

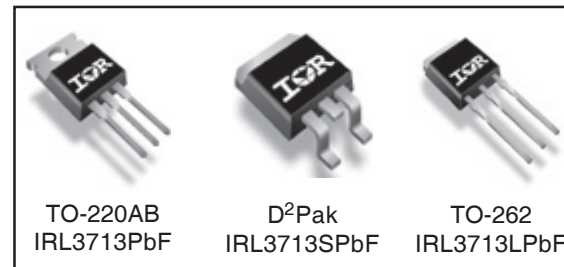
Applications

- High Frequency Isolated DC-DC Converters with Synchronous Rectification for Telecom and Industrial Use
- High Frequency Buck Converters for Computer Processor Power
- 100% R_G Tested
- Lead-Free

V _{DSS}	R _{DS(on)} max (mΩ)	I _D
30V	3.0@V _{GS} = 10V	260A [Ⓞ]

Benefits

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



Absolute Maximum Ratings

Symbol	Parameter	Max	Units
V _{DS}	Drain-Source Voltage	30	V
V _{GS}	Gate-to-Source Voltage	± 20	V
I _D @ T _C = 25°C	Continuous Drain Current, V _{GS} @ 10V	260 [Ⓞ]	A
I _D @ T _C = 100°C	Continuous Drain Current, V _{GS} @ 10V	180 [Ⓞ]	
I _{DM}	Pulsed Drain Current ^①	1040 [Ⓞ]	
P _D @ T _C = 25°C	Maximum Power Dissipation	330	W
P _D @ T _C = 100°C	Maximum Power Dissipation	170	
	Linear Derating Factor	2.2	W/°C
T _J , T _{STG}	Junction and Storage Temperature Range	-55 to +175	°C

Thermal Resistance

Symbol	Parameter	Typ	Max	Units
R _{θJC}	Junction-to-Case ^②	—	0.45*	°C/W
R _{θCS}	Case-to-Sink, Flat, Greased Surface ^④	0.50	—	
R _{θJA}	Junction-to-Ambient ^{④⑦}	—	62	
R _{θJA}	Junction-to-Ambient (PCB Mount) ^{⑤⑦}	—	40	

* R_{θJC} (end of life) for D²Pak and TO-262 = 0.50°C/W. This 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.

Notes ^① through ^⑦ are on page 11

IRL3713/S/LPbF

International
 Rectifier

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

Symbol	Parameter	Min	Typ	Max	Units	Conditions
V _{(BR)DSS}	Drain-to-Source Breakdown Voltage	30	—	—	V	V _{GS} = 0V, I _D = 250μA
ΔV _{(BR)DSS} /ΔT _J	Breakdown Voltage Temp. Coefficient	—	0.027	—	V/°C	Reference to 25°C, I _D = 1mA
R _{DS(on)}	Static Drain-to-Source On-Resistance	—	2.6	3.0	mΩ	V _{GS} = 10V, I _D = 38A ③
		—	3.3	4.0		V _{GS} = 4.5V, I _D = 30A ③
V _{GS(th)}	Gate Threshold Voltage	1.0	—	2.5	V	V _{DS} = V _{GS} , I _D = 250μA
I _{DSS}	Drain-to-Source Leakage Current	—	—	50	μA	V _{DS} = 30V, V _{GS} = 0V
		—	—	20		V _{DS} = 24V, V _{GS} = 0V
		—	—	100		V _{DS} = 24V, V _{GS} = 0V, T _J = 125°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°C (unless otherwise specified)

Symbol	Parameter	Min	Typ	Max	Units	Conditions
g _{fs}	Forward Transconductance	76	—	—	S	V _{DS} = 15V, I _D = 30A
Q _g	Total Gate Charge	—	75	110	nC	I _D = 30A
Q _{gs}	Gate-to-Source Charge	—	24	—		V _{DS} = 15V
Q _{gd}	Gate-to-Drain ("Miller") Charge	—	37	—		V _{GS} = 4.5V ④
Q _{oss}	Output Gate Charge	—	61	92		V _{GS} = 0V, V _{DS} = 15V
R _G	Gate Resistance	0.5	—	3.4	Ω	
t _{d(on)}	Turn-On Delay Time	—	16	—	ns	V _{DD} = 15V
t _r	Rise Time	—	160	—		I _D = 30A
t _{d(off)}	Turn-Off Delay Time	—	40	—		R _G = 1.8Ω
t _f	Fall Time	—	57	—		V _{GS} = 4.5V ④
C _{iss}	Input Capacitance	—	5890	—	pF	V _{GS} = 0V
C _{oss}	Output Capacitance	—	3130	—		V _{DS} = 15V
C _{rss}	Reverse Transfer Capacitance	—	630	—		f = 1.0MHz

Avalanche Characteristics

Symbol	Parameter	Typ	Max	Units
E _{AS}	Single Pulse Avalanche Energy ②	—	1530	mJ
I _{AR}	Avalanche Current ①	—	46	A

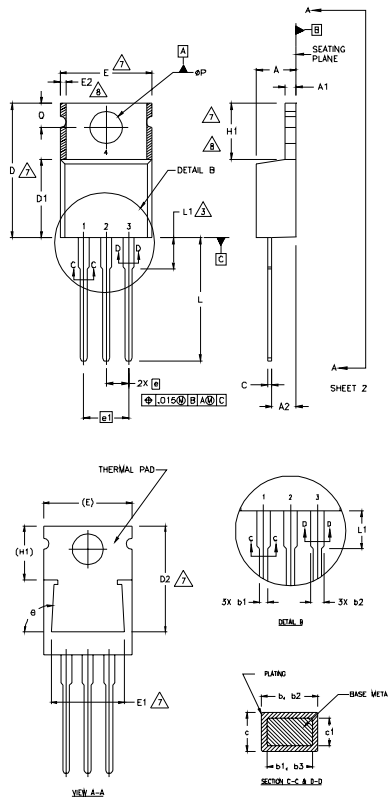
Diode Characteristics

Symbol	Parameter	Min	Typ	Max	Units	Conditions
I _S	Continuous Source Current (Body Diode)	—	—	260 ⑥	A	MOSFET symbol showing the integral reverse p-n junction diode.
I _{SM}	Pulsed Source Current (Body Diode) ①⑥	—	—	1040 ⑥		
V _{SD}	Diode Forward Voltage	—	0.80	1.3	V	T _J = 25°C, I _S = 30A, V _{GS} = 0V ③
		—	0.68	—		T _J = 125°C, I _S = 30A, V _{GS} = 0V ③
t _{rr}	Reverse Recovery Time	—	75	110	ns	T _J = 25°C, I _F = 30A, V _R = 0V
Q _{rr}	Reverse Recovery Charge	—	140	210	nC	di/dt = 100A/μs ③
t _{rr}	Reverse Recovery Time	—	78	120	ns	T _J = 125°C, I _F = 30A, V _R = 20V
Q _{rr}	Reverse Recovery Charge	—	160	240	nC	di/dt = 100A/μs ③

IRL3713/S/LPbF

TO-220AB Package Outline

Dimensions are shown in millimeters (inches)



- NOTES:
- 1 DIMENSIONING AND TOLERANCING PER ASME Y14.5 M- 1994.
 - 2 DIMENSIONS ARE SHOWN IN INCHES [MILLIMETERS].
 - 3 LEAD DIMENSION AND FINISH UNCONTROLLED IN L1.
 - 4 DIMENSION D & E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED .005" (0.127) PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY. DIMENSION b1 & c1 APPLY TO BASE METAL ONLY.
 - 5 CONTROLLING DIMENSION : INCHES.
 - 6 THERMAL PAD CONTOUR OPTIONAL WITHIN DIMENSIONS E,H1,D2 & E1
 - 7 DIMENSION E2 x H1 DEFINE A ZONE WHERE STAMPING AND SINGULATION IRREGULARITIES ARE ALLOWED.
 - 8

LEAD ASSIGNMENTS

- HEXLEF**
- 1 - GATE
 - 2 - DRAIN
 - 3 - SOURCE

IRBLS CoPACK

- 1 - GATE
- 2 - COLLECTOR
- 3 - EMITTER

DIODES

- 1 - ANODE/OPEN
- 2 - CATHODE
- 3 - ANODE

SYMBOL	DIMENSIONS				NOTES
	MILLIMETERS		INCHES		
	MIN.	MAX.	MIN.	MAX.	
A	3.56	4.82	.140	.190	
A1	0.51	1.40	.020	.055	
A2	2.04	2.92	.080	.115	
b	0.38	1.01	.015	.040	
b1	0.38	0.96	.015	.038	5
b2	1.15	1.77	.045	.070	
b3	1.15	1.73	.045	.068	
c	0.36	0.61	.014	.024	
c1	0.36	0.56	.014	.022	5
D	14.22	16.51	.560	.650	4
D1	8.38	9.02	.330	.355	
D2	12.19	12.88	.480	.507	7
E	9.66	10.66	.380	.420	4,7
E1	8.38	8.89	.330	.350	7
e	2.54 BSC		.100 BSC		
e1	3.08		.200 BSC		
H1	5.85	6.55	.230	.270	7,8
L	12.70	14.73	.500	.580	
L1	-	6.35	-	.250	3
øP	3.54	4.08	.139	.161	
Q	2.54	3.42	.100	.135	
ø	90°-93°		90°-93°		

TO-220AB Part Marking Information

EXAMPLE: THIS IS AN IRF1010
 LOT CODE 1789
 ASSEMBLED ON WW 19, 1997
 IN THE ASSEMBLY LINE "C"

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

