

PD - 93810  
 PD - 93811

International  
**IR** Rectifier

# IRF7809A/IRF7811A

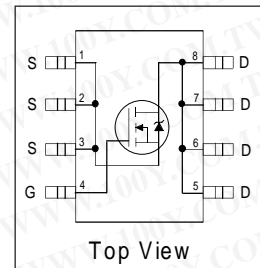
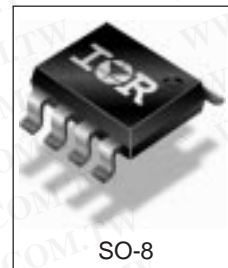
PROVISIONAL DATASHEET

- 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

## HEXFET® Chipset for DC-DC Converters

### Description

These new devices employ advanced HEXFET® Power MOSFET technology to achieve an unprecedented balance of on-resistance and gate charge. The reduced conduction and switching losses make them ideal for high efficiency DC-DC converters that power the latest generation of microprocessors.



Both the IRF7809A and IRF7811A have been optimized and are 100% tested 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 IRF7809A offers particularly low  $R_{DS(on)}$  and high  $C_{dv/dt}$  immunity for synchronous FET applications. The IRF7811A offers an extremely low combination of  $Q_{sw}$  &  $R_{DS(on)}$  for reduced losses in control FET applications.

### DEVICE RATINGS

	IRF7809A	IRF7811A
$V_{DS}$	30V	28V
$R_{DS(on)}$	8.5 mΩ	12 mΩ
$Q_G$	73 nC	23 nC
$Q_{sw}$	22.5 nC	7 nC
$Q_{oss}$	30 nC	31 nC

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.

### Absolute Maximum Ratings

Parameter	Symbol	IRF7809A	IRF7811A	Units
Drain-Source Voltage	$V_{DS}$	30	28	V
Gate-Source Voltage	$V_{GS}$	±12		
Continuous Drain or Source Current ( $V_{GS} \geq 4.5V$ )	$T_A = 25^\circ C$	14.5	11.4	A
	$T_L = 90^\circ C$	14.2	11.2	
Pulsed Drain Current①	$I_{DM}$	100	100	
Power Dissipation	$T_A = 25^\circ C$	2.5		W
	$T_L = 90^\circ C$	2.4		
Junction & Storage Temperature Range	$T_J, T_{STG}$	-55 to 150		°C
Continuous Source Current (Body Diode)	$I_S$	2.5	2.5	A
Pulsed Source Current①	$I_{SM}$	50	50	

### Thermal Resistance

Parameter	Symbol	Max.	Units
Maximum Junction-to-Ambient③	$R_{\theta JA}$	50	°C/W
Maximum Junction-to-Lead	$R_{\theta JL}$	25	°C/W

www.irf.com

1

# IRF7809A/IRF7811A

International  
**IR** Rectifier

Electrical Characteristics		IRF7809A			IRF7811A			Units	Conditions
Parameter		Min	Typ	Max	Min	Typ	Max		
Drain-to-Source Breakdown Voltage*	$V_{DS}$	30	-	-	28	-	-	V	$V_{GS} = 0V, I_D = 250\mu A$
Static Drain-Source on Resistance*	$R_{DS(on)}$		7	8.5		10	12	m $\Omega$	$V_{GS} = 4.5V, I_D = 15A$ ②
Gate Threshold Voltage*	$V_{GS(th)}$	1.0			1.0			V	$V_{DS} = V_{GS}, I_D = 250\mu A$
Drain-Source Leakage Current*	$I_{DSS}$			30			30	$\mu A$	$V_{DS} = 24V, V_{GS} = 0$
				150			150		$V_{DS} = 24V, V_{GS} = 0,$ $T_j = 100^\circ C$
Gate-Source Leakage Current*	$I_{GSS}$			$\pm 100$			$\pm 100$	nA	$V_{GS} = \pm 12V$
Total Gate Chg Cont FET*	$Q_G$		61	75		19	23	nC	$V_{GS} = 5V, I_D = 15A, V_{DS} = 16V$
Total Gate Chg Sync FET*	$Q_G$		55	73		17	20.5		$V_{GS} = 5V, V_{DS} < 100mV$
Pre-Vth Gate-Source Charge	$Q_{GS1}$		14			2.7			$V_{DS} = 16V, I_D = 15A$
Post-Vth Gate-Source Charge	$Q_{GS2}$		3.5			1.3			
Gate to Drain Charge	$Q_{GD}$		13.5			4.5			
Switch Chg( $Q_{GS2} + Q_{GD}$ )*	$Q_{sw}$		17	22.5		5.8	7.0		
Output Charge*	$Q_{oss}$		25	30		26	31		$V_{DS} = 16V, V_{GS} = 0$
Gate Resistance	$R_G$		1.1			1.8		$\Omega$	
Turn-on Delay Time	$t_{d(on)}$		19			8		ns	$V_{DD} = 16V, I_D = 15A$
Rise Time	$t_r$		9			4			$V_{GS} = 5V$
Turn-off Delay Time	$t_{d(off)}$		32			16			Clamped Inductive Load
Fall Time	$t_f$		12			8			
Input Capacitance	$C_{iss}$	-	7300	-	-	1800	-	pF	$V_{DS} = 16V, V_{GS} = 0$
Output Capacitance	$C_{oss}$	-	900	-	-	900	-		
Reverse Transfer Capacitance	$C_{rss}$	-	350	-	-	60	-		

## Source-Drain Rating & Characteristics

Parameter		Min	Typ	Max	Min	Typ	Max	Units	Conditions
Diode Forward Voltage*	$V_{SD}$			1.0			1.0	V	$I_S = 15A$ ②, $V_{GS} = 0V$
Reverse Recovery Charge④	$Q_{rr}$		94			82		nC	$di/dt \sim 700A/\mu s$ $V_{DS} = 16V, V_{GS} = 0V, I_S = 15A$
Reverse Recovery Charge (with Parallel Schottky)④	$Q_{rr(s)}$		87			74		nC	$di/dt = 700A/\mu s$ (with 10BQ040) $V_{DS} = 16V, V_{GS} = 0V, I_S = 15A$

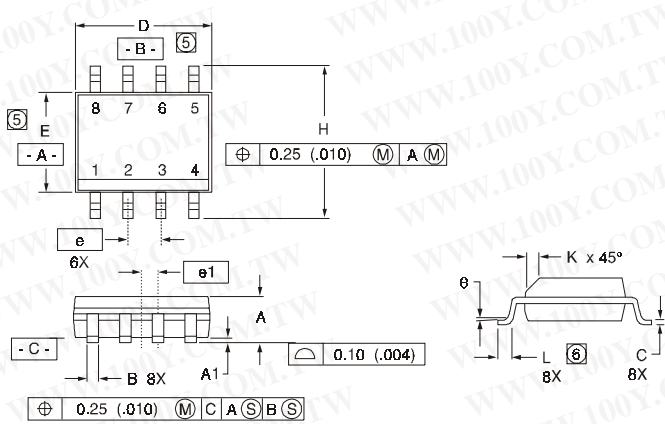
### Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature.
  - ② Pulse width  $\leq 300 \mu s$ ; duty cycle  $\leq 2\%$ .
  - ③ When mounted on 1 inch square copper board,  $t < 10$  sec.
  - ④ Typ = measured -  $Q_{oss}$
- \* Devices are 100% tested to these parameters.

International  
**IOR** Rectifier

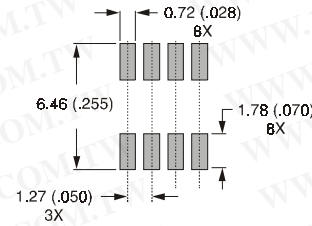
# IRF7809A/IRF7811A

## SO-8 Package Outline



DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.0532	.0688	1.35	1.75
A1	.0040	.0098	0.10	0.25
B	.014	.018	0.36	0.46
C	.0075	.0098	0.19	0.25
D	.189	.196	4.80	4.98
E	.150	.157	3.81	3.99
e	.050 BASIC		1.27 BASIC	
e1	.025 BASIC		0.635 BASIC	
H	.2284	.2440	5.80	6.20
K	.011	.019	0.28	0.48
L	.16	.050	0.41	1.27
$\theta$	0°	8°	0°	8°

### RECOMMENDED FOOTPRINT

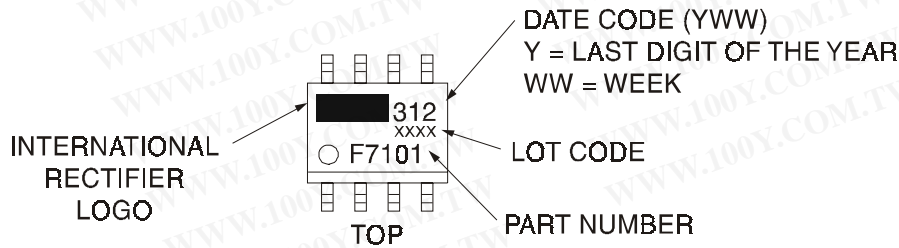


### NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M-1982.
2. CONTROLLING DIMENSION: INCH.
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 0.25 (.006).
- (6) DIMENSIONS IS THE LENGTH OF LEAD FOR SOLDERING TO A SUBSTRATE..

## Part Marking Information

EXAMPLE: THIS IS AN IRF7101

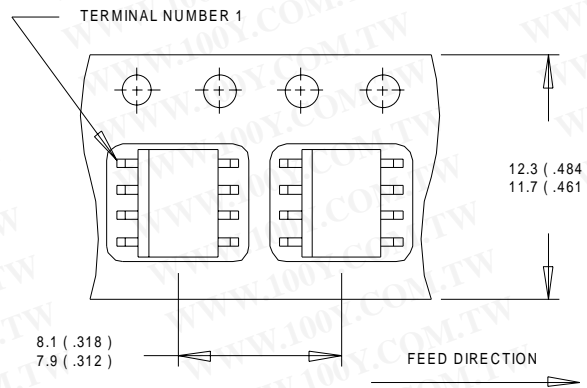


# IRF7809A/IRF7811A

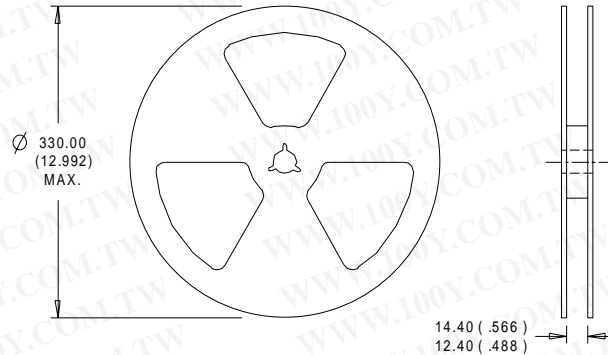
International  
**IR** Rectifier

## SO-8 Tape & Reel Information

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.

International  
**IR** Rectifier

**WORLD HEADQUARTERS:** 233 Kansas St., El Segundo, California 90245, Tel: (310) 252-7105

**IR GREAT BRITAIN:** Hurst Green, Oxted, Surrey RH8 9BB, UK Tel: ++ 44 1883 732020

**IR CANADA:** 15 Lincoln Court, Brampton, Ontario L6T 3Z2, Tel: (905) 453 2200

**IR GERMANY:** Saalburgstrasse 157, 61350 Bad Homburg Tel: ++ 49 6172 96590

**IR ITALY:** Via Liguria 49, 10071 Borgaro, Torino Tel: ++ 39 11 451 0111

**IR JAPAN:** K&H Bldg., 2F, 3-30-4 Nishi-Ikebukuro 3-Chome, Toshima-Ku, Tokyo 171-0021 Japan Tel: 81 3 3983 0086

**IR SOUTHEAST ASIA:** 1 Kim Seng Promenade, Great World City West Tower, 13-11, Singapore 237994 Tel: 65 838 4630

**IR TAIWAN :** 16F, Suite B, 319, Sec.2, Tun Hwa South Road, Taipei 10673, Taiwan, R.O.C. Tel : 886-2-2739-4230

<http://www.irf.com/> Data and specifications subject to change without notice. 1/00