

# mDP 2.1 Test Fixture (RF Cable Type)

## User Manual



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| Product Name                                | Version | Date        | Comments |
|---------------------------------------------|---------|-------------|----------|
| mDP 2.1 Test Fixture Series (RF Cable Type) | 01      | Jan.10,2023 | Update   |

## 1. Introduction

This document introduces the product and electrical specifications of the mDP 2.1 Test Fixture (RF Cable Type).

## 2. Objectives

This specification provides the characteristics of mDP 2.1 Test Fixture (RF Cable Type) and it is used to test mDP 2.1 cable and system.



### 3. Product Description

#### 3-1. mDP 2.1 Test Fixture (RF Cable Type)

mDP 2.1 Test Fixture (RF Cable Type) is used for mDP cable compliance test.



Figure 3-1.  
TFDP-M21RA  
mDP 2.1 Receptacle Test Fixture  
(RF Cable Type)



Figure 3-2.  
TFDP-M21PA  
mDP2.1 Plug Test Fixture  
(RF Cable Type)

#### 3-2. mDP 2.1 Calibration Board (RF Cable Type)

mDP 2.1 Calibration Board (RF Cable Type) is use to do de-embedding the electrical length and losses within the mDP 2.1 Test Fixture (RF Cable Type).



Figure 3-3.  
TFDP-M21CA  
mDP 2.1 Calibration Board  
(RF Cable Type)



### 3-3. DP AUX Control Board

DP AUX Control Board is use to transfer the low-speed signal from mDP 2.1 Test Fixture (RF Cable Type) to the DP Cable and DPR100/DPR200. Please refer to section 4-2 & 4.3.



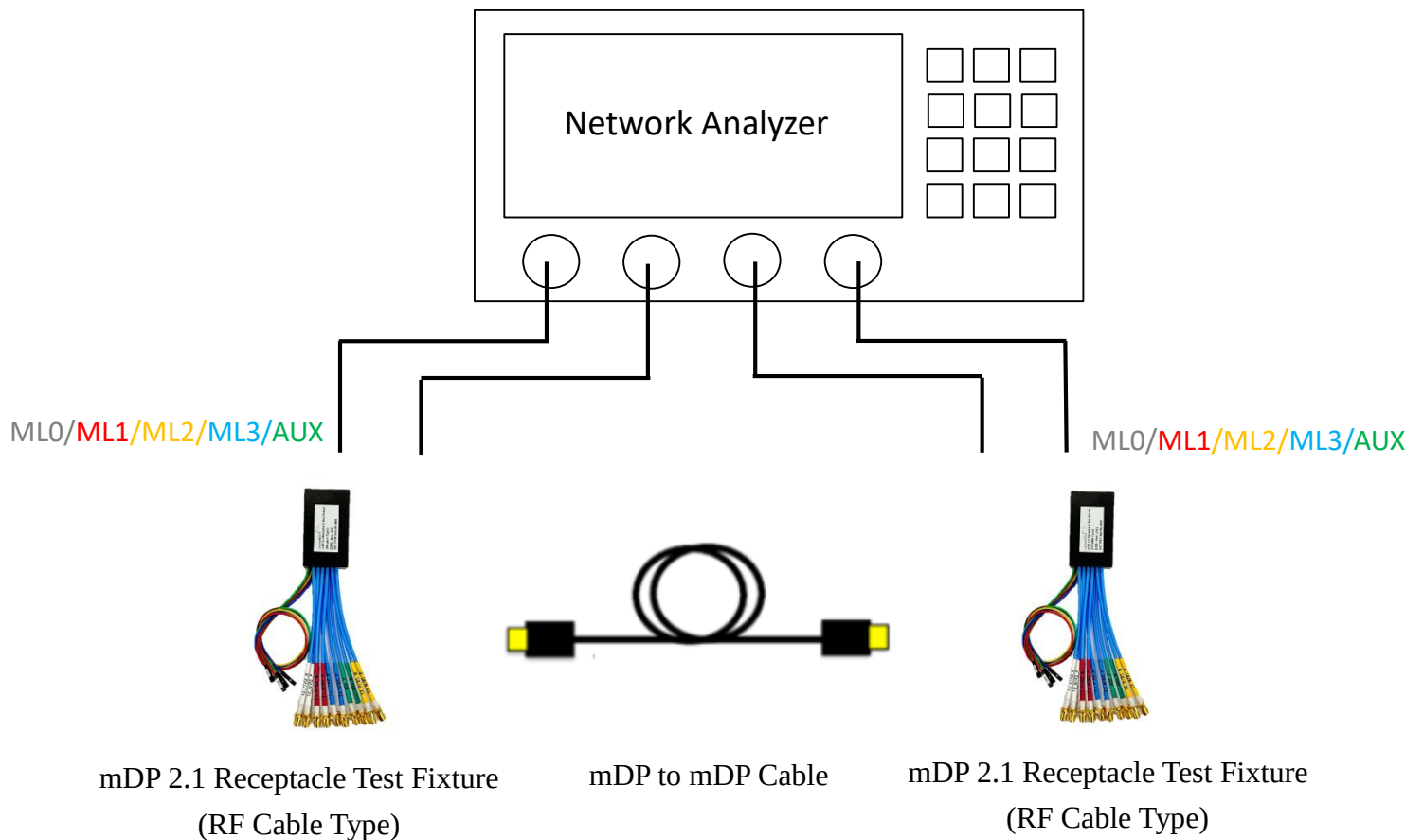
Figure 3-4.  
TFD-1601M  
DP AUX Control Board



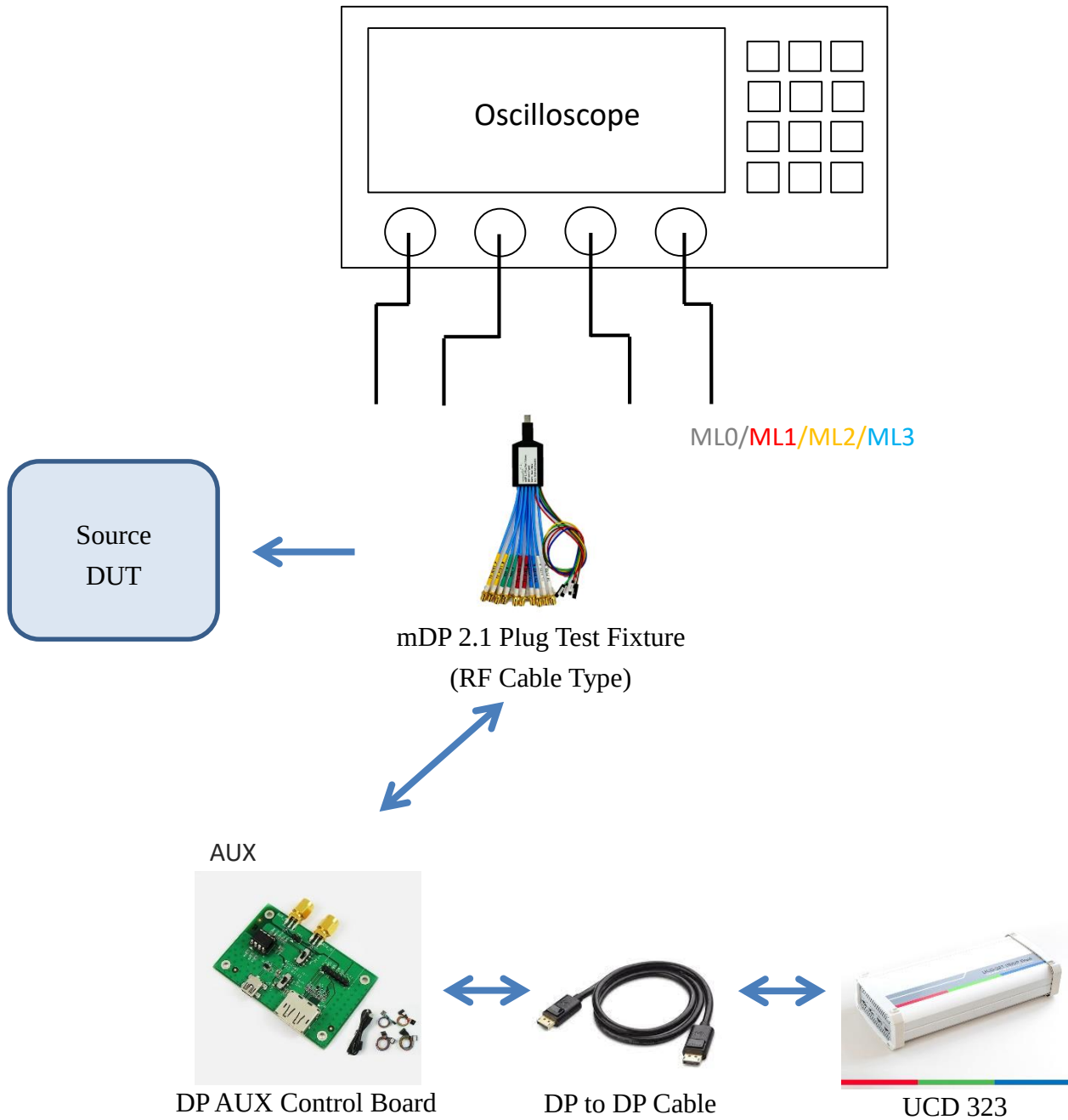
## 4. User Models

Test setup includes but not limited to the following examples:

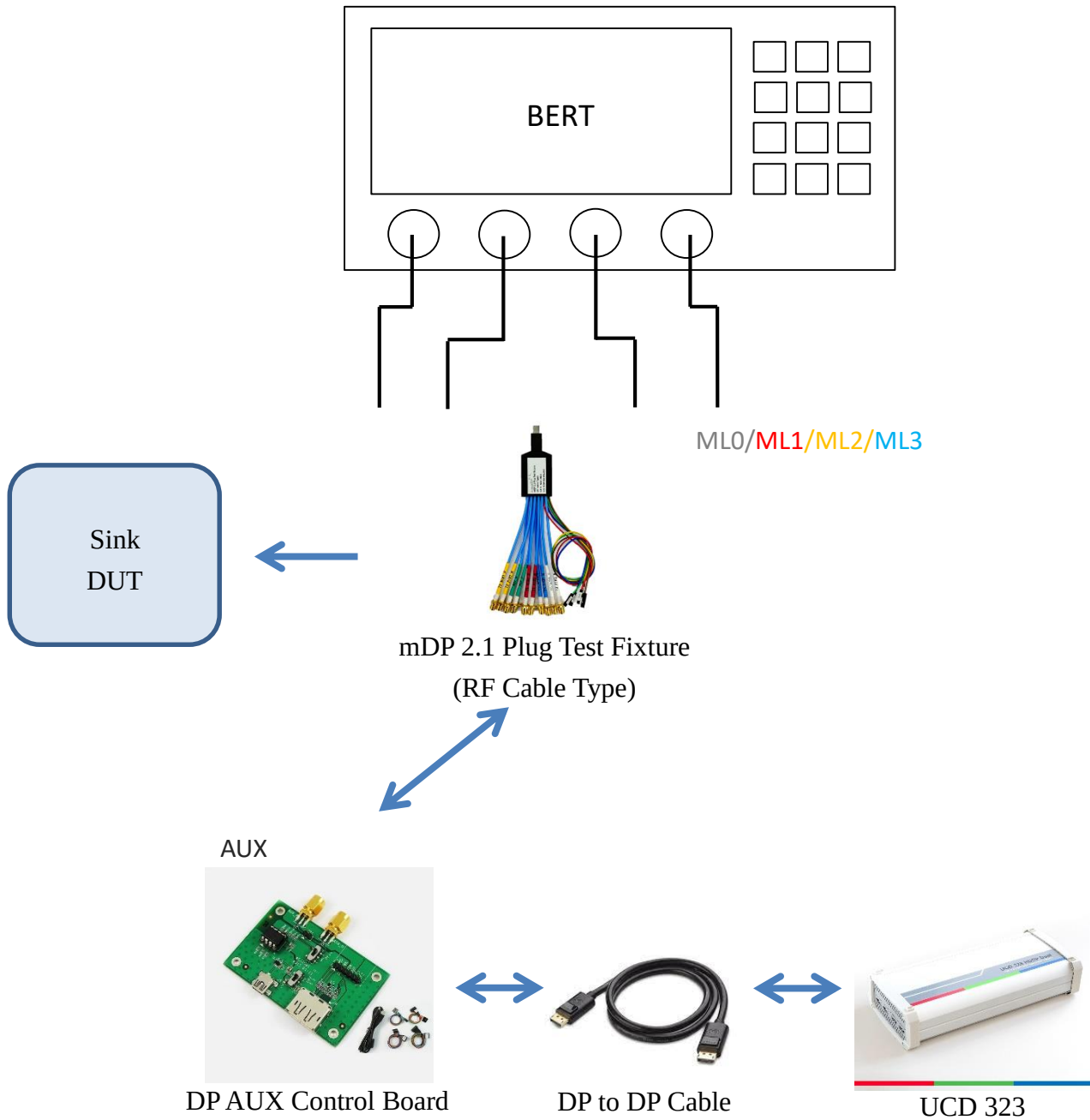
### 4-1. Cable Test Setup



## 4-2. System Test Setup (Source Test)



### 4-3. System Test Setup (Sink Test)



## 5. mDP 2.1 Test Fixture (RF Cable Type) Electrical Specification

| Test Item                                 | Requirements                                                                                                                                                                                                                                | Description                                                                       | Test Equipment                                                                                                                               | Result                                                                                                                                                                                                                                                   |
|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Insertion Loss Fit at Nyquist Frequencies | $\geq -1\text{dB @ } 0.1\text{ GHz}$<br>$\geq -4\text{dB @ } 2.7\text{GHz}$<br>$\geq -5.5\text{dB @ } 5.0\text{GHz}$<br>$\geq -6.5\text{dB @ } 6.75\text{GHz}$<br>$\geq -8.5\text{B @ } 10\text{GHz}$<br>$\geq -13\text{B @ } 15\text{GHz}$ | Frequency range :<br>20MHz~20GHz<br>IF Bandwidth :<br>1kHz<br>Sweep points : 2000 | Keysight<br>(E5071C-TDR)<br>300KHz~20GHz ENA<br>Network Analyzer<br>Keysight<br>(N4433A)<br>200KHz~20GHz<br>Electronic Calibration<br>Module | $\geq -0.23\text{dB @ } 0.1\text{ GHz}$<br>$\geq -1.41\text{dB @ } 2.7\text{GHz}$<br>$\geq -1.83\text{dB @ } 5.0\text{GHz}$<br>$\geq -2.06\text{dB @ } 6.75\text{GHz}$<br>$\geq -2.50\text{dB @ } 10\text{GHz}$<br>$\geq -3.66\text{dB @ } 15\text{GHz}$ |
| Integrated Return Loss                    | IRL PWL limit = -15dB @ ILfit -4dB<br>IRL PWL limit $\leq$ -15dB @ ILfit -5dB<br>IRL PWL limit $\leq$ -15dB @ ILfit -8.5dB                                                                                                                  |                                                                                   |                                                                                                                                              | -15.25db                                                                                                                                                                                                                                                 |
| Integrated Multi-reflection               | IMR $\leq$ 0.0579 x ILfitAtNq2 + 1.64 x<br>ILFixAtNq-23.23                                                                                                                                                                                  |                                                                                   |                                                                                                                                              | -34.46db                                                                                                                                                                                                                                                 |
| Differential to Common mode Conversion    | $\leq -17\text{db}$ from 100 MHz to 15 GHz                                                                                                                                                                                                  |                                                                                   |                                                                                                                                              | -30.38db                                                                                                                                                                                                                                                 |
| Integrated Crosstalk - DP [Normative]     | IXT_DP PWL limit = -34dB @ ILfit -4dB<br>IXT_DP PWL limit $\leq$ -34dB @ ILfit -5dB<br>IXT_DP PWL limit $\leq$ -36dB @ ILfit -8.5dB                                                                                                         |                                                                                   |                                                                                                                                              | -48.73db                                                                                                                                                                                                                                                 |
| Integrated Crosstalk between DP Lanes     | IFEXT $\leq$ -43 dB (up to 10GHz)                                                                                                                                                                                                           |                                                                                   |                                                                                                                                              | -53.73db                                                                                                                                                                                                                                                 |
| Intra-Pair Skew                           | Intra [Normative] $\leq$ 10ps                                                                                                                                                                                                               | 25ps (20%~80%)                                                                    |                                                                                                                                              | 2.9ps                                                                                                                                                                                                                                                    |
| Differential Impedance                    | Fixture 100 $\pm$ 5 $\Omega$<br>Connector 85 $\pm$ 10 $\Omega$                                                                                                                                                                              | 25ps (20% - 80%)                                                                  |                                                                                                                                              | Fixture 100 $\pm$ 5 $\Omega$<br>Connector 85 $\pm$ 10 $\Omega$                                                                                                                                                                                           |



## **6. Reference DP Specification**

1. Keysight Method of Implementation (MOI) for DisplayPort (DP) Version 2.1  
Passive DP80/DP40 Cable Compliance Test
2. VESA DisplayPort (DP) Standard Version 2.1 Enh DP Additions Section 4.1 Jun  
2022 R10
3. VESA DisplayPort (DP) Standard Version 2.1 Enh DP Additions Section 4.2 Jun  
2022 R9

