



**ELECTROSTATIC SENSITIVE DEVICE**  
OBSERVE HANDLING PRECAUTIONS

**MITSUBISHI RF POWER MOS FET**

# RD45HMF1

**Silicon MOSFET Power Transistor 900MHz,45W**

## DESCRIPTION

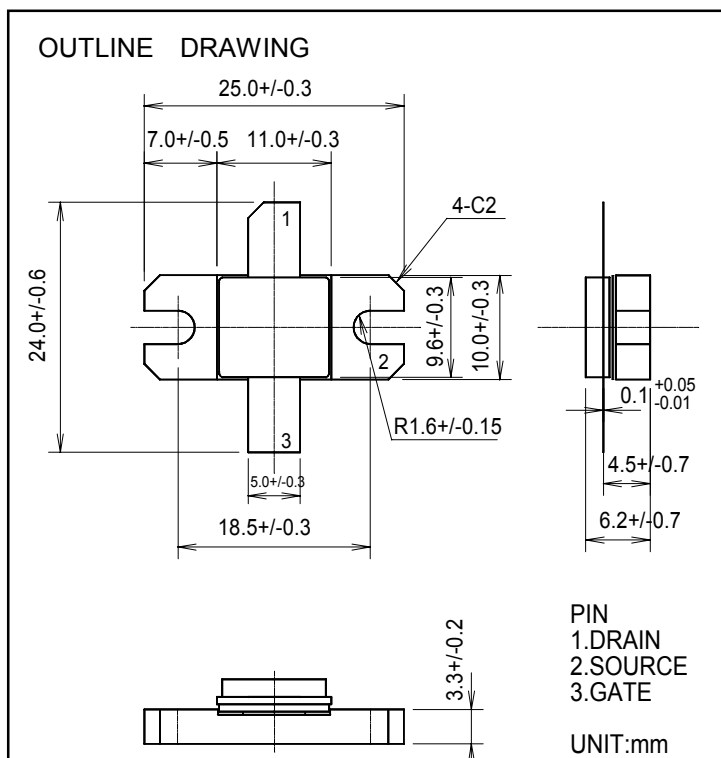
RD45HMF1 is a MOS FET type transistor specifically designed for 900MHz-band High power amplifiers applications.

## FEATURES

- High power and High Gain:  
Pout>45W, Gp>4.7dB @Vdd=12.5V,f=900MHz
- High Efficiency: 50%typ.

## APPLICATION

For output stage of high power amplifiers in 800-900MHz Band mobile radio sets.



## ABSOLUTE MAXIMUM RATINGS

(Tc=25°C UNLESS OTHERWISE NOTED)

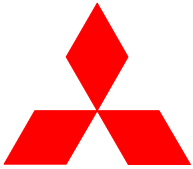
| SYMBOL  | PARAMETER               | CONDITIONS       | RATINGS     | UNIT |
|---------|-------------------------|------------------|-------------|------|
| Vdss    | Drain to source voltage | Vgs=0V           | 30          | V    |
| Vgss    | Gate to source voltage  | Vds=0V           | +/-20       | V    |
| Pch     | Channel dissipation     | Tc=25°C          | 125         | W    |
| Pin     | Input power             | Zg=Zl=50Ω        | 25          | W    |
| ID      | Drain current           | -                | 15          | A    |
| Tch     | Channel temperature     | -                | 175         | °C   |
| Tstg    | Storage temperature     | -                | -40 to +175 | °C   |
| Rth j-c | Thermal resistance      | junction to case | 1.2         | °C/W |

Note 1: Above parameters are guaranteed independently.

## ELECTRICAL CHARACTERISTICS (Tc=25°C UNLESS OTHERWISE NOTED)

| SYMBOL | PARAMETER                      | CONDITIONS                                                                     | LIMITS     |     |      | UNIT |
|--------|--------------------------------|--------------------------------------------------------------------------------|------------|-----|------|------|
|        |                                |                                                                                | MIN        | TYP | MAX. |      |
| IDSS   | Zerogate voltage drain current | VDS=17V, VGS=0V                                                                | -          | -   | 10   | uA   |
| Igss   | Gate to source leak current    | VGS=10V, VDS=0V                                                                | -          | -   | 1    | uA   |
| VTH    | Gate threshold voltage         | VDS=12V, IDS=1mA                                                               | 1.0        | -   | 3.0  | V    |
| Pout   | Output power                   | f=900MHz, VDD=12.5V                                                            | 45         | 50  | -    | W    |
| ηD     | Drain efficiency               | Pin=15W, Idq=2.0A                                                              | 45         | 50  | -    | %    |
|        | Load VSWR tolerance            | VDD=15.2V, Po=45W(PinControl)<br>Idq=2.0A, Zg=50Ω<br>Load VSWR=20:1(All Phase) | No destroy |     |      | -    |

Note : Above parameters , ratings , limits and conditions are subject to change.



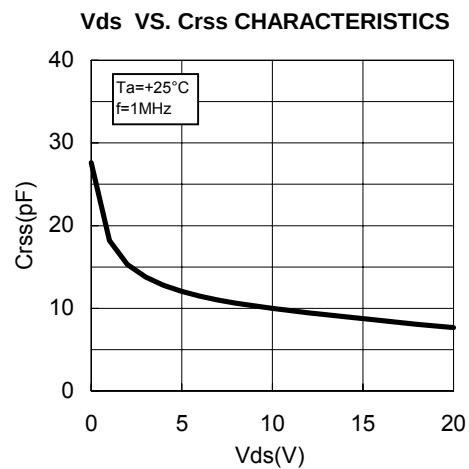
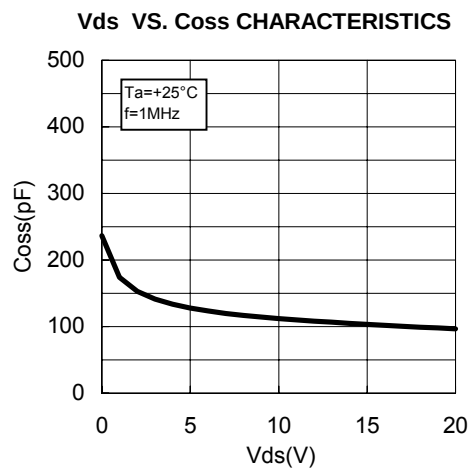
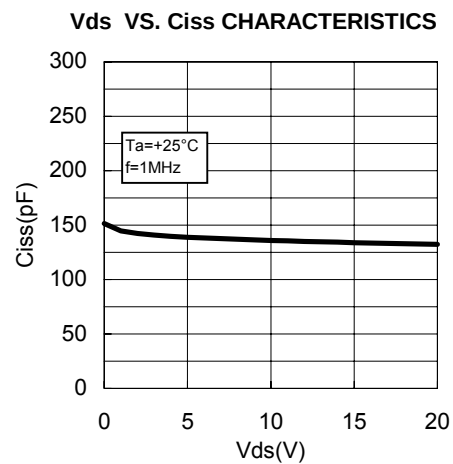
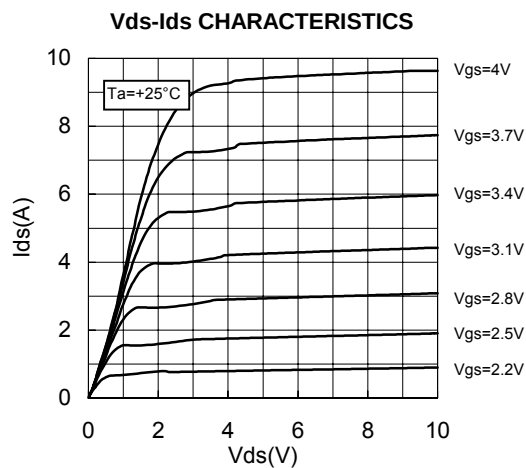
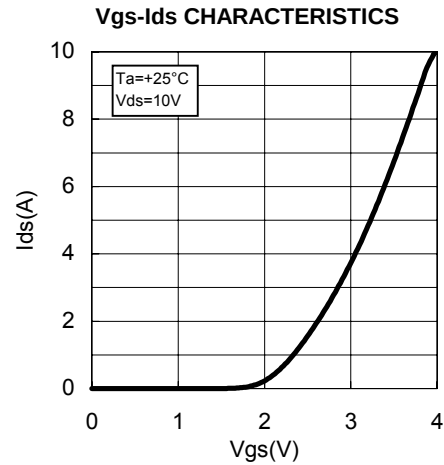
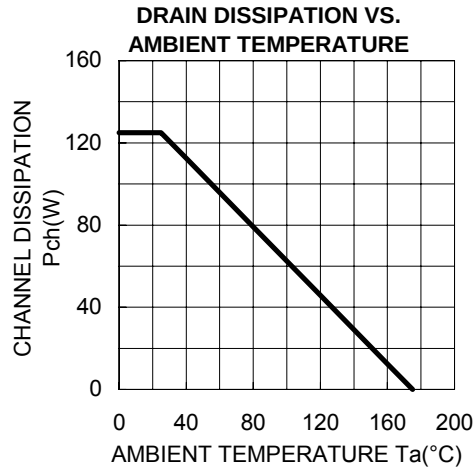
ELECTROSTATIC SENSITIVE DEVICE  
OBSERVE HANDLING PRECAUTIONS

MITSUBISHI RF POWER MOS FET

# RD45HMF1

Silicon MOSFET Power Transistor 900MHz,45W

## TYPICAL CHARACTERISTICS





ELECTROSTATIC SENSITIVE DEVICE  
OBSERVE HANDLING PRECAUTIONS

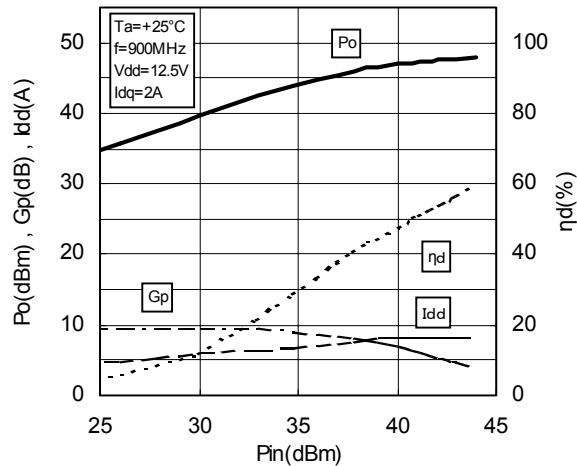
MITSUBISHI RF POWER MOS FET

# RD45HMF1

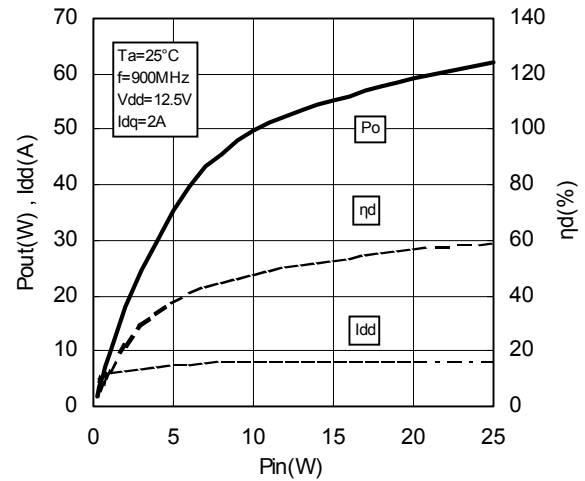
Silicon MOSFET Power Transistor 900MHz,45W

## TYPICAL CHARACTERISTICS

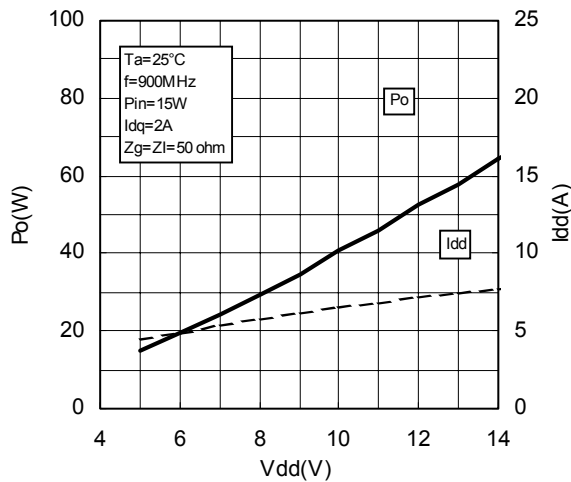
Pin-Po CHARACTERISTICS



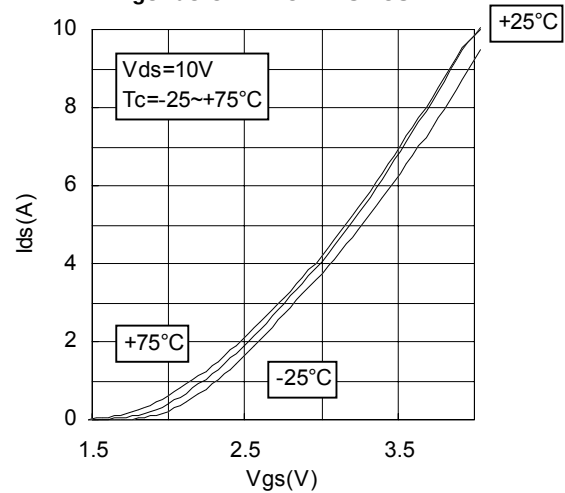
Pin-Po CHARACTERISTICS

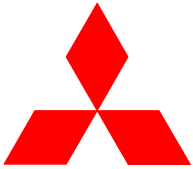


Vdd-Po CHARACTERISTICS



Vgs-Ids CHARACTERISTICS 2





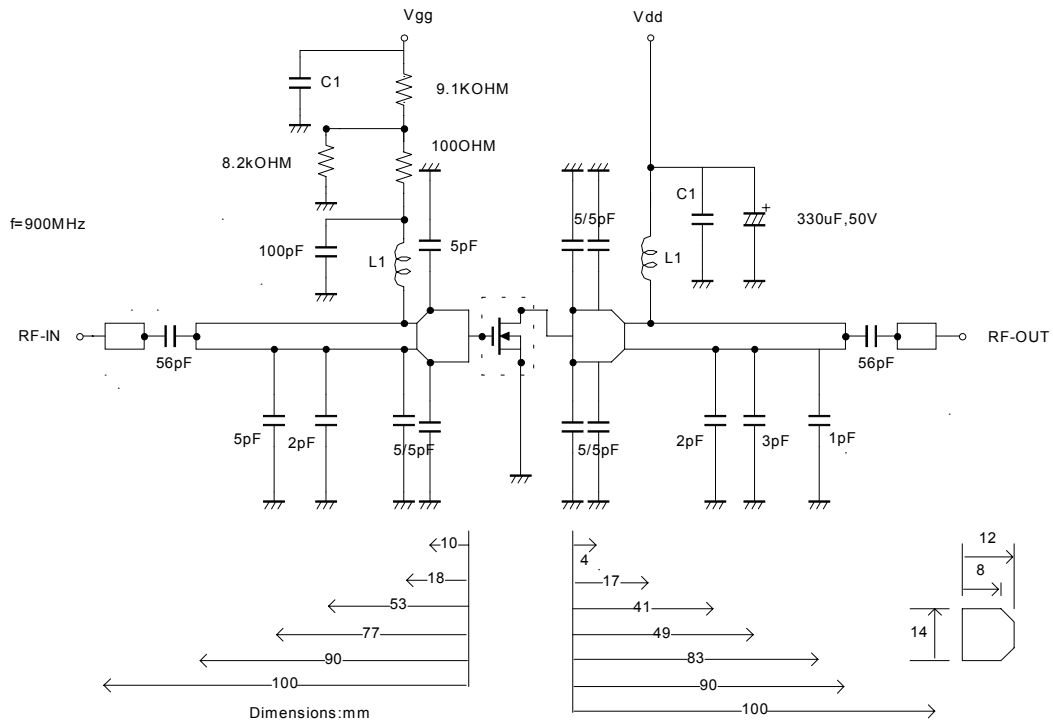
ELECTROSTATIC SENSITIVE DEVICE  
OBSERVE HANDLING PRECAUTIONS

MITSUBISHI RF POWER MOS FET

# RD45HMF1

Silicon MOSFET Power Transistor 900MHz,45W

## TEST CIRCUIT(f=900MHz)



C1:2200pF\*2 in parallel

L1:1Turns,I.D3mm,D1.5mm silver plated copper wire

Note:Board material-Teflon substrate

Micro strip line width=4.2mm/50OHM,er:2.7,t=1.6mm



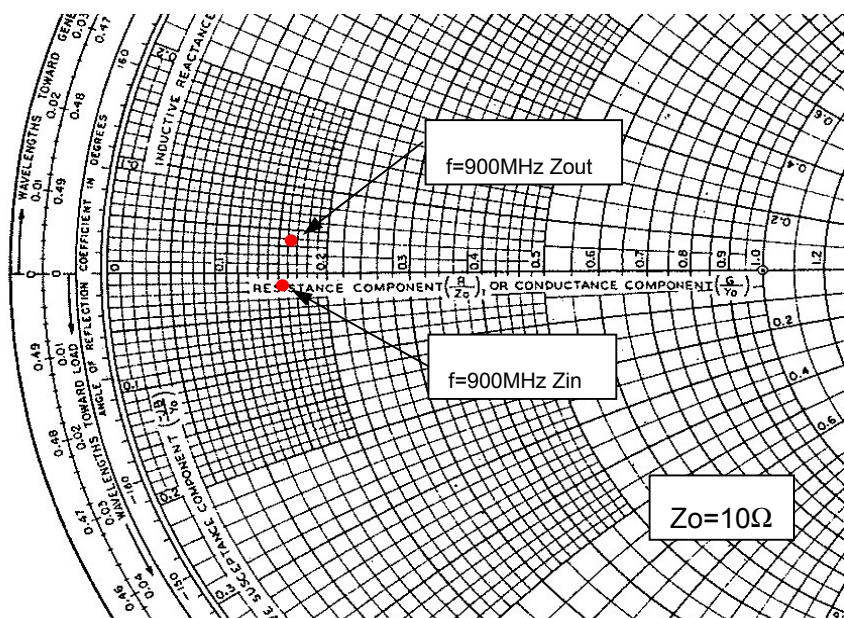
ELECTROSTATIC SENSITIVE DEVICE  
OBSERVE HANDLING PRECAUTIONS

MITSUBISHI RF POWER MOS FET

# RD45HMF1

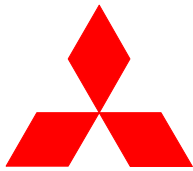
Silicon MOSFET Power Transistor 900MHz,45W

## INPUT/OUTPUT IMPEDANCE VS.FREQUENCY CHARACTERISTICS



Zin , Zout

| f     | Zin        | Zout       | Conditions                |
|-------|------------|------------|---------------------------|
| (MHz) | (ohm)      | (ohm)      |                           |
| 900   | 1.53-j0.17 | 1.63+j0.34 | Po=45W, Vdd=12.5V,Pin=15W |



ELECTROSTATIC SENSITIVE DEVICE  
OBSERVE HANDLING PRECAUTIONS

mitsubishi RF POWER MOS FET

RD45HMF1

Silicon MOSFET Power Transistor 900MHz,45W

RD45HMF1 S-PARAMETER DATA (@V<sub>dd</sub>=12.5V, I<sub>d</sub>=800mA)

| Freq.<br>[MHz] | S11   |        | S21   |       | S12   |       | S22   |        |
|----------------|-------|--------|-------|-------|-------|-------|-------|--------|
|                | (mag) | (ang)  | (mag) | (ang) | (mag) | (ang) | (mag) | (ang)  |
| 100            | 0.902 | -177.8 | 4.481 | 77.4  | 0.008 | 0.7   | 0.864 | -176.6 |
| 200            | 0.911 | -179.0 | 2.125 | 63.5  | 0.011 | -26.0 | 0.877 | -177.8 |
| 300            | 0.917 | -179.6 | 1.319 | 52.3  | 0.011 | -1.0  | 0.895 | -179.0 |
| 400            | 0.932 | 179.9  | 0.889 | 43.0  | 0.007 | -25.4 | 0.924 | 179.7  |
| 500            | 0.941 | 178.7  | 0.642 | 35.6  | 0.005 | 24.9  | 0.936 | 178.8  |
| 600            | 0.945 | 177.7  | 0.497 | 30.2  | 0.004 | 14.3  | 0.937 | 177.6  |
| 700            | 0.950 | 176.6  | 0.384 | 23.3  | 0.005 | 60.8  | 0.948 | 176.2  |
| 800            | 0.955 | 175.5  | 0.318 | 18.7  | 0.006 | 66.9  | 0.954 | 174.6  |
| 900            | 0.959 | 174.4  | 0.265 | 15.6  | 0.008 | 66.0  | 0.951 | 173.7  |
| 1000           | 0.961 | 173.6  | 0.226 | 11.1  | 0.008 | 33.5  | 0.956 | 172.5  |
| 1100           | 0.964 | 171.6  | 0.178 | 9.0   | 0.012 | 74.4  | 0.962 | 170.8  |
| 1200           | 0.963 | 170.3  | 0.166 | 7.6   | 0.009 | 52.8  | 0.961 | 169.6  |
| 1300           | 0.966 | 168.5  | 0.147 | 2.2   | 0.013 | 71.1  | 0.966 | 168.1  |
| 1400           | 0.967 | 167.0  | 0.109 | 0.3   | 0.016 | 70.5  | 0.961 | 166.1  |
| 1500           | 0.965 | 165.3  | 0.106 | 8.8   | 0.014 | 57.8  | 0.958 | 164.6  |
| 1600           | 0.969 | 163.0  | 0.102 | 16.2  | 0.022 | 71.3  | 0.968 | 163.2  |
| 1700           | 0.969 | 161.1  | 0.106 | 10.0  | 0.021 | 78.6  | 0.956 | 161.1  |
| 1800           | 0.966 | 158.8  | 0.113 | 4.1   | 0.024 | 65.7  | 0.960 | 159.5  |
| 1900           | 0.967 | 156.3  | 0.122 | -3.7  | 0.026 | 64.1  | 0.965 | 156.7  |
| 2000           | 0.963 | 153.9  | 0.106 | 1.7   | 0.028 | 59.4  | 0.955 | 154.6  |
| 2100           | 0.963 | 150.9  | 0.101 | 1.7   | 0.031 | 57.5  | 0.958 | 152.0  |
| 2200           | 0.961 | 148.3  | 0.093 | -6.4  | 0.031 | 55.0  | 0.961 | 148.9  |
| 2300           | 0.956 | 145.2  | 0.094 | -4.9  | 0.037 | 54.6  | 0.953 | 145.6  |
| 2400           | 0.955 | 142.3  | 0.096 | -6.1  | 0.038 | 52.0  | 0.949 | 142.9  |
| 2500           | 0.954 | 139.3  | 0.091 | -10.5 | 0.041 | 47.9  | 0.958 | 138.9  |
| 2600           | 0.949 | 136.1  | 0.093 | -12.6 | 0.044 | 43.8  | 0.943 | 135.4  |
| 2700           | 0.949 | 133.0  | 0.081 | -16.4 | 0.045 | 40.7  | 0.946 | 132.3  |
| 2800           | 0.948 | 129.6  | 0.083 | -19.7 | 0.046 | 33.2  | 0.948 | 127.9  |
| 2900           | 0.943 | 126.3  | 0.086 | -24.1 | 0.048 | 32.8  | 0.937 | 124.3  |
| 3000           | 0.939 | 123.0  | 0.087 | -31.6 | 0.061 | 10.7  | 0.934 | 120.9  |



**ELECTROSTATIC SENSITIVE DEVICE**  
OBSERVE HANDLING PRECAUTIONS

**MITSUBISHI RF POWER MOS FET**

# **RD45HMF1**

**Silicon MOSFET Power Transistor 900MHz,45W**

---

—————Keep safety first in your circuit designs! —————

Mitsubishi Electric Corporation puts the maximum effort into making semiconductor products better and more reliable, but there is always the possibility that trouble may occur with them. Trouble with semiconductors may lead to personal injury, fire or property damage. Remember to give due consideration to safety when making your circuit designs, with appropriate measures such as (i) placement of substitutive, auxiliary circuits, (ii) use of non-flammable material or (iii) prevention against any malfunction or mishap.