

Applications

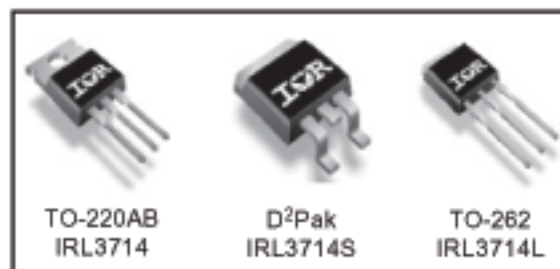
- High Frequency Isolated DC-DC Converters with Synchronous Rectification for Telecom and Industrial Use
- High Frequency Buck Converters for Computer Processor Power
- Lead-Free

HEXFET® Power MOSFET

V_{DSS}	R_{DS(on)} max	I_D
20V	20mΩ	36A

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	20	V
V _{GS}	Gate-to-Source Voltage	± 20	V
I _D @ T _C = 25°C	Continuous Drain Current, V _{GS} @ 10V	36	A
I _D @ T _C = 70°C	Continuous Drain Current, V _{GS} @ 10V	31	
I _{DM}	Pulsed Drain Current ^①	140	
P _D @ T _C = 25°C	Maximum Power Dissipation ^②	47	W
P _D @ T _C = 70°C	Maximum Power Dissipation ^②	33	W
	Linear Derating Factor	0.31	W/°C
T _J , T _{STG}	Junction and Storage Temperature Range	-55 to + 175	°C

Thermal Resistance

	Parameter	Typ.	Max.	Units
R _{θJC}	Junction-to-Case	—	3.2	°C/W
R _{θCS}	Case-to-Sink, Flat, Greased Surface ^③	0.50	—	
R _{θJA}	Junction-to-Ambient ^④	—	62	
R _{θJA}	Junction-to-Ambient (PCB mount) ^⑤	—	40	

Notes ① through ⑤ are on page 11

IRL3714/S/LPbF

International
IGR Rectifier

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

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	20	—	—	V	$V_{GS} = 0V, I_D = 250\mu A$
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.022	—	V/°C	Reference to $25^\circ\text{C}, I_D = 1\text{mA}$
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	15	20	mΩ	$V_{GS} = 10V, I_D = 18A$ Ⓞ
		—	21	28		$V_{GS} = 4.5V, I_D = 14A$ Ⓞ
$V_{GS(th)}$	Gate Threshold Voltage	1.0	—	3.0	V	$V_{DS} = V_{GS}, I_D = 250\mu A$
I_{DSS}	Drain-to-Source Leakage Current	—	—	20	μA	$V_{DS} = 16V, V_{GS} = 0V$
		—	—	100		$V_{DS} = 16V, V_{GS} = 0V, T_J = 125^\circ\text{C}$
I_{GSS}	Gate-to-Source Forward Leakage	—	—	200	nA	$V_{GS} = 16V$
	Gate-to-Source Reverse Leakage	—	—	-200		$V_{GS} = -16V$


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

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
g_{fs}	Forward Transconductance	17	—	—	S	$V_{DS} = 10V, I_D = 14A$
Q_g	Total Gate Charge	—	6.5	9.7	nC	$I_D = 14A$
Q_{gs}	Gate-to-Source Charge	—	1.8	—		$V_{DS} = 10V$
Q_{gd}	Gate-to-Drain ("Miller") Charge	—	2.9	—		$V_{GS} = 4.5V$
Q_{oss}	Output Gate Charge	—	7.1	—		$V_{GS} = 0V, V_{DS} = 10V$
$t_{d(on)}$	Turn-On Delay Time	—	8.7	—	ns	$V_{DD} = 10V$
t_r	Rise Time	—	78	—		$I_D = 14A$
$t_{d(off)}$	Turn-Off Delay Time	—	10	—		$R_G = 1.8\Omega$
t_f	Fall Time	—	4.5	—		$V_{GS} = 4.5V$ Ⓞ
C_{iss}	Input Capacitance	—	670	—	pF	$V_{GS} = 0V$
C_{oss}	Output Capacitance	—	470	—		$V_{DS} = 10V$
C_{rss}	Reverse Transfer Capacitance	—	68	—		$f = 1.0\text{MHz}$

Avalanche Characteristics

Symbol	Parameter	Typ.	Max.	Units
E_{AS}	Single Pulse Avalanche EnergyⓄ	—	72	mJ
I_{AR}	Avalanche CurrentⓄ	—	14	A

Diode Characteristics

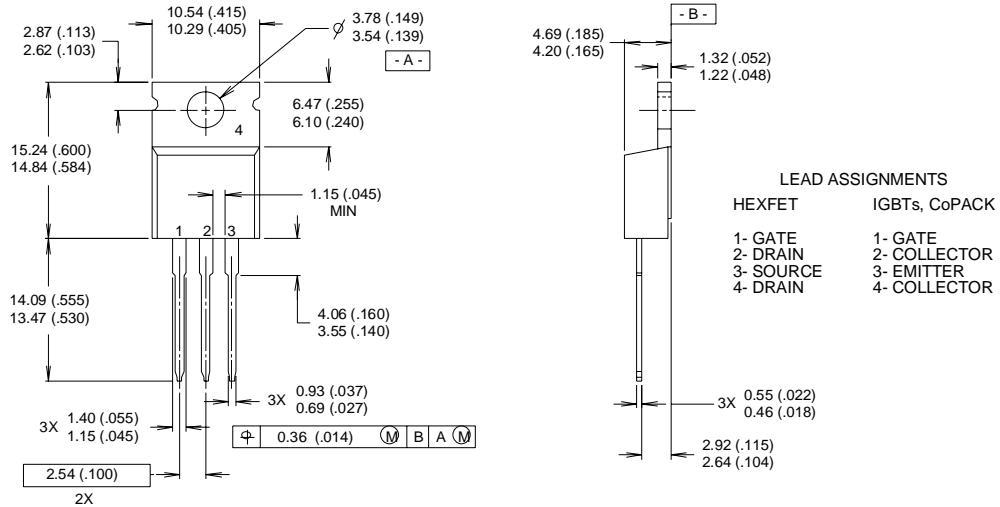
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	36	—	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode) Ⓞ	—	140	—		
V_{SD}	Diode Forward Voltage	—	—	1.3	V	$T_J = 25^\circ\text{C}, I_S = 18A, V_{GS} = 0V$ Ⓞ
		—	0.88	—		$T_J = 125^\circ\text{C}, I_S = 18A, V_{GS} = 0V$ Ⓞ
t_{rr}	Reverse Recovery Time	—	35	53	ns	$T_J = 25^\circ\text{C}, I_F = 18A, V_R = 10V$
Q_{rr}	Reverse Recovery Charge	—	34	51		$di/dt = 100A/\mu s$ Ⓞ
t_{rr}	Reverse Recovery Time	—	35	53	ns	$T_J = 125^\circ\text{C}, I_F = 18A, V_R = 10V$
Q_{rr}	Reverse Recovery Charge	—	35	53		$di/dt = 100A/\mu s$ Ⓞ

IRL3714/S/LPbF



TO-220AB Package Outline

Dimensions are shown in millimeters (inches)



NOTES:

- 1 DIMENSIONING & TOLERANCING PER ANSI Y14.5M, 1982.
- 2 CONTROLLING DIMENSION : INCH

- 3 OUTLINE CONFORMS TO JEDEC OUTLINE TO-220AB.
- 4 HEATSINK & LEAD MEASUREMENTS DO NOT INCLUDE BURRS.

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"

