

## 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 FC1005V/00 utilizes on-board LO synthesizers. 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. The converter is controlled through a standard I2C interface.

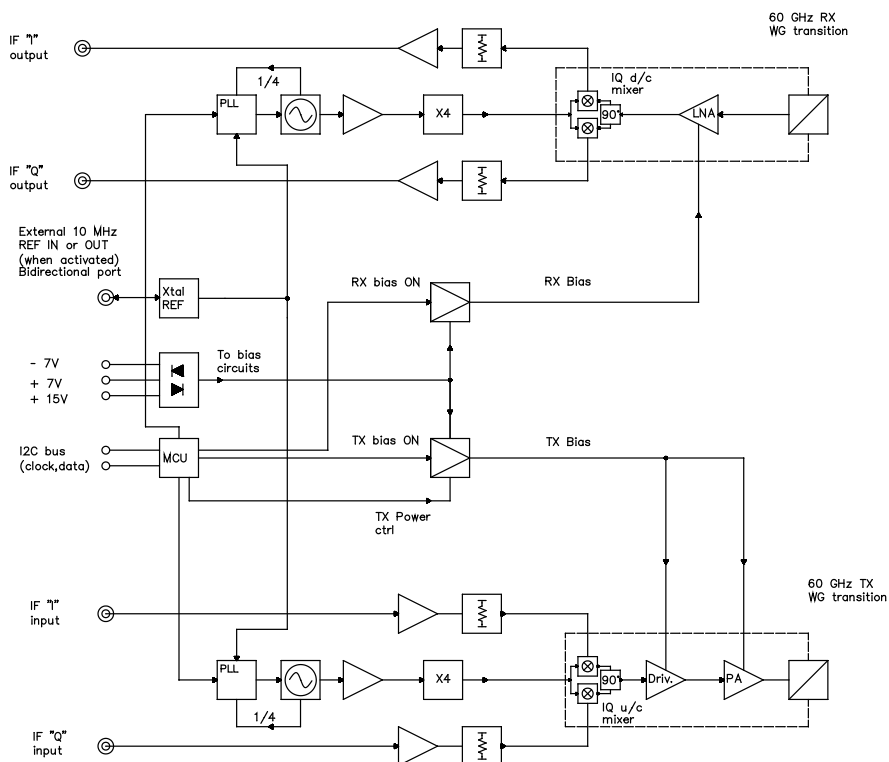
## Applications

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

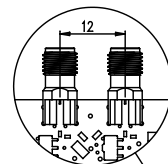
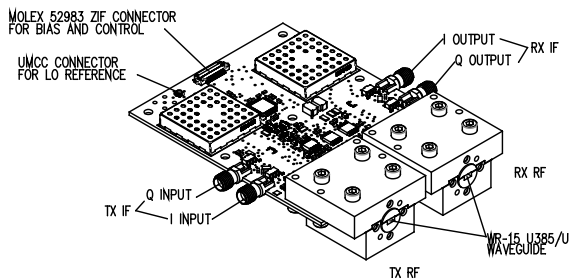
# FC1005V/00 58-63 GHz V-band Converter with LO

# SIVERSIMA

## Block Diagram

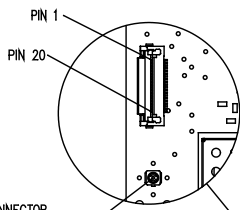


## Interfaces



STANDARD SMA FEMALE  
COAX CONNECTORS  
50 OHM  
SEE MANUAL FOR  
INSTALLATION NOTE  
FOR SINGLE PORT USE, TERMINATE  
OTHER CONNECTOR IN 50 OHM

Pin #	Converter with synth
1	GND
2	VDD
3	VDD
4	VDD
5	VDD
6	GND
7	VSS
8	VSS
9	GND
10	VPP
11	VPP
12	GND
13	NC
14	NC
15	NC
16	NC
17	NC
18	I2C-SCL
19	GND
20	I2C-SDA



ULTRA-MINIATURE COAX CONNECTOR  
10 MHz REFERENCE SIGNAL FOR LOCAL  
OSCILLATOR - 50 OHM

Signal	Description
NC	No connect
GND	Ground
VDD	+7V
VPP	+15V
VSS	-7V
I2C-SCL	I2C bus clock
I2C-SDA	I2C bus data

**FC1005V/00**  
**58-63 GHz V-band Converter with LO**



<b>Transmit Up-Converter</b>				
<b>Parameter</b>	<b>Min</b>	<b>Typical</b>	<b>Max</b>	<b>Units</b>
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 phase noise @ 100 kHz offset @ V-band			-80	dBc/Hz
LO synthesizer frequency range	56.8		59.6	GHz
LO synthesizer step size @ V-band		0.25		MHz
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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<b>Receive Down-Converter</b>				
<b>Parameter</b>	<b>Min</b>	<b>Typical</b>	<b>Max</b>	<b>Units</b>
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 phase noise @ 100 kHz offset @ V-band			-80	dBc/Hz
LO synthesizer frequency range	56.8		59.6	GHz
LO synthesizer step size @ V-band		0.25		MHz
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.

**FC1005V/00**  
**58-63 GHz V-band Converter with LO**



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*		1260	1300	mA
VPP voltage *	14.75		15.25	V
VPP current consumption*		20	30	mA
Total power consumption*		9.5		W
External reference level	0.5	1	3	V (peak-to-peak)
External reference input frequency		10		MHz
Internal reference output frequency		10		MHz
Internal reference output frequency accuracy	-5		5	ppm
Internal reference output level		3		V (peak-to-peak)
Overall dimensions			117x80 x26	mm
Weight		≈ 200		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
External/internal reference connector	UMCC