



DB-900-100W

RF POWER AMPLIFIER using 2 x PD57060S The *LdmoST* FAMILY

PRELIMINARY DATA

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

- EXCELLENT THERMAL STABILITY
- COMMON SOURCE CONFIGURATION
- $P_{OUT} = 100\text{ W}$ 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

$P_{out} = 20\text{ W}$

Gain = 13 dB

$N_d = 22\%$

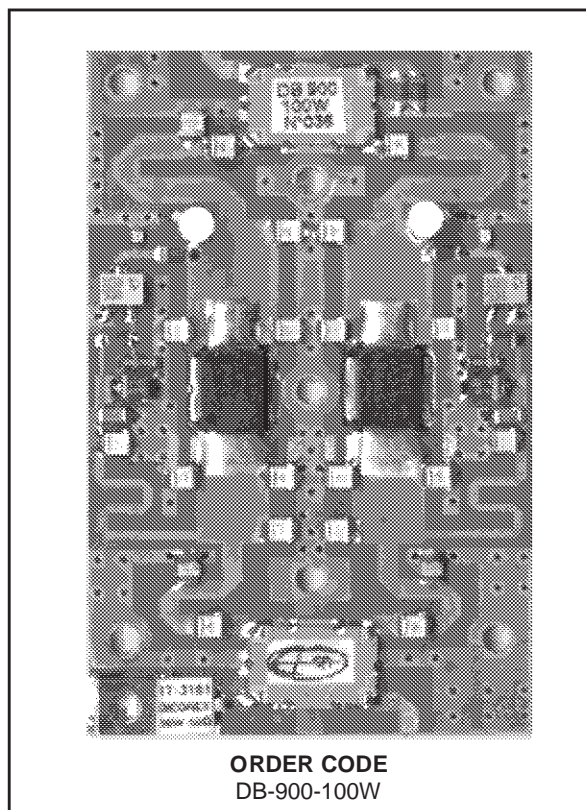
ACPR (750 KHz) : -45 dBc

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), 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.



ORDER CODE
DB-900-100W

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 ($T_{amb} = +25^{\circ}\text{C}$, $V_{dd} = 26\text{V}$, $I_{dq} = 2 \times 200 \text{ mA}$)

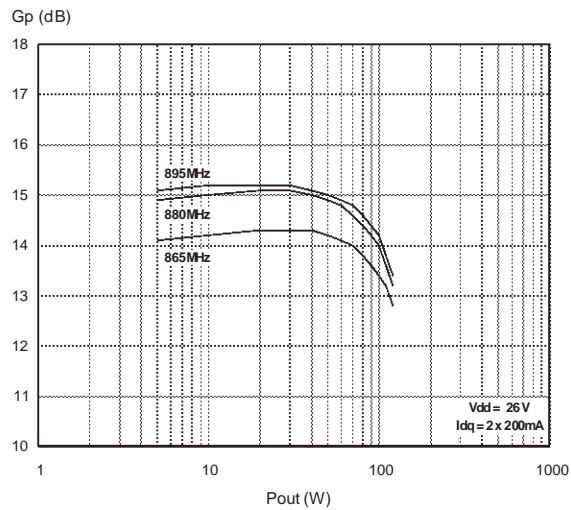
| Symbol | Test Conditions | Min. | Typ. | Max. | Unit |
|------------------|--|------|------|---------|------|
| FREQ. | Frequency Range | 869 | | 894 | MHz |
| Gain | $P_{OUT} = 100 \text{ W}$ | 12.5 | 13 | | dB |
| P_{1dB} | Over frequency range: 869 - 894 MHz | 100 | | | W |
| Flatness | Over frequency 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 ₃ | $P_{OUT} = 100 \text{ WPEP}$ | | | -25 | dBc |

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

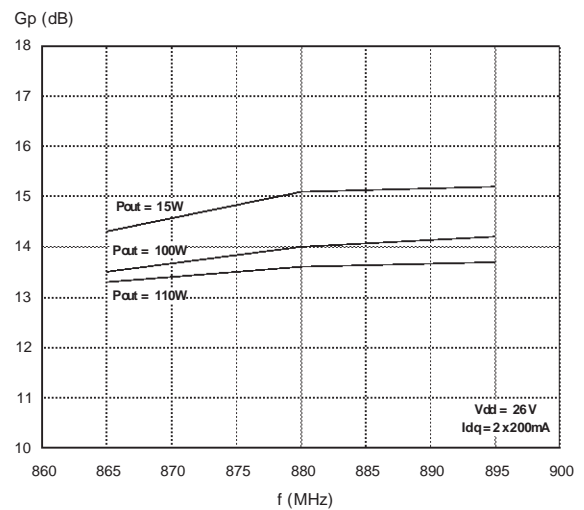
| Frequency | Pout CH PWR | Pout CH PWR | ACPR -750 KHz | ACPR +750 KHz | ACPR -1.98 MHz | ACPR +1.98 MHz | I total | Nd |
|-----------|----------------|----------------|------------------|------------------|-------------------|-------------------|------------|------|
| (MHz) | (W) | (dBm) | (dBc) | (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

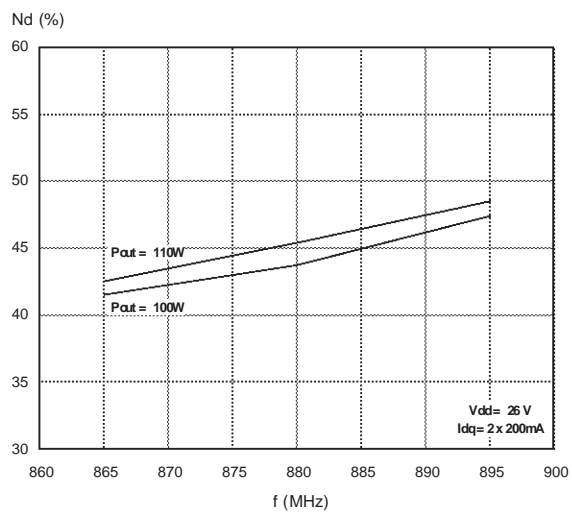
Power Gain vs Output Power



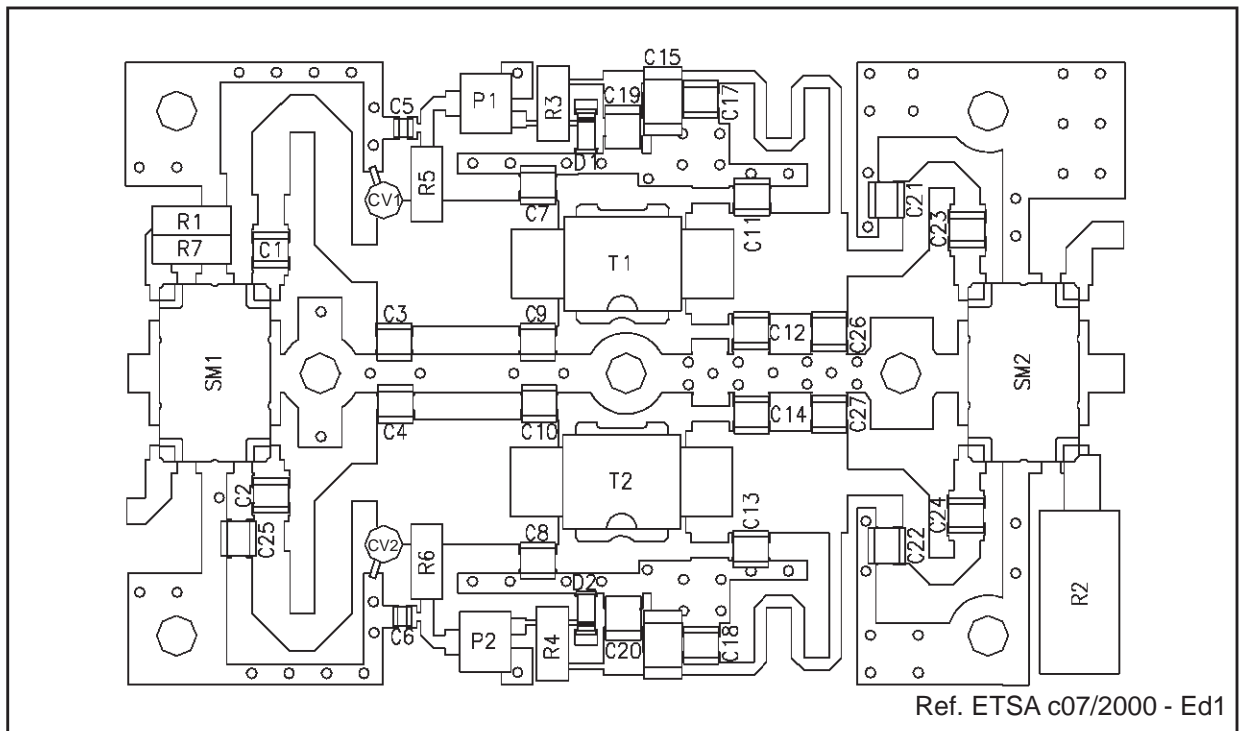
Power Gain vs Frequency



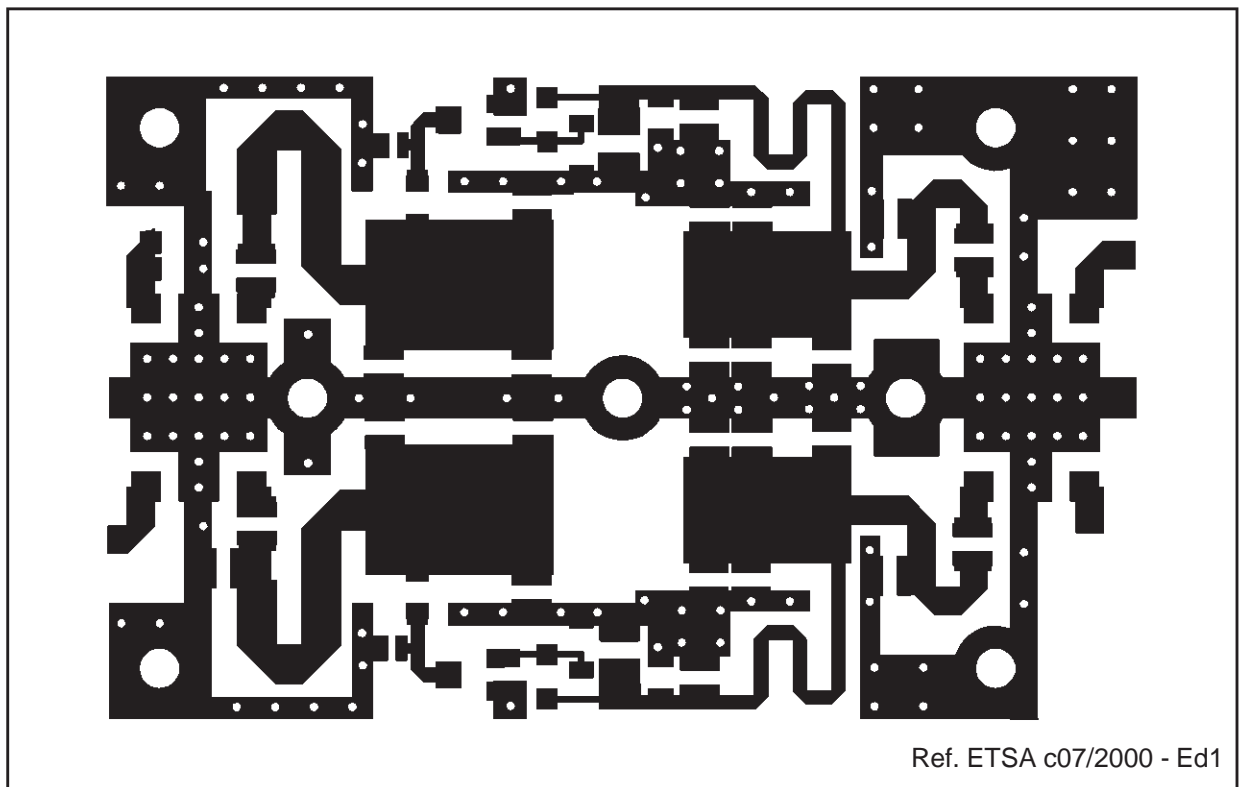
Efficiency vs Frequency



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 | 1μF / 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 35μ |
| SUBSTRATE | TEFLON-GLASS Er = 2.55 |
| BACK SIDE | COPPER FLANGE 2 mm THICKNESS |
| CERAMIC CHIP CAPACITORS | ATC100B or EQUIVALENT |

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