PD - 95270

International
IOR Rectifier

IRL7833PbF
IRL7833SPbF
IRL7833LPbF

HEXFET® Power MOSFET

V_{DSS}	$R_{DS(on)}$ max	Qg
30V	3.8mΩ	32nC

Applications

- High Frequency Synchronous Buck Converters for Computer Processor Power
- High Frequency Isolated DC-DC Converters with Synchronous Rectification for Telecom and Consumer Use
- Lead-Free

Benefits

- Very Low RDS(on) at 4.5V V_{GS}
- Ultra-Low Gate Impedance
- Fully Characterized Avalanche Voltage and Current

TO-220AB IRL7833 | D^2Pak IRL7833S | TO-262 IRL7833L

Absolute Maximum Ratings

	Parameter	Max.	Units
V_{DS}	Drain-to-Source Voltage	30	V
V_{GS}	Gate-to-Source Voltage	± 20	
I_D @ T_C = 25°C	Continuous Drain Current, V_{GS} @ 10V	150④	A
I_D @ T_C = 100°C	Continuous Drain Current, V_{GS} @ 10V	110④	
I_{DM}	Pulsed Drain Current ①	600	
P_D @T_C = 25°C	Maximum Power Dissipation ⑤	140	W
P_D @T_C = 100°C	Maximum Power Dissipation ⑤	72	
	Linear Derating Factor	0.96	W/°C
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to + 175	°C
	Mounting Torque, 6-32 or M3 screw	10 lbf•in (1.1N•m)	

Thermal Resistance

	Parameter	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case	——	1.04	°C/W
$R_{\theta CS}$	Case-to-Sink, Flat, Greased Surface ⑥	0.50	——	
$R_{\theta JA}$	Junction-to-Ambient ⑥	——	62	
$R_{\theta JA}$	Junction-to-Ambient (PCB Mount) ⑤	——	40	

Notes ① through ⑥ are on page 12

Static @ T_J = 25°C (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
BV_{DSS}	Drain-to-Source Breakdown Voltage	30	—	—	V	V_{GS} = 0V, I_D = 250µA
$\Delta BV_{DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	18	—	mV/°C	Reference to 25°C, I_D = 1mA
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	3.1	3.8	mΩ	V_{GS} = 10V, I_D = 38A ④
		—	3.7	4.5		V_{GS} = 4.5V, I_D = 30A ④
$V_{GS(th)}$	Gate Threshold Voltage	1.4	—	2.3	V	V_{DS} = V_{GS}, I_D = 250µA
$\Delta V_{GS(th)}/\Delta T_J$	Gate Threshold Voltage Coefficient	—	-11	—	mV/°C	
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°C
I_{GSS}	Gate-to-Source Forward Leakage	—	—	100	nA	V_{GS} = 20V
	Gate-to-Source Reverse Leakage	—	—	-100		V_{GS} = -20V
gfs	Forward Transconductance	150	—	—	S	V_{DS} = 15V, I_D = 30A
Q_g	Total Gate Charge	—	32	47		
Q_{gs1}	Pre-Vth Gate-to-Source Charge	—	8.7	—		V_{DS} = 16V
Q_{gs2}	Post-Vth Gate-to-Source Charge	—	5.1	—	nC	V_{GS} = 4.5V
Q_{gd}	Gate-to-Drain Charge	—	13	—		I_D = 30A
Q_{godr}	Gate Charge Overdrive	—	5.3	—		See Fig. 16
Q_{sw}	Switch Charge (Q_{gs2} + Q_{gd})	—	18	—		
Q_{oss}	Output Charge	—	22	—	nC	V_{DS} = 16V, V_{GS} = 0V
$t_{d(on)}$	Turn-On Delay Time	—	18	—		V_{DD} = 15V, V_{GS} = 4.5V ④
t_r	Rise Time	—	50	—	ns	I_D = 26A
$t_{d(off)}$	Turn-Off Delay Time	—	21	—		Clamped Inductive Load
t_f	Fall Time	—	6.9	—		
C_{iss}	Input Capacitance	—	4170	—		V_{GS} = 0V
C_{oss}	Output Capacitance	—	950	—	pF	V_{DS} = 15V
C_{rss}	Reverse Transfer Capacitance	—	470	—		f = 1.0MHz

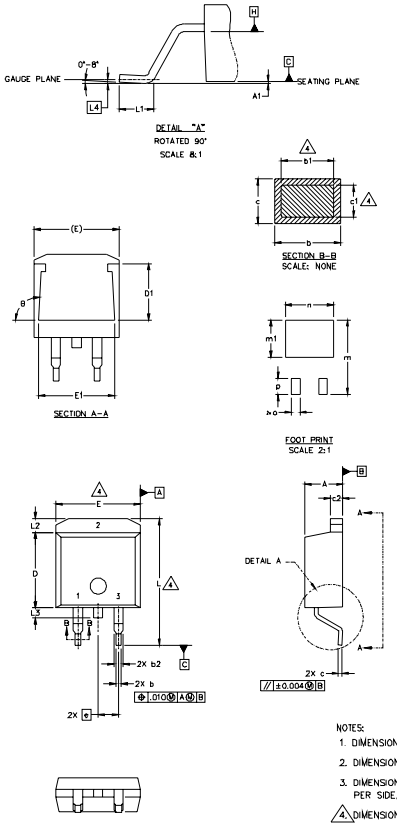
Avalanche Characteristics

	Parameter	Typ.	Max.	Units
E_{AS}	Single Pulse Avalanche Energy②⑥	—	560	mJ
I_{AR}	Avalanche Current ①	—	30	A
E_{AR}	Repetitive Avalanche Energy ①	—	14	mJ

Diode Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	150④	A	MOSFET symbol showing the integral reverse p-n junction diode.
I_{SM}	Pulsed Source Current (Body Diode) ①⑥	—	—	600		
V_{SD}	Diode Forward Voltage	—	—	1.2	V	T_J = 25°C, I_S = 30A, V_{GS} = 0V ④
t_{rr}	Reverse Recovery Time	—	42	63	ns	T_J = 25°C, I_F = 30A, V_{DD} = 15V
Q_{rr}	Reverse Recovery Charge	—	34	51	nC	di/dt = 100A/µs ④

D²Pak Package Outline



SYMBOL	DIMENSIONS				NOTES
	MILLIMETERS		INCHES		
	MIN.	MAX.	MIN.	MAX.	
A	4.06	4.83	.160	.190	
A1		0.127		.005	
b	0.51	0.99	.020	.039	
b1	0.51	0.89	.020	.035	4
b2	1.14	1.40	.045	.055	
c	0.43	0.63	.017	.025	
c1	0.38	0.74	.015	.029	4
c2	1.14	1.40	.045	.055	
D	8.51	9.65	.335	.380	3
D1	5.33		.210		
E	9.65	10.67	.380	.420	3
E1	6.22		.245		
e	2.54 BSC		.100 BSC		
L	14.61	15.88	.575	.625	
L1	1.78	2.79	.070	.110	
L2		1.65		.065	
L3	1.27	1.78	.050	.070	
L4	0.25 BSC		.010 BSC		
m	17.78		.700		
m1	8.89		.350		
n	11.43		.450		
o	2.08		.082		
p	3.81		.150		
θ	90°	93°	90°	93°	

LEAD ASSIGNMENTS

HEXFET	IGBTs, CoPACK	DIODES
1.– GATE	1.– GATE	1 – ANODE *
2.– DRAIN	2.– COLLECTOR	2.– CATHODE
3.– SOURCE	3.– EMITTER	3.– ANODE

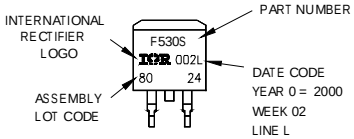
* PART DEPENDENT.

NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M–1994
2. DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES].
3. DIMENSION D & E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED 0.127 [.005"] PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTMOST EXTREMES OF THE PLASTIC BODY.
4. DIMENSION b1 AND c1 APPLY TO BASE METAL ONLY.
5. CONTROLLING DIMENSION: INCH.

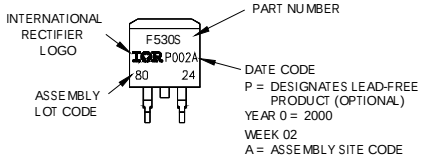
D²Pak Part Marking Information

EXAMPLE: THIS IS AN IRF530S WITH
LOT CODE 8024
ASSEMBLED ON WW 02, 2000
IN THE ASSEMBLY LINE "L"

Note: "P" in assembly line
position indicates "Lead-Free"



OR



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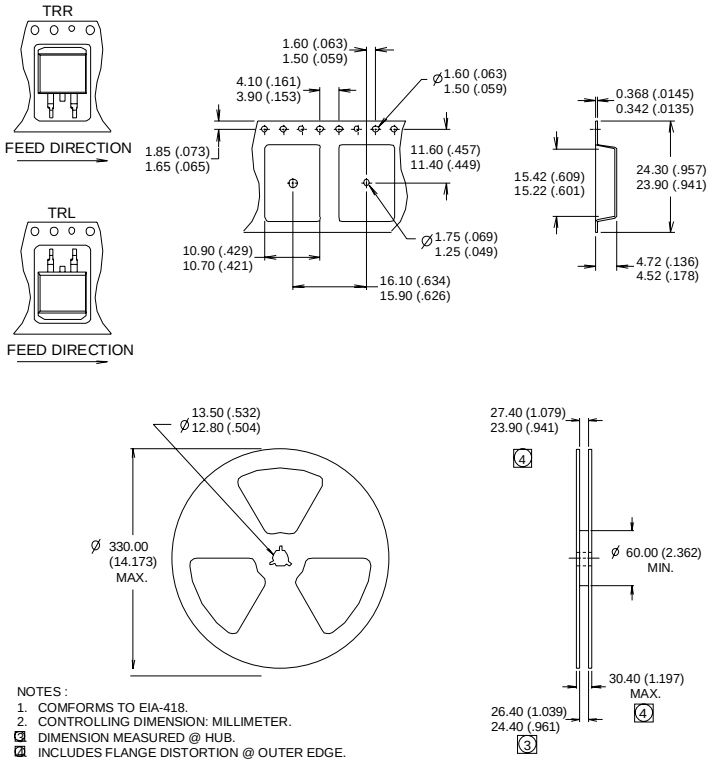
D²Pak Tape & Reel Information

Dimensions are shown in millimeters (inches)



Notes:

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

② Starting T_J = 25°C, L = 1.3mH, R_G = 25Ω, I_{AS} = 30A.

③ Pulse width ≤ 400µs; duty cycle ≤ 2%.

④ Calculated continuous current based on maximum allowable junction temperature. Package limitation current is 75A.

⑤ When mounted on 1" square PCB (FR-4 or G-10 Material). For recommended footprint and soldering techniques refer to application note #AN-994.

⑥ This is only applied to TO-220AB package.

TO-220AB package isnot recommended for Surface Mount Application.

Data and specifications subject to change without notice.
This product has been designed and qualified for the Industrial market.

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