

International IOR Rectifier

PD-94009

IRF7811AV

- 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

Description

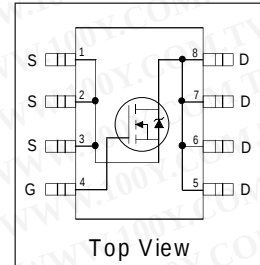
This new device employs advanced HEXFET Power MOSFET technology to achieve an unprecedented balance of on-resistance and gate charge. The reduced conduction and switching losses make it ideal for high efficiency DC-DC converters that power the latest generation of microprocessors.

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.



SO-8



Top View

DEVICE CHARACTERISTICS ⑤

	IRF7811AV
$R_{DS(on)}$	11mΩ
Q_G	17nC
Q_{sw}	6.7nC
Q_{oss}	8.1nC

Absolute Maximum Ratings

Parameter	Symbol	IRF7811AV	Units
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	
Continuous Drain or Source Current ($V_{GS} \geq 4.5V$)	$T_A = 25^\circ C$	I_D	10.8
	$T_L = 90^\circ C$		11.8
Pulsed Drain Current①	I_{DM}	100	A
Power Dissipation③	$T_A = 25^\circ C$	P_D	2.5
	$T_L = 90^\circ C$		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 Current①	I_{SM}	50	

Thermal Resistance

Parameter		Max.	Units
Maximum Junction-to-Ambient③	$R_{\theta JA}$	50	°C/W
Maximum Junction-to-Lead	$R_{\theta JL}$	20	°C/W

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Electrical Characteristics

Parameter		Min	Typ	Max	Units	Conditions
Drain-to-Source Breakdown Voltage	V_{DS}	30	—	—	V	$V_{GS} = 0V, I_D = 250\mu A$
Static Drain-Source on Resistance	$R_{DS(on)}$		11	14	m Ω	$V_{GS} = 4.5V, I_D = 15A$
Gate Threshold Voltage	$V_{GS(th)}$	1.0			V	$V_{DS} = V_{GS}, I_D = 250\mu A$
Drain-Source Leakage Current	I_{DSS}			20	μA	$V_{DS} = 24V, V_{GS} = 0$
				100		$V_{DS} = 24V, V_{GS} = 0, T_j = 100^\circ C$
Gate-Source Leakage Current	I_{GSS}			± 100	nA	$V_{GS} = \pm 20V$
Total Gate Chg Cont FET	Q_G		17	26	nC	$V_{GS} = 5V, I_D = 15A, V_{DS} = 24V$
Total Gate Chg Sync FET	Q_G		14	21		$V_{GS} = 5V, V_{DS} < 100mV$
Pre-Vth Gate-Source Charge	Q_{GS1}		3.4			$V_{DS} = 16V, I_D = 15A$
Post-Vth Gate-Source Charge	Q_{GS2}		1.6			
Gate to Drain Charge	Q_{GD}		5.1			
Switch Chg($Q_{GS2} + Q_{GD}$)	Q_{SW}		6.7			
Output Charge	Q_{OSS}		8.1	12		$V_{DS} = 16V, V_{GS} = 0$
Gate Resistance	R_G		2.2		Ω	
Turn-on Delay Time	$t_{d(on)}$		8.6		ns	$V_{DD} = 16V, I_D = 15A$
Rise Time	t_r		21			$V_{GS} = 5V$
Turn-off Delay Time	$t_{d(off)}$		43			Clamped Inductive Load
Fall Time	t_f		10			
Input Capacitance	C_{iss}	—	1801	—	pF	$V_{DS} = 16V, V_{GS} = 0$
Output Capacitance	C_{oss}	—	723	—		
Reverse Transfer Capacitance	C_{rss}	—	46	—		

Source-Drain Rating & Characteristics

Parameter		Min	Typ	Max	Units	Conditions
Diode Forward Voltage	V_{SD}			1.3	V	$I_S = 15A, V_{GS} = 0V$
Reverse Recovery Charge④	Q_{rr}		50		nC	$di/dt \sim 700A/\mu s$ $V_{DS} = 16V, V_{GS} = 0V, I_S = 15A$
Reverse Recovery Charge (with Parallel Schottky)④	$Q_{rr(s)}$		43		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 $\leq 400\mu s$; 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 $V_{GS} = 5.0V$, $I_F = 15A$.

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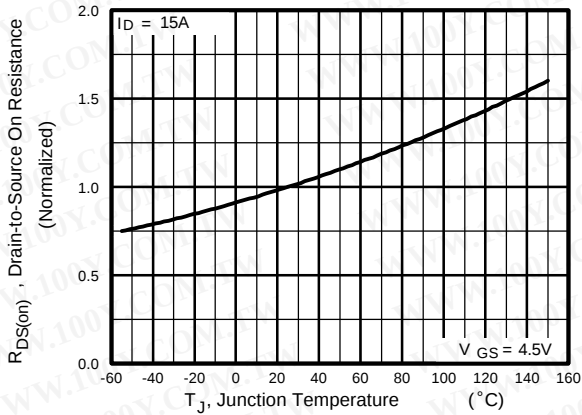


Figure 1. Normalized On-Resistance vs. Temperature

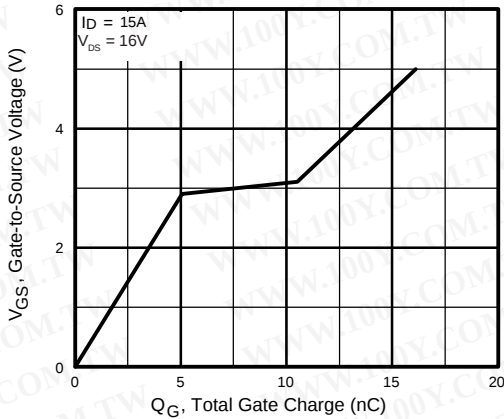


Figure 2. Gate-to-Source Voltage vs. Typical Gate Charge

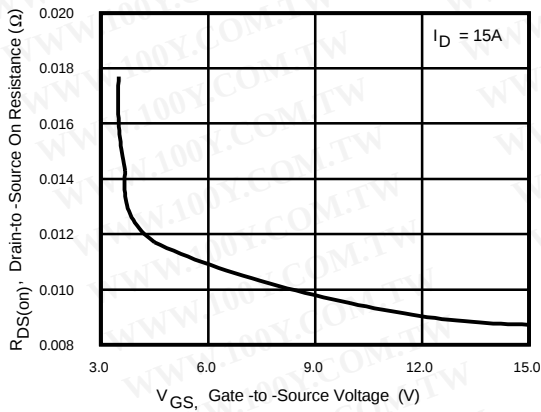


Figure 3. Typical Rds(on) vs. Gate-to-Source Voltage

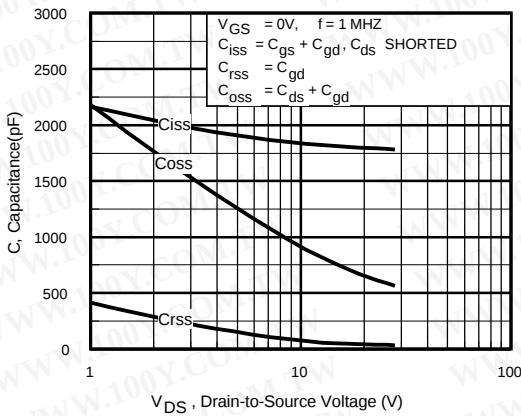


Figure 4. Typical Capacitance vs. Drain-to-Source Voltage

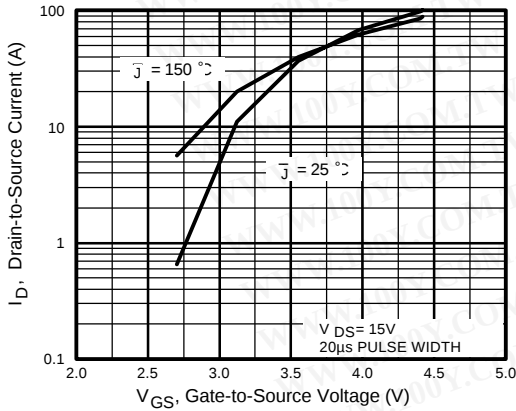


Figure 5. Typical Transfer Characteristics

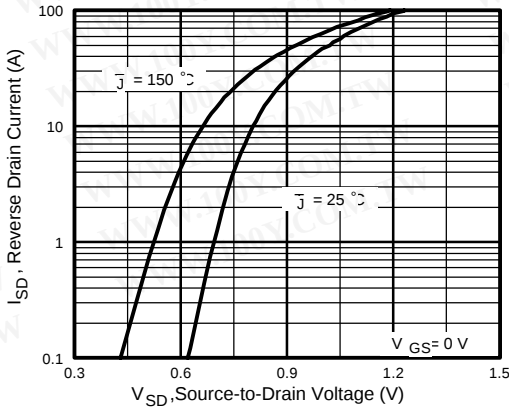


Figure 6. Typical Source-Drain Diode Forward Voltage

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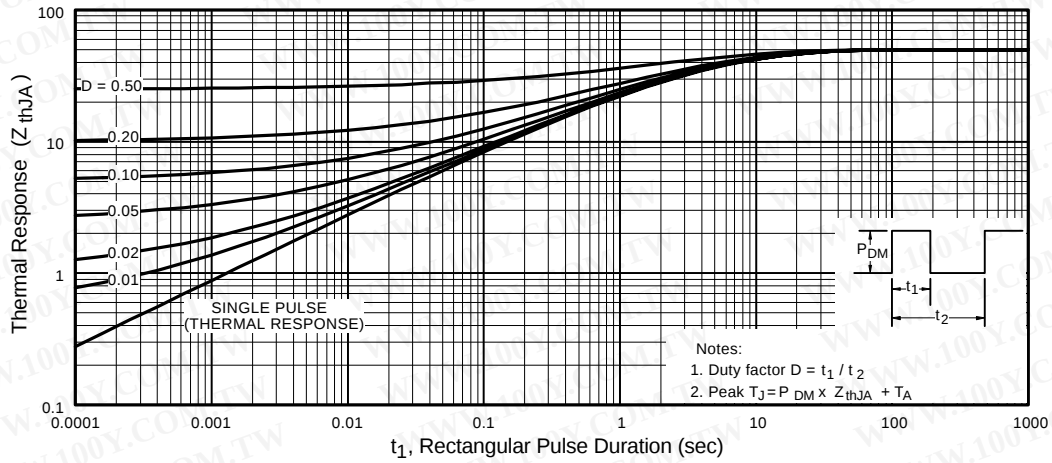


Figure 7. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

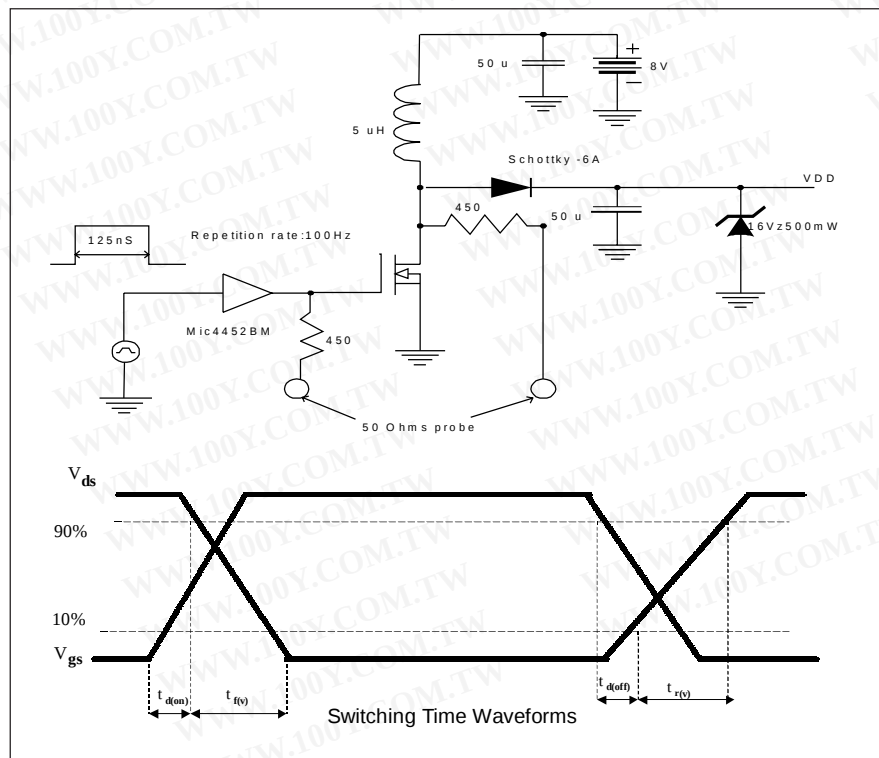
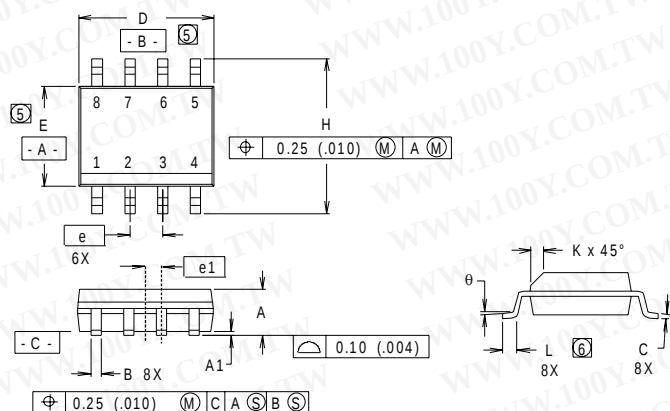


Figure 8. Clamped Inductive load test diagram and switching waveform

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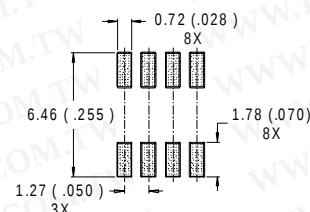
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SO-8 Package Details



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	0.16	.050	0.41	1.27
θ	0°	8°	0°	8°

RECOMMENDED FOOTPRINT

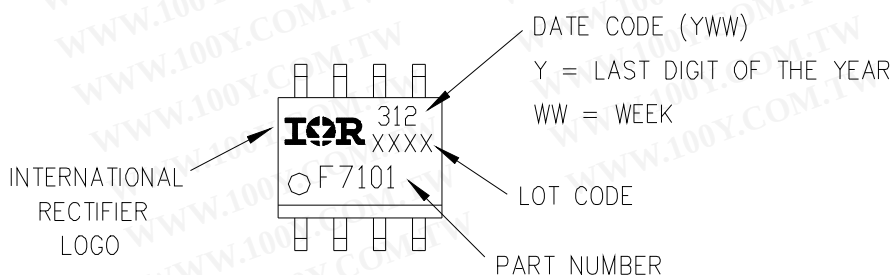


NOTES:

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..

SO-8 Part Marking

EXAMPLE: THIS IS AN IRF7101

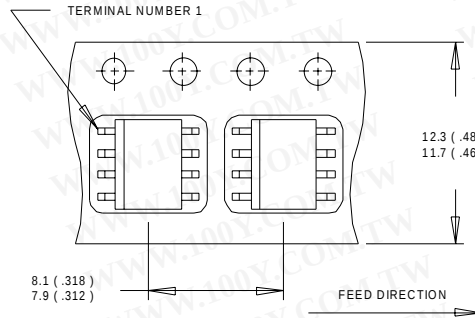


勝特力材料 886-3-5753170
 勝特力电子(上海) 86-21-54151736
 勝特力电子(深圳) 86-755-83298787
 Http://www.100y.com.tw

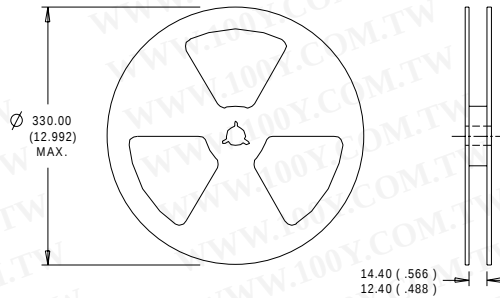
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SO-8 Tape and Reel



- 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 industrial market.
 Qualification Standards can be found on IR's Web site.

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