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MICROWAVE CORPORATION v03.0514



HMC523LC4

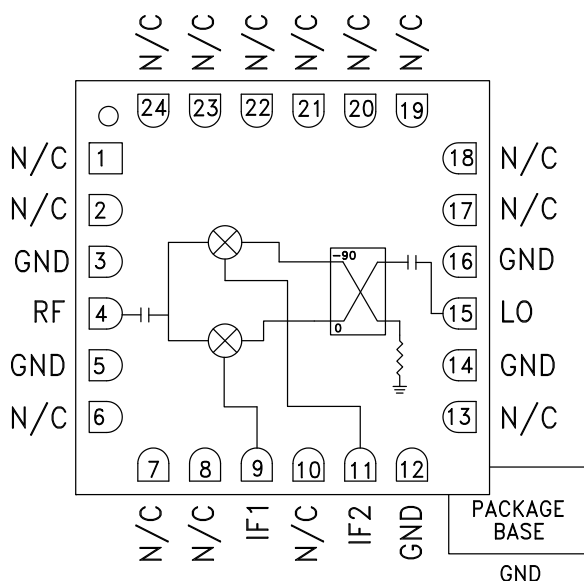
GaAs MMIC I/Q MIXER 15 - 23 GHz

Typical Applications

The HMC523LC4 is ideal for:

- Point-to-Point Radios
- Point-to-Multi-Point Radios & VSAT
- Test Equipment & Sensors
- Military End-Use

Functional Diagram



Features

- Wide IF Bandwidth: DC - 3.5 GHz
- Image Rejection: 25 dB
- LO to RF Isolation: 47 dB
- High Input IP3: +25 dBm
- 24 Lead 4x4mm SMT Package: 16mm²

General Description

The HMC523LC4 is a compact general purpose I/Q MMIC mixer in a leadless RoHS compliant SMT package, which can be used as either an Image Reject Mixer or a Single Sideband Upconverter. The mixer utilizes two standard Hittite double balanced mixer cells and a 90 degree hybrid fabricated in a GaAs MESFET process. A low frequency quadrature hybrid was used to produce a 100 MHz USB IF output. This product is a much smaller alternative to hybrid style Image Reject Mixers and Single Sideband Upconverter assemblies. The HMC523LC4 eliminates the need for wire bonding allowing use of surface mount manufacturing techniques.

Electrical Specifications, $T_A = +25^\circ\text{C}$, $IF = 100\text{ MHz}$, $LO = +17\text{ dBm}$ *

Parameter	Min.	Typ.	Max.	Min.	Typ.	Max.	Units
Frequency Range, RF/LO	15 - 21			21 - 23			GHz
Frequency Range, IF	DC - 3.5			DC - 3.5			GHz
Conversion Loss (As IRM)		8	10		10	13	dB
Image Rejection	19	25		19	25		dB
1 dB Compression (Input)		+15			+18		dBm
LO to RF Isolation	40	47		40	45		dB
LO to IF Isolation	17	22		17	22		dB
IP3 (Input)		+25			+20		dBm
Amplitude Balance		0.3			0.3		dB
Phase Balance		4			4		Deg

* Unless otherwise noted, all measurements performed as downconverter.

For price, delivery and to place orders: Hittite Microwave Corporation, 2 Elizabeth Drive, Chelmsford, MA 01824

Phone: 978-250-3343 Fax: 978-250-3373 Order On-line at www.hittite.com

Application Support: Phone: 978-250-3343 or apps@hittite.com

Data Taken As IRM With External IF Hybrid

Conversion Gain vs. Temperature

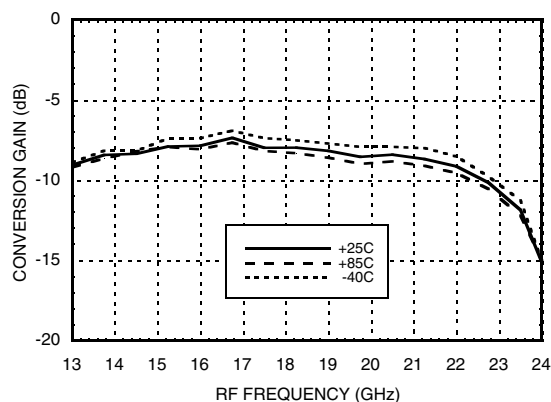
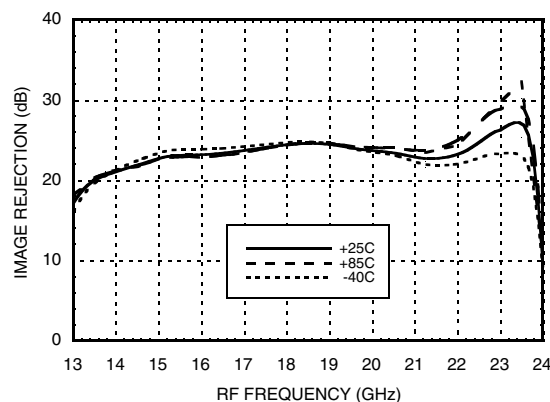
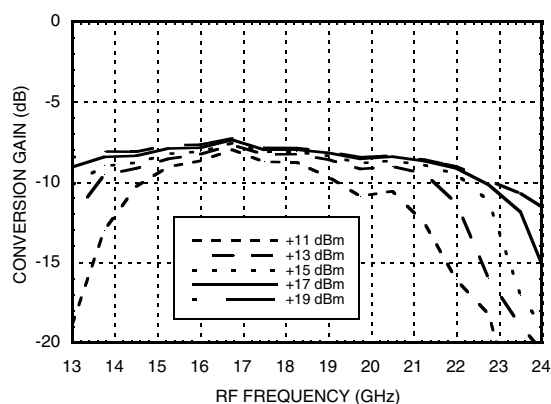


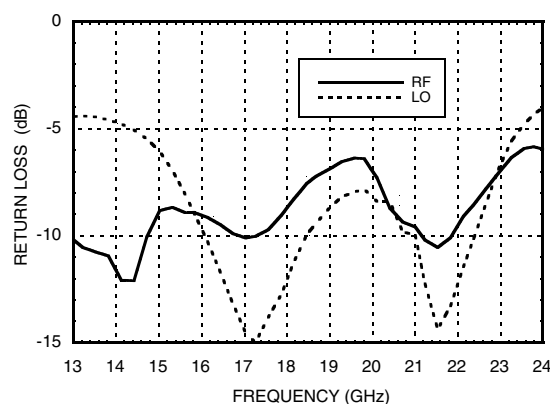
Image Rejection vs. Temperature



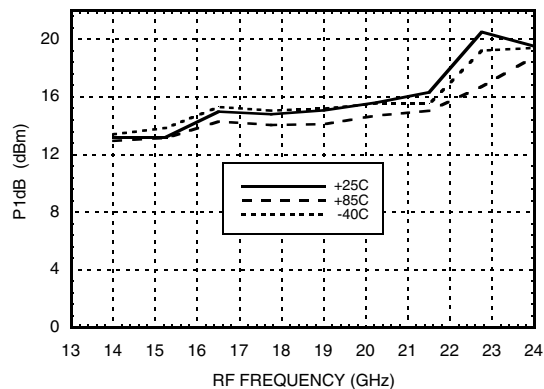
Conversion Gain vs. LO Drive



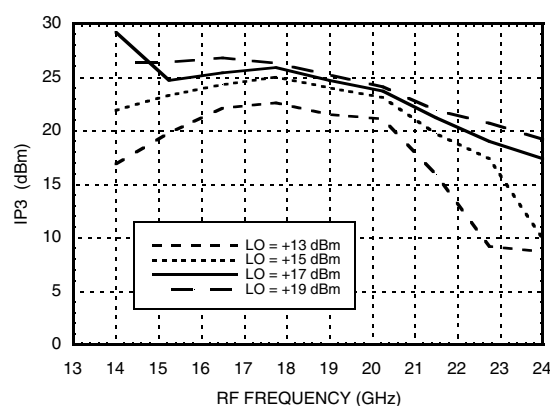
Return Loss



Input P1dB vs. Temperature



Input IP3 vs. LO Drive





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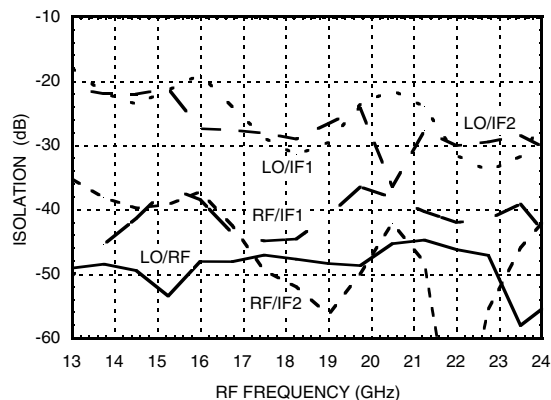


HMC523LC4

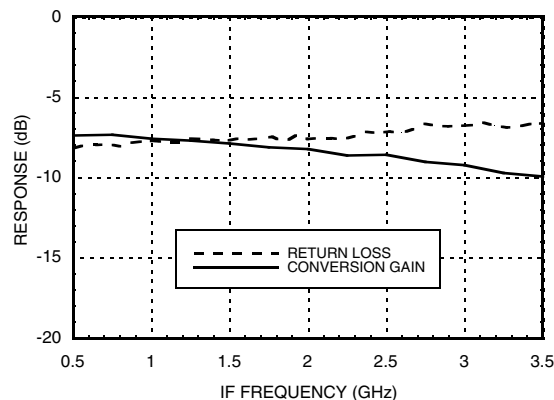
GaAs MMIC I/Q MIXER
15 - 23 GHz

Quadrature Channel Data Taken Without IF Hybrid

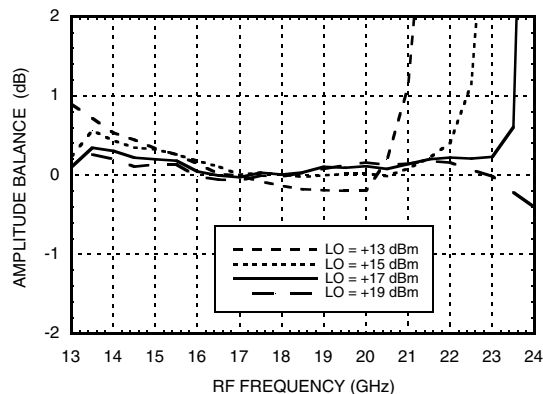
Isolations



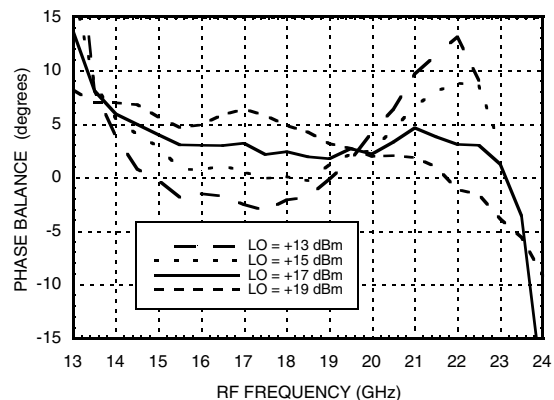
IF Bandwidth



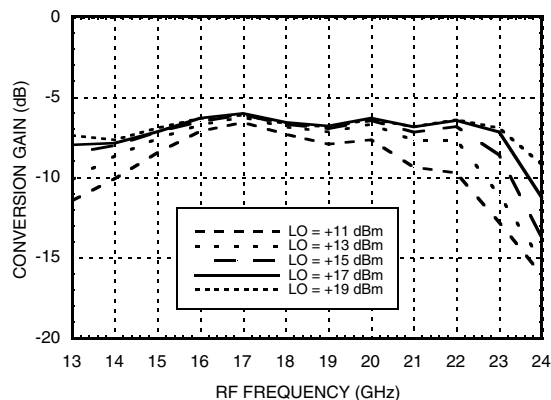
Amplitude Balance vs. LO Drive



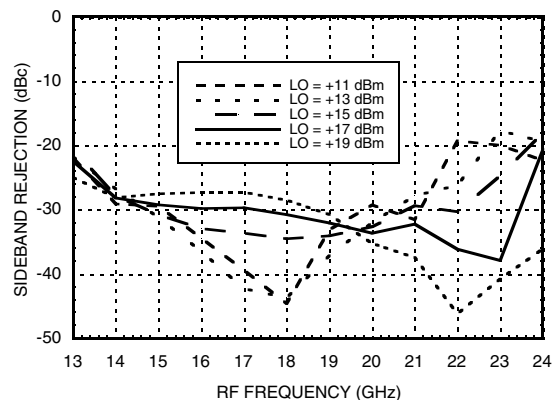
Phase Balance vs. LO Drive



Upconverter Performance Conversion Gain vs. LO Drive



Upconverter Performance Sideband Rejection vs. LO Drive



Harmonics of LO

LO Freq. (GHz)	nLO Spur at RF Port	
	1	2
15.5	47	51
17	49	56
18.5	50	63
20	47	73
21.5	50	72
23	53	71

LO = + 15 dBm
Values in dBc below input LO level measured at RF Port.

MxN Spurious Outputs

mRF	nLO				
	0	1	2	3	4
0	xx	-9	29	xx	xx
1	34	0	46	61	xx
2	87	65	82	62	87
3	xx	87	92	86	90
4	xx	xx	84	92	92

RF = 17.6 GHz @ -10 dBm
LO = 17.5 GHz @ +15 dBm
Data taken without IF hybrid
All values in dBc below IF power level

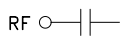
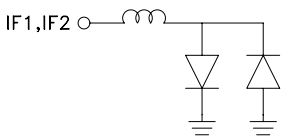
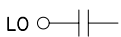
Absolute Maximum Ratings

RF / IF Input	+20 dBm
LO Drive	+ 27 dBm
Channel Temperature	150°C
Continuous Pdiss (T=85°C) (derate 5.22 mW/°C above 85°C)	340 mW
Thermal Resistance (R _{TH}) (junction to package bottom)	191.5 °C/W
Storage Temperature	-65 to +150 °C
Operating Temperature	-55 to +85 °C
ESD Sensitivity (HBM)	Class 1A

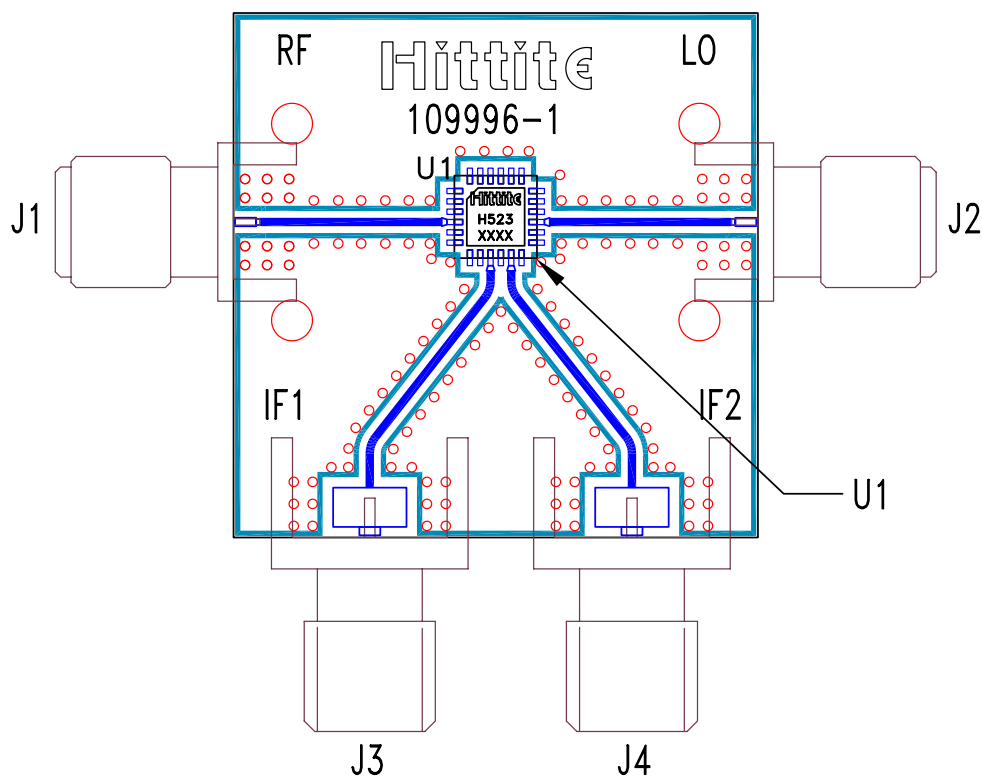


**ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS**

Pin Descriptions

Pin Number	Function	Description	Interface Schematic
1, 2, 6 - 8, 10, 13, 17 - 24	N/C	No connection required. These pins may be connected to RF/DC ground without affecting performance.	
3, 5, 12, 14, 16	GND	These pins and package bottom must be connected to RF/DC ground.	
4	RF	This pin is AC coupled and matched to 50 Ohms from 15 to 23 GHz.	
9	IF1	This pin is DC coupled. For applications not requiring operation to DC, this port should be DC blocked externally using a series capacitor whose value has been chosen to pass the necessary IF frequency range. For operation to DC, this pin must not source/sink more than 3mA of current or part non-function and possible part failure will result.	
11	IF2		
15	LO	This pin is AC coupled and matched to 50 Ohms from 15 to 23 GHz.	

Evaluation PCB



List of Materials for Evaluation PCB 109998 ^[1]

Item	Description
J1, J2	PCB Mount K RF Connector, SRI
J3 - J4	PCB Mount SMA Connector, Johnson
U1	HMC523LC4
PCB [2]	109996 Evaluation Board

[1] Reference this number when ordering complete evaluation PCB

[2] Circuit Board Material: Rogers 4350

The circuit board used in the application should use RF circuit design techniques. Signal lines should have 50 Ohm impedance while the package ground leads and exposed paddle should be connected directly to the ground plane similar to that shown. A sufficient number of via holes should be used to connect the top and bottom ground planes. The evaluation circuit board shown is available from Hittite upon request.



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HMC523LC4

GaAs MMIC I/Q MIXER
15 - 23 GHz



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

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- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
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- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

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- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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