PD- 93843A

International
IOR Rectifier

SMPS MOSFET

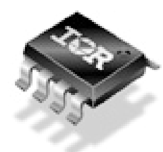
IRF7463

HEXFET® Power MOSFET

V_{DSS}	$R_{DS(on)}$ max	I_D
30V	**0.008Ω**	**14A**

Applications
- High Frequency DC-DC Converters with Synchronous Rectification

Benefits
- Ultra-Low $R_{DS(on)}$ at 4.5V V_{GS}
- Low Charge and Low Gate Impedance to Reduce Switching Losses
- Fully Characterized Avalanche Voltage and Current



SO-8

Absolute Maximum Ratings

	Parameter	Max.	Units
I_D @ T_A = 25°C	Continuous Drain Current, V_{GS} @ 10V	14	
I_D @ T_A = 70°C	Continuous Drain Current, V_{GS} @ 10V	11	A
I_{DM}	Pulsed Drain Current ①	110	
P_D @T_A = 25°C	Power Dissipation ⑦	2.5	W
P_D @T_A = 70°C	Power Dissipation	1.6	
	Linear Derating Factor	0.02	W/°C
V_{GS}	Gate-to-Source Voltage	± 12	V
T_J, T_{STG}	Junction and Storage Temperature Range	-55 to + 150	

Thermal Resistance

	Parameter	Max.	Units
$R_{\theta JA}$	Maximum Junction-to-Ambient⑥	50	°C/W

Typical SMPS Topologies

- Telecom 48V Input Converters with Logic-Level Driven Synchronous Rectifiers

Notes ① through ⑥ are on page 7

3/30/00

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

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	30	——	——	V	V_{GS} = 0V, I_D = 250μA
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	——	0.029	——	V/°C	Reference to 25°C, I_D = 1mA
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	——	0.0063	0.0080	Ω	V_{GS} = 10V, I_D = 14A ④
		——	0.0074	0.0095		V_{GS} = 4.5V, I_D = 12A ④
		——	0.0105	0.020		V_{GS} = 2.8V, I_D = 3.5A ④
$V_{GS(th)}$	Gate Threshold Voltage	0.6	——	2.0	V	V_{DS} = V_{GS}, I_D = 250μA
I_{DSS}	Drain-to-Source Leakage Current	——	——	20	μA	V_{DS} = 24V, V_{GS} = 0V
		——	——	100		V_{DS} = 24V, V_{GS} = 0V, T_J = 100°C
I_{GSS}	Gate-to-Source Forward Leakage	——	——	200	nA	V_{GS} = 12V
	Gate-to-Source Reverse Leakage	——	——	-200		V_{GS} = -12V

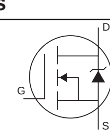
Dynamic @ T_J = 25°C (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
g_{fs}	Forward Transconductance	31	——	——	S	V_{DS} = 24V, I_D = 14A
Q_g	Total Gate Charge	——	34	51	nC	I_D = 14A
Q_{gs}	Gate-to-Source Charge	——	7.5	11		V_{DS} = 24V
Q_{gd}	Gate-to-Drain ("Miller") Charge	——	13	20		V_{GS} = 5.0V, ④
$t_{d(on)}$	Turn-On Delay Time	——	20	——	ns	V_{DD} = 15V,
t_r	Rise Time	——	16	——		I_D = 1.0A
$t_{d(off)}$	Turn-Off Delay Time	——	41	——		R_G = 6.0Ω
t_f	Fall Time	——	44	——		V_{GS} = 4.5V ④
C_{iss}	Input Capacitance	——	3110	——	pF	V_{GS} = 0V
C_{oss}	Output Capacitance	——	850	——		V_{DS} = 25V
C_{rss}	Reverse Transfer Capacitance	——	130	——		ƒ = 1.0MHz

Avalanche Characteristics

	Parameter	Typ.	Max.	Units
E_{AS}	Single Pulse Avalanche Energy②	——	320	mJ
I_{AR}	Avalanche Current①	——	14	A
E_{AR}	Repetitive Avalanche Energy①	——	0.25	mJ

Diode Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	——	——	2.5	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode) ①	——	——	110		
V_{SD}	Diode Forward Voltage	——	——	1.2	V	T_J = 25°C, I_S = 2.5A, V_{GS} = 0V ④
t_{rr}	Reverse Recovery Time	——	64	96	ns	T_J = 25°C, I_F = 2.5A
Q_{rr}	Reverse Recovery Charge	——	99	150	nC	di/dt = 100A/μs ④

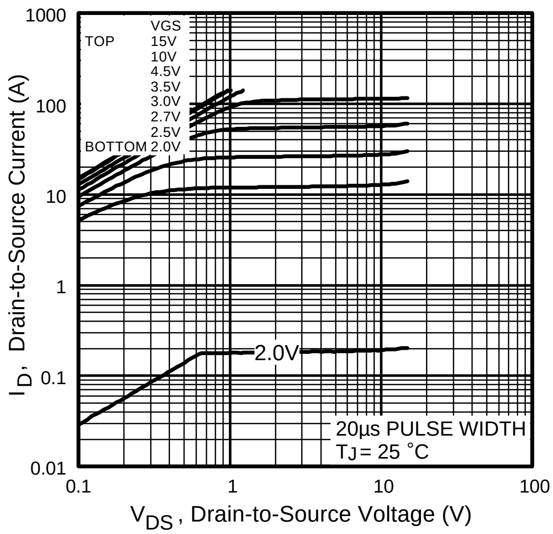


Fig 1. Typical Output Characteristics

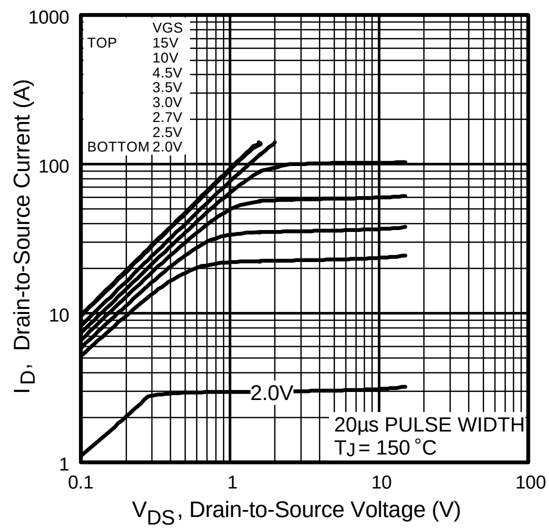


Fig 2. Typical Output Characteristics

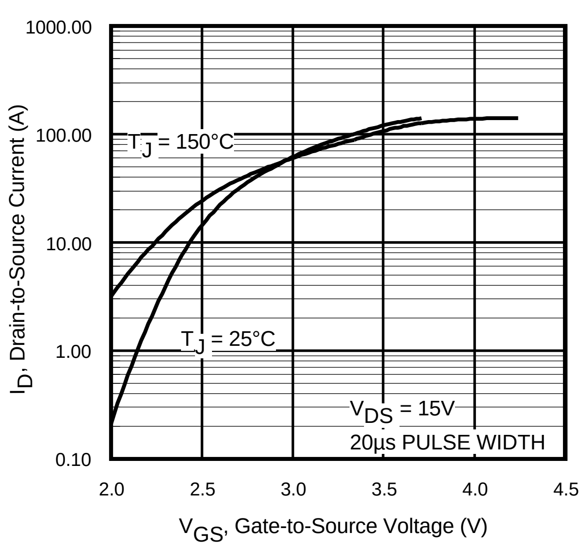


Fig 3. Typical Transfer Characteristics

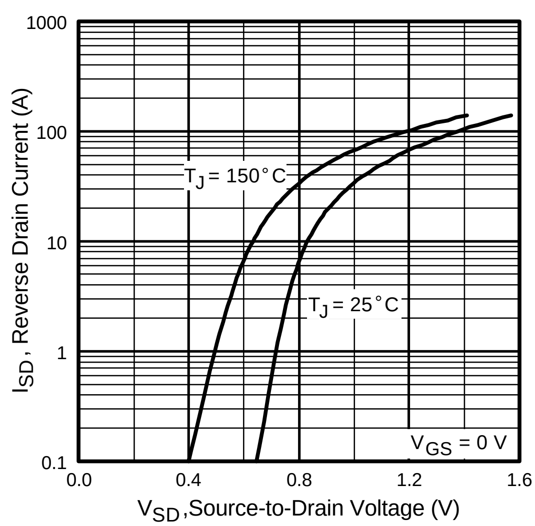


Fig 4. Typical Source-Drain Diode Forward Voltage

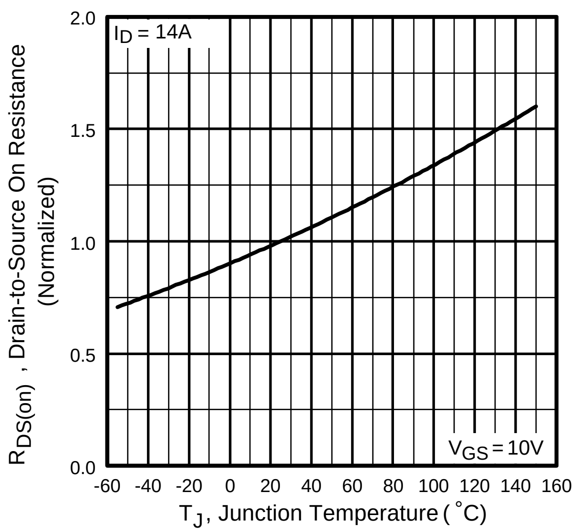


Fig 5. Normalized On-Resistance Vs. Temperature

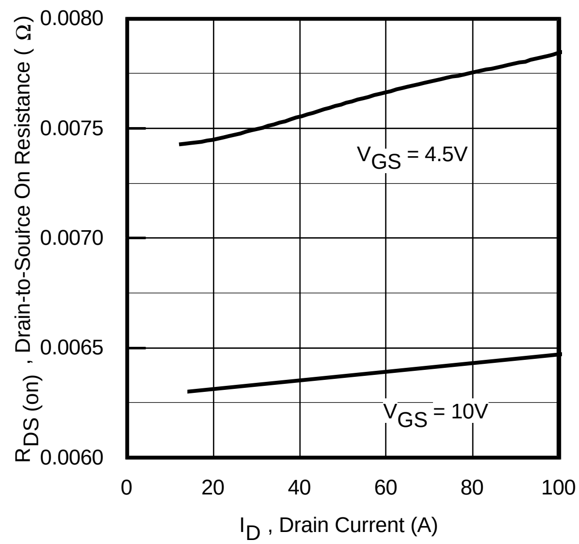


Fig 6. On-Resistance Vs. Drain Current

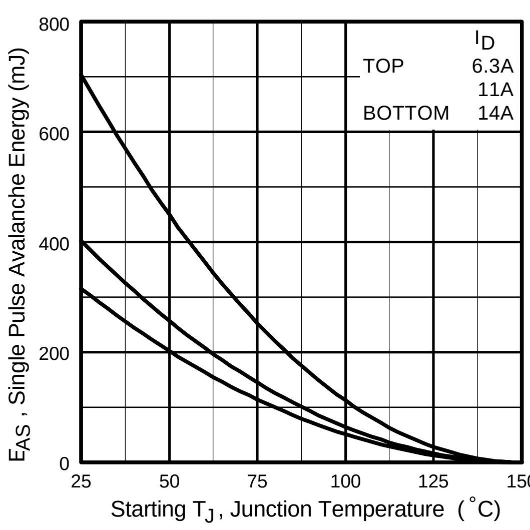


Fig 7. Maximum Avalanche Energy Vs. Drain Current

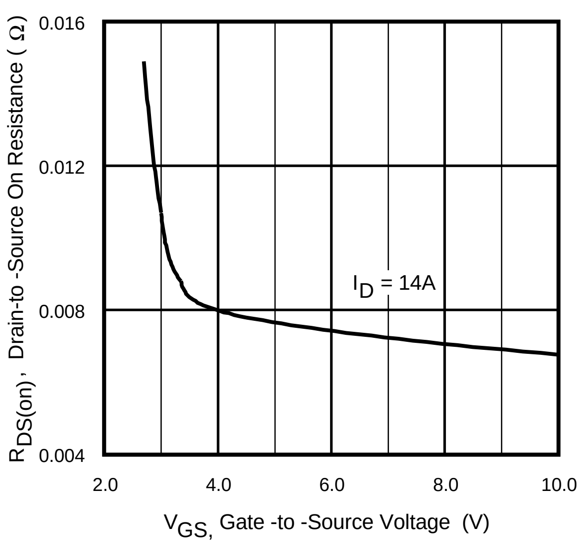


Fig 8. On-Resistance Vs. Gate Voltage

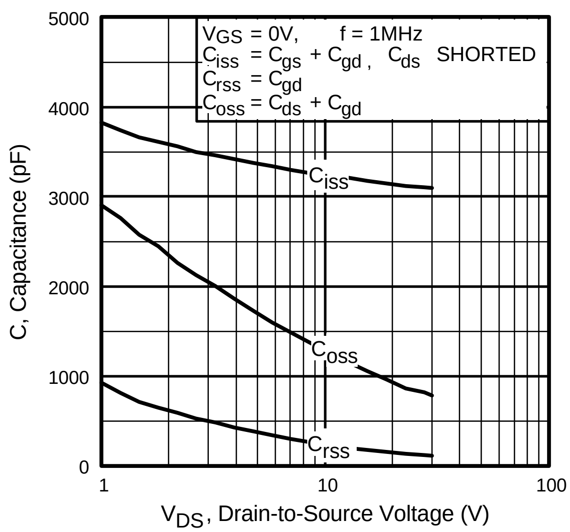


Fig 9. Typical Capacitance Vs. Drain-to-Source Voltage

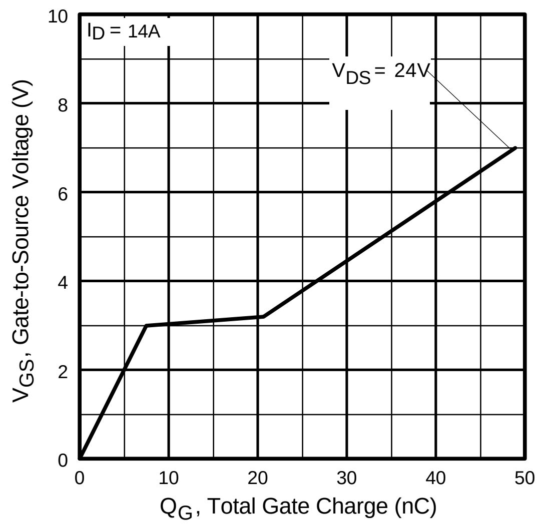


Fig 10. Typical Gate Charge Vs. Gate-to-Source Voltage

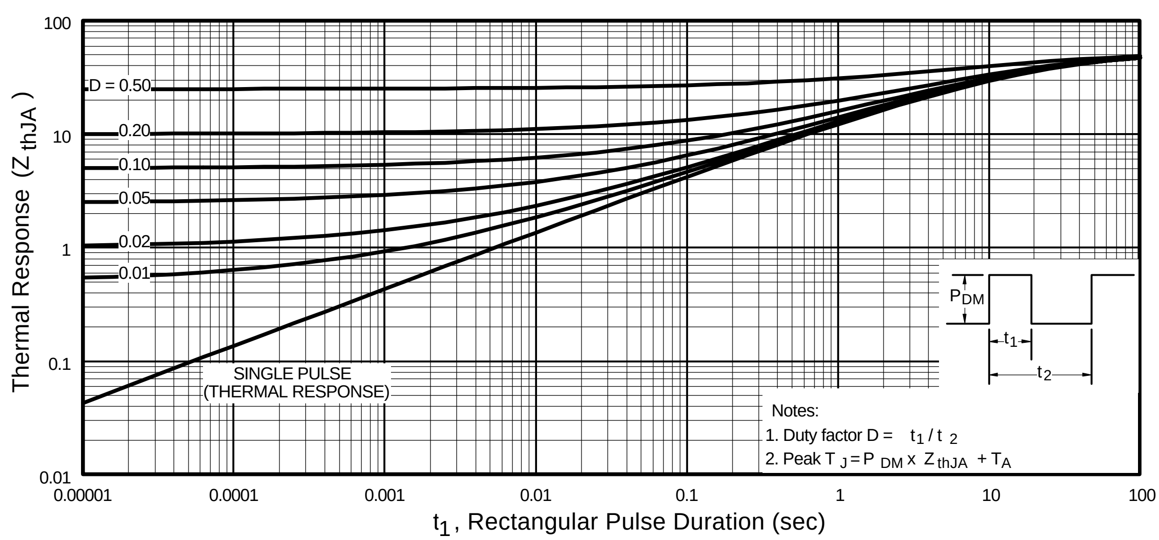
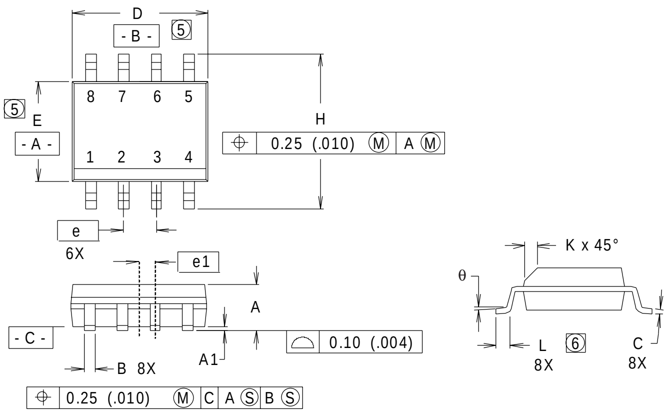


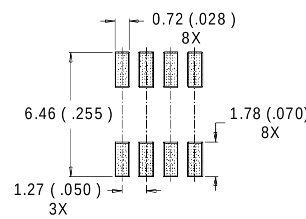
Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

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



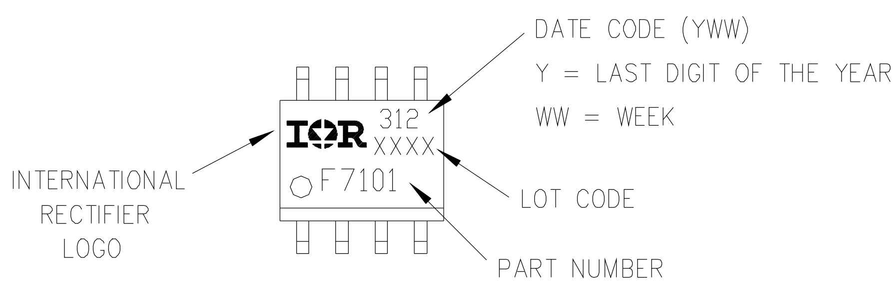
NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M-1982.
2. CONTROLLING DIMENSION : INCH.
3. DIMENSIONS ARE SHOWN IN MILLIMETERS (INCHES).
4. OUTLINE CONFORMS TO JEDEC OUTLINE MS-012AA.

5 DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS
MOLD PROTRUSIONS NOT TO EXCEED 0.25 (.006).

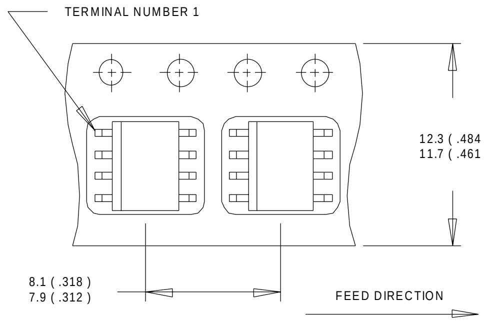
6 DIMENSIONS IS THE LENGTH OF LEAD FOR SOLDERING TO A SUBSTRATE..

SO-8 Part Marking

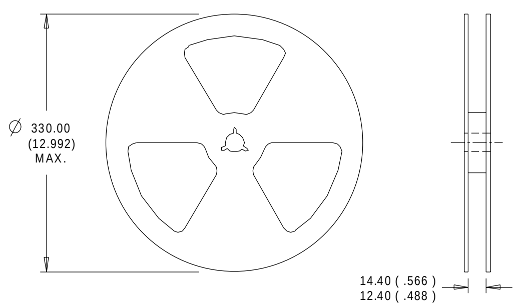
EXAMPLE: THIS IS AN IRF7101



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.

Notes:

① Repetitive rating; pulse width limited by max. junction temperature.

② Starting $T_J = 25°C$, $L = 3.3mH$ $R_G = 25\Omega$, $I_{AS} = 14A$.

③ $I_{SD} \leq 14A$, $di/dt \leq 93A/\mu s$, $V_{DD} \leq V_{(BR)DSS}$, $T_J \leq 150°C$

④ Pulse width ≤ 300µs; duty cycle ≤ 2%.

⑤ C_{oss} eff. is a fixed capacitance that gives the same charging time as C_{oss} while V_{DS} is rising from 0 to 80% V_{DSS}

⑥ When mounted on 1 inch square copper board, t<10 sec

International
IOR Rectifier

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IR GERMANY: Saalburgstrasse 157, 61350 Bad Homburg Tel: ++ 49 (0) 6172 96590
IR ITALY: Via Liguria 49, 10071 Borgaro, Torino Tel: ++ 39 011 451 0111
IR JAPAN: K&H Bldg., 2F, 30-4 Nishi-Ikebukuro 3-Chome, Toshima-Ku, Tokyo 171 Tel: 81 (0)3 3983 0086
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Data and specifications subject to change without notice. 3/00