PD- 95325

International
IOR Rectifier

SMPS MOSFET

IRFB17N20DPbF
IRFS17N20DPbF
IRFSL17N20DPbF

HEXFET® Power MOSFET

V_{DSS}	$R_{DS(on)}$ max	I_D
200V	**0.17Ω**	**16A**

Applications

- High frequency DC-DC converters
- Lead-Free

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

TO-220AB
IRFB17N20D

D^2Pak
IRFS17N20D

TO-262
IRFSL17N20D

Absolute Maximum Ratings

	Parameter	Max.	Units
I_D @ T_C = 25°C	Continuous Drain Current, V_{GS} @ 10V	16	A
I_D @ T_C = 100°C	Continuous Drain Current, V_{GS} @ 10V	12	
I_{DM}	Pulsed Drain Current ①	64	
P_D @T_A = 25°C	Power Dissipation ⑦	3.8	W
P_D @T_C = 25°C	Power Dissipation	140	
	Linear Derating Factor	0.90	W/°C
V_{GS}	Gate-to-Source Voltage	± 30	V
dv/dt	Peak Diode Recovery dv/dt ③	2.7	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)	
	Mounting torqe, 6-32 or M3 screw⑥	10 lbf•in (1.1N•m)	

Typical SMPS Topologies

- Telecom 48V input Forward Converter

Notes ① through ⑤ are on page 11

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

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	200	—	—	V	V_{GS} = 0V, I_D = 250µA
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.25	—	V/°C	Reference to 25°C, I_D = 1mA ⑥
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	—	0.17	Ω	V_{GS} = 10V, I_D = 9.8A ④
$V_{GS(th)}$	Gate Threshold Voltage	3.0	—	5.5	V	V_{DS} = V_{GS}, I_D = 250µA
I_{DSS}	Drain-to-Source Leakage Current	—	—	25	µA	V_{DS} = 200V, V_{GS} = 0V
		—	—	250		V_{DS} = 160V, V_{GS} = 0V, T_J = 150°C
I_{GSS}	Gate-to-Source Forward Leakage	—	—	100	nA	V_{GS} = 30V
	Gate-to-Source Reverse Leakage	—	—	-100		V_{GS} = -30V

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

	Parameter	Min.	Typ.	Max.	Units	Conditions
g_{fs}	Forward Transconductance	5.3	—	—	S	V_{DS} = 50V, I_D = 9.8A
Q_g	Total Gate Charge	—	33	50	nC	I_D = 9.8A
Q_{gs}	Gate-to-Source Charge	—	8.4	13		V_{DS} = 160V
Q_{gd}	Gate-to-Drain ("Miller") Charge	—	16	24		V_{GS} = 10V, ④⑥
$t_{d(on)}$	Turn-On Delay Time	—	11	—	ns	V_{DD} = 100V
t_r	Rise Time	—	19	—		I_D = 9.8A
$t_{d(off)}$	Turn-Off Delay Time	—	18	—		R_G = 5.1Ω
t_f	Fall Time	—	6.6	—		V_{GS} = 10V ④
C_{iss}	Input Capacitance	—	1100	—	pF	V_{GS} = 0V
C_{oss}	Output Capacitance	—	190	—		V_{DS} = 25V
C_{rss}	Reverse Transfer Capacitance	—	44	—		f = 1.0MHz⑥
C_{oss}	Output Capacitance	—	1340	—		V_{GS} = 0V, V_{DS} = 1.0V, f = 1.0MHz
C_{oss}	Output Capacitance	—	76	—		V_{GS} = 0V, V_{DS} = 160V, f = 1.0MHz
C_{oss} eff.	Effective Output Capacitance	—	130	—		V_{GS} = 0V, V_{DS} = 0V to 160V ⑤

Avalanche Characteristics

	Parameter	Typ.	Max.	Units
E_{AS}	Single Pulse Avalanche Energy②⑥	—	240	mJ
I_{AR}	Avalanche Current①	—	9.8	A
E_{AR}	Repetitive Avalanche Energy①	—	14	mJ

Thermal Resistance

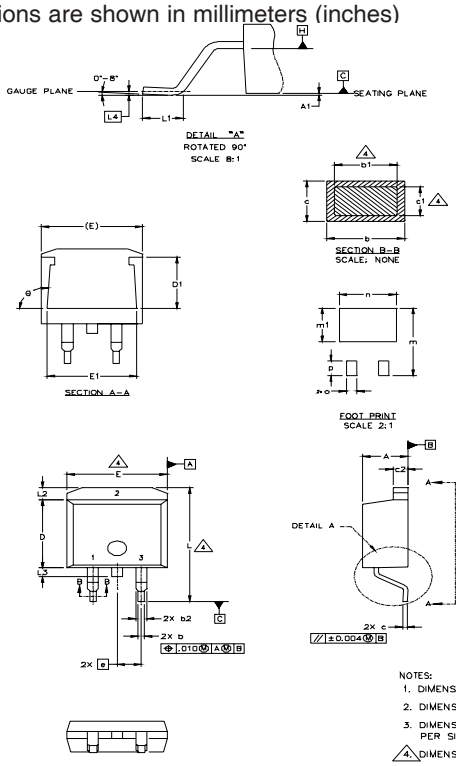
	Parameter	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case	—	1.1	°C/W
$R_{\theta CS}$	Case-to-Sink, Flat, Greased Surface ⑥	0.50	—	
$R_{\theta JA}$	Junction-to-Ambient⑥	—	62	
$R_{\theta JA}$	Junction-to-Ambient⑦	—	40	

Diode Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	16	A	MOSFET symbol showing the integral reverse p-n junction diode.
I_{SM}	Pulsed Source Current (Body Diode) ①⑥	—	—	64		
V_{SD}	Diode Forward Voltage	—	—	1.3	V	T_J = 25°C, I_S = 9.8A, V_{GS} = 0V ④
t_{rr}	Reverse Recovery Time	—	160	240	ns	T_J = 25°C, I_F = 9.8A
Q_{rr}	Reverse RecoveryCharge	—	900	1350	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)				

D²Pak Package Outline

Dimensions are shown in millimeters (inches)



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

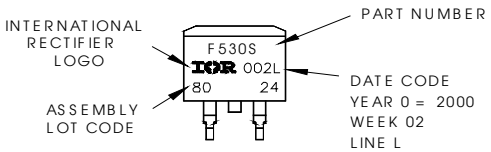
* PART DEPENDENT.

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.

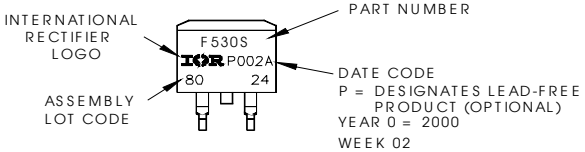
D²Pak Part Marking Information (Lead-Free)

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"

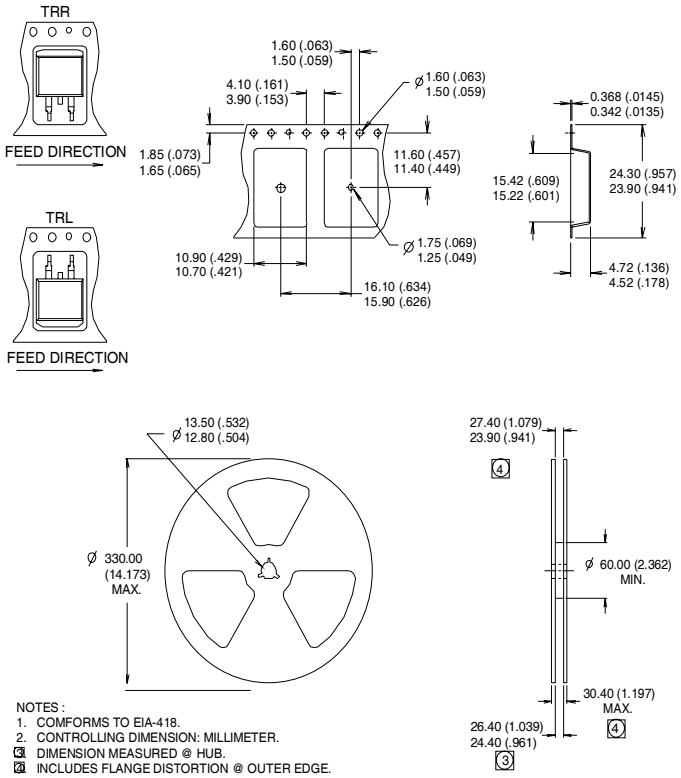


OR



D²Pak Tape & Reel Infomation

Dimensions are shown in millimeters (inches)



Notes:

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

$R_G = 25\Omega$, $I_{AS} = 9.8A$.

② Starting $T_J = 25°C$, L = 5.0mH

③ $I_{SD} \leq 9.8A$, $di/dt \leq 110A/\mu s$, $V_{DD} \leq V_{(BR)DSS}$, $T_J \leq 175°C$

④ Pulse width ≤ 300µs; duty cycle ≤ 2%.

⑤ 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}

⑥ This is only applied to TO-220AB package

⑦ This is applied to D²Pak, 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.

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