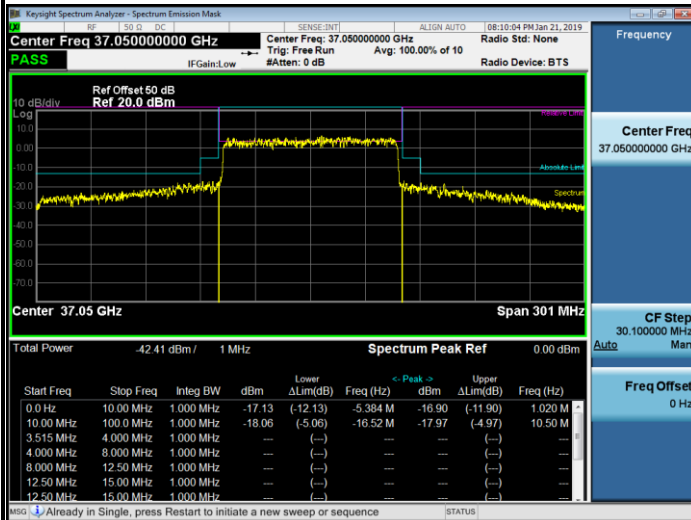




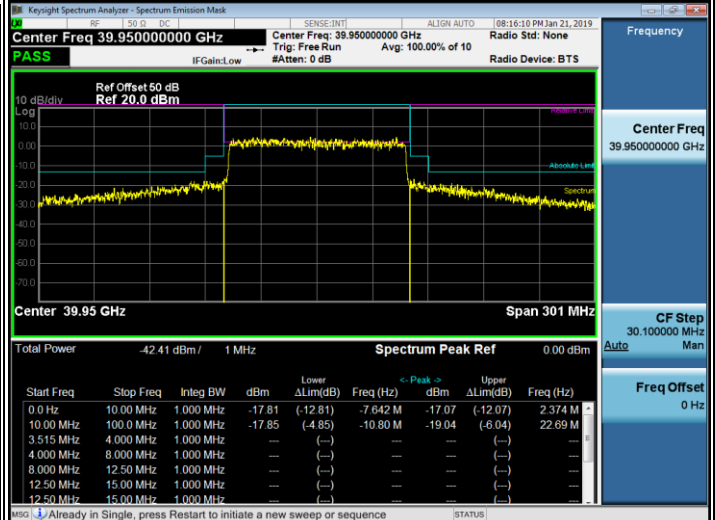
Module 3

NR Band n260 / 100MHz / 16QAM

Lowest Band Edge / Full RB

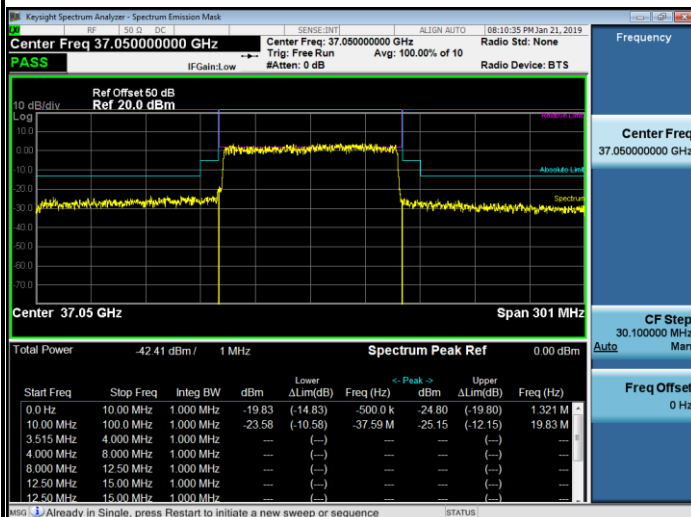


Highest Band Edge / Full RB

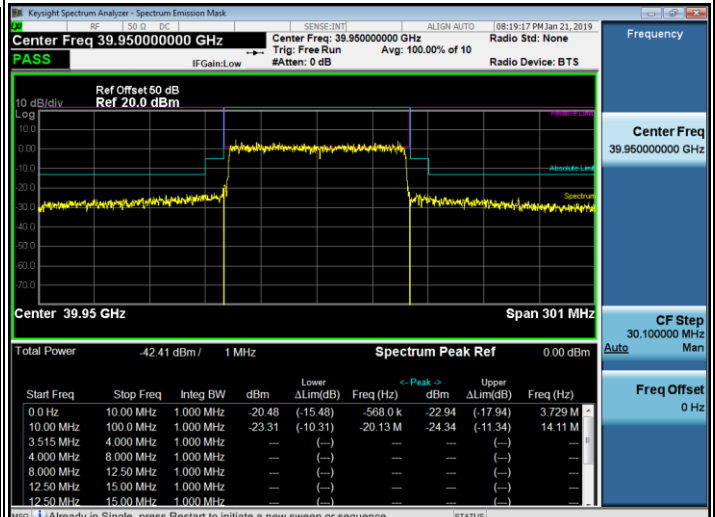


NR Band n260 / 100MHz / 64QAM

Lowest Band Edge / Full RB



Highest Band Edge / Full RB

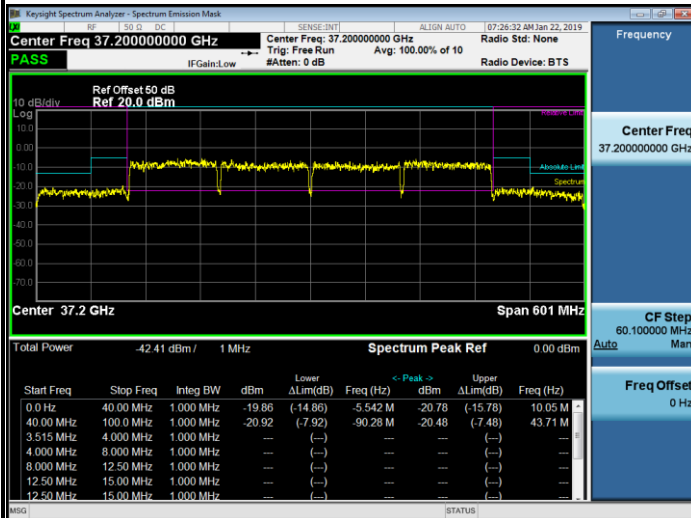




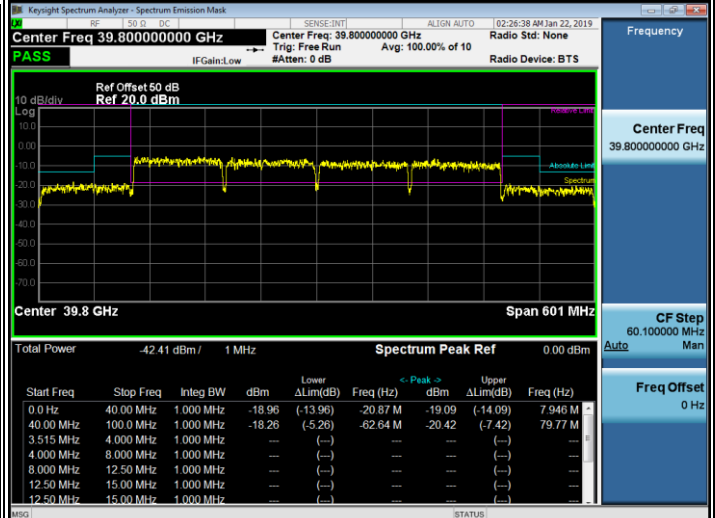
Module 3

NR Band n260 / 400MHz / QPSK

Lowest Band Edge / Full RB

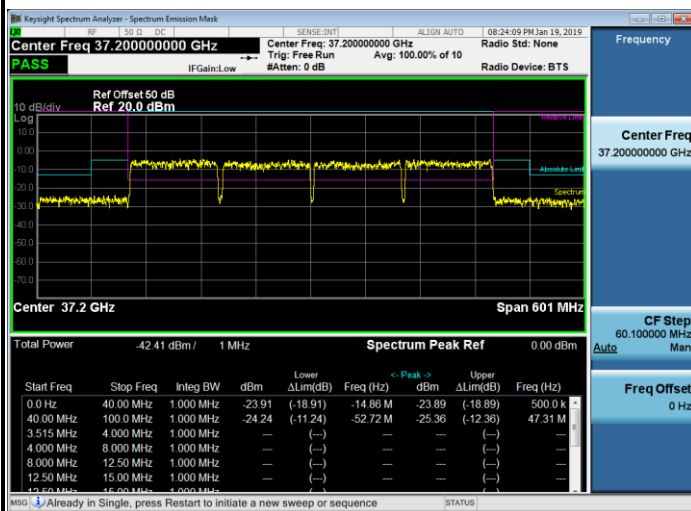


Highest Band Edge / Full RB

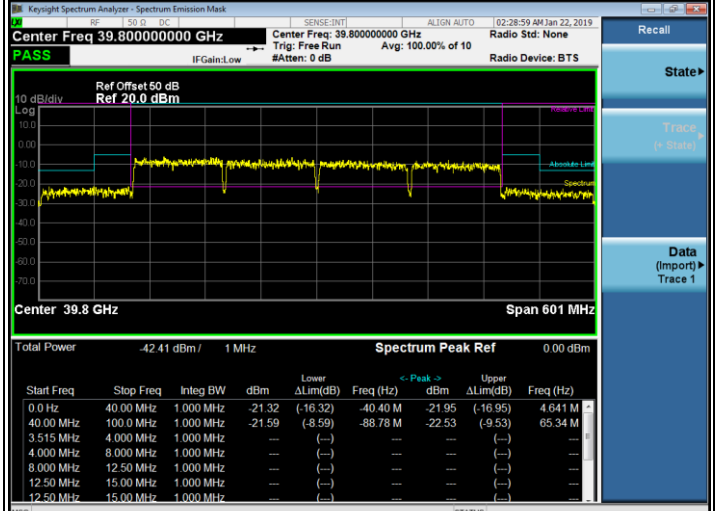


NR Band n260 / 400MHz / 16QAM

Lowest Band Edge / Full RB



Highest Band Edge / Full RB

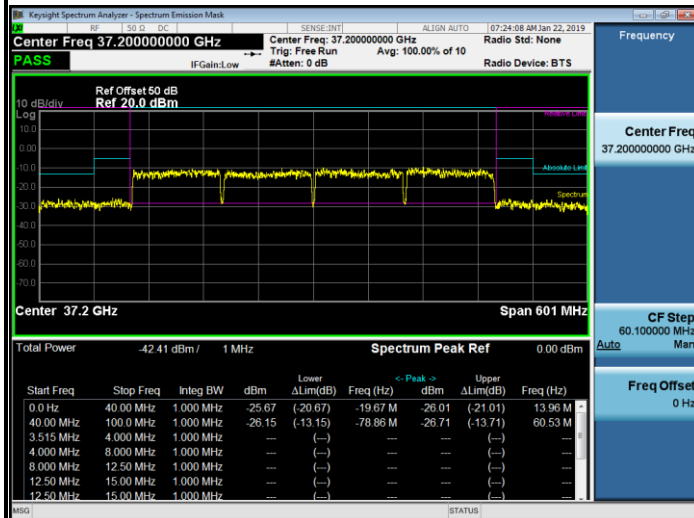




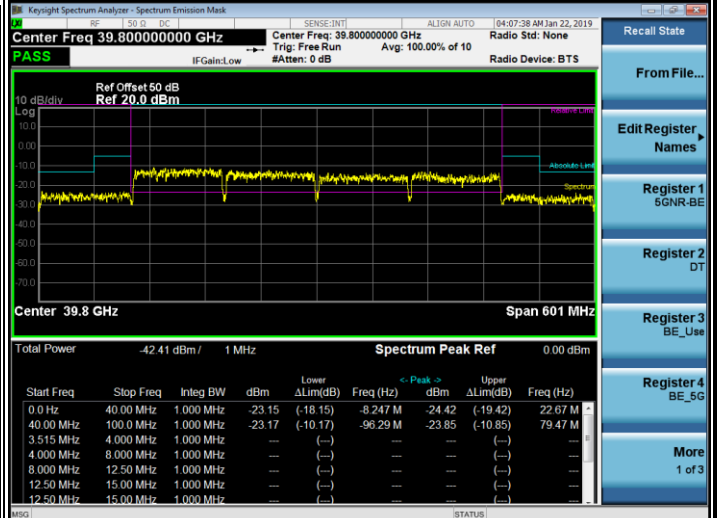
Module 3

NR Band n260 / 400MHz / 64QAM

Lowest Band Edge / Full RB



Highest Band Edge / Full RB

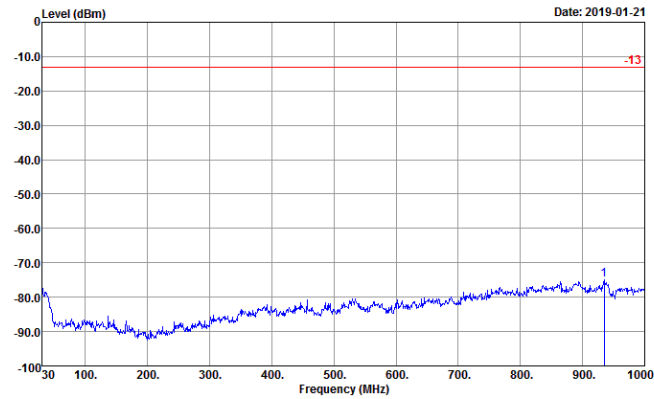




Radiated Spurious Emission

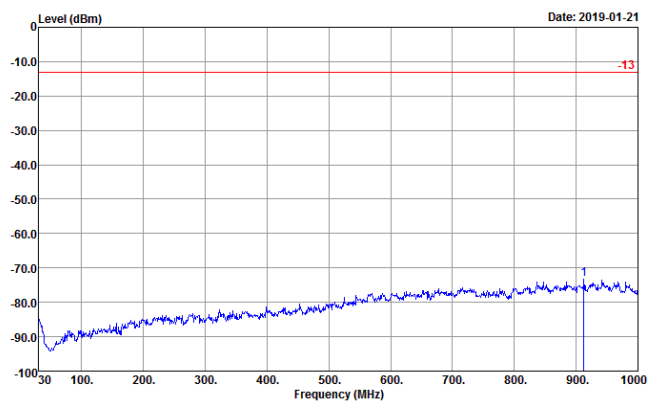


There is no significant spurious emission signal found for frequency started from 9kHz up to 18GHz.
Only the noise floor is reported.

NR Band n260 (30MHz-1GHz)**Horizontal**

Site : 03CH10-HY
Condition : -13 EIRP_WO HORIZONTAL
Project : 890514

	Freq	Level	Over Limit	Limit Line	Read Level
	MHz	dBm	dB	dBm	dBm
1	935.01	-75.02	-62.02	-13.00	-81.98

Vertical

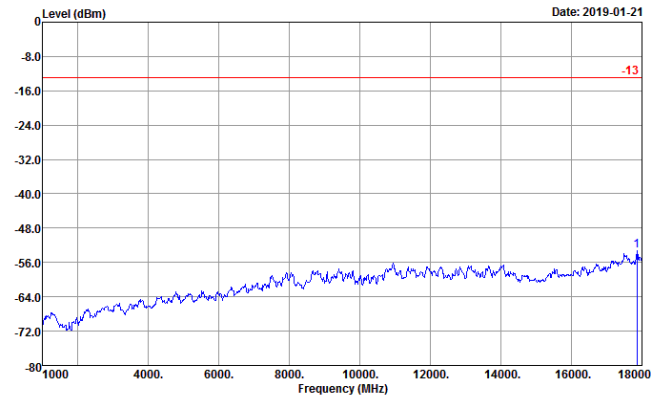
Site : 03CH10-HY
Condition : -13 EIRP_WO VERTICAL
Project : 890514

	Freq	Level	Over Limit	Limit Line	Read Level
	MHz	dBm	dB	dBm	dBm
1	912.70	-73.31	-60.31	-13.00	-82.13



NR Band n260 (1GHz-18GHz)

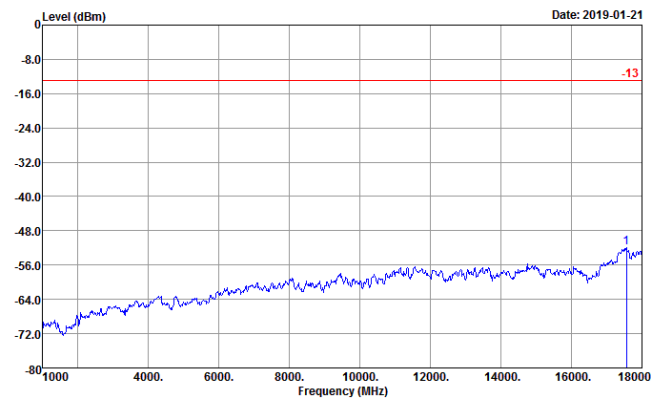
Horizontal



Site : 03CH10-HY
Condition : -13 EIRP_WO HORIZONTAL
Project : 890514

	Freq	Level	Over Limit	Limit Line	Read Level
	MHz	dBm	dB	dBm	dBm
1	17864.00	-53.36	-40.36	-13.00	-63.72

Vertical



Site : 03CH10-HY
Condition : -13 EIRP_WO VERTICAL
Project : 890514

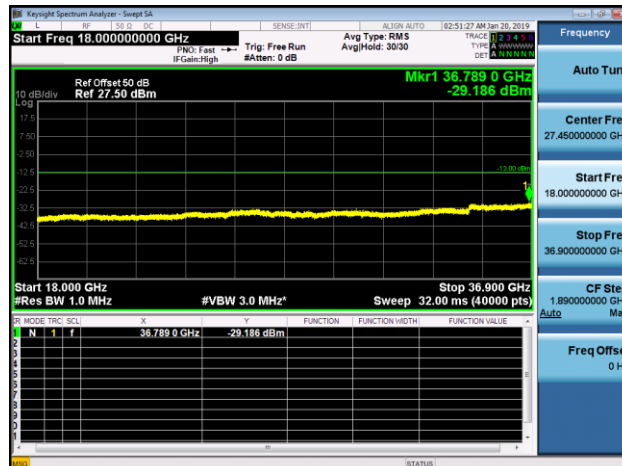
	Freq	Level	Over Limit	Limit Line	Read Level
	MHz	dBm	dB	dBm	dBm
1	17558.00	-51.90	-38.90	-13.00	-63.38



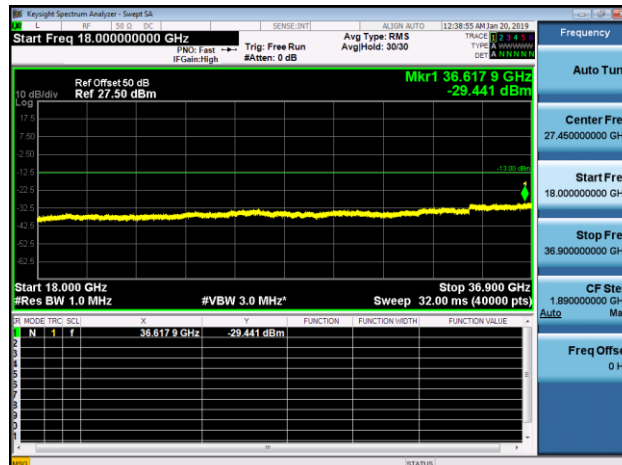
There is no significant spurious emission signal found for frequency started from 18GHz up to 37.9GHz.
Only the noise floor is reported.

NR Band n260 (18GHz-37.9GHz)

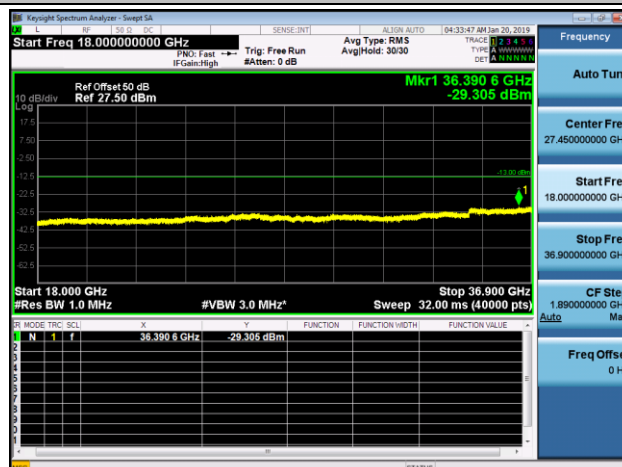
50MHz



100MHz



400MHz

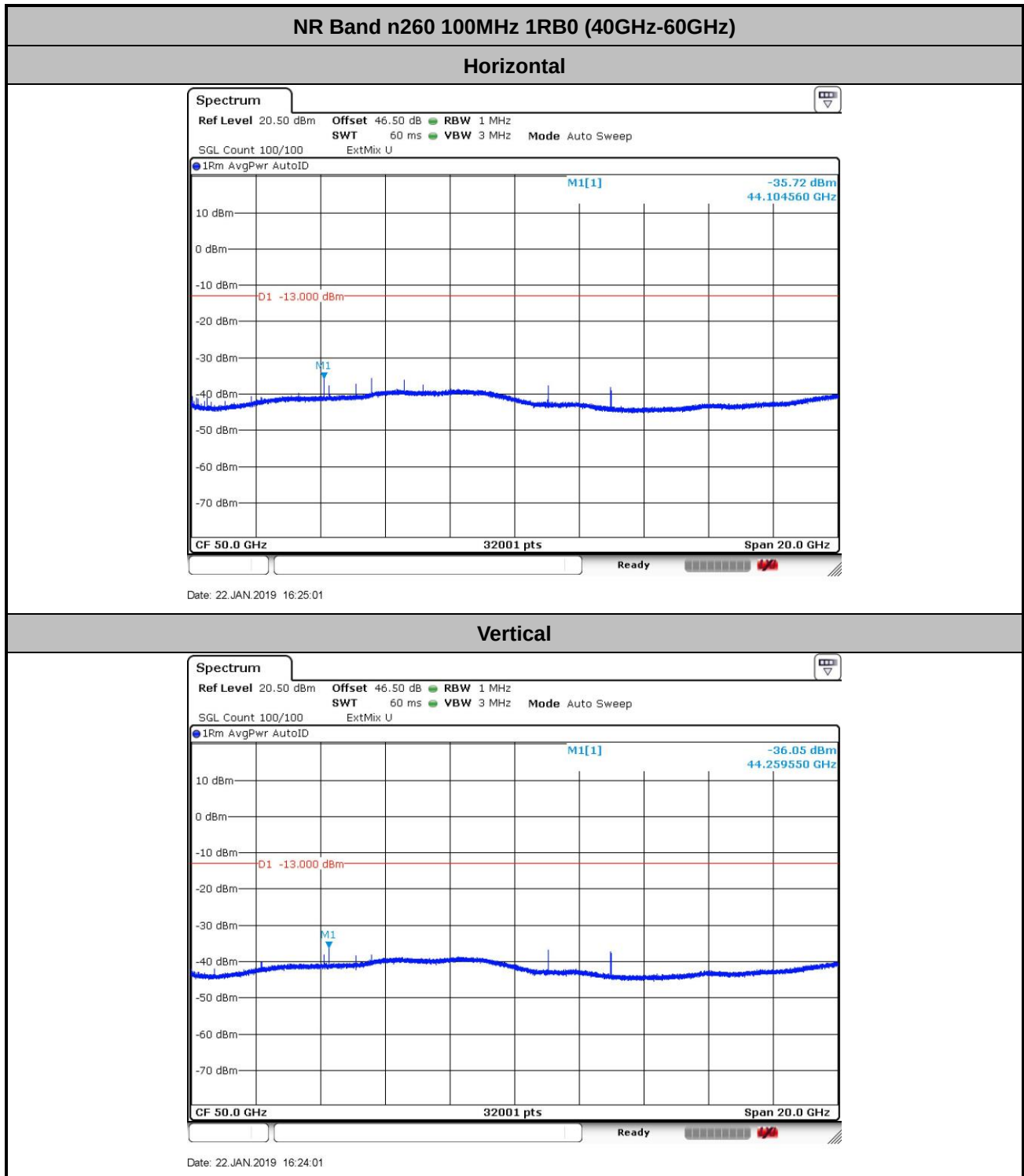


Remark: In band and out of band frequencies are omitted.



For frequency investigated started from 40GHz up to 60GHz:

The worst case signal found is at least 20dB below the limit line. Only the worst case plot is reported.

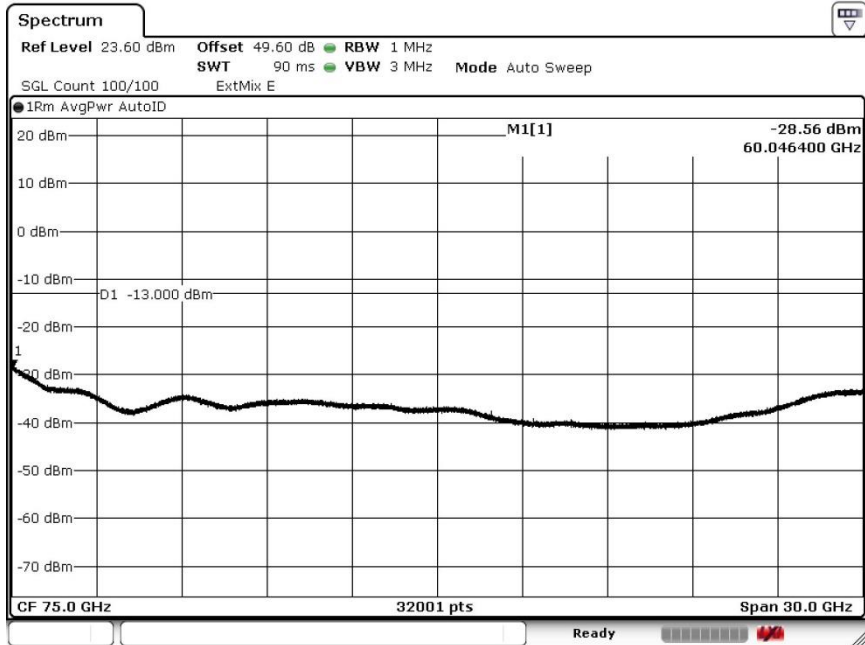


$$\begin{aligned}\text{Offset} &= \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} + 107 + 20\log(D) - 104.8 \\ &= 42.1 + 2.2 + 107 + 20\log(1) - 104.8 = 46.5 \text{ (dB)}\end{aligned}$$

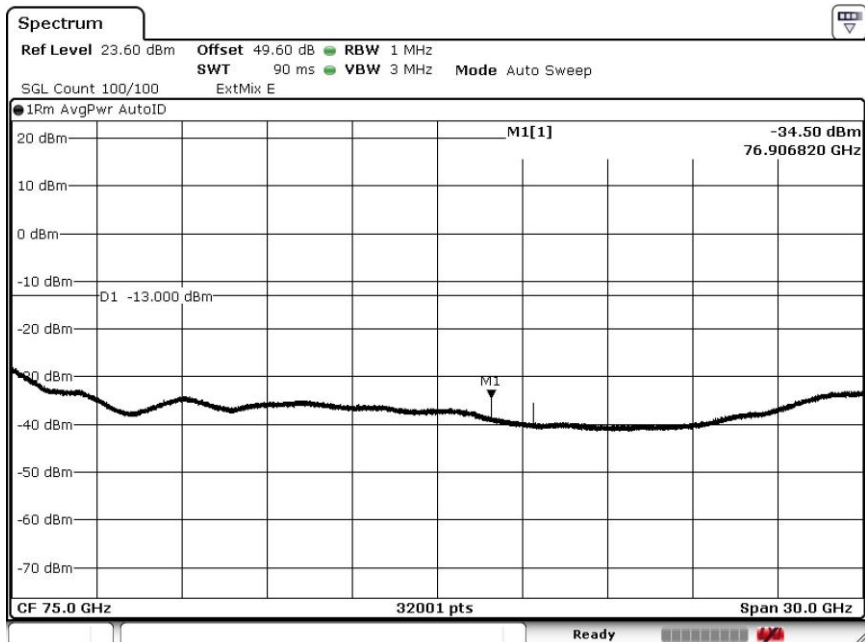


For frequency investigated started from 60GHz up to 90GHz:

The worst case signal found is at least 20dB below the limit line. Only the worst case plot is reported.

NR Band n260 100MHz 1RB0 (60GHz-90GHz)**Horizontal**

Date: 22.JAN.2019 16:46:32

Vertical

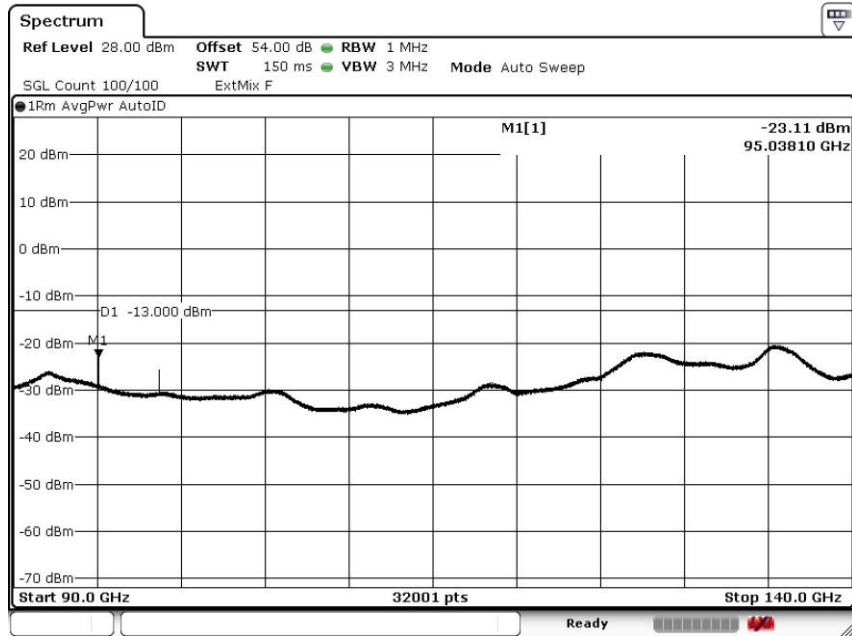
Date: 22.JAN.2019 16:49:00

$$\begin{aligned}\text{Offset} &= \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} + 107 + 20\log(D) - 104.8 \\ &= 45.2 + 2.2 + 107 + 20\log(1) - 104.8 = 49.6 \text{ (dB)}\end{aligned}$$



For frequency investigated started from 90GHz up to 140GHz:

The worst case signal found is about 10dB below the limit line. Only the worst case plot is reported.

NR Band n260 100MHz 1RB0 (90GHz-140GHz)**Horizontal**

Date: 22 JAN 2019 16:56:34

Vertical

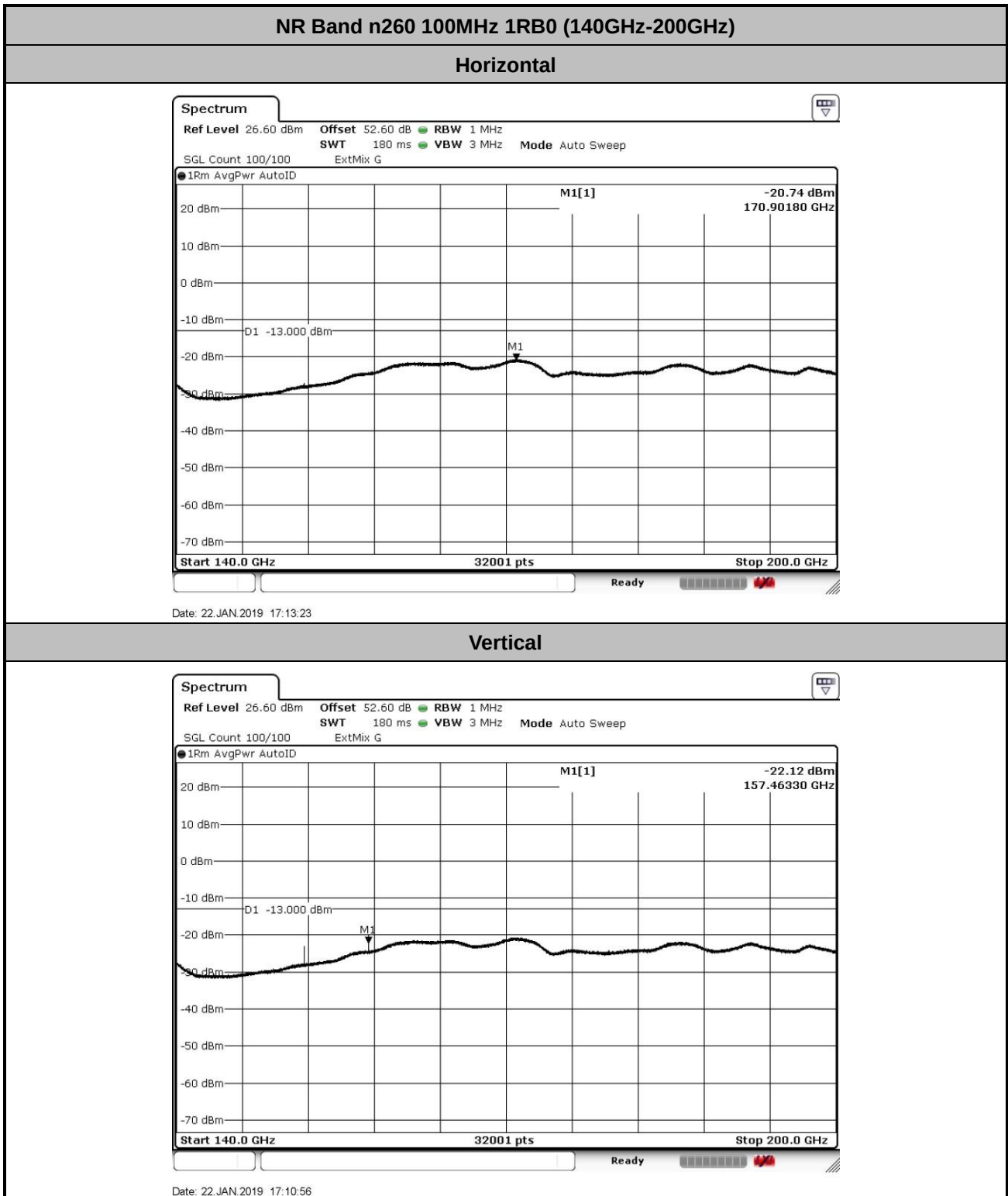
Date: 22 JAN 2019 16:58:14

Offset = Antenna Factor (dB/m) + Cable Loss (dB) + 107 + 20log (D) – 104.8

$$= 49.6 + 2.2 + 107 + 20\log(1) - 104.8 = 54.0 \text{ (dB)}$$

For frequency investigated started from 140GHz up to 200GHz:

The worst case signal found is about 6dB below the limit line. Only the worst case plot is reported.



$$\begin{aligned} \text{Offset} &= \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} + 107 + 20\log(D) - 104.8 \\ &= 54.2 + 2.2 + 107 + 20\log(0.5) - 104.8 = 52.6 \text{ (dB)} \end{aligned}$$

Frequency Stability

Test Conditions		NR Band n260 / Middle Channel			Limit
Temperature (°C)	Voltage (Volt)	CW tone			Note 2.
		Frequency (GHz)	Deviation (kHz)	Deviation (ppm)	Result
50	Normal Voltage	38499860000	-164	-4.26	PASS
40	Normal Voltage	38499854000	-170	-4.42	
30	Normal Voltage	38499937000	-87	-2.26	
20(Ref.)	Normal Voltage	38500024000	0	0.00	
10	Normal Voltage	38500090000	66	1.71	
0	Normal Voltage	38500186000	162	4.21	
-10	Normal Voltage	38500225000	201	5.22	
-20	Normal Voltage	38500227000	203	5.27	
-30	Normal Voltage	38500165000	141	3.66	
20	Maximum Voltage	38499860000	-164	-4.26	
20	Normal Voltage	38499854000	-170	-4.42	
20	Battery End Point	38499937000	-87	-2.26	

Note:

1. Normal Voltage =3.85 V. ; Battery End Point (BEP) =3.4 V. ; Maximum Voltage =4.35 V.
2. The frequency fundamental emissions stay within the operation band.



Appendix B. R&S Mixer Certificate



Radiometer Physics
A Rohde & Schwarz Company

Calibration Certificate

Kalibrierschein

Certificate Number 24-0060-100986-01

Zertifikatsnummer

Unit Data

Item
Gegenstand **Harmonic Mixer, 40 GHz to 60 GHz**

Manufacturer
Hersteller **RPG**

Type
Typ **RPG FS-Z60**

Material Number
Materialnummer **1048.0171.02** Serial Number
Seriennummer **100986**

Asset Number
Inventarnummer

This calibration certificate documents, that the named item is tested and measured against defined specifications. Measurement results are located usually in the corresponding interval with a probability of approx. 95% (coverage factor $k = 2$). Calibration is performed with test equipment and standards directly or indirectly traceable by means of approved calibration techniques to the PTB/DKD or other national/international standards, which realize the physical units of measurement according to the International System of Units (SI). In all cases where no standards are available, measurements are referenced to standards of the R&S laboratories. Principles and methods of calibration correspond with EN ISO/IEC 17025. This calibration certificate may not be reproduced other than in full. Calibration certificates without signatures are not valid. The user is obliged to have the object recalibrated at appropriate intervals.

Order Data

Customer
Auftraggeber

Order Number
Bestellnummer

Date of Receipt
Eingangsdatum

Performance

Place and Date of Calibration
Ort und Datum der Kalibrierung

Scope of Calibration
Umfang der Kalibrierung

Statement of Compliance
(Incoming)
Konformitätsaussage
(Anlieferung)

Statement of Compliance
(Outgoing)
Konformitätsaussage
(Auslieferung)

Extend of Calibration Documents
Umfang des Kalibrierdokuments

Meckenheim, 2018-10-31

Standard Calibration

New device

All measured values are within the data sheet specifications.

**2 pages Calibration Certificate
5 pages Outgoing Results**

Dieser Kalibrierschein dokumentiert, dass der genannte Gegenstand nach festgelegten Vorgaben geprüft und gemessen wurde. Die Messwerte lagen im Regelfall mit einer Wahrscheinlichkeit von annähernd 95% im zugeordneten Werteintervall (Erweiterte Messunsicherheit mit $k = 2$). Die Kalibrierung erfolgte mit Messmitteln und Normalen, die direkt oder indirekt durch Ableitung mittels anerkannter Kalibriertechniken rückgeführt sind auf Normale der PTB/DKD oder anderer nationaler/internationaler Standards zur Darstellung der physikalischen Einheiten in Übereinstimmung mit dem Internationalen Einheitensystem (SI). Wenn keine Normale existieren, erfolgt die Rückführung auf Bezugsnormale der R&S-Laboratorien. Grundsätze und Verfahren der Kalibrierung beziehen sich auf EN ISO/IEC 17025. Dieser Kalibrierschein darf nur vollständig und unverändert weiterverbreitet werden. Kalibrierscheine ohne Unterschriften sind ungültig. Für die Einhaltung einer angemessenen Frist zur Wiederholung der Kalibrierung ist der Benutzer verantwortlich.

Radiometer Physics GmbH; Meckenheim

Date of Issue
Ausstellungsdatum

2018-11-05

Head of Laboratory
Laborleitung

Schulze

Person Responsible
Bearbeiter

D. Heinze

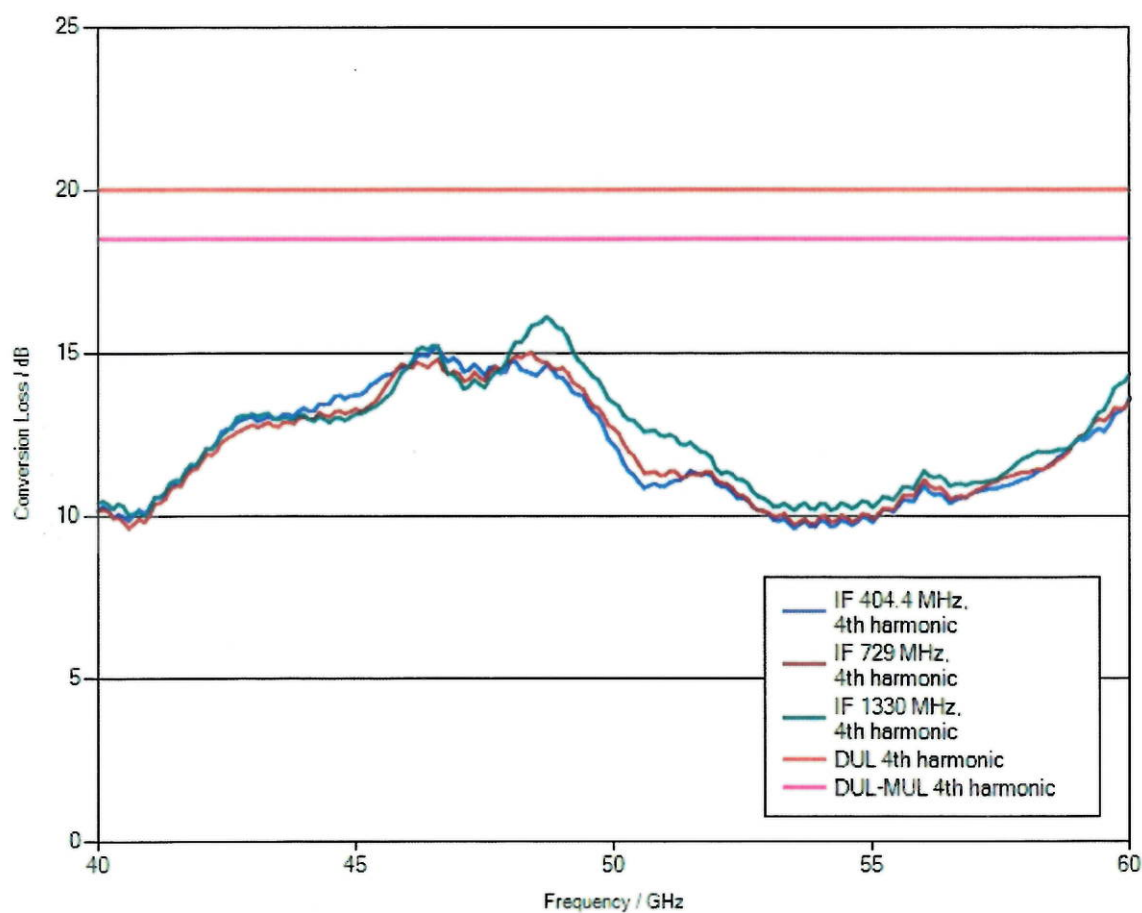
Heinze

Page (Seite) 1/2
Vers2010-05-05/
RPG2014-02-28

1.2 Conversion loss

LO level +13 dBm nominal
Bias 0 A

Measurement uncertainty: 1.5 dB



Note: Numeric calibration data can be found attached to the PDF file of the calibration certificate. Click the "paper clip" symbol to display the file.

The file has been renamed for safety reasons.

When downloading the file onto your PC, please delete the ".file" extension and unzip the data.

Calibration Certificate

Kalibrierschein

Certificate Number 24-0090-101811-01

Zertifikatsnummer

Unit Data

Item
Gegenstand **Harmonic Mixer, 60 GHz to 90 GHz**

Manufacturer
Hersteller **ROHDE & SCHWARZ**

Type
Typ **R&S® FS-Z90**

Material Number
Materialnummer **1048.0371.02** Serial Number
Seriennummer **101811**

Asset Number
Inventarnummer

This calibration certificate documents, that the named item is tested and measured against defined specifications. Measurement results are located usually in the corresponding interval with a probability of approx. 95% (coverage factor $k = 2$). Calibration is performed with test equipment and standards directly or indirectly traceable by means of approved calibration techniques to the PTB/DKD or other national/international standards, which realize the physical units of measurement according to the International System of Units (SI). In all cases where no standards are available, measurements are referenced to standards of the R&S laboratories. Principles and methods of calibration correspond with EN ISO/IEC 17025. This calibration certificate may not be reproduced other than in full. Calibration certificates without signatures are not valid. The user is obliged to have the object recalibrated at appropriate intervals.

Order Data

Customer
Auftraggeber

Order Number
Bestellnummer

Date of Receipt
Eingangdatum

Performance

Place and Date of Calibration
Ort und Datum der Kalibrierung

Meckenheim, 2018-07-16

Scope of Calibration
Umfang der Kalibrierung

Standard Calibration

Statement of Compliance
(Incoming)
Konformitätsaussage
(Anlieferung)

New device

Statement of Compliance
(Outgoing)
Konformitätsaussage
(Auslieferung)

All measured values are within the data sheet specifications.

Extend of Calibration Documents
Umfang des Kalibrierdokuments

**2 pages Calibration Certificate
5 pages Outgoing Results**

Dieser Kalibrierschein dokumentiert, dass der genannte Gegenstand nach festgelegten Vorgaben geprüft und gemessen wurde. Die Messwerte lagen im Regelfall mit einer Wahrscheinlichkeit von annähernd 95% im zugeordneten Werteintervall (Erweiterte Messunsicherheit mit $k = 2$). Die Kalibrierung erfolgte mit Messmitteln und Normalen, die direkt oder indirekt durch Ableitung mittels anerkannter Kalibriertechniken rückgeführt sind auf Normale der PTB/DKD oder anderer nationaler/internationaler Standards zur Darstellung der physikalischen Einheiten in Übereinstimmung mit dem Internationalen Einheitensystem (SI). Wenn keine Normale existieren, erfolgt die Rückführung auf Bezugsnormale der R&S-Laboratorien. Grundsätze und Verfahren der Kalibrierung beziehen sich auf EN ISO/IEC 17025. Dieser Kalibrierschein darf nur vollständig und unverändert weiterverbreitet werden. Kalibrierscheine ohne Unterschriften sind ungültig. Für die Einhaltung einer angemessenen Frist zur Wiederholung der Kalibrierung ist der Benutzer verantwortlich.

Radiometer Physics GmbH; Meckenheim

Date of Issue
Ausstellungsdatum

2018-07-19

Head of Laboratory
Laborleitung


Ceru

Person Responsible
Bearbeiter

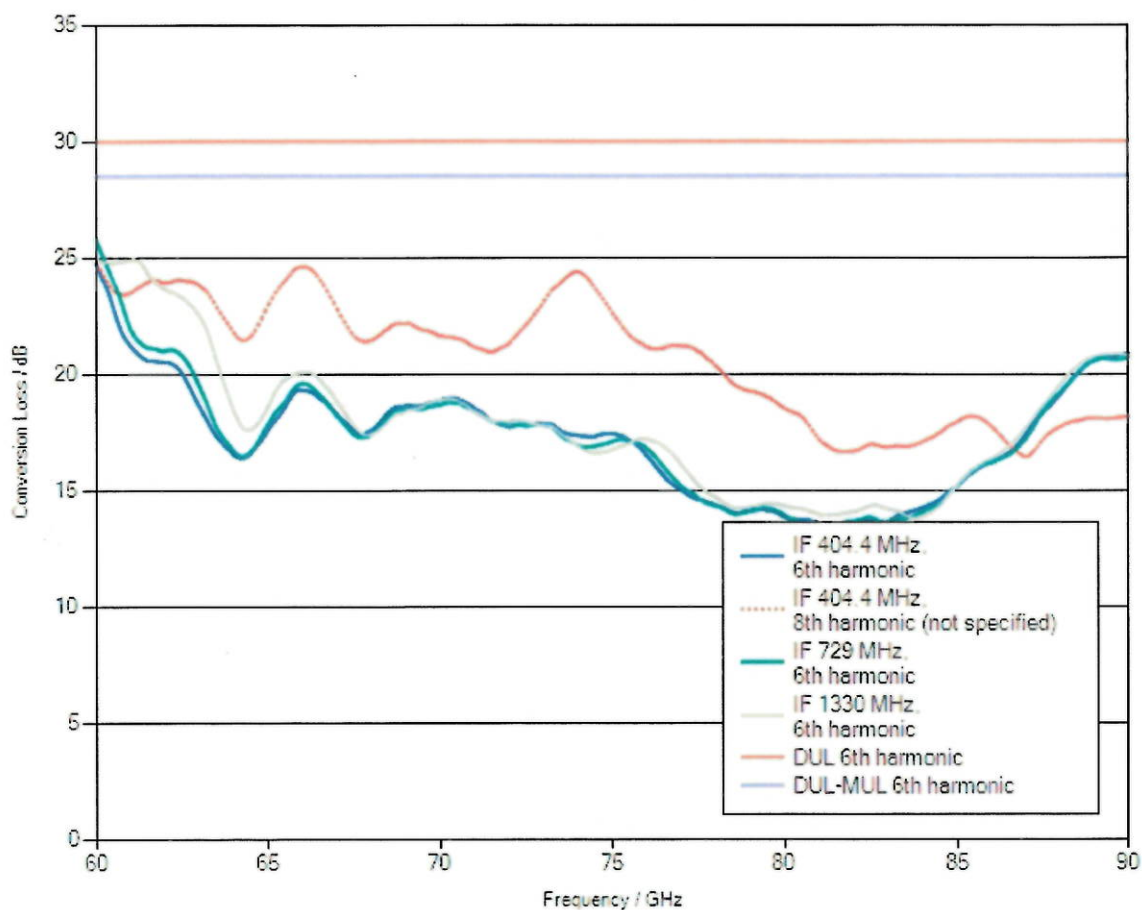

Grossmindorf

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Vers2010-05-05/
RPG2014-02-28

1.2 Conversion loss

LO level +14 dBm nominal
Bias 0 A

Measurement uncertainty: 1.5 dB



Note: Numeric calibration data can be found attached to the PDF file of the calibration certificate. Click the "paper clip" symbol to display the file.

The file has been renamed for safety reasons.

When downloading the file onto your PC, please delete the ".file" extension and unzip the data.



Radiometer Physics
A Rohde & Schwarz Company

Calibration Certificate

Kalibrierschein

Certificate Number **24-0140-101128-01**

Zertifikatsnummer

Unit Data

Item
Gegenstand **Harmonic Mixer, 90 GHz to 140 GHz**

Manufacturer
Hersteller **RPG**

Type
Typ **RPG FS-Z140**

Material Number
Materialnummer **3622.0708.02** Serial Number
Seriennummer **101128**

Asset Number
Inventarnummer

This calibration certificate documents, that the named item is tested and measured against defined specifications. Measurement results are located usually in the corresponding interval with a probability of approx. 95% (coverage factor $k = 2$). Calibration is performed with test equipment and standards directly or indirectly traceable by means of approved calibration techniques to the PTB/DKD or other national/international standards, which realize the physical units of measurement according to the International System of Units (SI). In all cases where no standards are available, measurements are referenced to standards of the R&S laboratories. Principles and methods of calibration correspond with EN ISO/IEC 17025. This calibration certificate may not be reproduced other than in full. Calibration certificates without signatures are not valid. The user is obliged to have the object recalibrated at appropriate intervals.

Order Data

Customer
Auftraggeber

Order Number
Bestellnummer

Date of Receipt
Eingangsdatum

Performance

Place and Date of Calibration
Ort und Datum der Kalibrierung

Meckenheim, 2018-09-03

Scope of Calibration
Umfang der Kalibrierung

Standard Calibration

Statement of Compliance
(Incoming)
Konformitätsaussage
(Anlieferung)

New device

Statement of Compliance
(Outgoing)
Konformitätsaussage
(Auslieferung)

All measured values are within the data sheet specifications.

Extend of Calibration Documents
Umfang des Kalibrierdokuments

**2 pages Calibration Certificate
5 pages Outgoing Results**

Dieser Kalibrierschein dokumentiert, dass der genannte Gegenstand nach festgelegten Vorgaben geprüft und gemessen wurde. Die Messwerte lagen im Regelfall mit einer Wahrscheinlichkeit von annähernd 95% im zugeordneten Werteintervall (Erweiterte Messunsicherheit mit $k = 2$). Die Kalibrierung erfolgte mit Messmitteln und Normalen, die direkt oder indirekt durch Ableitung mittels anerkannter Kalibriertechniken rückgeführt sind auf Normale der PTB/DKD oder anderer nationaler/internationaler Standards zur Darstellung der physikalischen Einheiten in Übereinstimmung mit dem internationalen Einheitensystem (SI). Wenn keine Normale existieren, erfolgt die Rückführung auf Bezugsnormale der R&S-Laboratorien. Grundsätze und Verfahren der Kalibrierung beziehen sich auf EN ISO/IEC 17025. Dieser Kalibrierschein darf nur vollständig und unverändert weiterverbreitet werden. Kalibrierscheine ohne Unterschriften sind ungültig. Für die Einhaltung einer angemessenen Frist zur Wiederholung der Kalibrierung ist der Benutzer verantwortlich.

Radiometer Physics GmbH; Meckenheim

Date of Issue
Ausstellungsdatum

Head of Laboratory
Laborleitung

Person Responsible
Bearbeiter

2018-09-06

Schulze

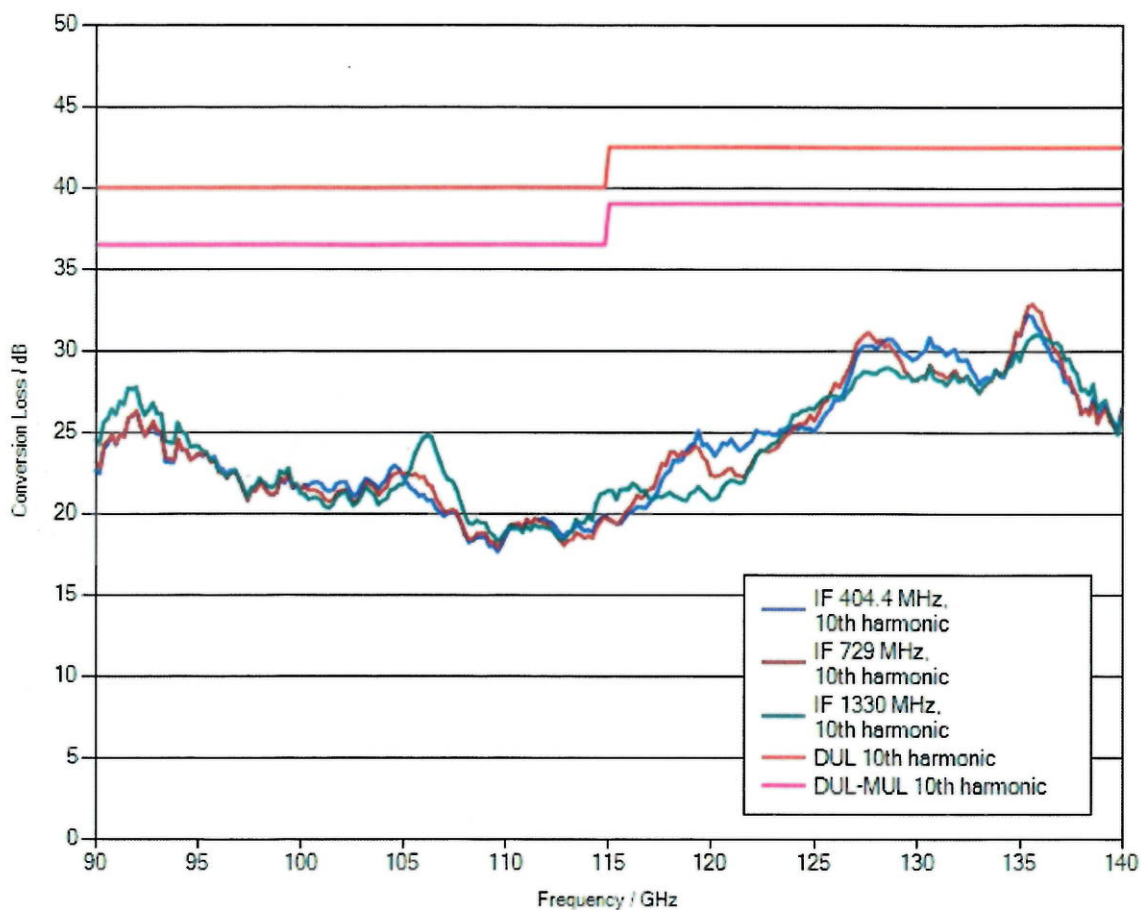
Dick

Page (Seite) 1/2
Vers2010-05-05/
RPG2014-02-28

1.2 Conversion loss

LO level +14 dBm nominal
Bias 0 A

Measurement uncertainty: 3.5 dB



Note: Numeric calibration data can be found attached to the PDF file of the calibration certificate. Click the “paper clip” symbol to display the file.

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