



## DB-900-100W

100W / 26V / 869-894 MHz PA using 2x PD57060S

The *LdmoST* FAMILY

PRELIMINARY DATA

RF POWER AMPLIFIER DEMOBOARD USING  
TWO N-CHANNEL ENHANCEMENT-MODE  
LATERAL MOSFETs

- EXCELLENT THERMAL STABILITY
- COMMON SOURCE CONFIGURATION
- $P_{OUT} = 100$  W min. with 13 dB gain over 869-894 MHz
- 10:1 LOAD VSWR CAPABILITY
- BeO FREE AMPLIFIER

TYPICAL CDMA PERFORMANCE:

IS-95 CDMA / 9ch FWD

$P_{out} = 20$ W

Gain = 13 dB

$N_d = 22\%$

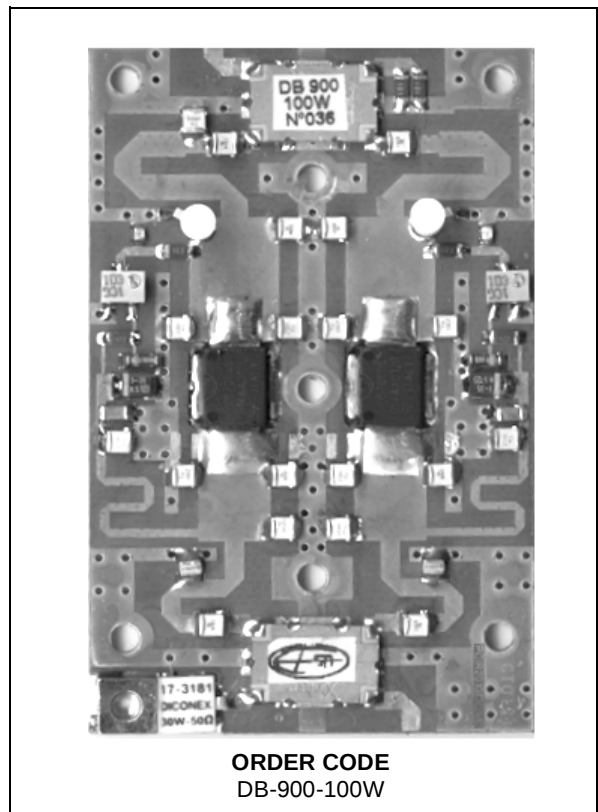
ACPR (750 KHz) : -45 dBc

ACPR (1.98 MHz) : -60 dBc

### DESCRIPTION

The DB-900-100W is a common source N-Channel enhancement-mode lateral Field-Effect RF power amplifier designed for IS-54/-136 & IS-95 base station applications.

The DB-900-100W is designed in cooperation with Europeenne de Telecommunications S.A. ([www.etsa.rf](http://www.etsa.rf)), for high gain and broadband performance operating in common source mode at 26 V, capable of withstanding load mismatch up to 10:1 all phases and with harmonics lower than 30 dBc.



MECH. SPECIFICATION L=80 mm W=50 mm H=10 mm

### ABSOLUTE MAXIMUM RATINGS ( $T_{CASE} = 25^{\circ}\text{C}$ )

| Symbol     | Parameter                                             | Value      | Unit               |
|------------|-------------------------------------------------------|------------|--------------------|
| $V_{DD}$   | Supply voltage                                        | 32         | V                  |
| $I_D$      | Drain Current                                         | 12         | A                  |
| $P_{DISS}$ | Power dissipation at $T_{case} = +85^{\circ}\text{C}$ | 145        | W                  |
| $T_{CASE}$ | Operating Case Temperature                            | -20 to +85 | $^{\circ}\text{C}$ |
| $P_{amb}$  | Max. Ambient Temperature                              | +55        | $^{\circ}\text{C}$ |

**DB-900-100W****ELECTRICAL SPECIFICATION ( $T_{amb} = +25^{\circ}\text{C}$ ,  $V_{dd} = 26\text{V}$ ,  $I_{dq} = 2 \times 200 \text{ mA}$ )**

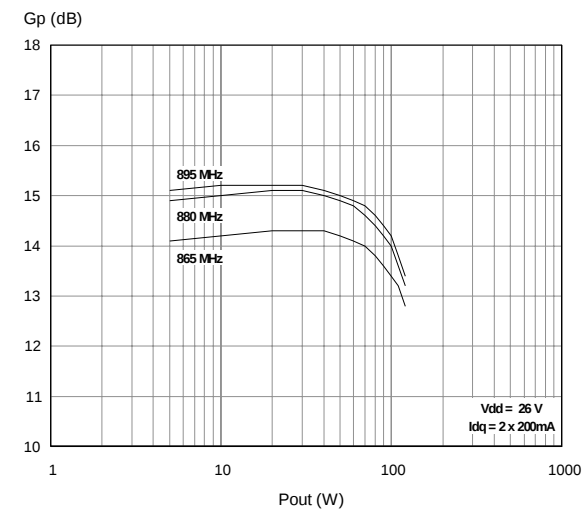
| Symbol           | Test Conditions                                      | Min. | Typ. | Max.    | Unit |
|------------------|------------------------------------------------------|------|------|---------|------|
| FREQ.            | Frequency Range                                      | 869  |      | 894     | MHz  |
| Gain             | $P_{OUT} = 100 \text{ W}$                            | 12.5 | 13   |         | dB   |
| $P_{1dB}$        | Over frequency range: 869 - 894 MHz                  | 100  |      |         | W    |
| Flatness         | Over frequency range and @ $P_{OUT} = 100 \text{ W}$ |      |      | +/- 0.5 | dB   |
| Flatness         | $P_{OUT}$ from 0.1W to 100 W                         |      |      | 1       | dB   |
| ND at $P_{1dB}$  | $P_{1dB}$                                            | 40   | 45   |         | %    |
| IRTL             | Input return Loss $P_{OUT}$ from 0.1W to 100 W       |      | -20  | -15     | dB   |
| Harmonic         | $P_{OUT} = 100 \text{ W}$                            |      | -40  | -30     | dBc  |
| VSWR             | Load Mismatch all phases @ $P_{OUT} = 100 \text{ W}$ | 10:1 |      |         |      |
| Spurious         | 10:1 VSWR all phases and $P_{OUT}$ from 0.1 to 100W  |      |      | -76     | dBc  |
| IMD <sub>3</sub> | $P_{OUT} = 100 \text{ WPEP}$                         |      |      | -25     | dBc  |

**TYPICAL CDMA PERFORMANCE IS 95 / 9ch FWD ( $V_{dd} = 26\text{V}$ ,  $I_{dq} = 350\text{mA}$ )**

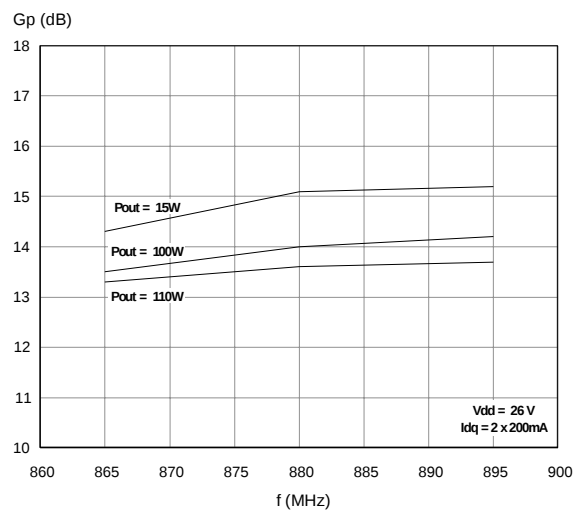
| Frequency | Pout<br>CH PWR | Pout<br>CH PWR | ACPR<br>-750 KHz | ACPR<br>+750 KHz | ACPR<br>-1.98 MHz | ACPR<br>+1.98 MHz | I<br>total | Nd   |
|-----------|----------------|----------------|------------------|------------------|-------------------|-------------------|------------|------|
| (MHz)     | (W)            | (dBm)          | (dBc)            | (dBc)            | (dBc)             | (dBc)             | (A)        | (%)  |
| 865       | 10             | 40.0           | 53.4             | 50.8             | 67.0              | 67.0              | 2.5        | 15.4 |
| 880       | 10             | 40.0           | 54.2             | 51.7             | 68.6              | 68.3              |            |      |
| 895       | 10             | 40.0           | 53.2             | 51.7             | 69.0              | 69.0              |            |      |
| 865       | 20             | 43.0           | 45.0             | 45.0             | 64.0              | 64.0              | 3.5        | 22.0 |
| 880       | 20             | 43.0           | 45.1             | 45.4             | 64.7              | 64.7              |            |      |
| 895       | 20             | 43.0           | 45.2             | 45.7             | 66.8              | 66.5              |            |      |

TYPICAL PERFORMANCE

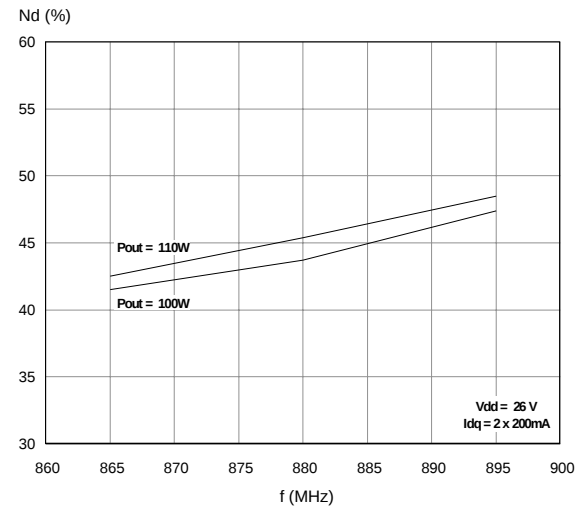
Power Gain vs Output Power



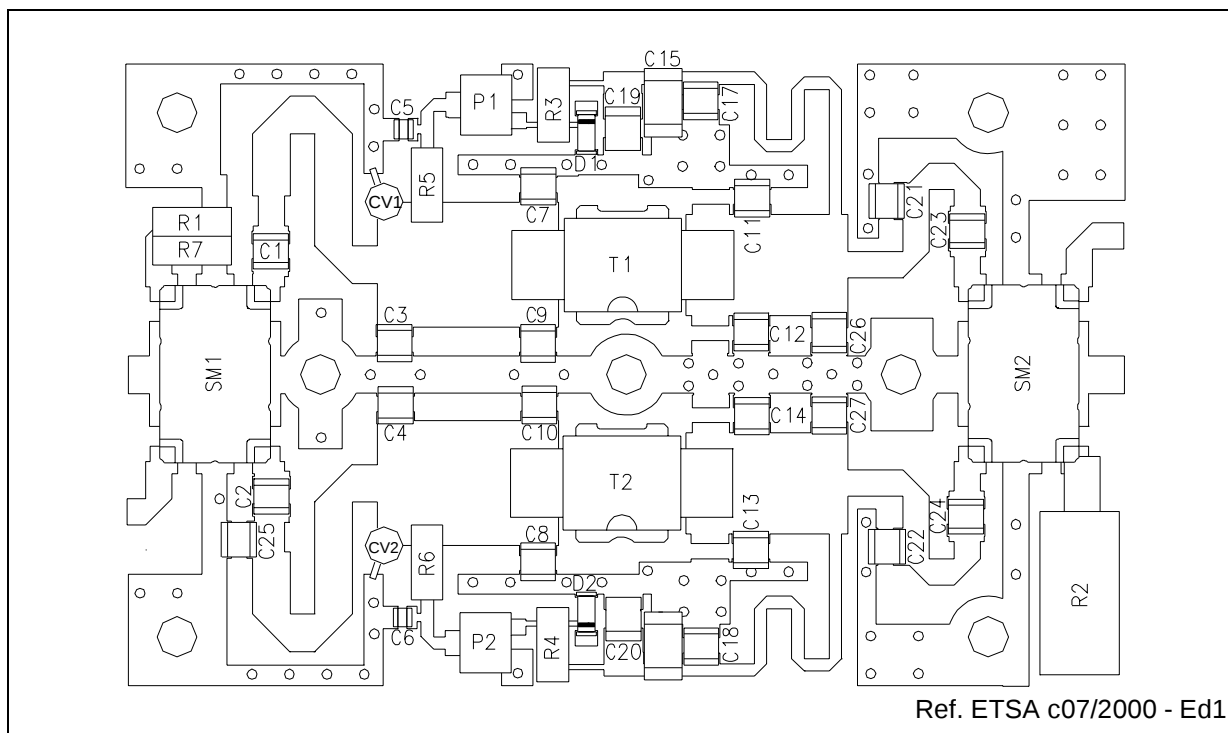
Power Gain vs Frequency



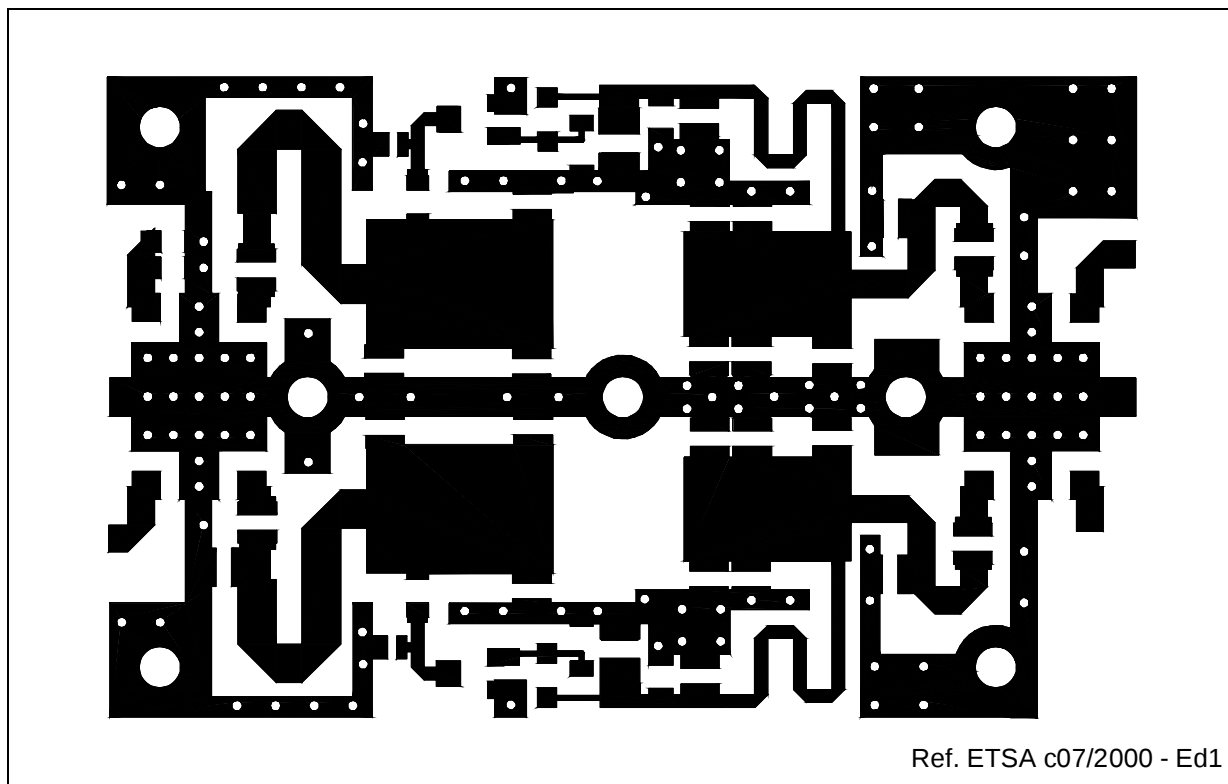
Efficiency vs Frequency



## TEST FIXTURE COMPONENT LAYOUT



## TEST CIRCUIT PHOTOMASTER



**TEST CIRCUIT COMPONENT PART LIST**

| COMPONENT                 | DESCRIPTION                                    |
|---------------------------|------------------------------------------------|
| T1, T2                    | PD57060S TRANSISTOR                            |
| C1, C2, C23, C24          | 47pF - 500V CERAMIC CHIP CAPACITOR             |
| C3, C4, C12, C14          | 6.8pF - 500V CERAMIC CHIP CAPACITOR            |
| C5, C6, C17, C18          | 100pF - 500V CERAMIC CHIP CAPACITOR            |
| C7, C8, C9, C10, C11, C13 | 10pF - 500V CERAMIC CHIP CAPACITOR             |
| C15, C16                  | 100nF - 63V CERAMIC CHIP CAPACITOR             |
| C19, C20                  | 1 $\mu$ F / 35V ELECTROLYTIC CAPACITOR         |
| C26, C27                  | 3.3pF - 500V CERAMIC CHIP CAPACITOR            |
| C21, C22                  | 4.7pF - 500V CERAMIC CHIP CAPACITOR            |
| C25                       | 0.5pF - 500V CERAMIC CHIP CAPACITOR            |
| CV1, CV2                  | ADJUSTABLE CAPACITOR 0.6 - 4.5pF / 500V        |
| P1, P2                    | 10K Ohms MULTITURN POTENTIOMETER               |
| R1, R7                    | 100 Ohms 1/4W 1206 SMD CHIP RESISTOR           |
| R2                        | 50 Ohms 30W - 4GHz LOAD                        |
| R3, R4                    | 4.7K Ohms 1/4W 1206 SMD CHIP RESISTOR          |
| R5, R6                    | 10K Ohms 1/4W 1206 SMD CHIP RESISTOR           |
| D1, D2                    | ZENER DIODE 5V - 500 mW SOD80                  |
| SM1, SM2                  | 90° SMD HYBRID COUPLER ANAREN Xinger 1304-3    |
| BOARD                     | METCLAD MX3-30-C1/10C THK 0.762 mm Cu 35 $\mu$ |
| SUBSTRATE                 | TEFLON-GLASS Er = 2.55                         |
| BACK SIDE                 | COPPER FLANGE 2 mm THICKNESS                   |
| CERAMIC CHIP CAPACITORS   | ATC100B or EQUIVALENT                          |

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