

International  
**IR Rectifier**

**SMPS MOSFET**

PD- 93843A

**IRF7463**

HEXFET® Power MOSFET

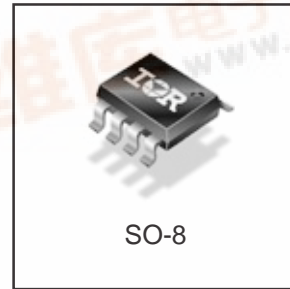
**Applications**

- High Frequency DC-DC Converters with Synchronous Rectification

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

**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



**Absolute Maximum Ratings**

	Parameter	Max.	Units
$I_D @ T_A = 25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10\text{V}$	14	A
$I_D @ T_A = 70^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10\text{V}$	11	
$I_{DM}$	Pulsed Drain Current ①	110	
$P_D @ T_A = 25^\circ\text{C}$	Power Dissipation ②	2.5	W
$P_D @ T_A = 70^\circ\text{C}$	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-Ambient ③	50	°C/W

**Typical SMPS Topologies**

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

Notes ① through ③ are on page 7

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## Static @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	30	—	—	V	$V_{GS} = 0V, I_D = 250\mu A$
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.029	—	V/ $^\circ\text{C}$	Reference to $25^\circ\text{C}, I_D = 1\text{mA}$
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	0.0063	0.0080	$\Omega$	$V_{GS} = 10V, I_D = 14A$ 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	$V_{DS} = V_{GS}, I_D = 250\mu A$
$I_{DSS}$	Drain-to-Source Leakage Current	—	—	20	$\mu A$	$V_{DS} = 24V, V_{GS} = 0V$
		—	—	100		$V_{DS} = 24V, V_{GS} = 0V, T_J = 100^\circ\text{C}$
$I_{GSS}$	Gate-to-Source Forward Leakage	—	—	200	nA	$V_{GS} = 12V$
	Gate-to-Source Reverse Leakage	—	—	-200		$V_{GS} = -12V$

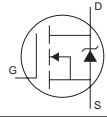
## Dynamic @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

	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	—		$R_G = 6.0\Omega$
$t_f$	Fall Time	—	44	—		$V_{GS} = 4.5V$ ④
$C_{iss}$	Input Capacitance	—	3110	—	pF	$V_{GS} = 0V$
$C_{oss}$	Output Capacitance	—	850	—		$V_{DS} = 25V$
$C_{riss}$	Reverse Transfer Capacitance	—	130	—		$f = 1.0\text{MHz}$

## 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	$T_J = 25^\circ\text{C}, I_S = 2.5A, V_{GS} = 0V$ ④
$t_{rr}$	Reverse Recovery Time	—	64	96	ns	$T_J = 25^\circ\text{C}, I_F = 2.5A$
$Q_{rr}$	Reverse Recovery Charge	—	99	150	nC	$di/dt = 100A/\mu s$ ④

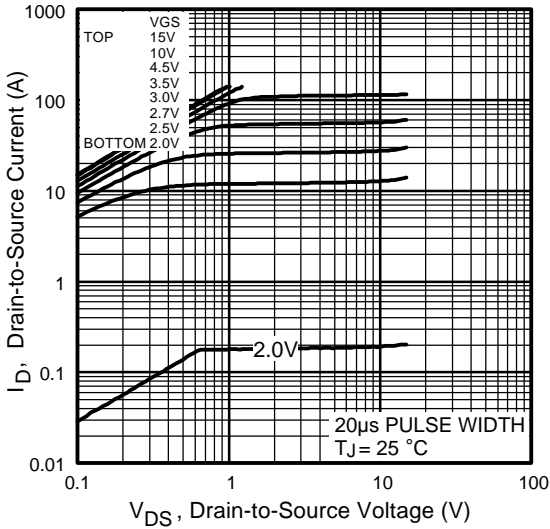


Fig 1. Typical Output Characteristics

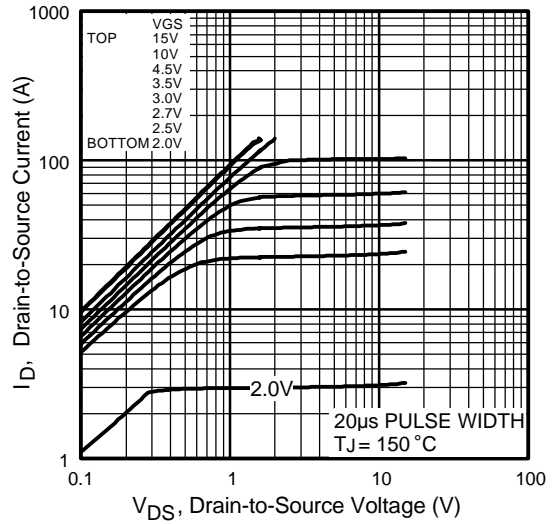


Fig 2. Typical Output Characteristics

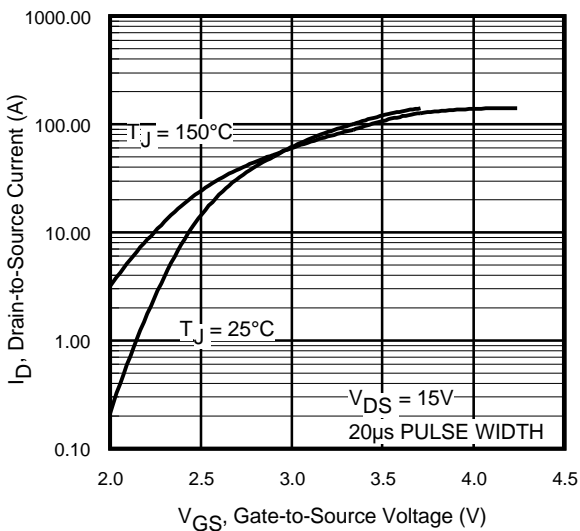


Fig 3. Typical Transfer Characteristics

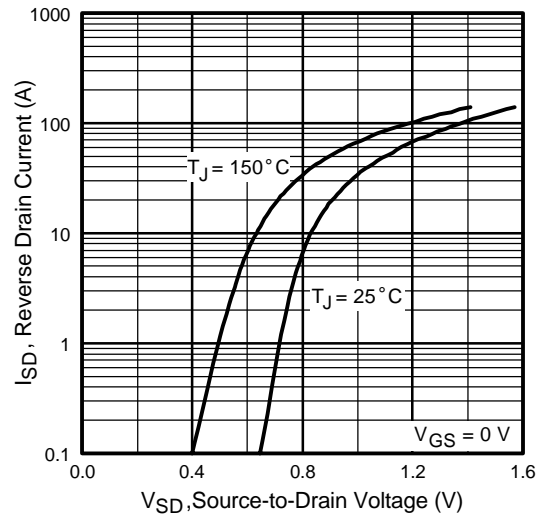
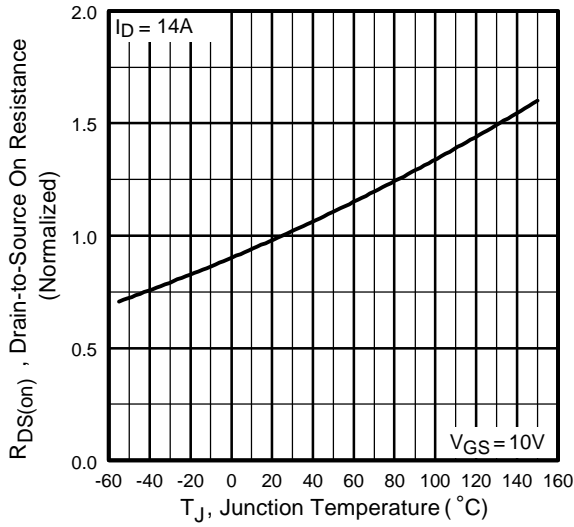


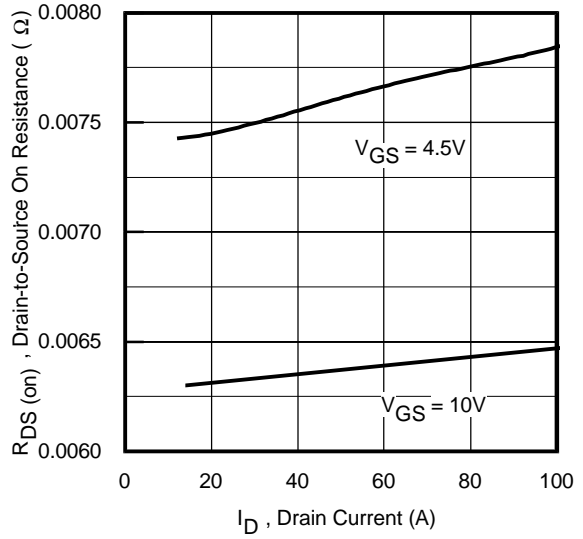
Fig 4. Typical Source-Drain Diode Forward Voltage

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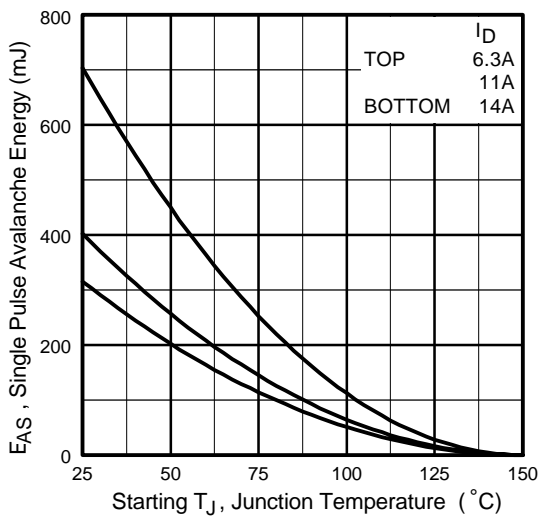
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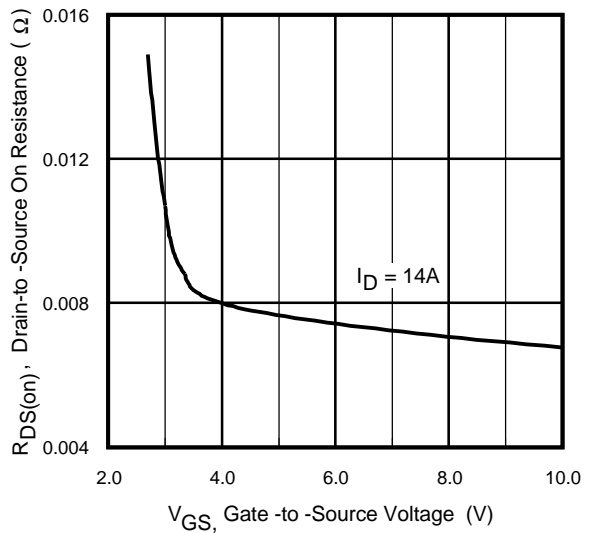
**Fig 5.** Normalized On-Resistance Vs. Temperature



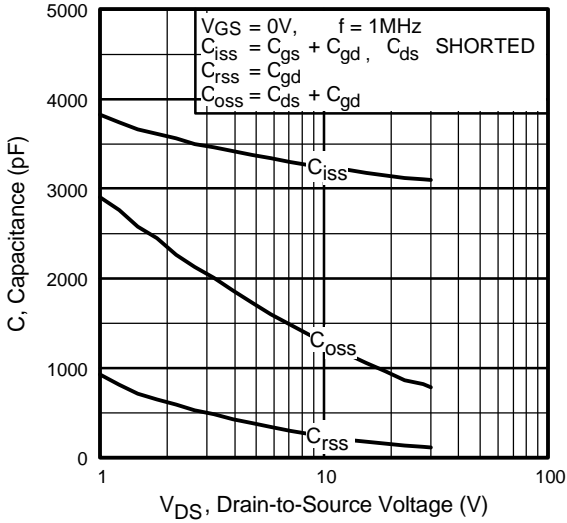
**Fig 6.** On-Resistance Vs. Drain Current



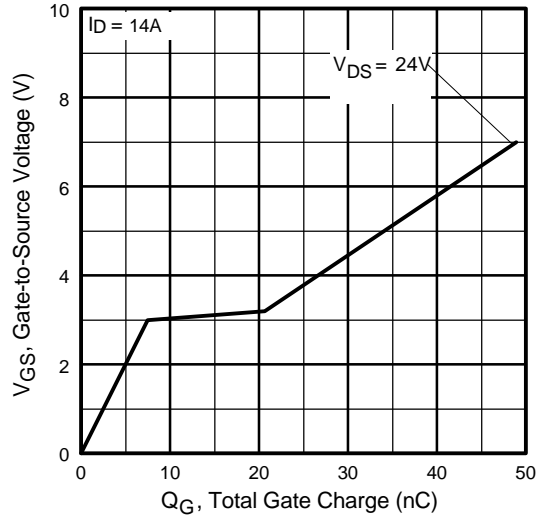
**Fig 7.** Maximum Avalanche Energy Vs. Drain Current



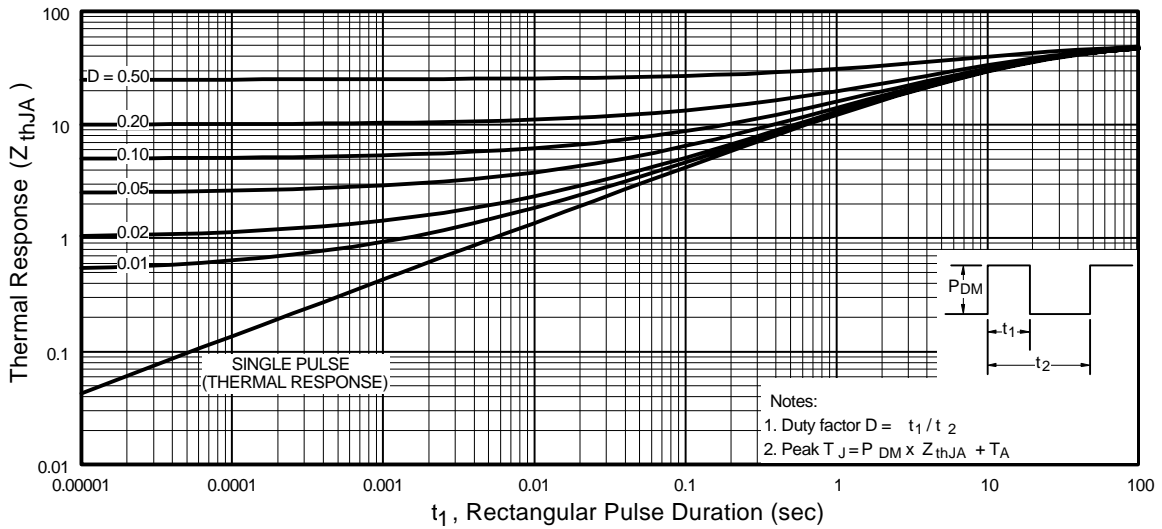
**Fig 8.** On-Resistance Vs. Gate Voltage



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



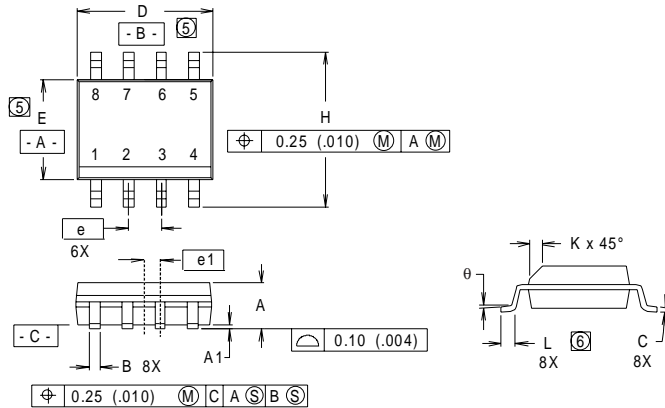
**Fig 10.** Typical Gate Charge Vs. Gate-to-Source Voltage



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

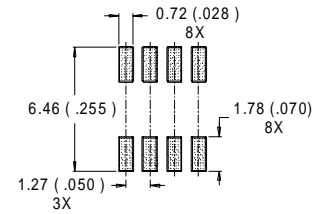
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## SO-8 Package Details



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
$\theta$	0°	8°	0°	8°

### RECOMMENDED FOOTPRINT

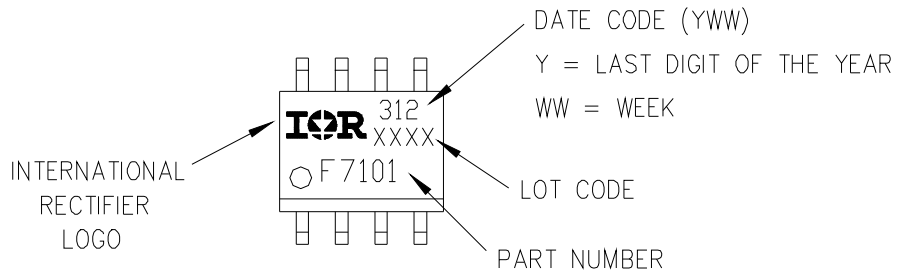


### NOTES:

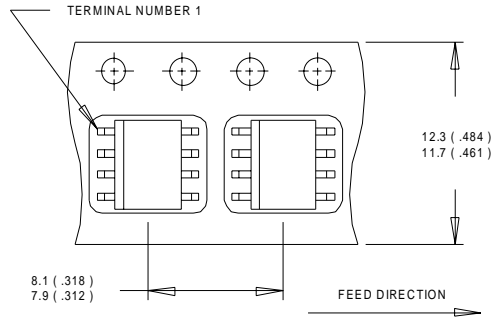
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M-1982.
2. CONTROLLING DIMENSION : INCH.
3. DIMENSIONS ARE SHOWN IN MILLIMETERS (INCHES).
4. OUTLINE CONFORMS TO JEDEC OUTLINE MS-012AA.
5. DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS  
MOLD PROTRUSIONS NOT TO EXCEED 0.25 (.006).
6. DIMENSIONS IS THE LENGTH OF LEAD FOR SOLDERING TO A SUBSTRATE..

## SO-8 Part Marking

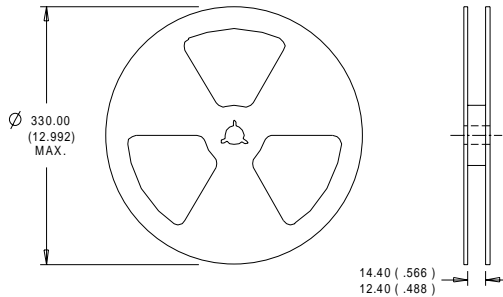
EXAMPLE: THIS IS AN IRF7101



**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  $T_J = 25^\circ\text{C}$ ,  $L = 3.3\text{mH}$   
 $R_G = 25\Omega$ ,  $I_{AS} = 14\text{A}$ .
- ③  $I_{SD} \leq 14\text{A}$ ,  $di/dt \leq 93\text{A}/\mu\text{s}$ ,  $V_{DD} \leq V_{(BR)DSS}$ ,  
 $T_J \leq 150^\circ\text{C}$
- ④ Pulse width  $\leq 300\mu\text{s}$ ; duty cycle  $\leq 2\%$ .
- 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