Evaluation Board Documentation

TRF7003 RF Power Amplifier 4.8 Volt GSM Application

APPLICATION BRIEF: SWRA009

Wireless Communications Business Unit

Digital Signal Processing Solutions
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TEXAS INSTRUMENTS

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TRF7003 RF Power Amplifier 4.8 Volt GSM Application

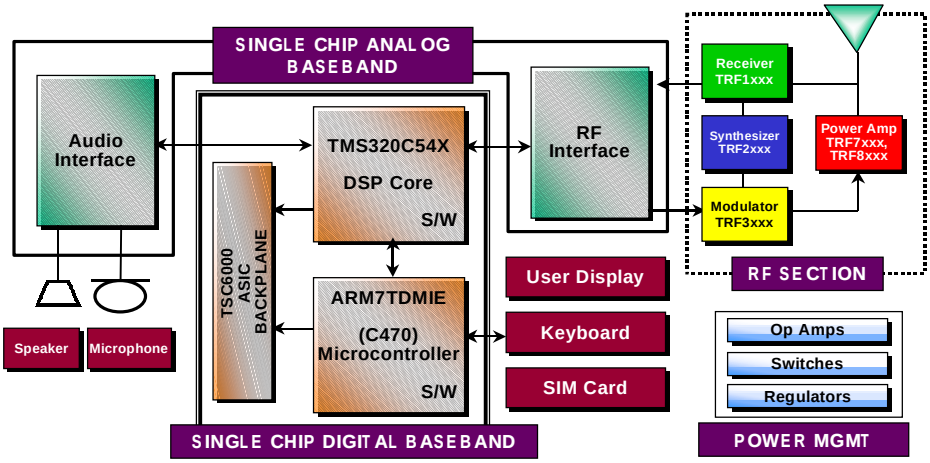
Abstract

The evaluation board documentation for the TRF7003 RF Power Amplifier is primarily for device assessment. Included in this documentation are the following:

- The Evaluation Board Mechanical Outline
- The Evaluation Board Schematic for GSM. The schematic also includes a component list describing the resistors, inductors, and capacitors, along with the suppliers and board material specifications.
- A Typical RF Performance Graph
- The Test Bench Diagram with organized instructions for configuration.

Product Support

The TI Advantage Extends Beyond RF to Every Other Major Wireless System Block



Digital Baseband

TI's single-chip Digital Baseband Platform, combines two high-performance core processors – a digital signal processor tailored for digital wireless applications and a microcontroller designed specifically for low-power embedded systems. The customizable platform helps wireless digital telephone manufacturers lower component counts, save board space, reduce power consumption, introduce new features, save development costs and achieve faster time to market, at the same time giving them flexibility and performance to support any standard worldwide.

Analog Baseband

TI analog baseband components provide a Mixed-signal bridge between the real world of analog signals and digital signal processors, the key enabling technology of the digital wireless industry. Using a seamless architecture for wireless communications technology, TI matches its baseband interfaces, radio frequency ICs and power management ICs to digital signal processing engines to create complete DSP Solutions for digital wireless systems.

Power Management

TI provides power management solutions with integration levels designed to meet the needs of a range of wireless applications. From discrete LDOs and voltage supervisors to complete power supplies for the baseband section, TI power management solutions play an important role in increasing wireless battery life, time-to-market and system functionality.

For more information visit the Wireless Communications web site at www.ti.com/sc/docs/wireless/home.htm.

Related Documentation

The following list specifies product names, part numbers, and literature numbers of corresponding TI documentation.

- *MOSFET POWER AMPLIFIER*, Literature number SLWS058A

World Wide Web

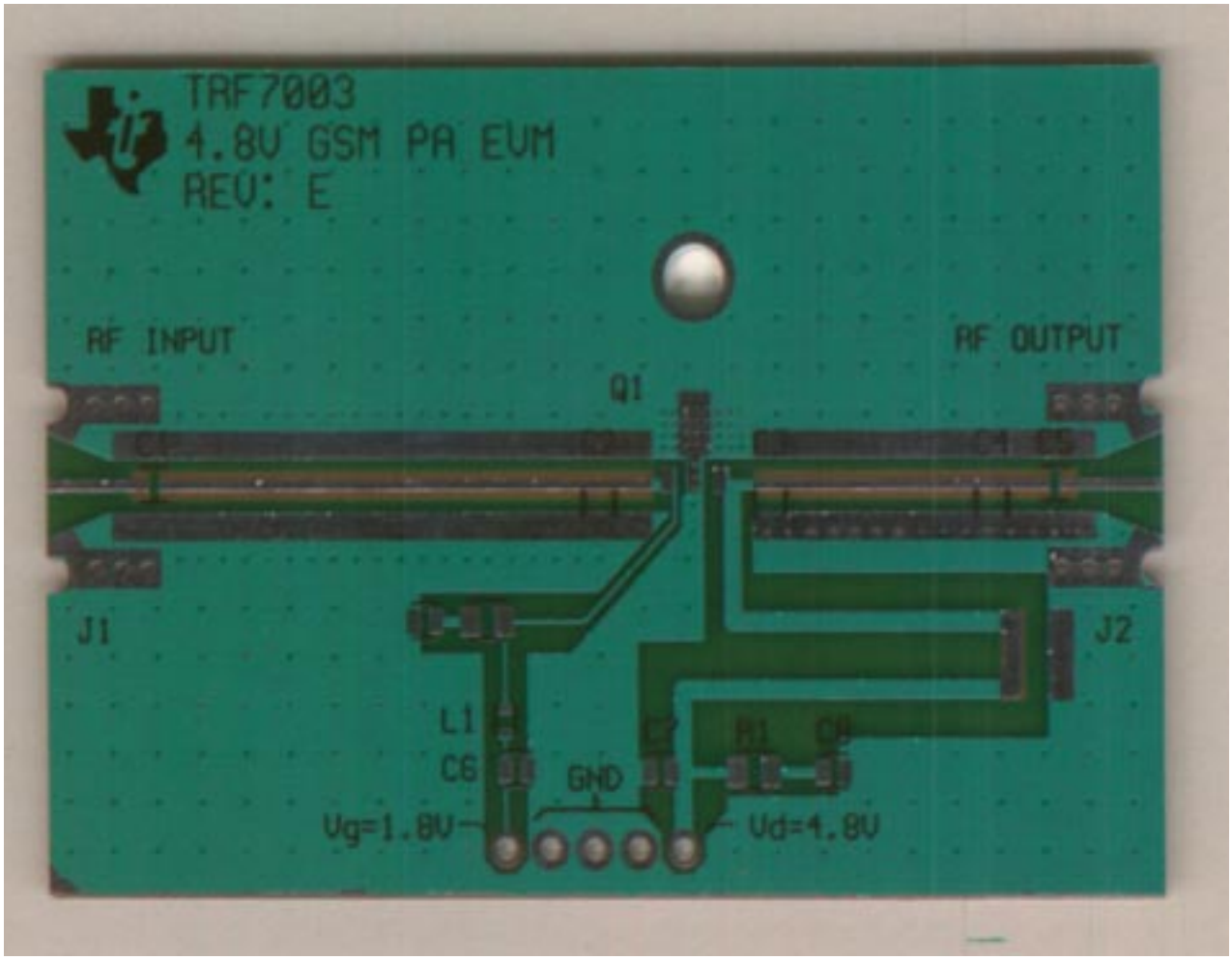
Our World Wide Web site at www.ti.com contains the most up to date product information, revisions, and additions. Users registering with TI&ME can build custom information pages and receive new product updates automatically via email.

Email

For technical issues or clarification on products, please send a detailed email to sc-infomaster@ti.com. Questions receive prompt attention and are usually answered within one business day.

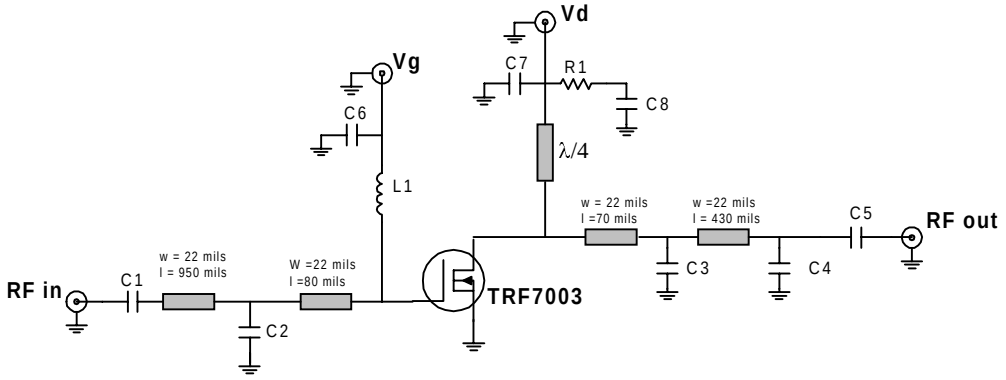
Evaluation Board Mechanical Outline

Figure 1. TRF7003 Evaluation Board Mechanical Outline (top view)



Evaluation Board Schematic

Figure 2. Evaluation Board Schematic for GSM



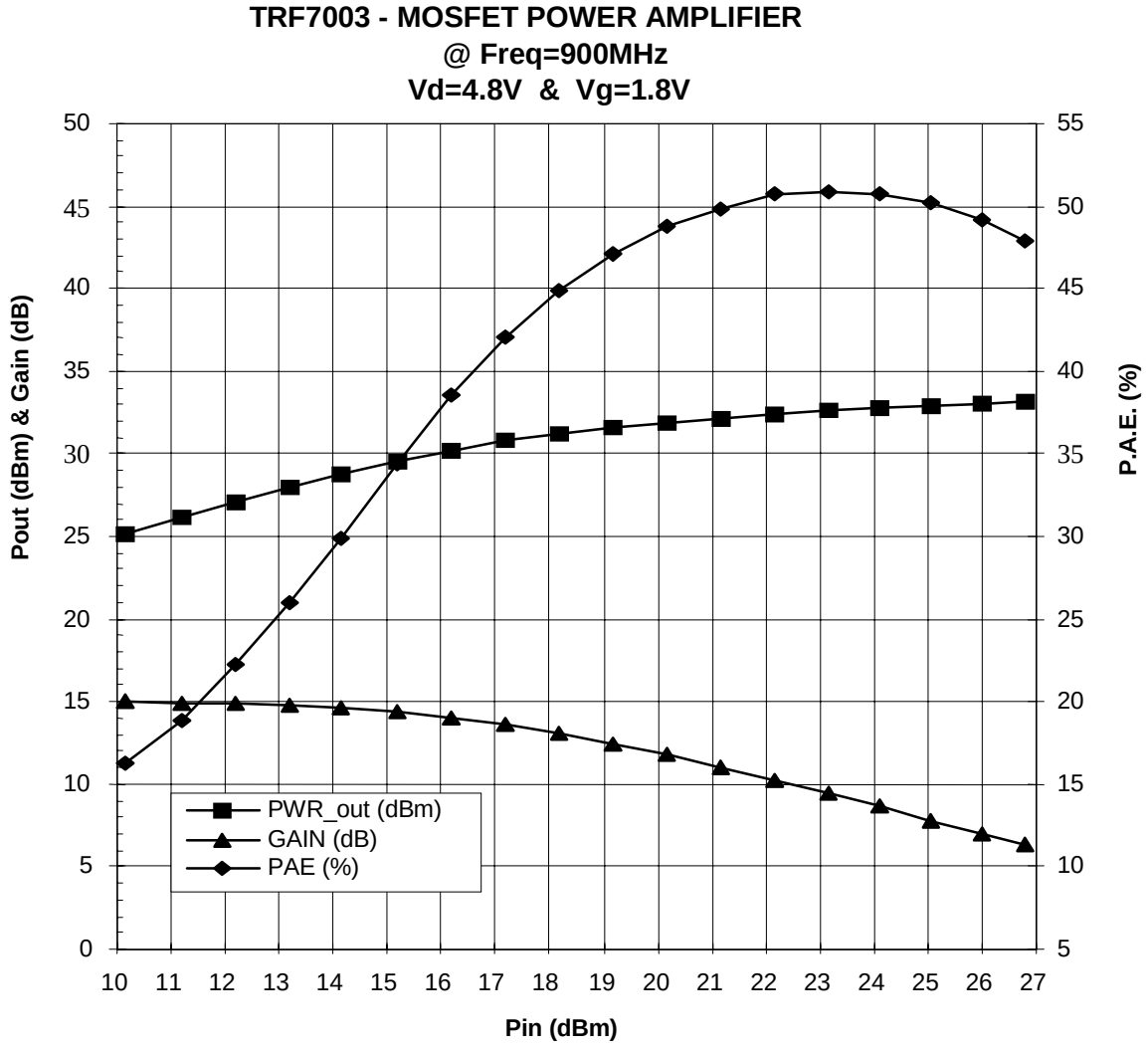
Component List:

Resistor	Inductor	Capacitor
R1 = 30 Ω	L1 = 15 nH	C1 = 20 pF
		C2 = 18 pF
		C3 = 16 pF
Suppliers:		C4 = 2.7 pF
• IMS		C5 = 100 pF
RCI-0603 series (resistors)		C6 = 1 uF
• Toko		C7 = 100 pF
L61608 series or LL2012 (inductors)		C8 = 1 uF
• ATC		
ATC100 series (capacitors)		
• Murata		
GRM36 series (capacitors)		
• THERMALLY		
6390B (heat sink)		

Board Material Specifications: Type FR4 ; ε_r = 4.3 ; h = 12 mils

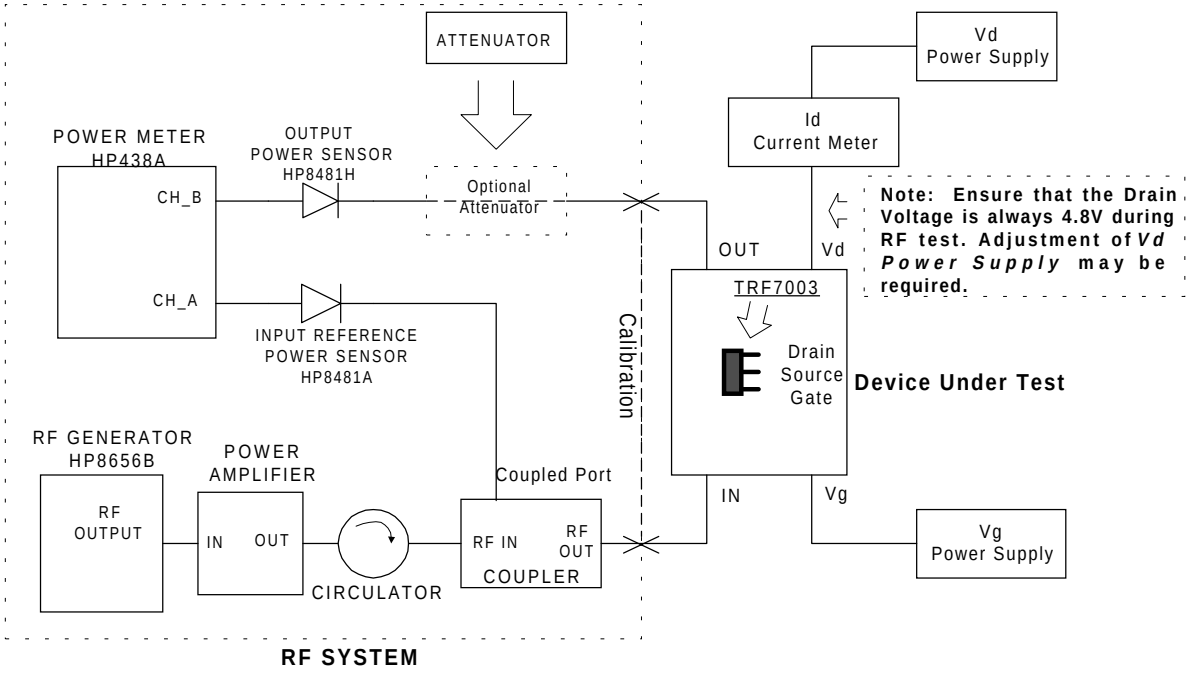
Typical RF Performance

Figure 3. Typical (C.W.) Power Added Efficiency /Pout/Gain vs. Pin



Test Bench Diagram

Figure 4. Test Bench Configuration



1) Configure Test Bench as shown.
2) Calibrate *RF SYSTEM* - less *Device Under Test*.
   a) Zero and calibrate POWER METER, POWER SENSORS.
   b) Set RF power and frequency on RF GENERATOR.

      Caution: Do not over-drive the input of POWER AMPLIFIER.
   c) RF Input Calibration:

      Offset Channel A of POWER METER by the difference between the reading of Channel B and Channel A. Verify that Channel A reading and Channel B reading are the same after offsetting.
   d) RF Output Calibration:

      Attach an Attenuator to OUTPUT POWER SENSOR. Offset Channel B of POWER METER by the difference between the reading of Channel A and Channel B. Verify that Channel A reading and Channel B reading are the same after offsetting.

3) Device D.C. Power-up

   a) Set *Vd Power Supply* to 4.8Vdc at the Drain terminal of TRF7003.

   b) Set *Vg Power Supply* to approx. 1.8 Vdc.

   c) Adjust *Vg Power Supply* so that *Id Current Meter* reads 550mA.

   Note: Ensure that the Drain Voltage is always 4.8V during RF test. Adjustment of *Vd Power Supply* may be required.

Evaluation Board Disclaimer

Please note that the enclosed evaluation boards are experimental Printed Circuit Boards and are therefore only intended for device evaluation.

We would like to draw your attention to the fact that these boards have been processed through one or more of Texas Instruments' external subcontractors which have not been production qualified.

Device parameters measured, using these boards, are not representative of any final data sheet or of a final production version. Texas Instruments does not represent or guarantee that a final version will be made available after device evaluation.

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