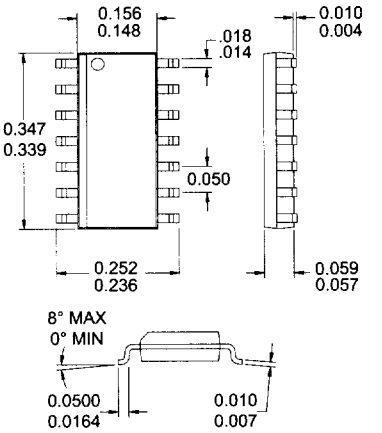
Typical Applications

- Digital and Spread-Spectrum Systems
- GMSK, QPSK, DQPSK, QAM Modulation
- Private Mobile Radio and TETRA systems
- AM, SSB, DSB Modulation
- Image-Reject Upconverters

Product Description

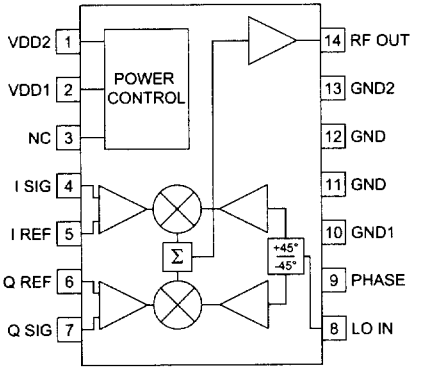
The RF2485 is a monolithic integrated universal modulation system capable of generating modulated AM, PM, or compound carriers in the VHF and UHF frequency range. The IC contains all of the required components to implement the modulation function including differential amplifiers for the baseband inputs, a 90° hybrid phase splitter, limiting LO amplifiers, two balanced mixers, a combining amplifier, and an output RF amplifier which will drive a 50Ω load. Component matching, which can only be accomplished with monolithic construction, is used to full advantage to obtain excellent amplitude balance and high phase accuracy. The unit features low power consumption, single power supply operation and adjustment free operation with no external parts required to operate the part as specified.



Package Style: SOIC-14

Optimum Technology Matching® Applied

- ☐ Si BJT
- ☐ Si Bi-CMOS
- ☐ InGaP/HBT
- ☐ GaAs HBT
- ☐ SiGe HBT
- ☐ GaN HEMT
- ☑ GaAs MESFET
- ☐ Si CMOS
- ☐ SiGe Bi-CMOS



Functional Block Diagram

Features

- Single 5V Power Supply
- Low Power
- Excellent Amplitude and Phase Balance
- Extremely Low Broadband Noise Floor
- 200MHz to 600MHz Operation

Ordering Information

RF2485	VHF Quadrature Modulator
RF2485 PCBA	Fully Assembled Evaluation Board

RF Micro Devices, Inc.
7628 Thorndike Road
Greensboro, NC 27409, USA

Tel (336) 664 1233
Fax (336) 664 0454
http://www.rfmd.com

Absolute Maximum Ratings

Parameter	Rating	Unit
Supply Voltage	-0.5 to +7.5	V_{DC}
Input LO and RF Levels	+10	dBm
Operating Ambient Temperature	-40 to +85	°C
Storage Temperature	-40 to +150	°C

Caution! ESD sensitive device.

Parameter	Specification			Unit	Condition
	Min.	Typ.	Max.		
LO Input					T=25°C, V_{DD}=5V_{DC}, I&Q inputs=2V_{PP}
Frequency Range	200		600	MHz	
Power Level	-3		+6	dBm	
Input VSWR		1.2:1			With external 50Ω termination; see application schematic, note A.
Modulation Input					
Frequency Range	DC		100	MHz	
Reference Voltage (V_{REF})	2.0		3.0	V	
Modulation (I&Q)		V_{REF}±0.7		V	I & Q signals for -0.5dBm output power.
Modulation (I&Q)		V_{REF}±1.5		V	I & Q signals for +5dBm output power.
Maximum Modulation (I&Q)		V_{REF}±2.5		V	In-phase and quadrature signals.
Input Resistance		3000		Ω	
DC Offset		50	150	mV	I_{SIG}-I_{REF} and Q_{SIG}-Q_{REF}; to achieve maximum carrier suppression.
Amplitude Error (I/Q)		0.2		dB	
Quadrature Phase Error		±1	±3	°	From 350MHz to 450MHz.
RF Output					V_{DD}=5V, LO Power=0dBm, LO Freq=400MHz, SSB, I&Q input=0.7V_P
Output Power	-1.5	-0.5		dBm	
Output Impedance		50		Ω	
Output VSWR		1.5:1			
Broadband Noise Floor		-149	-147	dBm/Hz	At 5MHz offset
Sideband Suppression	30	43		dB	Unadjusted
Carrier Suppression	20	26		dB	Modulation DC offset can be externally adjusted for optimum suppression. Suppression is typically better than 25dB without adjustment.
IM3	-40	-52		dBc	
TETRA Modulation					
Channel Power	-3.0	-2.5	-2.0	dBm	1.7V_{P-P} TETRA Modulation LO, 450MHz @ -5.0dBm, V_{REF} 2.5V
Adjacent Channel Power Rejection				dBc	VCC=5.0V
25kHz	-47.0	-48.0	-49.0	dBc	
50kHz	-67.0	-68.5	-70.0	dBc	
Power Supply					
Voltage		5		V	Specifications
	4.5		5.5	V	Operating Limits
Current		28	39	mA	Operating