UDCX-3748

mmWave Solution

DATA SHEET

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1. UDC Overview

Aethertek's up down converter "UDCX-3748" is designed for testing mmWave devices, including CPE, FWA, and Radio Unit, offering a cost-effective solution by integrating with mass production testers. Its built-in GPS functionality ensures stable clock sources, enhancing frequency stability.

2. Key Features

- SSupports 5G NR FR2 bands n259, n260, and n262
- Compliant with 3GPP Rel 16 5G-NR standards
- 256QAM DL / UL modulation
- Maximum carrier bandwidth 1GHz
- Synchronization modes : GPS, Internal REF, External REF IN
- Includes a 10MHz output
- Ensures +/- 10 ppb frequency stability of the internal clock
- Features a USB Type-C control interface

3. Absolute Maximum Ratings

Table1. Radio Absolute Maximum Power Ratings

Parameters	Type	Min	Typ.	Max	Unit	Note
RF Ports	I/O	-	-	See Note	dBm	Max Input : -10dBm Max Output : 10dBm
IF Ports	I	-	-	-30	dBm	[1]
External REF IN	I	-	-	5	dBm	50 Ohm [2]
REF Out	O	-	-	5	dBm	50 Ohm [2]

[1] To ensure the signal quality and meet the 3GPP specification as TS38.141, the value is defined based on test condition 5G NR waveform TM3.1a (BW100MHz, PAPR 10.xdB@CCDF 0.01%).
[2] The potential tolerance for power is within +/- 1.5dB.

Table2. General Absolute Maximum Ratings

Parameters	Min	Typ.	Max	Unit	Note
Power supply voltage	-	12	-	V	-
Power supply current	-	-	3	A	-
Operating Temperature	3	-	40	℃	
Storage Temperature	-40	-	85	℃	

4. RF specification

Table3. RF General characteristics

Feature	UDC X capability
Operating frequency	37GHz to 50GHz
IF Frequency range	2.5GHz to 7.0GHz
Duplexing	TDD
Max carrier Bandwidth	1000MHz (100MHz, 10CC)
IF Connector interface	SMA 2.92mm-F, 50 Ohm
RF Connector interface	SMA 2.92mm-F, 50 Ohm

Parameters	Min	Typ.	Max	Unit	Note
RF frequency ragne	37	-	50	GHz	
IF frequency range	2.5	-	7.0	GHz	
LO frequency range	32	-	48	GHz	LO, Low side injection
RF Return Loss	-	-9	-	dB	
IF Return Loss	-	-10	-	dB	
External REF IN	-	10	-	MHz	Adjustable [4]
REF Out	-	10	-	MHz	Adjustable [4]

Up-conversion mode

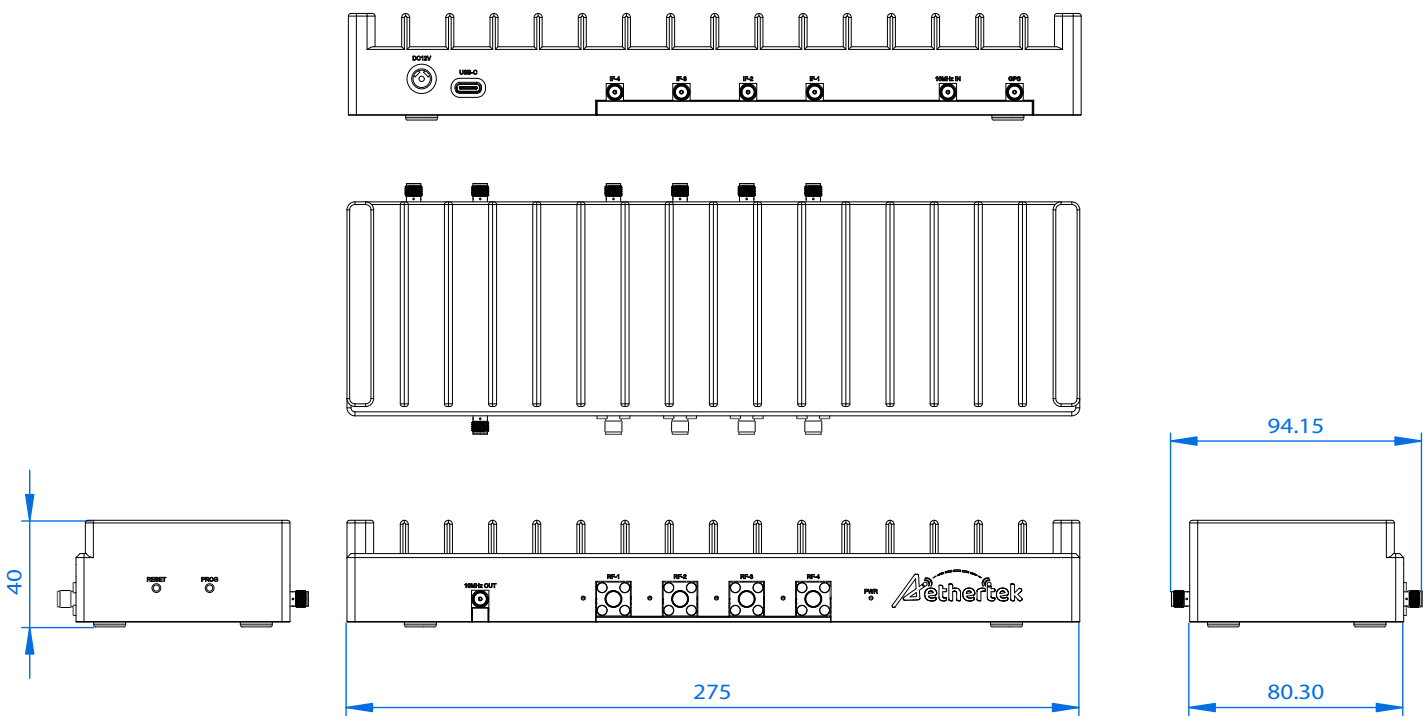
Parameters	Min	Typ.	Max	Unit	Note
Up-Conversion Gain	-	28	36	dB	
Up-Conversion Gain control	-	-	29	dB	
SSB Noise Figure	-	6	-	dB	[1]
Coupling Between RF ports	35	-	-	dB	[2]
RF Output P1dB	-	10	-	dBm	Maximum Gain

Down-conversion mode

Parameters	Min	Typ.	Max	Unit	Note
Up-Conversion Gain	-	6	9	dB	
Up-Conversion Gain control	-	-	15	dB	
SSB Noise Figure	-	8	-	dB	[3]
Coupling Between RF ports	35	-	-	dB	[2]
RF Output P1dB	-12	-10	-	dBm	Maximum Gain

[1] Maximum gain mode, IF = 2.5 - 7.0 GHz, RF = 37 - 50 GHz.
[2] Maximum gain mode, IF = 4GHz, LO = 35GHz, RF = 39GHz.
[3] Maximum gain mode, IF = 2.0 - 5.0 GHz, LO = 35GHz, RF = 37 - 40 GHz, IF = 2.0 - 5.5 GHz, LO = 38GHz, RF = 38 - 43.5GHz, IF = 3.0 - 4.0 GHz, LO = 44.2GHz, RF = 47.2 - 48.2 GHz.
[4] The default setting is 10MHz. For frequency adjustments, users can easily contact Aethertek to upgrade the firmware

5. Dimension



6. UDC X High-Level block diagram

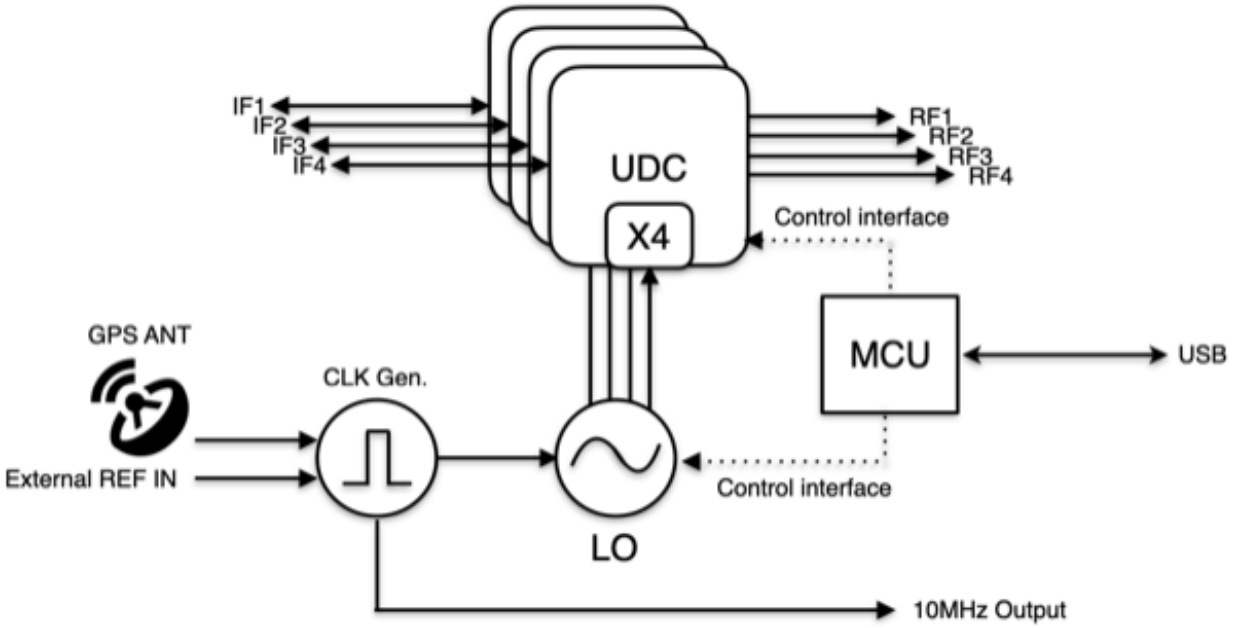
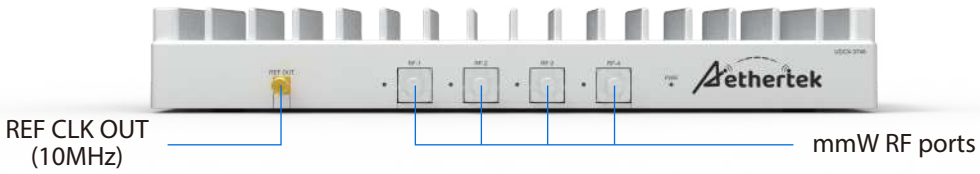
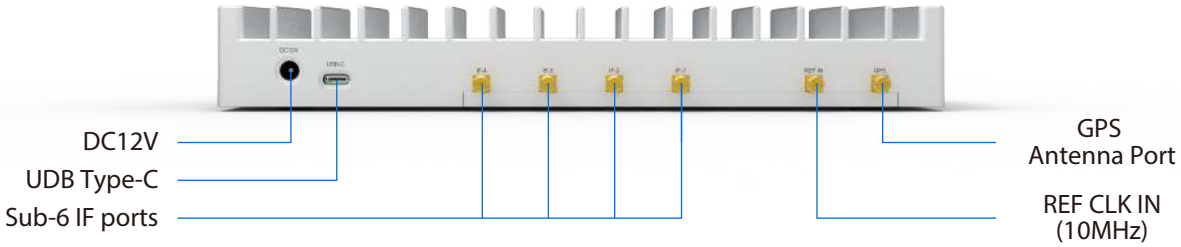


Figure1. UDC X High-Level block diagram

7. Front / Rear Panel Interface definition





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Contact us to experience our 5G innovative solutions!

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