# EIC1314-2

## 13.75-14.50 GHz 2-Watt Internally-Matched Power FET

Issued Date: 01-21-04

### FEATURES

- **13.75-14.50 GHz Bandwidth**
- **Input/Output Impedance Matched to 50 Ohms**
- **+33.5 dBm Output Power at 1dB Compression**
- **6.5 dB Power Gain at 1dB Compression**
- **30% Power Added Efficiency**
- **-42 dBc IM3 at Po = 22.5 dBm SCL**
- **Hermetic Metal Flange Package**
- **100% Tested for DC, RF, and $R_{TH}$**


**Caution! ESD sensitive device.**

### DESCRIPTION

**The EIC1314-2 is a high power, highly linear, single stage MFET amplifier in a flange mount package. This amplifier features Excelics' unique PHEMT transistor technology.**

### ELECTRICAL CHARACTERISTICS ($T_a$ = 25°C)

| SYMBOL | PARAMETERS/TEST CONDITIONS[1] | MIN | TYP | MAX | UNITS |
|---|---|---|---|---|---|
| $P_{1dB}$ | Output Power at 1dB Compression f = 13.75-14.50GHz<br>$V_{DS}$ = 10 V, $I_{DSQ}$ = 550mA | 32.5 | 33.5 | | dBm |
| $G_{1dB}$ | Gain at 1dB Compression f = 13.75-14.50GHz<br>$V_{DS}$ = 10 V, $I_{DSQ}$ = 550mA | 5.5 | 6.5 | | dB |
| $\Delta G$ | Gain Flatness f = 13.75-14.50GHz<br>$V_{DS}$ = 10 V, $I_{DSQ}$ = 550mA | | | ±0.6 | dB |
| PAE | Power Added Efficiency at 1dB Compression<br>$V_{DS}$ = 10 V, $I_{DSQ}$ = 550mA f = 13.75-14.50GHz | | 30 | | % |
| $Id_{1dB}$ | Drain Current at 1dB Compression f = 13.75-14.50GHz | | 600 | 700 | mA |
| IM3 | Output 3rd Order Intermodulation Distortion<br>Δf = 10 MHz 2-Tone Test; Pout = 22.5 dBm S.C.L[2]<br>$V_{DS}$ = 10 V, $I_{DSQ}$ ≈ 65% IDSS f = 14.50GHz | -38 | -42 | | dBc |
| $I_{DSS}$ | Saturated Drain Current $V_{DS}$ = 3 V, $V_{GS}$ = 0 V | | 1040 | 1440 | mA |
| $V_P$ | Pinch-off Voltage $V_{DS}$ = 3 V, $I_{DS}$ = 10 mA | | -2.5 | -4.0 | V |
| $R_{TH}$ | Thermal Resistance[3] | | 11 | 12 | °C/W |

Notes:
1. Tested with 100 Ohm gate resistor.
2. S.C.L. = Single Carrier Level.
3. Overall Rth depends on case mounting.

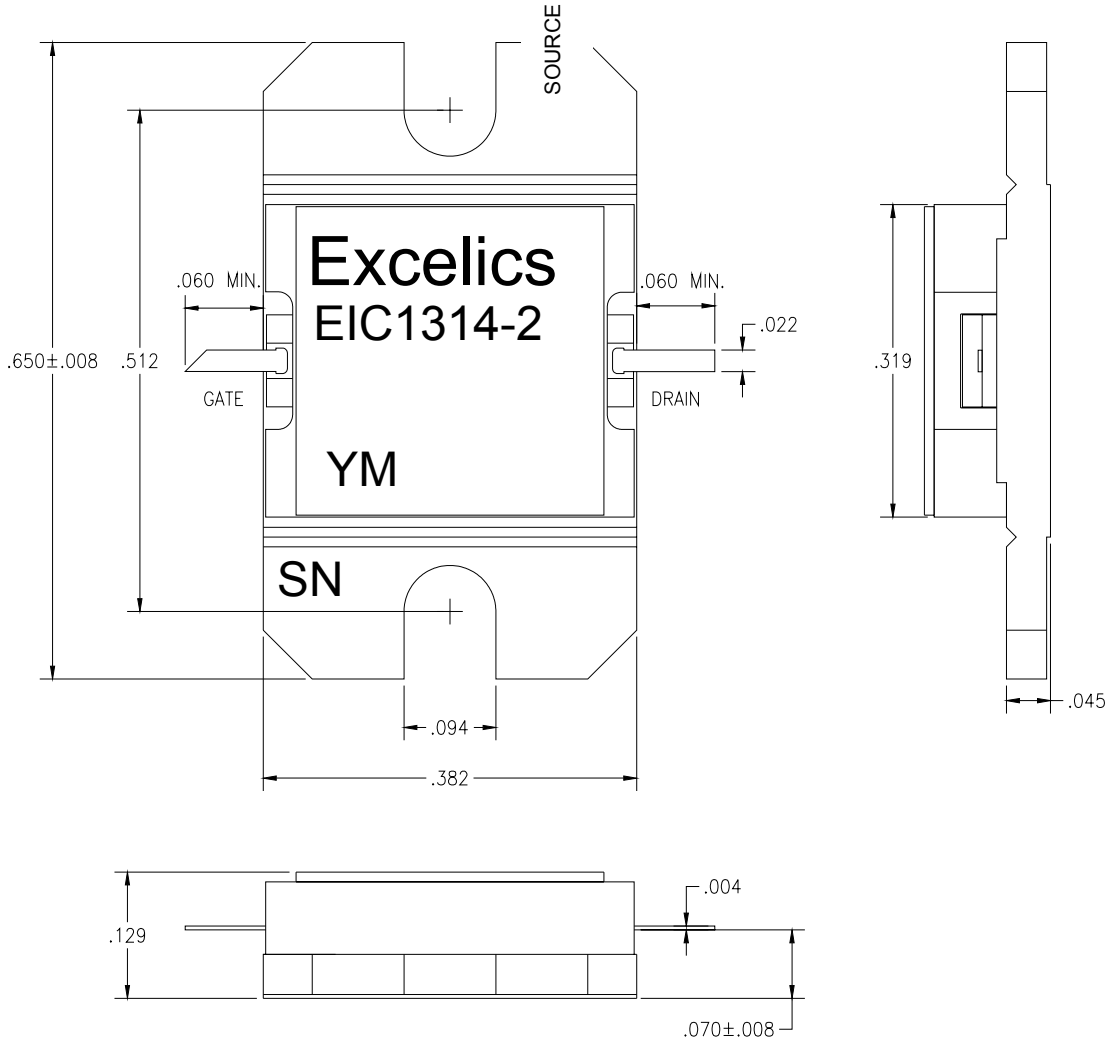
## ABSOLUTE MAXIMUM RATINGS FOR CONTINUOUS OPERATION[1,2]

| SYMBOL | CHARACTERISTIC | VALUE |
|---|---|---|
| $V_{DS}$ | Drain to Source Voltage | 10 V |
| $V_{GS}$ | Gate to Source Voltage | -4.5 V |
| $I_{DS}$ | Drain Current | IDSS |
| $I_{GSF}$ | Forward Gate Current | 20 mA |
| $P_{IN}$ | Input Power | @ 3dB compression |
| $P_T$ | Total Power Dissipation | 10 W |
| $T_{CH}$ | Channel Temperature | 150°C |
| $T_{STG}$ | Storage Temperature | -65/+150°C |

Notes:
1. Operating the device beyond any of the above ratings may result in permanent damage or reduction of MTTF.
2. Bias conditions must also satisfy the following equation $P_T < (T_{CH} - T_{PKG})/R_{TH}$; where $T_{PKG}$ = temperature of package, and $P_T = (V_{DS} * I_{DS}) - (P_{OUT} - P_{IN})$.

## PACKAGE OUTLINE

Dimensions in inches, Tolerance ± .005 unless otherwise specified




## ORDERING INFORMATION

| Part Number | Grade[1] | $f_{Test}$ (GHz) | $P_{1dB}$ (min) | $IM_3$ (min)[2] |
|---|---|---|---|---|
| EIC1314-2 | Industrial | 13.75-14.50 GHz | 32.5 | -38.0 |

Notes: 1. Contact factory for military and hi-rel grades.
2. Exact test conditions are specified in "Electrical Characteristics" table.