

FLM1414-8F

Internally Matched Power GaAs FET

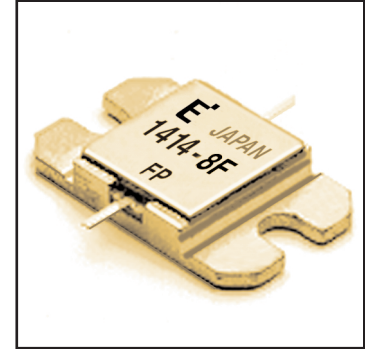
FEATURES

- High Output Power: $P_{1dB} = 39.0\text{dBm}$ (Typ.)
- High Gain: $G_{1dB} = 6.0\text{dB}$ (Typ.)
- High PAE: $\eta_{add} = 27\%$ (Typ.)
- Low $IM_3 = -46\text{dBc}@P_o = 28.5\text{dBm}$ (Typ.)
- Broad Band: 14.0 ~ 14.5GHz
- Impedance Matched $Z_{in}/Z_{out} = 50\Omega$
- Hermetically Sealed

DESCRIPTION

The FLM1414-8F is a power GaAs FET that is internally matched for standard communication bands to provide optimum power and gain in a 50 ohm system.

Eudyna's stringent Quality Assurance Program assures the highest reliability and consistent performance.



ABSOLUTE MAXIMUM RATING (Ambient Temperature $T_a=25^\circ\text{C}$)

| Item | Symbol | Condition | Rating | Unit |
|-------------------------|-----------|--------------------------|-------------|------------------|
| Drain-Source Voltage | V_{DS} | | 15 | V |
| Gate-Source Voltage | V_{GS} | | -5 | V |
| Total Power Dissipation | P_T | $T_c = 25^\circ\text{C}$ | 42.8 | W |
| Storage Temperature | T_{stg} | | -65 to +175 | $^\circ\text{C}$ |
| Channel Temperature | T_{ch} | | 175 | $^\circ\text{C}$ |

Fujitsu recommends the following conditions for the reliable operation of GaAs FETs:

1. The drain-source operating voltage (V_{DS}) should not exceed 10 volts.
2. The forward and reverse gate currents should not exceed 32.0 and -4.4 mA respectively with gate resistance of 100 Ω .

ELECTRICAL CHARACTERISTICS (Ambient Temperature $T_a=25^\circ\text{C}$)

| Item | Symbol | Test Conditions | Limit | | | Unit |
|--------------------------------------|-----------------|--|-------|------|-----------|--------------------|
| | | | Min. | Typ. | Max. | |
| Saturated Drain Current | I_{DSS} | $V_{DS} = 5\text{V}, V_{GS} = 0\text{V}$ | - | 3400 | 5200 | mA |
| Transconductance | g_m | $V_{DS} = 5\text{V}, I_{DS} = 2200\text{mA}$ | - | 3400 | - | mS |
| Pinch-off Voltage | V_p | $V_{DS} = 5\text{V}, I_{DS} = 170\text{mA}$ | -0.5 | -1.5 | -3.0 | V |
| Gate Source Breakdown Voltage | V_{GSO} | $I_{GS} = -170\mu\text{A}$ | -5.0 | - | - | V |
| Output Power at 1dB G.C.P. | P_{1dB} | $V_{DS} = 10\text{V}$ $f = 14.0 \sim 14.5 \text{GHz}$ $I_{DS} = 0.65 I_{DSS}(\text{Typ.})$ $Z_S = Z_L = 50\Omega$ | 38.5 | 39.0 | - | dBm |
| Power Gain at 1dB G.C.P. | G_{1dB} | | 5.0 | 6.0 | - | dB |
| Drain Current | I_{dsr} | | - | 2200 | 2600 | mA |
| Power-Added Efficiency | η_{add} | | - | 27 | - | % |
| Gain Flatness | ΔG | | - | - | ± 0.6 | dB |
| 3rd Order Intermodulation Distortion | IM_3 | $f = 14.5\text{GHz}, \Delta f = 10\text{MHz}$ 2-Tone Test $P_{out} = 28.5\text{dBm S.C.L.}$ | -44 | -46 | - | dBc |
| Thermal Resistance | R_{th} | Channel to Case | - | 3.0 | 3.5 | $^\circ\text{C/W}$ |
| Channel Temperature Rise | ΔT_{ch} | $10\text{V} \times I_{dsr} \times R_{th}$ | - | - | 80 | $^\circ\text{C}$ |

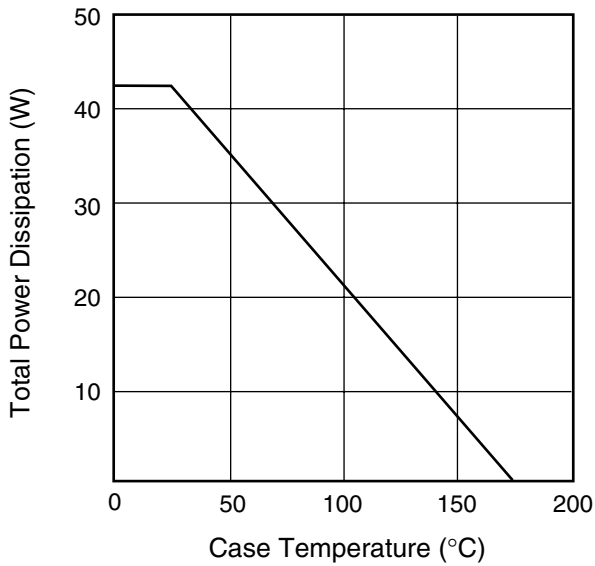
CASE STYLE: IA

G.C.P.: Gain Compression Point, S.C.L.: Single Carrier Level

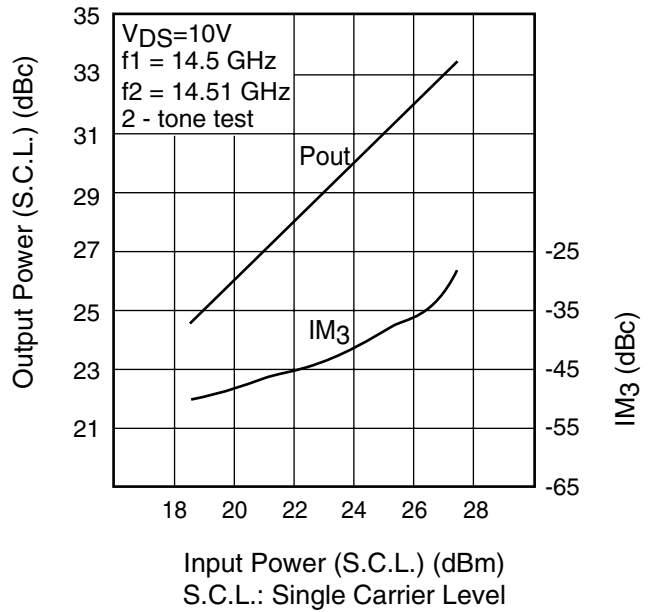
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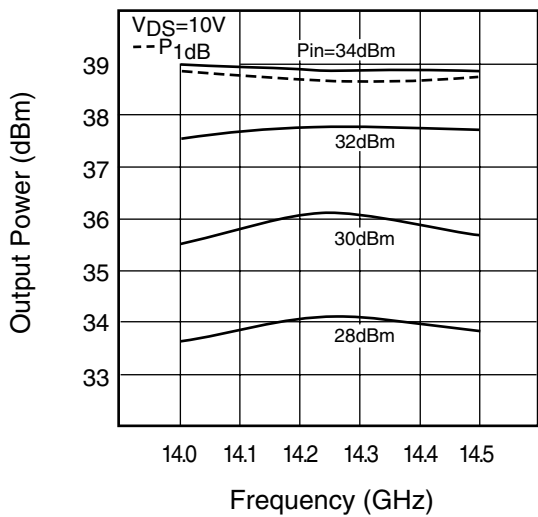
POWER DERATING CURVE



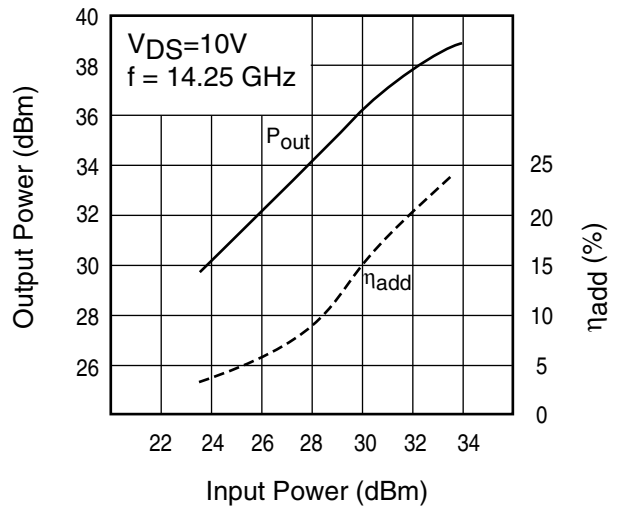
OUTPUT POWER & IM₃ vs. INPUT POWER



OUTPUT POWER vs. FREQUENCY

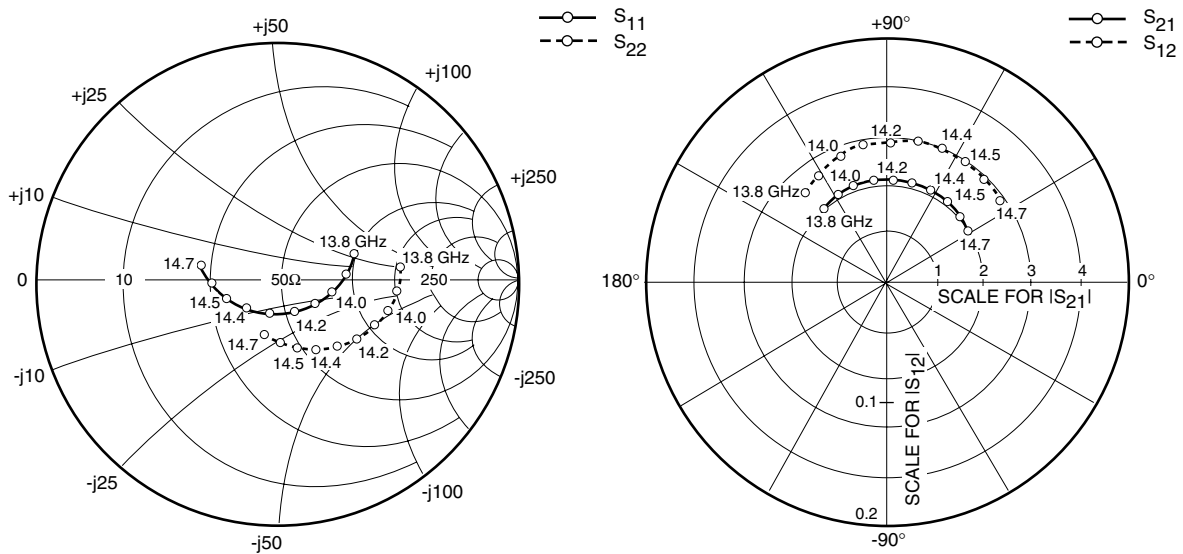


OUTPUT POWER vs. INPUT POWER



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S-PARAMETERS

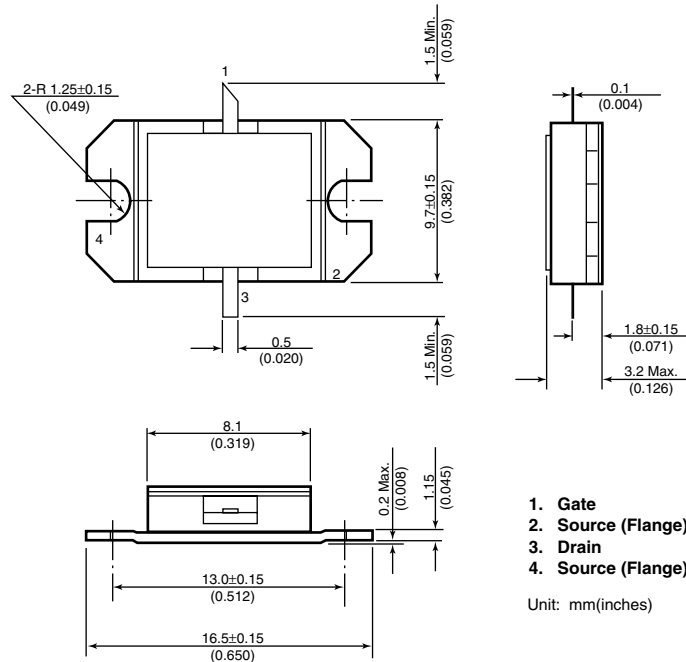
$V_{DS} = 10V, I_{DS} = 2200mA$

| FREQUENCY (MHZ) | S11 | | S21 | | S12 | | S22 | |
|--------------------|------|--------|-------|-------|------|-------|------|--------|
| | MAG | ANG | MAG | ANG | MAG | ANG | MAG | ANG |
| 13800 | .337 | 18.1 | 2.004 | 130.1 | .100 | 132.0 | .513 | 4.9 |
| 13900 | .284 | 4.4 | 2.044 | 119.3 | .104 | 121.3 | .497 | -5.7 |
| 14000 | .231 | -12.4 | 2.081 | 108.6 | .110 | 109.7 | .474 | -16.3 |
| 14100 | .182 | -33.2 | 2.103 | 97.6 | .114 | 99.8 | .444 | -26.7 |
| 14200 | .147 | -64.5 | 2.116 | 86.4 | .114 | 88.6 | .413 | -37.7 |
| 14300 | .144 | -103.7 | 2.115 | 75.1 | .119 | 77.3 | .373 | -49.0 |
| 14400 | .172 | -137.1 | 2.097 | 63.7 | .119 | 67.5 | .338 | -60.8 |
| 14500 | .221 | -160.1 | 2.067 | 52.4 | .118 | 56.1 | .300 | -74.0 |
| 14600 | .272 | -176.7 | 2.017 | 41.3 | .116 | 45.9 | .264 | -88.6 |
| 14700 | .323 | 170.6 | 1.949 | 30.3 | .115 | 35.6 | .237 | -105.3 |

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Case Style "IA" Metal-Ceramic Hermetic Package



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CAUTION

Eudyna Devices Inc. products contain **gallium arsenide (GaAs)** which can be hazardous to the human body and the environment. For safety, observe the following procedures:

- Do not put this product into the mouth.
- Do not alter the form of this product into a gas, powder, or liquid through burning, crushing, or chemical processing as these by-products are dangerous to the human body if inhaled, ingested, or swallowed.
- Observe government laws and company regulations when discarding this product. This product must be discarded in accordance with methods specified by applicable hazardous waste procedures.

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