PD-94061B

International
IOR Rectifier

SMPS MOSFET

IRFR3711
IRFU3711

HEXFET® Power MOSFET

V_{DSS}	$R_{DS(on)}$ max	I_D
20V	**6.5mΩ**	**110A④**

D-Pak
IRFR3711

I-Pak
IRFU3711

Applications

- High Frequency Isolated DC-DC Converters with Synchronous Rectification for Telecom and Industrial Use
- High Frequency Buck Converters for Server Processor Power Synchronous FET
- Optimized for Synchronous Buck Converters Including Capacitive Induced Turn-on Immunity
- 100% R_G Tested

Benefits

- Ultra-Low Gate Impedance
- Very Low RDS(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-Source Voltage	± 20	
I_D @ T_C = 25°C	Continuous Drain Current, V_{GS} @ 10V	100 ④	A
I_D @ T_C = 100°C	Continuous Drain Current, V_{GS} @ 10V	69 ④	
I_{DM}	Pulsed Drain Current ①	440	
P_D @T_A = 25°C	Maximum Power Dissipation ⑤	2.5	W
P_D @T_C = 25°C	Maximum Power Dissipation	120	
	Linear Derating Factor	0.96	W/°C
T_J, T_{STG}	Junction and Storage Temperature Range	-55 to +150	°C

Thermal Resistance

Symbol	Parameter	Typ	Max	Units
$R_{\theta JC}$	Junction-to-Case ⑥	–––	1.04	°C/W
$R_{\theta JA}$	Junction-to-Ambient (PCB Mount) ⑤⑥	–––	50	
$R_{\theta JA}$	Junction-to-Ambient ⑥	–––	110	

Notes ① through ⑥ are on page 10

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

Symbol	Parameter	Min	Typ	Max	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	20	—	—	V	V_{GS} = 0V, I_D = 250µA
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.022	—	V/°C	Reference to 25°C, I_D = 1mA
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	5.2	6.5	mΩ	V_{GS} = 10V, I_D = 15A ③
		—	6.7	8.5		V_{GS} = 4.5V, I_D = 12A ③
$V_{GS(th)}$	Gate Threshold Voltage	1.0	—	3.0	V	V_{DS} = V_{GS}, I_D = 250µA
I_{DSS}	Drain-to-Source Leakage Current	—	—	140	µA	V_{DS} = 20V, V_{GS} = 0V
		—	—	20		V_{DS} = 16V, V_{GS} = 0V
		—	—	100		V_{DS} = 16V, 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	53	—	—	S	V_{DS} = 16V, I_D = 30A
Q_g	Total Gate Charge	—	29	44	nC	I_D = 15A
Q_{gs}	Gate-to-Source Charge	—	7.3	—		V_{DS} = 10V
Q_{gd}	Gate-to-Drain ("Miller") Charge	—	8.9	—		V_{GS} = 4.5V ③
Q_{oss}	Output Gate Charge	—	33	—		V_{GS} = 0V, V_{DS} = 10V
R_G	Gate Resistance	0.3	—	2.5	Ω	
$t_{d(on)}$	Turn-On Delay Time	—	12	—	ns	V_{DD} = 10V
t_r	Rise Time	—	220	—		I_D = 30A
$t_{d(off)}$	Turn-Off Delay Time	—	17	—		R_G = 1.8Ω
t_f	Fall Time	—	12	—		V_{GS} = 4.5V ③
C_{iss}	Input Capacitance	—	2980	—	pF	V_{GS} = 0V
C_{oss}	Output Capacitance	—	1770	—		V_{DS} = 10V
C_{rss}	Reverse Transfer Capacitance	—	280	—		f = 1.0MHz

Avalanche Characteristics

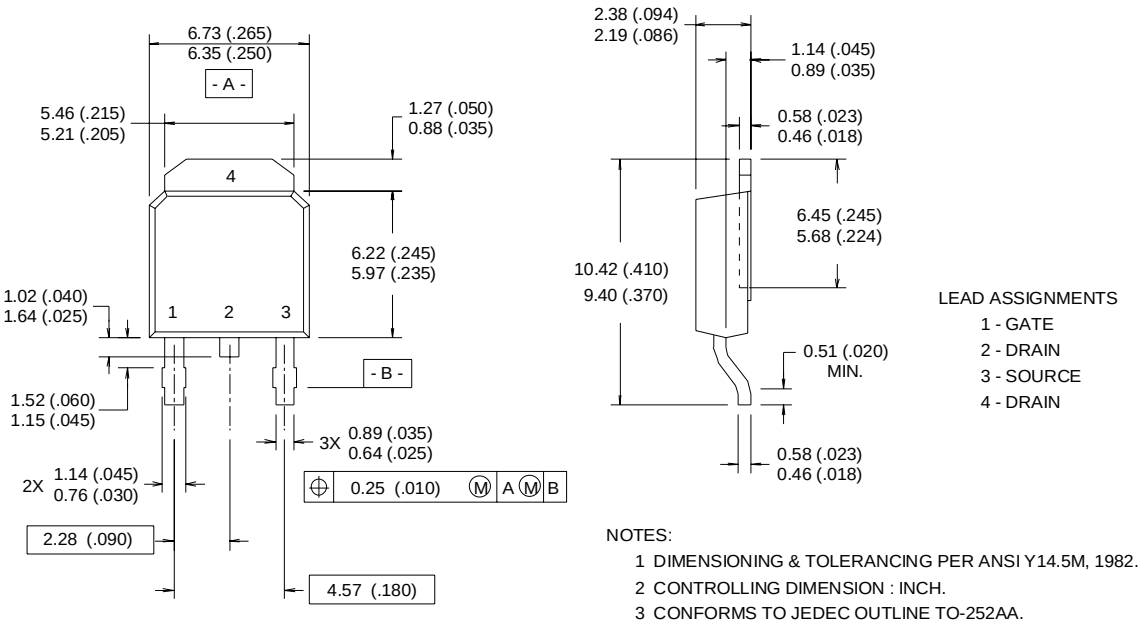
Symbol	Parameter	Typ	Max	Units
E_{AS}	Single Pulse Avalanche Energy②	—	460	mJ
I_{AR}	Avalanche Current ①	—	30	A

Diode Characteristics

Symbol	Parameter	Min	Typ	Max	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	110 ④	A	MOSFET symbol showing the integral reverse p-n junction diode.
I_{SM}	Pulsed Source Current (Body Diode) ①	—	—	440		
V_{SD}	Diode Forward Voltage	—	0.88	1.3	V	T_J = 25°C, I_S = 30A, V_{GS} = 0V ③
		—	0.82	—		T_J = 125°C, I_S = 30A, V_{GS} = 0V ③
t_{rr}	Reverse Recovery Time	—	50	75	ns	T_J = 25°C, I_F = 16A, V_R = 10V
Q_{rr}	Reverse Recovery Charge	—	61	92	nC	di/dt = 100A/µs ③
t_{rr}	Reverse Recovery Time	—	48	72	ns	T_J = 125°C, I_F = 16A, V_R = 10V
Q_{rr}	Reverse Recovery Charge	—	65	98	nC	di/dt = 100A/µs ③

D-Pak (TO-252AA) Package Outline

Dimensions are shown in millimeters (inches)

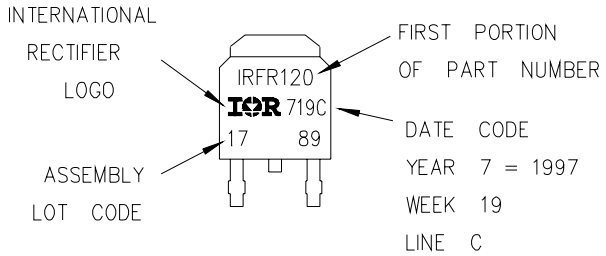


LEAD ASSIGNMENTS
1 - GATE
2 - DRAIN
3 - SOURCE
4 - DRAIN

NOTES:
1 DIMENSIONING & TOLERANCING PER ANSI Y14.5M, 1982.
2 CONTROLLING DIMENSION : INCH.
3 CONFORMS TO JEDEC OUTLINE TO-252AA.
4 DIMENSIONS SHOWN ARE BEFORE SOLDER DIP, SOLDER DIP MAX. +0.16 (.006).

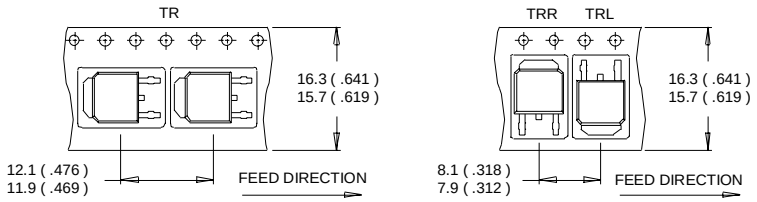
D-Pak (TO-252AA) Part Marking Information

EXAMPLE: THIS IS AN IRFR120
LOT CODE 1789
ASSEMBLED ON WW 19, 1997
IN THE ASSEMBLY LINE "C"

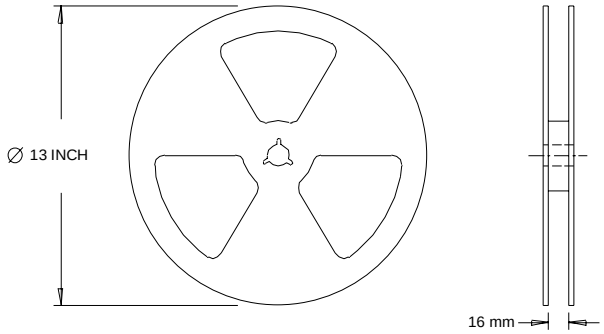


D-Pak (TO-252AA) Tape & Reel Information

Dimensions are shown in millimeters (inches)



NOTES :
1. CONTROLLING DIMENSION : MILLIMETER.
2. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS (INCHES).
3. OUTLINE CONFORMS TO EIA-481 & EIA-541.



NOTES :
1. OUTLINE CONFORMS TO EIA-481.

Notes:

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

② Starting T_J = 25°C, L = 1.0mH R_G = 25Ω, I_{AS} = 30A.

③ Pulse width ≤ 400µs; duty cycle ≤ 2%.

④ Calculated continuous current based on maximum allowable junction temperature. Package limitation current is 30A.

⑤ When mounted on 1" square PCB (FR-4 or G-10 Material) . For recommended footprint and soldering techniques refer to application note #AN-994

⑥ R_θ is measured at T_J approximately at 90°C

Data and specifications subject to change without notice.
This product has been designed and qualified for the industrial market.

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