

< C band internally matched power GaAs FET >

MGFC47A4450

4.4 – 5.0 GHz BAND / 50W

DESCRIPTION

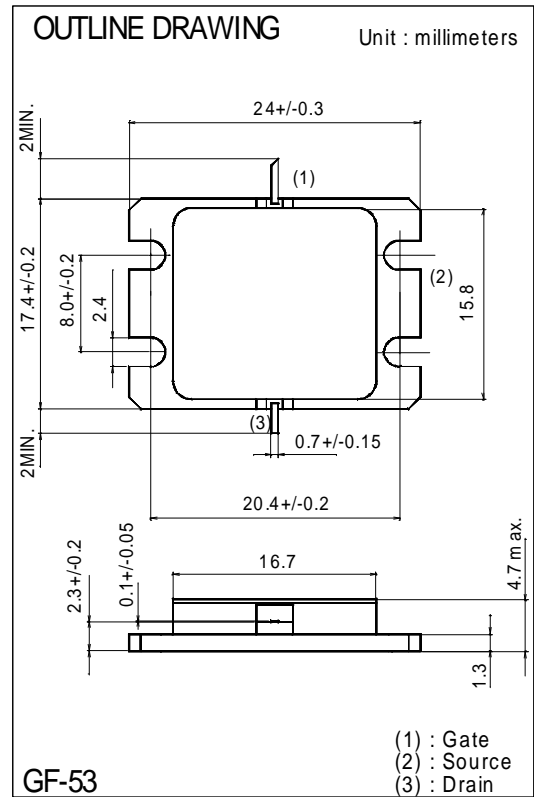
The MGFC47A4450 is an internally impedance-matched GaAs power FET especially designed for use in 4.4 – 5.0 GHz band amplifiers. The hermetically sealed metal-ceramic package guarantees high reliability.

FEATURES

- Class AB operation
- Internally matched to 50(ohm) system
- High output power
P1dB=50W (TYP.) @f=4.4 – 5.0GHz
- High power gain
GLP=10.5dB (TYP.) @f=4.4 – 5.0GHz
- High power added efficiency
PAE=40% (TYP.) @f=4.4 – 5.0GHz

APPLICATION

- Radio Link



RECOMMENDED BIAS CONDITIONS

- VDS=10V • ID=9.8A • RG=10ohm

Absolute maximum ratings (Ta=25°C)

| Symbol | Parameter | Ratings | Unit |
|--------|----------------------------------|-------------|------|
| VGDO | Gate to drain breakdown voltage | -20 | V |
| VGSO | Gate to source breakdown voltage | -10 | V |
| IGR | Reverse gate current | -130 | mA |
| IGF | Forward gate current | 168 | mA |
| PT *1 | Total power dissipation | 166 | W |
| Tch | Channel temperature | 175 | °C |
| Tstg | Storage temperature | -65 to +175 | °C |

*1 : Tc=25°C

Electrical characteristics (Ta=25°C)

| Symbol | Parameter | Test conditions | Limits | | | Unit |
|--------------|--------------------------------------|--------------------------|--------|------|------|------|
| | | | Min. | Typ. | Max. | |
| VGS(off) | Gate to source cut-off voltage | VDS=3V, ID=168mA | -1 | - | -4 | V |
| P1dB | Output power at 1dB gain compression | VDS=10V, ID(RF off)=9.8A | 46 | 47 | - | dBm |
| GLP | Linear Power Gain | f=4.4 – 5.0GHz | 9.5 | 10.5 | - | dB |
| ID | Drain current | | - | 11 | - | A |
| PAE | Power added efficiency | | - | 40 | - | % |
| Rth(ch-c) *2 | Thermal resistance | delta Vf method | - | 0.8 | 0.9 | °C/W |

*2 : Channel-case

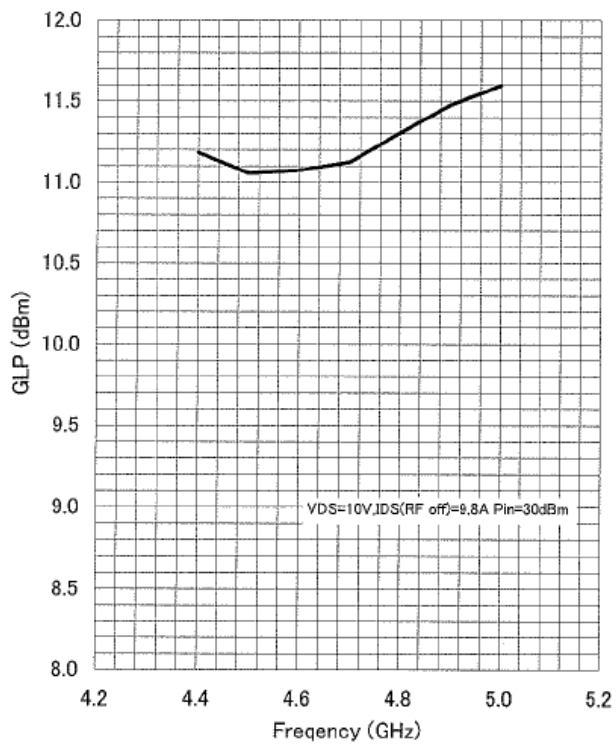
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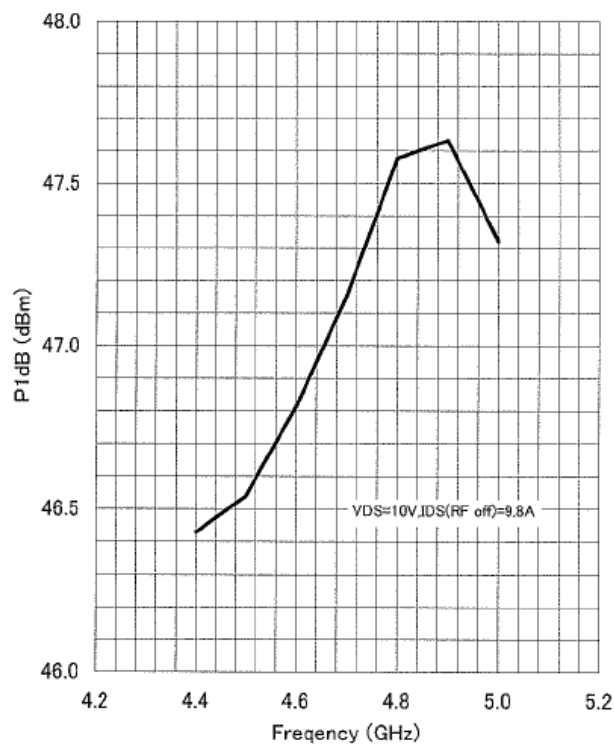
4.4 – 5.0 GHz BAND / 50W

MGFC47A4450 TYPICAL CHARACTERISTICS

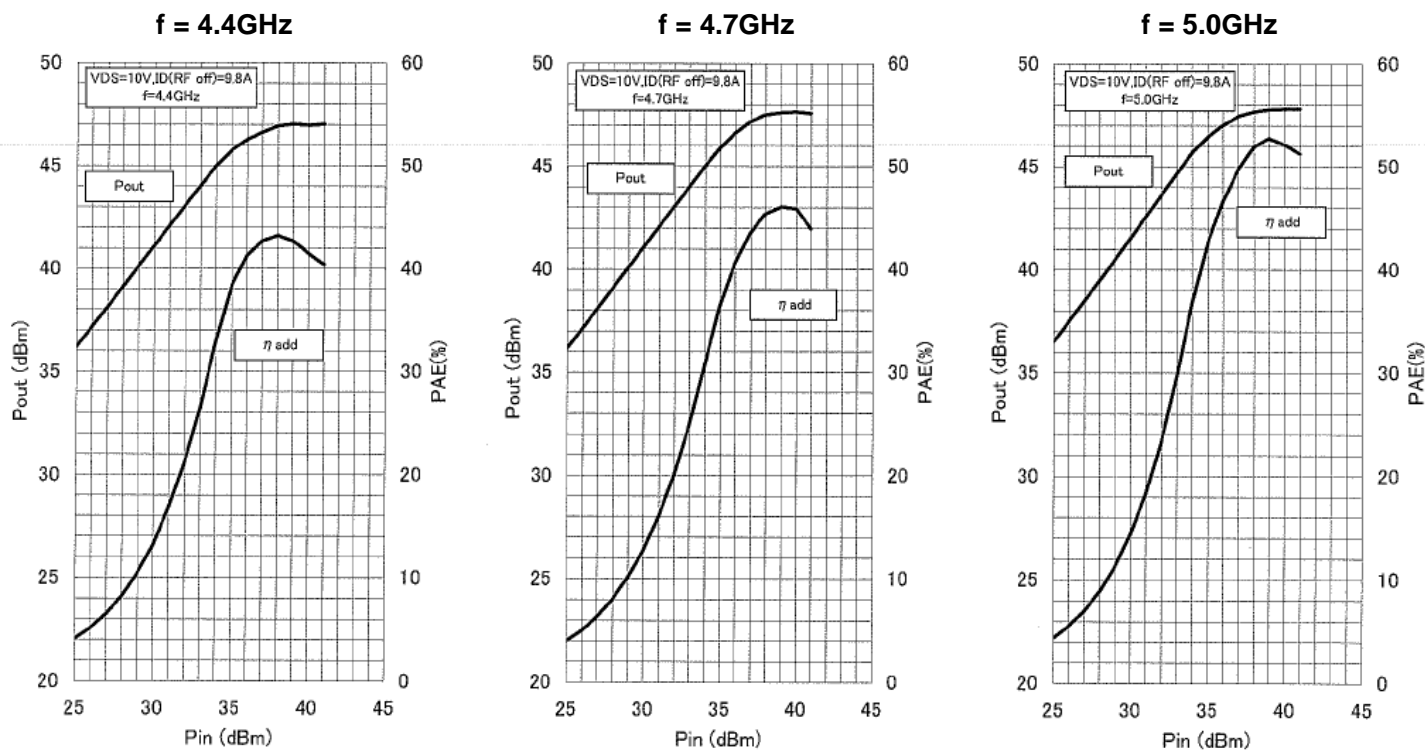
GLP vs. f



P1dB vs. f



Pout , PAE vs. Pin



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4.4 – 5.0 GHz BAND / 50W

MGFC47A4450 S-parameters(Ta=25deg.C , VDS=10(V),IDS=8(A))

| f (GHz) | S Parameters(TYP.) | | | | | | | |
|------------|--------------------|-----------|-------|-------|-------|-------|-------|--------|
| | S11 | | S21 | | S12 | | S22 | |
| | MAG. | ANG(deg.) | [MAG] | [ANG] | [MAG] | [ANG] | [MAG] | [ANG] |
| 4.20 | 0.776 | 24.3 | 2.862 | 177.9 | 0.034 | 126.1 | 0.269 | 57.6 |
| 4.25 | 0.745 | 14.8 | 3.067 | 168.4 | 0.039 | 113.5 | 0.234 | 47.0 |
| 4.30 | 0.707 | 3.9 | 3.276 | 158.5 | 0.044 | 102.5 | 0.199 | 36.2 |
| 4.35 | 0.663 | -7.9 | 3.475 | 148.0 | 0.049 | 90.3 | 0.166 | 21.3 |
| 4.40 | 0.615 | -21.0 | 3.654 | 137.2 | 0.055 | 78.5 | 0.130 | 3.7 |
| 4.45 | 0.567 | -35.2 | 3.836 | 126.1 | 0.060 | 66.1 | 0.103 | -20.4 |
| 4.50 | 0.513 | -51.0 | 3.971 | 114.6 | 0.065 | 54.5 | 0.086 | -49.2 |
| 4.55 | 0.465 | -68.2 | 4.092 | 102.9 | 0.070 | 42.4 | 0.080 | -83.3 |
| 4.60 | 0.421 | -87.1 | 4.162 | 91.1 | 0.074 | 30.3 | 0.086 | -114.7 |
| 4.65 | 0.381 | -107.9 | 4.190 | 79.1 | 0.077 | 18.1 | 0.099 | -143.6 |
| 4.70 | 0.354 | -130.1 | 4.178 | 67.2 | 0.081 | 6.9 | 0.117 | -166.6 |
| 4.75 | 0.334 | -153.4 | 4.126 | 55.5 | 0.082 | -4.8 | 0.136 | 172.9 |
| 4.80 | 0.327 | -176.8 | 4.033 | 43.7 | 0.084 | -15.6 | 0.156 | 155.5 |
| 4.85 | 0.331 | 160.4 | 3.921 | 32.5 | 0.085 | -26.5 | 0.178 | 138.1 |
| 4.90 | 0.341 | 139.1 | 3.784 | 21.4 | 0.086 | -37.4 | 0.204 | 122.1 |
| 4.95 | 0.360 | 120.3 | 3.643 | 10.7 | 0.086 | -48.3 | 0.231 | 107.3 |
| 5.00 | 0.394 | 103.0 | 3.514 | 0.2 | 0.086 | -58.6 | 0.262 | 93.9 |
| 5.05 | 0.436 | 86.8 | 3.366 | -10.6 | 0.085 | -68.9 | 0.295 | 80.8 |
| 5.10 | 0.482 | 71.3 | 3.204 | -21.4 | 0.083 | -79.5 | 0.333 | 68.9 |
| 5.15 | 0.526 | 56.9 | 3.026 | -32.0 | 0.080 | -89.8 | 0.369 | 57.6 |
| 5.20 | 0.571 | 43.7 | 2.844 | -42.4 | 0.078 | -99.9 | 0.412 | 47.2 |

This S-Parameter data show measurements performed on each single-ended FET

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