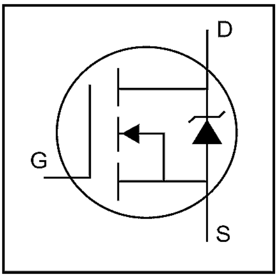
International
IOR Rectifier

PD - 94170

IRF2807S
IRF2807L

HEXFET® Power MOSFET

- Advanced Process Technology
- Ultra Low On-Resistance
- Dynamic dv/dt Rating
- 175°C Operating Temperature
- Fast Switching
- Fully Avalanche Rated



V_{DSS} = 75V

$R_{DS(on)}$ = 13mΩ

I_D = 82A⑦

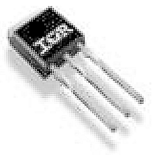
Description

Advanced HEXFET® Power MOSFETs from International Rectifier utilize advanced processing techniques to achieve extremely low on-resistance per silicon area. This benefit, combined with the fast switching speed and ruggedized device design that HEXFET power MOSFETs are well known for, provides the designer with an extremely efficient and reliable device for use in a wide variety of applications.

The D^2Pak is a surface mount power package capable of accommodating die sizes up to HEX-4. It provides the highest power capability and the lowest possible on-resistance in any existing surface mount package. The D^2Pak is suitable for high current applications because of its low internal connection resistance and can dissipate up to 2.0W in a typical surface mount application.

The through-hole version (IRF2807L) is available for low-profile applications.


D^2Pak
IRF2807S


TO-262
IRF2807L

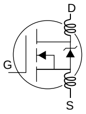
Absolute Maximum Ratings

	Parameter	Max.	Units
I_D @ T_C = 25°C	Continuous Drain Current, V_{GS} @ 10V	82⑦	A
I_D @ T_C = 100°C	Continuous Drain Current, V_{GS} @ 10V	58	
I_{DM}	Pulsed Drain Current ①	280	
P_D @T_C = 25°C	Power Dissipation	230	W
	Linear Derating Factor	1.5	W/°C
V_{GS}	Gate-to-Source Voltage	± 20	V
I_{AR}	Avalanche Current①	43	A
E_{AR}	Repetitive Avalanche Energy①	23	mJ
dv/dt	Peak Diode Recovery dv/dt ③	5.9	V/ns
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to + 175	°C
	Soldering Temperature, for 10 seconds	300 (1.6mm from case)	
	Mounting torque, 6-32 or M3 srew	10 lbf•in (1.1N•m)	

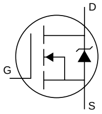
Thermal Resistance

	Parameter	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case	——	0.65	°C/W
$R_{\theta JA}$	Junction-to-Ambient (PCB mount)**	——	40	

Electrical Characteristics @ T_J = 25°C (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	75	–––	–––	V	V_{GS} = 0V, I_D = 250μA
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	–––	0.074	–––	V/°C	Reference to 25°C, I_D = 1mA
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	–––	–––	13	mΩ	V_{GS} = 10V, I_D = 43A ④
$V_{GS(th)}$	Gate Threshold Voltage	2.0	–––	4.0	V	V_{DS} = V_{GS}, I_D = 250μA
g_{fs}	Forward Transconductance	38	–––	–––	S	V_{DS} = 50V, I_D = 43A④
I_{DSS}	Drain-to-Source Leakage Current	–––	–––	25	μA	V_{DS} = 75V, V_{GS} = 0V
		–––	–––	250		V_{DS} = 60V, V_{GS} = 0V, T_J = 150°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	–––	–––	160	nC	I_D = 43A
Q_{gs}	Gate-to-Source Charge	–––	–––	29		V_{DS} = 60V
Q_{gd}	Gate-to-Drain ("Miller") Charge	–––	–––	55		V_{GS} = 10V, See Fig. 6 and 13
$t_{d(on)}$	Turn-On Delay Time	–––	13	–––	ns	V_{DD} = 38V
t_r	Rise Time	–––	64	–––		I_D = 43A
$t_{d(off)}$	Turn-Off Delay Time	–––	49	–––		R_G = 2.5Ω
t_f	Fall Time	–––	48	–––		V_{GS} = 10V, See Fig. 10 ④
L_D	Internal Drain Inductance	–––	4.5	–––	nH	Between lead, 6mm (0.25in.) from package and center of die contact 
L_S	Internal Source Inductance	–––	7.5	–––		
C_{iss}	Input Capacitance	–––	3820	–––	pF	V_{GS} = 0V
C_{oss}	Output Capacitance	–––	610	–––		V_{DS} = 25V
C_{rss}	Reverse Transfer Capacitance	–––	130	–––		ƒ = 1.0MHz, See Fig. 5
E_{AS}	Single Pulse Avalanche Energy②	–––	1280⑤	340⑥	mJ	I_{AS} = 50A, L = 370μH

Source-Drain Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	–––	–––	82⑦	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode)①	–––	–––	280		
V_{SD}	Diode Forward Voltage	–––	–––	1.2	V	T_J = 25°C, I_S = 43A, V_{GS} = 0V ④
t_{rr}	Reverse Recovery Time	–––	100	150	ns	T_J = 25°C, I_F = 43A
Q_{rr}	Reverse Recovery Charge	–––	410	610	nC	di/dt = 100A/μs ④
t_{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by L_S+L_D)				

Notes:

① Repetitive rating; pulse width limited by max. junction temperature. (See fig. 11)

② Starting T_J = 25°C, L = 370μH R_G = 25Ω, I_{AS} = 43A, V_{GS}=10V (See Figure 12)

③ $I_{SD} \le 43A$, di/dt ≤ 300A/μs, $V_{DD} \le V_{(BR)DSS}$, $T_J \le 175°C$

④ Pulse width ≤ 400μs; duty cycle ≤ 2%.

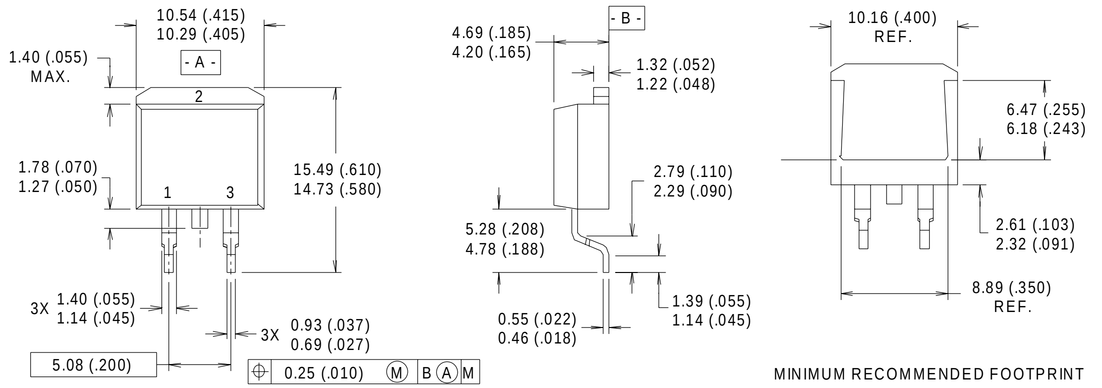
⑤ This is a typical value at device destruction and represents operation outside rated limits.

⑥ This is a calculated value limited to T_J = 175°C .

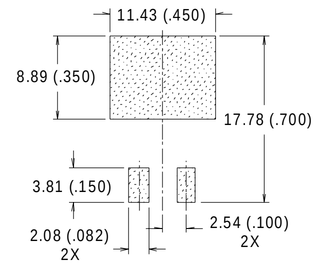
⑦ Calculated continuous current based on maximum allowable junction temperature. Package limitation current is 75A.

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

D^2Pak Package Outline



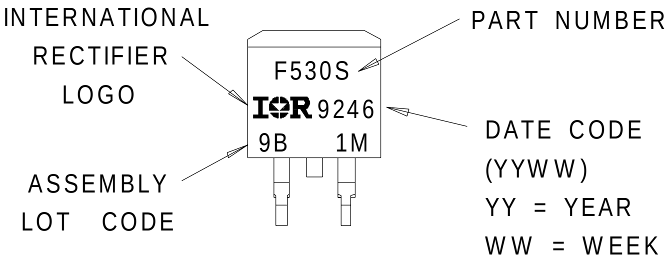
MINIMUM RECOMMENDED FOOTPRINT



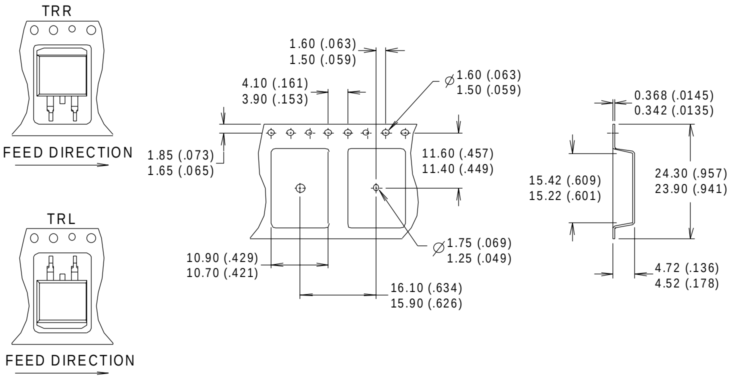
NOTES:
1 DIMENSIONS AFTER SOLDER DIP.
2 DIMENSIONING & TOLERANCING PER ANSI Y14.5M, 1982.
3 CONTROLLING DIMENSION : INCH.
4 HEATSINK & LEAD DIMENSIONS DO NOT INCLUDE BURRS.

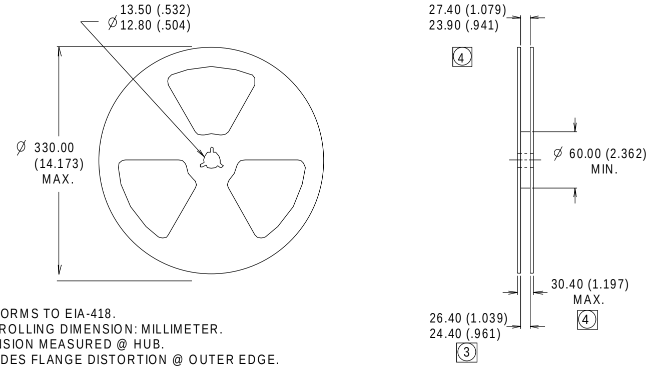
LEAD ASSIGNMENTS
1 - GATE
2 - DRAIN
3 - SOURCE

D^2Pak Part Marking Information



D^2Pak Tape & Reel Information





NOTES :
1. COMFORMS TO EIA-418.
2. CONTROLLING DIMENSION: MILLIMETER.
③ DIMENSION MEASURED @ HUB.
④ INCLUDES FLANGE DISTORTION @ OUTER EDGE.

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