

IRF7726PbF

HEXFET® Power MOSFET

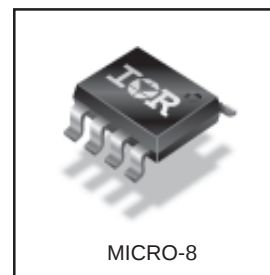
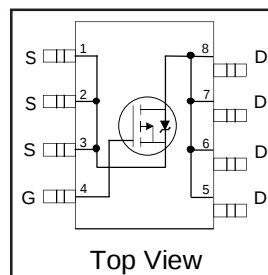
- Ultra Low On-Resistance
- P-Channel MOSFET
- Very Small SOIC Package
- Low Profile (< 1.2mm)
- Available in Tape & Reel
- Lead-Free

V_{DS}	$R_{DS(on)}$ max	I_D
-30V	0.026@ $V_{GS} = -10V$	-7.0A
	0.040@ $V_{GS} = -4.5V$	-6.0A

Description

HEXFET® Power MOSFETs from International Rectifier utilize advanced processing techniques to achieve extremely low on-resistance per silicon area. This benefit, combined with the ruggedized device design, that International Rectifier is well known for, provides the designer with an extremely efficient and reliable device for battery and load management.

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 (<1.2mm) 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	-30	V
I_D @ $T_A = 25^\circ C$	Continuous Drain Current, V_{GS} @ -10V	-7.0	A
I_D @ $T_A = 70^\circ C$	Continuous Drain Current, V_{GS} @ -10V	-5.7	
I_{DM}	Pulsed Drain Current①	-28	
P_D @ $T_A = 25^\circ C$	Maximum Power Dissipation③	1.79	W
P_D @ $T_A = 70^\circ C$	Maximum Power Dissipation③	1.14	W
	Linear Derating Factor	0.01	W/°C
V_{GS}	Gate-to-Source Voltage	±20	V
T_J, T_{STG}	Junction and Storage Temperature Range	-55 to +150	°C

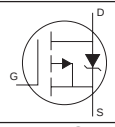
Thermal Resistance

	Parameter	Max.	Units
$R_{\theta JA}$	Maximum Junction-to-Ambient③	70	°C/W

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	-30	—	—	V	$V_{GS} = 0V, I_D = -250\mu A$
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.016	—	V/°C	Reference to 25°C , $I_D = -1mA$
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	—	0.026	Ω	$V_{GS} = -10V, I_D = -7.0A$ ②
		—	—	0.040		$V_{GS} = -4.5V, I_D = -6.0A$ ②
$V_{GS(th)}$	Gate Threshold Voltage	-1.0	—	-2.5	V	$V_{DS} = V_{GS}, I_D = -250\mu A$
g_{fs}	Forward Transconductance	10	—	—	S	$V_{DS} = -10V, I_D = -7.0A$
I_{DSS}	Drain-to-Source Leakage Current	—	—	-15	μA	$V_{DS} = -24V, V_{GS} = 0V$
		—	—	-25		$V_{DS} = -24V, V_{GS} = 0V, T_J = 70^\circ\text{C}$
I_{GSS}	Gate-to-Source Forward Leakage	—	—	-100	nA	$V_{GS} = -20V$
	Gate-to-Source Reverse Leakage	—	—	100		$V_{GS} = 20V$
Q_g	Total Gate Charge	—	46	69	nC	$I_D = -7.0A$
Q_{gs}	Gate-to-Source Charge	—	8.0	—		$V_{DS} = -15V$
Q_{gd}	Gate-to-Drain ("Miller") Charge	—	8.1	—		$V_{GS} = -10V$
$t_{d(on)}$	Turn-On Delay Time	—	15	23	ns	$V_{DD} = -15V, V_{GS} = -10V$
t_r	Rise Time	—	25	38		$I_D = -1.0A$
$t_{d(off)}$	Turn-Off Delay Time	—	227	341		$R_G = 6.0\Omega$
t_f	Fall Time	—	107	161		$R_D = 15\Omega$ ②
C_{iss}	Input Capacitance	—	2204	—	pF	$V_{GS} = 0V$
C_{oss}	Output Capacitance	—	341	—		$V_{DS} = -25V$
C_{rss}	Reverse Transfer Capacitance	—	220	—		$f = 1.0MHz$

Source-Drain Ratings and Characteristics

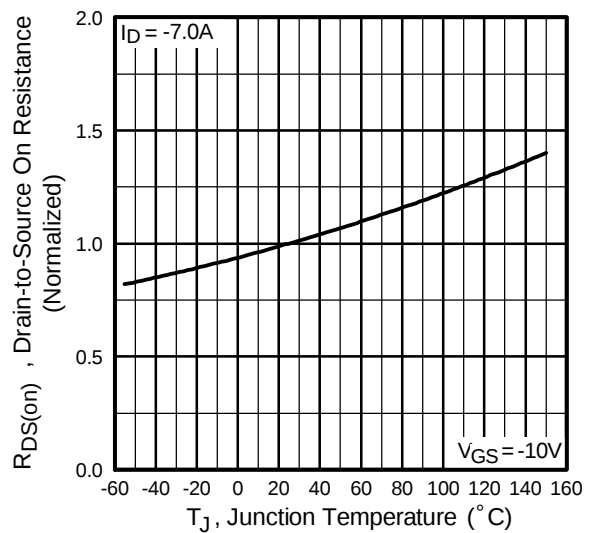
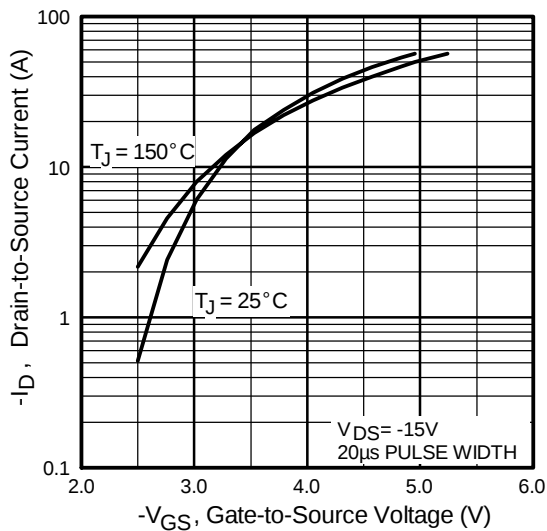
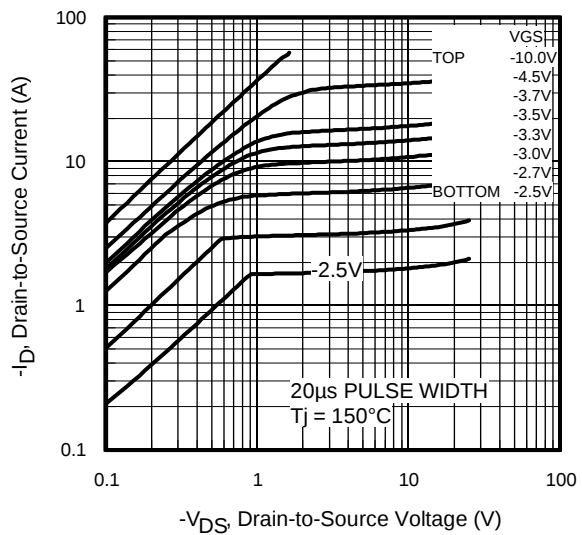
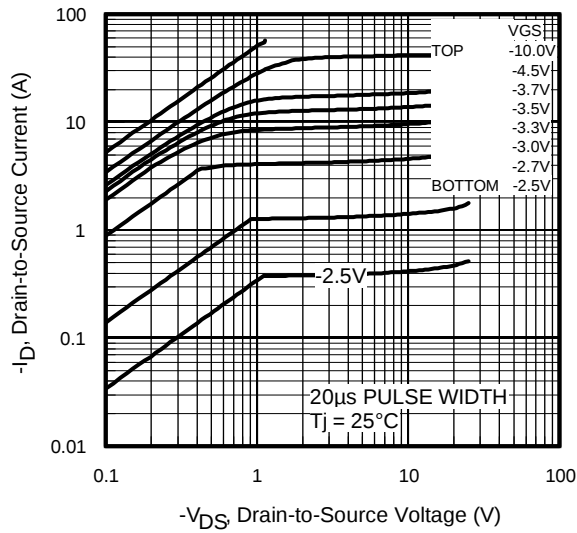
	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	-1.8	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode) ①	—	—	-28		
V_{SD}	Diode Forward Voltage	—	—	-1.2	V	$T_J = 25^\circ\text{C}, I_S = -1.8A, V_{GS} = 0V$ ②
t_{rr}	Reverse Recovery Time	—	35	53	ns	$T_J = 25^\circ\text{C}, I_F = -1.8A$
Q_{rr}	Reverse Recovery Charge	—	32	48	μC	$di/dt = -100A/\mu s$ ②

Notes:

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

③ When mounted on 1 inch square copper board, $t < 10$ sec.

② Pulse width $\leq 400\mu s$; duty cycle $\leq 2\%$.



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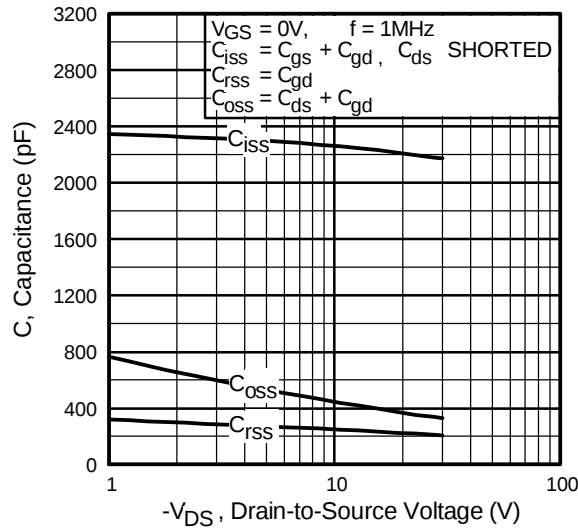


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

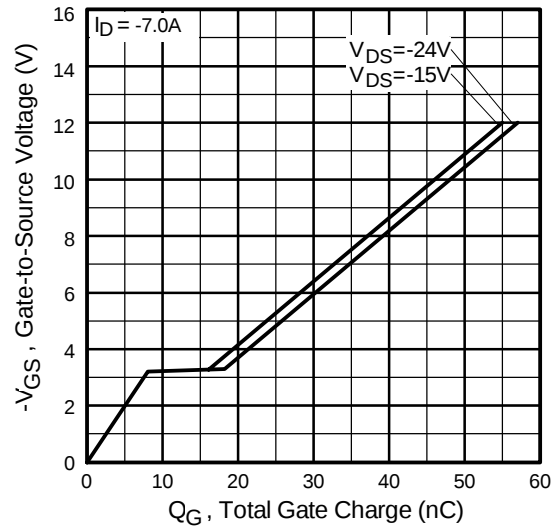


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

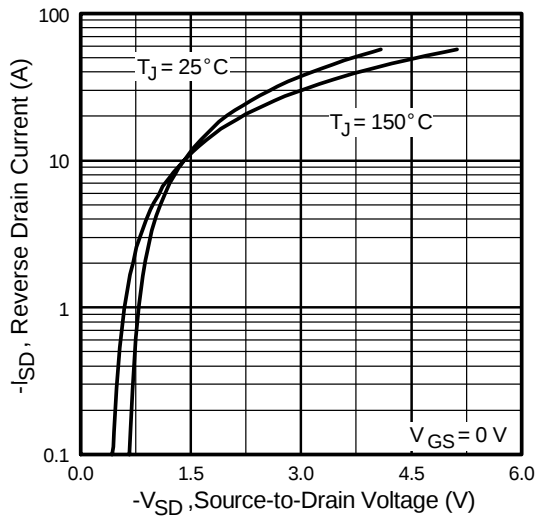


Fig 7. Typical Source-Drain Diode Forward Voltage

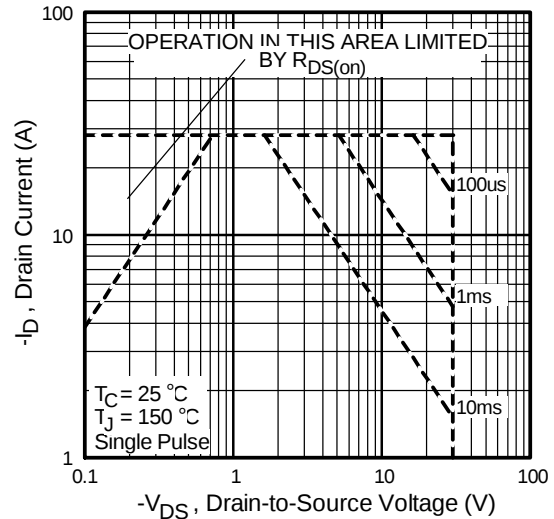


Fig 8. Maximum Safe Operating Area

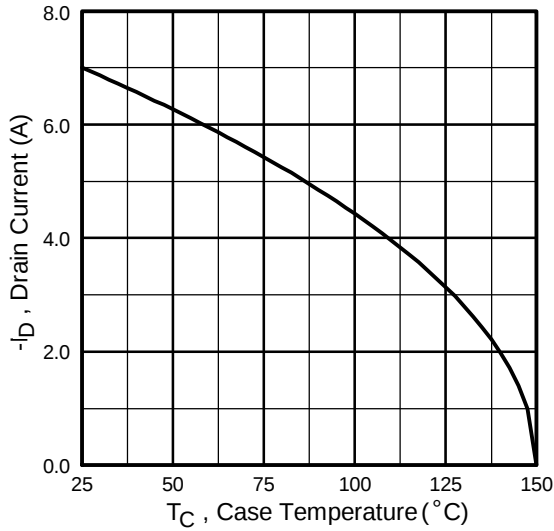


Fig 9. Maximum Drain Current Vs. Case Temperature

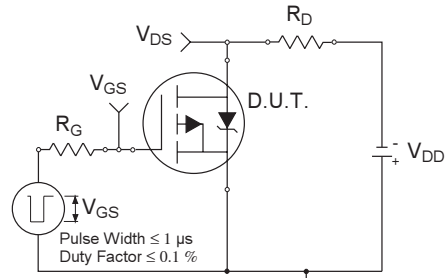


Fig 10a. Switching Time Test Circuit

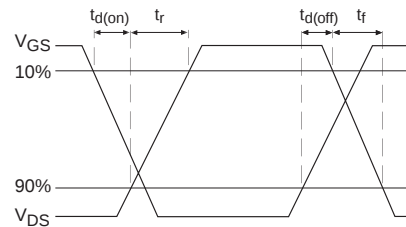


Fig 10b. Switching Time Waveforms

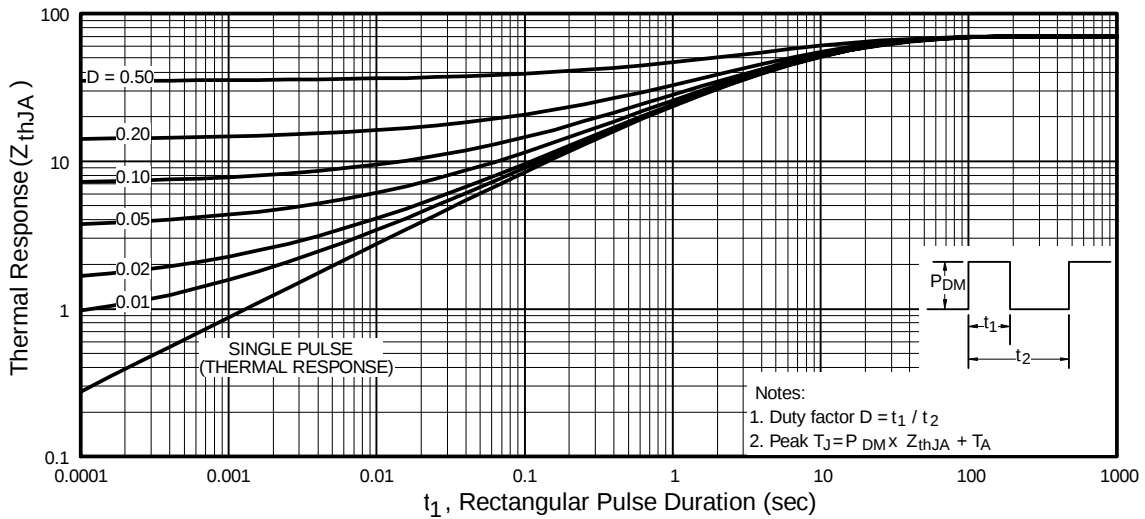


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

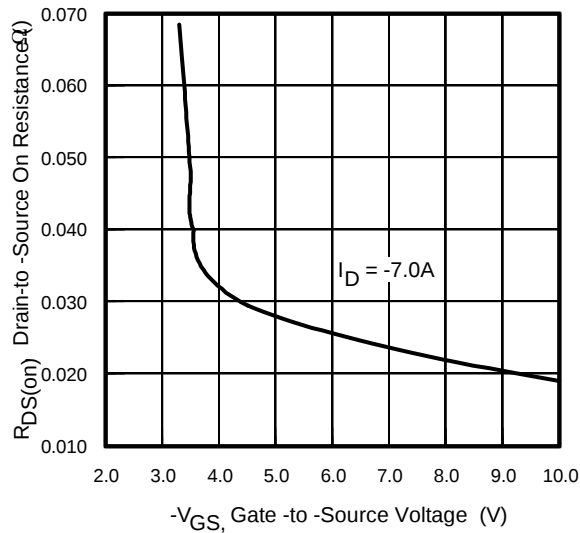


Fig 12. Typical On-Resistance Vs. Gate Voltage

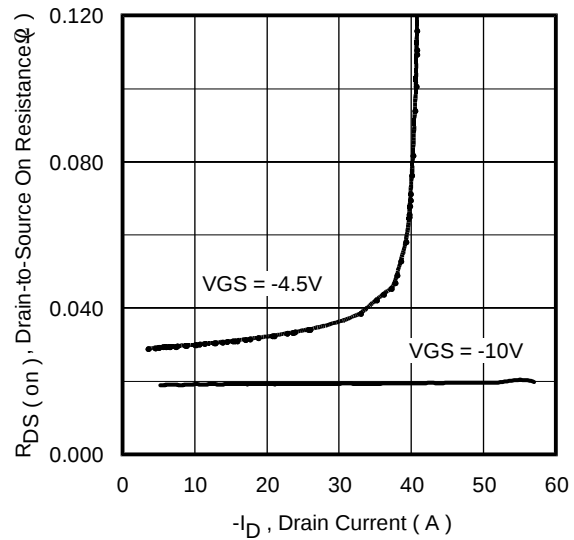


Fig 13. Typical On-Resistance Vs. Drain Current

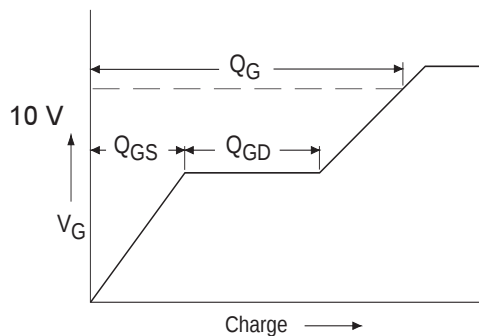


Fig 14a. Basic Gate Charge Waveform

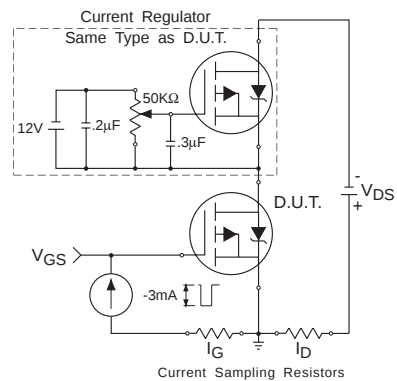


Fig 14b. Gate Charge Test Circuit

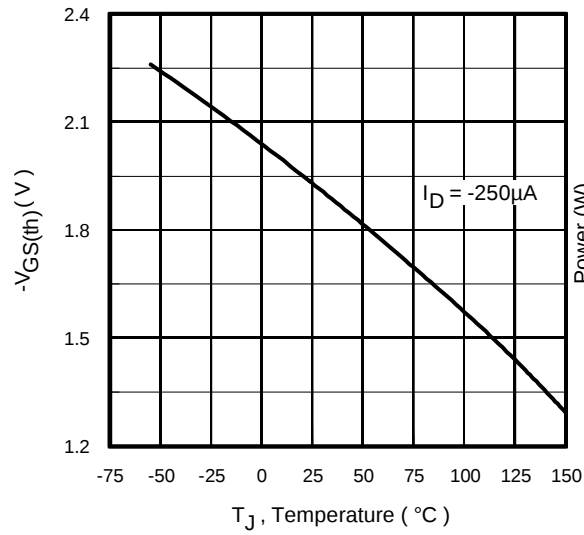


Fig 15. Typical $V_{GS(th)}$ Vs. Junction Temperature

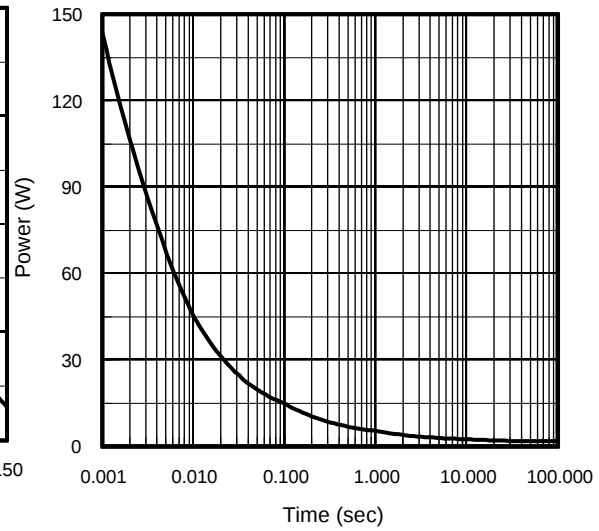


Fig 16. Typical Power Vs. Time

The diagram shows a Class D amplifier circuit. A square-wave voltage source is connected to the gate of a MOSFET through a resistor. The MOSFET's source is grounded, and its drain is connected to a load inductor. The other end of the inductor is connected to the D.U.T. (Device Under Test), which is represented by a resistor. The D.U.T. is connected to ground. A transformer is shown in the feedback path, with its primary connected to the D.U.T. and its secondary connected to the gates of both the MOSFET and the diode. The diode's anode is connected to the MOSFET's drain, and its cathode is connected to ground. The output of the amplifier is taken from the MOSFET's drain. The circuit is enclosed in a box with the title 'Circuit Layout Considerations' and a list of considerations: Low Stray Inductance, Ground Plane, and Low Leakage Inductance Current Transformer.

Circuit Layout Considerations

- Low Stray Inductance
- Ground Plane
- Low Leakage Inductance Current Transformer

• dv/dt controlled by R_G
 • I_{SD} controlled by Duty Factor "D"
 • D.U.T. - Device Under Test

** Use P-Channel Driver for P-Channel Measurements

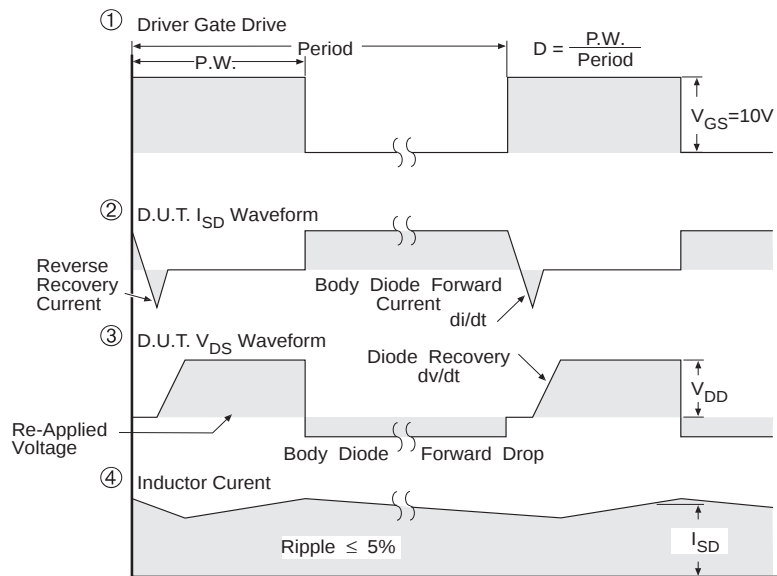
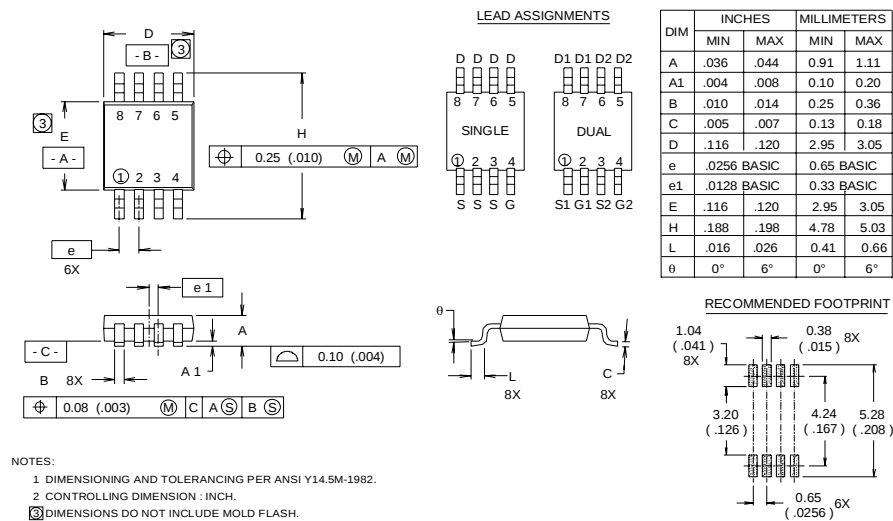


Fig 17 For P Channel HEXFETS

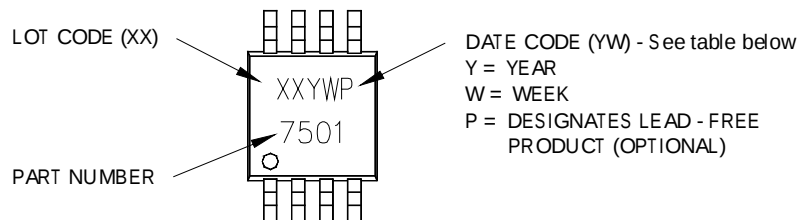
Micro8 Package Outline

Dimensions are shown in millimeters (inches)



Micro8 Part Marking Information

EXAMPLE: THIS IS AN IRF7501



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

YEAR	Y	WORK WEEK	W
2001	1	01	A
2002	2	02	B
2003	3	03	C
2004	4	04	D
2005	5		
2006	6		
2007	7		
2008	8		
2009	9		
2010	0	24	X
		25	Y
		26	Z

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

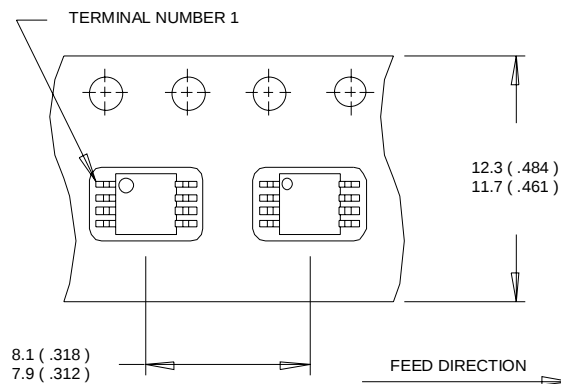
YEAR	Y	WORK WEEK	W
2001	A	27	A
2002	B	28	B
2003	C	29	C
2004	D	30	D
2005	E		
2006	F		
2007	G		
2008	H		
2009	J		
2010	K	50	X
		51	Y
		52	Z

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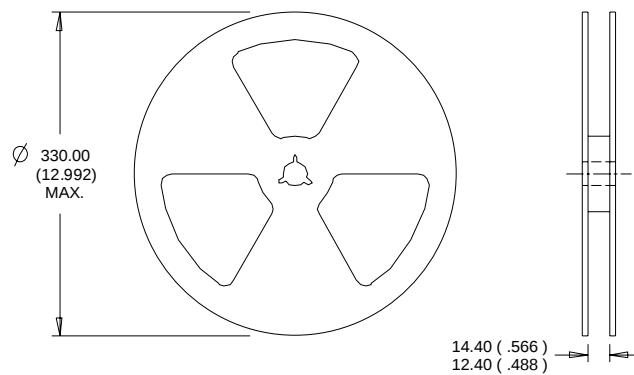
Micro8 Tape & Reel Information

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.

Data and specifications subject to change without notice.
This product has been designed and qualified for the Consumer market.
Qualifications Standards can be found on IR's Web site.

International
IR Rectifier

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Visit us at www.irf.com for sales contact information.02/05

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