

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



Table 1. Maximum Ratings

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.

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

Freescale Semiconductor, Inc.

Electrical Characteristics

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, $T_A = 25^\circ\text{C}$, 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, $\Delta V_{ref} = 0.01$ V)		-	-	50:1	$\frac{RFV_{rms}}{V_{ref}}$
Bleed thru Power ($P_{in(f0)} \leq -12$ dBm, $V_{ref} = 0.04$, $V_{abc} = 10$ k load)		-	-	-36	dBm
RF Leakage Current ($I_{DD1} + I_{DD2} + I_{DD3}$, $P_{in}(f_0) \leq 5.0$ dBm) ($V_{abc} = 10$ k load, $V_{ref} = 0.04$ V)		-	-	35	mA
Output Power Switching Speed ($\pm$ 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

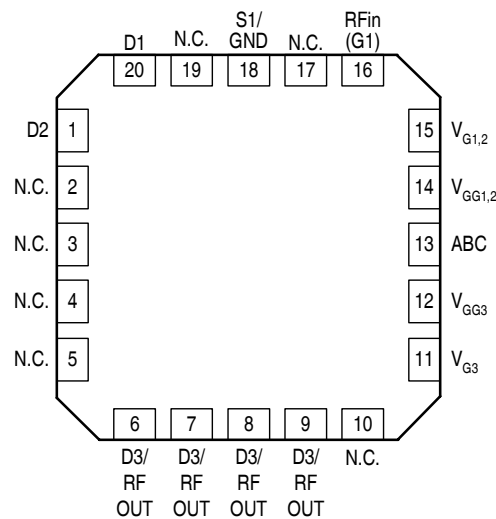


Figure 2. Pin Connections

3 Typical Performance Characteristics

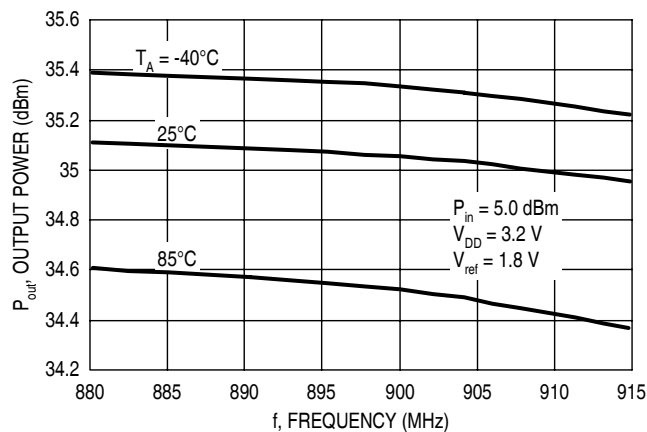


Figure 3. Output Power versus Frequency

Freescale Semiconductor, Inc. Typical Performance Characteristics

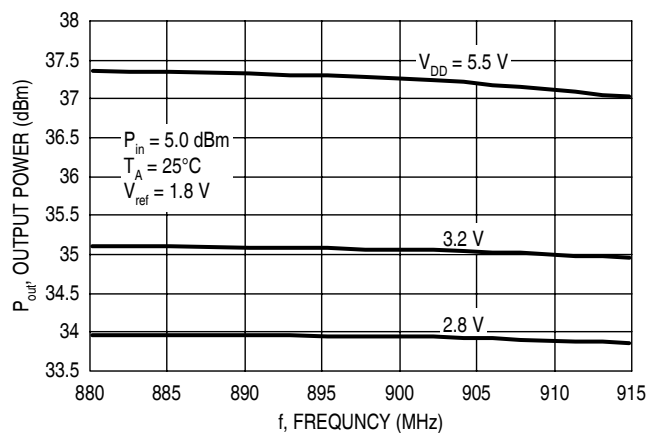


Figure 4. Output Power versus Frequency

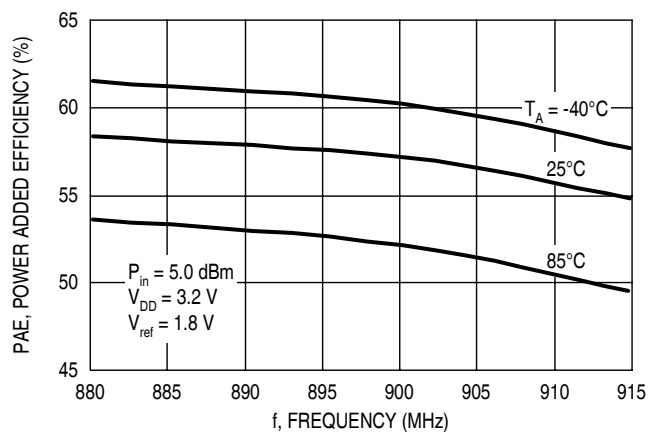


Figure 5. Power Added Efficiency versus Frequency

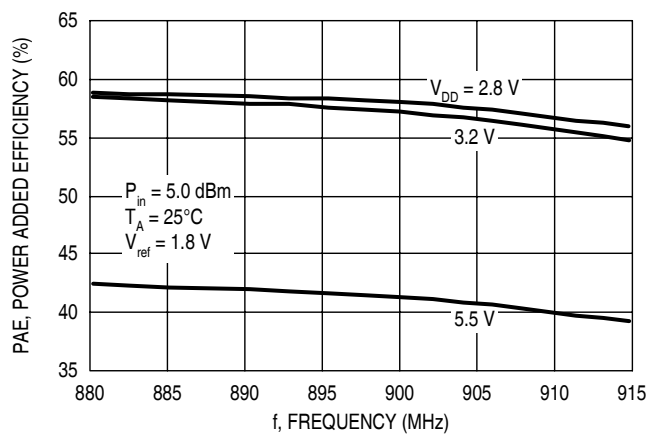


Figure 6. Power Added Efficiency versus Frequency

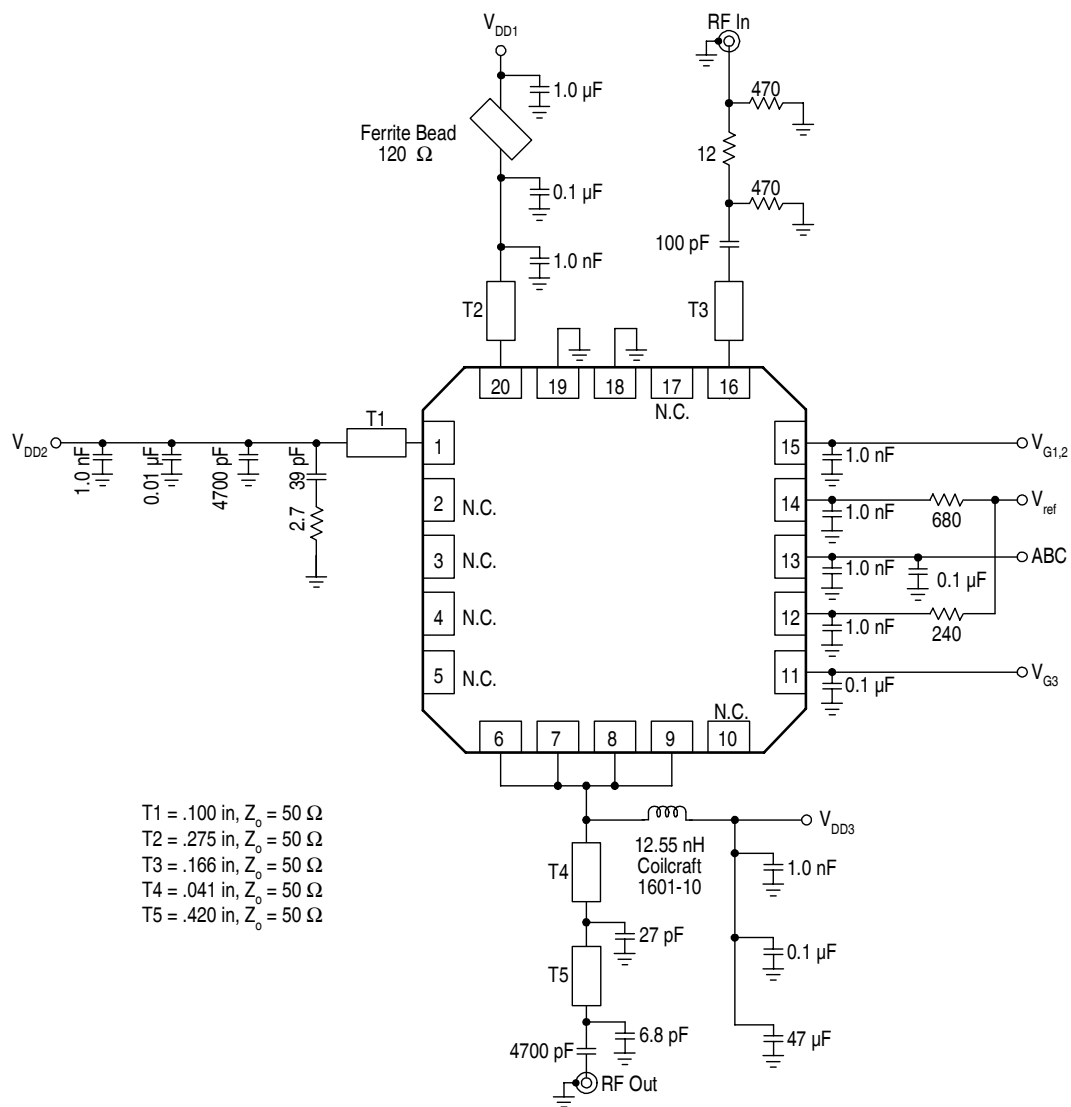


Figure 7. Application Schematic

5 Packaging

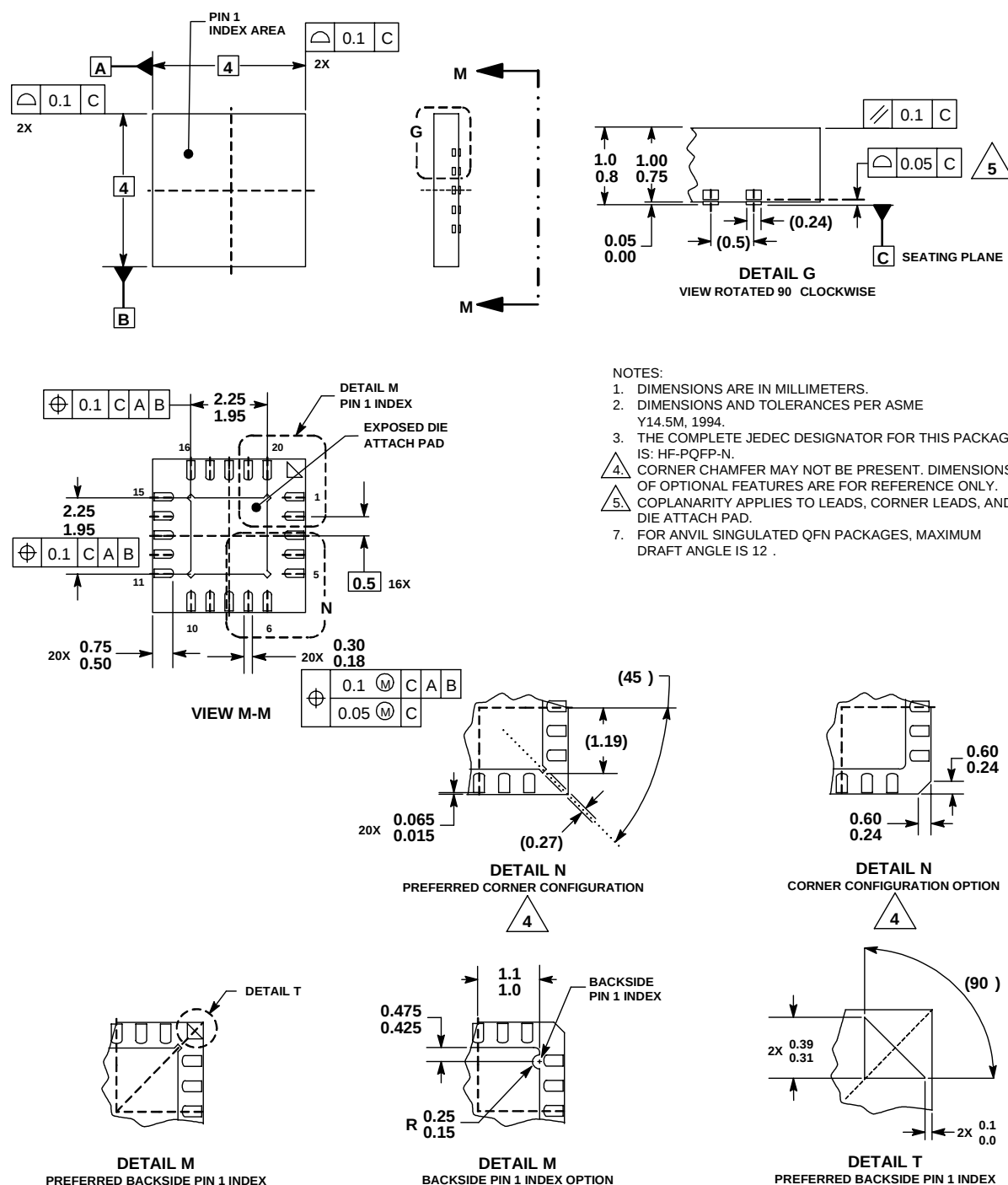


Figure 8. Outline Dimensions for QFN-20
(Case 1308-02, Issue C)

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