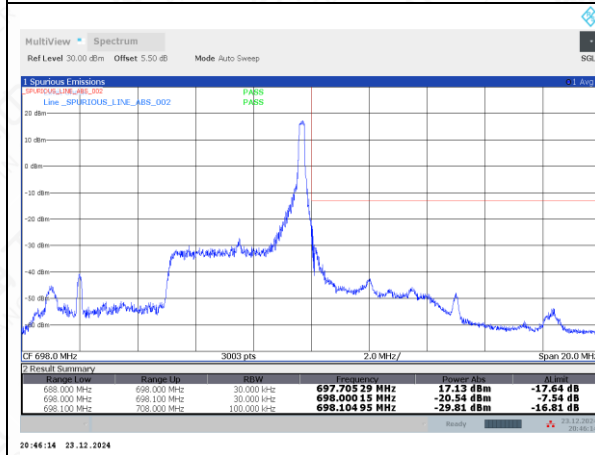
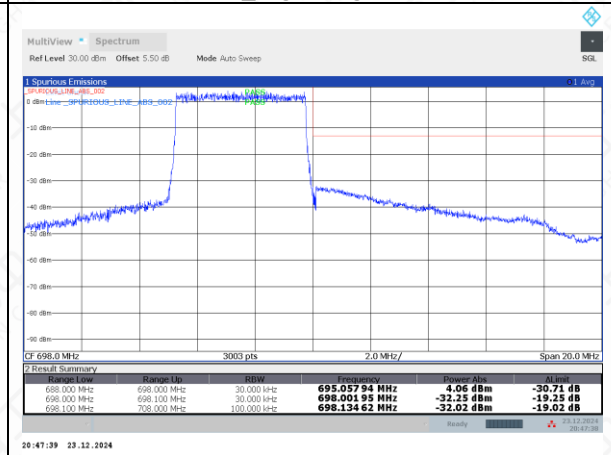


### FDD71HighRange\_5MHz\_QPSK\_1RB\_HighRange



### FDD71HighRange\_5MHz\_QPSK\_FullRB\_HighRange



## 6.7 Conducted Spurious Emission

### 6.7.1 Measurement Limit

FCC §22.917(a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB.

FCC §24.238(a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB.

FCC §27.53(a) For mobile and portable stations operating in the 2305–2315 MHz and 2350–2360 MHz bands:

- (i) By a factor of not less than:  $43 + 10 \log(P)$  dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, not less than  $55 + 10 \log(P)$  dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2341 and 2345 MHz, not less than  $61 + 10 \log(P)$  dB on all frequencies between 2324 and 2328 MHz and on all frequencies between 2337 and 2341 MHz, and not less than  $67 + 10 \log(P)$  dB on all frequencies between 2328 and 2337 MHz;
- (ii) By a factor of not less than  $43 + 10 \log(P)$  dB on all frequencies between 2300 and 2305 MHz,  $55 + 10 \log(P)$  dB on all frequencies between 2296 and 2300 MHz,  $61 + 10 \log(P)$  dB on all frequencies between 2292 and 2296 MHz,  $67 + 10 \log(P)$  dB on all frequencies between 2288 and 2292 MHz, and  $70 + 10 \log(P)$  dB below 2288 MHz;
- (iii) By a factor of not less than  $43 + 10 \log(P)$  dB on all frequencies between 2360 and 2365 MHz, and not less than  $70 + 10 \log(P)$  dB above 2365 MHz.

FCC §27.53(c)

For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

- (1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB;
- (2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB;
- (3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than  $76 + 10 \log(P)$  dB in a 6.25 kHz band segment, for base and fixed stations;
- (4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than  $65 + 10 \log(P)$  dB in a 6.25 kHz band segment, for mobile and portable stations;
- (5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;
- (6) Compliance with the provisions of paragraphs (c)(3) and (c)(4) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

FCC §27.53(f) For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to  $-70$  dBW/MHz equivalent isotropically radiated power (EIRP) for



wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

FCC §27.53(m)(4) For mobile digital stations, the attenuation factor shall be not less than  $40 + 10 \log(P)$  dB on all frequencies between the channel edge and 5 megahertz from the channel edge,  $43 + 10 \log(P)$  dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and  $55 + 10 \log(P)$  dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than  $43 + 10 \log(P)$  dB on all frequencies between 2490.5 MHz and 2496 MHz and  $55 + 10 \log(P)$  dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

FCC §27.53(h):

AWS emission limits —

(1) General protection levels. Except as otherwise specified below, for operations in the 1695–1710 MHz, 1710–1755 MHz, 1755–1780 MHz, 1915–1920 MHz, 1995–2000 MHz, 2000–2020 MHz, 2110–2155 MHz, 2155–2180 MHz, and 2180–2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10}(P)$  dB.

(2) Additional protection levels. Notwithstanding the foregoing paragraph (h)(1) of this section:

(i) Operations in the 2180–2200 MHz band are subject to the out-of-band emission requirements set forth in § 27.1134 for the protection of federal government operations operating in the 2200–2290 MHz band.

(ii) For operations in the 2000–2020 MHz band, the power of any emissions below 2000 MHz shall be attenuated below the transmitter power (P) in watts by at least  $70 + 10 \log_{10}(P)$  dB.

(iii) For operations in the 1915–1920 MHz band, the power of any emission between 1930–1995 MHz shall be attenuated below the transmitter power (P) in watts by at least  $70 + 10 \log_{10}(P)$  dB.

(iv) For operations in the 1995–2000 MHz band, the power of any emission between 2005–2020 MHz shall be attenuated below the transmitter power (P) in watts by at least  $70 + 10 \log_{10}(P)$  dB.

FCC §27.50(c)(10) Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

FCC §27.53(g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least  $43 + 10 \log(P)$  dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

RSS-133 5.6, RSS-199 5.6:

Unwanted emissions shall be measured in terms of average values while the transmitter is operating at the manufacturer's rated power and modulated as specified in RSS-Gen.

Equipment shall meet the unwanted emission limits, specified in table 3, outside each frequency block group. For each channel bandwidth supported by the equipment under test, the unwanted emissions shall be measured and reported for two channel frequencies: one located as close as possible to the low end and one located as close as possible to the high end of the equipment's operating frequency range. For the unwanted emission limits, in the 1 MHz bands immediately outside and adjacent to the frequency

block group, the power shall be measured with a resolution bandwidth of at least 1% of the occupied bandwidth (OBW). Beyond these 1 MHz bands, a resolution bandwidth of 1 MHz shall be used. A narrower resolution bandwidth may be used, provided that the measured power is integrated over the full required measurement bandwidth of 1 MHz, or 1% of the OBW, as applicable.

For all equipment, the TRP or total conducted power (sum of conducted power across all antenna connectors), where applicable, of the unwanted emissions outside the frequency block or frequency block group shall not exceed the limits shown in the table.

Offset frequency from the edge of the frequency block group (MHz)	Unwanted emission limit
$\leq 1$	-13 dBm/(1% of OBW)
$> 1$	-13 dBm/MHz

#### RSS-139 5.6

Unwanted emissions shall be measured in terms of average values.

For all equipment, the TRP or total conducted power (sum of conducted power across all antenna connectors) of the unwanted emissions outside the frequency block or frequency block group shall not exceed the limits shown in table.

Offset frequency from the edge of the frequency block group (MHz)	Unwanted emission limit
1 MHz	-13 dBm/(1% of OB*)
$>1$ MHz	-13 dBm/MHz

#### RSS-132 5.5

Equipment shall meet the unwanted emission limits specified below:

- i. In the first 1.0 MHz band immediately outside and adjacent to each of the sub-bands specified in Section 5.1, the power of emissions per any 1% of the occupied bandwidth shall be attenuated below the transmitter output power  $P$  (dBW) by at least  $43 + 10 \log(p)$  dB.
- ii. After the first 1.0 MHz immediately outside and adjacent to each of the sub-bands, the power of emissions in any 100 kHz bandwidth shall be attenuated below the transmitter output power  $P$  (dBW) by at least  $43 + 10 \log(p)$  dB. If the measurement is performed using 1% of the occupied bandwidth, power integration over 100 kHz is required.

$p$  is the output power specified in watts.

#### RSS 130 4.7:

The unwanted emissions in any 100 kHz bandwidth on any frequency outside the low frequency edge and the high frequency edge of each frequency block range(s), shall be attenuated below the transmitter power,  $P$  (dBW), by at least  $43 + 10 \log_{10} p$  (watts), dB. However, in the 100 kHz band immediately outside of the equipment's frequency block range, a resolution bandwidth of 30 kHz may be employed. In addition to the limit outlined in section 4.7.1 above, equipment operating in the frequency bands 746-756 MHz and 777-787 MHz shall also comply with the following restrictions:

- a. the power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHz and 793-806 MHz shall be attenuated below the transmitter power,  $P$  (dBW), by at least:
  - i.  $76 + 10 \log_{10} p$  (watts), dB, for base and fixed equipment and
  - ii.  $65 + 10 \log_{10} p$  (watts), dB, for mobile and portable equipment
- b. the e.i.r.p. in the band 1559-1610 MHz shall not exceed  $-70$  dBW/MHz for wideband signal and  $-80$  dBW for discrete emission with bandwidth less than 700 Hz.

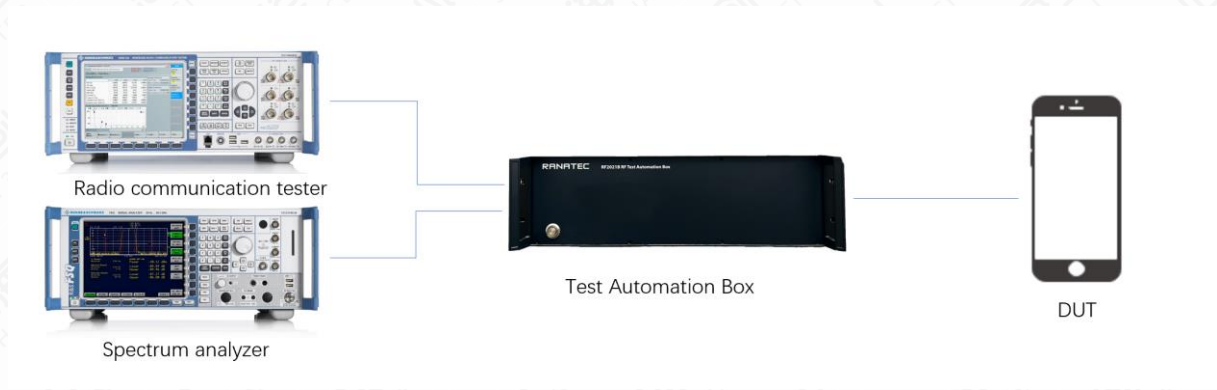


### 6.7.2 Method of Measurement

The following steps outline the procedure used to measure the conducted emissions from the EUT.

1. Determine frequency range for measurements: From CFR 2.1057 the spectrum should be investigated from the lowest radio frequency generated in the equipment up to at least the 10th harmonic of the carrier frequency. For the mobile station equipment tested, this equates to a frequency range of 13 MHz to 9 GHz, data taken from 10 MHz to 25 GHz.
2. Determine EUT transmit frequencies: below outlines the band edge frequencies pertinent to conducted emissions testing.
3. The number of sweep points of spectrum analyzer is set to 30001 which is greater than span/RBW.

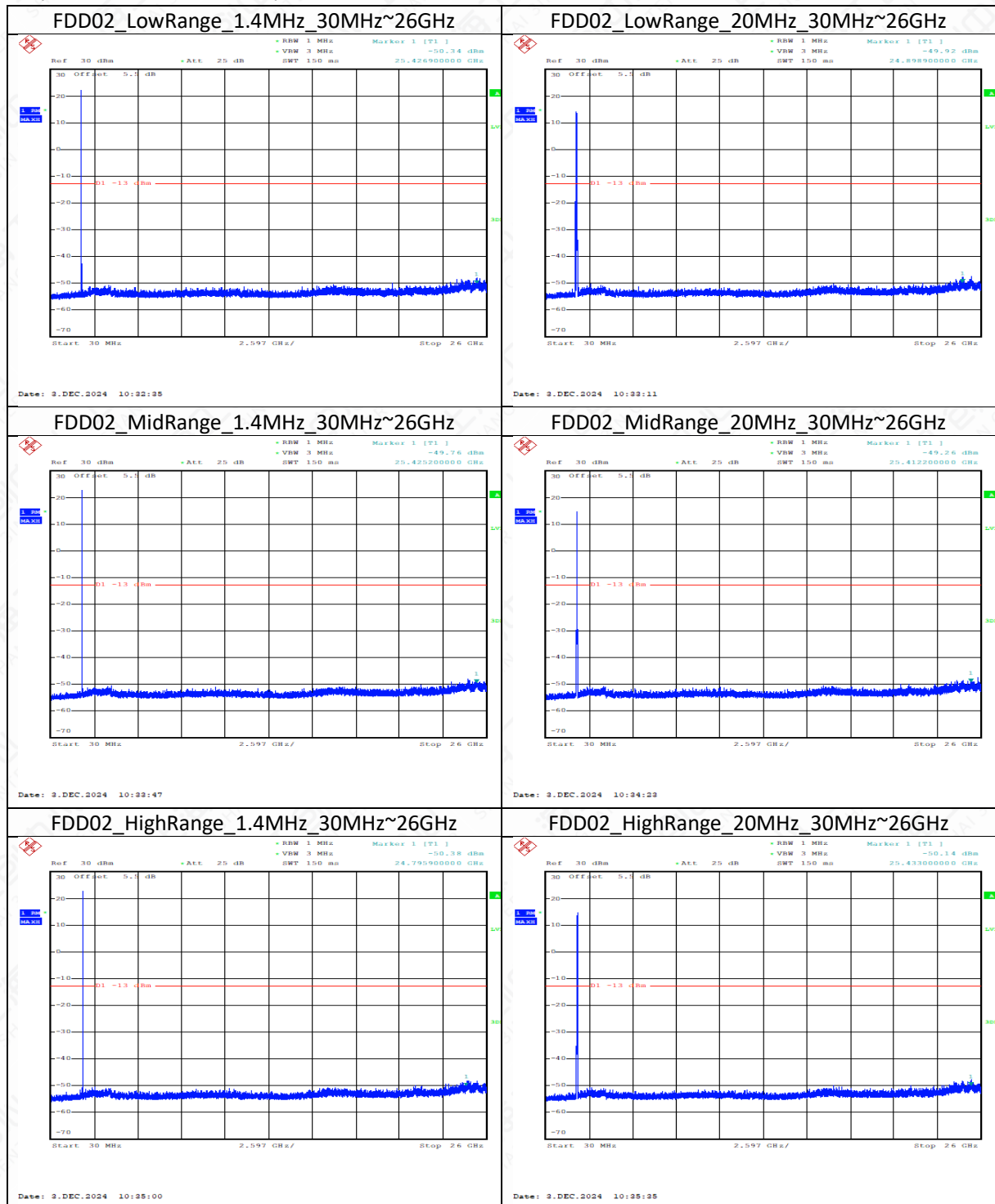
### 6.7.3 Test Setup

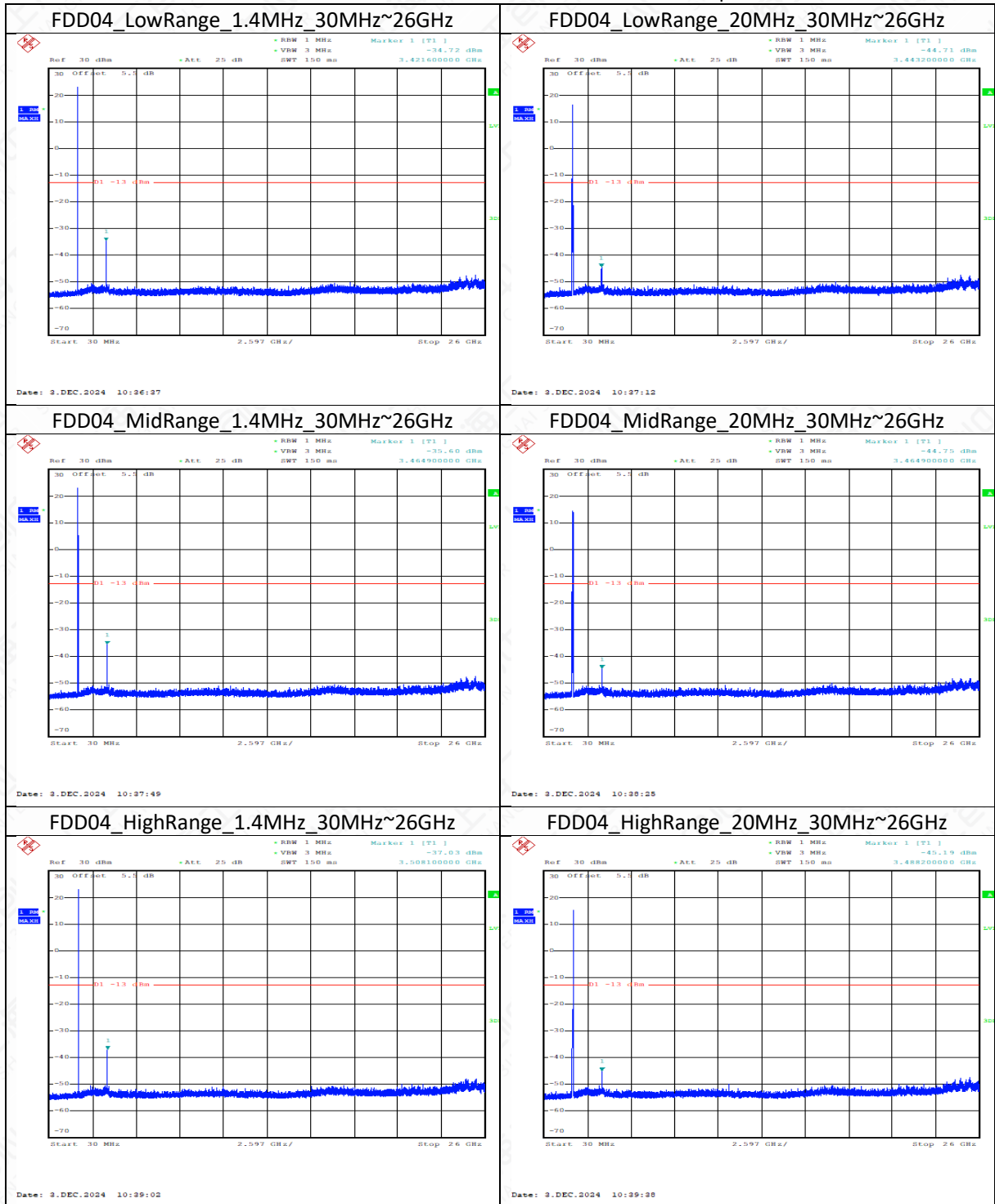


### 6.7.4 Measurement result

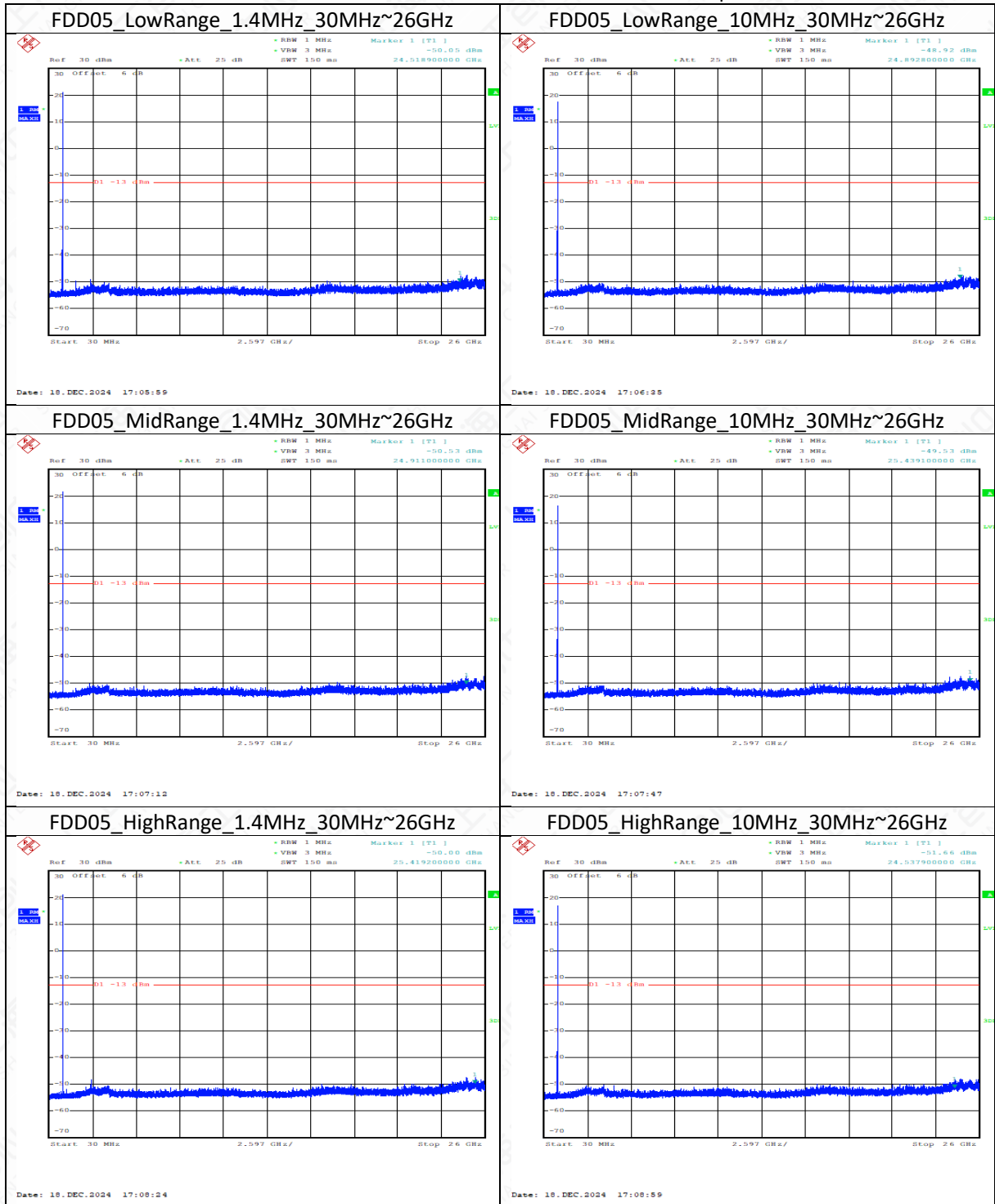
Band	RB Config
Band 2	fullRB
Band 4	fullRB
Band 5	fullRB
Band 7	fullRB
Band 12	fullRB
Band 13	fullRB
Band 17	fullRB
Band 25	fullRB
Band 26 (824-849MHz)	fullRB
Band 38	fullRB
Band 41	fullRB
Band 41 (Note 1)	fullRB
Band66	fullRB
Band 71	fullRB

Only the worst mode data is provided.

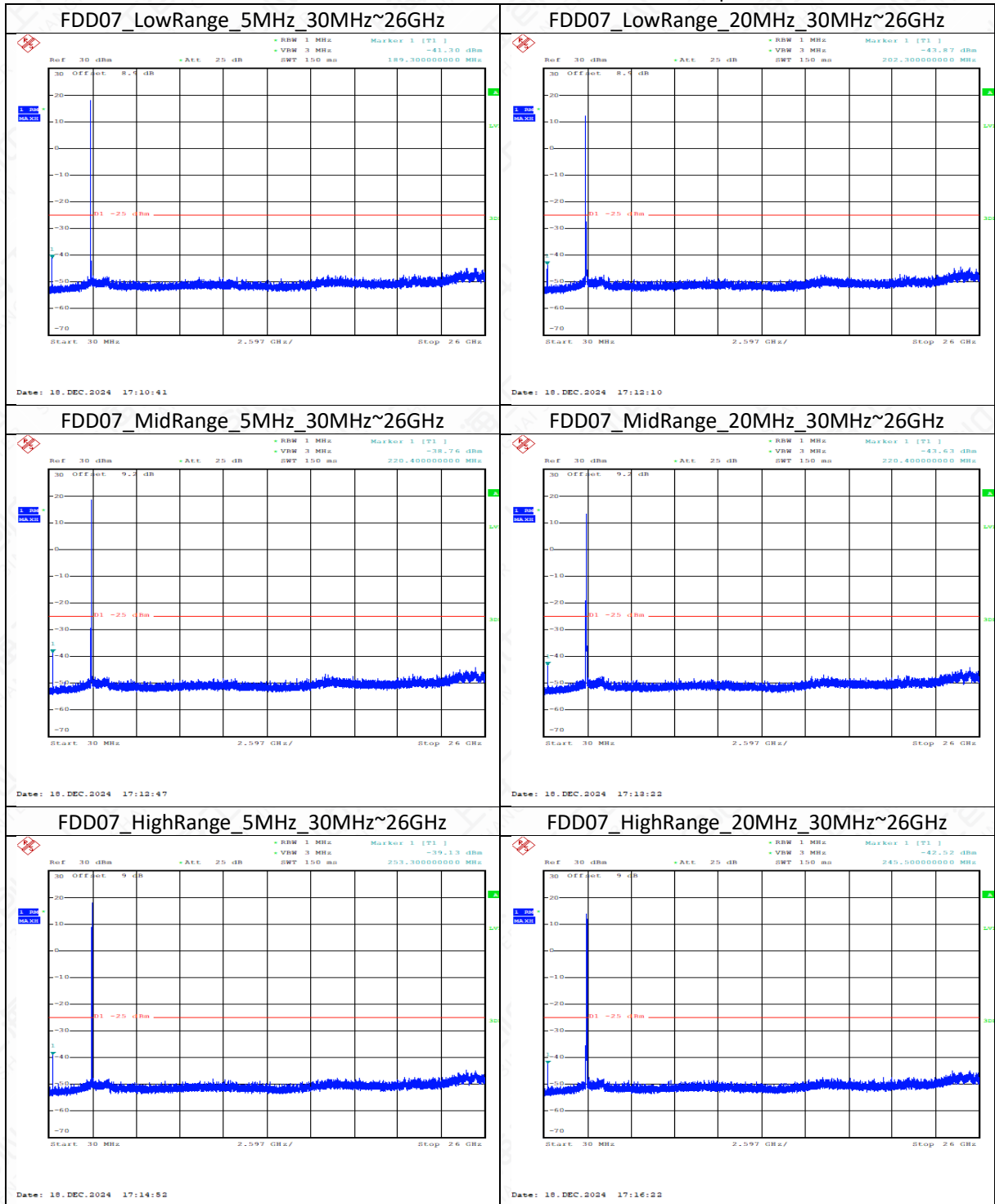


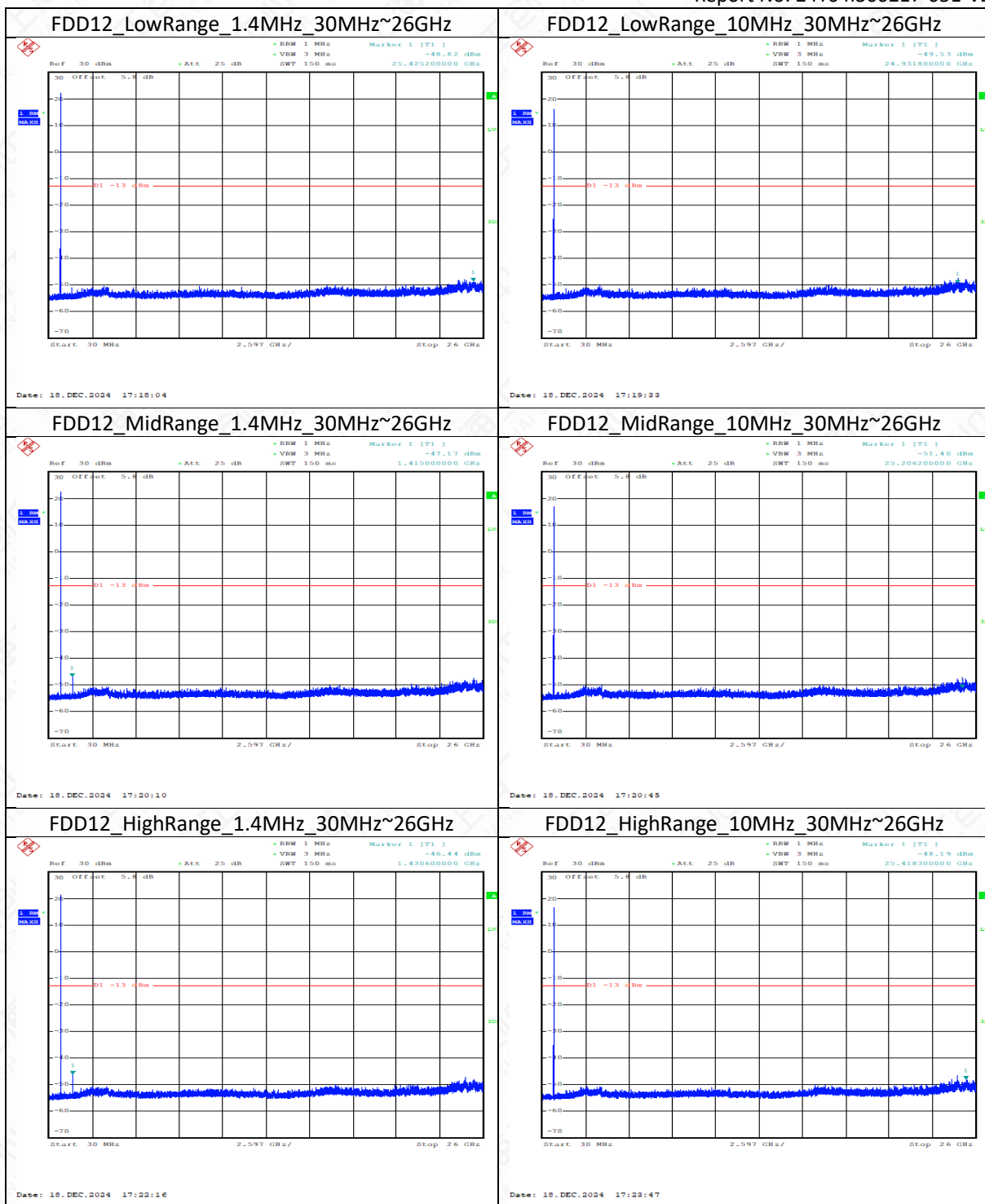




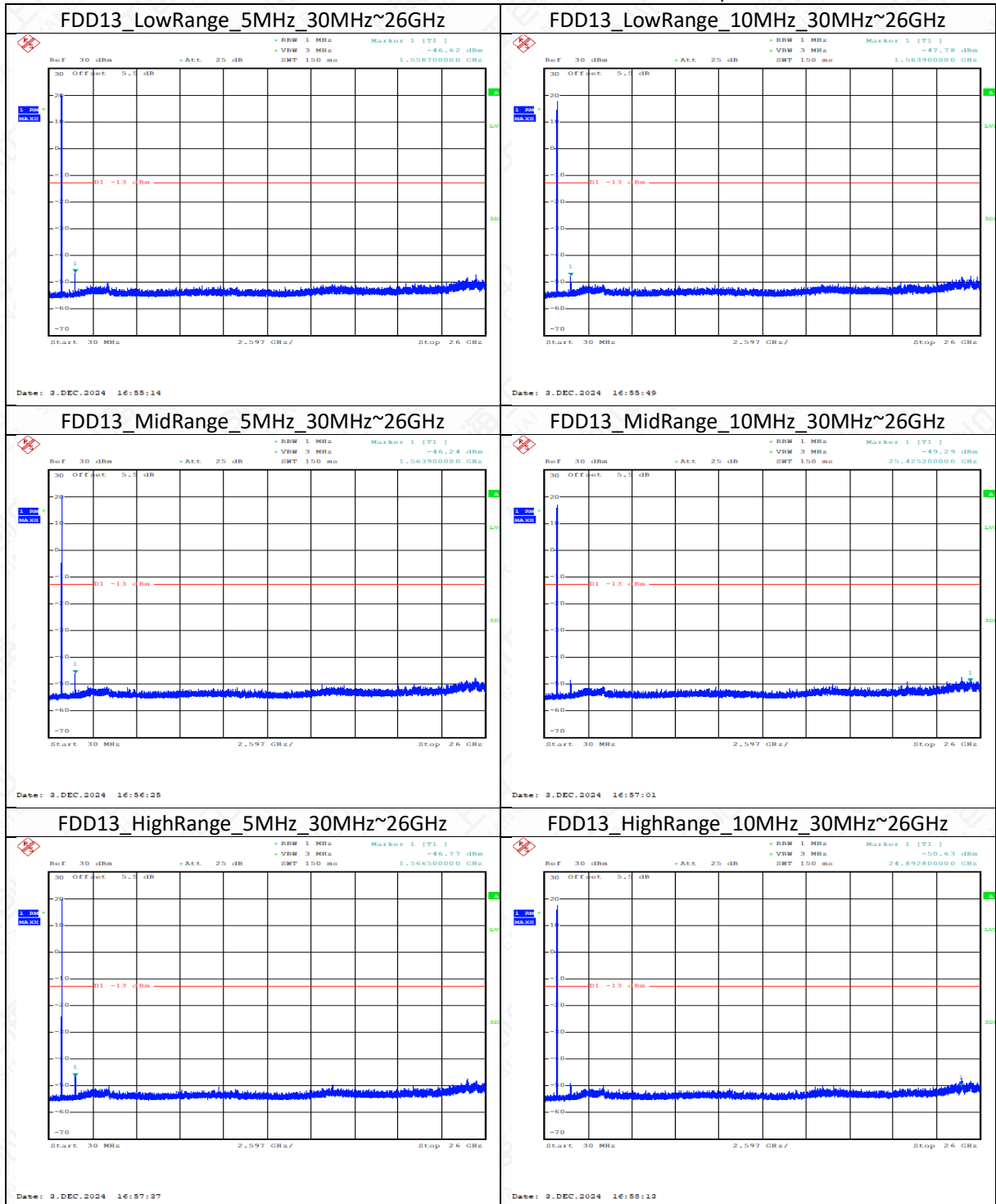


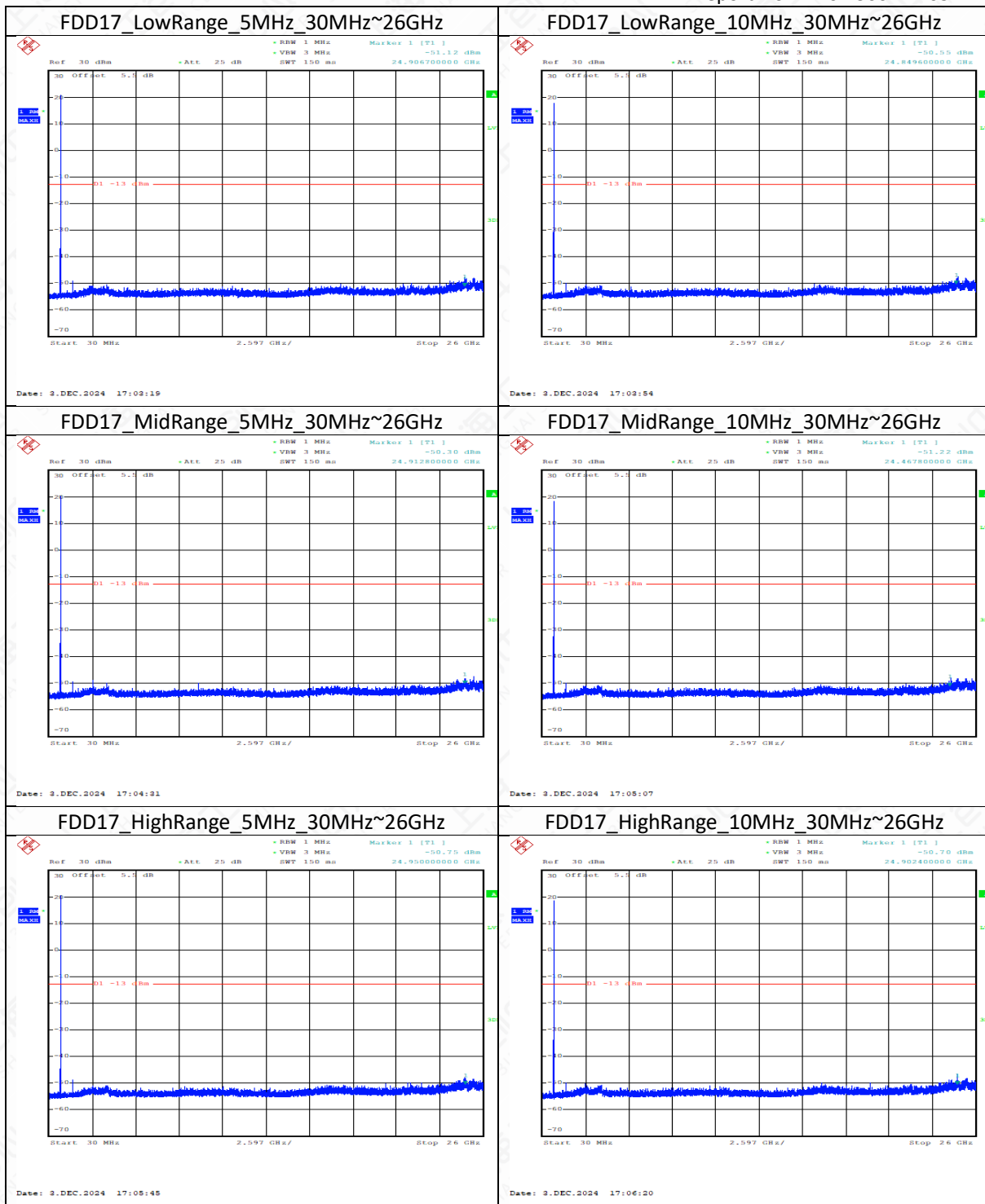




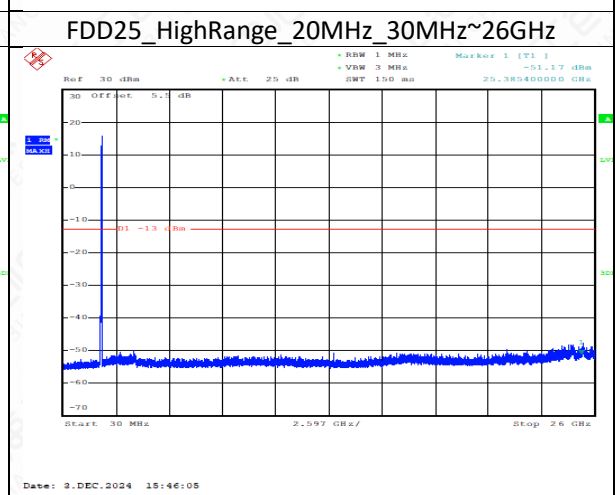
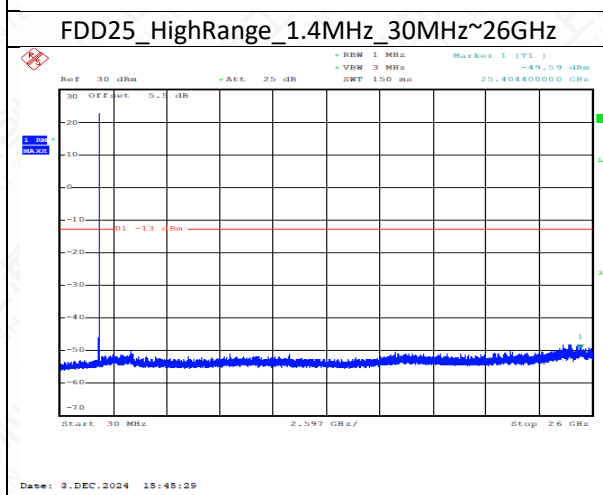
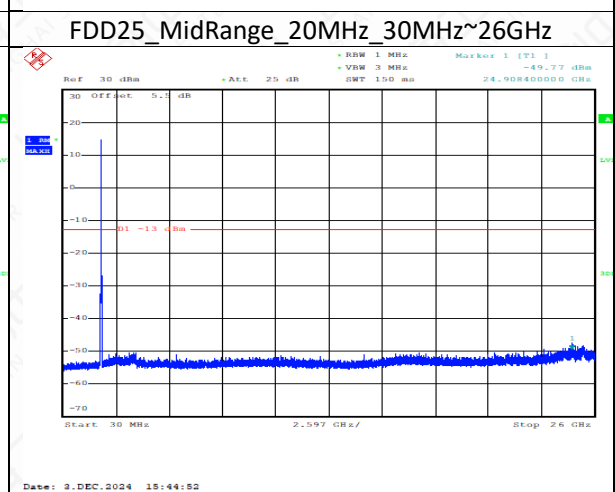
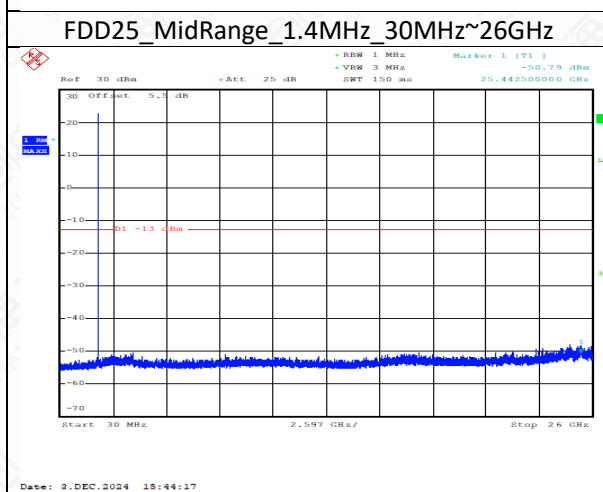
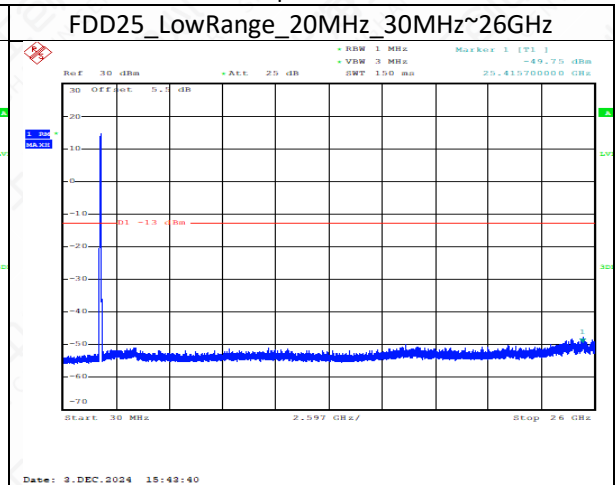
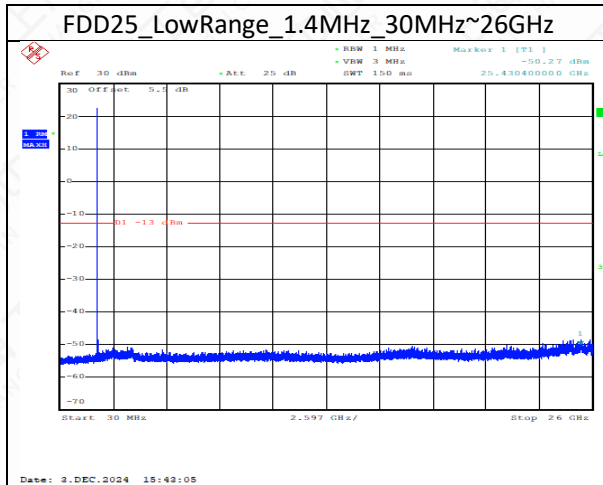


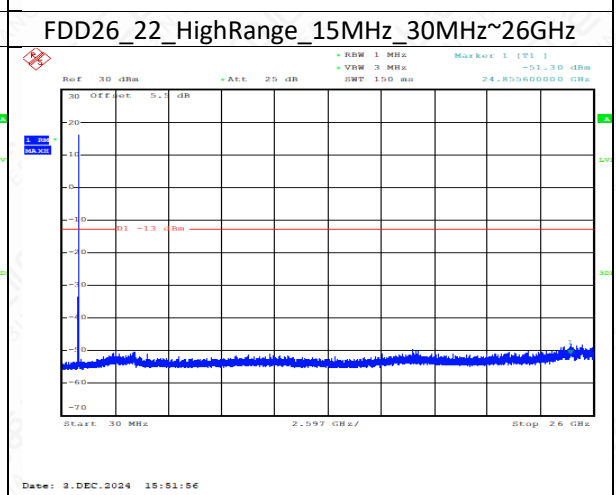
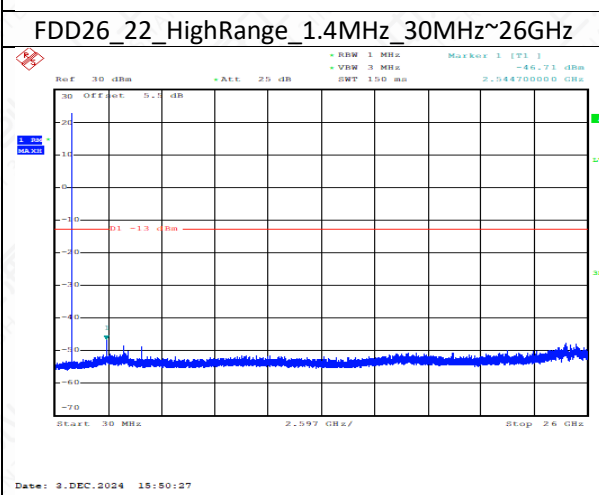
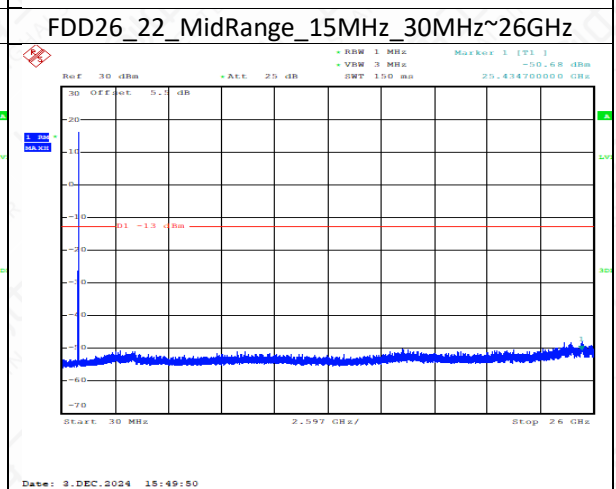
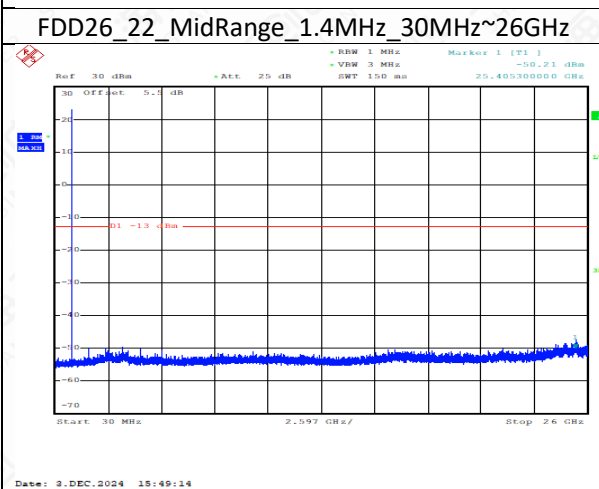
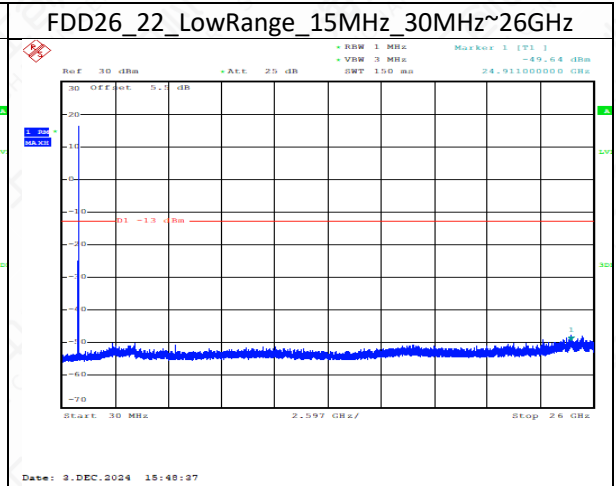
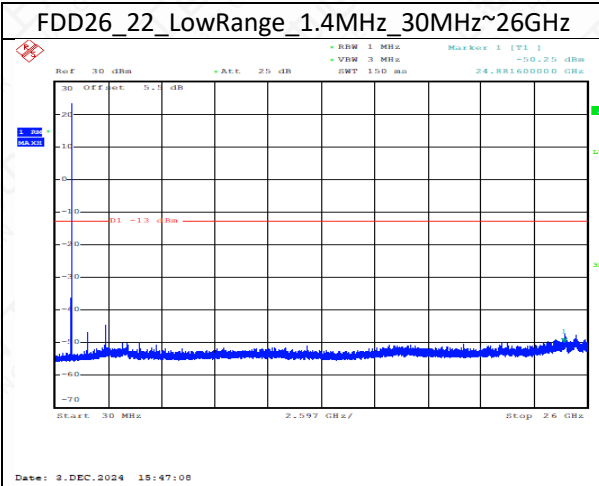




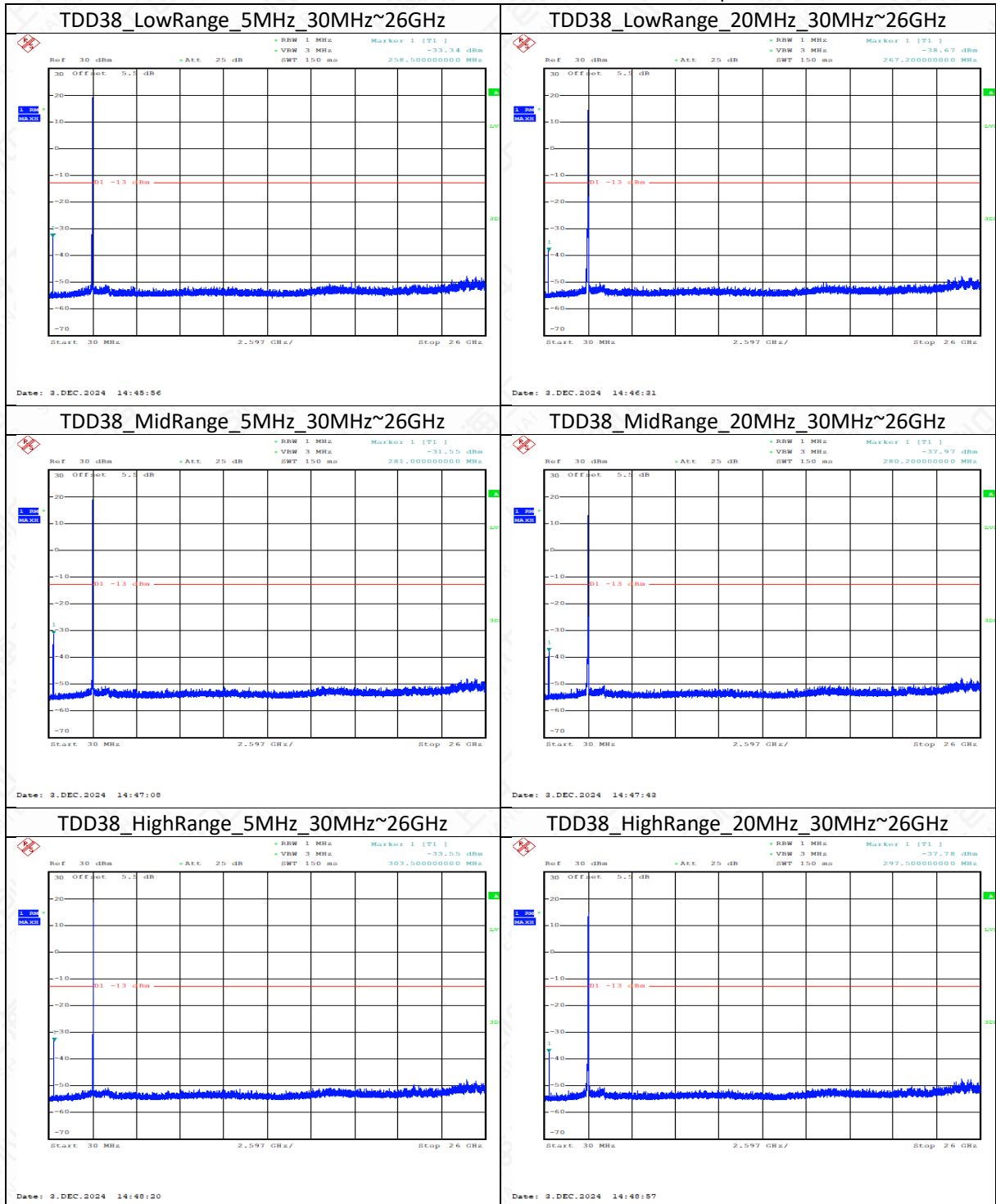




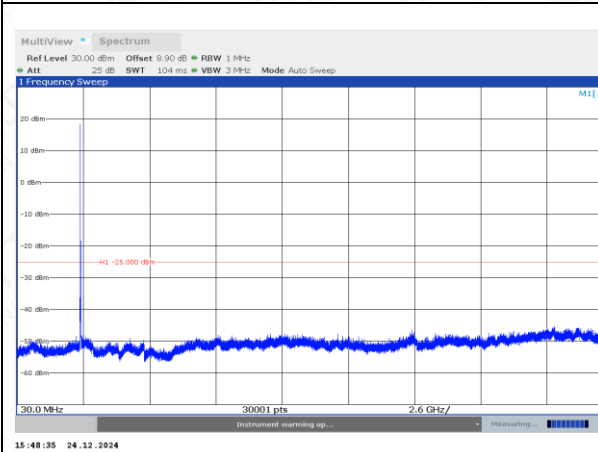




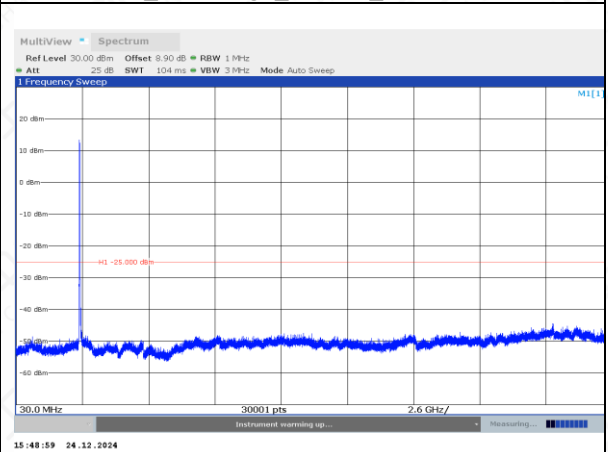




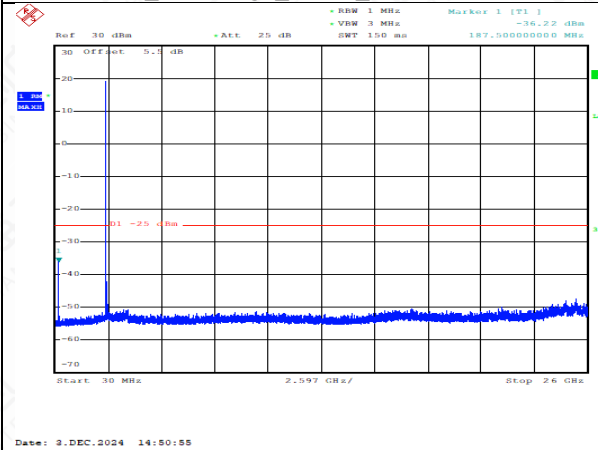
TDD41(Note 1)\_LowRange\_5MHz\_30MHz~26GHz



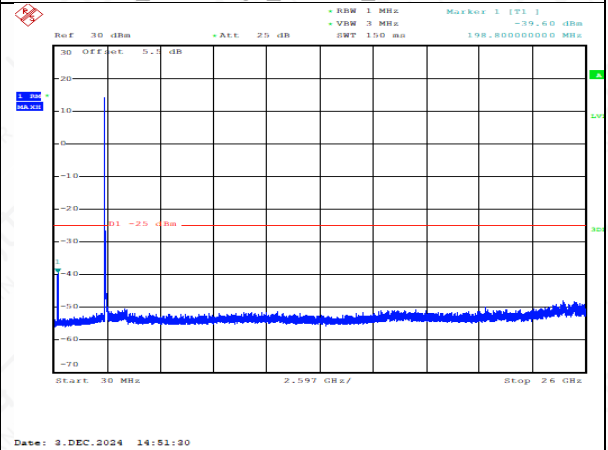
TDD41  
(Note 1)\_LowRange\_20MHz\_30MHz~26GHz



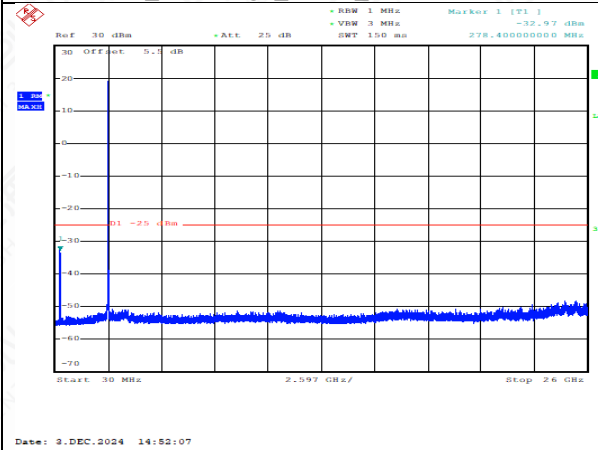
TDD41\_LowRange\_5MHz\_30MHz~26GHz



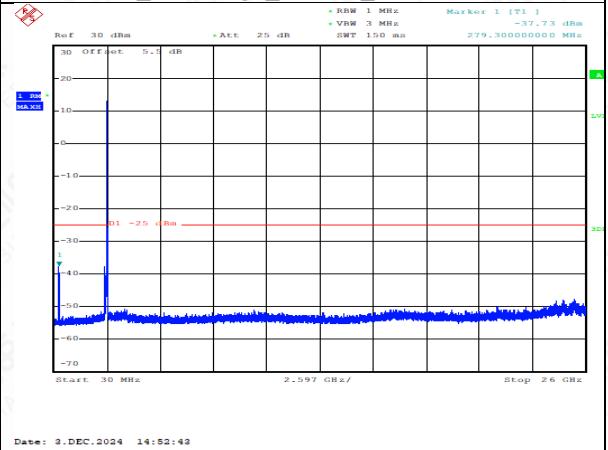
TDD41\_LowRange\_20MHz\_30MHz~26GHz



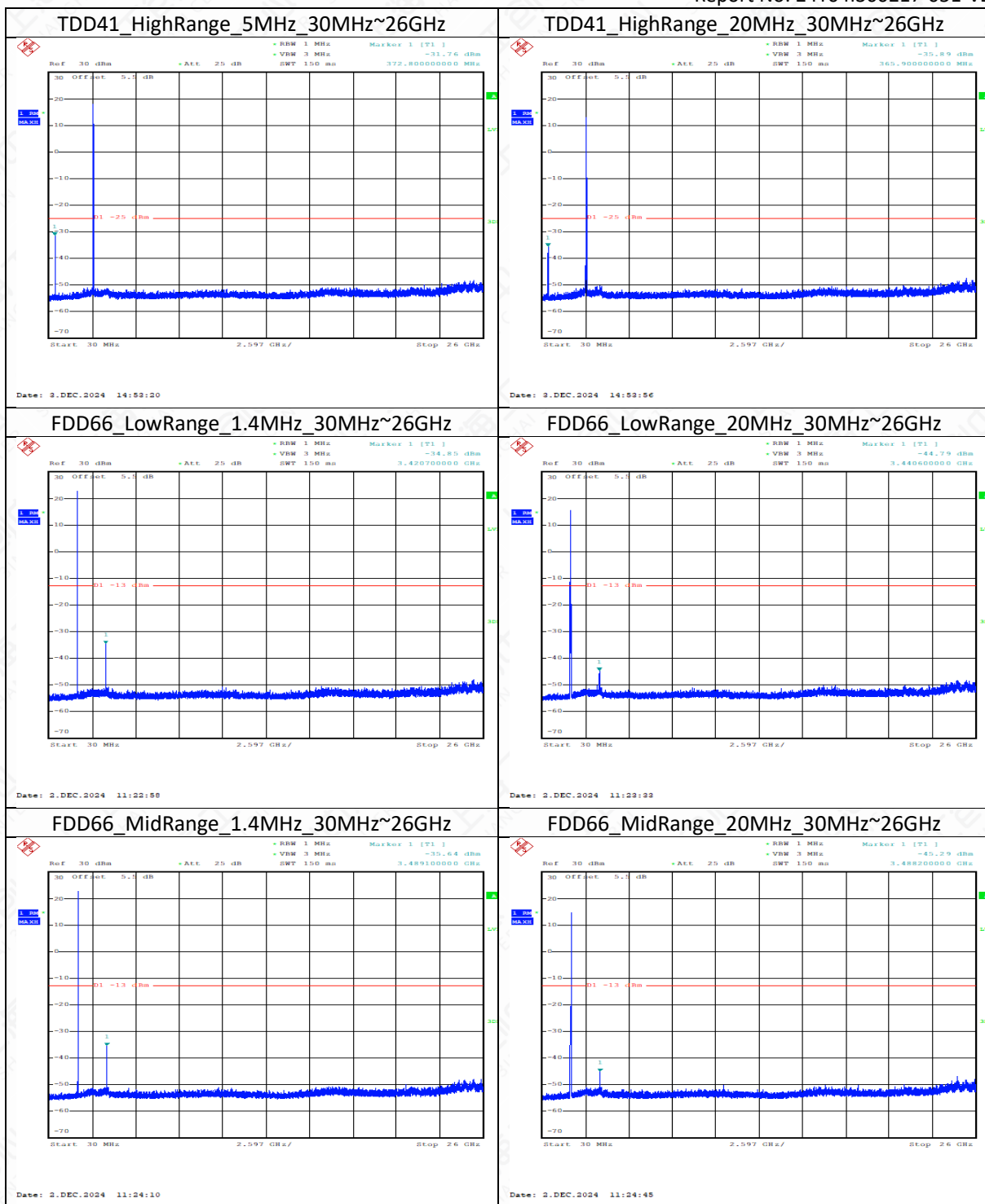
TDD41\_MidRange\_5MHz\_30MHz~26GHz

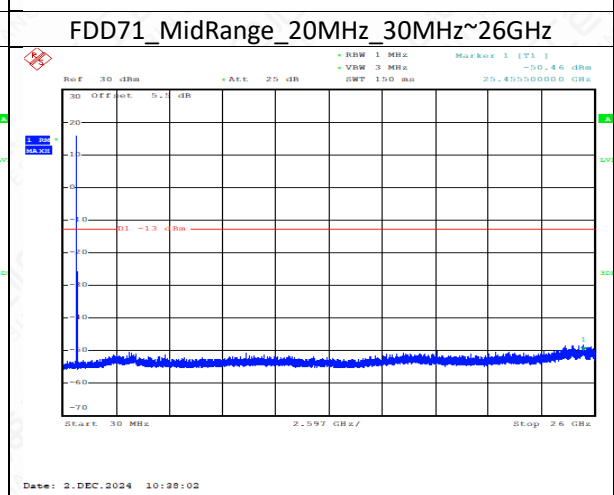
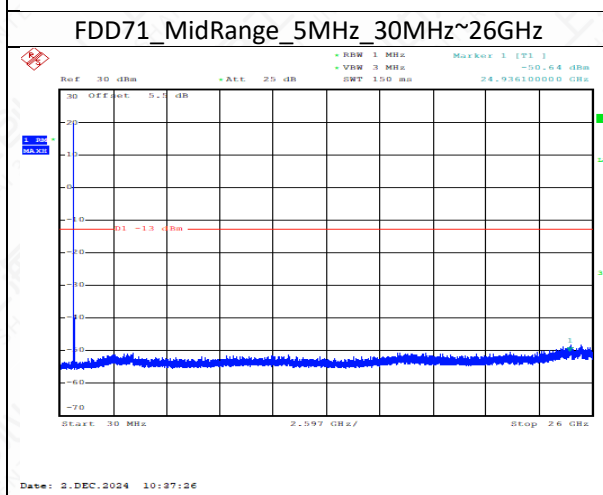
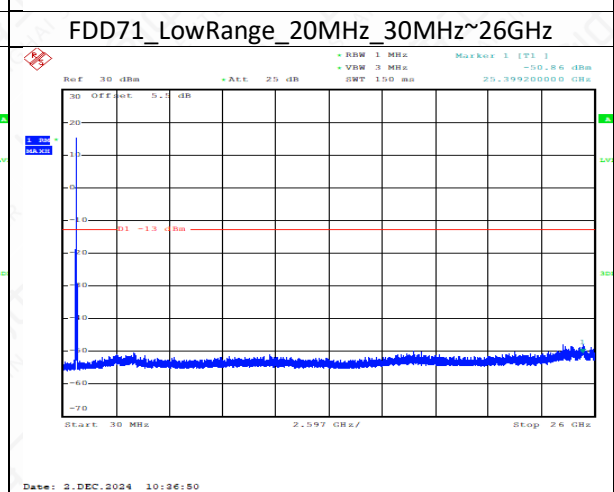
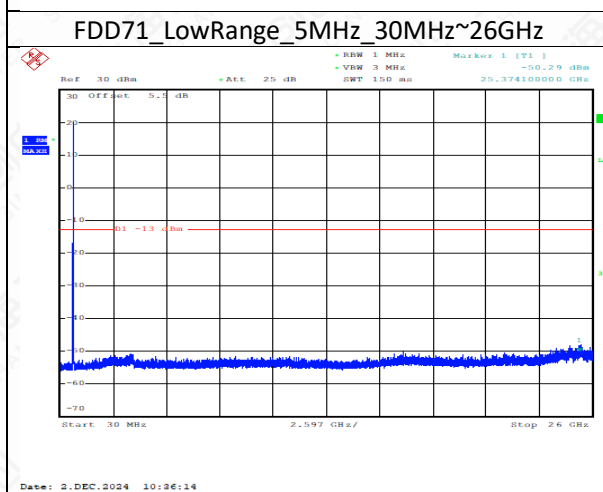
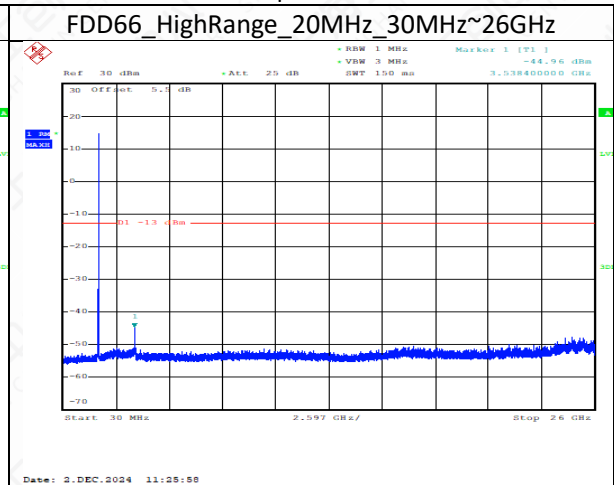
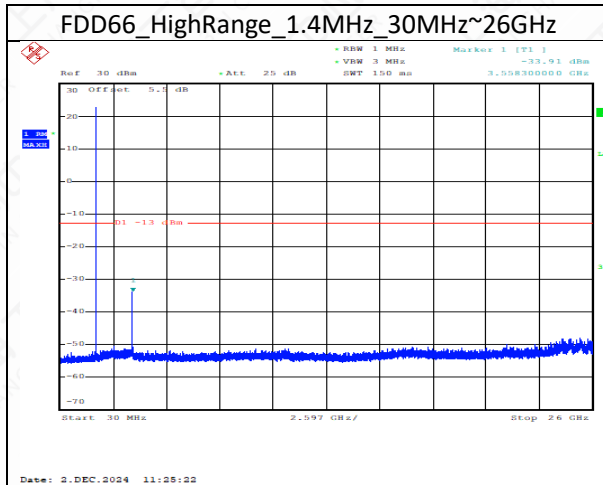


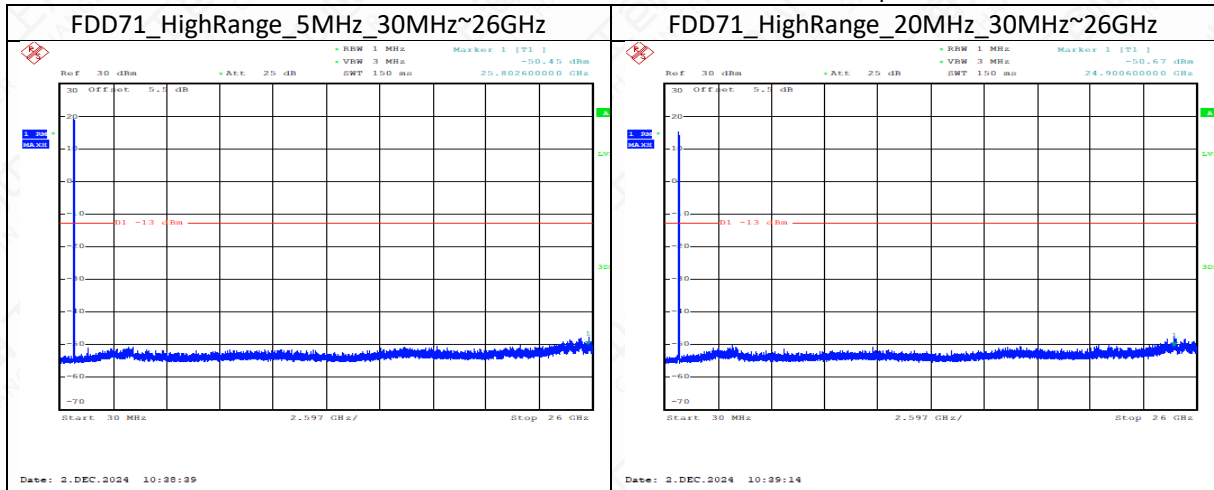
TDD41\_MidRange\_20MHz\_30MHz~26GHz











Note 1: This frequency range(2500-2690MHz) is only applicable for IC certification.



## 6.8 Peak-To-Average Power Ratio

### 6.8.1 Measurement Limit

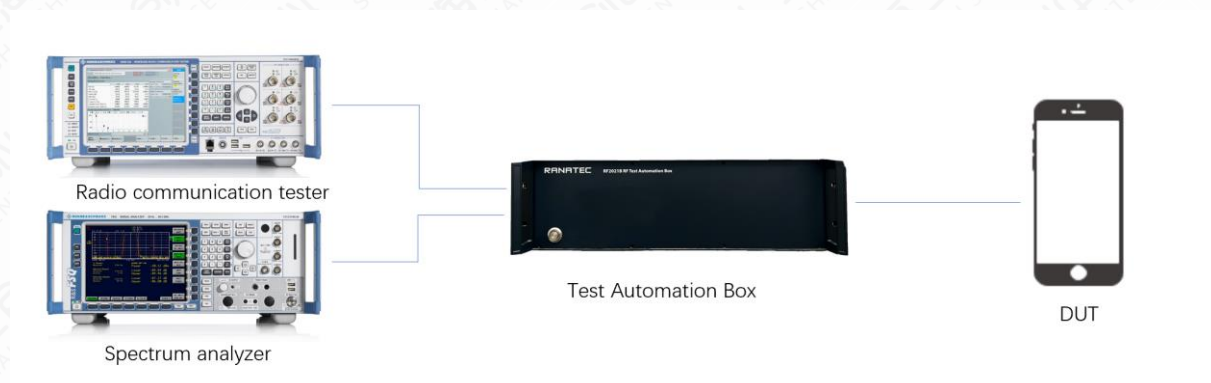
The peak-to-average ratio (PAR) of the transmission must not exceed 13 dB.

### 6.8.2 Method of Measurement

The peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB. The PAPR measurements should be made using either an instrument with complementary cumulative distribution function (CCDF) capabilities to determine that PAPR will not exceed 13 dB for more than 0.1 percent of the time or other Commission approved procedure. The measurement must be performed using a signal corresponding to the highest PAPR expected during periods of continuous transmission. According to KDB 971168 5.7:

- Refer to instrument's analyzer instruction manual for details on how to use the power statistics/CCDF function;
- Set resolution/measurement bandwidth  $\geq$  signal's occupied bandwidth;
- Set the number of counts to a value that stabilizes the measured CCDF curve;
- Set the measurement interval to 1 ms
- Record the maximum PAPR level associated with a probability of 0.1%

### 6.8.3 Test Setup



### 6.8.4 Measurement results

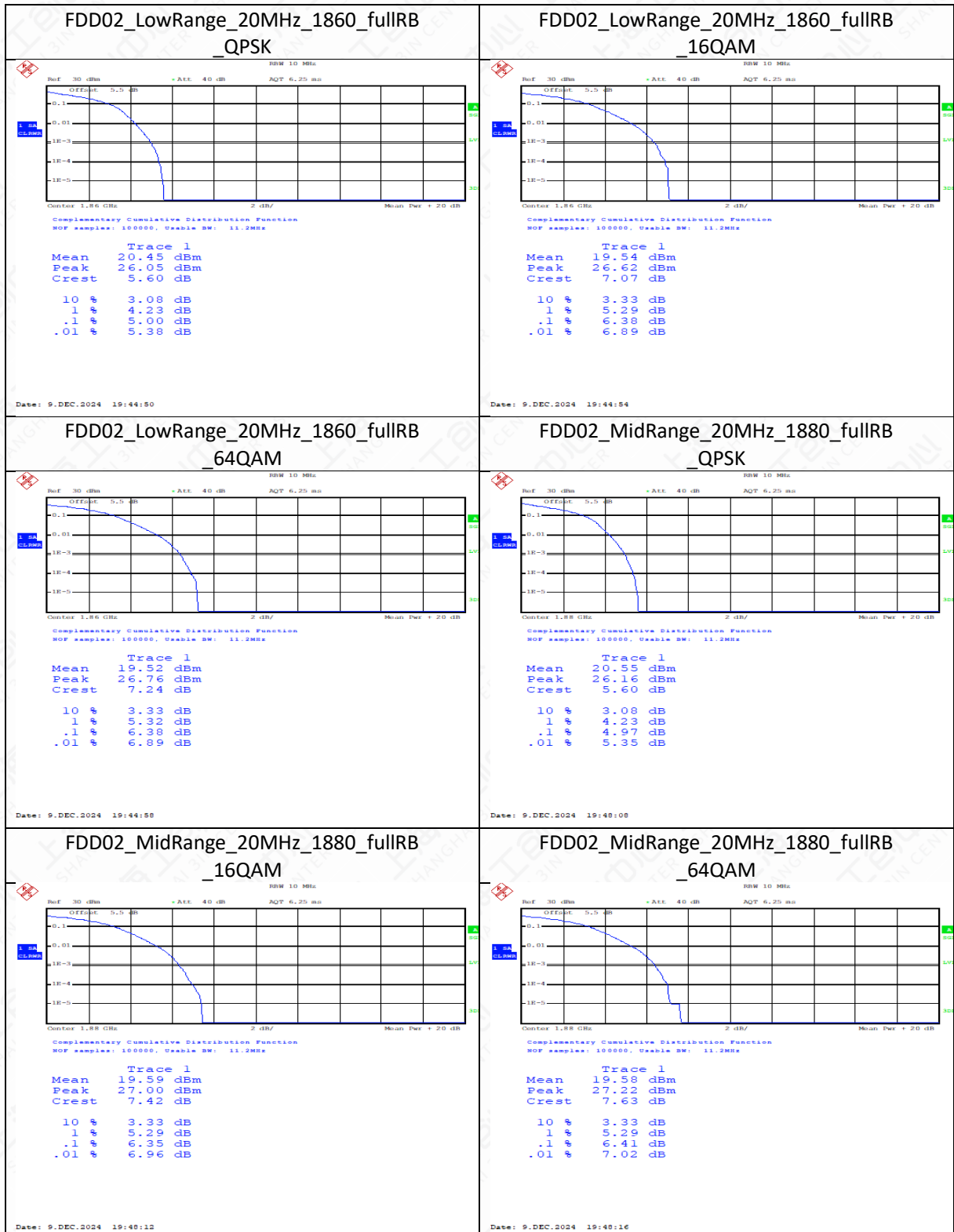
Band	Range	BandWidth	RbMode	QPSK(dBm)	16QAM(dBm)	64QAM(dBm)
FDD02	LowRange	20	fullRB	5.00	6.38	6.38
FDD02	MidRange	20	fullRB	4.97	6.35	6.41
FDD02	HighRange	20	fullRB	5.06	6.41	6.41
FDD04	LowRange	20	fullRB	5.00	6.25	6.25
FDD04	MidRange	20	fullRB	5.00	6.22	6.19
FDD04	HighRange	20	fullRB	4.94	6.22	6.22
FDD05	LowRange	10	fullRB	5.51	6.35	6.35
FDD05	MidRange	10	fullRB	5.38	6.22	6.28

FDD05	HighRange	10	fullRB	5.64	6.31	6.47
FDD07	LowRange	20	fullRB	5.16	6.03	6.03
FDD07	MidRange	20	fullRB	5.38	6.22	6.22
FDD07	HighRange	20	fullRB	4.97	6.25	6.22
FDD12	LowRange	10	fullRB	5.54	6.41	6.38
FDD12	MidRange	10	fullRB	5.42	6.25	6.28
FDD12	HighRange	10	fullRB	5.35	6.22	6.19
FDD13	LowRange	10	fullRB	5.48	6.25	6.28
FDD13	MidRange	10	fullRB	5.51	6.28	6.31
FDD13	HighRange	10	fullRB	5.48	6.28	6.28
FDD17	LowRange	10	fullRB	5.26	6.12	6.09
FDD17	MidRange	10	fullRB	5.22	5.99	6.03
FDD17	HighRange	10	fullRB	5.22	5.96	6.06
FDD25	LowRange	20	fullRB	5.00	6.38	6.73
FDD25	MidRange	20	fullRB	4.97	6.44	6.79
FDD25	HighRange	20	fullRB	5.03	6.38	6.76
FDD26_22	LowRange	15	fullRB	4.71	6.03	6.38
FDD26_22	MidRange	15	fullRB	4.68	5.93	6.19
FDD26_22	HighRange	15	fullRB	4.87	6.03	6.22
TDD38	LowRange	20	fullRB	6.60	7.82	7.79
TDD38	MidRange	20	fullRB	7.98	7.76	7.76
TDD38	HighRange	20	fullRB	6.51	7.76	7.79
TDD41	LowRange	20	fullRB	7.79	9.17	9.10
TDD41	MidRange	20	fullRB	7.60	9.10	9.13
TDD41	HighRange	20	fullRB	7.08	7.95	8.59
TDD41(Note 1)	LowRange	20	fullRB	7.58	8.48	8.56
FDD66	LowRange	20	fullRB	5.03	6.25	6.54
FDD66	MidRange	20	fullRB	4.94	6.19	6.54
FDD66	HighRange	20	fullRB	4.94	6.12	6.31

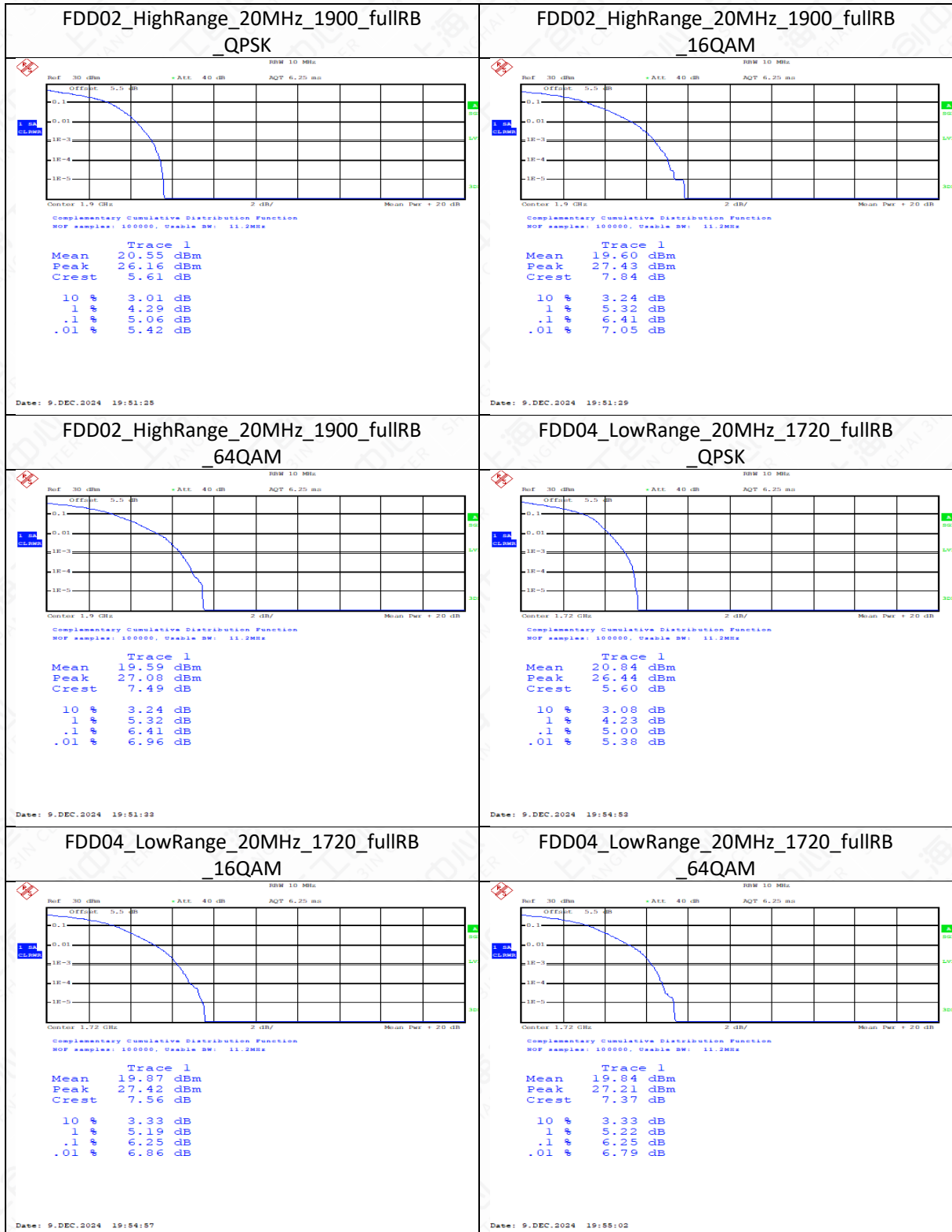


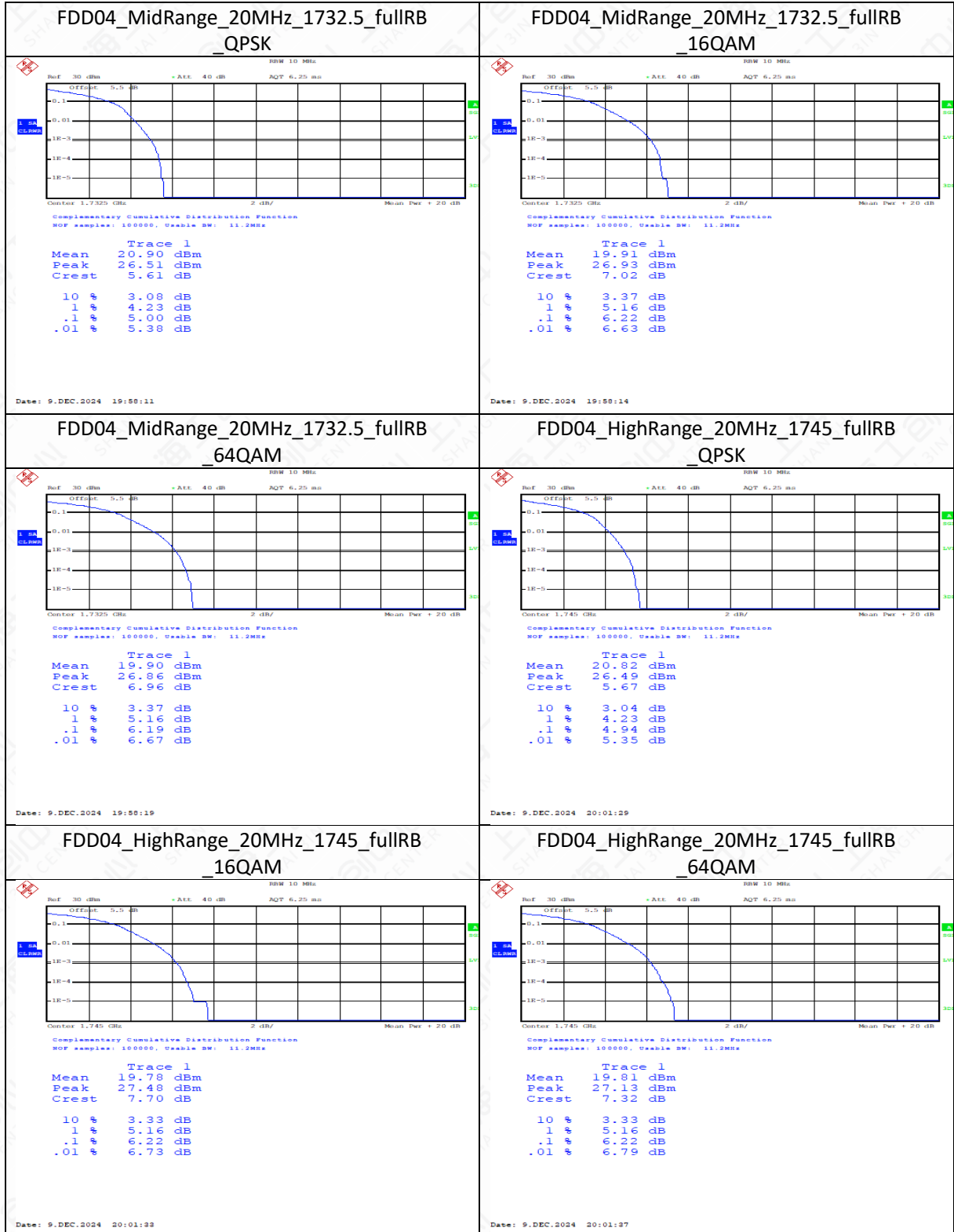
FDD71	LowRange	20	fullRB	4.97	6.44	6.70
FDD71	MidRange	20	fullRB	4.94	6.35	6.70
FDD71	HighRange	20	fullRB	4.97	6.38	6.73

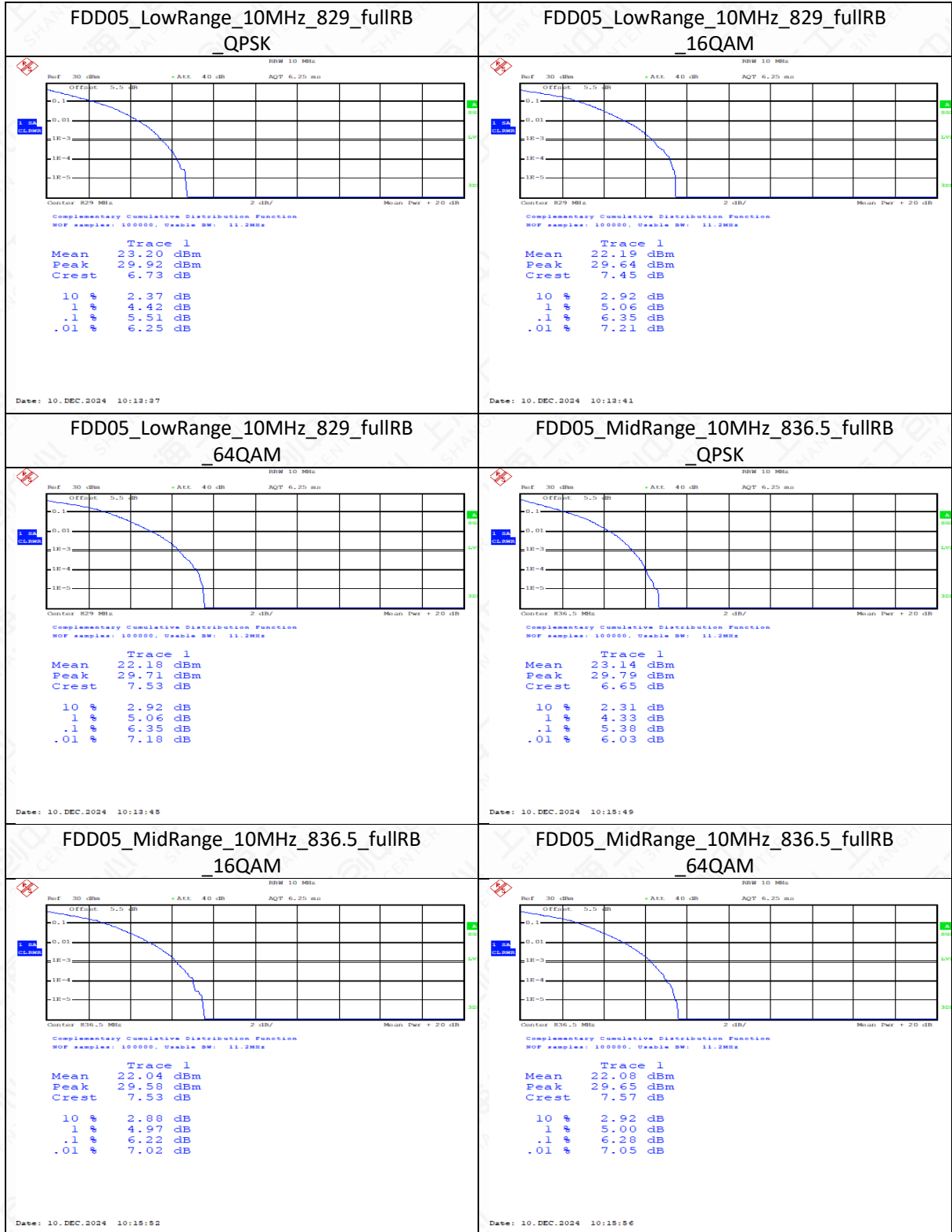
Note 1: This frequency range is only applicable for IC certification.



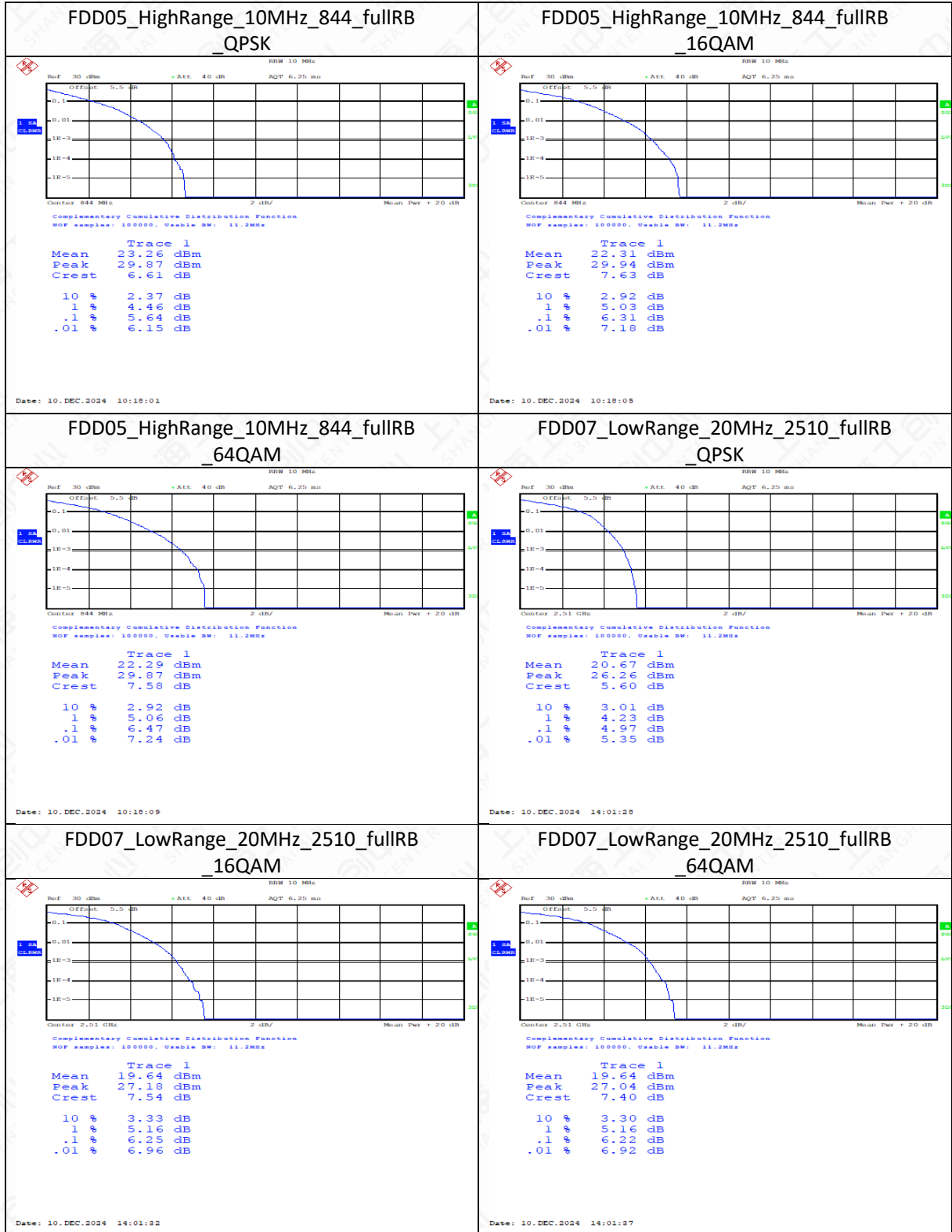


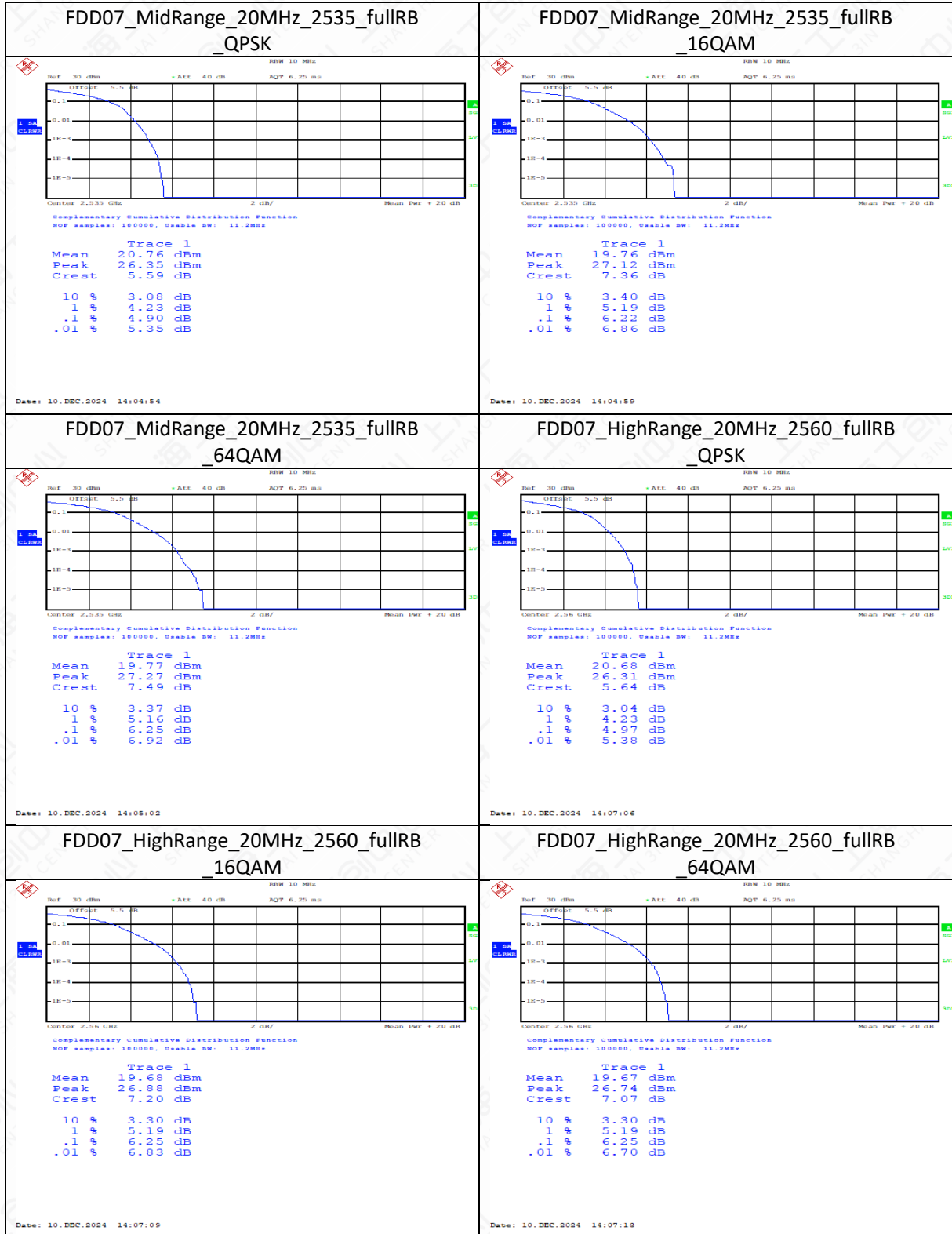


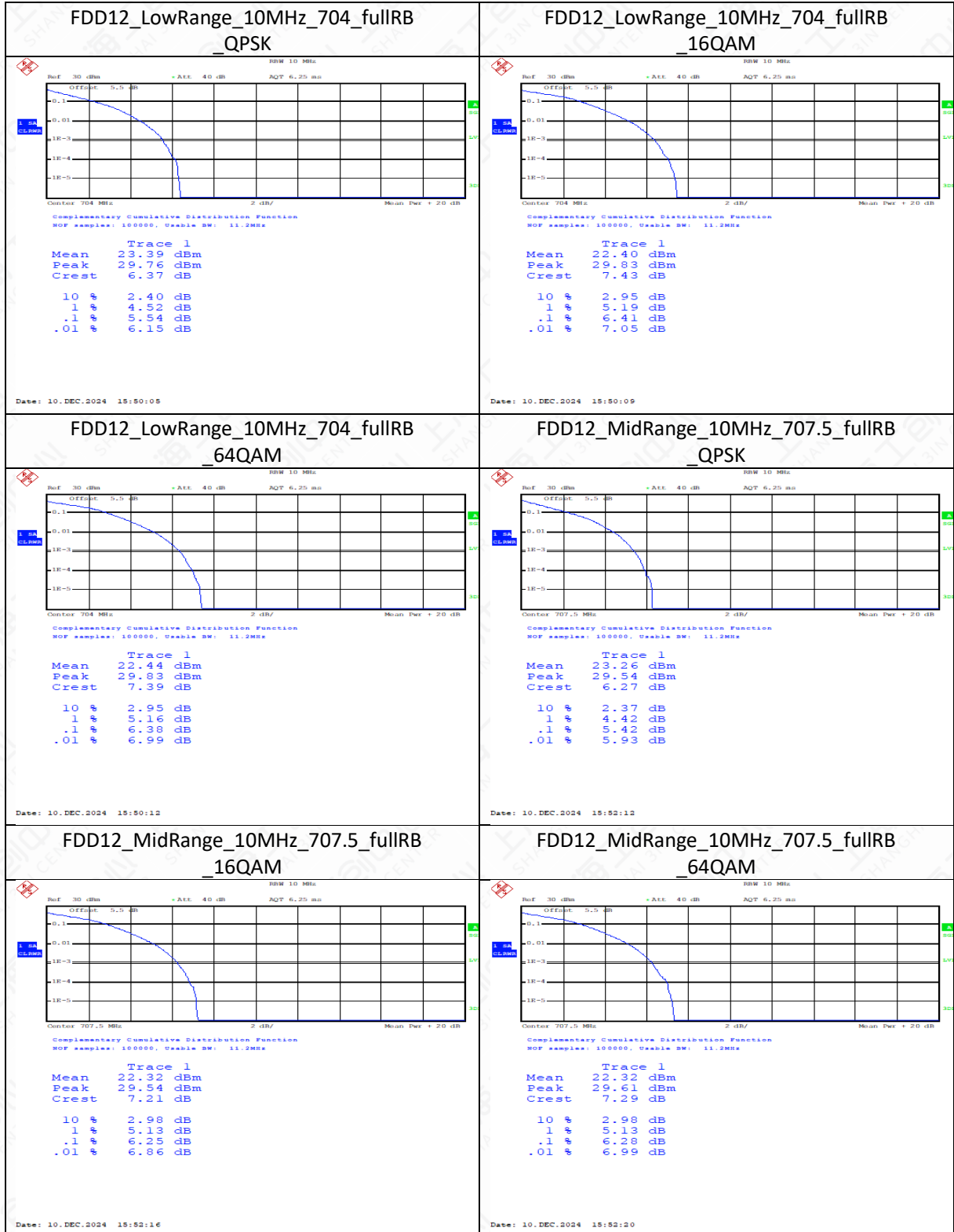




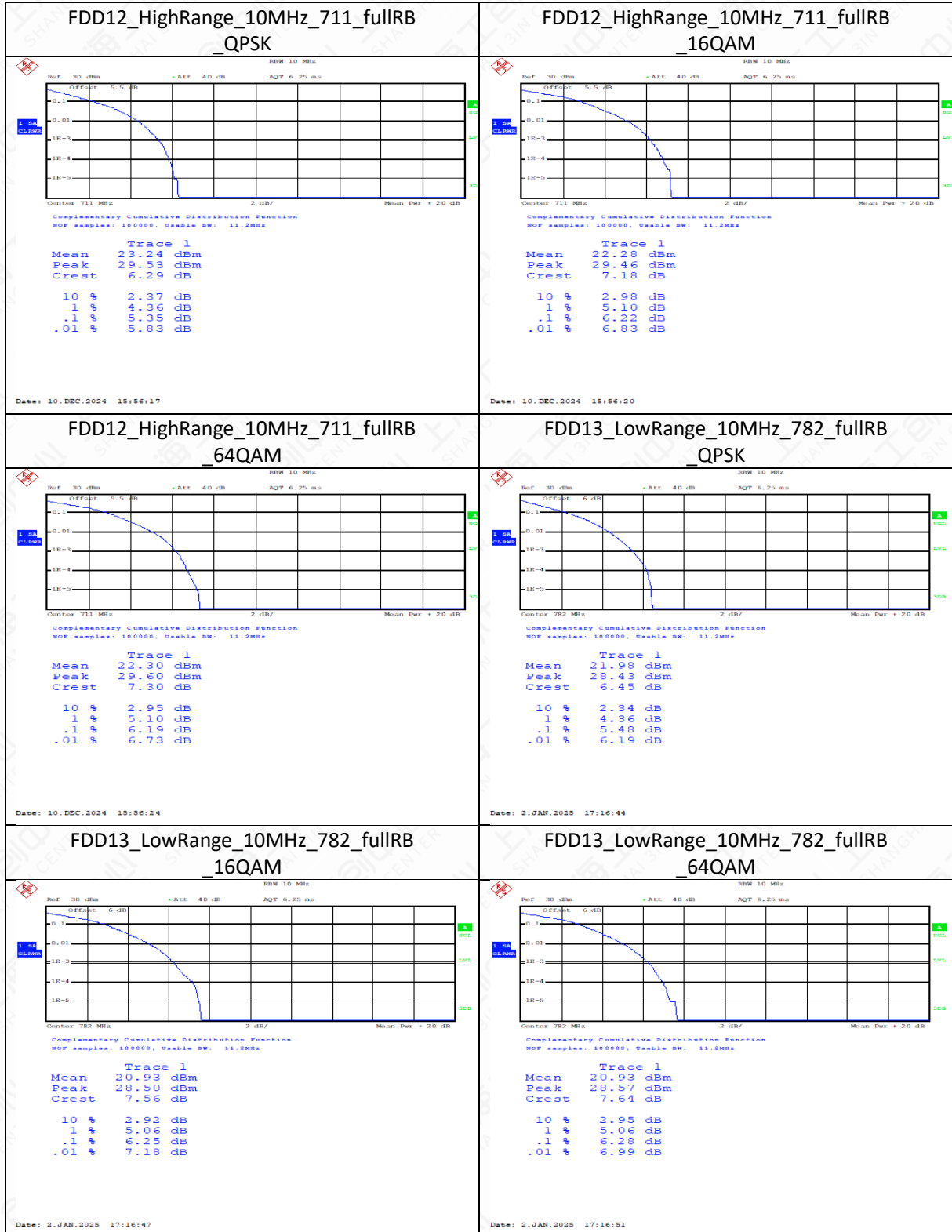


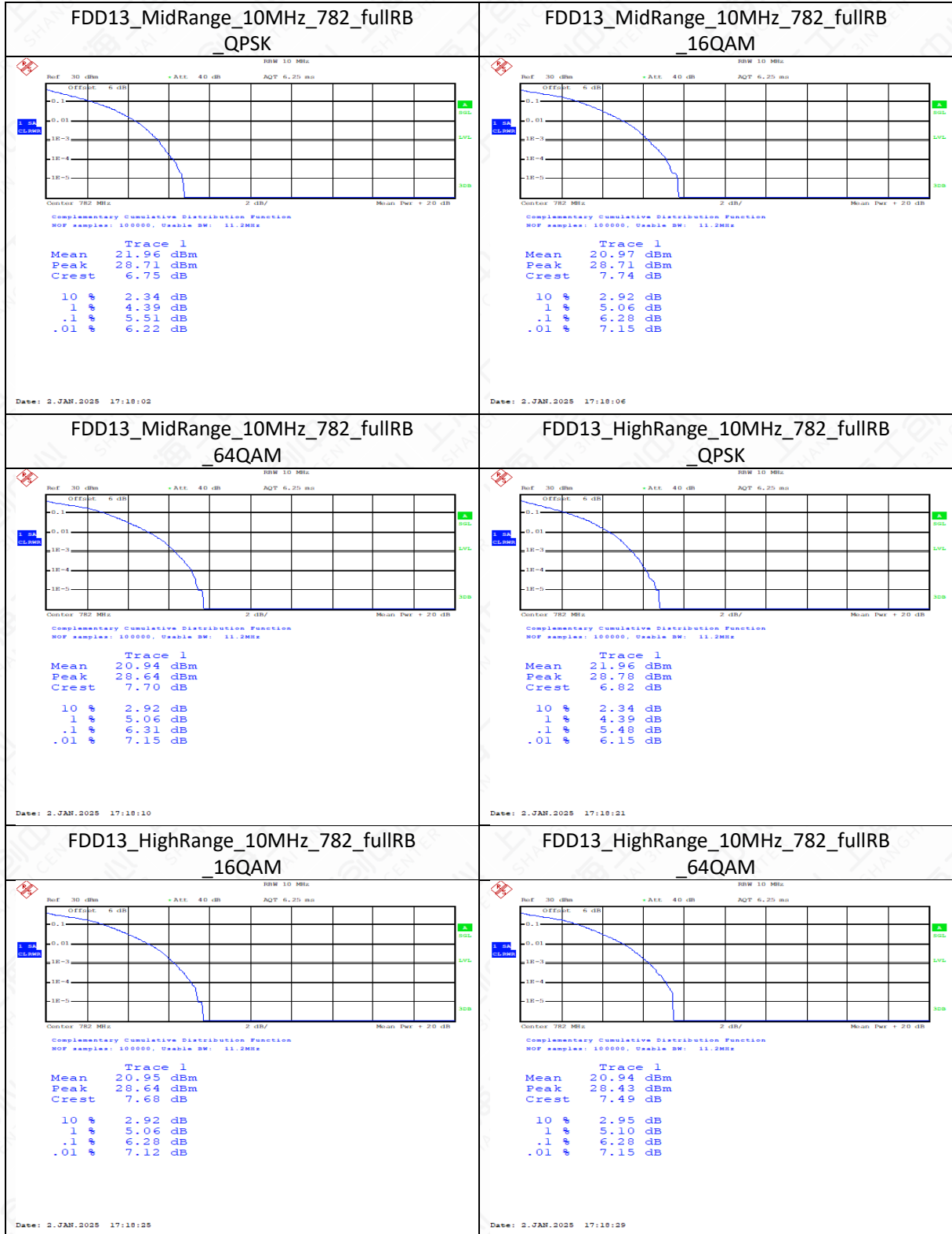


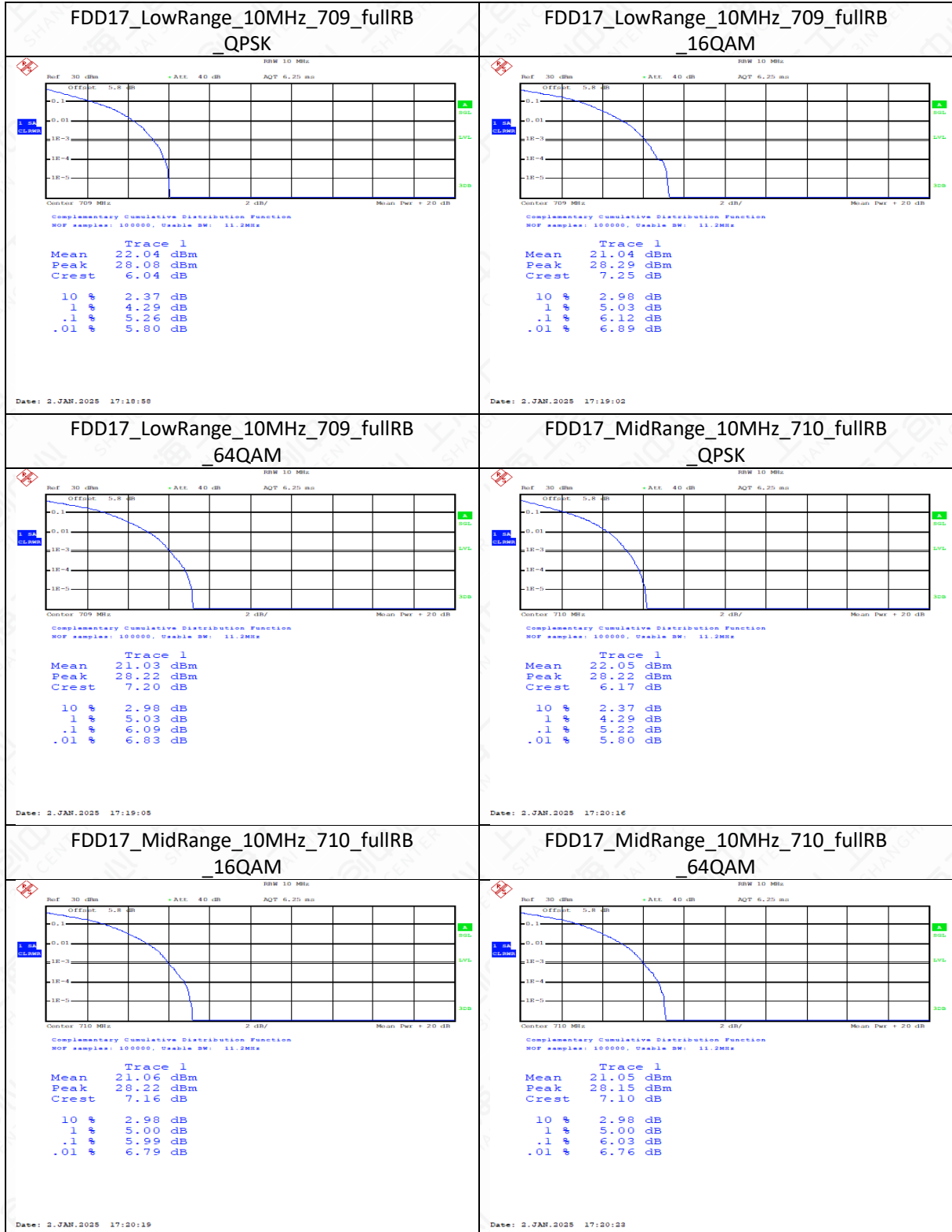




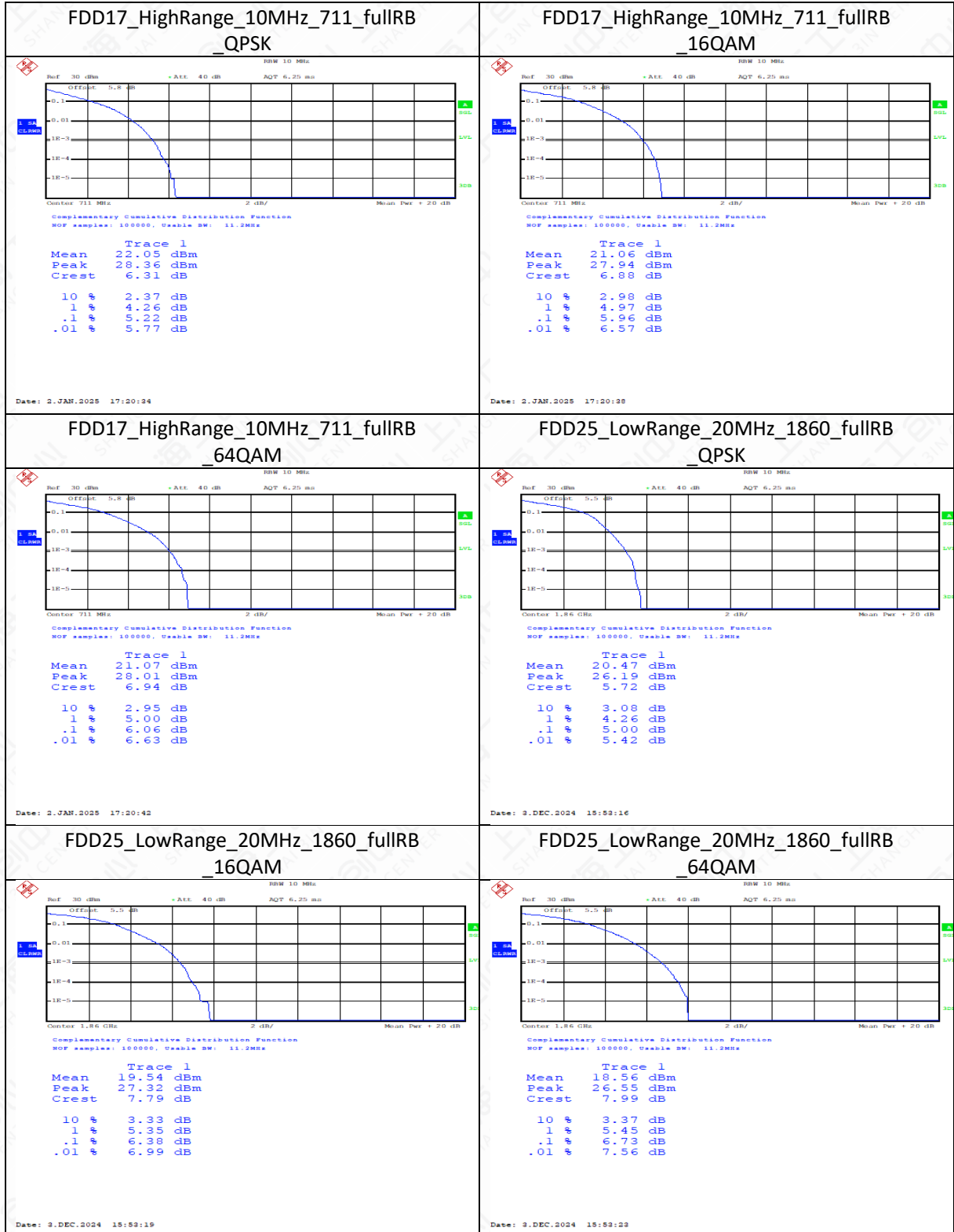


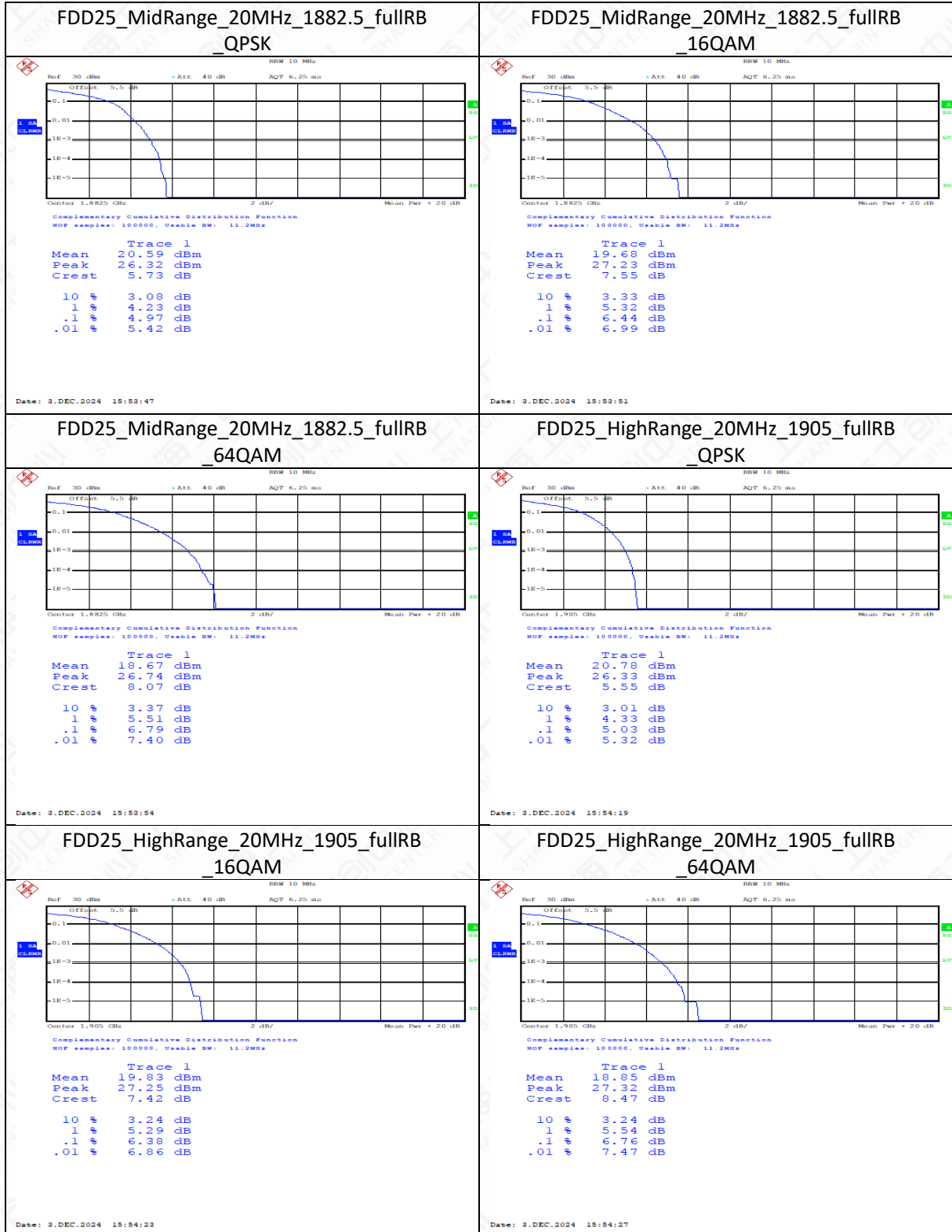


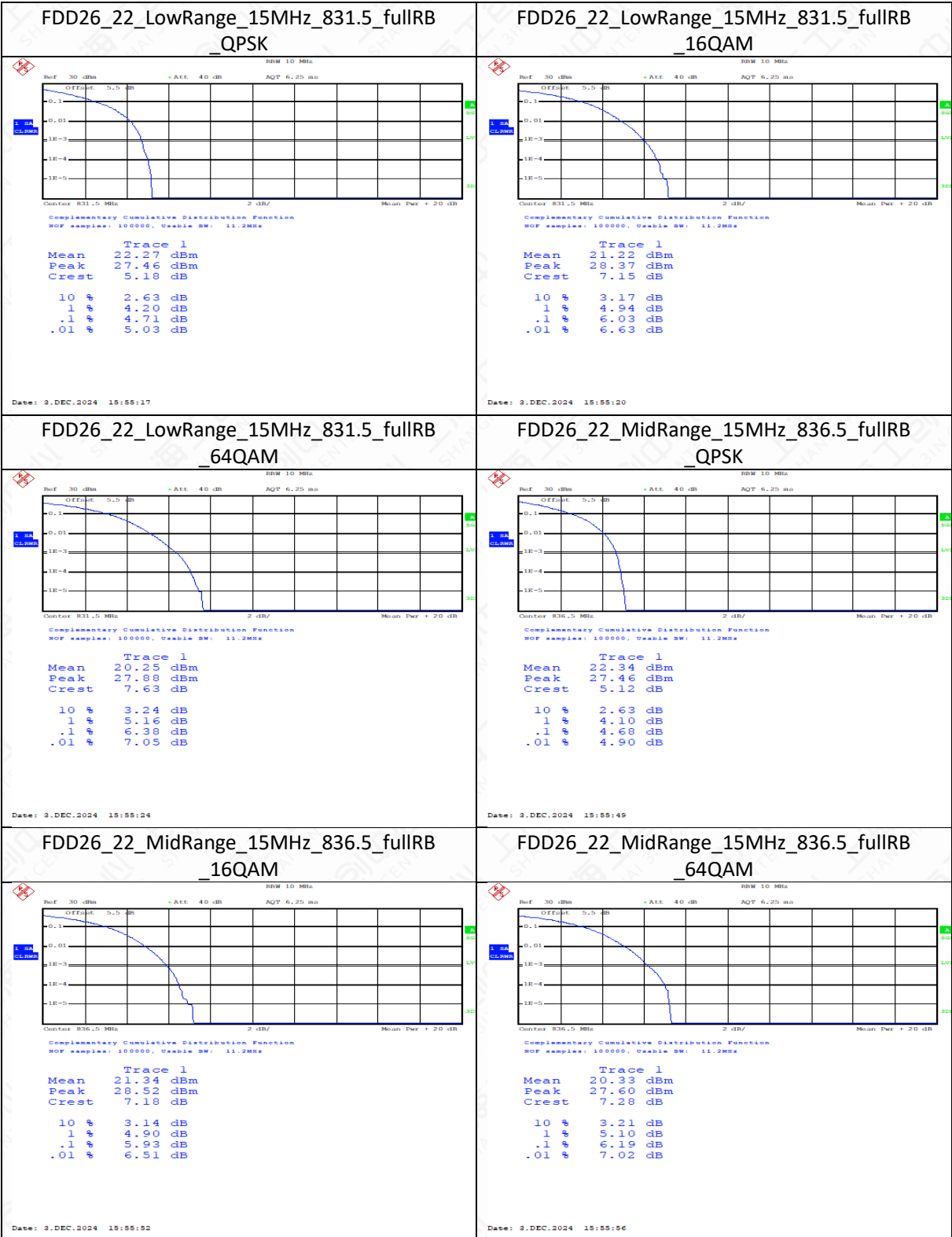




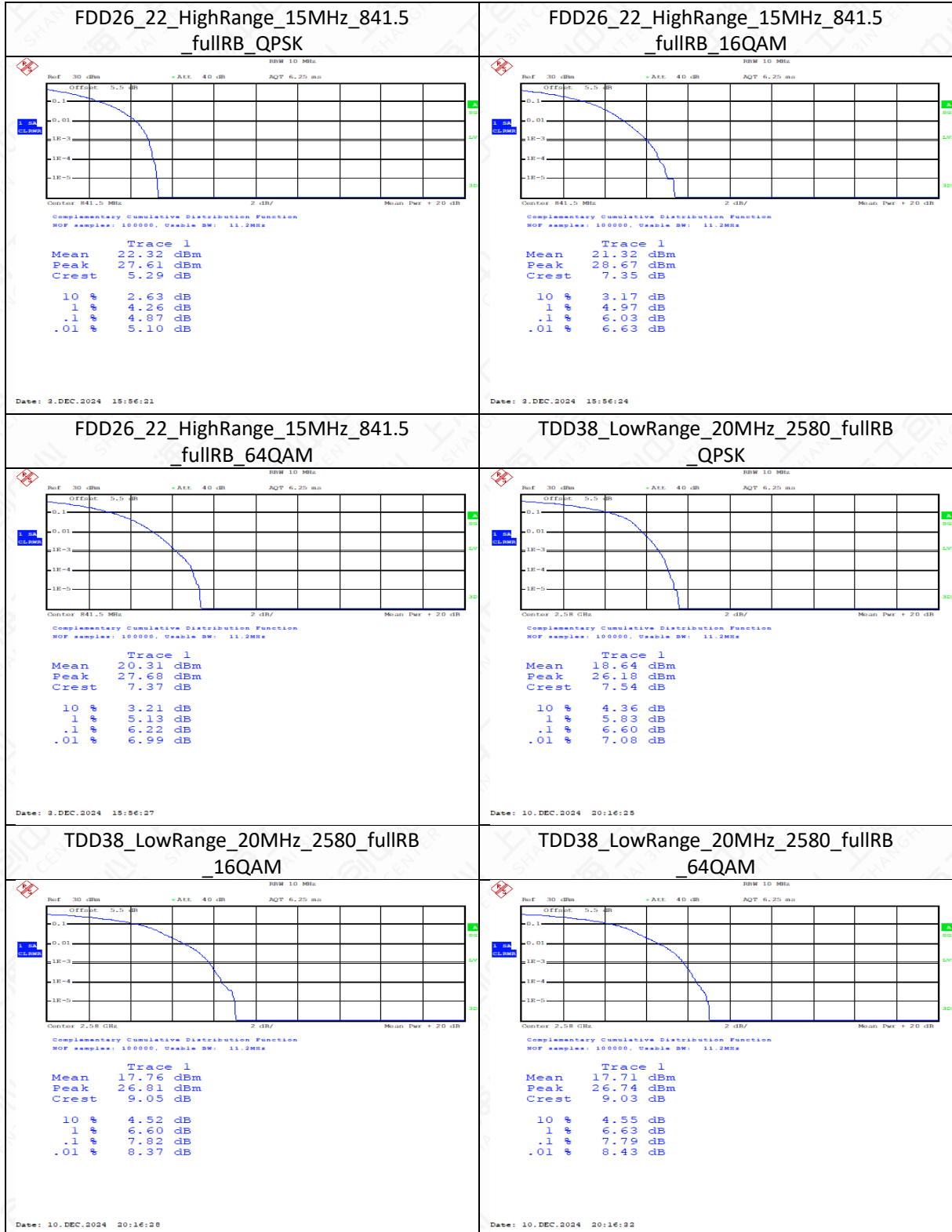


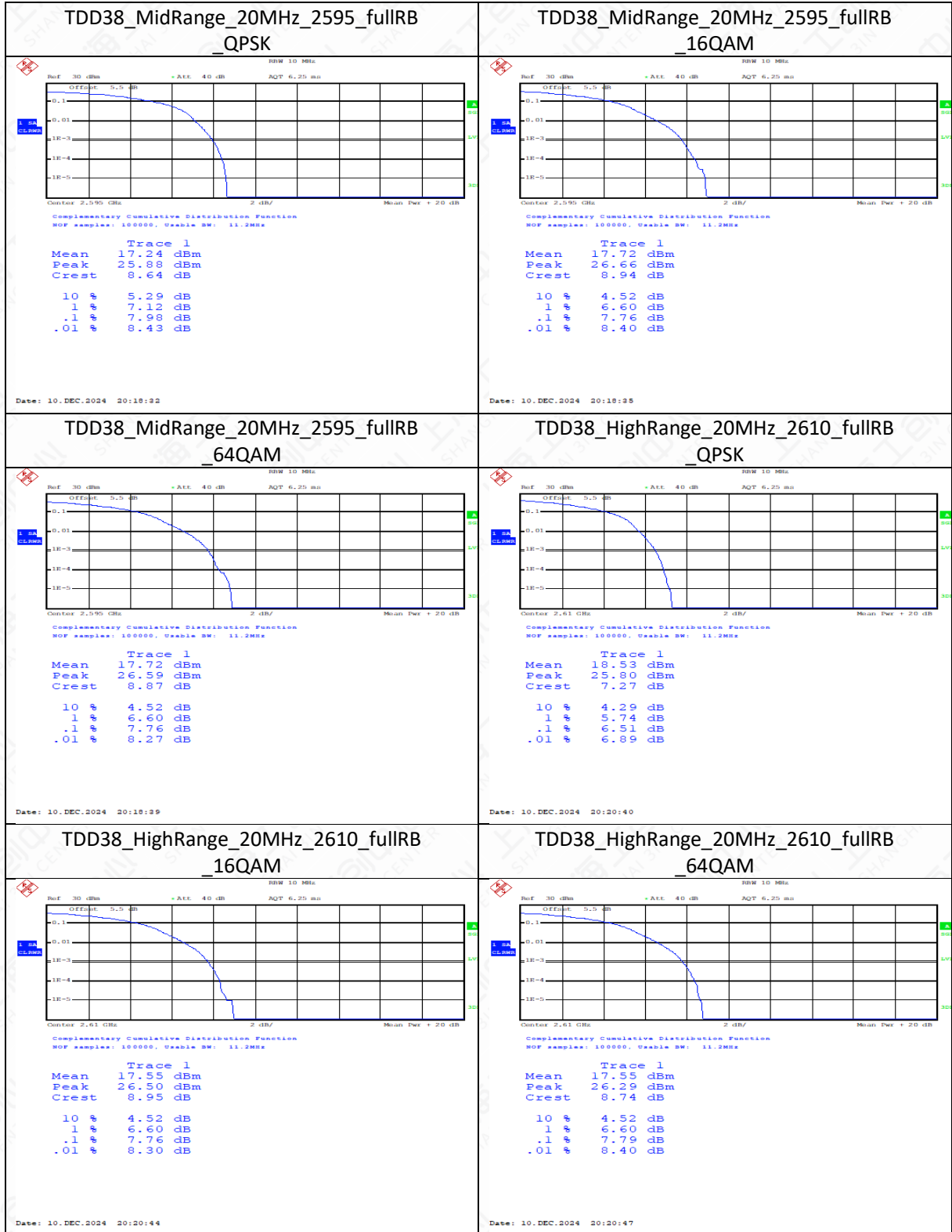


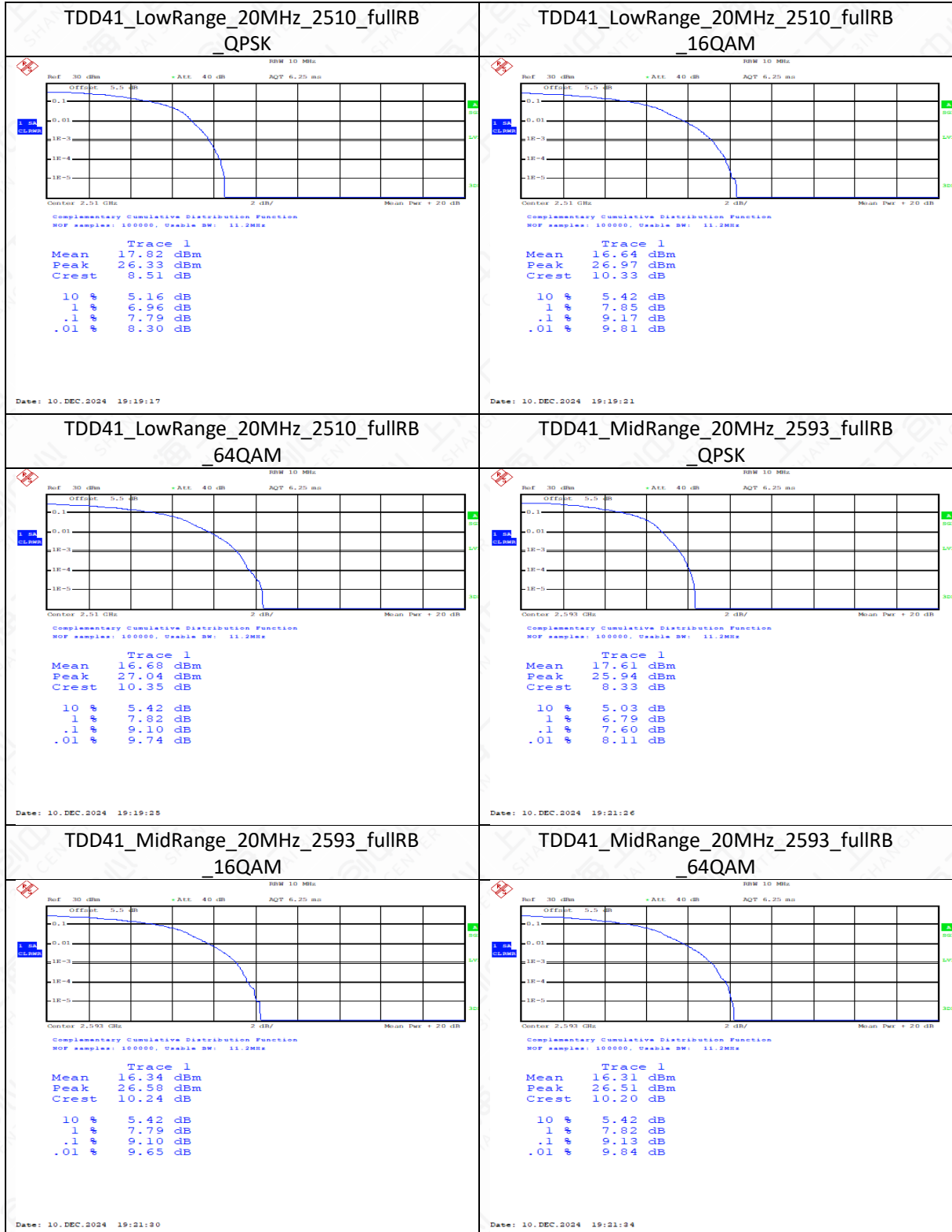




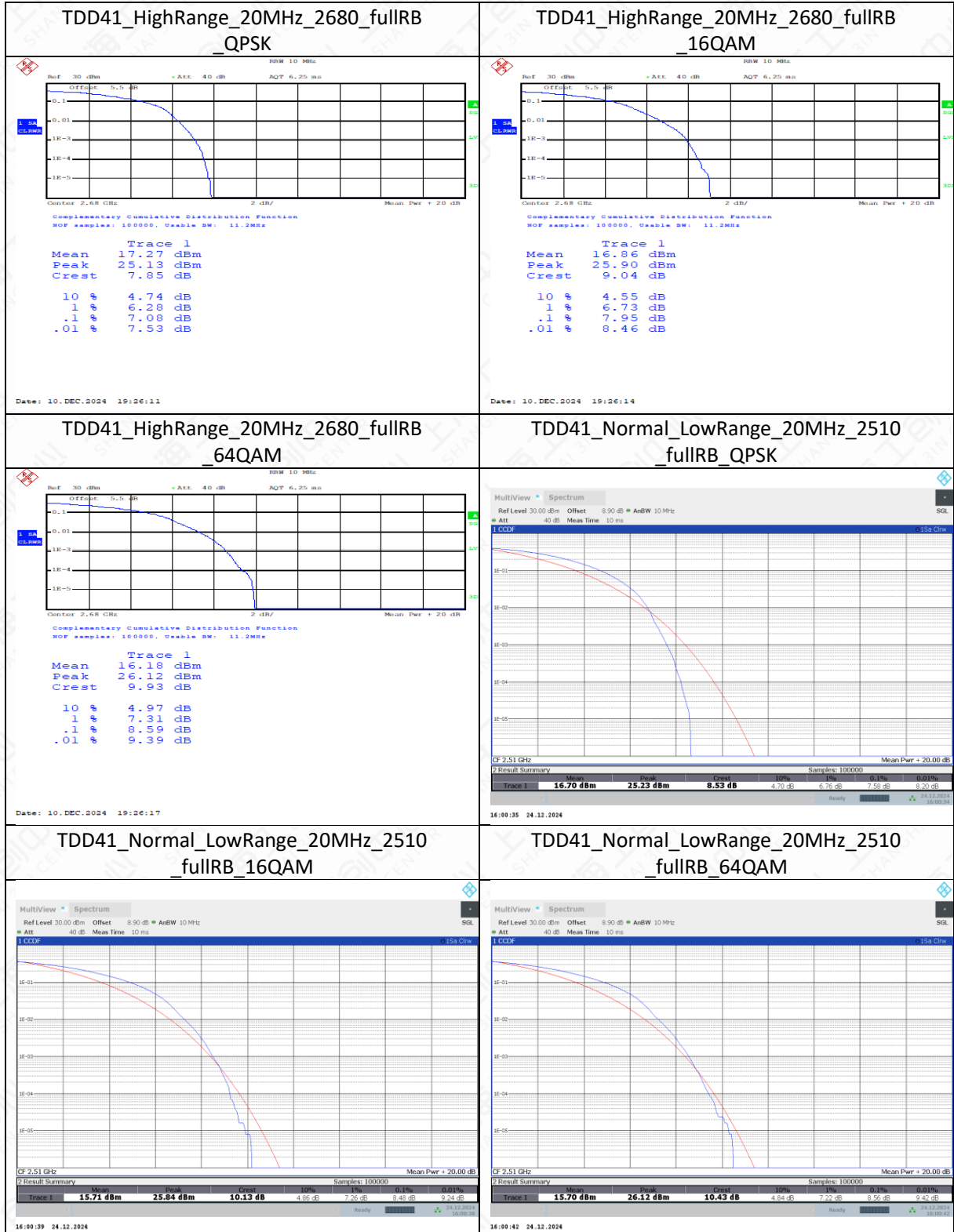


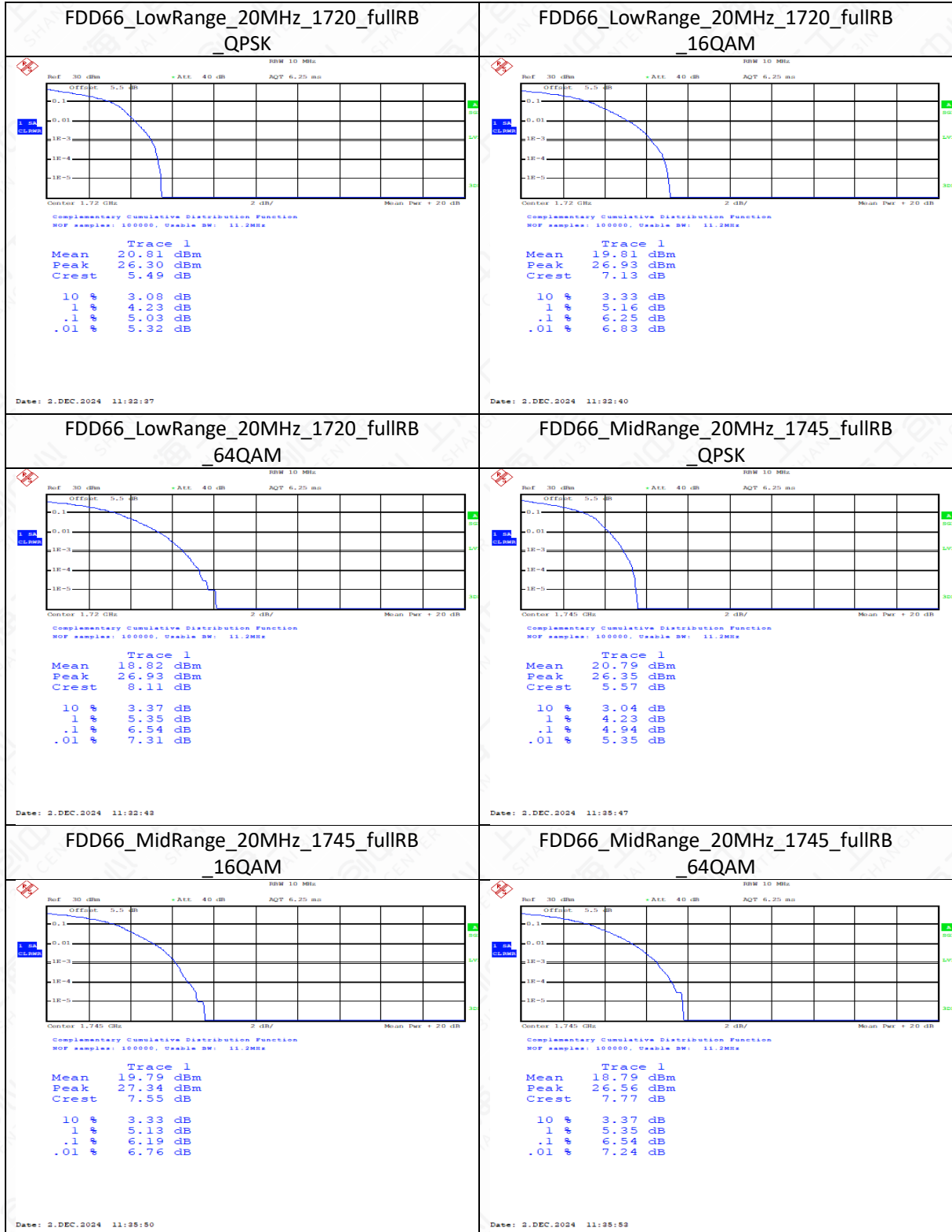


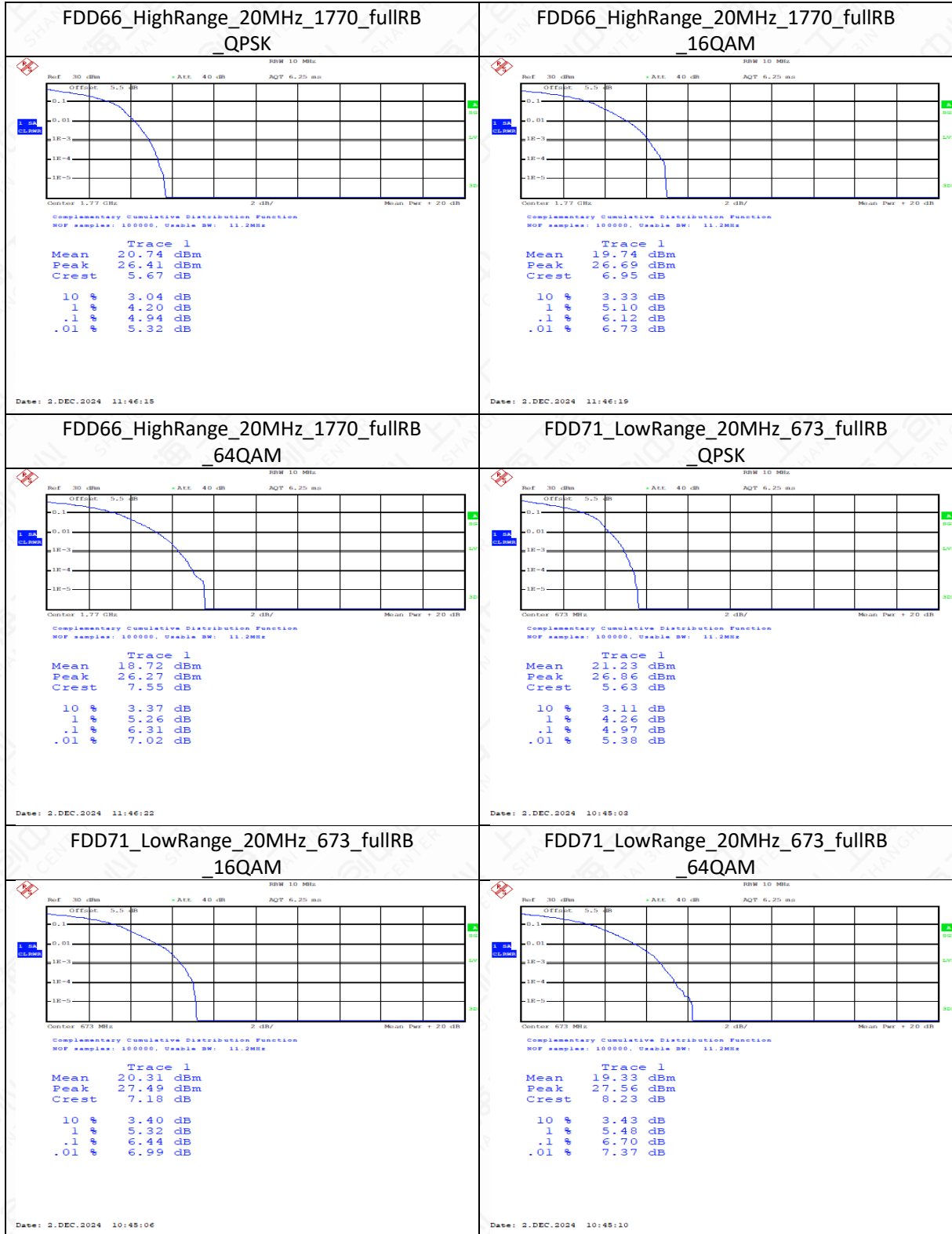




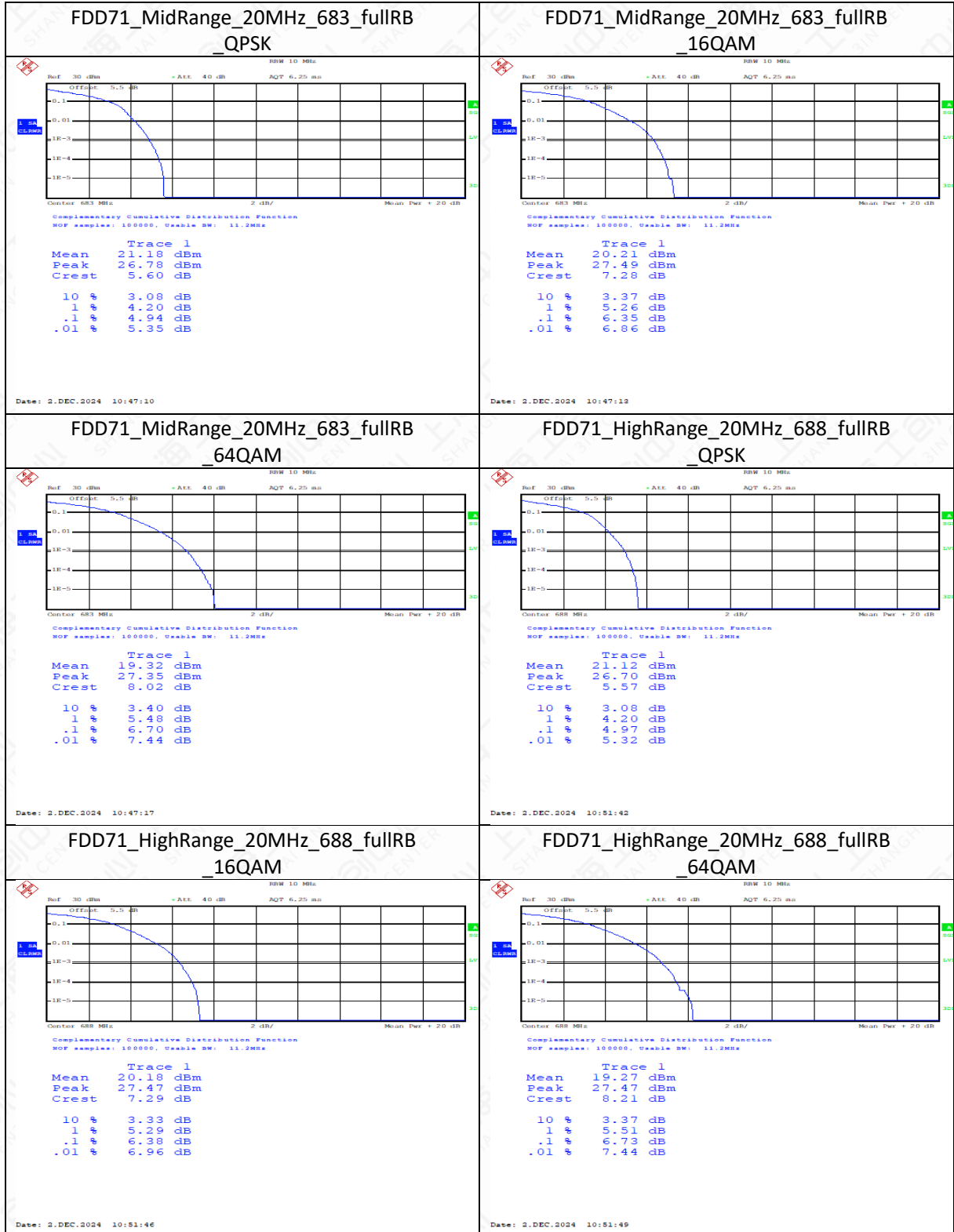












**Annex A: Revised History**

Version	Revised Content
V0	Initial
V1	Modified Emissions Information Band 7/25/41 data in section 4.3
V2	Add Emissions Information Band 41 IC frequency range data in section 4.3

## Annex B: Accreditation Certificate



### Accredited Laboratory

A2LA has accredited

## INDUSTRIAL INTERNET INNOVATION CENTER (SHANGHAI) CO., LTD.

Shanghai, People's Republic of China

for technical competence in the field of

### Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).



Presented this 20<sup>th</sup> day of September 2023.



Mr. Trace McInturf, Vice President, Accreditation Services  
For the Accreditation Council  
Certificate Number 3682.01  
Valid to February 28, 2025

For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.

**END OF REPORT**