

FLM1414-15F

X,Ku-Band Internally Matched FET

FEATURES

- High Output Power: P1dB=42.0dBm(Typ.)
- High Gain: G1dB=6.0dB(Typ.)
- High PAE: η_{add} =26%(Typ.)
- Broad Band: 14.0~14.5GHz
- Impedance Matched Zin/Zout = 50 Ω
- Hermetically Sealed Package



DESCRIPTION

The FLM1414-15F is a power GaAs FET that is internally matched for standard communication bands to provide optimum power and gain in a 50 Ω system.

ABSOLUTE MAXIMUM RATINGS (Case Temperature Tc=25°C)

| Item | Symbol | Rating | Unit |
|-------------------------|------------------|-------------|------|
| Drain-Source Voltage | V _{DS} | 15 | V |
| Gate-Source Voltage | V _{GS} | -5 | V |
| Total Power Dissipation | PT | 75 | W |
| Storage Temperature | T _{stg} | -65 to +175 | °C |
| Channel Temperature | T _{ch} | 175 | °C |

RECOMMENDED OPERATING CONDITION(Case Temperature Tc=25°C)

| Item | Symbol | Condition | Limit | Unit |
|----------------------|-----------------|-----------------------------|-------------|------|
| DC Input Voltage | V _{DS} | | ≤ 10 | V |
| Forward Gate Current | I _{GF} | R _G =50 Ω | ≤ 48 | mA |
| Reverse Gate Current | I _{GR} | R _G =50 Ω | ≥ -6.6 | mA |

ELECTRICAL CHARACTERISTICS (Case Temperature Tc=25°C)

| Item | Symbol | Test Conditions | Limit | | | Unit |
|--------------------------------------|------------------|--|---|-------|-------|-------|
| | | | Min. | Typ. | Max. | |
| Drain Current | I _{DSS} | V _{DS} =5V, V _{GS} =0V | - | 7.2 | 10.0 | A |
| Transconductance | g _m | V _{DS} =5V, I _{DS} =3600mA | - | 6700 | - | mS |
| Pinch-off Voltage | V _P | V _{DS} =5V, I _{DS} =300mA | -0.5 | -1.5 | -3.0 | V |
| Gate-Source Breakdown Voltage | V _{GSO} | I _{GS} =-340 μ A | -5.0 | - | - | V |
| Output Power at 1dB G.C.P. | P _{1dB} | V _{DS} =10V f=14.0 - 14.5 GHz I _{DS} =0.6I _{DSS} (typ) Z _S =Z _L =50 Ω | 41.5 | 42.0 | - | dBm |
| Power Gain at 1dB G.C.P. | G _{1dB} | | 5.0 | 6.0 | - | dB |
| Drain Current | I _{DSR} | | - | 4200 | 5000 | mA |
| Power-added Efficiency | η_{add} | | - | 26 | - | % |
| Gain Flatness | ΔG | | - | - | 1.2 | dB |
| 3rd Order Intermodulation Distortion | IM ₃ | | f=14.5 GHz Δf =10MHz, 2-Tone Test P _{out} =30.0dBm(S.C.L.) | -42.0 | -45.0 | - |
| Thermal Resistance | R _{th} | Channel to Case | - | 1.8 | 2.0 | °C /W |
| Channel Temperature Rise | ΔT_{ch} | 10V x I _{DSR} X R _{th} | - | - | 80 | °C |

CASE STYLE: IB

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

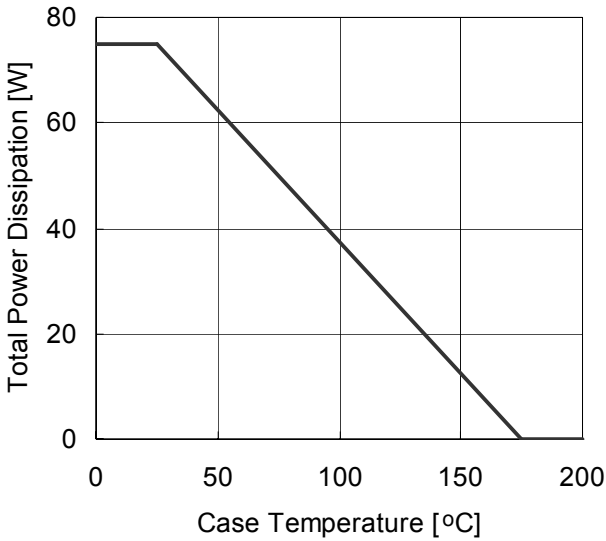
| | | |
|-----|-----------|--------|
| ESD | Class III | 2000V~ |
|-----|-----------|--------|

Note : Based on EIAJ ED-4701 C-111A(C=100pF, R=1.5k Ω)

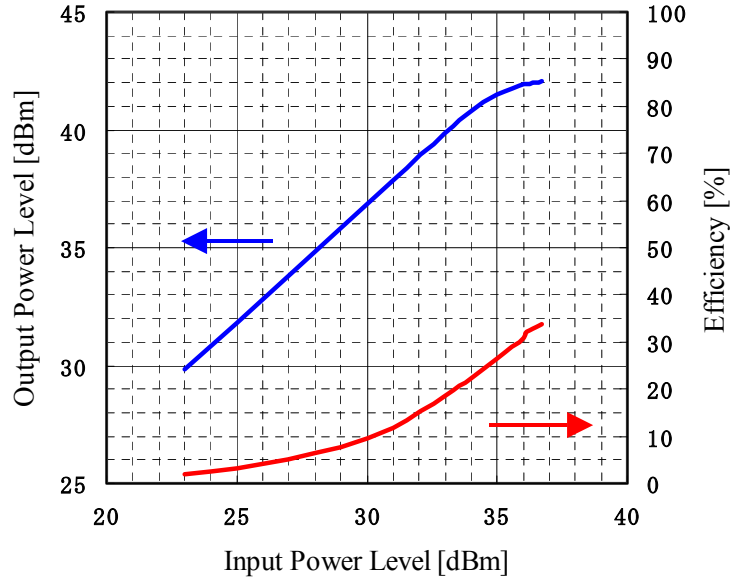
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POWER DERATING CURVE

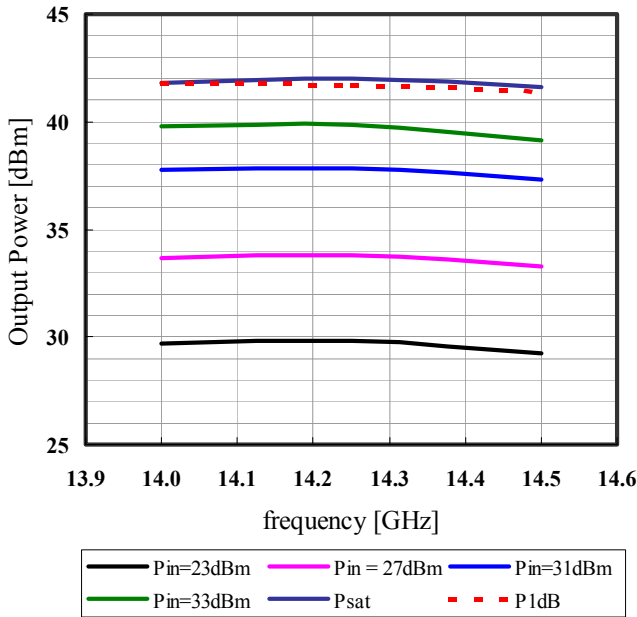


OUTPUT POWER , EFFICIENCY vs. INPUT POWER



OUTPUT POWER vs. FREQUENCY

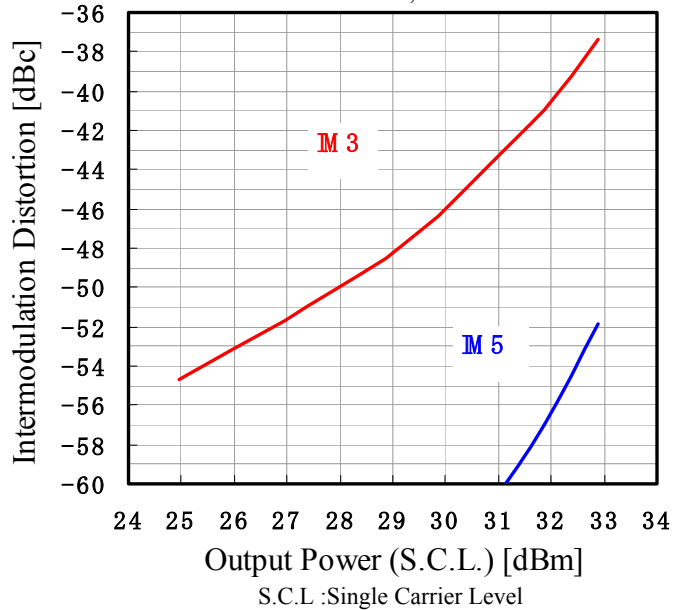
VDS=10V, IDS=0.65IDS



IMD vs OUTPUT POWER

VDS=10V, IDS=0.65IDS

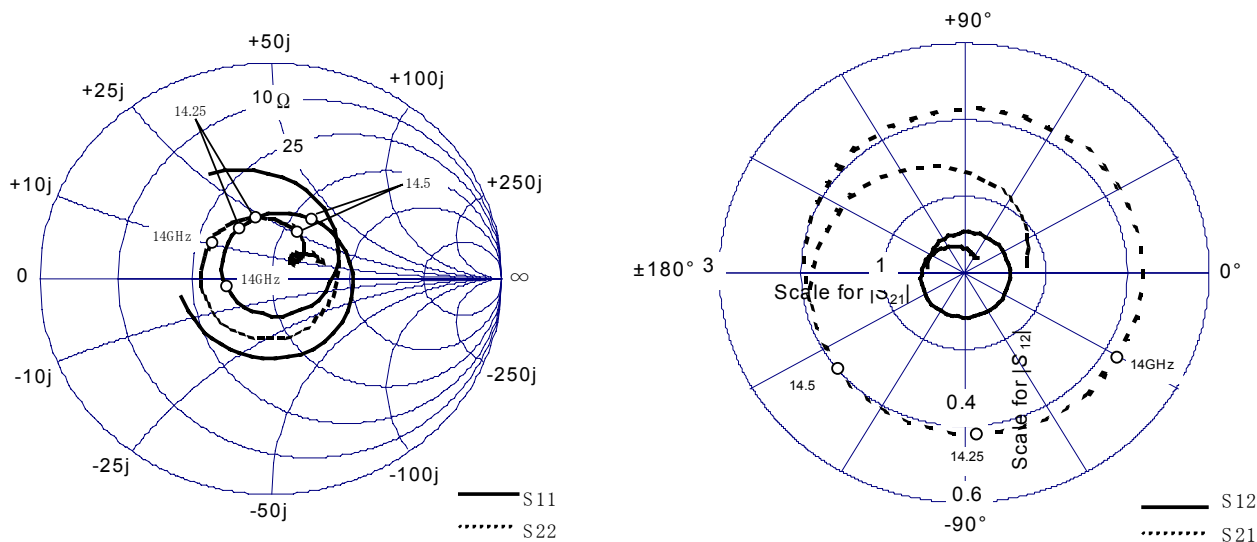
f1=14.50GHz, f2=14.51GHz



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S-PARAMETER



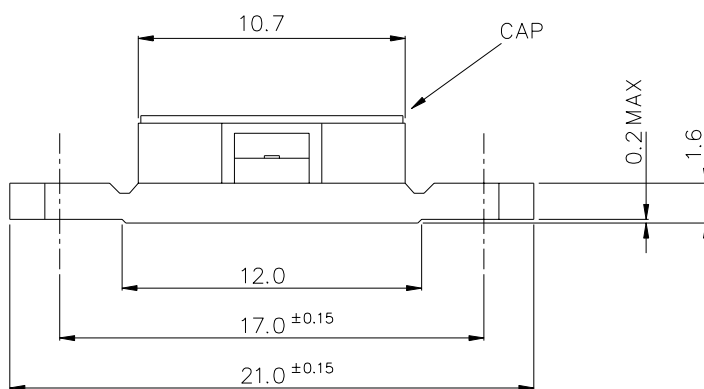
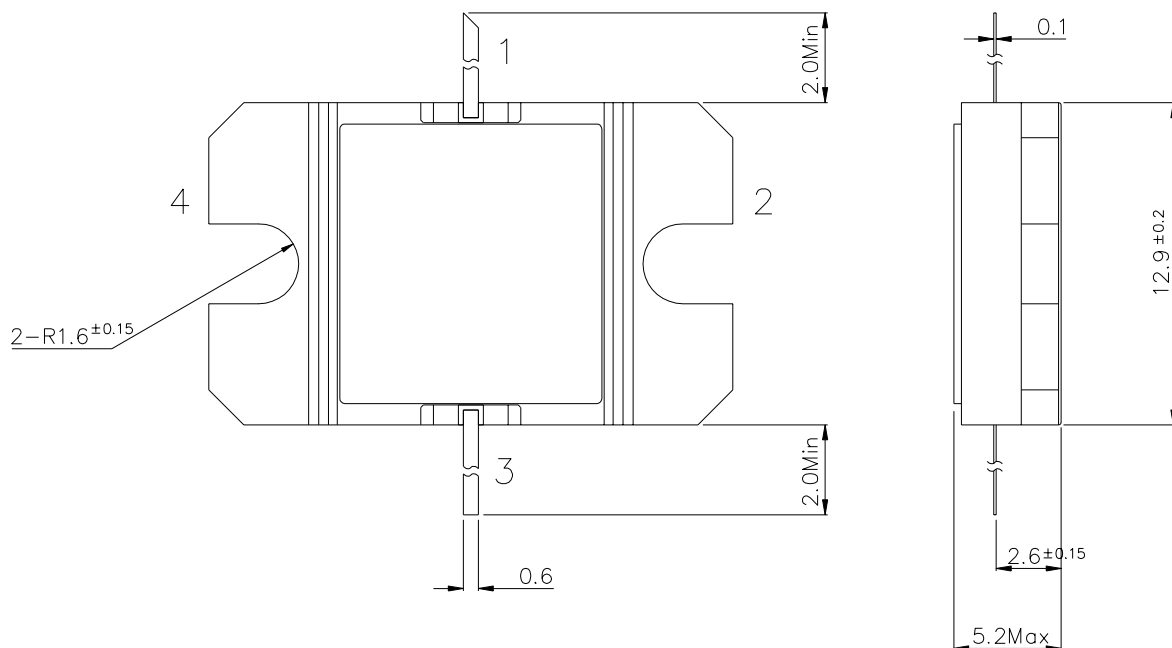
VDS=10V, IDS=4355mA

| Freq [GHz] | S11 | | S21 | | S12 | | S22 | |
|---------------|-------|----------|-------|----------|-------|----------|-------|----------|
| | MAG | ANG | MAG | ANG | MAG | ANG | MAG | ANG |
| 11.0 | 0.883 | 78.074 | 0.679 | -162.875 | 0.023 | 158.196 | 0.757 | 36.902 |
| 11.5 | 0.842 | 6.384 | 0.812 | 115.730 | 0.029 | 77.861 | 0.708 | -38.816 |
| 12.0 | 0.805 | -68.624 | 1.046 | 32.823 | 0.040 | -0.870 | 0.612 | -118.143 |
| 12.5 | 0.729 | -155.313 | 1.503 | -65.968 | 0.064 | -91.628 | 0.455 | 143.005 |
| 13.0 | 0.553 | 118.032 | 1.922 | -168.885 | 0.092 | 170.080 | 0.308 | 23.310 |
| 13.5 | 0.301 | 14.254 | 2.153 | 84.943 | 0.108 | 68.684 | 0.285 | -105.214 |
| 14.0 | 0.193 | -169.602 | 2.182 | -30.677 | 0.114 | -35.708 | 0.308 | 146.159 |
| 14.5 | 0.330 | 57.246 | 1.987 | -141.198 | 0.113 | -134.062 | 0.243 | 62.332 |
| 15.0 | 0.373 | -69.708 | 1.440 | 104.525 | 0.082 | 126.406 | 0.118 | 45.259 |
| 15.5 | 0.400 | -173.403 | 0.733 | 2.596 | 0.045 | 48.953 | 0.247 | 10.815 |
| 16.0 | 0.529 | 119.056 | 0.486 | -75.751 | 0.034 | -13.903 | 0.293 | -37.756 |

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CASE STYLE: IB



PIN ASSIGNMENT

- 1 : GATE
- 2 : SOURCE
- 3 : DRAIN
- 4 : SOURCE

Unit : mm

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