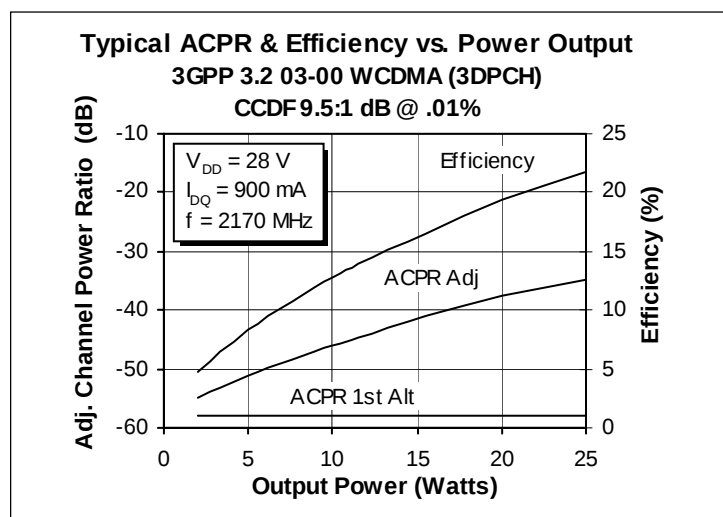


# GOLDMOS® Field Effect Transistor

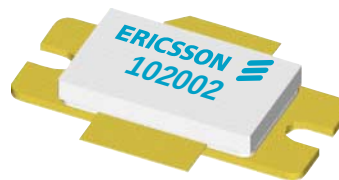
## 90 Watts, 2110-2170 MHz

### Description

The PTF 102002 is an internally matched 90-watt GOLDMOS FET intended for WCDMA applications from 2110 to 2170 MHz. This LDMOS device typically operates at 40% efficiency at P-1dB with a linear gain of 11.5 dB. Full gold metallization ensures excellent device lifetime and reliability.



- **Typical WCDMA Performance @ 2170 MHz**
  - 3GPP 3.2, 3 DPCH, CCDF 9.5:1 dB @ .01% Peak/Avg Ratio
  - Output Power = 11.5 Watts
  - Efficiency = 14%
  - Adjacent Channel Power =
    - 3.84 MHz: -45 dBc @ 5 MHz
    - 3.84 MHz: -58 dBc @ 10 MHz
    - 3.84 MHz: -62 dBc @ 15 MHz
- **CW Performance**
  - Minimum Output Power = 90 Watts
  - Linear Gain = 11.5 dB
  - Efficiency = 40% Typical at P-1dB
- Full Gold Metallization
- Excellent Thermal Stability
- Integrated ESD Protection
- Broadband Internal Matching



Package 20267

### Guaranteed Performance

#### Two-Tone Measurements

Unless otherwise indicated:  $V_{DD} = 28\text{ V}$ ,  $P_{OUT} = 45\text{ W}_{(AVG)}$ ,  $I_{DQ} = 900\text{ mA}$ ,  $f_C = 2.17\text{ GHz}$ , Tone Spacing = 0.1 MHz

| Characteristic             | Symbol   | Min  | Typ | Max | Units |
|----------------------------|----------|------|-----|-----|-------|
| Gain                       | $G_{ps}$ | 11.5 | —   | —   | dB    |
| Drain Efficiency           | $\eta_D$ | 30   | —   | —   | %     |
| Intermodulation Distortion | IMD      | —    | -30 | -27 | dBc   |

#### WCDMA Measurements

Unless otherwise indicated:  $V_{DD} = 28\text{ V}$ ,  $P_{OUT} = 11.5\text{ W}_{(AVG)}$ ,  $I_{DQ} = 900\text{ mA}$ ,  $f_C = 2.17\text{ GHz}$ , WCDMA 3GPP 3.2, 3 DPCH

| Characteristic               | Symbol   | Min  | Typ | Max | Units |
|------------------------------|----------|------|-----|-----|-------|
| Adjacent Channel Power Ratio | ACPR     | —    | -45 | -42 | dB    |
| Gain                         | $G_{ps}$ | 12.5 | —   | —   | dB    |
| Drain Efficiency             | $\eta_D$ | 14   | —   | —   | %     |

All published data at  $T_{CASE} = 25^\circ\text{C}$  unless otherwise indicated.

\* Note: Specification is preliminary and subject to change. Order this product or obtain additional information from your Ericsson Sales Representative.

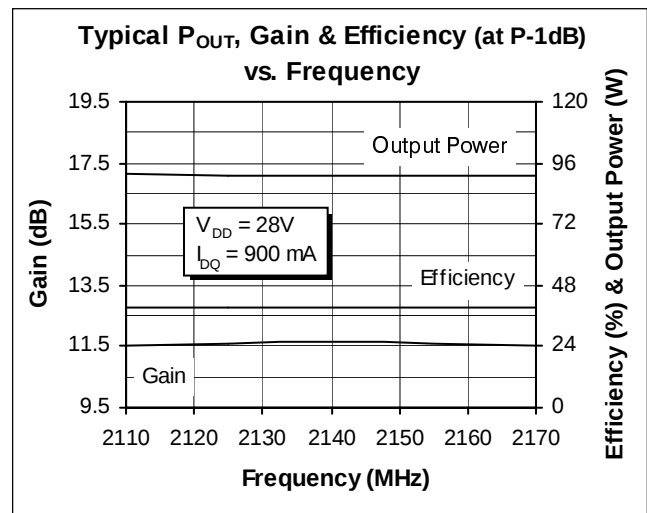
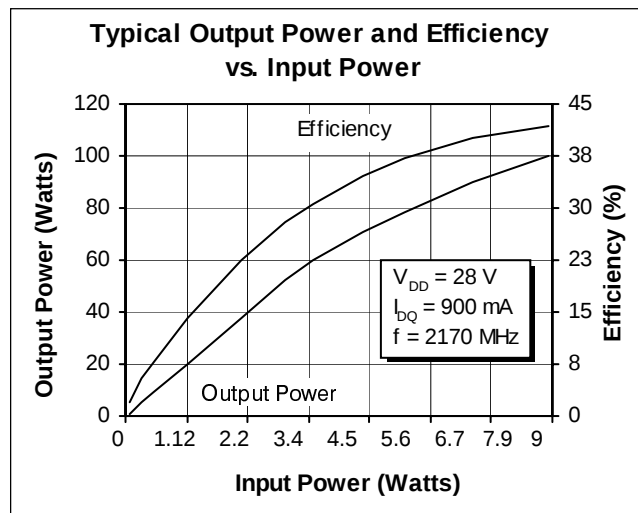
## Electrical Characteristics (100% Tested)

| Characteristic                 | Conditions                                     | Symbol        | Min | Typ | Max | Units         |
|--------------------------------|------------------------------------------------|---------------|-----|-----|-----|---------------|
| Drain-Source Breakdown Voltage | $V_{GS} = 0\text{ V}$ , $I_D = 25\text{ mA}$   | $V_{(BR)DSS}$ | 65  | —   | —   | Volts         |
| Drain-Source Leakage Current   | $V_{DS} = 28\text{ V}$ , $V_{GS} = 0\text{ V}$ | $I_{DSS}$     | —   | —   | 1.0 | $\mu\text{A}$ |
| Gate Threshold Voltage         | $V_{DS} = 10\text{ V}$ , $I_D = 100\text{ mA}$ | $V_{GS(th)}$  | 3.0 | —   | 5.0 | Volts         |
| On-State Resistance            | $V_{GS} = 10\text{ V}$ , $I_{DS} = 1\text{ A}$ | $R_{DS(on)}$  | —   | .1  | —   | Ohms          |

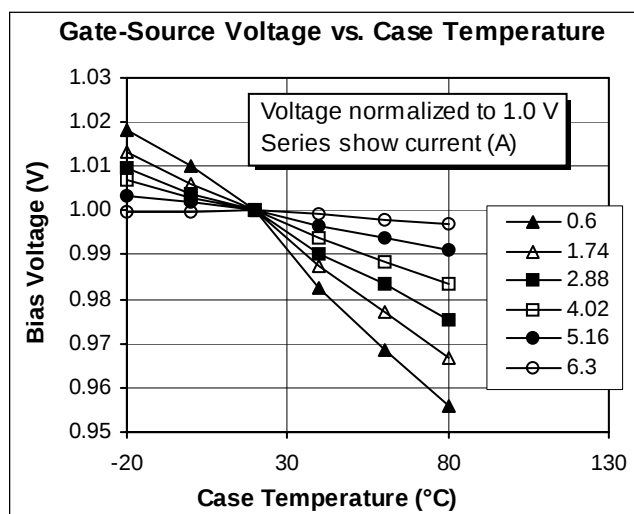
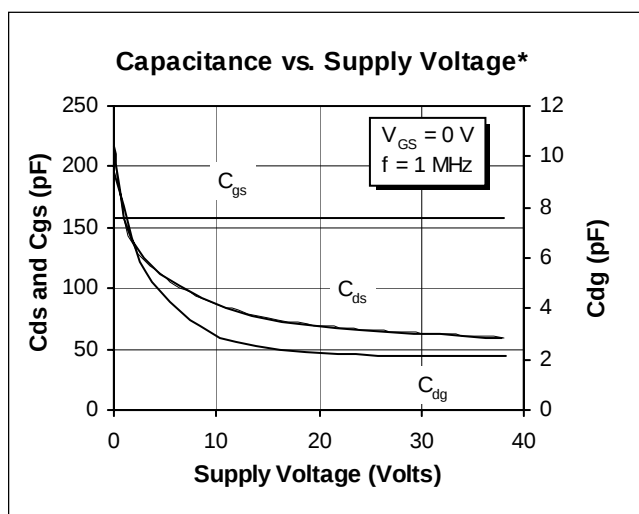
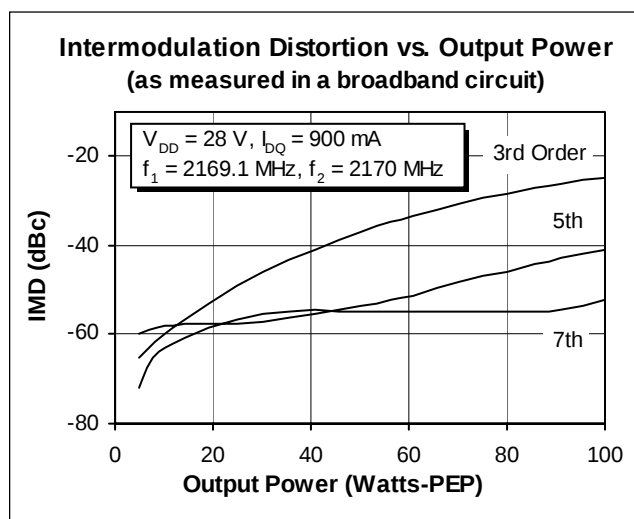
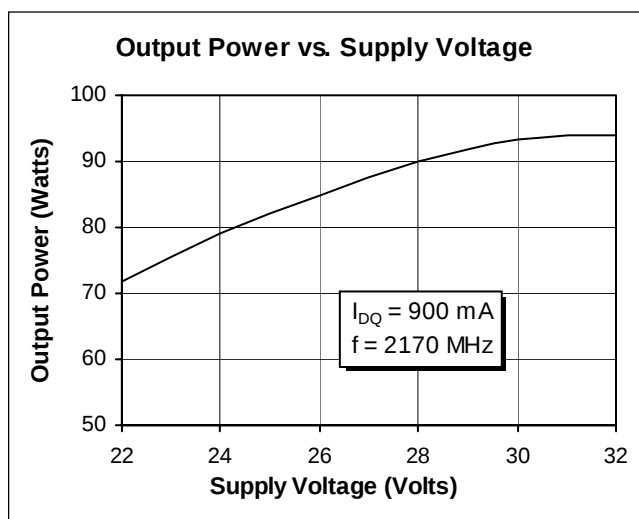
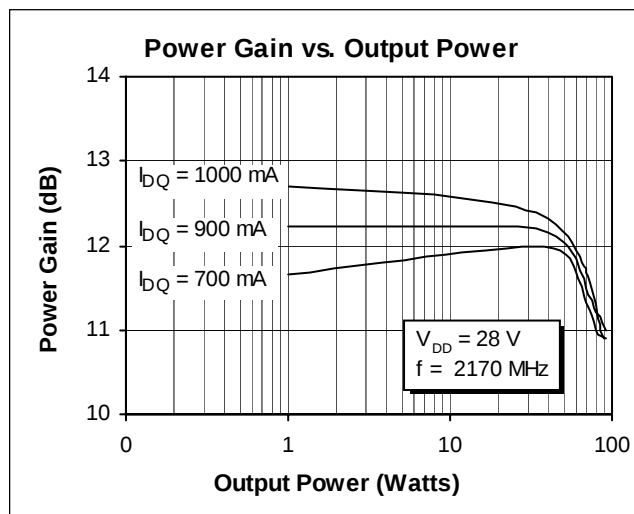
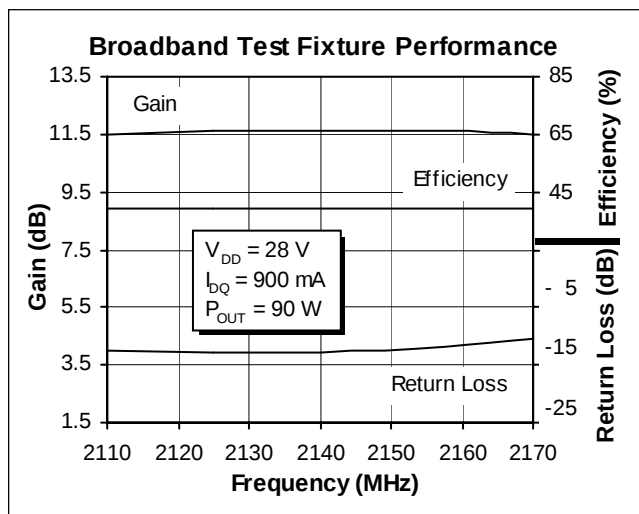
## Maximum Ratings

| Parameter                                                        | Symbol          | Value       | Unit                                 |
|------------------------------------------------------------------|-----------------|-------------|--------------------------------------|
| Drain-Source Voltage                                             | $V_{DSS}$       | 65          | Vdc                                  |
| Gate-Source Voltage                                              | $V_{GS}$        | +15         | Vdc                                  |
| Operating Junction Temperature                                   | $T_J$           | 200         | $^{\circ}\text{C}$                   |
| Total Device Dissipation<br>Above $25^{\circ}\text{C}$ derate by | $P_D$           | 270<br>1.54 | Watts<br>$\text{W}/^{\circ}\text{C}$ |
| Storage Temperature Range                                        | $T_{STG}$       | -40 to +150 | $^{\circ}\text{C}$                   |
| Thermal Resistance ( $T_{CASE} = 70^{\circ}\text{C}$ )           | $R_{\theta JC}$ | 0.65        | $^{\circ}\text{C}/\text{W}$          |

## Typical Performance

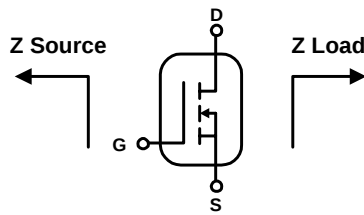


## Typical Performance (cont.)

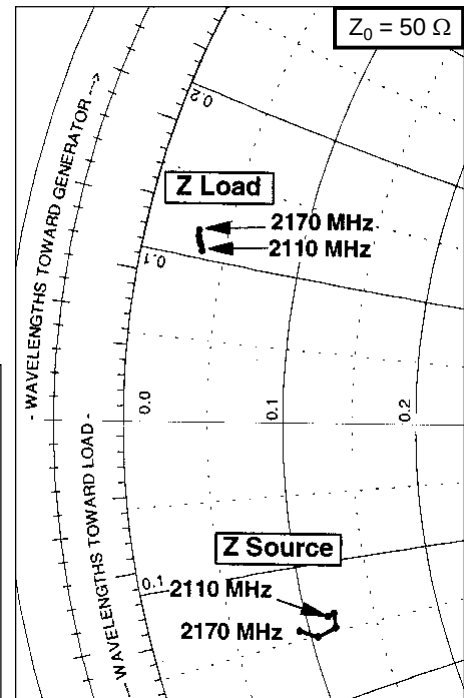


\* This part is internally matched. Measurements of the finished product will not yield these results.

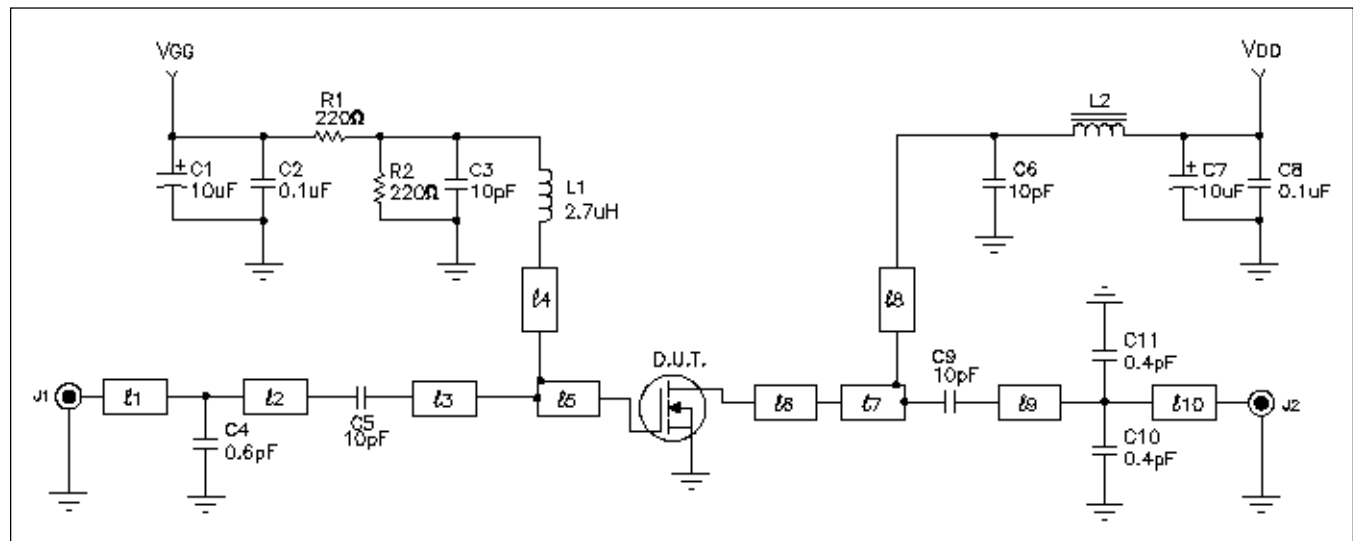
## Impedance Data



| Frequency | Z Source $\Omega$ |       | Z Load $\Omega$ |      |
|-----------|-------------------|-------|-----------------|------|
| MHz       | R                 | jX    | R               | jX   |
| 2110      | 5.79              | -6.94 | 1.81            | 5.26 |
| 2125      | 6.02              | -6.90 | 1.74            | 5.42 |
| 2140      | 5.96              | -7.40 | 1.68            | 5.53 |
| 2155      | 5.26              | -7.57 | 1.62            | 5.68 |
| 2170      | 4.69              | -7.20 | 1.60            | 5.87 |



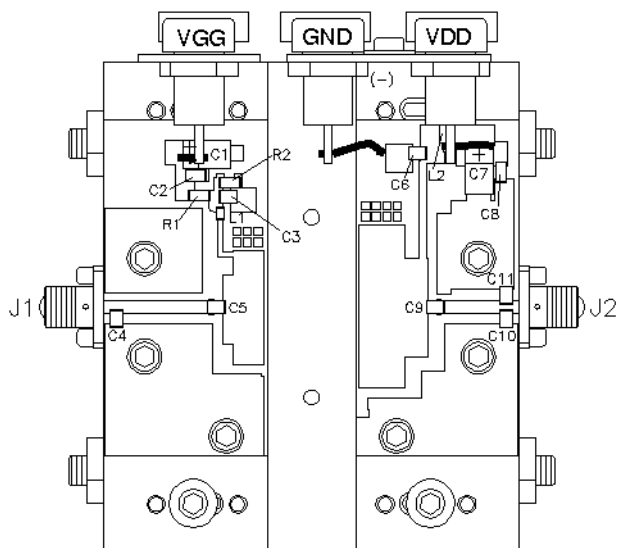
## Test Circuit



Test Circuit Schematic for  $f = 2170$  MHz

|           |                          |                           |                |                                              |                       |
|-----------|--------------------------|---------------------------|----------------|----------------------------------------------|-----------------------|
| D.U.T.    | PTF 102002               | LDMOS Transistor          | C1, C7         | Capacitor, 10 $\mu$ F, 35 VDC                | Digi-Key PCS56106-ND  |
| $\ell 1$  | $0.026 \lambda$ 2170 MHz | Microstrip 41 $\Omega$    | C2, C8         | Capacitor, 0.1 $\mu$ F                       | Digi-Key P4525-ND     |
| $\ell 2$  | $0.232 \lambda$ 2170 MHz | Microstrip 41 $\Omega$    | C3, C5, C6, C9 | Capacitor, 10 pF                             | ATC 100 B             |
| $\ell 3$  | $0.027 \lambda$ 2170 MHz | Microstrip 14.70 $\Omega$ | C4             | Capacitor, 0.6 pF                            | ATC 100 A             |
| $\ell 4$  | $0.116 \lambda$ 2170 MHz | Microstrip 78 $\Omega$    | C10, C11       | Capacitor, 0.4 pF                            | ATC 100 A             |
| $\ell 5$  | $0.081 \lambda$ 2170 MHz | Microstrip 9.50 $\Omega$  | J1, J2         | Female SMA Connector, Panel Mount            |                       |
| $\ell 6$  | $0.116 \lambda$ 2170 MHz | Microstrip 6.82 $\Omega$  | L1             | Chip Inductor, 2.7 $\mu$ H, SMT              | TOKO, # LL 2012-F2N75 |
| $\ell 7$  | $0.061 \lambda$ 2170 MHz | Microstrip 10.88 $\Omega$ | L2             | Ferrite, 6 mm                                | Philips 53/3/4.6-452  |
| $\ell 8$  | $0.237 \lambda$ 2170 MHz | Microstrip 65 $\Omega$    | R1, R2         | Resistor, 220 ohm                            | Digi-Key 220QBK-ND    |
| $\ell 9$  | $0.167 \lambda$ 2170 MHz | Microstrip 50 $\Omega$    | PCB            | .050" Thick, 2 Oz Copper Both Sides, 1 layer |                       |
| $\ell 10$ | $0.026 \lambda$ 2170 MHz | Microstrip 50 $\Omega$    |                | Rogers, TMM6                                 |                       |

## Case Outline Specifications



*Assembly Diagram (not to scale)*

## Case Outline Specifications

