

## IRFM9240

### POWER MOSFET THRU-HOLE (TO-254AA)

### 200V, P-CHANNEL

#### Product Summary

Part Number	RDS(on)	Id
IRFM9240	0.51Ω	-11A

#### Features:

- Simple Drive Requirements
- Ease of Paralleling
- Hermetically Sealed
- Electrically Isolated
- Dynamic dv/dt Rating
- Light-weight

#### Absolute Maximum Ratings

	Parameter		Units
Id @ VGS = -10V, TC = 25°C	Continuous Drain Current	-11	A
Id @ VGS = -10V, TC = 100°C	Continuous Drain Current	-7.0	
IDM	Pulsed Drain Current ①	-44	
PD @ TC = 25°C	Max. Power Dissipation	125	W
	Linear Derating Factor	1.0	W/°C
VGS	Gate-to-Source Voltage	±20	V
EAS	Single Pulse Avalanche Energy ②	500	mJ
IAR	Avalanche Current ①	-11	A
EAR	Repetitive Avalanche Energy ①	12.5	mJ
dv/dt	Peak Diode Recovery dv/dt ③	-5.0	V/ns
TJ	Operating Junction	-55 to 150	°C
TSTG	Storage Temperature Range		
	Lead Temperature	300 ( 0.063 in.(1.6mm) from case for 10s)	
	Weight	9.3 (typical)	g

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### Electrical Characteristics @ T<sub>j</sub> = 25°C (Unless Otherwise Specified)

	Parameter	Min	Typ	Max	Units	Test Conditions
BV <sub>DSS</sub>	Drain-to-Source Breakdown Voltage	-200	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = -1.0mA
ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	Temperature Coefficient of Breakdown Voltage	—	-0.2	—	V/°C	Reference to 25°C, I <sub>D</sub> = -1.0mA
R <sub>DS(on)</sub>	Static Drain-to-Source On-State Resistance	—	—	0.51	Ω	V <sub>GS</sub> = -10V, I <sub>D</sub> = -7.0A <sup>④</sup>
		—	—	0.52		V <sub>GS</sub> = -10V, I <sub>D</sub> = -11A <sup>④</sup>
V <sub>GS(th)</sub>	Gate Threshold Voltage	-2.0	—	-4.0	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA
g <sub>fs</sub>	Forward Transconductance	4.0	—	—	S (r <sub>S</sub> )	V <sub>DS</sub> > -15V, I <sub>DS</sub> = -7.0A <sup>④</sup>
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	—	—	-25	μA	V <sub>DS</sub> = -160V, V <sub>GS</sub> = 0V
		—	—	-250		V <sub>DS</sub> = -160V V <sub>GS</sub> = 0V, T <sub>J</sub> = 125°C
I <sub>GSS</sub>	Gate-to-Source Leakage Forward	—	—	-100	nA	V <sub>GS</sub> = -20V
I <sub>GSS</sub>	Gate-to-Source Leakage Reverse	—	—	100	nA	V <sub>GS</sub> = 20V
Q <sub>g</sub>	Total Gate Charge	—	—	60	nC	V <sub>GS</sub> = -10V, I <sub>D</sub> = -11A V <sub>DS</sub> = -100V
Q <sub>gs</sub>	Gate-to-Source Charge	—	—	15		
Q <sub>gd</sub>	Gate-to-Drain ('Miller') Charge	—	—	38		
t <sub>d(on)</sub>	Turn-On Delay Time	—	—	35	ns	V <sub>DD</sub> = -100V, I <sub>D</sub> = -11A, R <sub>G</sub> = 9.1Ω, V <sub>GS</sub> = -10V
t <sub>r</sub>	Rise Time	—	—	85		
t <sub>d(off)</sub>	Turn-Off Delay Time	—	—	85		
t <sub>f</sub>	Fall Time	—	—	65		
L <sub>S</sub> + L <sub>D</sub>	Total Inductance	—	6.8	—	nH	Measured from drain lead (6mm/ 0.25in. from package) to source lead (6mm/0.25in. from package)
C <sub>iss</sub>	Input Capacitance	—	1200	—	pF	V <sub>GS</sub> = 0V, V <sub>DS</sub> = -25V f = 1.0MHz
C <sub>oss</sub>	Output Capacitance	—	570	—		
C <sub>rss</sub>	Reverse Transfer Capacitance	—	81	—		

### Source-Drain Diode Ratings and Characteristics

	Parameter	Min	Typ	Max	Units	Test Conditions
I <sub>S</sub>	Continuous Source Current (Body Diode)	—	—	-11	A	
I <sub>SM</sub>	Pulse Source Current (Body Diode) <sup>①</sup>	—	—	-44		
V <sub>SD</sub>	Diode Forward Voltage	—	—	-4.6	V	T <sub>J</sub> = 25°C, I <sub>S</sub> = -11A, V <sub>GS</sub> = 0V <sup>④</sup>
t <sub>rr</sub>	Reverse Recovery Time	—	—	440	nS	T <sub>J</sub> = 25°C, I <sub>F</sub> = -11A, di/dt ≤ 100A/μs
Q <sub>RR</sub>	Reverse Recovery Charge	—	—	7.2	μC	V <sub>DD</sub> ≤ -50V <sup>④</sup>
t <sub>on</sub>	Forward Turn-On Time	Intrinsic turn-on time is negligible. Turn-on speed is substantially controlled by L <sub>S</sub> + L <sub>D</sub> .				

### Thermal Resistance

	Parameter	Min	Typ	Max	Units	Test Conditions
R <sub>thJC</sub>	Junction-to-Case	—	—	1.0	°C/W	Typical socket mount
R <sub>thCS</sub>	Case-to-sink	—	0.21	—		
R <sub>thJA</sub>	Junction-to-Ambient	—	—	48		