

IRFR3711ZCPbF
IRFU3711ZCPbF

HEXFET® Power MOSFET

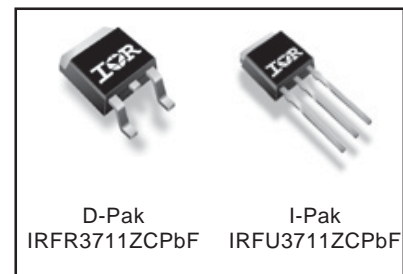
Applications

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

V_{DSS}	R_{DS(on)} max	Qg
20V	5.7mΩ	18nC

Benefits

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



Absolute Maximum Ratings

	Parameter	Max.	Units
V _{DS}	Drain-to-Source Voltage	20	V
V _{GS}	Gate-to-Source Voltage	± 20	
I _D @ T _C = 25°C	Continuous Drain Current, V _{GS} @ 10V	93 [ⓐ]	A
I _D @ T _C = 100°C	Continuous Drain Current, V _{GS} @ 10V	66 [ⓐ]	
I _{DM}	Pulsed Drain Current [ⓑ]	370	
P _D @ T _C = 25°C	Maximum Power Dissipation [ⓒ]	79	W
P _D @ T _C = 100°C	Maximum Power Dissipation [ⓒ]	39	
	Linear Derating Factor	0.53	W/°C
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	—	1.9	°C/W
R _{θJA}	Junction-to-Ambient (PCB Mount) [ⓑ]	—	50	
R _{θJA}	Junction-to-Ambient	—	110	

Notes [ⓐ] through [ⓒ] are on page 11

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International
IR Rectifier

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

	Parameter	Min.	Typ.	Max.	Units	Conditions
BV _{DSS}	Drain-to-Source Breakdown Voltage	20	—	—	V	V _{GS} = 0V, I _D = 250μA
ΔBV _{DSS} /ΔT _J	Breakdown Voltage Temp. Coefficient	—	13	—	mV/°C	Reference to 25°C, I _D = 1mA
R _{DS(on)}	Static Drain-to-Source On-Resistance	—	4.5	5.7	mΩ	V _{GS} = 10V, I _D = 15A ③
		—	6.2	7.8		V _{GS} = 4.5V, I _D = 12A ③
V _{GS(th)}	Gate Threshold Voltage	1.55	2.0	2.45	V	V _{DS} = V _{GS} , I _D = 250μA
ΔV _{GS(th)} /ΔT _J	Gate Threshold Voltage Coefficient	—	-5.4	—	mV/°C	
I _{DSS}	Drain-to-Source Leakage Current	—	—	1.0	μA	V _{DS} = 16V, V _{GS} = 0V
		—	—	150		V _{DS} = 16V, V _{GS} = 0V, T _J = 125°C
I _{GSS}	Gate-to-Source Forward Leakage	—	—	100	nA	V _{GS} = 20V
	Gate-to-Source Reverse Leakage	—	—	-100		V _{GS} = -20V
g _{fs}	Forward Transconductance	48	—	—	S	V _{DS} = 10V, I _D = 12A
Q _g	Total Gate Charge	—	18	27	nC	V _{DS} = 10V V _{GS} = 4.5V I _D = 12A See Fig. 16
Q _{gs1}	Pre-V _{th} Gate-to-Source Charge	—	5.1	—		
Q _{gs2}	Post-V _{th} Gate-to-Source Charge	—	1.8	—		
Q _{gd}	Gate-to-Drain Charge	—	6.5	—		
Q _{godr}	Gate Charge Overdrive	—	4.6	—		
Q _{sw}	Switch Charge (Q _{gs2} + Q _{gd})	—	8.3	—		
Q _{oss}	Output Charge	—	9.8	—	nC	V _{DS} = 10V, V _{GS} = 0V
t _{d(on)}	Turn-On Delay Time	—	12	—	ns	V _{DD} = 15V, V _{GS} = 4.5V ② I _D = 12A Clamped Inductive Load
t _r	Rise Time	—	13	—		
t _{d(off)}	Turn-Off Delay Time	—	15	—		
t _f	Fall Time	—	5.2	—		
C _{iss}	Input Capacitance	—	2160	—	pF	V _{GS} = 0V V _{DS} = 10V f = 1.0MHz
C _{oss}	Output Capacitance	—	700	—		
C _{rss}	Reverse Transfer Capacitance	—	360	—		

Avalanche Characteristics

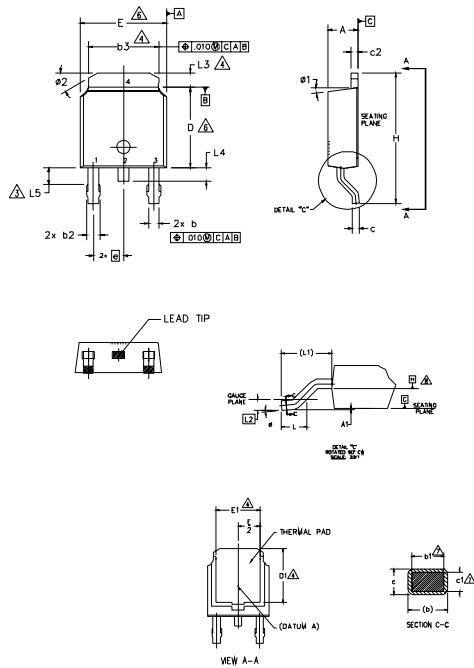
	Parameter	Typ.	Max.	Units
E _{AS}	Single Pulse Avalanche Energy ②	—	140	mJ
I _{AR}	Avalanche Current ①	—	12	A
E _{AR}	Repetitive Avalanche Energy ①	—	7.9	mJ

Diode Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I _S	Continuous Source Current (Body Diode)	—	—	93 ④	A	MOSFET symbol showing the integral reverse p-n junction diode.
I _{SM}	Pulsed Source Current (Body Diode) ①	—	—	370		
V _{SD}	Diode Forward Voltage	—	—	1.0	V	T _J = 25°C, I _S = 12A, V _{GS} = 0V ③
t _{rr}	Reverse Recovery Time	—	19	28	ns	T _J = 25°C, I _F = 12A, V _{DD} = 10V
Q _{rr}	Reverse Recovery Charge	—	9.4	14	nC	di/dt = 100A/μs ③
t _{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

D-Pak (TO-252AA) Package Outline

Dimensions are shown in millimeters (inches)



- NOTES:
- 1- DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994
 - 2- DIMENSIONS ARE SHOWN IN INCHES [MILLIMETERS]
 - 3- LEAD DIMENSION UNCONTROLLED IN L5.
 - 4- DIMENSION D1, E1, L3 & b3 ESTABLISH A MINIMUM MOUNTING SURFACE FOR THERMAL PAD.
 - 5- SECTION C-C DIMENSIONS APPLY TO THE FLAT SECTION OF THE LEAD BETWEEN .005 AND 0.10 [0.13 AND 0.25] FROM THE LEAD TIP.
 - 6- DIMENSION D & E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED .005 [0.13] PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTMOST EXTREMES OF THE PLASTIC BODY.
 - 7- DIMENSION b1 & c1 APPLIED TO BASE METAL ONLY.
 - 8- DATUM A & B TO BE DETERMINED AT DATUM PLANE H.
 - 9- OUTLINE CONFORMS TO JEDEC OUTLINE TO-252AA.

SYMBOL	DIMENSIONS				NOTES
	MILLIMETERS		INCHES		
	MIN.	MAX.	MIN.	MAX.	
A	2.18	2.39	.086	.094	7
A1	-	0.13	-	.005	
b	0.64	0.89	.025	.035	4
b1	0.65	0.79	.025	.031	
b2	0.76	1.14	.030	.045	7
b3	4.95	5.46	.195	.215	
c	0.46	0.61	.018	.024	6
c1	0.41	0.56	.016	.022	
c2	0.46	0.89	.018	.035	4
D	5.97	6.22	.235	.245	
D1	5.21	-	.205	-	6
E	6.35	6.73	.250	.265	
E1	4.32	-	.170	-	4
e	2.29 BSC		.090 BSC		
H	9.40	10.41	.370	.410	3
L	1.40	1.78	.055	.070	
L1	2.74 BSC		.108 REF.		
L2	0.51 BSC		.020 BSC		
L3	0.89	1.27	.035	.050	4
L4	-	1.02	-	.040	
L5	1.14	1.52	.045	.060	3
φ	0"	10"	0"	10"	
φ1	0"	15"	0"	15"	
φ2	25"	35"	25"	35"	

LEAD ASSIGNMENTS

HEXFET

- 1.- GATE
- 2.- DRAIN
- 3.- SOURCE
- 4.- DRAIN

IGBT & CoPAK

- 1.- GATE
- 2.- COLLECTOR
- 3.- EMITTER
- 4.- COLLECTOR

D-Pak (TO-252AA) Part Marking Information

EXAMPLE: THIS IS AN IRFR120
WITH ASSEMBLY
LOT CODE 1234
ASSEMBLED ON WW 16, 2001
IN THE ASSEMBLY LINE "A"

Note: "P" in assembly line position indicates "Lead-Free"
"P̄" in assembly line position indicates "Lead-Free" qualification to the Consumer-Level

OR

