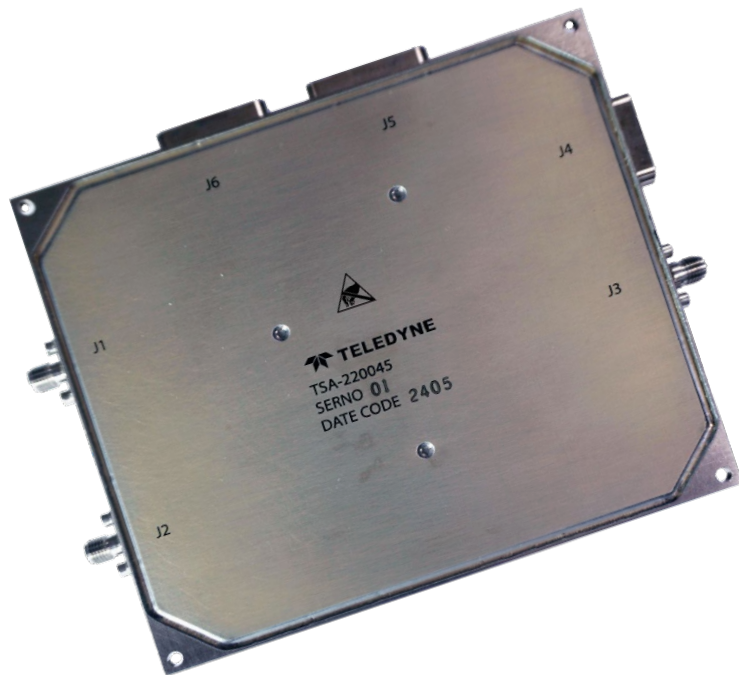


Description

This Ka-Band Block Upconverter (BUC) is designed to operate over four switch select 1GHz BW output frequency ranges. The unit can be factory configured for a single output frequency range, or be switched via a RS-422 control to any one of the four bands. The standard switched unit is configured with the following operating bands: 27.5-29.1, 28-29, 29-30, and 30-31 GHz. This product may be configured for alternate 1GHz BW bands down to 25 GHz.



Other Products:

Low Noise Block Converters (Ku & X-Band)

Block Up Converters (Ku & X-Band)

Low Noise Amplifiers (Ku & K-Band)

Solid State Power Amplifiers
(X, Ku & Ka-Band)

Synthesizers (L, C or X-Band)

Specifications:

Parameter		Value	Parameter		Value
Output Freq. Range	(Switchable)	27.5 to 31 GHz	External Reference Clock Input Freq. Multiplexed with IF input		10 MHz
Input Power with No Damage ¹		5 dBm	External Reference Clock Input Level ¹	25 °C	0 ± 3 dBm
Input Freq. Range	Switched LO, Non-Inversion	1.0 to 2.0 GHz	External Reference Clock Waveform ¹	50 Ohm load	Sinusoidal
Output Power, Linear		+5 dBm min	External Reference Clock Phase Noise Requirement	10 Hz Offset 100 Hz Offset 1 Khz Offset	-120 dBc/Hz -145 dBc/Hz -165 dBc/Hz
Modulation Spectrum at Linear Power ³		-50 dBc	Output Connector (J3)		2.9 mm-F
Group Delay Variation over full band ¹		3nsec Max	IF Input Connector (J2)		SMA(F)
Gain		26dB Min	DC Power Connector (J6)		21 Pin Micro-D
VSWR Input		2:1	Monitor & Control Connector (J4)		15 Pin Micro-D
VSWR Output		1.7:1	SSPA, Interface Connector (J5)		25 Pin Micro-D
Gain Variation vs Freq. at fixed Temperature	Over any 40MHz IF BW Over full IF BW	± 0.75 dB ± 3.0 dB	Ref Output Connector (J1)		SMA(F)
Gain Variation vs Temperature at fixed Freq.		± 3.0 dB	Size		5.0" x 4.5" x 1.15"
Output Spurious @ Linear Power	2 nd Harmonic (2xIF)+LO Fc> ± 20MHz	-55 dBc	Weight		1 lbs max.
LO Freq. Range	Switched LO, Low Side 50 Mhz Tuning Step Size	26.55 GHz 27.05 GHz 28.05 GHz 29.05 GHz	Finish	Body Mounting Surface	Electroless Nickel Chem Film
Phase Noise (with 10 MHz external Reference)	100 Hz Offset 1 KHz Offset 10 KHz Offset 100 KHz Offset 1 MHz Offset 10 MHz Offset	-62 dBc/Hz -72 dBc/Hz -78 dBc/Hz -92 dBc/Hz -112 dBc/Hz -115 dBc/Hz	Altitude ^{1,2}	Operational	≤ 60,000 ft
Input Voltage ¹		+28 ± 0.5 VDC	Relative Humidity ¹		Fully Hermetic
-max spurious with max input ripple	60 Hz, to 1 MHz, 100 mVpp		Shock ^{1,2}	RTCA DO-160G	6g, 11ms Half Sine
			Operating Temp Range		-55°C to +85°C
			Input DC Current		400 mA at 28V max

¹GBNT = Guaranteed but not tested.

²Designed to comply with RTCA DO 160G, Section 7, Category B. Compliance by analysis of similarity to FATR-211042.

³OQPSK FSymbol = 10 Msps Spectral Re-growth @ 1.0 x FSymbol

Micro D Connector Pinout Descriptions

Micro D Connector J5 on the BUC consists of 15 pins with the pinouts as described in Table 1. The RS-422 GND is internally connected to the GND pins but is provided as a separate output to connect with the source RS-422 connection. Please see Table 3 on how to interface the BUC RS-422 with the system or source RS-422. Micro D Connector J6 on the BUC provides for input DC power connections to power the BUC and pass thru DC power to SSPA.

Table 1: J4 Pin Connections

J5 PIN CONNECTIONS		
PIN NO.	FUNCTION	DESCRIPTION
J4 -1	+RX (RS-422)	
J4-2	-RX (RS-422)	
J4-3	GND	
J4-4	RESERVED	
J4-5	RFTXEN	
J4-6	FACTORY RESERVED	
J4-7	FACTORY RESERVED	
J4-8	CUSTOMER RESERVED	
J4-9	+TX (RS-422)	
J4-10	-TX (RS-422)	
J4-11	FACTORY RESERVED	
J4-12	FACTORY RESERVED	
J4-13	FACTORY RESERVED	
J4-14	CUSTOMER RESERVED	
J4-15	CUSTOMER RESERVED	

Table 2: J5 Connector Functions

J5 PIN CONNECTIONS		
PIN NO.	FUNCTION	DESCRIPTION
J5 -1	+28V_SSPA	
J5-2	+28V_SSPA	
J5-3	+28V_SSPA	
J5-4	+28V_SSPA	
J5-5	GND	
J5-6	GND	
J5-7	GND	
J5-8	-TX (RS-422)	
J5-9	+RX (RS-422)	
J5-10	RFTXEN (OPTIONAL, +3.3V=ON, OV=OFF	
J5-11	GND (RS-422)	

J5-12	GND	
J5-13	RESERVED (DO NOT CONNECT)	
J5-14	+28V_SSPA	
J5-15	+28V_SSPA	
J5-16	+28V_SSPA	
J5-17	GND	
J5-18	GND	
J5-19	GND	
J5-20	GND	
J5-21	+TX (RS-422)	
J5-22	-RX (RS-422)	
J5-23	SUMFLT (OPTIONAL, +3.3V=FAULT)	
J5-24	GND	
J5-25	RESERVED (DO NOT CONNECT)	

Table 3: J6 Connector Functions

J6 PIN CONNECTIONS		
PIN NO.	FUNCTION	DESCRIPTION
J6 -1	+28V_BUC	
J6-2	+28V_BUC	
J6-3	+28V_SSPA	
J6-4	NC	
J6-5	NC	
J6-6	GND	
J6-7	GND	
J6-8	GND	
J6-9	NC	
J6-10	NC	
J6-11	GND	
J6-12	+28V_SSPA	
J6-13	+28V_SSPA	
J6-14	+28V_SSPA	
J6-15	NC	
J6-16	NC	
J6-17	GND	
J6-18	GND	
J6-19	GND	
J6-20	NC	
J6-21	NC	

Table 4: RS-422 BUC Command List

“VER”	Indicates Firmware Version
“SN”	Indicates Unit Serial Number
“ECHO 0”	Turns Command Echo OFF (command sent is not repeated back)
“ECHO 1”	Turns Command Echo ON (command send is repeated back)
“RF0”	Turns RF TX OFF
“RF1”	Turns RF TX ON
“STA”	Reports Fault Status
“POUT”	Reports Output Power (dBm)
“FREQ”	Reports Current FS DAC value
“FS WORD HHHH”	Frequency Select, 4 digit HEX value (HHHH) represents the band control. DAC value 0 to 4095
“TEMP”	Reports BUC Temperature (°C)
“SAVEFS”	Save Gain Control Value to Memory

Digital Protocols

Communication with the BUC is done through RS-422. However, there are two discrete pins: LOCK and MUTE. MUTE is a hardwired TTL controlled pin for disabling RF power in case of emergency. This pin is high through an internal pull-up. To disable the unit, simply ground this pin. LOCK is a hardwired TTL level (+3.3V high) signal that indicates a fault when HIGH and no fault when LOW. The fault status can also be read through the RS-422. The serial format is shown in Table 4. A high-to-low transition indicates the start of the data. A newline (“\n”) following the command indicates the end of the command.

Outline:

NOTES: (UNLESS OTHERWISE SPECIFIED)

1. DIMENSIONS ARE IN INCHES.
2. TOLERANCES: .XXX ± .010 .XX ± .02
3. MARKING AS SHOWN SHALL BE PERMANENT AND LEGIBLE PER MIL-STD-130 USING BLACK EPOXY BASE INK.
4. CASE MATERIAL: ALUMINUM
5. FINISH: ALL SURFACES EXCEPT TOP AND BOTTOM COVER ARE ELECTROLESS NICKEL PLATE PER MIL-C-26074. TOP AND BOTTOM COVERS ARE CHEM FILM PER MIL-DTL-5541, CLASS 3, YELLOW.

