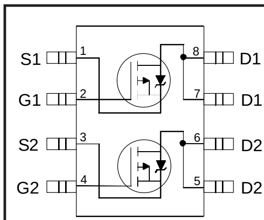
International
IOR Rectifier

IRF7555PbF

HEXFET® Power MOSFET

- Trench Technology
- Ultra Low On-Resistance
- Dual P-Channel MOSFET
- Very Small SOIC Package
- Low Profile (<1.1mm)
- Available in Tape & Reel
- Lead-Free



Top View

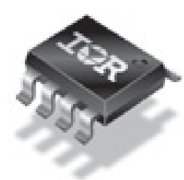
V_{DSS} = -20V

$R_{DS(on)}$ = 0.055Ω

Description

New trench 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 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 has half the footprint area of the standard SO-8. This makes the Micro8 an ideal package 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.


Micro8™

Absolute Maximum Ratings

	Parameter	Max.	Units
V_{DS}	Drain-Source Voltage	-20	V
I_D @ T_A = 25°C	Continuous Drain Current, V_{GS} @ -4.5V	-4.3	A
I_D @ T_A = 70°C	Continuous Drain Current, V_{GS} @ -4.5V	-3.4	
I_{DM}	Pulsed Drain Current①	-34	
P_D @T_A = 25°C	Maximum Power Dissipation④	1.25	W
P_D @T_A = 70°C	Maximum Power Dissipation④	0.8	W
	Linear Derating Factor	10	mW/°C
V_{GS}	Gate-to-Source Voltage	± 12	V
E_{AS}	Single Pulse Avalanche Energy④	36	mJ
dv/dt	Peak Diode Recovery dv/dt ②	1.1	V/ns
T_J , T_{STG}	Junction and Storage Temperature Range	-55 to + 150	°C
	Soldering Temperature, for 10 seconds	240 (1.6mm from case)	

Thermal Resistance

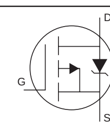
	Parameter Max.	Units	
$R_{\theta JA}$	Maximum Junction-to-Ambient ④	100	°C/W

2/22/05

Electrical Characteristics @ T_J = 25°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 = -250μA
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	–––	-0.005	–––	V/°C	Reference to 25°C, I_D = -1mA
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	–––	–––	0.055	Ω	V_{GS} = -4.5V, I_D = -4.3A ③
		–––	–––	0.105		V_{GS} = -2.5V, I_D = -3.4A ③
$V_{GS(th)}$	Gate Threshold Voltage	-0.60	–––	-1.2	V	V_{DS} = V_{GS}, I_D = -250μA
g_{fs}	Forward Transconductance	2.5	–––	–––	S	V_{DS} = -10V, I_D = -0.8A
I_{DSS}	Drain-to-Source Leakage Current	–––	–––	-1.0	μA	V_{DS} = -16V, V_{GS} = 0V
		–––	–––	-25		V_{DS} = -16V, V_{GS} = 0V, T_J = 125°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	–––	10	15	nC	I_D = -3.0A
Q_{gs}	Gate-to-Source Charge	–––	2.1	3.1		V_{DS} = -10V
Q_{gd}	Gate-to-Drain ("Miller") Charge	–––	2.5	3.7		V_{GS} = -5.0V
$t_{d(on)}$	Turn-On Delay Time	–––	10	–––	ns	V_{DD} = -10V
t_r	Rise Time	–––	46	–––		I_D = -2.0A
$t_{d(off)}$	Turn-Off Delay Time	–––	60	–––		R_G = 6.0Ω
t_f	Fall Time	–––	64	–––		R_D = 5.0Ω ③
C_{iss}	Input Capacitance	–––	1066	–––	pF	V_{GS} = 0V
C_{oss}	Output Capacitance	–––	402	–––		V_{DS} = -10V
C_{rss}	Reverse Transfer Capacitance	–––	126	–––		f = 1.0MHz

Source-Drain Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	–––	–––	-1.3	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode) ①	–––	–––	-34		
V_{SD}	Diode Forward Voltage	–––	–––	-1.2	V	T_J = 25°C, I_S = -1.6A, V_{GS} = 0V ③
t_{rr}	Reverse Recovery Time	–––	54	82	ns	T_J = 25°C, I_F = -2.5A
Q_{rr}	Reverse Recovery Charge	–––	41	61	nC	di/dt = -100A/μs ③

Notes:

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

② $I_{SD} \le$ -2.0A, di/dt $\le$ -140A/μs, $V_{DD} \le V_{(BR)DSS}$, $T_J \le$ 150°C

③ Pulse width $\le$ 300μs; duty cycle $\le$ 2%.

④ Surface mounted on FR-4 board, t $\le$ 10sec.

⑤ Starting T_J = 25°C, L = 8.0mH R_G = 25Ω, I_{AS} = -3.0A.

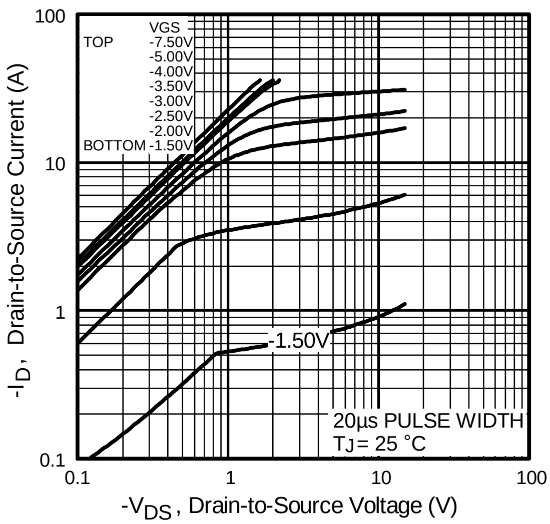


Fig 1. Typical Output Characteristics

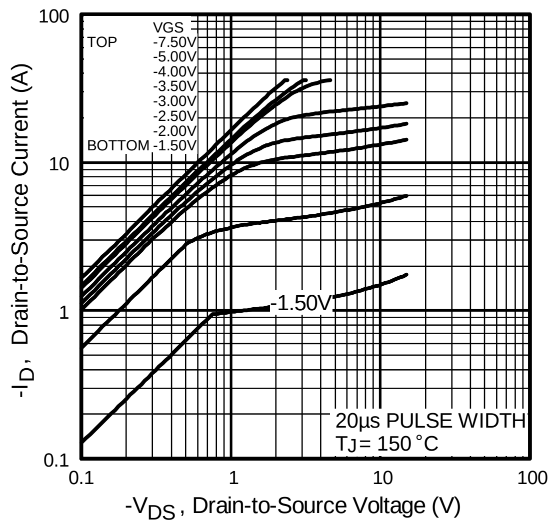


Fig 2. Typical Output Characteristics

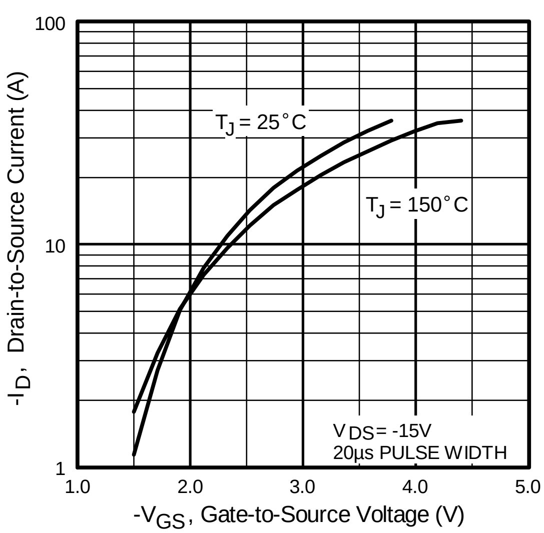


Fig 3. Typical Transfer Characteristics

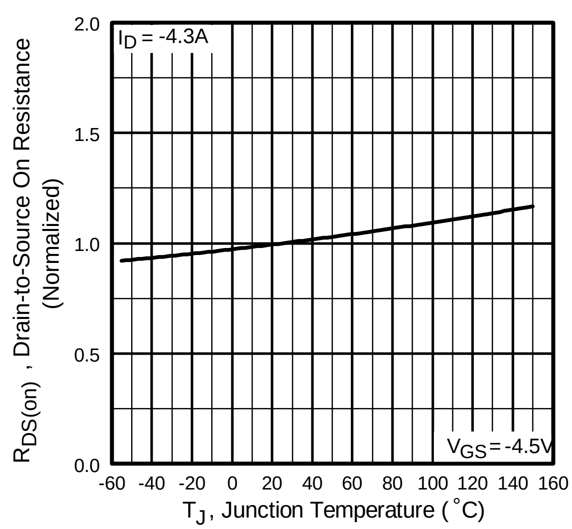


Fig 4. Normalized On-Resistance Vs. Temperature

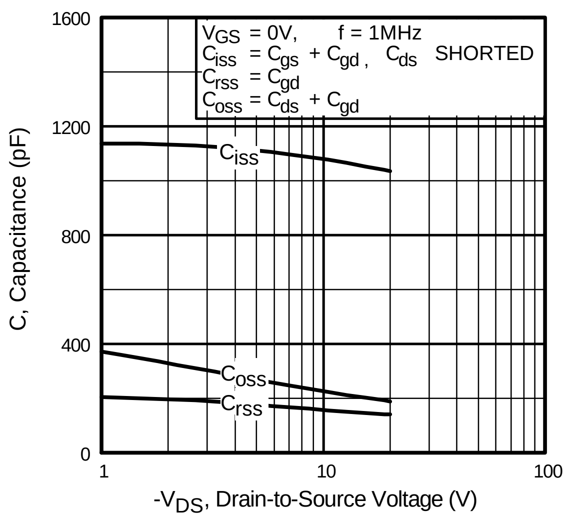


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

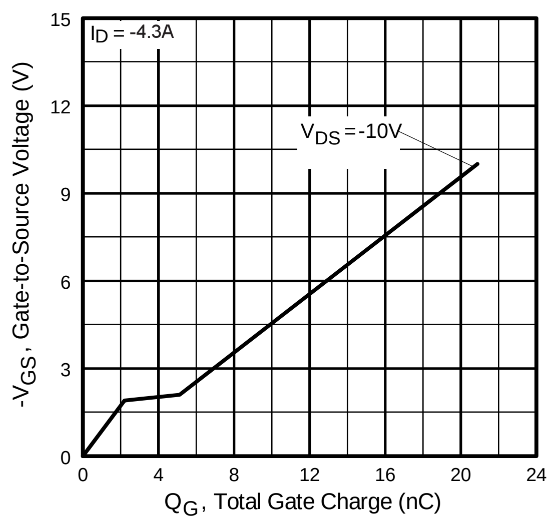


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

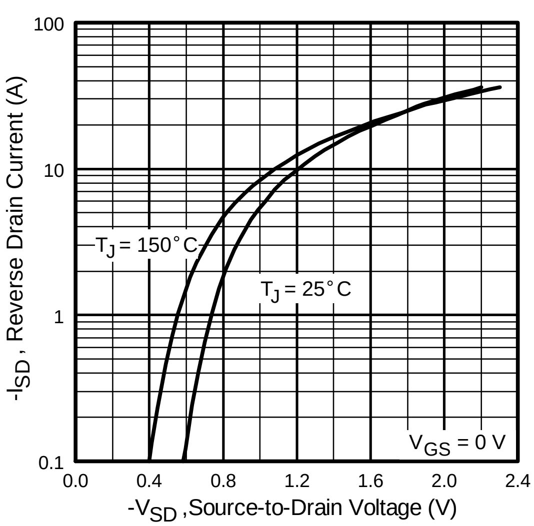


Fig 7. Typical Source-Drain Diode Forward Voltage

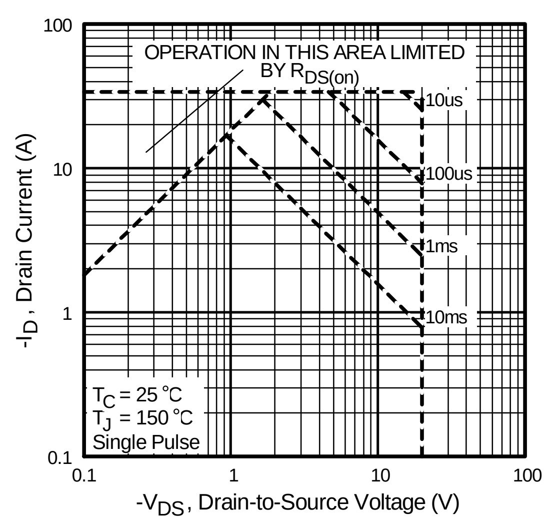


Fig 8. Maximum Safe Operating Area

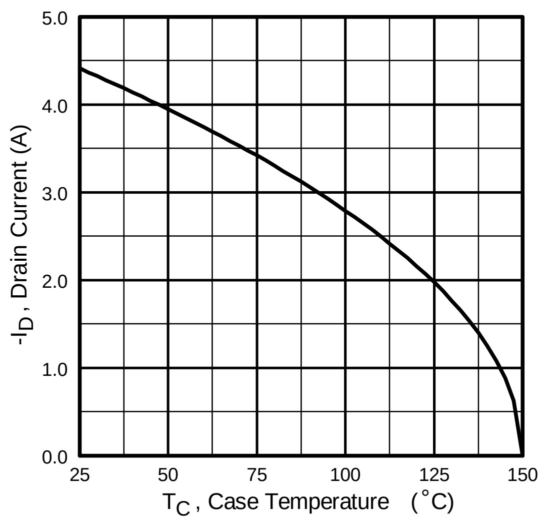


Fig 9. Maximum Drain Current Vs. Case Temperature

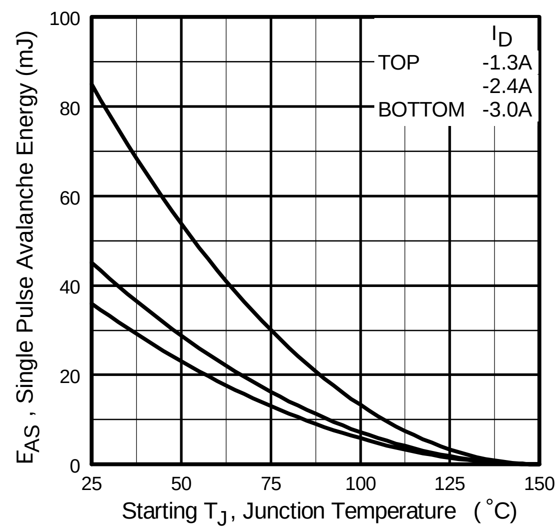


Fig 10. Maximum Avalanche Energy Vs. Drain Current

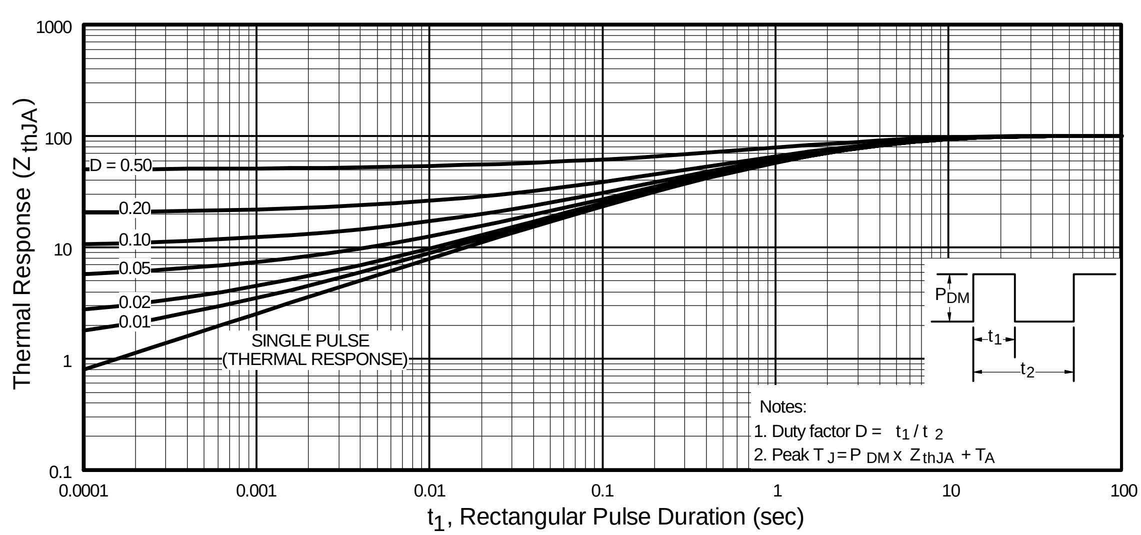


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

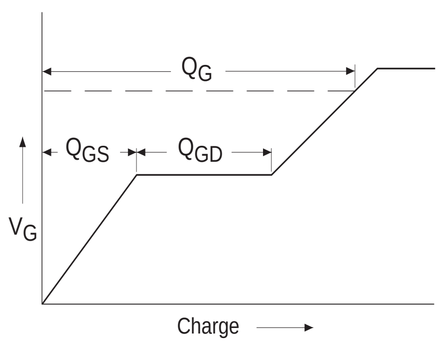


Fig 12a. Basic Gate Charge Waveform

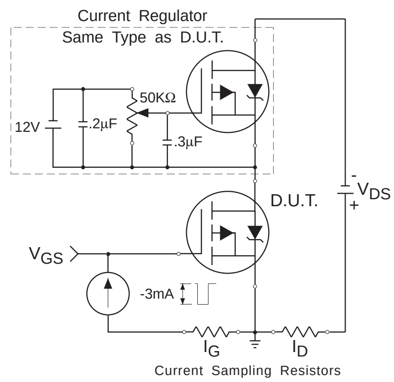


Fig 12b. Gate Charge Test Circuit

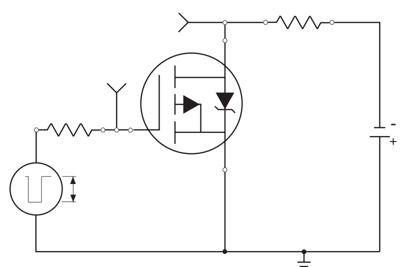


Fig 13a. Switching Time Test Circuit

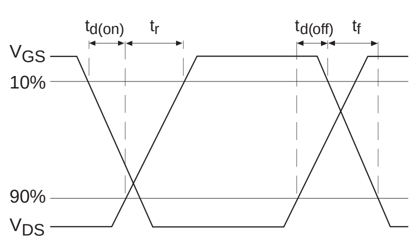
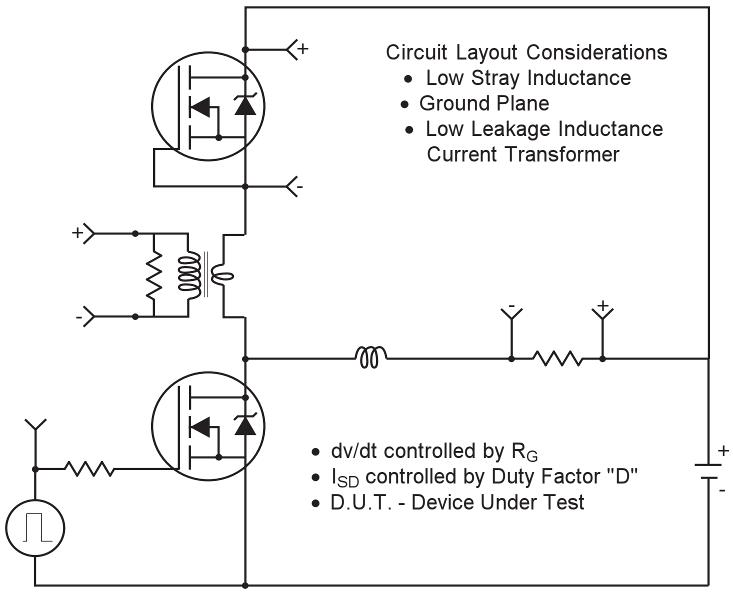
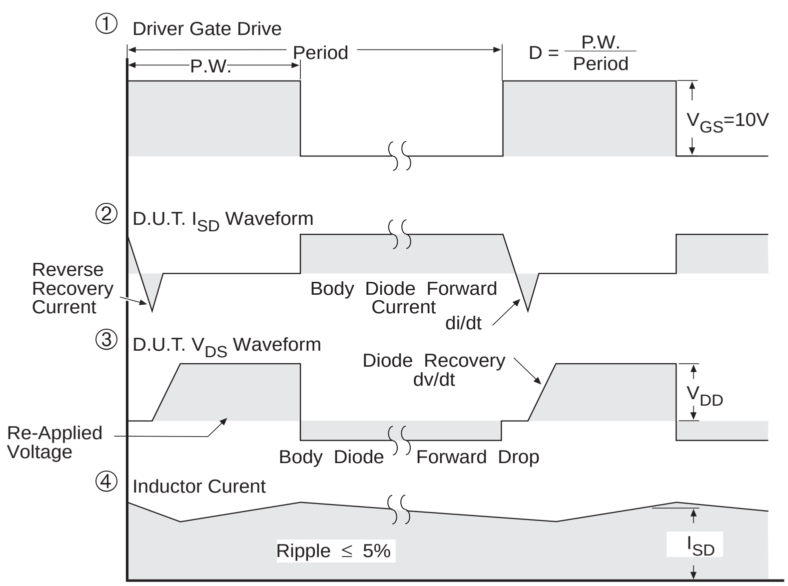


Fig 13b. Switching Time Waveforms

Peak Diode Recovery dv/dt Test Circuit



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

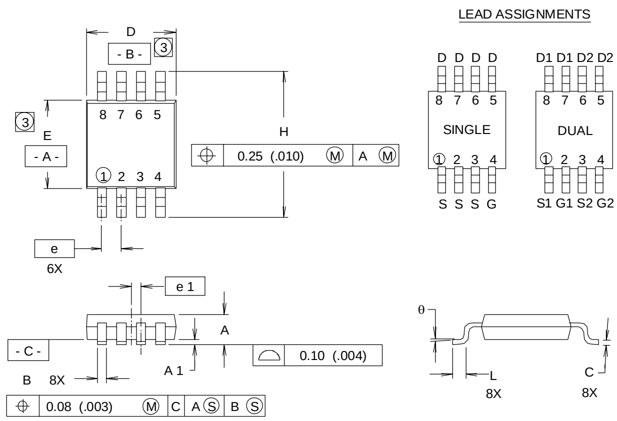


*** V_{GS} = 5.0V for Logic Level and 3V Drive Devices

Fig -14 For P Channel HEXFETS

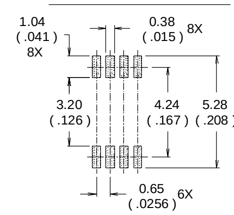
Micro8 Package Outline

Dimensions are shown in milimeters (inches)



DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.036	.044	0.91	1.11
A1	.004	.008	0.10	0.20
B	.010	.014	0.25	0.36
C	.005	.007	0.13	0.18
D	.116	.120	2.95	3.05
e	.0256 BASIC		0.65 BASIC	
e1	.0128 BASIC		0.33 BASIC	
E	.116	.120	2.95	3.05
H	.188	.198	4.78	5.03
L	.016	.026	0.41	0.66
θ	0°	6°	0°	6°

RECOMMENDED FOOTPRINT



NOTES:

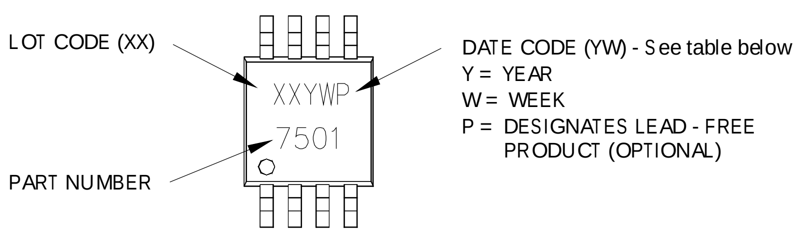
1 DIMENSIONING AND TOLERANCING PER ANSI Y14.5M-1982.

2 CONTROLLING DIMENSION : INCH.

3 DIMENSIONS DO NOT INCLUDE MOLD FLASH.

Micro8 Part Marking Information

EXAMPLE: THIS IS AN IRF7501



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

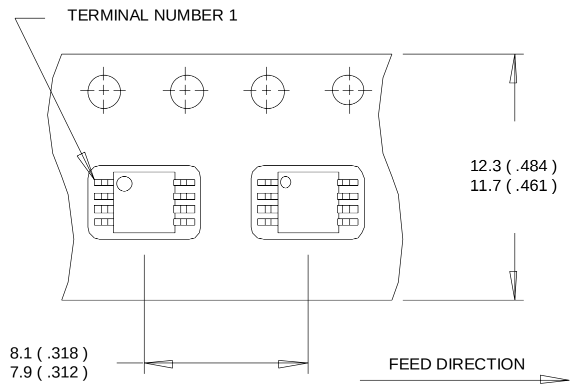
YEAR	Y	WORK WEEK	W
2001	1	01	A
2002	2	02	B
2003	3	03	C
2004	4	04	D
2005	5		
2006	6		
2007	7		
2008	8		
2009	9	↓	↓
2010	0	24	X
		25	Y
		26	Z

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

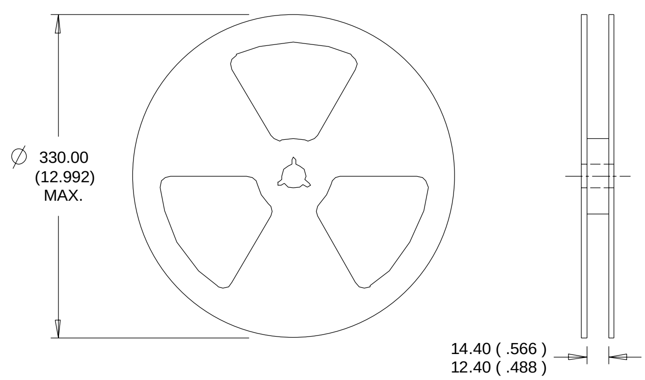
YEAR	Y	WORK WEEK	W
2001	A	27	A
2002	B	28	B
2003	C	29	C
2004	D	30	D
2005	E		
2006	F		
2007	G		
2008	H		
2009	J	↓	↓
2010	K	50	X
		51	Y
		52	Z

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.

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