Technical Data

MRFIC0970/D
Rev. 0, 07/2002

3.2 V GSM GaAs Integrated Power Amplifier

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MRFIC0970

(Scale 2:1)

Package Information
Plastic Package
Case 1308
(QFN-20)

Ordering Information

Device	Marking	Package
MRFIC0970	0970	QFN-20

The MRFIC0970 is a single supply, RF power amplifier designed for the 2.0 W GSM900 handheld radios. The device is packaged in the QFN-20 package, with exposed backside pad, which allows excellent electrical and thermal performance through a solderable contact.

- Target 3.2 V Characteristics:
  RF Output Power: 34.5 dBm Typical
  Efficiency: 50% Typical
- Single Positive Supply Solution
- Available in Tape and Reel only. R2 Suffix = 2500 Units per 12 mm, 13 inch Reel

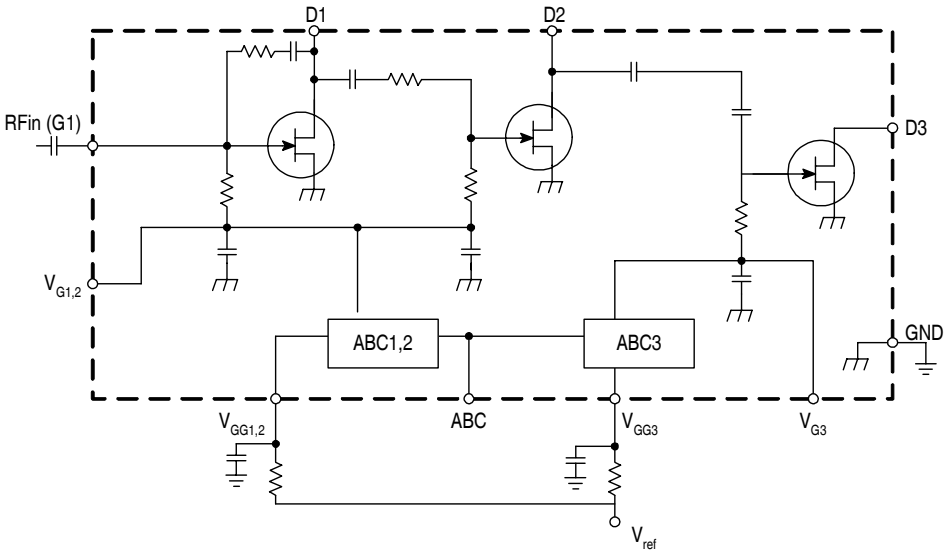

Figure 1. Functional Block Diagram

1 Electrical Characteristics

Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Supply Voltage	$V_{D1,2,3}$, V_{abc} V_{ref}	8.0 5.0	V V
RF Input Power	P_{in}	15	dBm
RF Output Power	P_{out}	38	dBm
Operating Case Temperature Range	T_C	-40 to 85	°C
Storage Temperature Range	T_{stg}	-40 to 85	°C
Junction Temperature	T_J	150	°C

NOTES: 1. Maximum Ratings are those values beyond which damage to the device may occur. Functional operation should be restricted to the limits in the Electrical Characteristics or Recommended Operating Conditions tables.
2 ESD (electrostatic discharge) immunity meets Human Body Model (HBM) ≤250 V and Machine Model (MM) ≤60 V. This device is rated Moisture Sensitivity Level (MSL) 1. Additional ESD data available upon request.

Table 2. Recommended Operating Conditions

Characteristic	Symbol	Min	Typ	Max	Unit
Supply Voltage	$V_{D1,2,3}$ V_{abc} V_{ref}	2.8 0 0.04	- - -	5.5 5.5 1.8	Vdc V V
Input Power	P_{in}	5.0	-	10	dBm

Table 3. Electrical Specifications

($V_{D1,2,3}$ = 3.2 V, V_{abc} = 2.6 V, P_{in} = 5.0 dBm, Peak measurement at 12.5% duty cycle, 4.6 ms period, T_A = 25°C, unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
Frequency Range	BW	880	-	915	MHz
Output Power	P_{out}	34.5	-	-	dBm
Power Added Efficiency	PAE	50	-	-	%
Minimum Output Power (V_{ref} = 0.04, V_{abc} = 2.6 V)		-	-	-17	dBm
Power Control Slope (V_{ref} = 0.1 to 1.8 V, ΔV_{ref} = 0.01 V)		-	-	50:1	$\frac{RFVrms}{V_{ref}}$
Bleed thru Power ($P_{in(fo)} \leq$ -12dBm, V_{ref} = 0.04, V_{abc} = 10 k load)		-	-	-36	dBm
RF Leakage Current ($I_{DD1} + I_{DD2} + I_{DD3,}$ Pin (f_o) ≤5.0 dBm) (V_{abc} = 10 k load, V_{ref} = 0.04 V)		-	-	35	mA
Output Power Switching Speed (± step input of V_{ref} RF Pout within 1.0 dB of final value)		-	-	1.0	µs
Input Return Loss	|S11|	-	-	6.0	dB
Noise Power in Rx band 925 to 935 MHz 935 to 960 MHz	NP	 - -	 - -	 -73 -85	dBm
Stability-Spurious Output (Load VSWR 6:1 all phase angles, Adjust $V_{D1, 2\&3}$ for specified power)	P_{spur}	-	-	-30	dBc
Load Mismatch Stress (Load VSWR = 10:1 all phase angles, 5 seconds, Adjust $V_{D1, 2\&3}$ for specified power)	No Degradation in Output Power Before & After Test				

2 Pin Connections

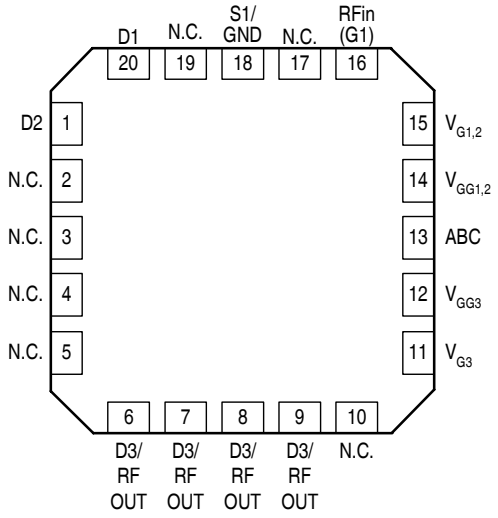

Figure 2. Pin Connections

3 Typical Performance Characteristics

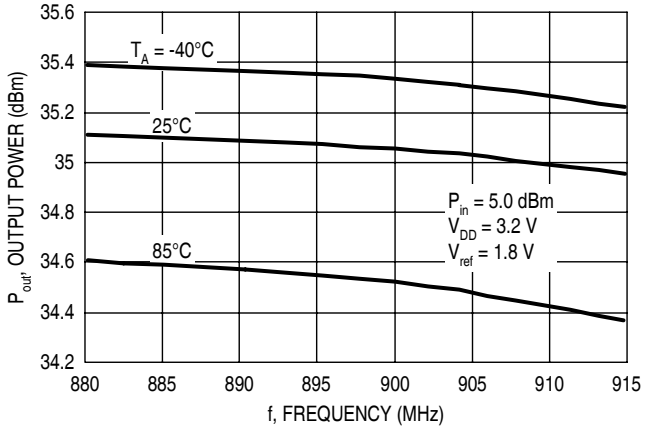

Figure 3. Output Power versus Frequency

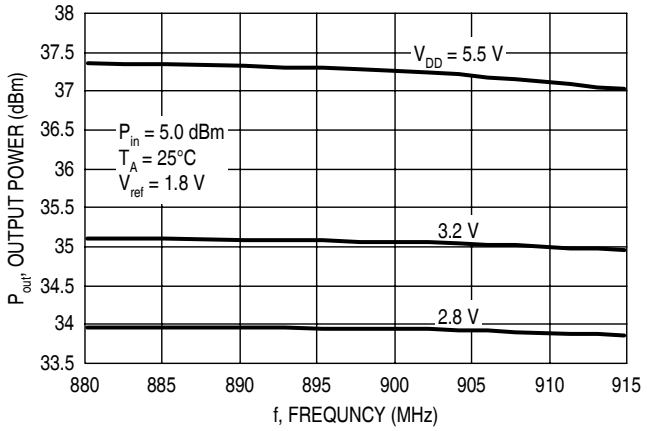

Figure 4. Output Power versus Frequency

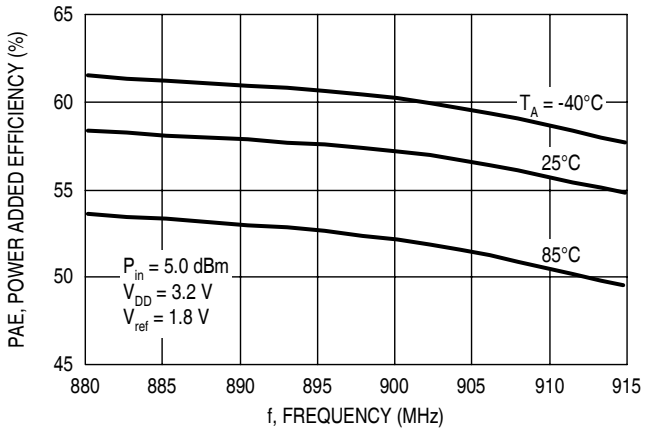

Figure 5. Power Added Efficiency versus Frequency

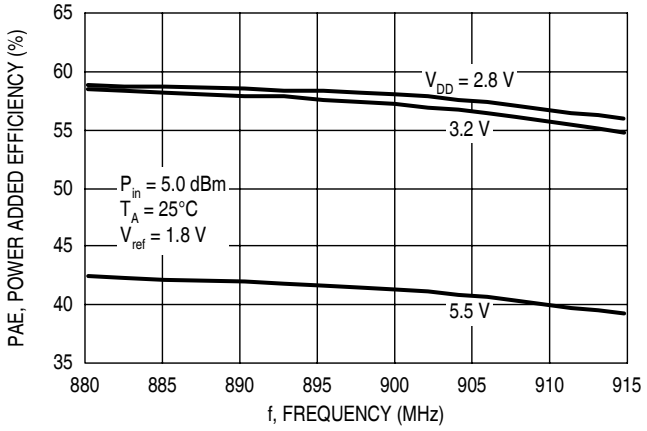

Figure 6. Power Added Efficiency versus Frequency

4 Application Schematic

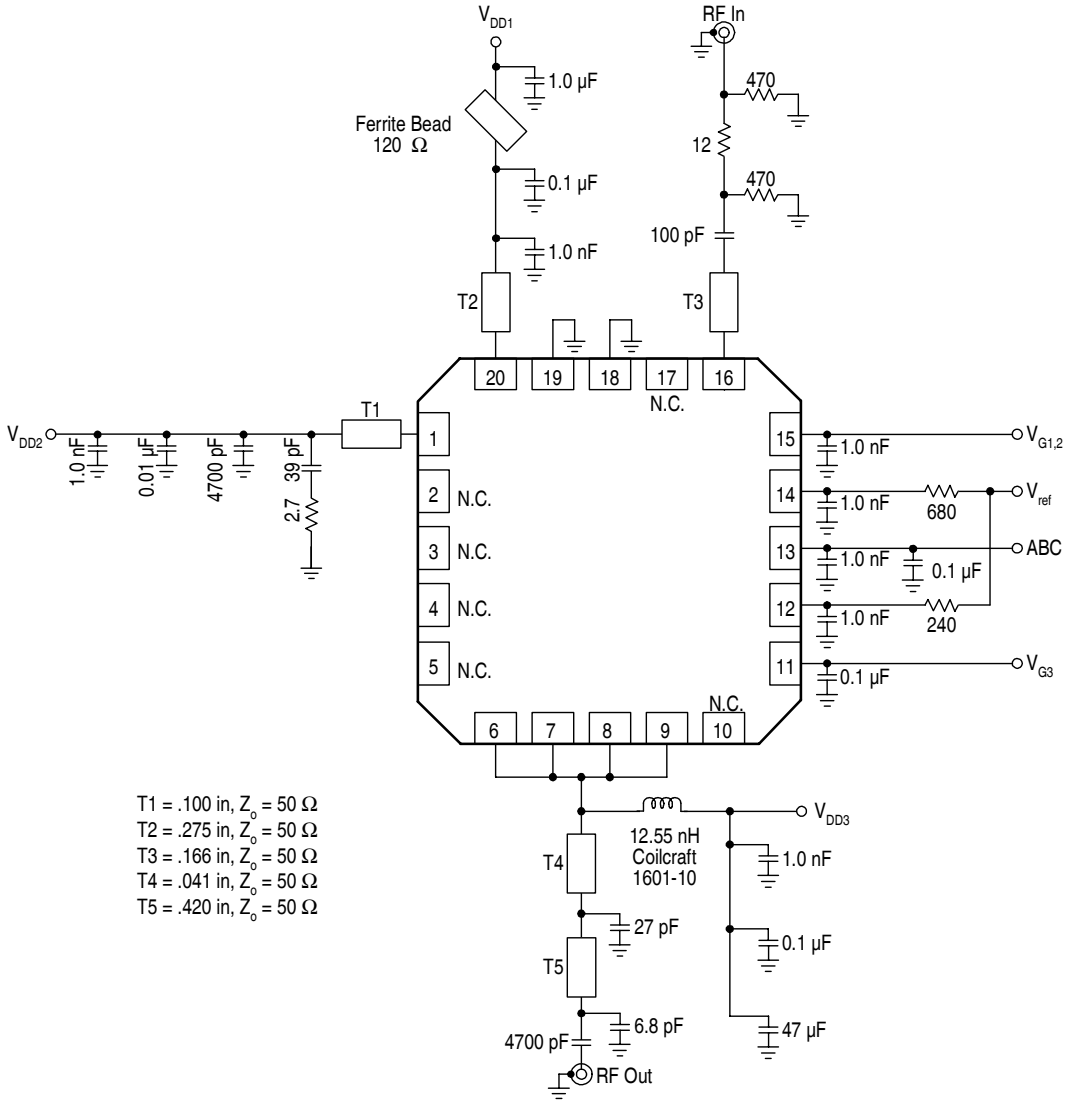

Figure 7. Application Schematic

5 Packaging

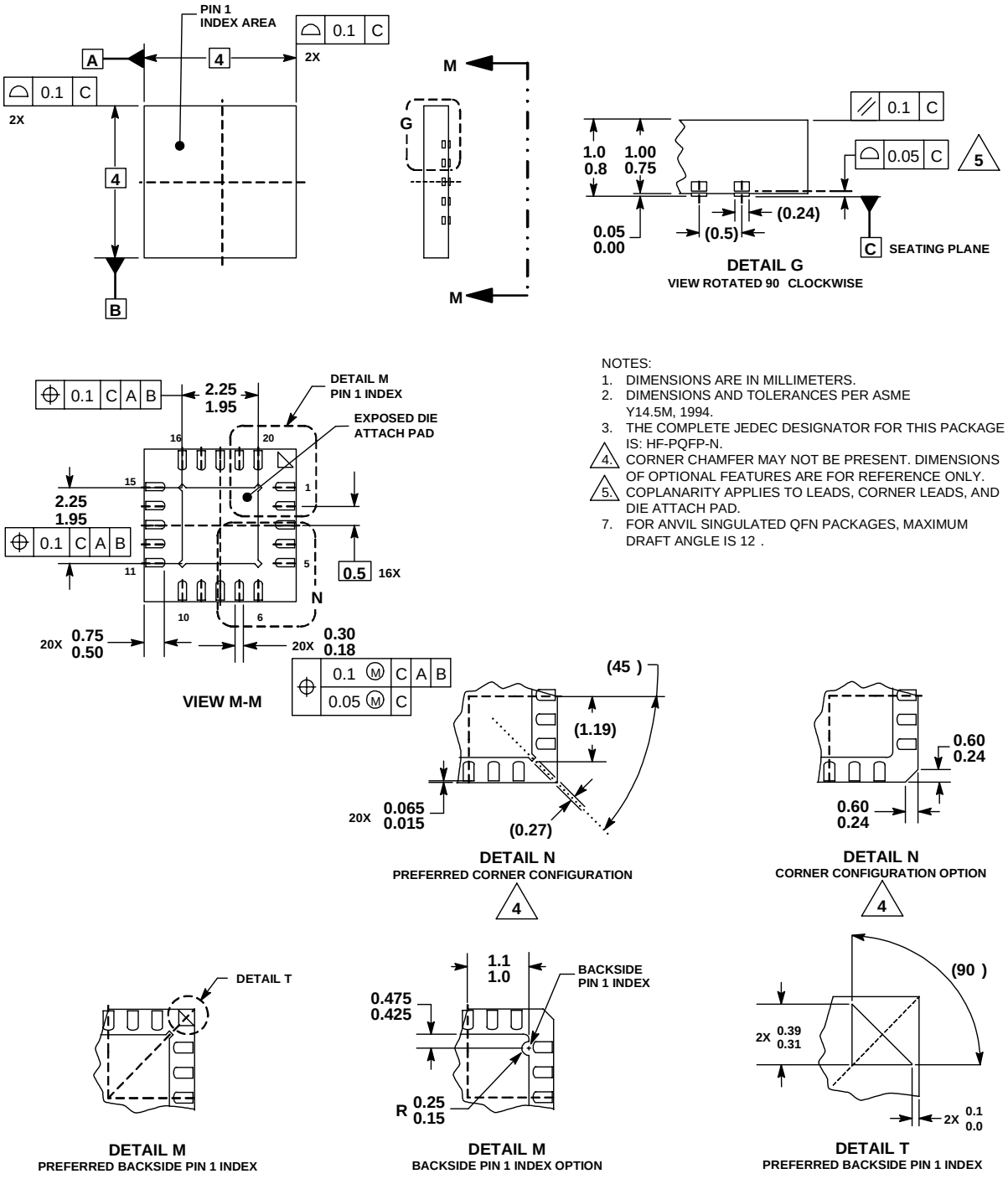

Figure 8. Outline Dimensions for QFN-20
(Case 1308-02, Issue C)

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