

## Excellent Integrated System Limited

Stocking Distributor

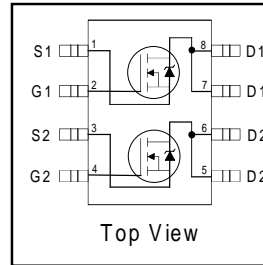
Click to view price, real time Inventory, Delivery & Lifecycle Information:

[International Rectifier \(Infineon Technologies Americas Corp.\)  
IRF7501TR](#)

For any questions, you can email us directly:

[sales@integrated-circuit.com](mailto:sales@integrated-circuit.com)

- Generation V Technology
- Ultra Low On-Resistance
- Dual N-Channel MOSFET
- Very Small SOIC Package
- Low Profile (<1.1mm)
- Available in Tape & Reel
- Fast Switching

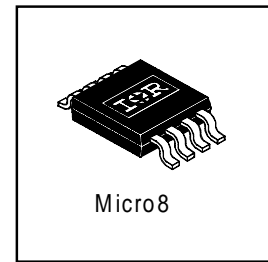


$V_{DS} = 20V$
$R_{DS(on)} = 0.135\Omega$

**Description**

Fifth Generation HEXFETs from International Rectifier utilize advanced processing techniques to achieve extremely low on-resistance per silicon area. This benefit, combined with the fast switching speed and ruggedized device design that HEXFET Power MOSFETs are well known for, provides the designer with an extremely efficient and reliable device for use in a wide variety of applications.

The new Micro8 package, with half the footprint area of the standard SO-8, provides the smallest footprint available in an SOIC outline. This makes the Micro8 an ideal device for applications where printed circuit board space is at a premium. The low profile (<1.1mm) of the Micro8 will allow it to fit easily into extremely thin application environments such as portable electronics and PCMCIA cards.



**Absolute Maximum Ratings**

	Parameter	Max.	Units
$V_{DS}$	Drain-Source Voltage	20	V
$I_D @ T_A = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	2.4	A
$I_D @ T_A = 70^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	1.9	
$I_{DM}$	Pulsed Drain Current ①	19	
$P_D @ T_A = 25^\circ C$	Maximum Power Dissipation④	1.25	W
$P_D @ T_A = 70^\circ C$	Maximum Power Dissipation ④	0.8	W
	Linear Derating Factor	0.01	W/°C
$V_{GSM}$	Gate-to-Source Voltage Single Pulse $t_p < 10\mu s$	16	V
$V_{GS}$	Gate-to-Source Voltage	$\pm 12$	V
$dv/dt$	Peak Diode Recovery $dv/dt$ ②	5.0	V/ns
TJ , TSTG	Operating Junction and Storage Temperature Range	-55 to + 150	°C
	Soldering Temperature, for 10 seconds	240 (1.6mm from case)	

**Thermal Resistance**

	Parameter	Max.	Units
$R_{\theta JA}$	Maximum Junction-to-Ambient ④	100	°C/W

All Micro8 Data Sheets reflect improved Thermal Resistance, Power and Current -Handling Ratings- effective only for product marked with Date Code 505 or later .

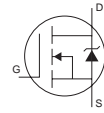
## IRF7501

International  
**IR** Rectifier

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

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	20	—	—	V	$V_{GS} = 0V, I_D = 250\mu A$
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.041	—	V/°C	Reference to $25^\circ\text{C}, I_D = 1mA$
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	0.085	0.135	$\Omega$	$V_{GS} = 4.5V, I_D = 1.7A$ ④
		—	0.120	0.20		$V_{GS} = 2.7V, I_D = 0.85A$ ④
$V_{GS(th)}$	Gate Threshold Voltage	0.70	—	—	V	$V_{DS} = V_{GS}, I_D = 250\mu A$
$g_{fs}$	Forward Transconductance	2.6	—	—	S	$V_{DS} = 10V, I_D = 0.85A$
$I_{DSS}$	Drain-to-Source Leakage Current	—	—	1.0	$\mu A$	$V_{DS} = 16V, V_{GS} = 0V$
		—	—	25		$V_{DS} = 16V, V_{GS} = 0V, T_J = 125^\circ\text{C}$
$I_{GSS}$	Gate-to-Source Forward Leakage	—	—	100	nA	$V_{GS} = 12V$
	Gate-to-Source Reverse Leakage	—	—	-100		$V_{GS} = -12V$
$Q_g$	Total Gate Charge	—	5.3	8.0	nC	$I_D = 1.7A$
$Q_{gs}$	Gate-to-Source Charge	—	0.84	1.3		$V_{DS} = 16V$
$Q_{gd}$	Gate-to-Drain ("Miller") Charge	—	2.2	3.3		$V_{GS} = 4.5V$ , See Fig. 9 ④
$t_{d(on)}$	Turn-On Delay Time	—	5.7	—	ns	$V_{DD} = 10V$
$t_r$	Rise Time	—	24	—		$I_D = 1.7A$
$t_{d(off)}$	Turn-Off Delay Time	—	15	—		$R_G = 6.0\Omega$
$t_f$	Fall Time	—	16	—		$R_D = 5.7\Omega$ ④
$C_{iss}$	Input Capacitance	—	260	—	pF	$V_{GS} = 0V$
$C_{oss}$	Output Capacitance	—	130	—		$V_{DS} = 15V$
$C_{riss}$	Reverse Transfer Capacitance	—	61	—		$f = 1.0MHz$ , See Fig. 8

### Source-Drain Ratings and Characteristics

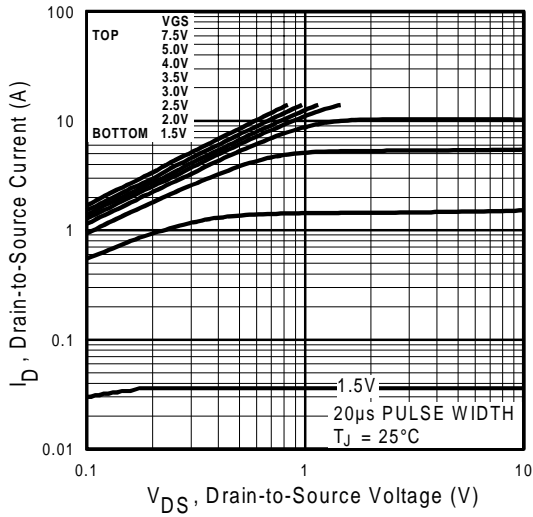
	Parameter	Min.	Typ.	Max.	Units	Conditions
$I_S$	Continuous Source Current (Body Diode)	—	—	1.25	A	MOSFET symbol showing the integral reverse p-n junction diode. 
$I_{SM}$	Pulsed Source Current (Body Diode) ①	—	—	19		
$V_{SD}$	Diode Forward Voltage	—	—	1.2	V	$T_J = 25^\circ\text{C}, I_S = 1.7A, V_{GS} = 0V$ ③
$t_{rr}$	Reverse Recovery Time	—	39	59	ns	$T_J = 25^\circ\text{C}, I_F = 1.7A$
$Q_{rr}$	Reverse Recovery Charge	—	37	56	nC	$di/dt = 100A/\mu s$ ③

#### Notes:

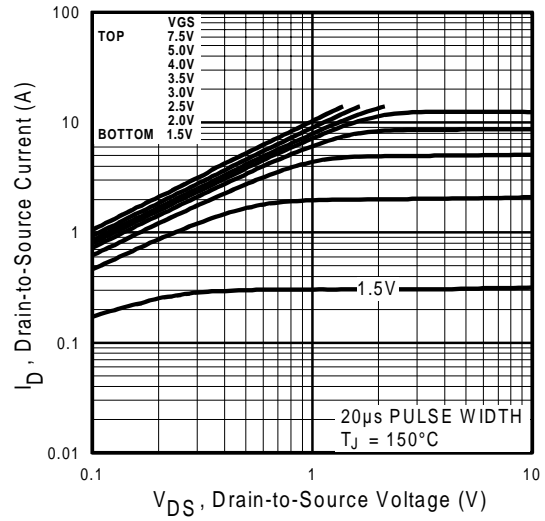
- ① Repetitive rating; pulse width limited by max. junction temperature. ( See fig. 10 )
- ②  $I_{SD} \leq 1.7A, di/dt \leq 66A/\mu s, V_{DD} \leq V_{(BR)DSS}, T_J \leq 150^\circ\text{C}$
- ③ Pulse width  $\leq 300\mu s$ ; duty cycle  $\leq 2\%$
- ④ Surface mounted on FR-4 board,  $t \leq 10sec$

International  
**IR** Rectifier

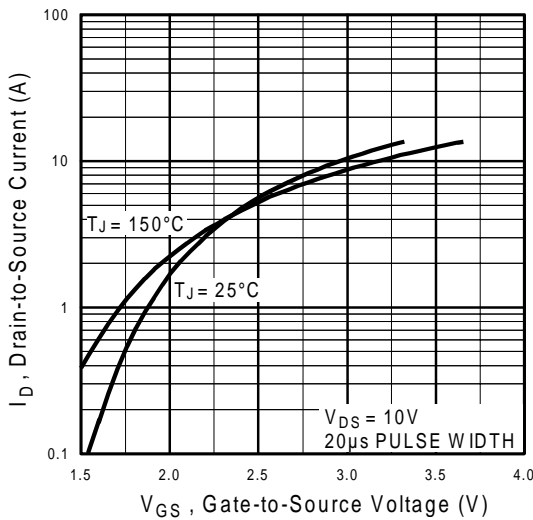
**IRF7501**



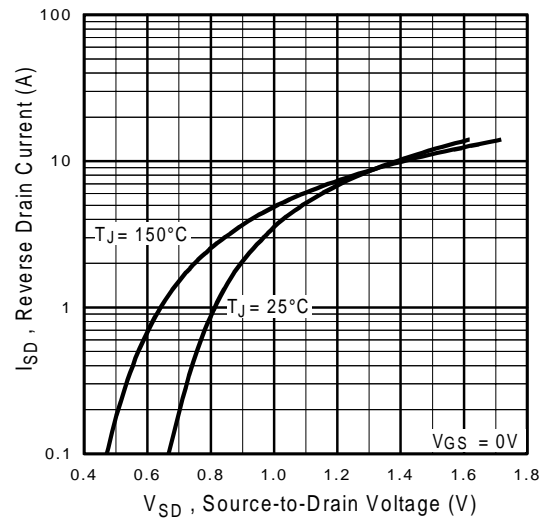
**Fig 1.** Typical Output Characteristics



**Fig 2.** Typical Output Characteristics



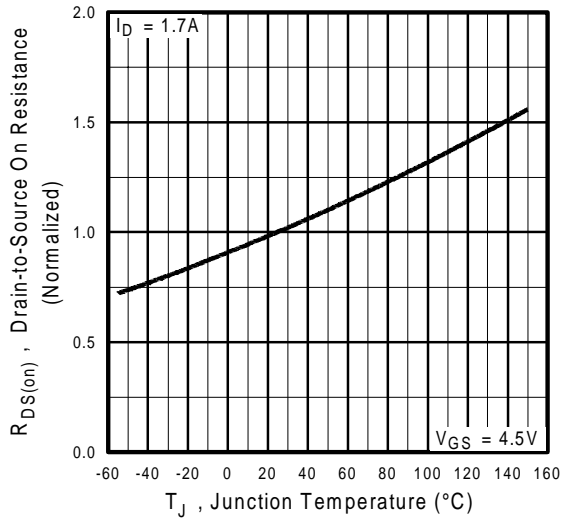
**Fig 3.** Typical Transfer Characteristics



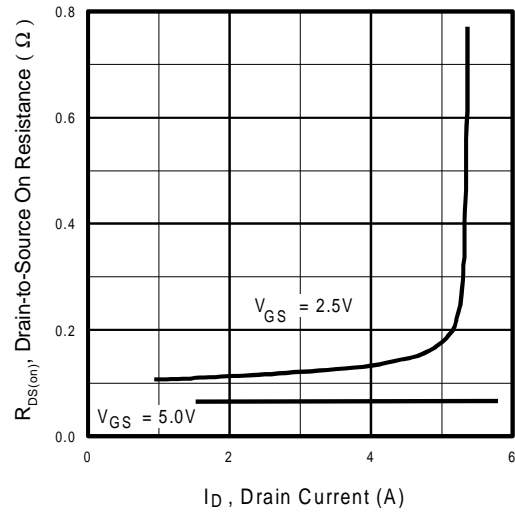
**Fig 7.** Typical Source-Drain Diode Forward Voltage

**IRF7501**

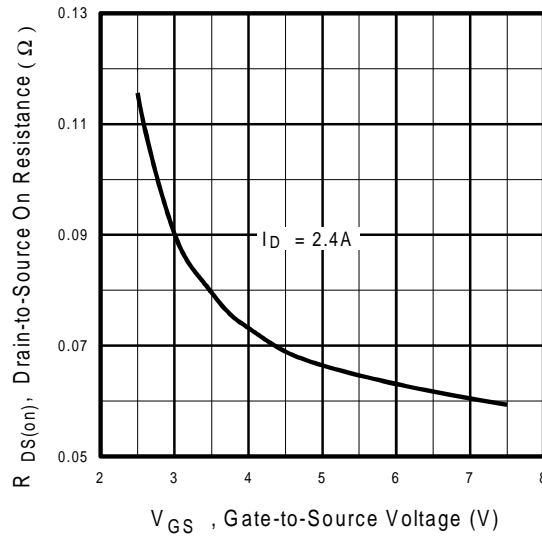
International  
**IR** Rectifier



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



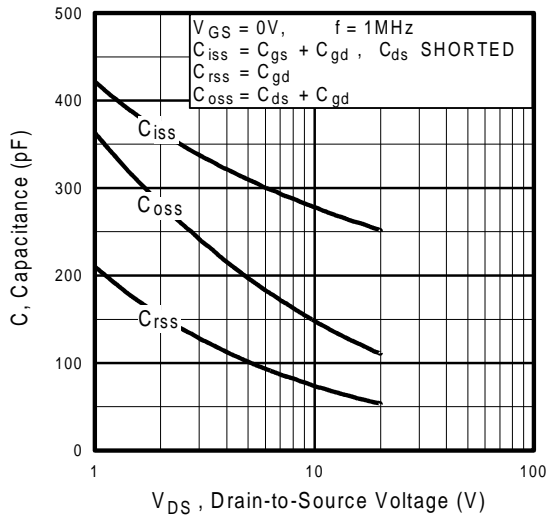
**Fig 6.** Typical On-Resistance Vs. Drain Current



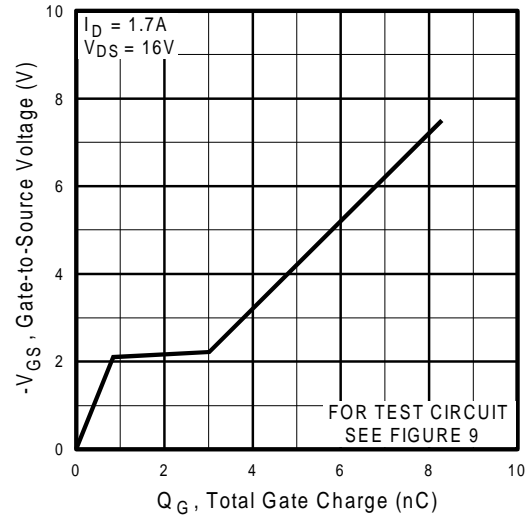
**Fig 7.** Typical On-Resistance Vs. Gate Voltage

International  
**IR** Rectifier

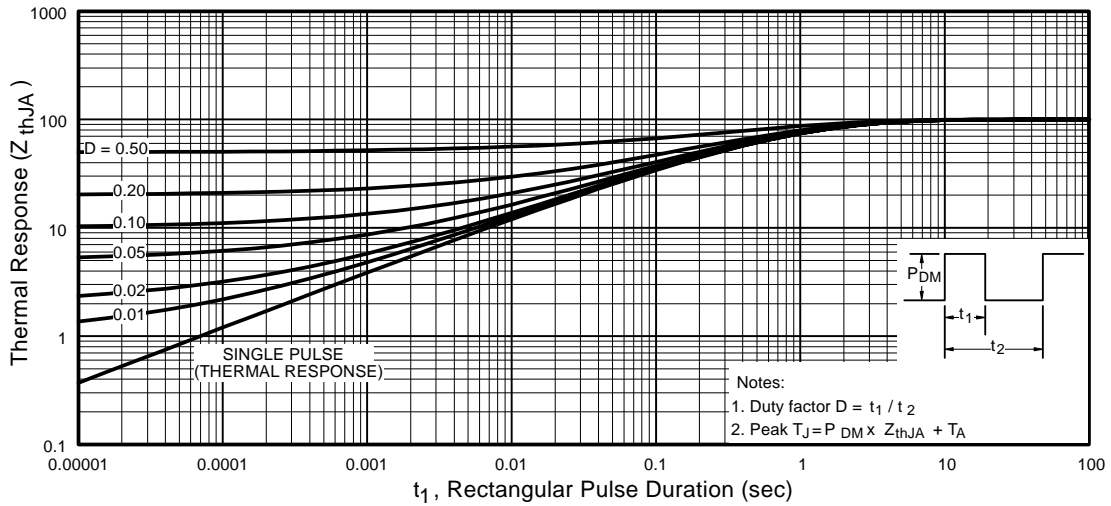
**IRF7501**



**Fig 8.** Typical Capacitance Vs. Drain-to-Source Voltage



**Fig 9.** Typical Gate Charge Vs. Gate-to-Source Voltage

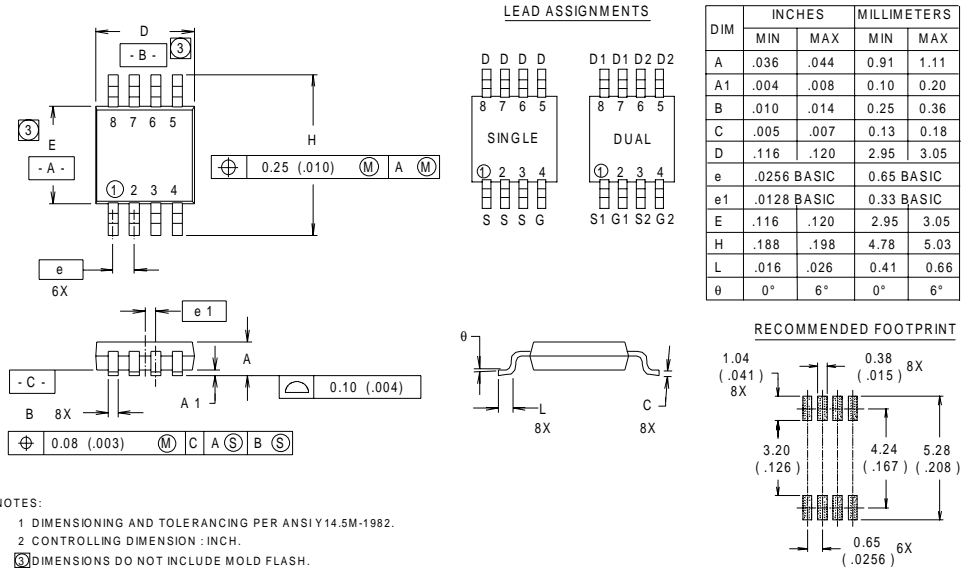


**Fig 10.** Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

# IRF7501



## Micro8 Package Outline

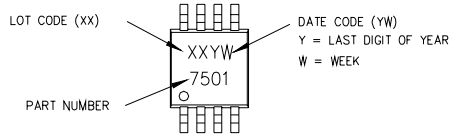


**NOTES:**  
 1 DIMENSIONING AND TOLERANCING PER ANSI Y14.5M-1982.  
 2 CONTROLLING DIMENSION : INCH.  
 3 DIMENSIONS DO NOT INCLUDE MOLD FLASH.

## Part Marking Information

### IRF7501 example

EXAMPLE: THIS IS AN IRF7501



WW = (1-26) IF PRECEDED BY LAST DIGIT OF CALENDAR YEAR

DATE CODE EXAMPLES:

YWW = 9503 = 5C  
 YWW = 9532 = 5F

YEAR	Y	WORK WEEK	W
2001	1	01	A
2002	2	02	B
2003	3	03	C
1994	4	04	D
1995	5		
1996	6		
1997	7		
1998	8		
1999	9		
2000	0	24	X
		25	Y
		26	Z

WW = (27-52) IF PRECEDED BY A LETTER

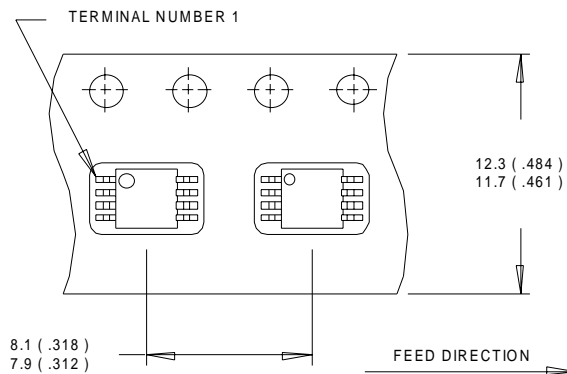
YEAR	Y	WORK WEEK	W
2001	A	27	A
2002	B	28	B
2003	C	29	C
1994	D	30	D
1995	E		
1996	F		
1997	G		
1998	H		
1999	J		
2000	K	50	X
		51	Y
		52	Z

International  
**IR** Rectifier

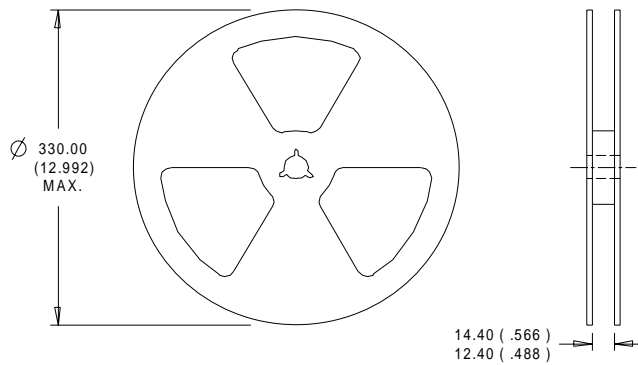
**IRF7501**

**Tape & Reel**

Dimensions are shown in millimeters (inches)



- NOTES:  
 1. OUTLINE CONFORMS TO EIA-481 & EIA-541.  
 2. CONTROLLING DIMENSION : MILLIMETER.



- 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) 322 3331  
**EUROPEAN HEADQUARTERS:** Hurst Green, Oxted, Surrey RH8 9BB, UK Tel: ++ 44 1883 732020  
**IR CANADA:** 7321 Victoria Park Ave., Suite 201, Markham, Ontario L3R 2Z8, Tel: (905) 475 1897  
**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 FAR EAST:** K&H Bldg., 2F, 30-4 Nishi-Ikebukuro 3-Chome, Toshima-Ku, Tokyo Japan 171 Tel: 81 3 3983 0086  
**IR SOUTHEAST ASIA:** 315 Outram Road, #10-02 Tan Boon Liat Building, Singapore 0316 Tel: 65 221 8371  
<http://www.irf.com/> Data and specifications subject to change without notice. 4/98