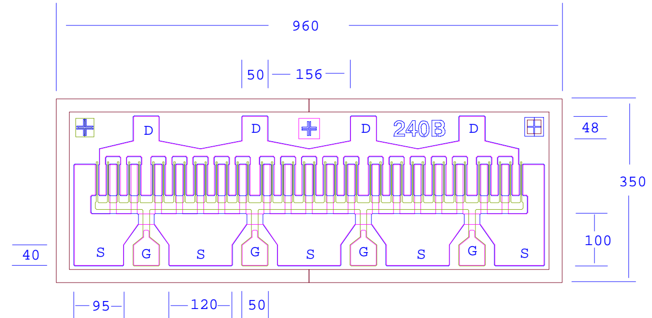
# Excelics EFC240B

## PRELIMINARY DATA SHEET

### Low Distortion GaAs Power FET

- +31.0dBm TYPICAL OUTPUT POWER
- 8.5dB TYPICAL POWER GAIN AT 12GHz
- HIGH BVgd FOR 10V BIAS
- 0.3 X 2400 MICRON RECESSED "MUSHROOM" GATE
- $Si_3N_4$ PASSIVATION
- ADVANCED EPITAXIAL DOPING PROFILE PROVIDES HIGH POWER EFFICIENCY, LINEARITY AND RELIABILITY
- Idss SORTED IN 40mA PER BIN RANGE




Chip Thickness: 75 ± 13 microns
All Dimensions In Microns

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

| SYMBOLS | PARAMETERS/TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|
| $P_{1dB}$ | Output Power at 1dB Compression f=12GHz<br>Vds=10V, Ids=50% Idss f=18GHz | 29.0 | 31.0<br>31.0 | | dBm |
| $G_{1dB}$ | Gain at 1dB Compression f=12GHz<br>Vds=10V, Ids=50% Idss f=18GHz | 7.0 | 8.5<br>6.0 | | dB |
| PAE | Power Added Efficiency at 1dB compression<br>Vds=10V, Ids=50% Idss f=12GHz | | 33 | | % |
| Idss | Saturated Drain Current Vds=3V, Vgs=0V | 320 | 520 | 720 | mA |
| Gm | Transconductance Vds=3V, Vgs=0V | 200 | 280 | | mS |
| Vp | Pinch-off Voltage Vds=3V, Ids=6mA | | -2.5 | -4.0 | V |
| BVgd | Drain Breakdown Voltage Igd=2.4mA | -15 | -20 | | V |
| BVgs | Source Breakdown Voltage Igs=2.4mA | -10 | -17 | | V |
| Rth | Thermal Resistance (Au-Sn Eutectic Attach) | | 20 | | °C/W |

## MAXIMUM RATINGS AT 25°C

| SYMBOLS | PARAMETERS | ABSOLUTE[1] | CONTINUOUS[2] |
|---|---|---|---|
| Vds | Drain-Source Voltage | 14V | 10V |
| Vgs | Gate-Source Voltage | -8V | -4.5V |
| Ids | Drain Current | Idss | 570mA |
| Igsf | Forward Gate Current | 60mA | 10mA |
| Pin | Input Power | 29dBm | @ 3dB Compression |
| Tch | Channel Temperature | 175°C | 150°C |
| Tstg | Storage Temperature | -65/175°C | -65/150°C |
| Pt | Total Power Dissipation | 6.8 W | 5.7 W |

Note: 1. Exceeding any of the above ratings may result in permanent damage.
2. Exceeding any of the above ratings may reduce MTTF below design goals.

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# EFC240B

PRELIMINARY DATA SHEET

## Low Distortion GaAs Power FET

### S-PARAMETERS

**10V, 1/2 Idss**

| Freq GHz | S11 Mag | S11 Ang | S21 Mag | S21 Ang | S12 Mag | S12 Ang | S22 Mag | S22 Ang |
|---|---|---|---|---|---|---|---|---|
| 1.000 | 0.944 | -86.7 | 7.064 | 130.8 | 0.041 | 41.9 | 0.296 | -132.9 |
| 2.000 | 0.915 | -125.9 | 4.551 | 104.6 | 0.052 | 22.7 | 0.374 | -146.8 |
| 3.000 | 0.907 | -144.8 | 3.217 | 89.3 | 0.055 | 13.2 | 0.409 | -152.2 |
| 4.000 | 0.907 | -155.6 | 2.450 | 78.1 | 0.054 | 6.7 | 0.433 | -154.1 |
| 5.000 | 0.912 | -161.6 | 1.929 | 69.0 | 0.052 | 2.7 | 0.460 | -157.6 |
| 6.000 | 0.911 | -166.1 | 1.596 | 60.9 | 0.050 | 0.1 | 0.487 | -158.3 |
| 7.000 | 0.920 | -169.0 | 1.362 | 54.1 | 0.049 | -2.2 | 0.512 | -159.2 |
| 8.000 | 0.915 | -171.1 | 1.181 | 47.7 | 0.047 | -3.4 | 0.549 | -161.0 |
| 9.000 | 0.919 | -173.3 | 1.040 | 41.7 | 0.045 | -4.5 | 0.586 | -161.9 |
| 10.000 | 0.922 | -176.1 | 0.922 | 35.7 | 0.041 | -5.2 | 0.620 | -162.0 |
| 11.000 | 0.925 | -179.2 | 0.826 | 30.0 | 0.041 | -6.2 | 0.647 | -162.2 |
| 12.000 | 0.932 | 178.8 | 0.747 | 24.7 | 0.039 | -7.5 | 0.673 | -163.2 |
| 13.000 | 0.933 | 177.0 | 0.681 | 19.1 | 0.037 | -7.5 | 0.690 | -165.6 |
| 14.000 | 0.939 | 175.4 | 0.622 | 13.8 | 0.035 | -7.7 | 0.716 | -168.5 |
| 15.000 | 0.941 | 172.9 | 0.569 | 8.5 | 0.035 | -7.0 | 0.739 | -170.1 |
| 16.000 | 0.945 | 170.6 | 0.522 | 3.0 | 0.035 | -6.4 | 0.752 | -172.8 |
| 17.000 | 0.946 | 169.7 | 0.483 | -2.1 | 0.035 | -7.5 | 0.764 | -177.3 |
| 18.000 | 0.952 | 170.3 | 0.452 | -7.0 | 0.034 | -6.2 | 0.776 | 176.4 |
| 19.000 | 0.955 | 170.4 | 0.421 | -12.7 | 0.034 | -6.5 | 0.791 | 169.8 |
| 20.000 | 0.955 | 168.7 | 0.387 | -18.0 | 0.035 | -3.8 | 0.813 | 164.9 |
| 21.000 | 0.954 | 160.5 | 0.359 | -23.1 | 0.034 | -5.3 | 0.835 | 168.3 |
| 22.000 | 0.948 | 158.1 | 0.327 | -26.7 | 0.035 | -2.1 | 0.847 | 166.2 |
| 23.000 | 0.958 | 157.0 | 0.303 | -30.7 | 0.035 | 0.6 | 0.870 | 163.7 |
| 24.000 | 0.956 | 156.1 | 0.275 | -33.9 | 0.036 | 2.9 | 0.876 | 162.1 |
| 25.000 | 0.961 | 155.3 | 0.251 | -36.4 | 0.038 | 7.7 | 0.887 | 160.5 |
| 26.000 | 0.954 | 153.5 | 0.232 | -39.0 | 0.036 | 10.4 | 0.897 | 160.1 |

**Note: The data included 0.7 mils diameter Au bonding wires: 4 gate wires, 15 mils each; 4 drain wires, 20 mils each; 10 source wires, 7 mils each.**

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