Software Specifications

Parameter	Conditions	Unit	Min.	Typ.	Max.
Switch time	---	ms	---	100	---
PC OS	Windows				
API Support Language	C#, C/C++, Python, LabView, MATLAB				
Control Interface	Ethernet				

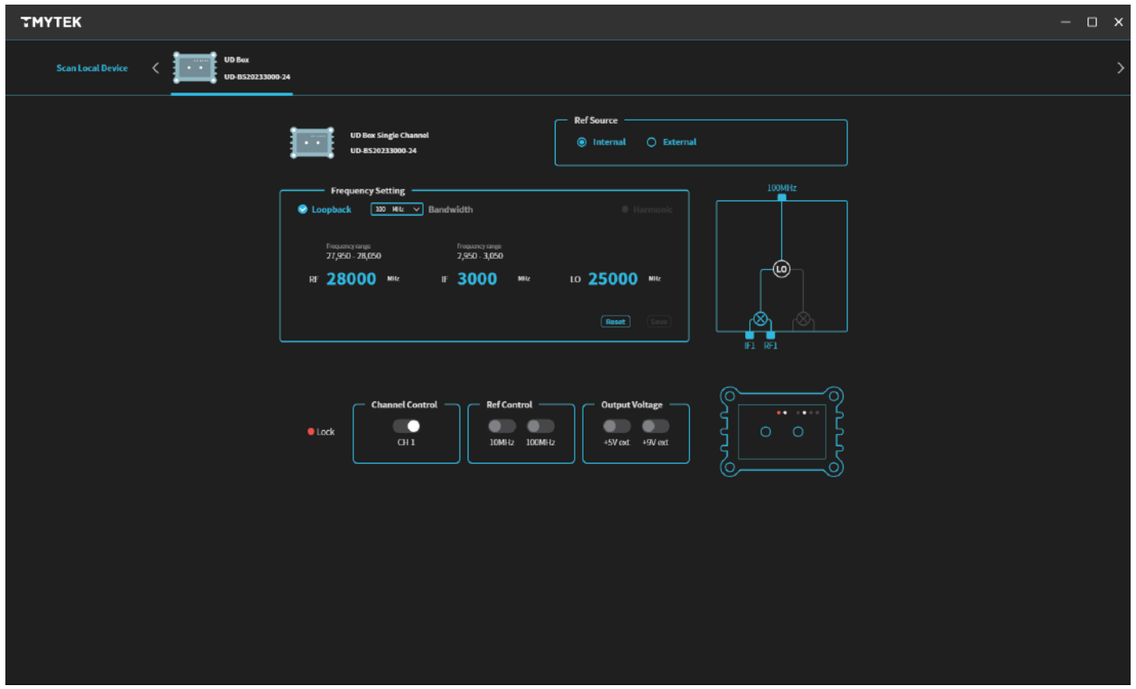

Figure 5. Controlling UD Box using TMXLAB Kit

UD Box

Compatible for All 5G NR Bands

5G era is coming soon. Massive deployment is expected in 2021 worldwide. IMT-2020 defines eMBB, URLLC and mMTC which are keys to successful 5G communications. TMYTEK has developed a scalable and flexible system to help our customers in moving onto 5G beamforming developments and tests with ease. We call it the BBox™. Our BBox™ is comprised of several building blocks including AA-Kit, ΦA Box, BB Switch, UD Box and control interface.

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/TMYtek

/TMY technology

Version: 2021-01

UD Box

World's Leading 5G Beamforming Solution Provider

www.tmytek.com

UDBox BB-UDC-2444-0014-S / BB-UDC-2444-0014-D

Features

- RF: 24 to 44 GHz
- IF: 0.01 to 14 GHz
- Adjustable LO frequency: 16 to 32 GHz
- Conversion Loss: 15 dB (typical)
- Integrated with internal LO source
- Choices of single or dual channels
- Up and down conversion in the same box
- Easy-to-use
- Ideal for 5G communication application
- RoHS Compliant

Function Block Diagram

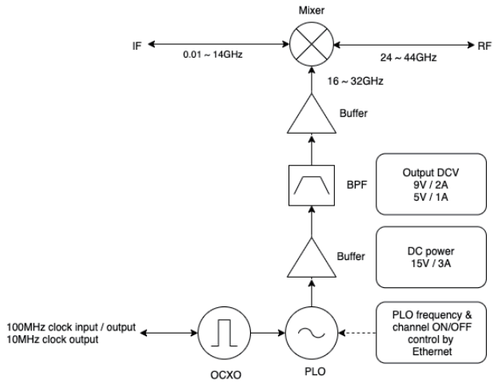

Figure 1. UD Box Single Channel Block Diagram

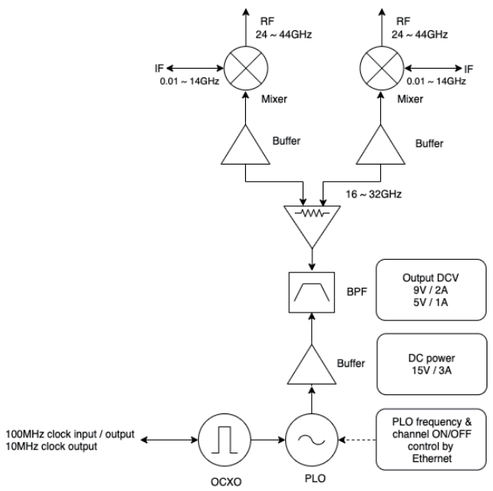

Figure 2. UD Box Dual Channel Block Diagram

RF Specifications

Parameter	Conditions	Unit	Min.	Typ.	Max.
RF Frequency	---	GHz	24	---	44
IF Frequency	---	GHz	0.01	---	14
LO Frequency	Controllable	GHz	16	---	32
LO Frequency Resolution	---	MHz	---	1	---
Reference Clock Stability (OCXO)	-30 ~ +70 degree	ppb	-50	---	50
Reference Clock Accuracy	-30 ~ +70 degree	Hz	-30	---	30
LO Stable Time	---	min	---	30	---
Conversion Loss	Full band	dB	9	15*1	20
RF to IF Isolation	With filter / No filter	dB	---	60 / 18	---
IF to LO Isolation	With filter / No filter	dB	---	60 / 15	---
Output P1dB	Up conversion Tested at RF port	dBm	-10	-5*1	-2
Input P1dB	Down conversion Tested at RF port	dBm	4	10*1	12
Noise Figure	Full band	dB	9	15*1	20
RF Return Loss	---	dB	7	10	---
IF Return Loss	---	dB	5	10	---
10 MHz Output Power	Internal	dBm	-3	---	---
100 MHz Output Power	Internal	dBm	---	4	---
100 MHz Input Power	External	dBm	1	---	8

**1 Typical Condition: RF 28 GHz / LO 26 GHz*

DC and Clock Specifications

Parameter	Conditions	Unit	Min.	Typ.	Max.
DC Power Consumption	Without external DC power output	W	---	10.5	18
DC Supply Voltage	---	V	---	15	---
DC Supply Current	---	A	---	3	---
External DC Power Outputs	5V DC Power	V	4.8	5	5.3
		A	---	---	1
	9V DC Power	V	8.6	9	9.5
		A	---	---	2
Reference Clock	Out	MHz	---	10	---
	In / Out	MHz	---	100	---

Connector Specifications

Parameter	Conditions	Location	Type and Function
RF	Single Channel	Front Panel	Single 2.4 mm connector
	Dual Channel	Front Panel	Two 2.4 mm connectors
IF	Single Channel	Front Panel	Single 2.92 mm connector
	Dual Channel	Front Panel	Two 2.92 mm connectors
Power DC IN		Back Panel	Input DC power
Frequency Control		Back Panel	Ethernet Port LO frequency control
ON/OFF Button		Back Panel	Power ON/OFF switch
Reference Clock Port	10MHz	Back Panel	BNC connector
	100 MHz	Back Panel	SMA connector
DC Power Output Port		Back Panel	Output 5V and 9V DC power

Accessories Specifications

The following accessories are developed by TMYTEK for use with UD Box under different applications (with emphasis on the 5G application). Please consult us for detailed accessories' specifications.

Item Type	3GPP Band	Unit	Operating Frequency
RF Filter	n257	GHz	26.5 - 29.5
	---	GHz	27 - 29
	n261	GHz	27.5 - 28.5
	n260	GHz	37 - 40
	---	GHz	39.7 - 45.3
IF Filter	---	GHz	0 - 6
	---	GHz	0 - 15
HPF Filter	---	GHz	22 - 40
Amplifier	---	GHz	0.01 - 40

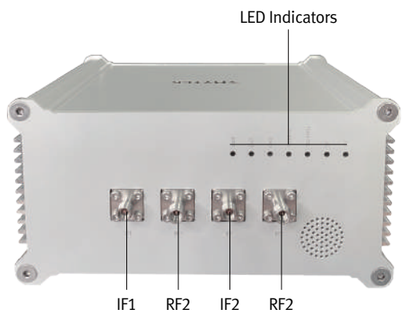

Figure 3. UD Box Front Panel - Dual Channel

In-Band Harmonics

Please be aware of the following in-band harmonics when using the UD Box.

Harmonic frequency	Unit
LO freq ÷ 1	GHz
LO freq ÷ 2	GHz
LO freq ÷ 4	GHz
LO freq × 2	GHz
LO freq × 3	GHz

Harmonic frequency	Unit
(LO freq ÷ 1) ± (LO freq ÷ 4)	GHz
(LO freq ÷ 2) ± (LO freq ÷ 4)	GHz
(LO freq ÷ 4) ± (LO freq ÷ 4)	GHz
(LO freq × 2) ± (LO freq ÷ 4)	GHz
(LO freq × 3) ± (LO freq ÷ 4)	GHz

Package Details

TMYTEK's connectorized packaging:

Parameter	Conditions	Unit	Min.	Typ.	Max.
Dimension	Length	mm	139	143	145
	Width	mm	150	152	154
	Height	mm	76	77	79
Weight	---	kg	---	1.3	---
Material	Aluminum	---	---	---	---

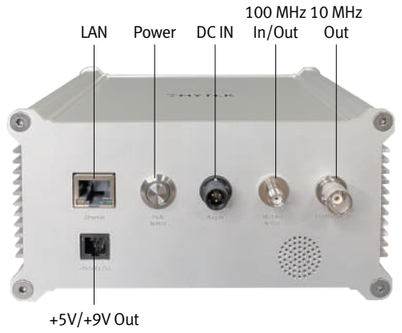

Figure 4. UD Box Back Panel