

IRF8010SPbF
IRF8010LPbF

HEXFET® Power MOSFET

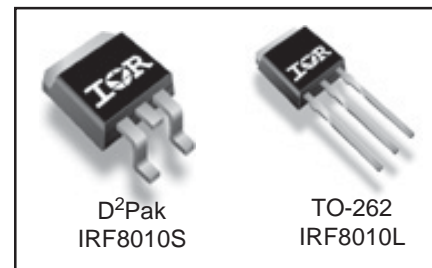
Applications

- High frequency DC-DC converters
- UPS and Motor Control
- Lead-Free

V_{DSS}	R_{DS(on) max}	I_D
100V	15mΩ	80A[Ⓓ]

Benefits

- Low Gate-to-Drain Charge to Reduce Switching Losses
- Fully Characterized Capacitance Including Effective C_{OSS} to Simplify Design, (See App. Note AN1001)
- Fully Characterized Avalanche Voltage and Current
- Typical R_{DS(on)} = 12mΩ



Absolute Maximum Ratings

	Parameter	Max.	Units
I _D @ T _C = 25°C	Continuous Drain Current, V _{GS} @ 10V	80 [Ⓓ]	A
I _D @ T _C = 100°C	Continuous Drain Current, V _{GS} @ 10V	57	
I _{DM}	Pulsed Drain Current [Ⓐ]	320	
P _D @ T _C = 25°C	Power Dissipation	260	W
	Linear Derating Factor	1.8	W/°C
V _{GS}	Gate-to-Source Voltage	± 20	V
dv/dt	Peak Diode Recovery dv/dt [Ⓒ]	16	V/ns
T _J	Operating Junction and	-55 to + 175	°C
T _{STG}	Storage Temperature Range		
	Soldering Temperature, for 10 seconds	300 (1.6mm from case)	

Thermal Resistance

	Parameter	Typ.	Max.	Units
R _{θJC}	Junction-to-Case	—	0.57	°C/W
R _{θJC}	Junction-to-Case (end of life) [Ⓔ]	—	0.80	
R _{θCS}	Case-to-Sink, Flat, Greased Surface	0.50	—	
R _{θJA}	Junction-to-Ambient (PCB Mount, steady state) [Ⓖ]	—	40	

Notes [Ⓐ] through [Ⓔ] are on page 8

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

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	100	—	—	V	$V_{GS} = 0V, I_D = 250\mu A$
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.11	—	V/°C	Reference to $25^\circ\text{C}, I_D = 1\text{mA}$
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	12	15	m Ω	$V_{GS} = 10V, I_D = 45A$ ④
$V_{GS(th)}$	Gate Threshold Voltage	2.0	—	4.0	V	$V_{DS} = V_{GS}, I_D = 250\mu A$
I_{DSS}	Drain-to-Source Leakage Current	—	—	20	μA	$V_{DS} = 100V, V_{GS} = 0V$
		—	—	250		$V_{DS} = 100V, V_{GS} = 0V, T_J = 125^\circ\text{C}$
I_{GSS}	Gate-to-Source Forward Leakage	—	—	200	nA	$V_{GS} = 20V$
	Gate-to-Source Reverse Leakage	—	—	-200		$V_{GS} = -20V$

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

	Parameter	Min.	Typ.	Max.	Units	Conditions
gfs	Forward Transconductance	82	—	—	V	$V_{DS} = 25V, I_D = 45A$
Q_g	Total Gate Charge	—	81	120	nC	$I_D = 80A$ $V_{DS} = 80V$ $V_{GS} = 10V$ ④
Q_{gs}	Gate-to-Source Charge	—	22	—		
Q_{gd}	Gate-to-Drain ("Miller") Charge	—	26	—		
$t_{d(on)}$	Turn-On Delay Time	—	15	—	ns	$V_{DD} = 50V$ $I_D = 80A$ $R_G = 39\Omega$ $V_{GS} = 10V$ ④
t_r	Rise Time	—	130	—		
$t_{d(off)}$	Turn-Off Delay Time	—	61	—		
t_f	Fall Time	—	120	—		
C_{iss}	Input Capacitance	—	3830	—	pF	$V_{GS} = 0V$ $V_{DS} = 25V$ $f = 1.0\text{MHz}$ $V_{GS} = 0V, V_{DS} = 1.0V, f = 1.0\text{MHz}$ $V_{GS} = 0V, V_{DS} = 80V, f = 1.0\text{MHz}$ $V_{GS} = 0V, V_{DS} = 0V \text{ to } 80V$ ③
C_{oss}	Output Capacitance	—	480	—		
C_{riss}	Reverse Transfer Capacitance	—	59	—		
C_{oss}	Output Capacitance	—	3830	—		
C_{oss}	Output Capacitance	—	280	—		
$C_{oss \text{ eff.}}$	Effective Output Capacitance	—	530	—		

Avalanche Characteristics

	Parameter	Typ.	Max.	Units
E_{AS}	Single Pulse Avalanche Energy ②⑦	—	310	mJ
I_{AR}	Avalanche Current ①	—	45	A
E_{AR}	Repetitive Avalanche Energy ①	—	26	mJ

Diode Characteristics

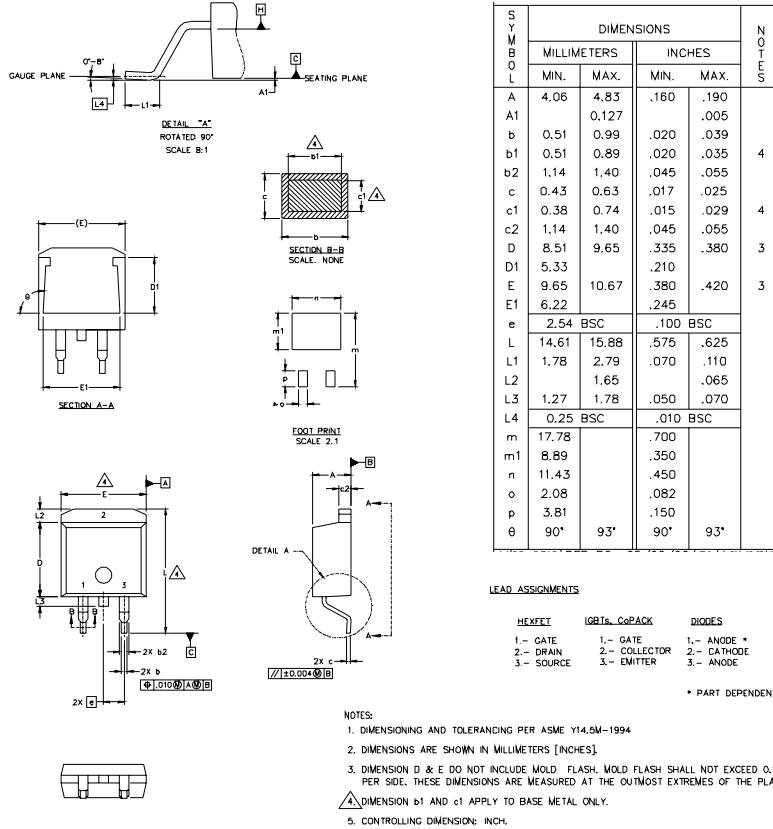
	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	80	A	MOSFET symbol showing the integral reverse p-n junction diode.
I_{SM}	Pulsed Source Current (Body Diode) ①⑦	—	—	320		
V_{SD}	Diode Forward Voltage	—	—	1.3	V	$T_J = 25^\circ\text{C}, I_S = 80A, V_{GS} = 0V$ ④
t_{rr}	Reverse Recovery Time	—	99	150	ns	$T_J = 150^\circ\text{C}, I_F = 80A, V_{DD} = 50V$
Q_{rr}	Reverse Recovery Charge	—	460	700	nC	$di/dt = 100A/\mu s$ ④
t_{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

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D²Pak Package Outline

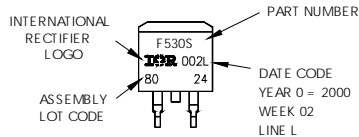
Dimensions are shown in millimeters (inches)



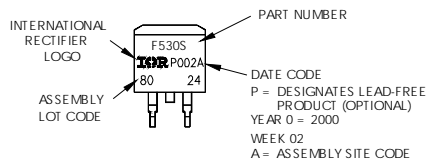
D²Pak Part Marking Information

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

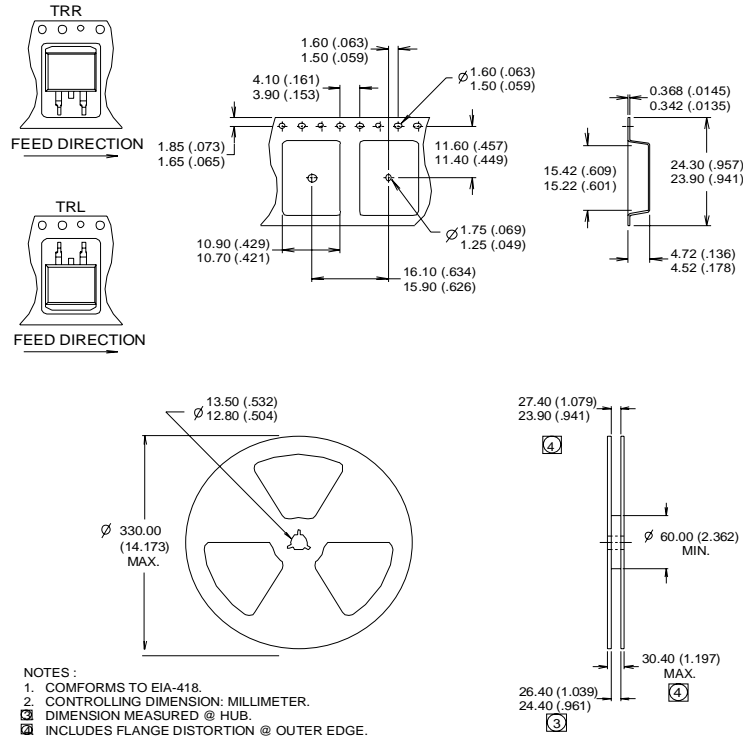


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D²Pak Tape & Reel Information

Dimensions are shown in millimeters (inches)



Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Starting $T_J = 25^\circ\text{C}$, $L = 0.31\text{mH}$, $R_G = 25\Omega$, $I_{AS} = 45\text{A}$.
- ③ $I_{SD} \leq 45\text{A}$, $di/dt \leq 110\text{A}/\mu\text{s}$, $V_{DD} \leq V_{(BR)DSS}$, $T_J \leq 175^\circ\text{C}$.
- ④ Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.
- ⑤ $R_{th(jc)}$ (end of life) is the maximum measured value after 1000 temperature cycles from -55 to 150°C and is accounted for by the physical wearout of the die attach medium in worse case PCB mounting condition of material (solder/substrate), process and re-flow temperature.
- ⑥ C_{oss} eff. is a fixed capacitance that gives the same charging time as C_{oss} while V_{DS} is rising from 0 to 80% V_{DSS} .
- ⑦ Calculated continuous current based on maximum allowable junction temperature. Package limitation current is 75A.
- ⑧ When mounted on 1" square PCB (FR-4 or G-10 Material). For recommended footprint and soldering techniques refer to application note #AN-994.

Data and specifications subject to change without notice.
This product has been designed and qualified for the Industrial market.
Qualification Standards can be found on IR's Web site.

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