

Sri Sai Communications Private Limited

SatCom & Defense Communication Systems & Products

DATASHEET

Ku Band Test Loop Translator (Multi-Band)

Model No : KUTLT-6001

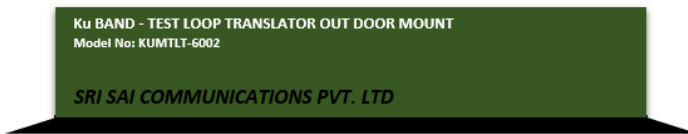
Introduction

The unit converts input frequency band of 13.75 to 14.50 GHz to the Output signal band of 10.70 to 12.75 GHz with Multi Band LO provides frequency conversion of Ku-Band earth terminal uplink transmit carrier signals to earth terminal downlink receive carrier signals for the purpose of the ground station system checkout in Ku Band. Main features related to Gain, gain flatness, phase noise, spurious levels etc., are highlighted in this data sheet. The unit is remotely controlled and monitored through different protocols like TCP/IP, RS422 et., The unit is housed in a 1RU chassis with agile features to cater for reliability and mechanical stability. Unit operates on 230V AC input power and the environmental specs catered for use in indoor controlled operations.

Features

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| <ul style="list-style-type: none"> ▪ Excellent phase noise of Local Oscillators with OCXO internal reference ▪ Very low in-band and out-of-band spurious ▪ M&C integration through TCP IP, RS422, etc., Integration Protocols ▪ Remote Management through Web Interface Console | <ul style="list-style-type: none"> ▪ On-board state-of-the-art microcontroller <ul style="list-style-type: none"> ○ Auto selectable Int./Ext. Reference ○ Memory storage facility for data recall ▪ Parameters like gain, frequency, etc are varied and displayed either on front panel or remote frontend ▪ Smart monitoring capabilities via TCP IP Remote Interface and M&C Applications |
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FRONT PANNEL VIEW



BACK PANNEL VIEW



Input Frequency	13.75 GHz	14.50 GHz
Output Frequency	10.70 GHz	12.75 GHz

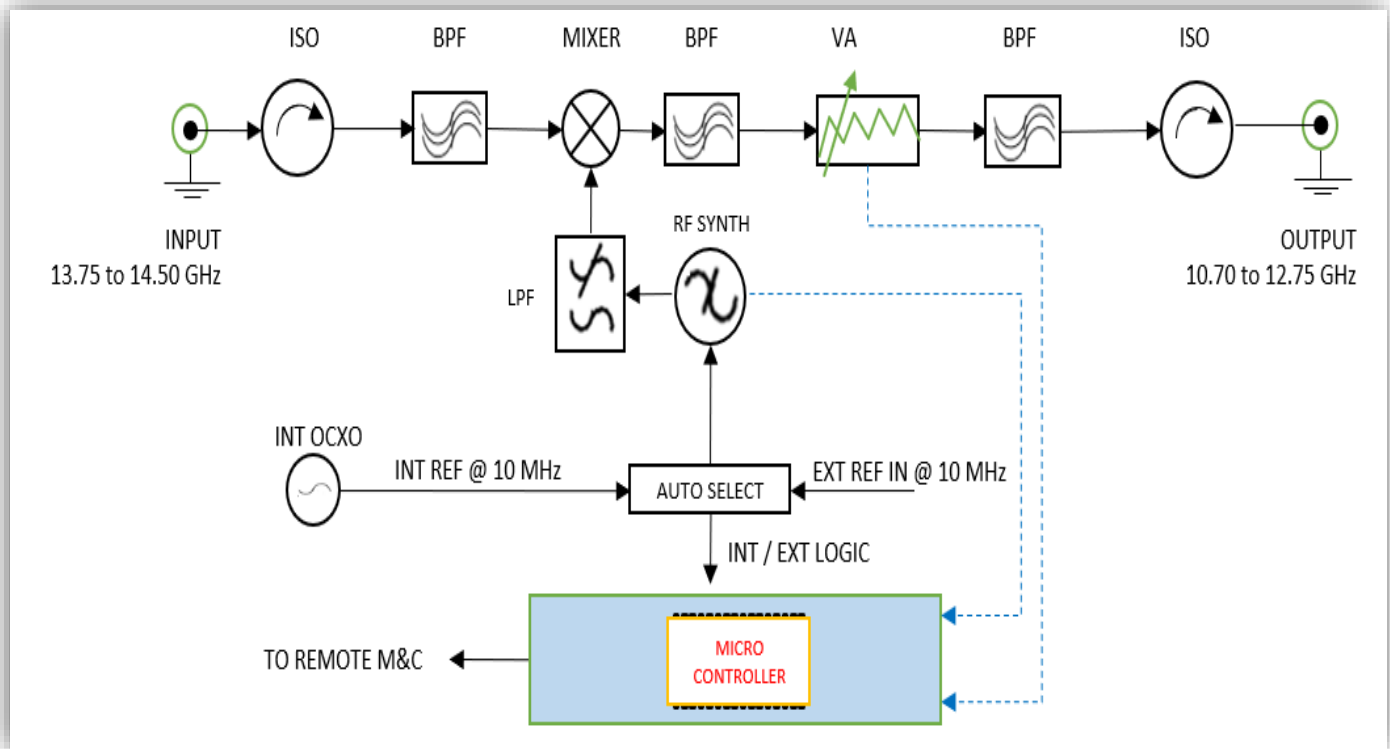
LO 1	17.50 GHz @ Step Size 1 KHz	LO 3	28.00 GHz @ Step Size 1 KHz
LO 2	23.00 GHz @ Step Size 1 KHz	LO 4	30.50 GHz @ Step Size 1 KHz

Parameters	Value
Conversion Loss	20 dB
Amplitude Response	± 0.5 dB over any 40 MHz ± 1.5 dB over output frequency band
Frequency stability	± 1 x 10 ⁻⁷ (0 to 50° C)
I/P & O/P Return Loss	18 dB min
Level Control	25 dB typical in 1 dB steps
Output Phase Noise	- 65 dBc @ 100 Hz - 75 dBc @ 1KHz - 85 dBc @ 10 KHz
Internal Reference	Auto Select @ 10 MHz
External reference input	External reference @ 10 MHz @ +3 dBm typical and +10 dBm max with auto select
Spurious	- 40 dBc In-Band - 50 dBm Out-Of-Band
Connectors – RF input & RF output	“N” – Type female Output RF - N Type (F) & Input IF - BNC (F)
Summary Alarm	Provided through remote M & C port for summary fault indication for any fault in lock status of LO, Power supply and control failure.
Mute	Rejection of 50 dB min
Remote Interface & Control	RS422 Protocol provided for M&C development for controlling and monitoring of the unit
Input AC voltage	230/240 VAC ±10%, 47 – 63 Hz
Operating Temperature	-20 to +60° C
Environmental	Temp. 0 – 60° C, 0 – 95% relative humidity and 9000 ft MSL
Type	Outdoor Mount

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BLOCK DIAGRAM



Ku-Band TLT Band Coverage Calculations

- ❖ Ku-Band TLT Unit utilizes Ultra Broad Band Mixer for covering LO drive frequency from 1.75 GHz to 3.05 GHz and yielding the output frequency range from 10.70 GHz to 12.75 GHz for the corresponding input range of 13.75 to 14.5 GHz
- ❖ The triple balanced mixer needs very high LO drive power due to very low LO frequency range for converting Ku-Band Input to Ku-Band output frequency
- ❖ The four fixed LO frequencies that are (F1) 1.75 GHz, (F2) 2.30 GHz, (F3) 2.80 GHz and (F4) 3.05 GHz will convert the input Ku band signal range to different ranges in the output frequency band to cover entire tuning and conversion from input band to output band
- ❖ Due to very high LO drive level, the mixer will produce harmonic frequencies which will span into the desired output frequency range for each LO
- ❖ The frequency conversion arrangement for F1 to F4 is so specified that the multiplication harmonic doesn't span into the specified output range for each frequency. However, for F1 1.75 GHz LO, the known spur will appear inside the desired range as significant spurious at 12.25 GHz (i.e 7×1750 MHz) and becomes unavoidable.
- ❖ All other output frequency ranges are specified taking care of the avoidance of the harmonic spurious to appear inside the output range.
- ❖ The selection of F1 to F4 will cover entire output range 10.7 to 12.75 GHz as required

The following table shows the frequency coverage calculations for F1 to F4 LO Frequencies. Below table shows the input RF frequency range to be fed for the corresponding output frequency range and takes care of non-appearance of the LO harmonic as spurious in the range:

LO	LO Freq. (GHz)	Input Freq. Range (GHz)		Output Freq. Range (GHz)		Spurious	Remarks
1	1.75	13.75	14.50	12.00	12.75	< -40 dBc	except the unavoidable LO 7th harmonic @ 12.25 GHz
2	2.30	14.00	14.50	11.70	12.20	< -40 dBc	LO harmonic out of range
3	2.80	14.05	14.50	11.25	11.70	< -40 dBc	LO harmonic out of range
4	3.05	13.75	14.50	10.70	11.45	< -40 dBc	LO harmonic out of range