

ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

MITSUBISHI RF POWER MOS FET

RD30HVF1

RoHS Compliance, Silicon MOSFET Power Transistor, 175MHz, 30W

DESCRIPTION

RD30HVF1 is a MOS FET type transistor specifically designed for VHF RF power amplifiers applications.

FEATURES

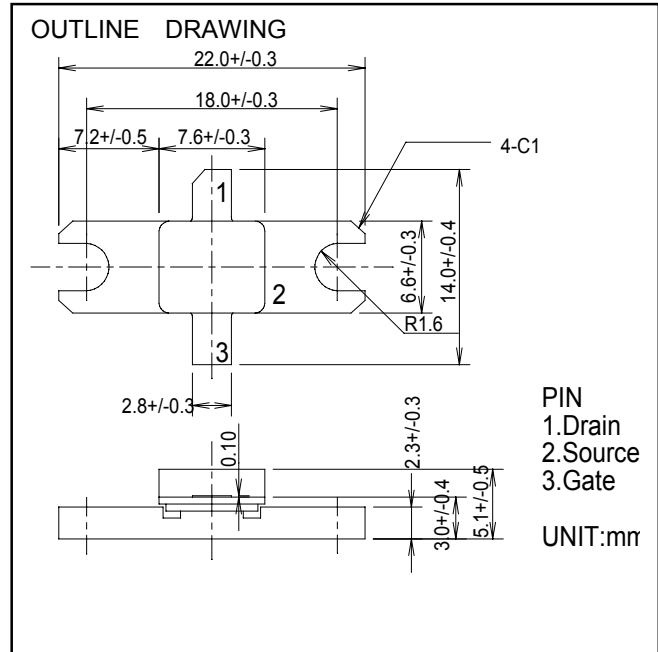
High power gain:
Pout>30W, Gp>14.7dB @Vdd=12.5V, f=175MHz
High Efficiency: 60%typ.

APPLICATION

For output stage of high power amplifiers in VHF band
Mobile radio sets.

RoHS COMPLIANT

RD30HVF1-101 is a RoHS compliant products.
RoHS compliance is indicate by the letter "G" after the Lot Marking.



ABSOLUTE MAXIMUM RATINGS

(Tc=25°C UNLESS OTHERWISE NOTED)

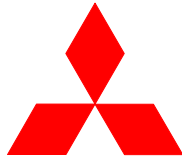
| SYMBOL | PARAMETER | CONDITIONS | RATINGS | UNIT |
|---------------------|-------------------------|-------------------------------------|-------------|------|
| V _{DSS} | Drain to source voltage | V _{gs} =0V | 30 | V |
| V _{GSS} | Gate to source voltage | V _{ds} =0V | +/-20 | V |
| P _{ch} | Channel dissipation | T _c =25°C | 75 | W |
| P _{in} | Input power | Z _g =Z _l =50Ω | 2.5 | W |
| I _D | Drain current | - | 7 | A |
| T _{ch} | Channel temperature | - | 175 | °C |
| T _{stg} | Storage temperature | - | -40 to +175 | °C |
| R _{th j-c} | Thermal resistance | junction to case | 2.0 | °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. | |
| I _{DSS} | Zero gate voltage drain current | V _{DS} =17V, V _{GS} =0V | - | - | 130 | uA |
| I _{GSS} | Gate to source leak current | V _{GS} =10V, V _{DS} =0V | - | - | 1 | uA |
| V _{TH} | Gate threshold voltage | V _{DS} =12V, I _{DS} =1mA | 1.3 | 1.8 | 2.3 | V |
| P _{out} | Output power | f=175MHz, V _{DD} =12.5V | 30 | 35 | - | W |
| η _D | Drain efficiency | P _{in} =1.0W, I _{dq} =0.5A | 55 | 60 | - | % |
| | Load VSWR tolerance | V _{DD} =15.2V, P _o =30W(PinControl) f=175MHz, I _{dq} =0.5A, Z _g =50Ω Load VSWR=20:1(All Phase) | No destroy | | | - |

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



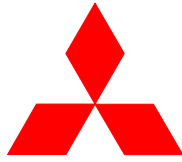
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TYPICAL CHARACTERISTICS

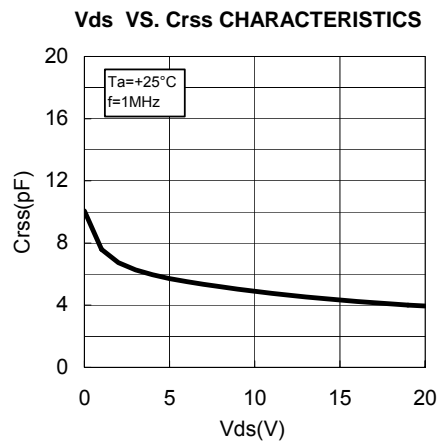
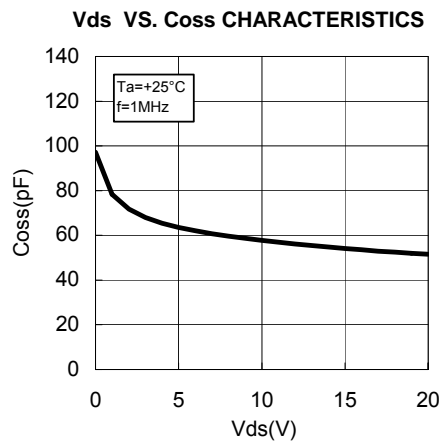
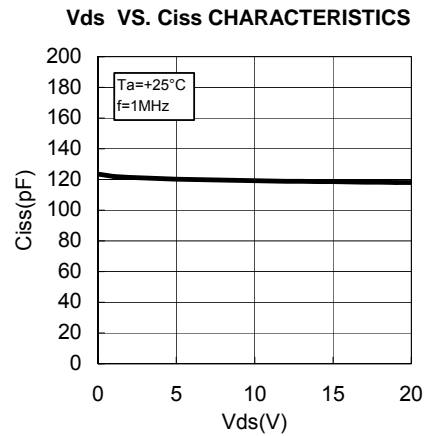
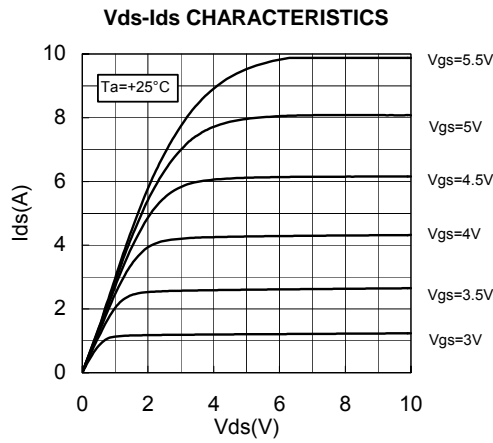
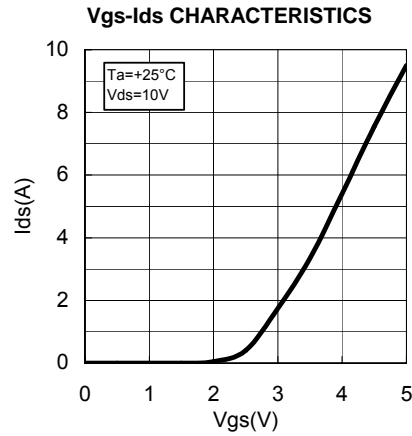
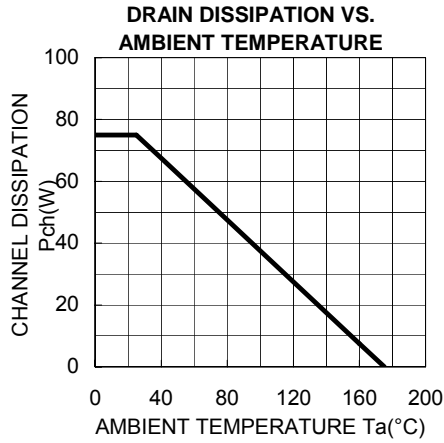


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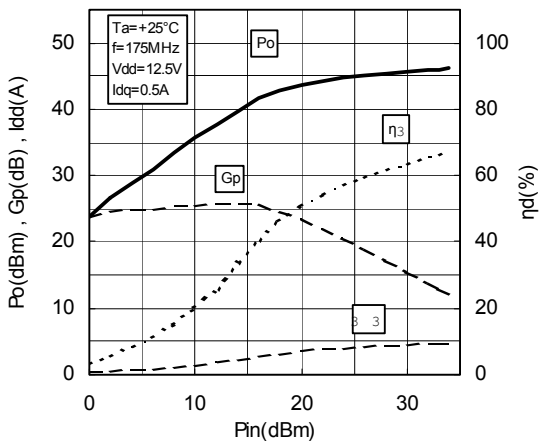
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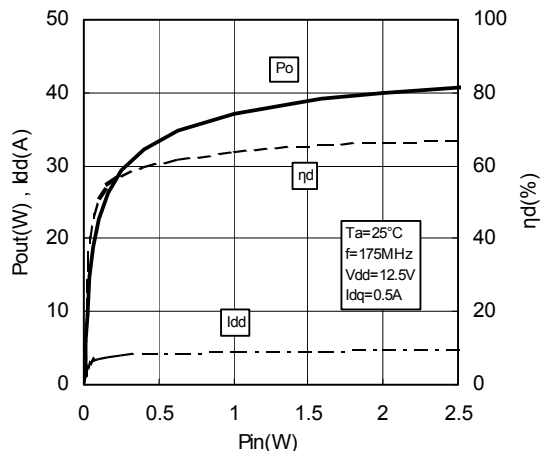
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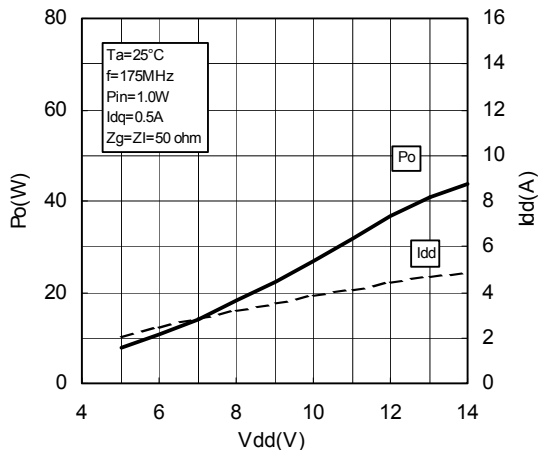
Pin-Po CHARACTERISTICS



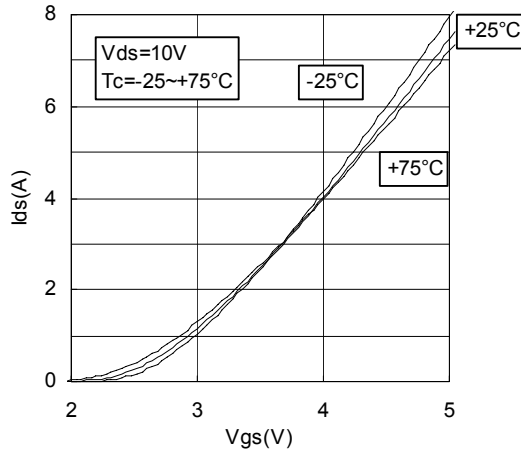
Pin-Po CHARACTERISTICS



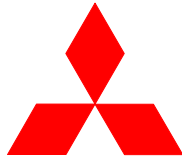
Vdd-Po CHARACTERISTICS



Vgs-Ids CHARACTERISTICS 2



TEST CIRCUIT(f=175MHz)

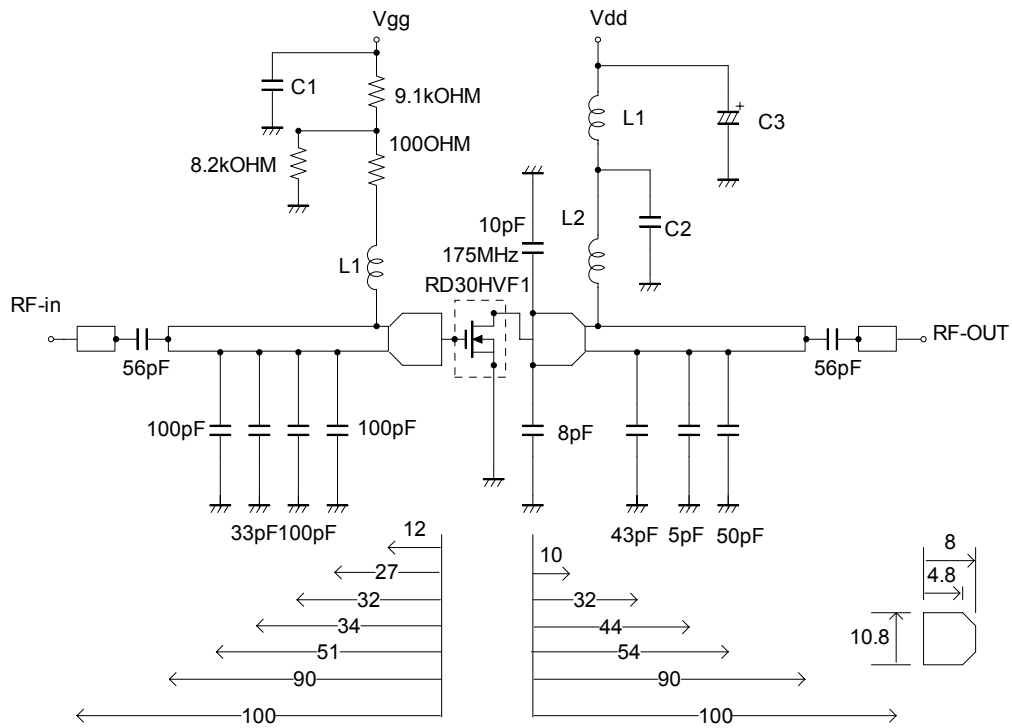


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C1: 2200pF 10uF in parallel

C2: 2200pF*2 in parallel

C3: 2200pF, 330uF in parallel

L1: 4 Turns, I.D 6mm, D 1.6mm P=1 silver plated copper wire

L2: 5 Turns, I.D 6mm, D 1.6mm P=1 silver plated copper wire

Note: Board material-Teflon substrate

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

Dimensions:mm

INPUT/OUTPUT IMPEDANCE VS.FREQUENCY CHARACTERISTICS

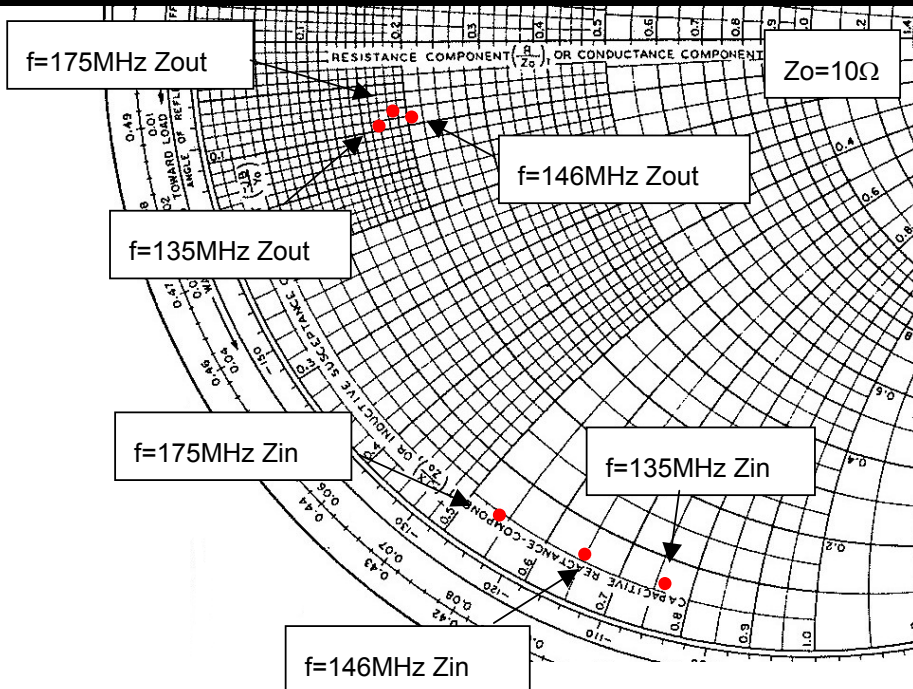


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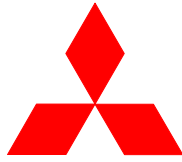
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Zin , Zout

| f | Zin | Zout | Conditions |
|-------|------------|------------|-----------------------------|
| (MHz) | (ohm) | (ohm) | |
| 135 | 0.71-j7.67 | 1.72-j0.86 | Po=40W, Vdd=12.5V, Pin=1.0W |
| 146 | 0.94-j6.46 | 2.12-j0.78 | Po=38W, Vdd=12.5V, Pin=1.0W |
| 175 | 0.53-j5.34 | 1.87-j0.70 | Po=35W, Vdd=12.5V, Pin=1.0W |



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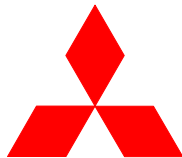
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RD30HVF1 S-PARAMETER DATA (@V_{dd}=12.5V, I_d=500mA)

| Freq. [MHz] | S11 | | S21 | | S12 | | S22 | |
|----------------|-------|--------|-------|-------|-------|-------|-------|--------|
| | (mag) | (ang) | (mag) | (ang) | (mag) | (ang) | (mag) | (ang) |
| 100 | 0.867 | -172.4 | 8.747 | 72.7 | 0.015 | -11.6 | 0.687 | -166.3 |
| 150 | 0.879 | -176.3 | 5.523 | 61.2 | 0.014 | -18.8 | 0.723 | -168.8 |
| 175 | 0.885 | -177.5 | 4.571 | 56.4 | 0.013 | -22.2 | 0.740 | -169.6 |
| 200 | 0.888 | -179.1 | 3.852 | 52.4 | 0.012 | -24.2 | 0.760 | -170.5 |
| 250 | 0.905 | 178.5 | 2.877 | 44.1 | 0.010 | -26.2 | 0.806 | -172.5 |
| 300 | 0.915 | 176.2 | 2.202 | 37.1 | 0.009 | -27.0 | 0.825 | -174.8 |
| 350 | 0.926 | 174.1 | 1.754 | 31.4 | 0.007 | -24.4 | 0.853 | -177.1 |
| 400 | 0.933 | 171.8 | 1.422 | 25.8 | 0.006 | -18.5 | 0.879 | -179.4 |
| 450 | 0.936 | 169.5 | 1.167 | 20.9 | 0.005 | -8.2 | 0.887 | 178.4 |
| 500 | 0.945 | 167.6 | 0.985 | 17.2 | 0.004 | 8.0 | 0.902 | 176.1 |
| 550 | 0.950 | 165.6 | 0.842 | 13.3 | 0.005 | 21.6 | 0.914 | 174.1 |
| 600 | 0.951 | 163.6 | 0.725 | 9.8 | 0.005 | 35.6 | 0.918 | 172.2 |
| 650 | 0.954 | 161.7 | 0.635 | 7.2 | 0.005 | 45.7 | 0.928 | 170.2 |
| 700 | 0.957 | 159.9 | 0.559 | 3.7 | 0.007 | 53.5 | 0.933 | 168.4 |
| 750 | 0.962 | 158.2 | 0.495 | 1.3 | 0.007 | 58.4 | 0.936 | 166.6 |
| 800 | 0.963 | 156.5 | 0.449 | -0.5 | 0.008 | 61.6 | 0.943 | 164.8 |
| 850 | 0.963 | 154.8 | 0.407 | -3.8 | 0.009 | 60.7 | 0.947 | 163.3 |
| 900 | 0.963 | 153.2 | 0.366 | -5.2 | 0.011 | 61.5 | 0.947 | 161.7 |
| 950 | 0.962 | 151.6 | 0.337 | -6.6 | 0.011 | 63.1 | 0.953 | 159.9 |
| 1000 | 0.964 | 150.1 | 0.315 | -9.9 | 0.013 | 65.6 | 0.955 | 158.7 |
| 1100 | 0.966 | 146.9 | 0.275 | -12.1 | 0.015 | 62.3 | 0.958 | 155.5 |



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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.