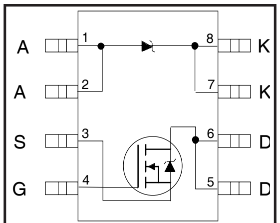
PD- 95241

International
IOR Rectifier

IRF7521D1PbF

FETKY™ MOSFET / Schottky Diode

- Co-packaged HEXFET® Power MOSFET and Schottky Diode
- N-Channel HEXFET
- Low V_F Schottky Rectifier
- Generation 5 Technology
- Micro8™ Footprint
- Lead-Free



Top View

V_{DSS} = 20V

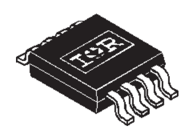
$R_{DS(on)}$ = 0.135Ω

Schottky Vf = 0.39V

Description

The **FETKY**™ family of co-packaged HEXFETs and Schottky diodes offer the designer an innovative board space saving solution for switching regulator applications. Generation 5 HEXFETs utilize advanced processing techniques to achieve extremely low on-resistance per silicon area. Combining this technology with International Rectifier's low forward drop Schottky rectifiers results in an extremely efficient device suitable for use in a wide variety of portable electronics applications like cell phone, PDA, etc.

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.



Micro8™

Absolute Maximum Ratings (T_A = 25°C unless otherwise noted)

Parameter		Maximum	Units
I_D @ T_A = 25°C	Continuous Drain Current, V_{GS} @ 4.5V	2.4	A
I_D @ T_A = 70°C		1.9	
I_{DM}	Pulsed Drain Current ①	19	
P_D @T_A = 25°C	Power Dissipation	1.3	W
P_D @T_A = 70°C		0.8	
	Linear Derating Factor	10	mW/°C
V_{GS}	Gate-to-Source Voltage	± 12	V
dv/dt	Peak Diode Recovery dv/dt ②	5.0	V/ns
T_J, T_{STG}	Junction and Storage Temperature Range	-55 to +150	°C

Thermal Resistance Ratings

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

Notes:

① Repetitive rating; pulse width limited by maximum junction temperature (see figure 9)

② $I_{SD} \leq 1.7A$, di/dt ≤ 66A/μs, $V_{DD} \leq V_{(BR)DSS}$, $T_J \leq 150°C$

③ Pulse width ≤ 300μs; duty cycle ≤ 2%

④ Surface mounted on FR-4 board, t ≤ 10sec.

5/12/04

MOSFET 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
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	——	0.085	0.135	Ω	V_{GS} = 4.5V, I_D = 1.7A ③
		——	0.12	0.20		V_{GS} = 2.7V, I_D = 0.85A ③
$V_{GS(th)}$	Gate Threshold Voltage	0.70	——	——	V	V_{DS} = V_{GS}, I_D = 250μA
g_{fs}	Forward Transconductance	2.6	——	——	S	V_{DS} = 10V, I_D = 0.85A
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	——	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. 6 ③
$t_{d(on)}$	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 = 6.0Ω
t_f	Fall Time	——	16	——		R_D = 5.7Ω, ③
C_{iss}	Input Capacitance	——	260	——	pF	V_{GS} = 0V
C_{oss}	Output Capacitance	——	130	——		V_{DS} = 15V
C_{rss}	Reverse Transfer Capacitance	——	61	——		ƒ = 1.0MHz, See Fig. 5

MOSFET Source-Drain Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current(Body Diode)	——	——	1.3	A	
I_{SM}	Pulsed Source Current (Body Diode)	——	——	14		
V_{SD}	Body Diode Forward Voltage	——	——	1.2	V	T_J = 25°C, I_S = 1.7A, V_{GS} = 0V
t_{rr}	Reverse Recovery Time (Body Diode)	——	39	59	ns	T_J = 25°C, I_F = 1.7A
Q_{rr}	Reverse RecoveryCharge	——	37	56	nC	di/dt = 100A/μs ③

Schottky Diode Maximum Ratings

	Parameter	Max.	Units.	Conditions	
$I_{F(av)}$	Max. Average Forward Current	1.9	A	50% Duty Cycle. Rectangular Wave, T_A = 25°C	
		1.4		See Fig.14 T_A = 70°C	
I_{SM}	Max. peak one cycle Non-repetitive Surge current	120	A	5μs sine or 3μs Rect. pulse	Following any rated load condition & with V_{RRM} applied
		11		10ms sine or 6ms Rect. pulse	

Schottky Diode Electrical Specifications

	Parameter	Max.	Units	Conditions	
V_{FM}	Max. Forward voltage drop	0.50	V	I_F = 1.0A, T_J = 25°C	
		0.62		I_F = 2.0A, T_J = 25°C	
		0.39		I_F = 1.0A, T_J = 125°C	
		0.57		I_F = 2.0A, T_J = 125°C .	
I_{RM}	Max. Reverse Leakage current	0.02	mA	V_R = 20V	T_J = 25°C
		8			T_J = 125°C
C_t	Max. Junction Capacitance	92	pF	V_R = 5Vdc (100kHz to 1 MHz) 25°C	
dv/dt	Max. Voltage Rate of Charge	3600	V/ μs	Rated V_R	

(HEXFET is the reg. TM for International Rectifier Power MOSFET's)

Power Mosfet Characteristics

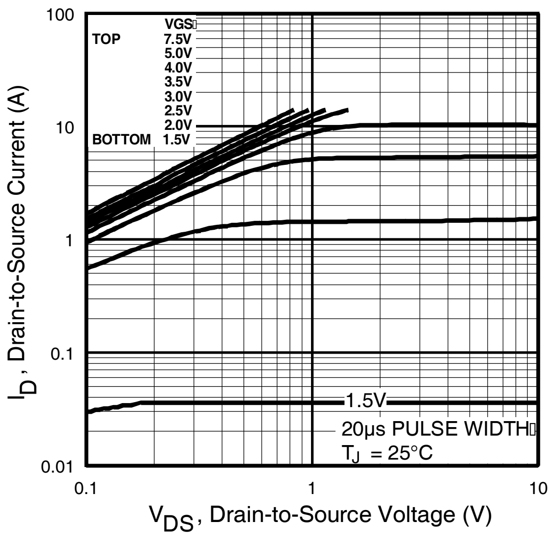


Fig 1. Typical Output Characteristics

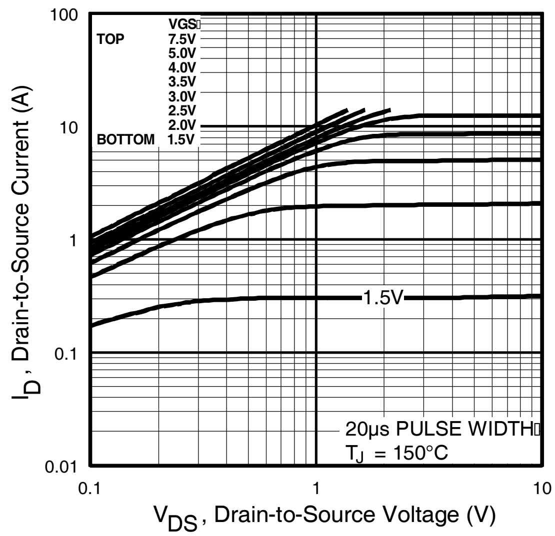


Fig 2. Typical Output Characteristics

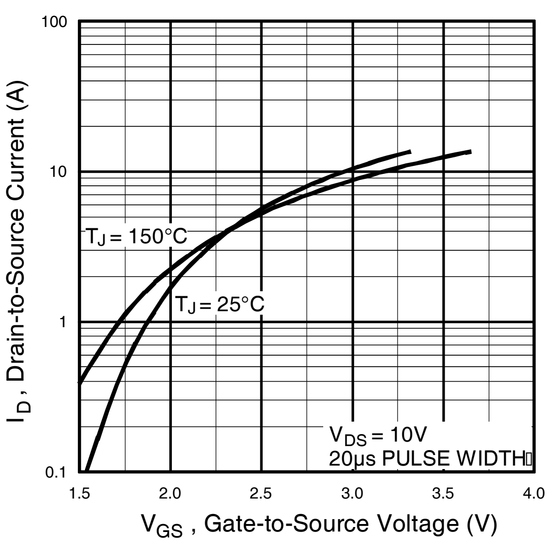


Fig 3. Typical Transfer Characteristics

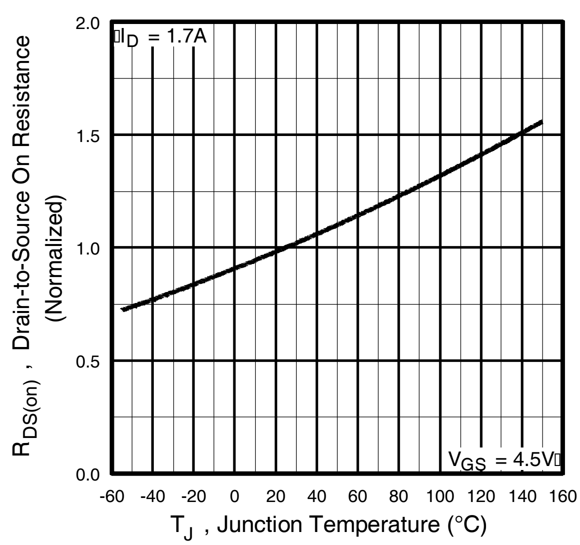


Fig 4. Normalized On-Resistance Vs. Temperature

Power Mosfet Characteristics

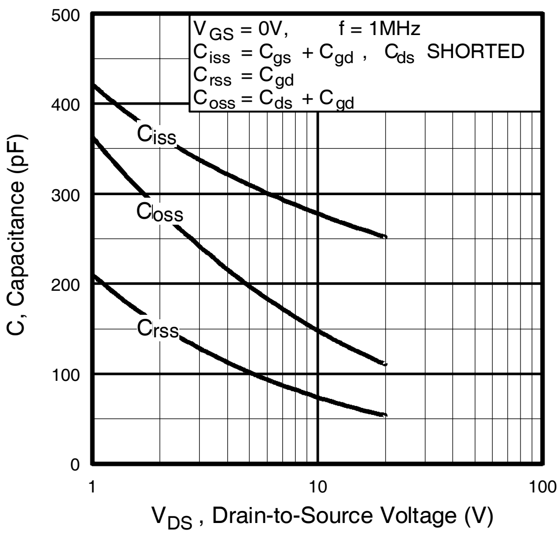


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

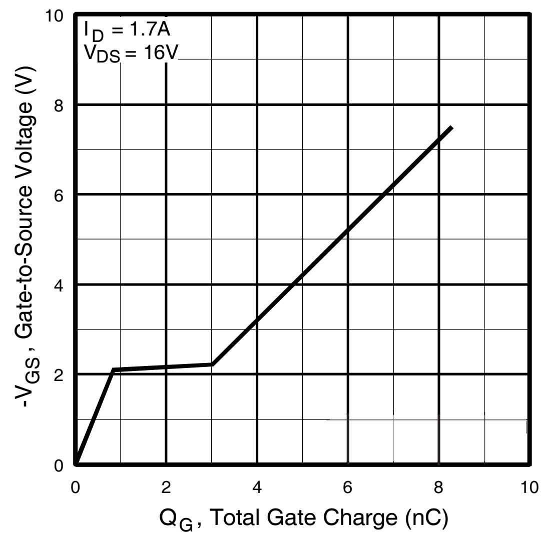


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

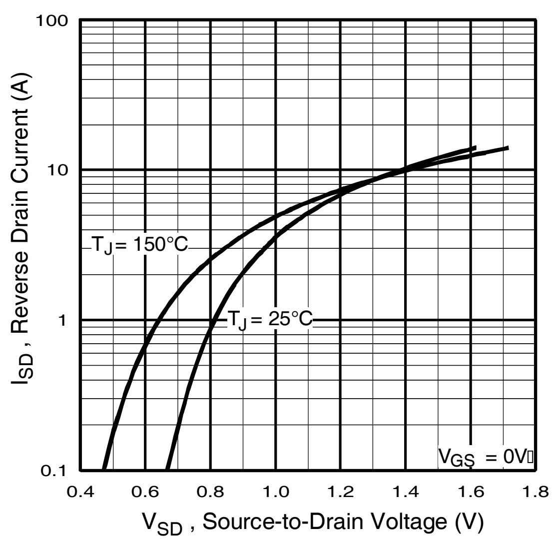


Fig 7. Typical Source-Drain Diode Forward Voltage

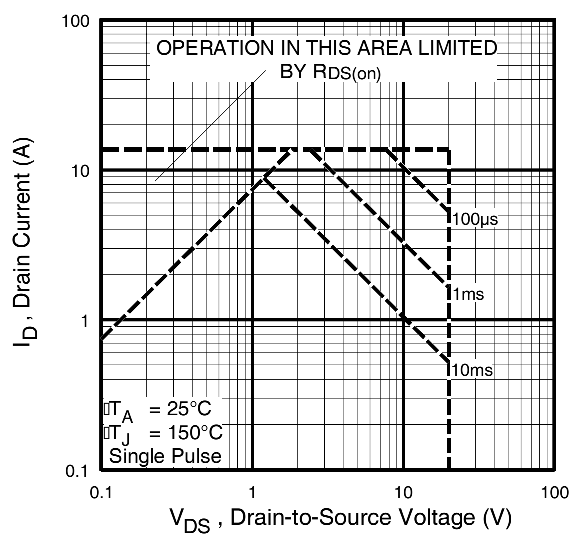


Fig 8. Maximum Safe Operating Area

Power Mosfet Characteristics

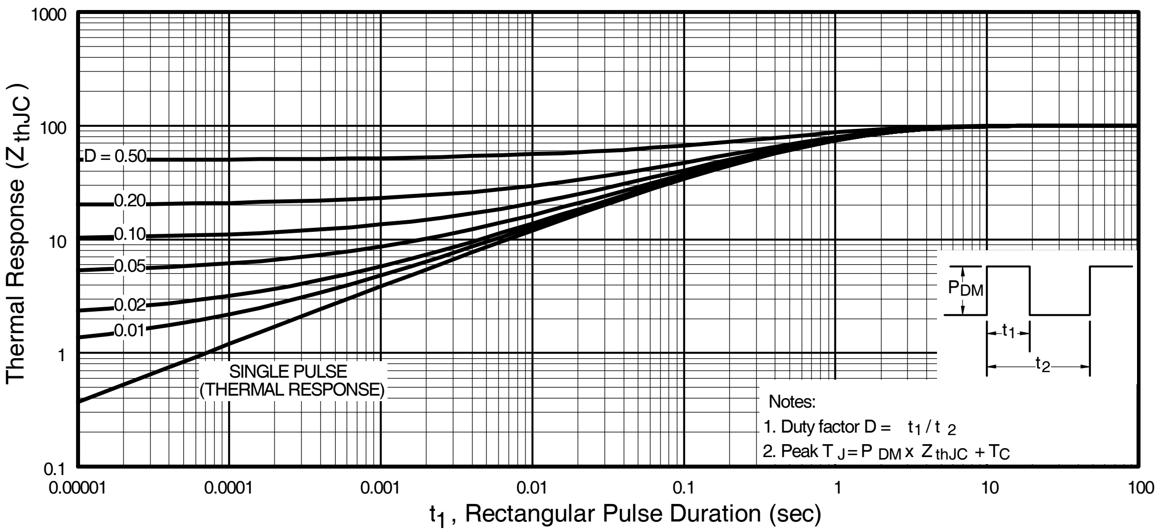


Fig 9. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

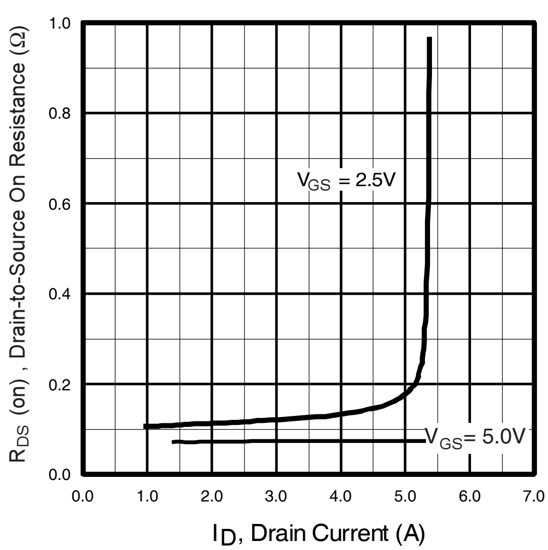


Fig 10. Typical On-Resistance Vs. Drain Current

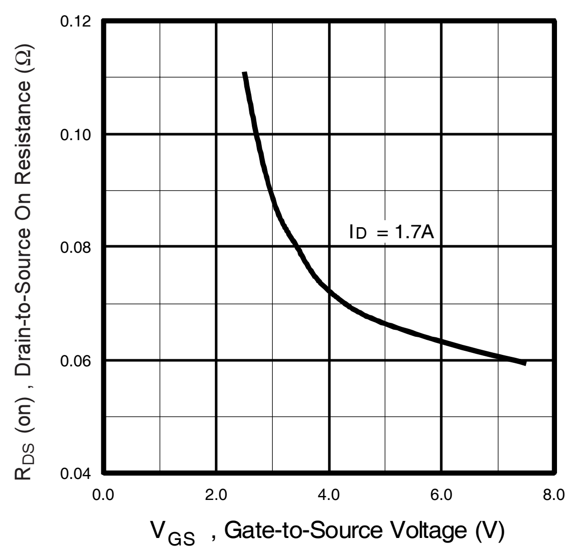


Fig 11. Typical On-Resistance Vs. Gate Voltage

Schottky Diode Characteristics

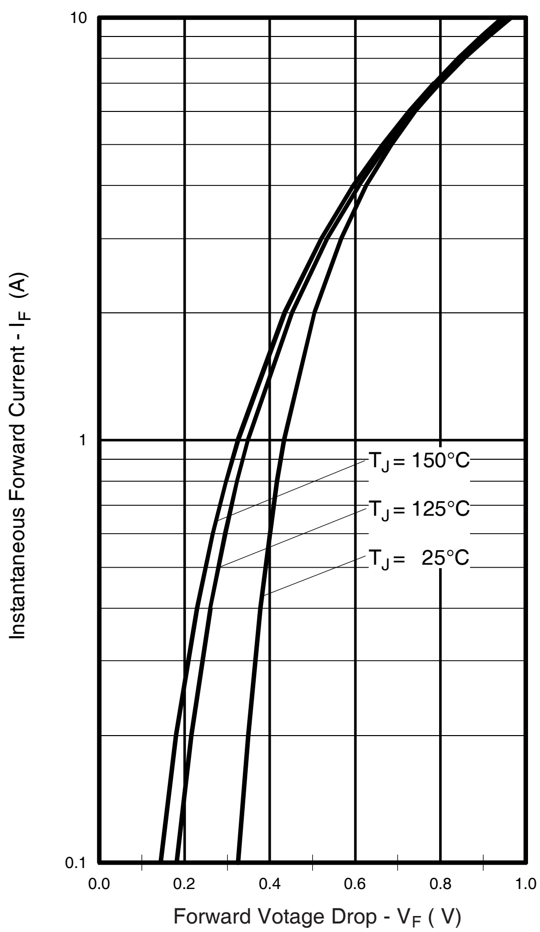


Fig. 12 -Typical Forward Voltage Drop Characteristics

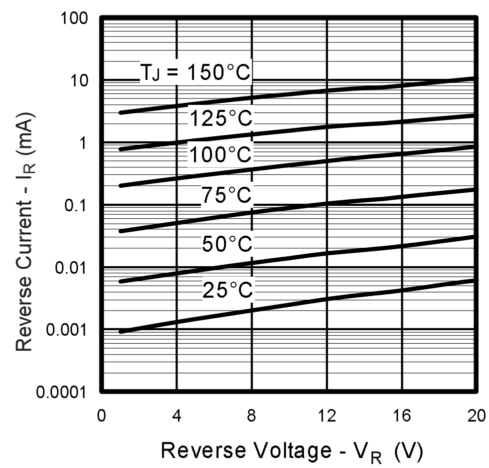


Fig. 13 - Typical Values of Reverse Current Vs. Reverse Voltage

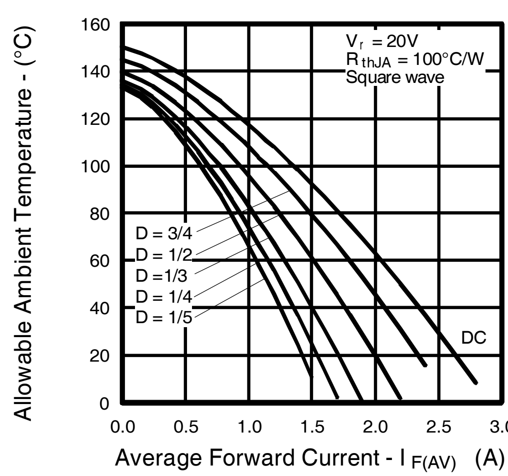
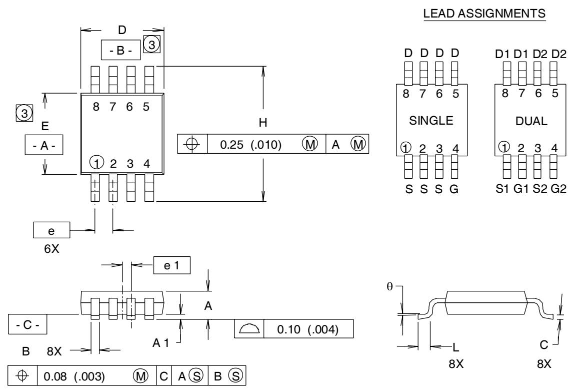


Fig.14 - Maximum Allowable Ambient Temp. Vs. Forward Current

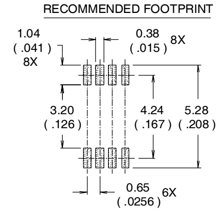
Micro8 Package Outline

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°

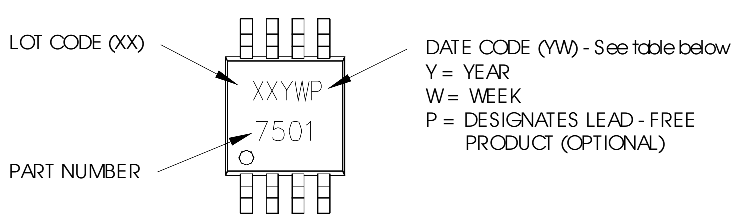
RECOMMENDED FOOTPRINT



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

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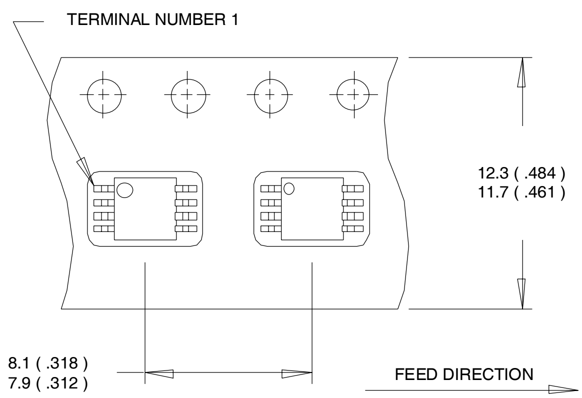
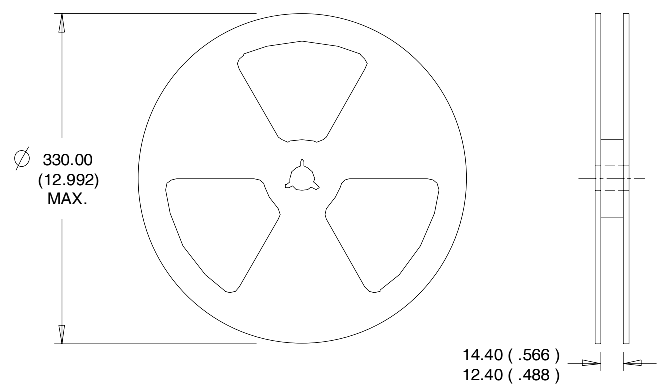
Micro8 Tape & Reel Information

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.
Qualification Standards can be found on IR's Web site.

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