

General

This converter platform is a broadband and versatile building block for V-band (58-63 GHz) applications. The platform is easily modified to customer requirements. It consists of one up- and one down-converter in a single unit. The up- and down-converter operate independently, and can thus be used in both frequency multiplexed and time multiplexed applications. The FC1003V/01 is designed for use with an external LO source. Waveguide filters and diplexers are available as options.

Features

- 58-63 GHz RF bandwidths (usable from 57-66 GHz)
- Platform concept, easy to customize
- 1.0-5.0 GHz IF bandwidth
- Small size and weight
- Standard waveguide and SMA interfaces

The basic V-band platform possesses a very broad IF bandwidth, from 1.0 to 5.0 GHz. A set of two identical V-band modules can be used in a full duplex configuration by appropriate choice of LO signals for the up- and down-converter respectively.

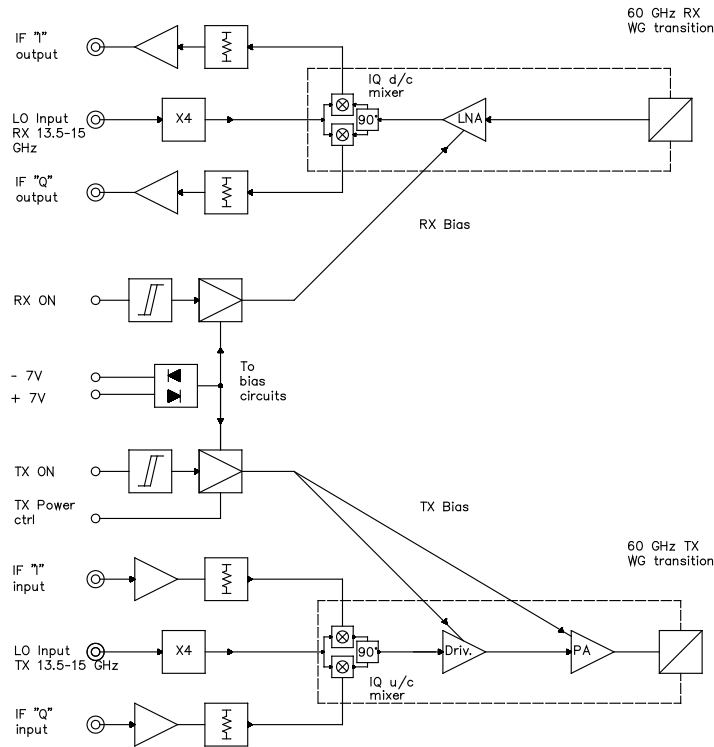
Applications

- Point-to-point or multi-point radio
- Multi-Gbps wireless transfer
- Measurement systems
- Any application requiring a high-quality mm-wave signal source

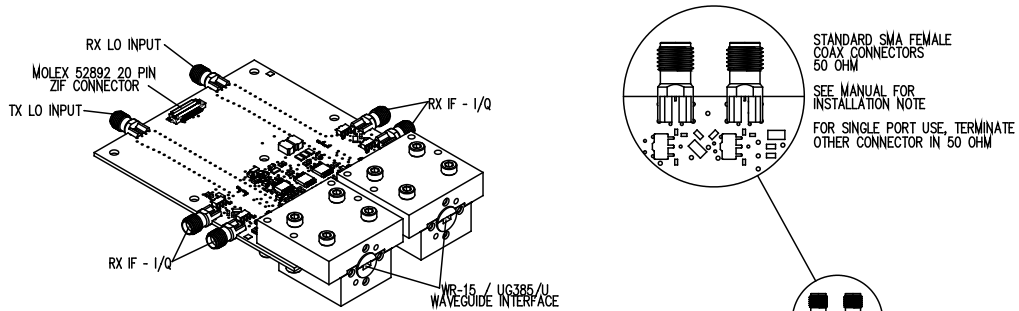
FC1003V/01 58-63 GHz V-band Converter



Block Diagram



Interfaces



Pin #	FC1003V/01
1	GND
2	VDD
3	VDD
4	VDD
5	VDD
6	GND
7	VSS
8	VSS
9	GND
10	NC
11	NC
12	GND
13	CTRL-TXON
14	CTRL-RXON
15	NC
16	NC
17	CTRL-POWER-TX
18	NC
19	GND
20	NC

Signal	Description
NC	No connect
GND	Ground
VDD	+7V
VSS	-7V

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Transmit Up-Converter				
Parameter	Min	Typical	Max	Units
RF output frequency range design/measured*	58-63			GHz
RF output frequency range operational, not guaranteed	57-66			GHz
IF input frequency range*	1		5	GHz
Nominal gain IF to RF*	25		40	dB
1-dB output compression point*	10			dBm
Saturated output power*	16			dBm
OIP3	20	25		dBm
LO synthesizer frequency range	54		60	GHz
Noise power density at waveguide output		-125		dBm/Hz
LO leakage (at port)		10	15	dBm
Gain flatness over frequency*			10	dB/GHz
Group delay variation		1		ns/GHz
RF Return loss		TBD		dB
IF Return loss	10			dB
I/Q balance phase		TBD		degrees
I/Q balance amplitude		2	4	dB
Image rejection	10	20		dB

* Value 100% production tested; all other values indicative.

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Receive Down-Converter				
Parameter	Min	Typical	Max	Units
RF output frequency range design/measured*	58-63			GHz
RF output frequency range operational, not guaranteed	57-66			GHz
IF output frequency range*	1		5	GHz
Nominal gain RF to IF*	8		20	dB
Noise figure *		8	10	dB
1-dB input compression point	TBD	TBD		dBm
LO synthesizer frequency range	54		60	GHz
Gain flatness over frequency		1	2	dB/GHz
Group delay variation		1		ns/GHz
Image rejection	10	14		dB
RF Return loss		TBD		dB
IF Return loss	10			dB
I/Q Balance Phase		TBD		deg
I/Q Balance Amplitude		2	3	dB

* Value 100% production tested; all other values indicative.

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Physical, Electrical and Environmental				
Parameter	Min	Typical	Max	Units
Operating temperature	-30		70	°C
Storage temperature	-50		80	°C
Humidity			90	% relative @25°C
Shock		Meets EN 300 019-2-4		
Vibration		Meets EN 300 019-1-4 Class 4.1		
VSS voltage*	-6.75		-7.25	V
VSS current consumption*		50	60	mA
VDD voltage *	6.75		7.25	V
VDD current consumption*		700	800	mA
Total power consumption*		5		W
Overall dimensions			117x80 x26	mm
Weight		≈ 180		g

* Value 100% production tested; all other values indicative.

Interfaces	
Waveguide input/output WR 15	UG-385/U
Control and bias connector	Molex 52893-2095
SMA connectors	SMA female