

**IRFM240**

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

**200V. N-CHANNEL**

**Product Summary**

Part Number	RDS(on)	Id
IRFM240	0.18 Ω	18A

**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	18	A
Id @ VGS = 10V, TC = 100°C	Continuous Drain Current	11	
IdM	Pulsed Drain Current ①	72	
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	450	mJ
IAR	Avalanche Current ①	18	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	2.6 (Typical)	g

For footnotes refer to the last page



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**Quality Semi-Conductors**

## IRFM240

### 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	—	0.29	—	V/°C	Reference to 25°C, I <sub>D</sub> = 1.0mA
R <sub>DS(on)</sub>	Static Drain-to-Source On-State Resistance	—	—	0.18	Ω	V <sub>GS</sub> = 10V, I <sub>D</sub> = 11A ④
		—	—	0.25		V <sub>GS</sub> = 10V, I <sub>D</sub> = 18A
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	6.1	—	—	S (r)	V <sub>DS</sub> > 15V, I <sub>DS</sub> = 11A ④
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> = 18A V <sub>DS</sub> = 100V
Q <sub>gs</sub>	Gate-to-Source Charge	—	—	10.6		
Q <sub>gd</sub>	Gate-to-Drain ('Miller') Charge	—	—	37.6		
t <sub>d(on)</sub>	Turn-On Delay Time	—	—	20	ns	V <sub>DD</sub> = 100V, I <sub>D</sub> = 18A, V <sub>GS</sub> = 10V, R <sub>G</sub> = 9.1Ω
t <sub>r</sub>	Rise Time	—	—	105		
t <sub>d(off)</sub>	Turn-Off Delay Time	—	—	58		
t <sub>f</sub>	Fall Time	—	—	67		
L <sub>S</sub> + L <sub>D</sub>	Total Inductance	—	4.0	—	nH	Measured from drain lead (6mm/ 0.25in. from package) to source lead (6mm/0.25in. from package)
C <sub>iss</sub>	Input Capacitance	—	1300	—	pF	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 25V f = 1.0MHz
C <sub>oss</sub>	Output Capacitance	—	400	—		
C <sub>rss</sub>	Reverse Transfer Capacitance	—	130	—		

### Source-Drain Diode Ratings and Characteristics

	Parameter	Min	Typ	Max	Units	Test Conditions
I <sub>S</sub>	Continuous Source Current (Body Diode)	—	—	18	A	T <sub>j</sub> = 25°C, I <sub>S</sub> = 18A, V <sub>GS</sub> = 0V ④
I <sub>SM</sub>	Pulse Source Current (Body Diode) ①	—	—	72		
V <sub>SD</sub>	Diode Forward Voltage	—	—	1.5	V	T <sub>j</sub> = 25°C, I <sub>F</sub> = 18A, di/dt ≤ 100A/μs
t <sub>rr</sub>	Reverse Recovery Time	—	—	500	nS	V <sub>DD</sub> ≤ 50V ④
Q <sub>RR</sub>	Reverse Recovery Charge	—	—	5.3	μC	
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> .				

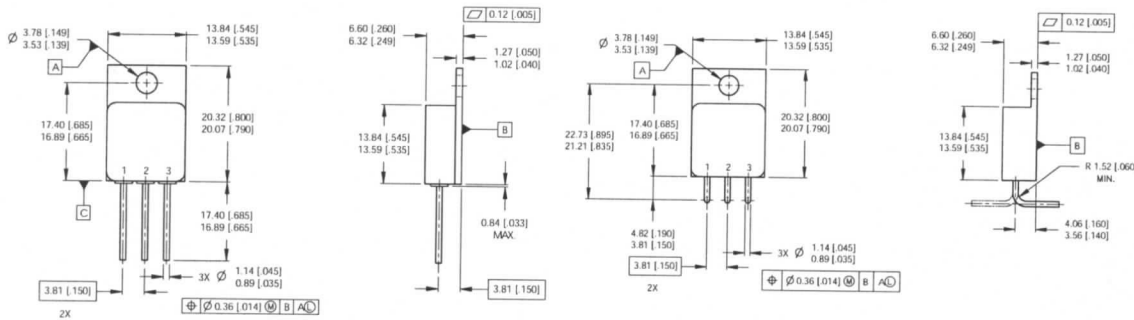
### Thermal Resistance

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

**Footnotes:**

- ① Repetitive Rating; Pulse width limited by maximum junction temperature.
- ②  $V_{DD} = 50V$ , starting  $T_J = 25^\circ C$ ,  $L = 1.3mH$   
Peak  $I_L = 18A$ ,  $V_{GS} = 10V$
- ③  $I_{SD} \leq 18A$ ,  $di/dt \leq 150A/\mu s$ ,  
 $V_{DD} \leq 200V$ ,  $T_J \leq 150^\circ C$
- ④ Pulse width  $\leq 300 \mu s$ ; Duty Cycle  $\leq 2\%$

**Case Outline and Dimensions — TO-254AA**



NOTES:

1. DIMENSIONING & TOLERANCING PER ASME Y14.5M-1994.
2. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES].
3. CONTROLLING DIMENSION: INCH.
4. CONFORMS TO JEDEC OUTLINE TO-254AA.

PIN ASSIGNMENTS

- 1 = DRAIN
- 2 = SOURCE
- 3 = GATE

**CAUTION**

**BERYLLIA WARNING PER MIL-PRF-19500**

Packages containing beryllia shall not be ground, sandblasted, machined or have other operations performed on them which will produce beryllia or beryllium dust. Furthermore, beryllium oxide packages shall not be placed in acids that will produce fumes containing beryllium.