



ZBUC L-Band Block Up Converter

Teledyne Paradise Datacom's modular ZBUC L-Band Block Up Converter module is an ideal companion product for any microwave power amplifier system requiring L-Band input.

This full- featured converter is housed in a compact enclosure and can be integrated into any of Teledyne Paradise Datacom's SSPAs to accommodate L-Band input operation. The new generation of Block Up Converters is loaded with features not normally found in L-Band BUCs.

The converter's embedded controller enables remote communication via the IF input with the Teledyne Paradise Datacom's Evolution Series L-Band Modem so that a SSPA-BUC outdoor unit can have complete monitor and control functionality from the modem's IF output.

This converter can automatically detect and phase lock to external reference frequencies of 10 and 50 MHz over a wide range of reference power levels. An optional internal reference oscillator is also available.

FEATURES

- Supports FSK Monitor & Control via the IF input
- Multiple reference frequency operation
- Integrates into Compact Outdoor Amplifier or Rack Mount Amplifier
- RS485 M&C
- Built-in 1:1 Redundancy Control
- Status LED

OPTIONS

- High stability internal 10 MHz reference with auto-detection and switch-over to an applied External Reference input

Specifications for Standard Configuration

PARAMETER	NOTES	LIMITS	UNITS
Gain		0-4	dB
Gain Flatness	standard bands	± 0.5	dB
	extended bands	± 0.65	dB
Gain Slope	per 40 MHz	± 0.15	dB
Gain Variation vs. Temperature	-20 to +70 °C baseplate	0 ± 2.5	dB
Output Power	P _{1dB} minimum	0	dBm
Intermodulation Distortion	3 dB back off relative to P _{1dB}	-25	dBc
Spurious	In-Band Signal Related (C-/X-/Ku-Band)	-50	dBc
	(C-Band Sub-Bands "B" and "L")	-40	dBc
	Close to Carrier Spurious (≤ 20 MHz)	-65	dBc
	Local Oscillator	-70	dBm
Harmonics	2 nd harmonic measured at P _{1dB}	-40	dBc
Output Spectrum	Low side Local Oscillator	Non Inverted	
Input Return Loss		15	dB
Output Return Loss		17.7	dB
Noise Figure		20	dB
Group Delay (per 40 MHz segment)	Linear	0.01	ns/MHz
	Parabolic	0.003	ns/MHz ²
	Ripple	1.0	ns p-p
Reference Input Frequency	Diplexed on L-Band Input Connector	10 or 50 MHz	MHz
Reference Input Power	Diplexed on L-Band Input Connector	-10 to +5	dBm
Input Voltage		8 to 30	VDC
Power Consumption	Without internal reference	12	W
	With internal reference	15	W
FSK Communication ¹ Diplexed on L-Band Input	Center Frequency	650	KHz
	Deviation	± 60	KHz
	Locking Range	± 32.5	KHz
	Input Power Range	-15 to -5	dBm
	Start Tone Time	10	msec
Alarm Output	Open Collector Output	High = Fault	
Internal Reference Option ²	Reference Frequency	10	MHz
	Stability over Temperature (-20 to +85 °C)	± 3 • 10 ⁻⁸	
	Aging per day (after 30 days)	± 1 • 10 ⁻⁹	
	Aging per year (after 30 days)	± 6 • 10 ⁻⁸	

¹ FSK Communication protocol, document # 201410

² Units with the internal reference option will automatically detect and switch to an applied external reference.

Specifications for High Gain and Power Configuration

PARAMETER	NOTES	LIMITS	UNITS
Gain	range	40-20	dB
Gain Flatness	standard bands	± 0.6	dB
	extended bands	± 0.75	dB
Gain Slope	per 40 MHz	± 0.2	dB
Gain Variation vs. Temperature	-20 to +70 °C baseplate	± 1.5	dB
Gain Adjustment	0.1 dB Resolution	20	dB
Output Power	P _{1dB} minimum	27	dBm
Intermodulation Distortion	3 dB back off relative to P _{1dB}	-25	dBc
Spurious	In-Band Signal Related (C-/X-/Ku-Band)	-50	dBc
	(C-Band Sub-Bands "B" and "L")	-40	dBc
	Close to Carrier Spurious (≤ 20 MHz)	-65	dBc
	Local Oscillator	-40	dBm
Harmonics	2 nd harmonic measured at P _{1dB}	-40	dBc
Output Spectrum	Low side Local Oscillator	Non Inverted	
Input Return Loss		15	dB
Output Return Loss		17.7	dB
Noise Figure		20	dB
Group Delay (per 40 MHz segment)	Linear	0.01	ns/MHz
	Parabolic	0.003	ns/MHz ²
	Ripple	1.0	ns p-p
Reference Input Frequency	Diplexed on L-Band Input Connector	10 or 50 MHz	MHz
Reference Input Power	Diplexed on L-Band Input Connector	-10 to +5	dBm
Input Voltage		8 to 30	VDC
Power Consumption	Without internal reference	22	W
	With internal reference	25	W
FSK Communication ¹ Diplexed on L-Band Input	Center Frequency	650	KHz
	Deviation	± 60	KHz
	Locking Range	± 32.5	KHz
	Input Power Range	-15 to -5	dBm
	Start Tone Time	10	msec
Alarm Output	Open Collector Output	High = Fault	
Internal Reference Option ²	Reference Frequency	10	MHz
	Stability over Temperature (-20 to +85 °C)	± 3 • 10 ⁻⁸	
	Aging per day (after 30 days)	± 1 • 10 ⁻⁹	
	Aging per year (after 30 days)	± 6 • 10 ⁻⁸	

¹ FSK Communication protocol, document # 201410

² Units with the internal reference option will automatically detect and switch to an applied external reference.



Frequency Bands

Band	Frequency Plan*	IF Input	LO Frequency	RF Output
C	Sub-Band "A"	950 - 1525 MHz	4.900 GHz	5.850 - 6.425 GHz
C	Sub-Band "B"	950 - 1825 MHz	4.900 GHz	5.850 - 6.725 GHz
C	Sub-Band "C"	950 - 1870 MHz	4.800 GHz	5.750 - 6.670 GHz
C	Sub-Band "E"	950 - 1250 MHz	5.475 GHz	6.425 - 6.725 GHz
C	Sub-Band "F"	950 - 1250 MHz	5.775 GHz	6.725 - 7.025 GHz
C	Sub-Band "G"	950 - 1675 MHz	4.800 GHz	5.750 - 6.475 GHz
C	Sub-Band "L"	950 - 1550 MHz	3.450 GHz	4.400 - 5.000 GHz
X	Sub-Band "A"	950 - 1450 MHz	6.950 GHz	7.900 - 8.400 GHz
X	Sub-Band "J"	1025 - 1800 MHz	6.100 GHz	7.125 - 7.900 GHz
Ku	Sub-Band "A"	950 - 1450 MHz	13.050 GHz	14.00 - 14.50 GHz
Ku	Sub-Band "B"	950 - 1700 MHz	12.800 GHz	13.75 - 14.50 GHz
Ku	Sub-Band "D"	1350 - 1650 MHz	13.750 GHz	15.10 - 15.40 GHz
Ku	Sub-Band "E"	1200 - 1450 MHz	11.800 GHz	13.00 - 13.25 GHz
Ku	Sub-Band "F"	950 - 1450 MHz	11.800 GHz	12.75 - 13.25 GHz

* Custom frequency plans available upon request.

Local Oscillator Phase Noise

Offset	Guaranteed Max.	C-Band Typical	X-Band Typical	Ku-Band Typical	Units
10 Hz	-30	-60	-58	-56	dBc/Hz
100 Hz	-60	-74	-70	-67	dBc/Hz
1 KHz	-70	-84	-80	-78	dBc/Hz
10 KHz	-80	-100	-94	-91	dBc/Hz
100 KHz	-90	-105	-97	-94	dBc/Hz
1 MHz	-90	-125	-122	-120	dBc/Hz

Recommended Reference Phase Noise

Offset	Max.	Units
10 Hz	-120	dBc/Hz
100 Hz	-140	dBc/Hz
1 KHz	-145	dBc/Hz
10 KHz	-152	dBc/Hz
100 KHz	-155	dBc/Hz



Part Number Configuration

ZBUC [] [X] [] [] [X] [X] [] [X] [X] [P]

Frequency Band	
C	C-Band
X	X-Band
K	Ku-Band

Configuration Modifier	
X	Standard
H	High Gain and Power

Frequency Sub-Band	
C-Band	
A	5.850 to 6.425 GHz
B	5.850 to 6.725 GHz
C	5.750 to 6.670 GHz
E	6.425 to 6.725 GHz
F	6.725 to 7.025 GHz
G	5.750 to 6.475 GHz
L	4.400 to 5.000 GHz
X-Band	
A	7.900 to 8.400 GHz
J	7.125 to 7.900 GHz
Ku-Band	
A	14.00 to 14.50 GHz
B	13.75 to 14.50 GHz
D	15.10 to 15.40 GHz
E	13.00 to 13.25 GHz
F	12.75 to 13.25 GHz

BUC Type	
P	PLO zBUC

Options	
XX	Standard

Reference Designator	
1	External Reference
2	Internal 10 MHz Reference

COMMENTS:

Use and Disclosure of Data: This product is classified as EAR99 and is subject to U.S. Department of Commerce regulations. Export, reexport or diversion contrary to U.S. law is prohibited.

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