

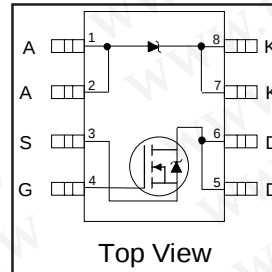
International IOR Rectifier

PD- 95434

IRF7523D1PbF

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

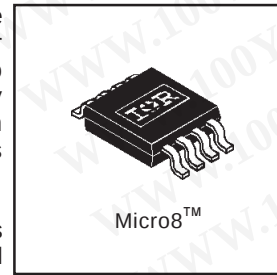


$V_{DSS} = 30V$
$R_{DS(on)} = 0.11\Omega$
Schottky $V_f = 0.39V$

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.



Absolute Maximum Ratings ($T_A = 25^\circ C$ unless otherwise noted)

Parameter		Maximum	Units
$I_D @ T_A = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^{(4)}$	2.7	A
$I_D @ T_A = 70^\circ C$		2.1	
I_{DM}	Pulsed Drain Current $^{(1)}$	21	
$P_D @ T_A = 25^\circ C$	Power Dissipation $^{(4)}$	1.25	W
$P_D @ T_A = 70^\circ C$		0.8	
	Linear Derating Factor	10	W/°C
V_{GS}	Gate-to-Source Voltage	± 20	V
dv/dt	Peak Diode Recovery dv/dt $^{(2)}$	6.2	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 11)
- $^{(2)}$ $I_{SD} \leq 1.7A$, $di/dt \leq 120A/\mu s$, $V_{DD} \leq V_{(BR)DSS}$, $T_J \leq 150^\circ C$
- $^{(3)}$ Pulse width $\leq 300\mu s$; duty cycle $\leq 2\%$
- $^{(4)}$ When mounted on 1 inch square copper board to approximate typical multi-layer PCB thermal resistance

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MOSFET 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	$V_{GS} = 0V, I_D = 250\mu A$
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	0.090	0.130	Ω	$V_{GS} = 10V, I_D = 1.7A$ ③
		—	0.140	0.190		$V_{GS} = 4.5V, I_D = 0.85A$ ③
$V_{GS(th)}$	Gate Threshold Voltage	1.0	—	—	V	$V_{DS} = V_{GS}, I_D = 250\mu A$
g_{fs}	Forward Transconductance	1.9	—	—	S	$V_{DS} = 10V, I_D = 0.85A$
I_{DSS}	Drain-to-Source Leakage Current	—	—	1.0	μA	$V_{DS} = 24V, V_{GS} = 0V$
		—	—	25		$V_{DS} = 24V, V_{GS} = 0V, T_J = 125^\circ\text{C}$
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	—	7.8	12	nC	$I_D = 1.7A$
Q_{gs}	Gate-to-Source Charge	—	1.2	1.8		$V_{DS} = 24V$
Q_{gd}	Gate-to-Drain ("Miller") Charge	—	2.5	3.8		$V_{GS} = 10V$ (see figure 10) ③
$t_{d(on)}$	Turn-On Delay Time	—	4.7	—	ns	$V_{DD} = 15V$
t_r	Rise Time	—	10	—		$I_D = 1.7A$
$t_{d(off)}$	Turn-Off Delay Time	—	12	—		$R_G = 6.1\Omega$
t_f	Fall Time	—	5.3	—		$R_D = 8.7\Omega$ ③
C_{iss}	Input Capacitance	—	210	—	pF	$V_{GS} = 0V$
C_{oss}	Output Capacitance	—	80	—		$V_{DS} = 25V$
C_{rss}	Reverse Transfer Capacitance	—	32	—		$f = 1.0\text{MHz}$ (see figure 9)

MOSFET Source-Drain Ratings and Characteristics

Parameter		Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	1.25	A	
I_{SM}	Pulsed Source Current (Body Diode)	—	—	21		
V_{SD}	Body Diode Forward Voltage	—	—	1.2	V	$T_J = 25^\circ\text{C}, I_S = 1.7A, V_{GS} = 0V$
t_{rr}	Reverse Recovery Time (Body Diode)	—	40	60	ns	$T_J = 25^\circ\text{C}, I_F = 1.7A$
Q_{rr}	Reverse Recovery Charge	—	48	72	nC	$di/dt = 100A/\mu s$ ③

Schottky Diode Maximum Ratings

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

Schottky Diode Electrical Specifications

	Parameter	Max.	Units	Conditions
V_{FM}	Max. Forward voltage drop	0.50	V	$I_F = 1.0A, T_J = 25^\circ\text{C}$
		0.62		$I_F = 2.0A, T_J = 25^\circ\text{C}$
		0.39		$I_F = 1.0A, T_J = 125^\circ\text{C}$
		0.57		$I_F = 2.0A, T_J = 125^\circ\text{C}$
I_{RM}	Max. Reverse Leakage current	0.06	mA	$V_R = 30V, T_J = 25^\circ\text{C}$
		16		$T_J = 125^\circ\text{C}$
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

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Power Mosfet Characteristics

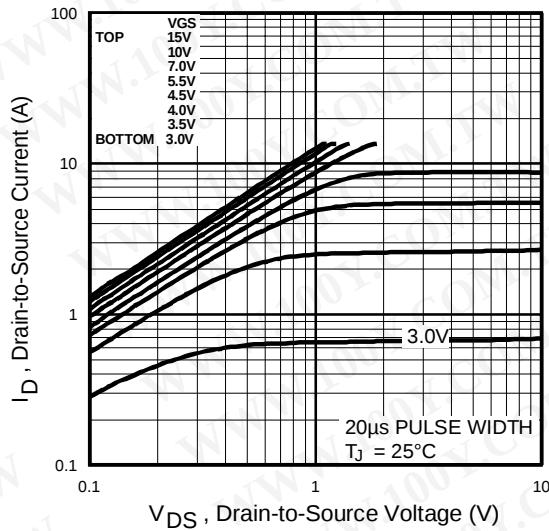


Fig 1. Typical Output Characteristics

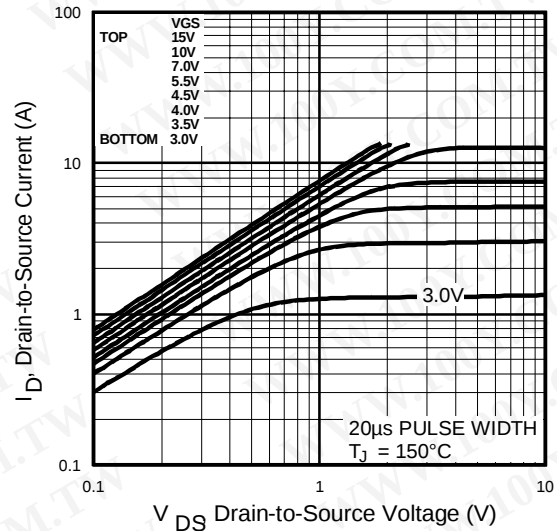


Fig 2. Typical Output Characteristics

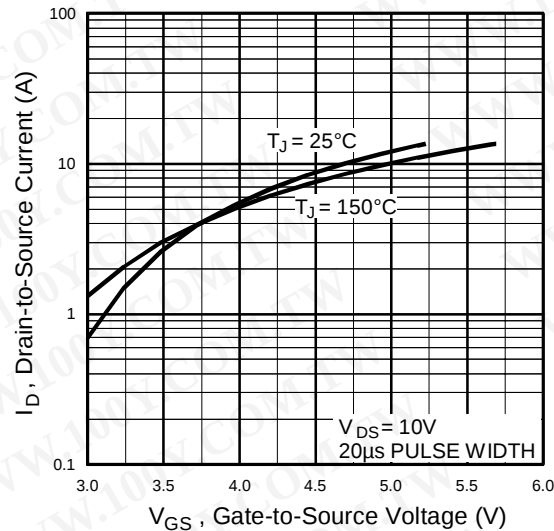


Fig 3. Typical Transfer Characteristics

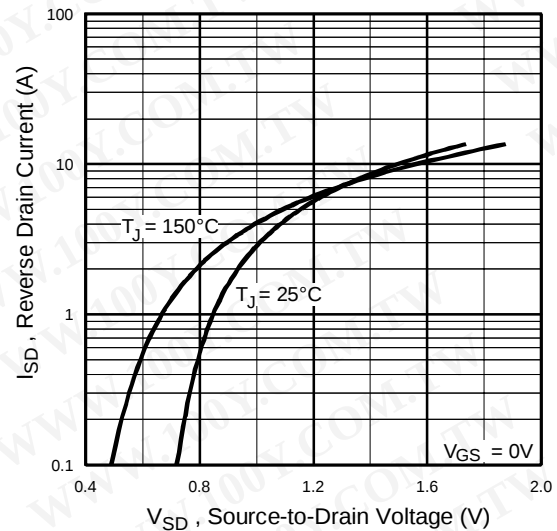


Fig 4. Typical Source-Drain Diode Forward Voltage

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Power Mosfet Characteristics

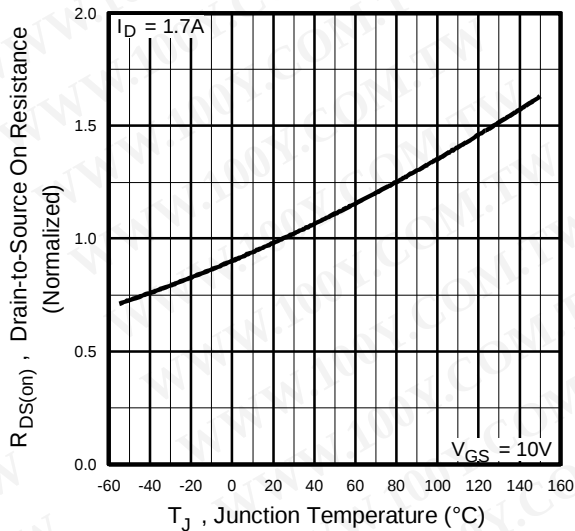


Fig 5. Normalized On-Resistance Vs. Temperature

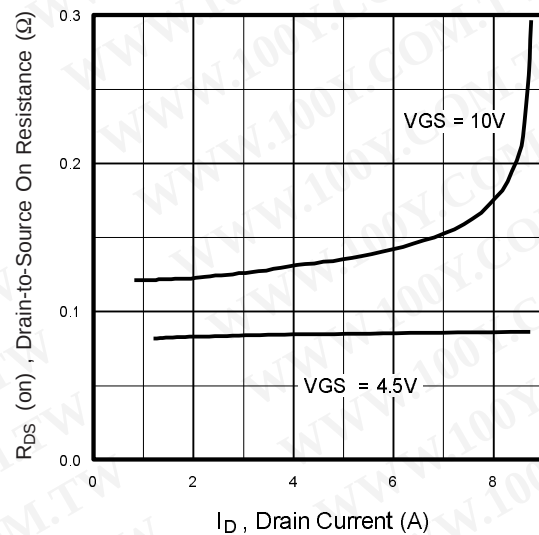


Fig 6. Typical On-Resistance Vs. Drain Current

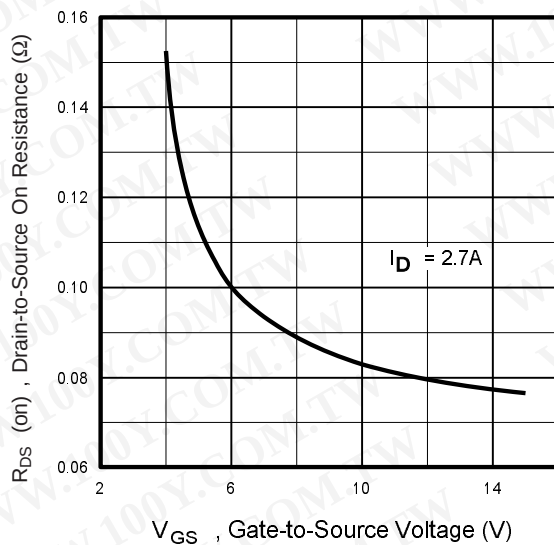


Fig 7. Typical On-Resistance Vs. Gate Voltage

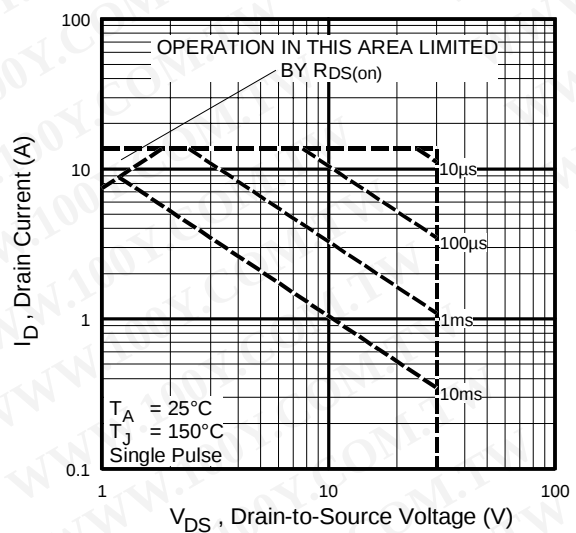


Fig 8. Maximum Safe Operating Area

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Power Mosfet Characteristics

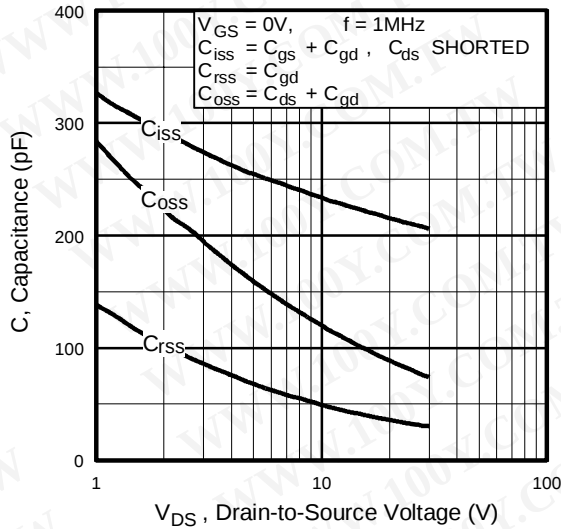


Fig 9. Typical Capacitance Vs. Drain-to-Source Voltage

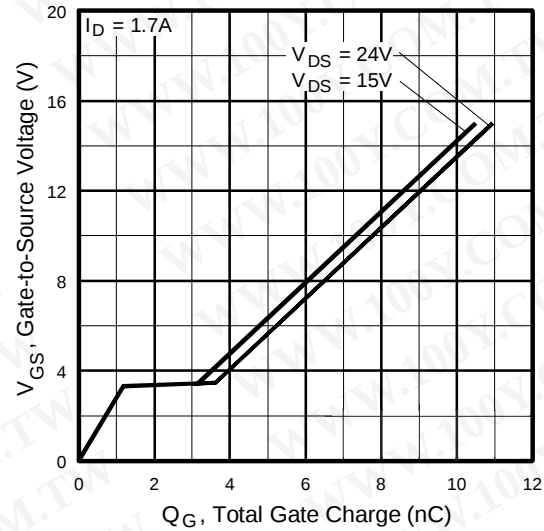


Fig 10. Typical Gate Charge Vs. Gate-to-Source Voltage

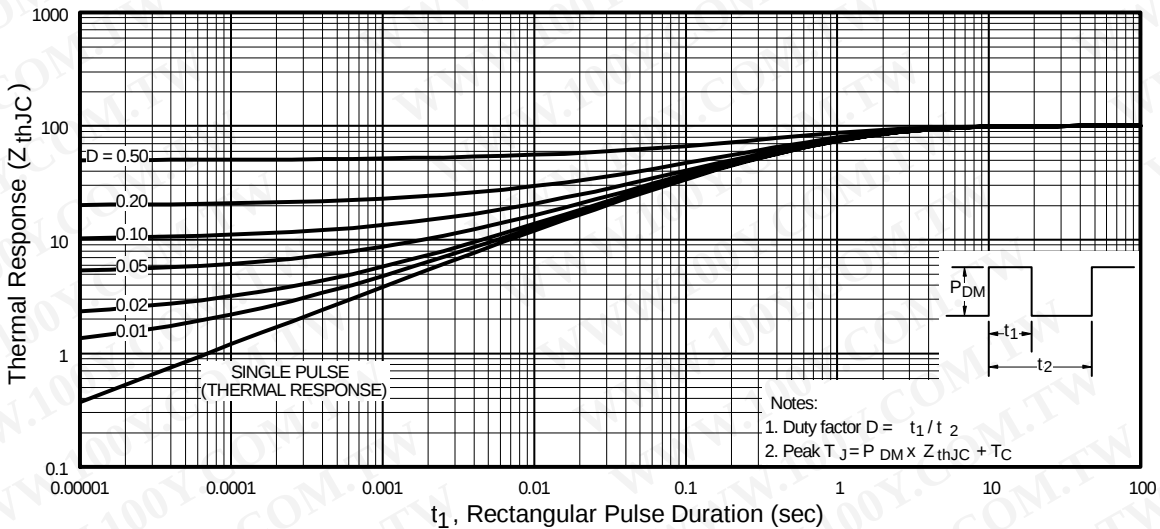


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

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Schottky Diode Characteristics

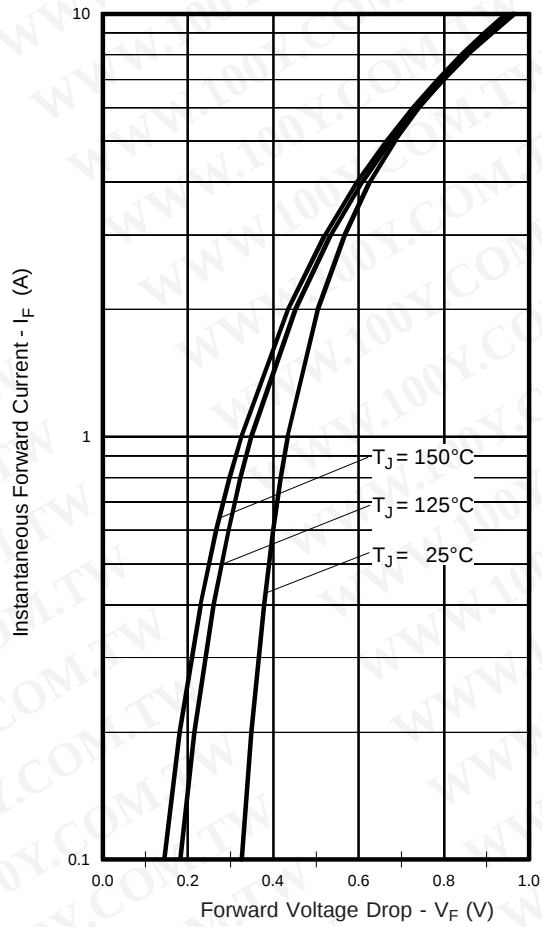


Fig. 12 - Typical Forward Voltage Drop Characteristics

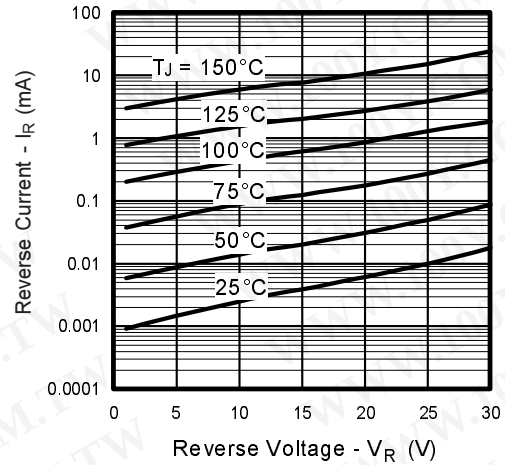


Fig. 13 - Typical Values of Reverse Current Vs. Reverse Voltage

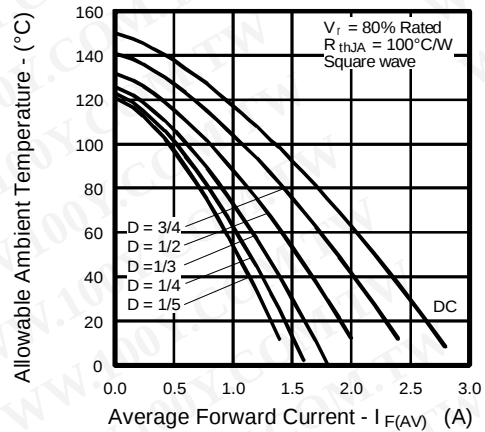


Fig.14 - Maximum Allowable Ambient Temp. Vs. Forward Current

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勝特力材料 886-3-5753170
勝特力电子(上海) 86-21-34970699
勝特力电子(深圳) 86-755-83298787
[Http://www.100y.com.tw](http://www.100y.com.tw)

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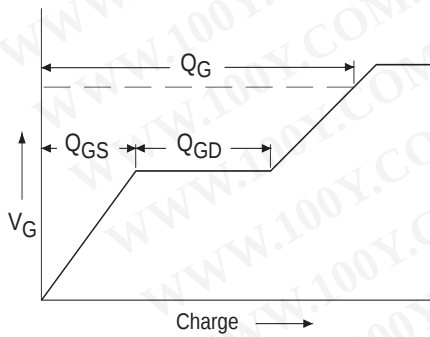


Fig 15a. Basic Gate Charge Waveform

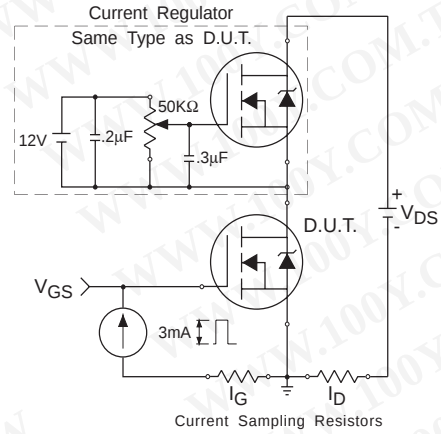


Fig 15b. Gate Charge Test Circuit

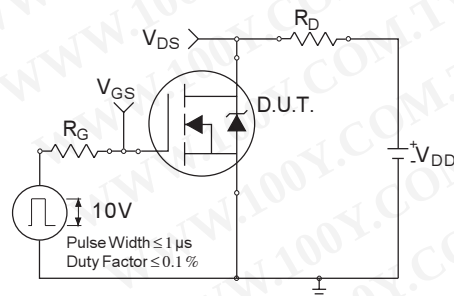


Fig 16a. Switching Time Test Circuit

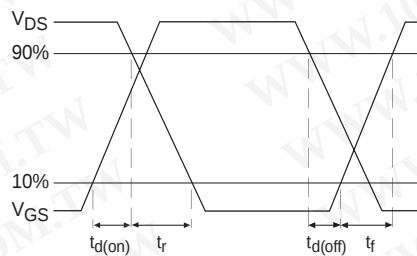
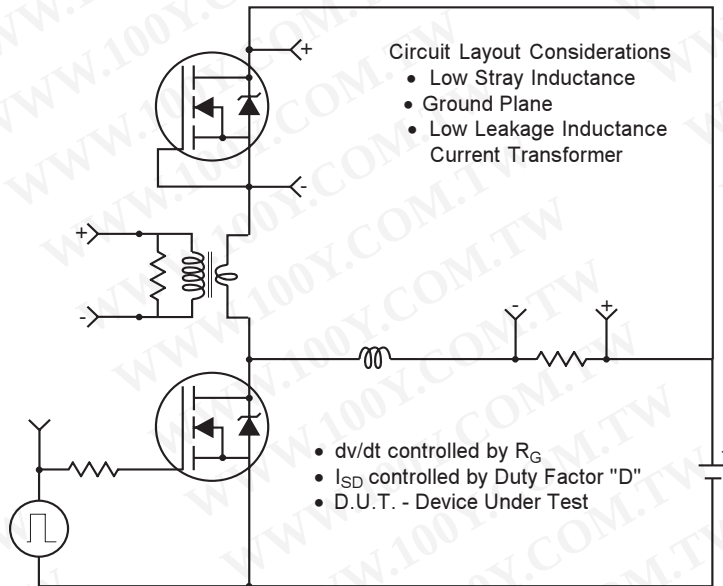


Fig 16b. Switching Time Waveforms

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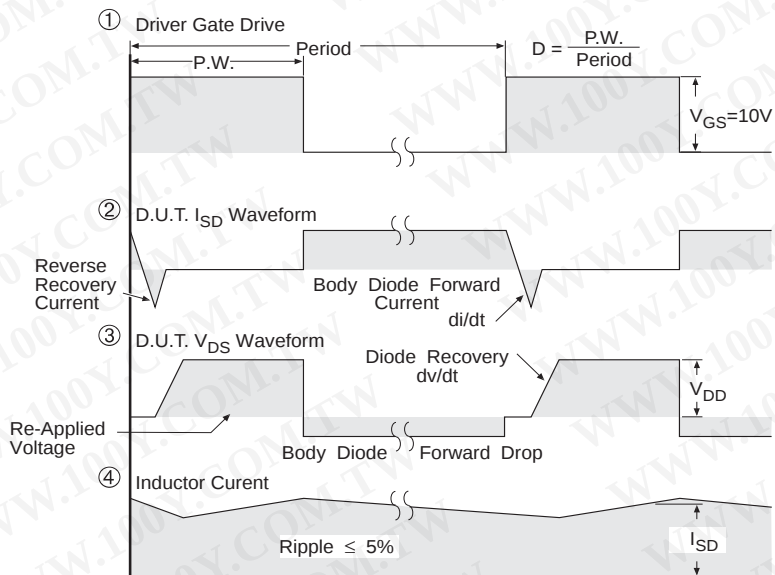
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Peak Diode Recovery dv/dt Test Circuit



* Reverse Polarity for P-Channel

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



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

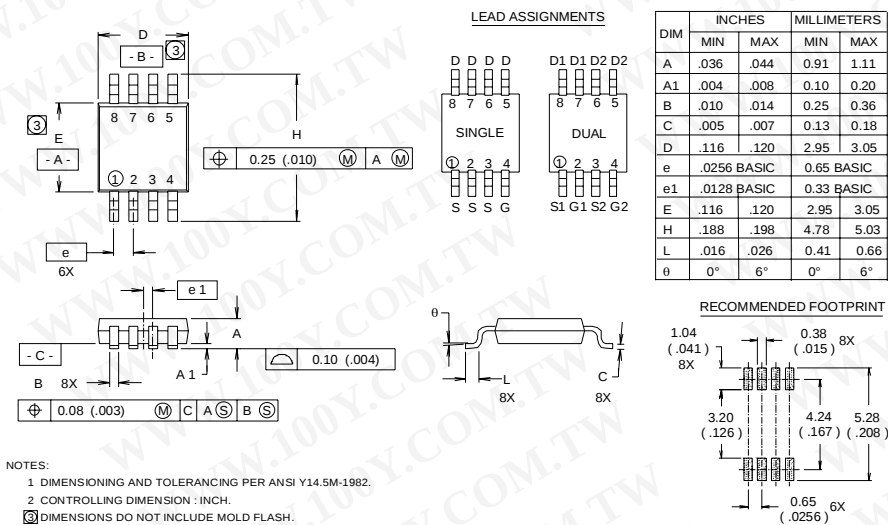
Fig 17 For N Channel HEXFETS

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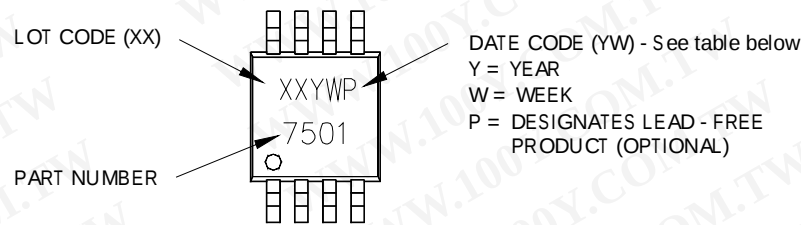
Micro8 Package Outline

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

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

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

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

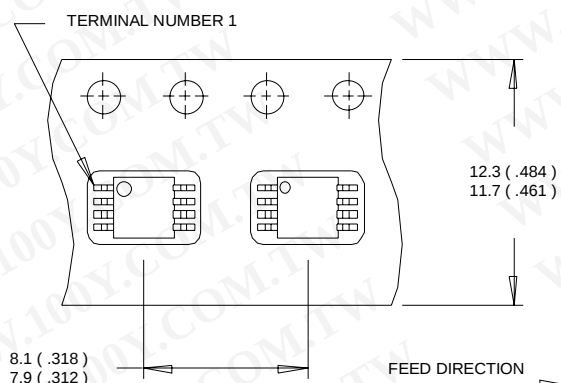
勝特力材料 886-3-5753170
勝特力电子(上海) 86-21-34970699
勝特力电子(深圳) 86-755-83298787
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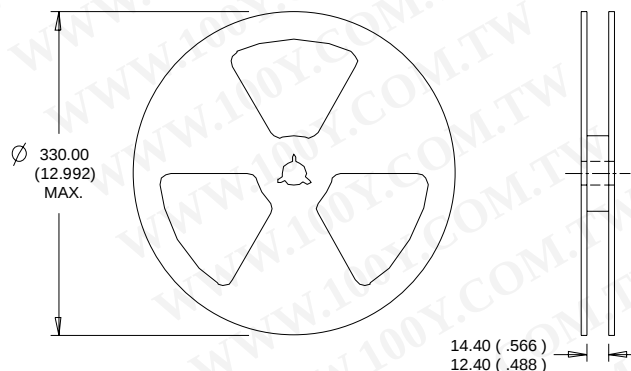
Micro8 Tape & Reel Information

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.

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