—	—	100	mA	$V_{DS} = 24V, V_{GS} = 0V, T_J = 100^\circ C$
Gate-to-Source Leakage Current	I_{GSS}	—	—	± 100	nA	$V_{GS} = \pm 20V$
Total Gate Charge, Control FET	Q_g	—	17	26	nC	$V_{DS} = 24V, I_D = 15A, V_{GS} = 5.0V$
Total Gate Charge, Synch FET	Q_g	—	14	21	nC	$V_{GS} = 5.0V, V_{DS} < 100mV$
Pre-V _{th} Gate-to-Source Charge	Q_{gs1}	—	3.4	—	nC	$V_{DS} = 16V, I_D = 15A$
Post-V _{th} Gate-to-Source Charge	Q_{gs2}	—	1.6	—	nC	
Gate-to-Drain ("Miller") Charge	Q_{gd}	—	5.1	—	nC	
Switch Charge ($Q_{gs2} + Q_{gd}$)	Q_{SW}	—	6.7	—	nC	
Output Charge	Q_{OSS}	—	8.1	12	nC	
Gate Resistance	R_G	0.5	—	4.4	Ω	$V_{DS} = 16V, V_{GS} = 0$
Turn-On Delay Time	$t_{d(on)}$	—	8.6	—	ns	$V_{DD} = 16V$ $I_D = 15A$ $V_{GS} = 5.0V$ Clamped Inductive Load
Rise Time	t_r	—	21	—	ns	
Turn-Off Delay Time	$t_{d(off)}$	—	43	—	ns	
Fall Time	t_f	—	10	—	ns	
Input Capacitance	C_{iss}	—	1801	—	pF	$V_{GS} = 0V$
Output Capacitance	C_{oss}	—	723	—	pF	$V_{DS} = 10V$
Reverse Transfer Capacitance	C_{rss}	—	46	—	pF	

Diode Characteristics

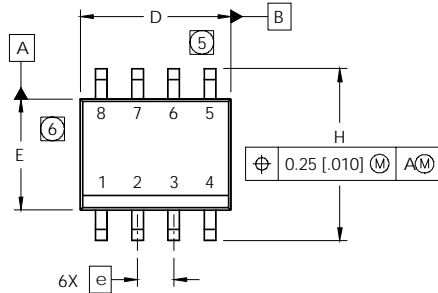
Parameter	Symbol	Min	Typ	Max	Units	Conditions
Diode Forward Voltage	V_{SD}	—	—	1.3	V	$T_J = 25^\circ C, I_S = 15A$ ②, $V_{GS} = 0V$
Reverse Recovery Charge ④	Q_{rr}	—	50	—	nC	$di/dt = 700A/\mu s$ $V_{DD} = 16V, V_{GS} = 0V, I_D = 15A$
Reverse Recovery Charge (with Parallel Schottsky) ④	Q_{rr}	—	43	—	nC	$di/dt = 700A/\mu s$, (with 10BQ040) $V_{DD} = 16V, V_{GS} = 0V, I_D = 15A$

Notes:

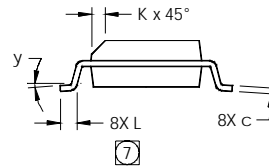
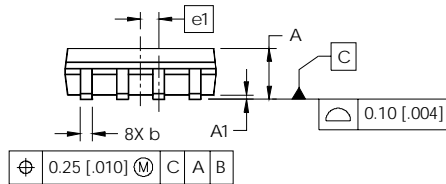
- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Pulse width $\leq 400 \mu s$; duty cycle $\leq 2\%$.
- ③ When mounted on 1 inch square copper board, $t < 10$ sec.
- ④ Typ = measured - Q_{oss}
- ⑤ Typical values of $R_{DS(on)}$ measured at $V_{GS} = 4.5V$, Q_g , Q_{SW} and Q_{OSS} measured at $V_{GS} = 5.0V$, $I_F = 15A$.
- ⑥ R_{θ} is measured at T_J approximately $90^\circ C$

SO-8 Package Outline

Dimensions are shown in millimeters (inches)



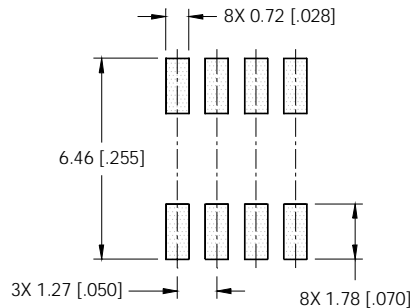
DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.0532	.0688	1.35	1.75
A1	.0040	.0098	0.10	0.25
b	.013	.020	0.33	0.51
c	.0075	.0098	0.19	0.25
D	.189	.1968	4.80	5.00
E	.1497	.1574	3.80	4.00
e	.050 BASIC		1.27 BASIC	
e1	.025 BASIC		0.635 BASIC	
H	.2284	.2440	5.80	6.20
K	.0099	.0196	0.25	0.50
L	.016	.050	0.40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



NOTES:

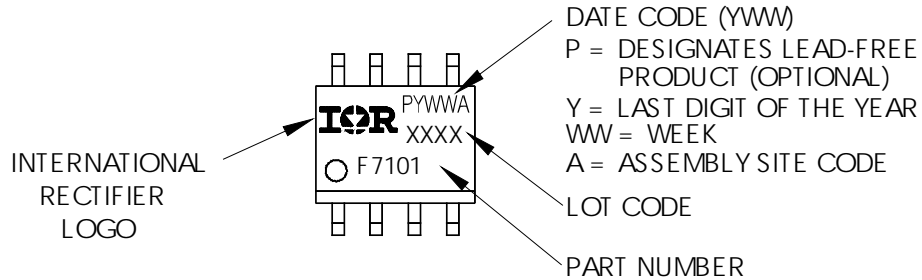
1. DIMENSIONING & TOLERANCING PER ASME Y14.5M-1994.
2. CONTROLLING DIMENSION: MILLIMETER
3. DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES].
4. OUTLINE CONFORMS TO JEDEC OUTLINE MS-012AA.
5. DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.15 [0.006].
6. DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.25 [0.010].
7. DIMENSION IS THE LENGTH OF LEAD FOR SOLDERING TO A SUBSTRATE.

FOOTPRINT



SO-8 Part Marking

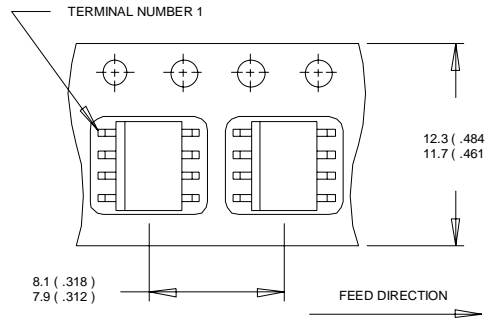
EXAMPLE: THIS IS AN IRF7101 (MOSFET)



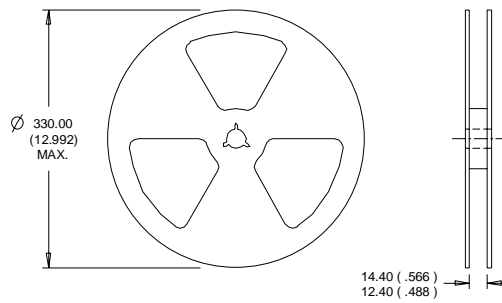
IRF7811AVPbF

International
IOR Rectifier

SO-8 Tape and Reel



- 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.

Data and specifications subject to change without notice.
This product has been designed and qualified for the Consumer market.

International
IOR Rectifier