PD - 93810
PD - 93811

International
IOR Rectifier

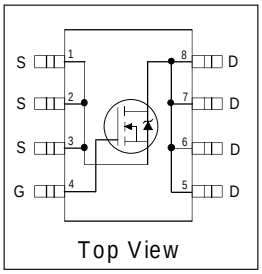
IRF7809A/IRF7811A

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


SO-8



Top View

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 Cdv/dt-induced turn-on immunity. The IRF7809A offers particulary low $R_{DS(on)}$ and high Cdv/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.

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 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

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	T_A = 25°C	I_D	14.5	11.4	A
Current ($V_{GS} \geq 4.5V$)	T_L = 90°C		14.2	11.2	
Pulsed Drain Current①		I_{DM}	100	100	
Power Dissipation	T_A = 25°C	P_D	2.5		W
	T_L = 90°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		Max.	Units
Maximum Junction-to-Ambient③	$R_{\theta JA}$	50	°C/W
Maximum Junction-to-Lead	$R_{\theta JL}$	25	°C/W

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Electrical Characteristics

Parameter		IRF7809A			IRF7811A			Units	Conditions
		Min	Typ	Max	Min	Typ	Max		
Drain-to-Source Breakdown Voltage*	BV_{DSS}	30	–	–	28	–	–	V	V_{GS} = 0V, I_D = 250µA
Static Drain-Source on Resistance*	$R_{DS(on)}$		7	8.5		10	12	mΩ	V_{GS} = 4.5V, I_D = 15A②
Gate Threshold Voltage*	$V_{GS(th)}$	1.0			1.0			V	V_{DS} = V_{GS}, I_D = 250µA
Drain-Source Leakage Current*	I_{DSS}			30			30	µA	V_{DS} = 24V, V_{GS} = 0
				150			150		V_{DS} = 24V, V_{GS} = 0, Tj = 100°C
Gate-Source Leakage Current*	I_{GSS}			±100			±100	nA	V_{GS} = ±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		Ω	
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	–		

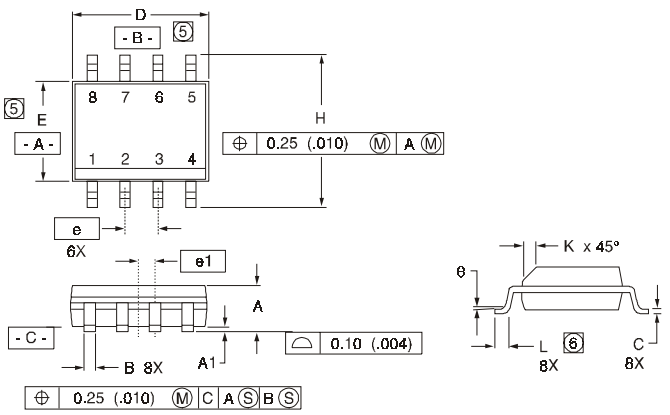
Source-Drain Rating & Characteristics

Parameter		Min	Typ	Max	Min	Typ	Max	Units	Conditions
Diode Forward Voltage*	V_{SD}			1.0			1.0	V	I_S = 15A②, V_{GS} = 0V
Reverse Recovery Charge④	Q_{rr}		94			82		nC	di/dt ~ 700A/µs V_{DS} = 16V, V_{GS} = 0V, I_S = 15A
Reverse Recovery Charge (with Parallel Schottky)④	$Q_{rr(s)}$		87			74			di/dt = 700A/µs (with 10BQ040) V_{DS} = 16V, V_{GS} = 0V, I_S = 15A

Notes:

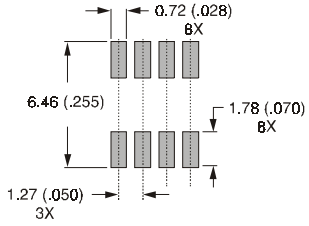
① Repetitive rating; pulse width limited by max. junction temperature.
② Pulse width ≤ 300 µs; duty cycle ≤ 2%.
③ When mounted on 1 inch square copper board, t < 10 sec.
④ Typ = measured - Q_{oss}
* Devices are 100% tested to these parameters.

SO-8 Package Outline



	INCHES		MILLIMETERS	
DIM	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
θ	0°	8°	0°	8°

RECOMMENDED FOOTPRINT

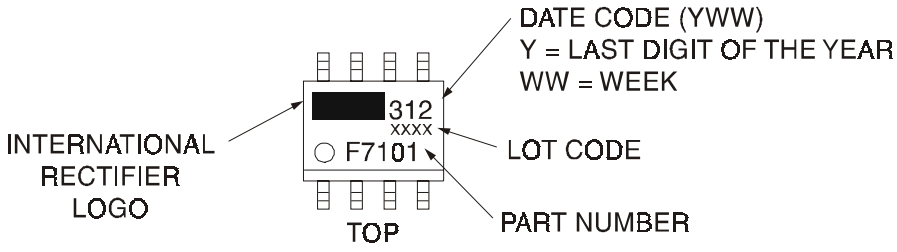


NOTES:

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..

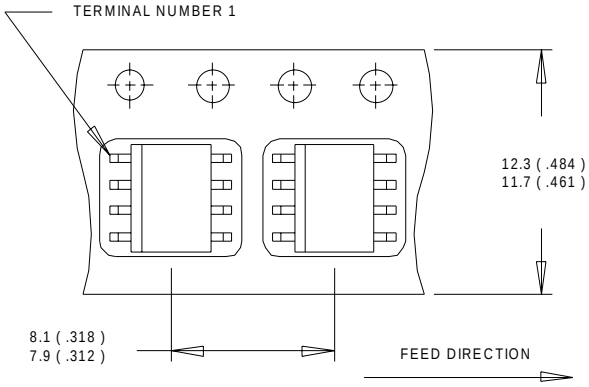
Part Marking Information

EXAMPLE: THIS IS AN IRF7101

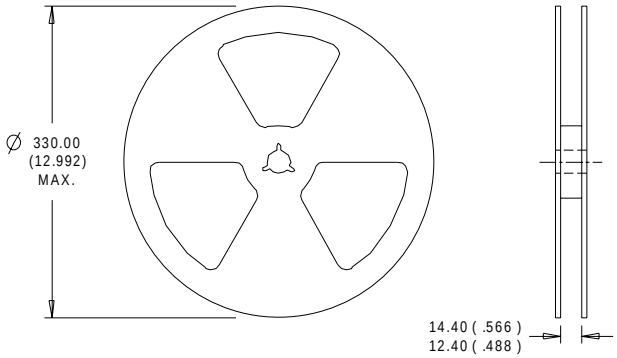


SO-8 Tape & Reel Information

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
IOR Rectifier

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