

勝特力材料 886-3-5753170
 勝特力电子(上海) 86-21-54151736
 勝特力电子(深圳) 86-755-83298787
 Http://www.100y.com.tw

PD - 97275A

International **IR** Rectifier

IRF7862PbF

HEXFET® Power MOSFET

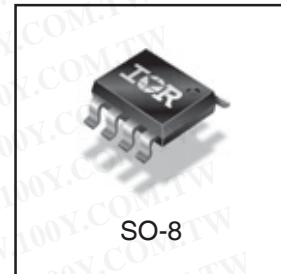
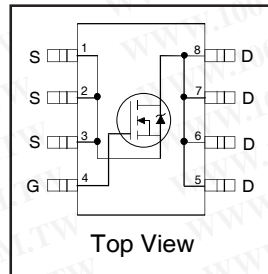
Applications

- Synchronous MOSFET for Notebook Processor Power
- Synchronous Rectifier MOSFET for Isolated DC-DC Converters

V_{DS}	$R_{DS(on)}$ max	Qg
30V	3.7mΩ @ $V_{GS} = 10V$	30nC

Benefits

- Very Low $R_{DS(on)}$ at 4.5V V_{GS}
- Ultra-Low Gate Impedance
- Fully Characterized Avalanche Voltage and Current
- 20V V_{GS} Max. Gate Rating
- 100% tested for Rg
- Lead-Free



Absolute Maximum Ratings

	Parameter	Max.	Units
V_{DS}	Drain-to-Source Voltage	30	V
V_{GS}	Gate-to-Source Voltage	± 20	
$I_D @ T_A = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	21	A
$I_D @ T_A = 70^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	17	
I_{DM}	Pulsed Drain Current ①	170	
$P_D @ T_A = 25^\circ C$	Power Dissipation	2.5	W
$P_D @ T_A = 70^\circ C$	Power Dissipation	1.6	
	Linear Derating Factor	0.02	W/°C
T_J	Operating Junction and	-55 to + 150	°C
T_{STG}	Storage Temperature Range		

Thermal Resistance

	Parameter	Typ.	Max.	Units
$R_{\theta JL}$	Junction-to-Drain Lead ⑤	—	20	°C/W
$R_{\theta JA}$	Junction-to-Ambient ④⑤	—	50	

Notes ① through ⑤ are on page 9

IRF7862PbF

International
IR Rectifier

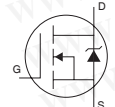
Static @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
BV_{DSS}	Drain-to-Source Breakdown Voltage	30	—	—	V	$V_{GS} = 0V, I_D = 250\mu A$
$\Delta BV_{DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.023	—	$V/^\circ\text{C}$	Reference to $25^\circ\text{C}, I_D = 1mA$
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	3.0	3.7	m Ω	$V_{GS} = 10V, I_D = 20A$ ③
		—	3.7	4.5		$V_{GS} = 4.5V, I_D = 16A$ ③
$V_{GS(th)}$	Gate Threshold Voltage	1.35	—	2.35	V	$V_{DS} = V_{GS}, I_D = 100\mu A$
$\Delta V_{GS(th)}$	Gate Threshold Voltage Coefficient	—	-5.4	—	$mV/^\circ\text{C}$	$V_{DS} = V_{GS}, I_D = 250\mu A$
I_{DSS}	Drain-to-Source Leakage Current	—	—	1.0	μA	$V_{DS} = 24V, V_{GS} = 0V$
		—	—	150		$V_{DS} = 24V, V_{GS} = 0V, T_J = 125^\circ\text{C}$
I_{GSS}	Gate-to-Source Forward Leakage	—	—	100	nA	$V_{GS} = 20V$
	Gate-to-Source Reverse Leakage	—	—	-100		$V_{GS} = -20V$
g_{fs}	Forward Transconductance	87	—	—	S	$V_{DS} = 15V, I_D = 16A$
Q_g	Total Gate Charge	—	30	45	nC	$V_{DS} = 15V$ $V_{GS} = 4.5V$ $I_D = 16A$ See Figs. 15 & 16
Q_{gs1}	Pre-V _{th} Gate-to-Source Charge	—	7.5	—		
Q_{gs2}	Post-V _{th} Gate-to-Source Charge	—	3.1	—		
Q_{gd}	Gate-to-Drain Charge	—	9.8	—		
Q_{godr}	Gate Charge Overdrive	—	9.6	—		
Q_{sw}	Switch Charge ($Q_{gs2} + Q_{gd}$)	—	12.9	—		
Q_{oss}	Output Charge	—	18	—	nC	$V_{DS} = 16V, V_{GS} = 0V$
R_g	Gate Resistance	—	1.0	1.6	Ω	
$t_{d(on)}$	Turn-On Delay Time	—	16	—	ns	$V_{DD} = 15V, V_{GS} = 4.5V$ $I_D = 16A$ $R_G = 1.8\Omega$ See Fig. 18
t_r	Rise Time	—	19	—		
$t_{d(off)}$	Turn-Off Delay Time	—	18	—		
t_f	Fall Time	—	11	—		
C_{iss}	Input Capacitance	—	4090	—	pF	$V_{GS} = 0V$ $V_{DS} = 15V$ $f = 1.0MHz$
C_{oss}	Output Capacitance	—	810	—		
C_{rss}	Reverse Transfer Capacitance	—	390	—		

Avalanche Characteristics

	Parameter	Typ.	Max.	Units
E_{AS}	Single Pulse Avalanche Energy ②	—	350	mJ
I_{AR}	Avalanche Current ①	—	16	A

Diode Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	3.1	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode) ①	—	—	170		
V_{SD}	Diode Forward Voltage	—	—	1.0	V	$T_J = 25^\circ\text{C}, I_S = 16A, V_{GS} = 0V$ ③
t_{rr}	Reverse Recovery Time	—	17	26	ns	$T_J = 25^\circ\text{C}, I_F = 16A, V_{DD} = 15V$
Q_{rr}	Reverse Recovery Charge	—	33	50	nC	$di/dt = 430A/\mu s$ ③
t_{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

International
IR Rectifier

IRF7862PbF

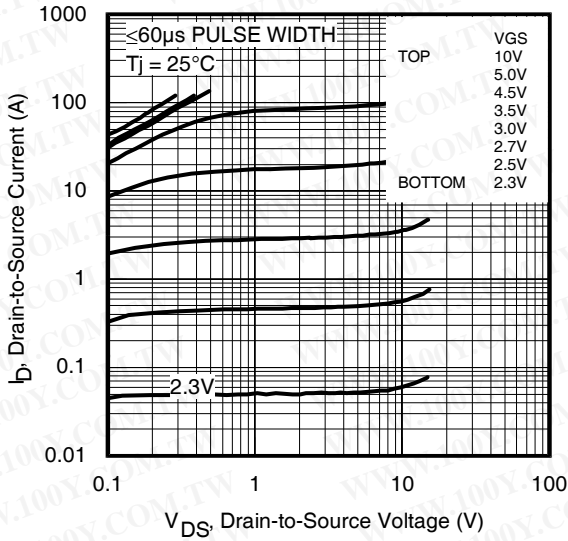


Fig 1. Typical Output Characteristics

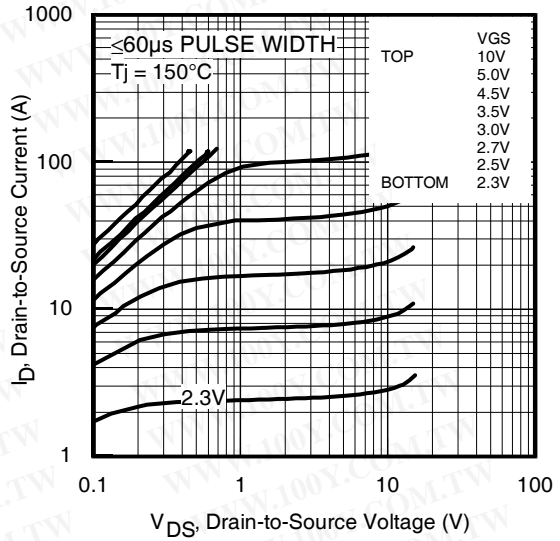


Fig 2. Typical Output Characteristics

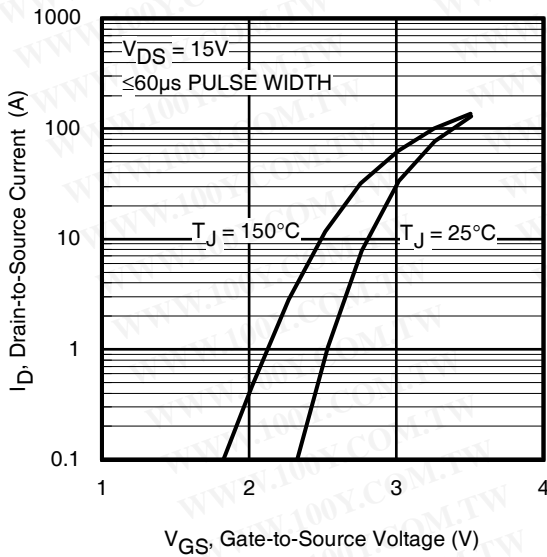


Fig 3. Typical Transfer Characteristics

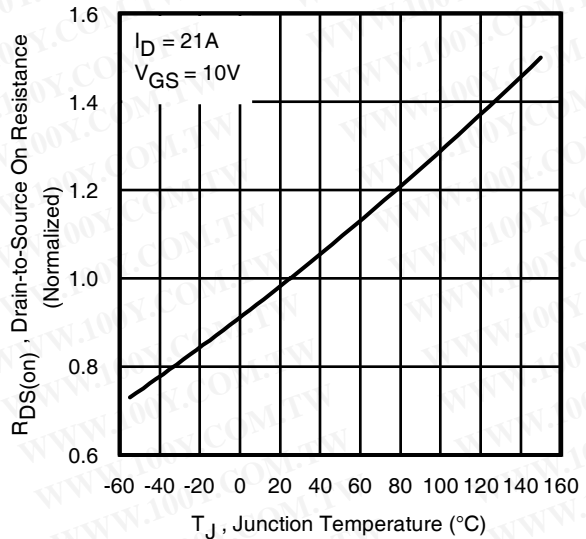


Fig 4. Normalized On-Resistance vs. Temperature

IRF7862PbF

International
IR Rectifier

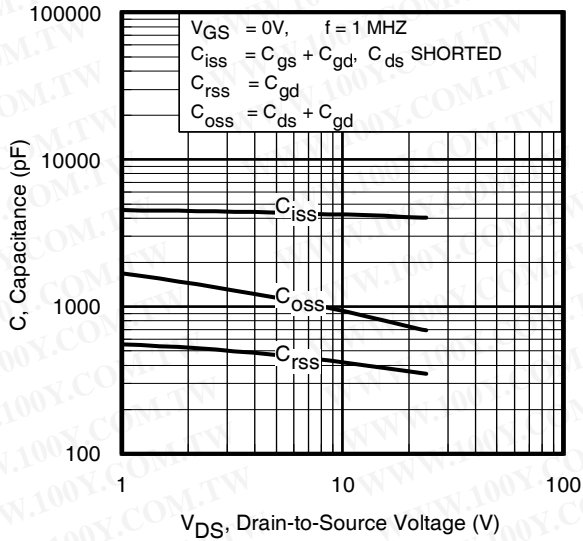


Fig 5. Typical Capacitance vs. Drain-to-Source Voltage

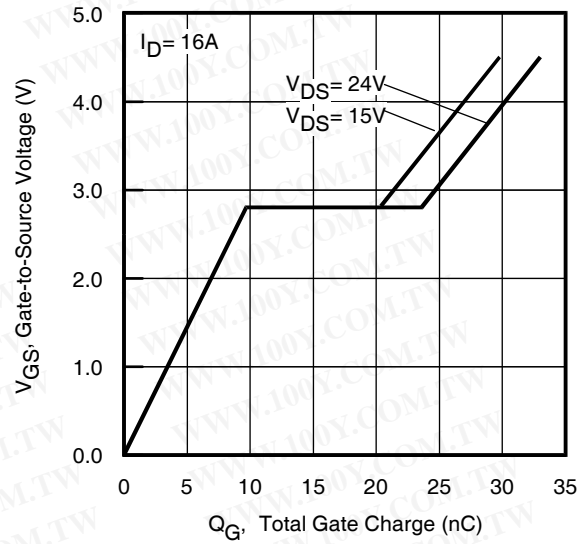


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

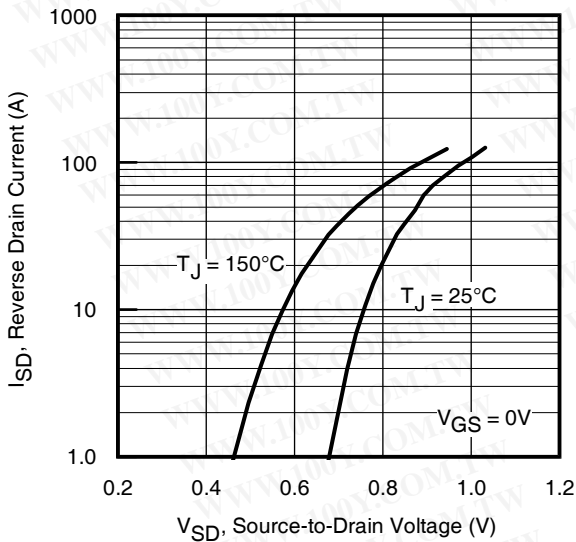


Fig 7. Typical Source-Drain Diode Forward Voltage

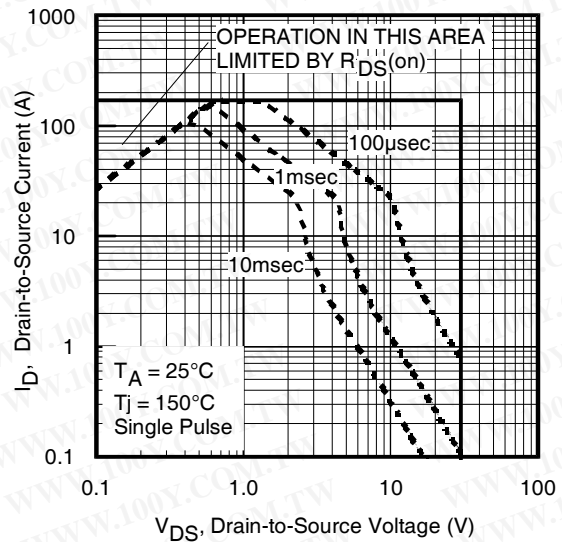


Fig 8. Maximum Safe Operating Area

勝特力材料 886-3-5753170
 勝特力电子(上海) 86-21-54151736
 勝特力电子(深圳) 86-755-83298787
 Http://www.100y.com.tw

International
IR Rectifier

IRF7862PbF

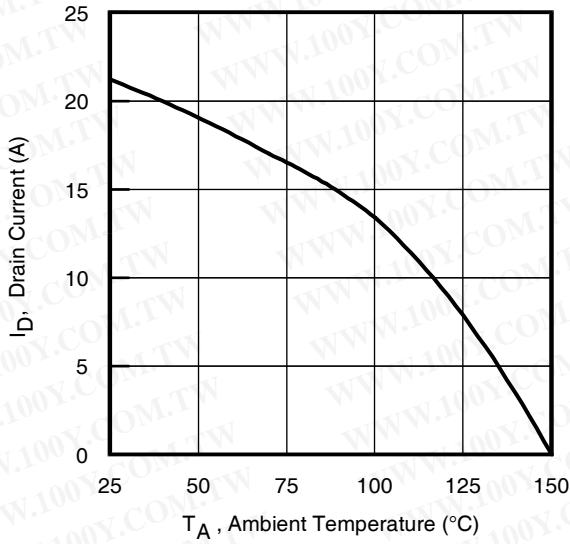


Fig 9. Maximum Drain Current vs. Ambient Temperature

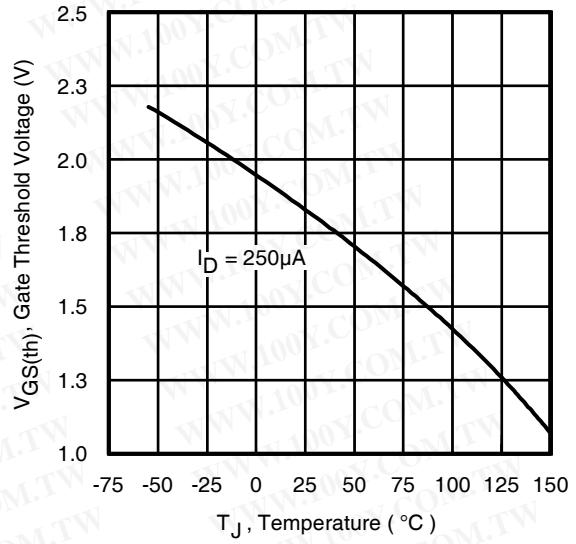


Fig 10. Threshold Voltage vs. Temperature

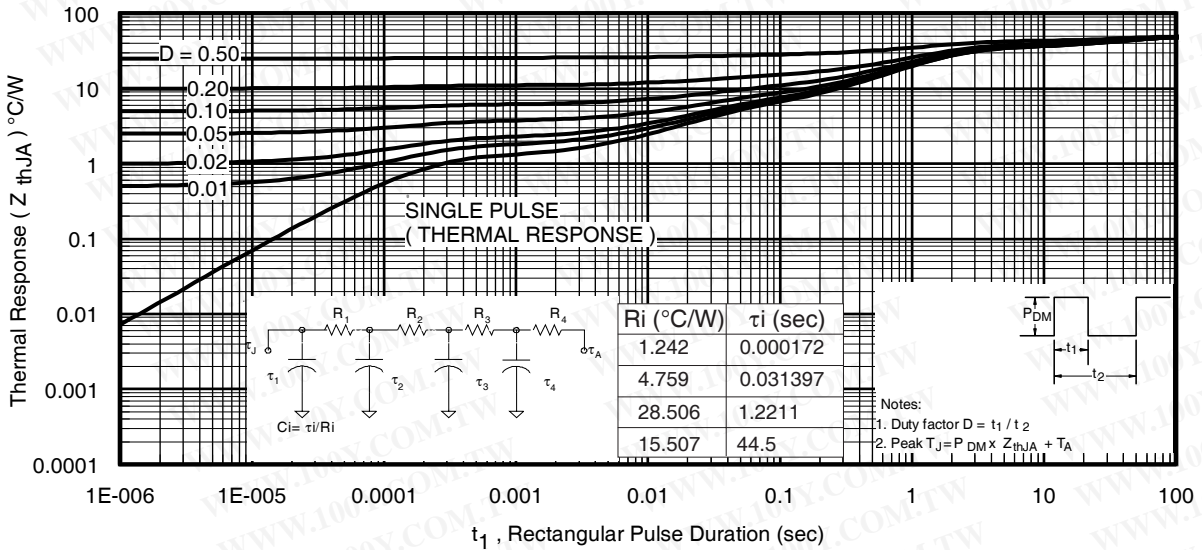


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

IRF7862PbF

International
IR Rectifier

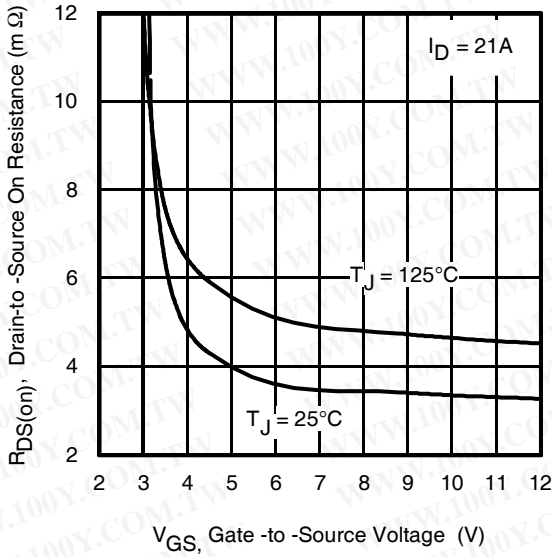


Fig 12. On-Resistance vs. Gate Voltage

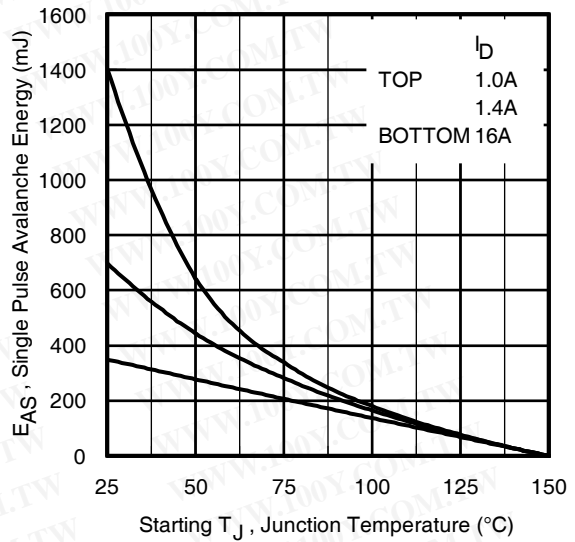


Fig 13. Maximum Avalanche Energy vs. Drain Current

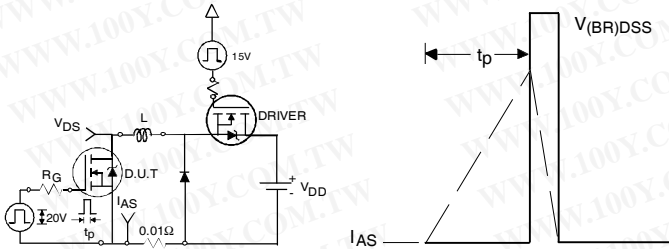


Fig 14. Unclamped Inductive Test Circuit and Waveform

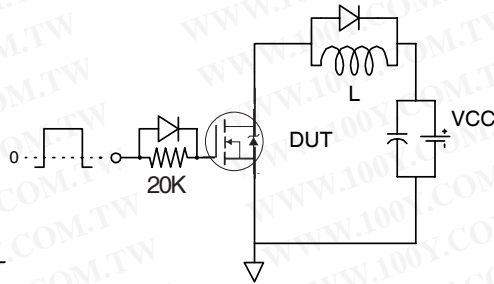


Fig 15. Gate Charge Test Circuit

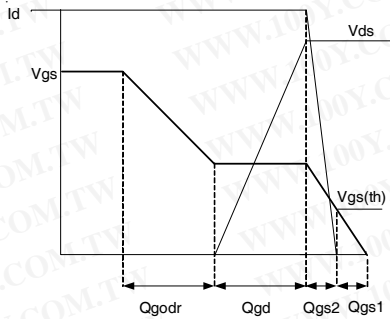
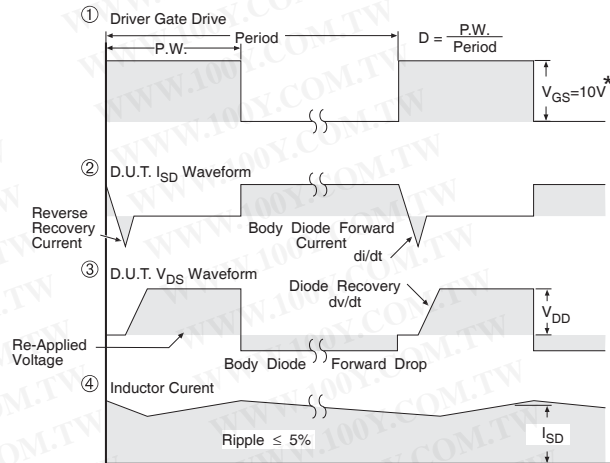
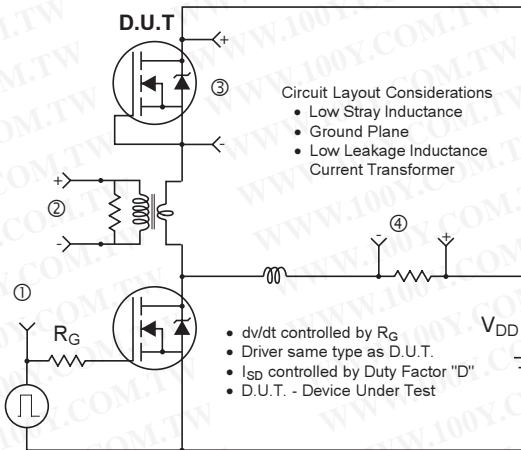


Fig 16. Gate Charge Waveform



* $V_{GS} = 5V$ for Logic Level Devices

Fig 17. Peak Diode Recovery dv/dt Test Circuit for N-Channel HEXFET® Power MOSFETs

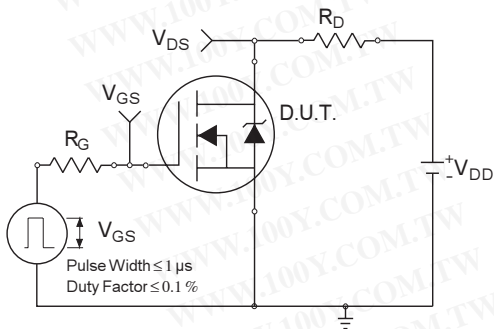


Fig 18a. Switching Time Test Circuit

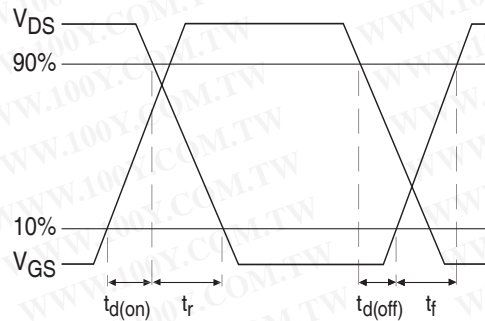


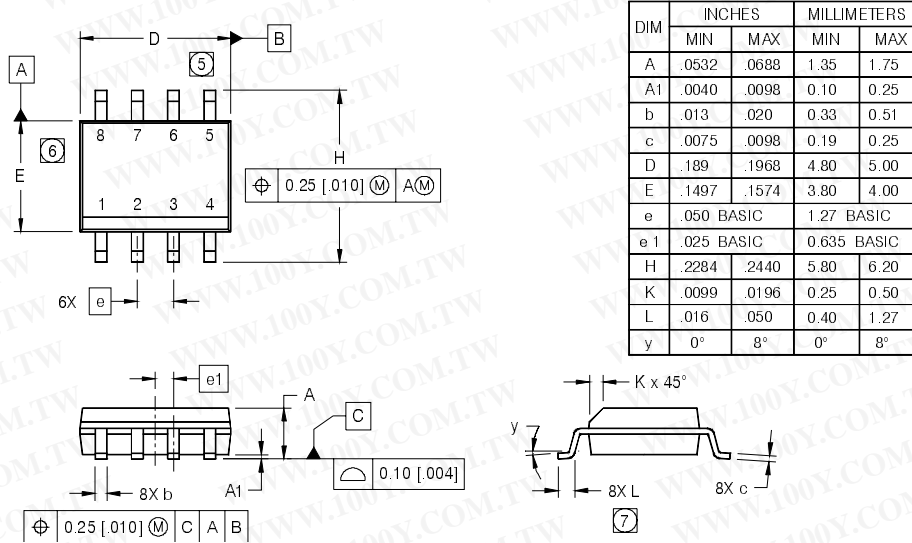
Fig 18b. Switching Time Waveforms

勝特力材料 886-3-5753170
 勝特力电子(上海) 86-21-54151736
 勝特力电子(深圳) 86-755-83298787
 Http://www.100y.com.tw

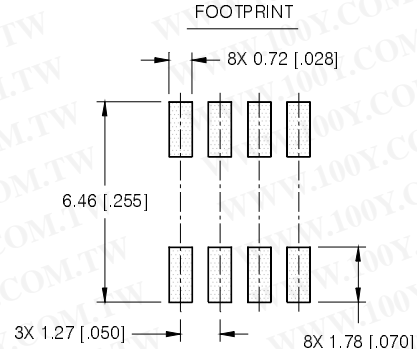
IRF7862PbF

International
IR Rectifier

SO-8 Package Outline (Dimensions are shown in millimeters (inches))

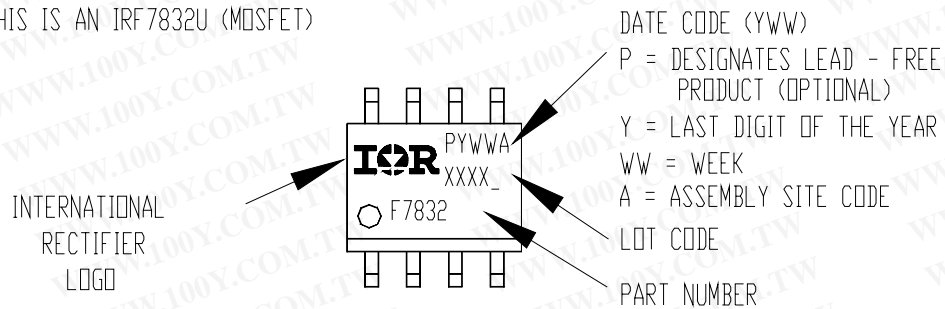


- NOTES:
- DIMENSIONING & TOLERANCING PER ASME Y14.5M-1994.
 - CONTROLLING DIMENSION: MILLIMETER
 - DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES].
 - OUTLINE CONFORMS TO JEDEC OUTLINE MS-012AA.
 - DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.15 [.006].
 - DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.25 [.010].
 - DIMENSION IS THE LENGTH OF LEAD FOR SOLDERING TO A SUBSTRATE.



SO-8 Part Marking

EXAMPLE: THIS IS AN IRF7832U (MOSFET)



Note: For the most current drawing please refer to IR website at <http://www.irf.com/package>

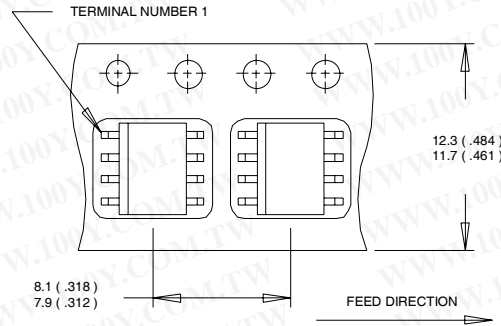
勝特力材料 886-3-5753170
 勝特力电子(上海) 86-21-54151736
 勝特力电子(深圳) 86-755-83298787
 Http://www.100y.com.tw

International
IR Rectifier

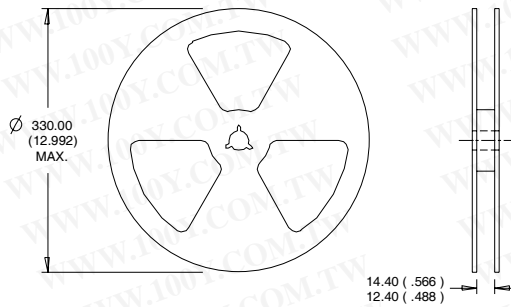
IRF7862PbF

SO-8 Tape and Reel

Dimensions are shown in millimeters (inches)



- NOTES:
1. CONTROLLING DIMENSION : MILLIMETER.
 2. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS(INCHES).
 3. OUTLINE CONFORMS TO EIA-481 & EIA-541.



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

Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Starting $T_J = 25^\circ\text{C}$, $L = 2.7\text{mH}$, $R_G = 25\Omega$, $I_{AS} = 16\text{A}$.
- ③ Pulse width $\leq 400\mu\text{s}$; duty cycle $\leq 2\%$.
- ④ When mounted on 1 inch square copper board.
- ⑤ R_θ is measured at T_J of approximately 90°C .

Note: For the most current drawing please refer to IR website at <http://www.irf.com/package>

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.

International
IR Rectifier

IR WORLD HEADQUARTERS: 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105

TAC Fax: (310) 252-7903

Visit us at www.irf.com for sales contact information.08/2007

www.irf.com