Annex 1: Measuring diagrams to
T E S T R E P O R T
No.: 17-1-0133807T02a

According to:
Title 47
FCC Regulations Subpart 15C
§15.225

ISED-Regulations
RSS-Gen, Issue 5
RSS-210, Issue 9

for

WITTE - Velbert GmbH & Co. KG

DAG SDH TAG3 NFC
Outer Door Handle with NFC

FCC ID: V2T-SDHTAG3NFC
ISED ID: 7575A-SDHTAG3NFC

Laboratory Accreditation and Listings
Accredited EMC-Test Laboratory
accredited according to DIN EN ISO/IEC 17025

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1. Measuring diagrams

1.1. 99% Occupied bandwidth

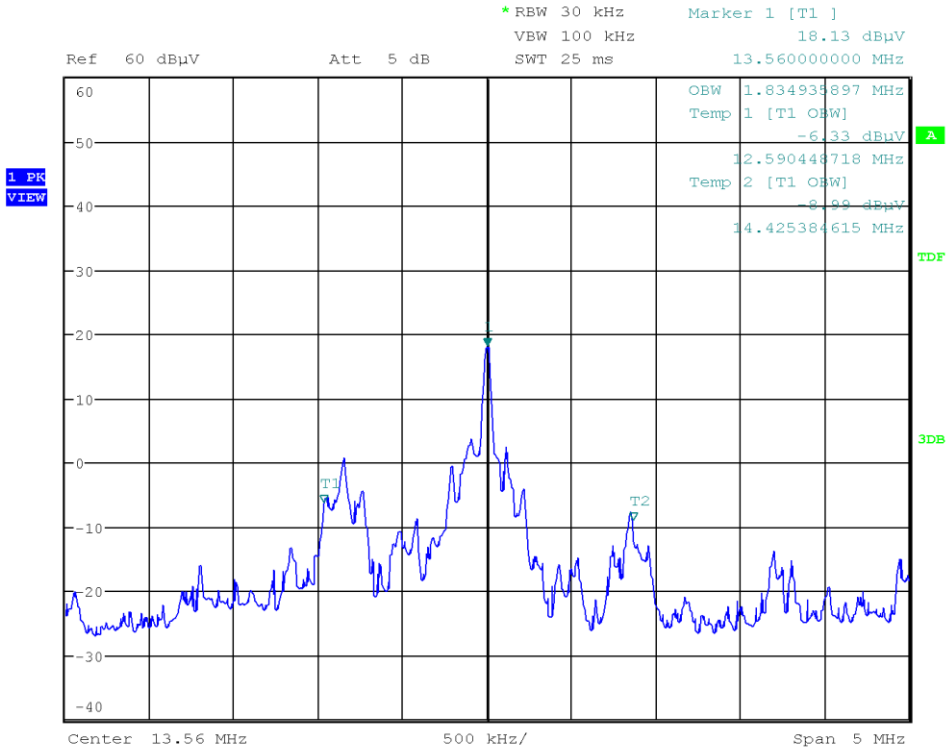


Diagram 1: 99% OBW

Remark: The emission level of the carrier and the side bands are all below the limit in §15.225 (a)(b)(c)(d)

1.2. H-Field requirements (§15.225 (a)(b)(c))

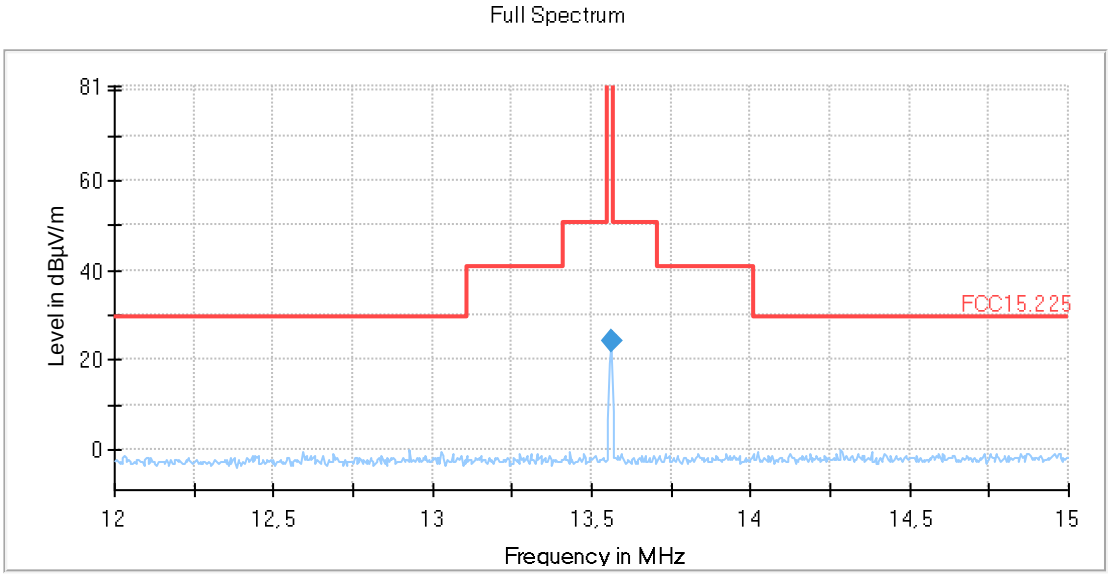
2.01_H_Field_TX_standing

Common Information

Test Description:	Magnetic Field Strength Measurement related to 30 m distance
Test Site Location:	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
Version of Testsoftware:	EMC32 V9.25.0
Test Standard:	FCC 15.225; RSS-Gen: Issue 5
Operator:	GHu
Operating Mode:	TX CW
Power during tests:	fully loaded batteries
Comment 1:	-
Environmental Conditions::	Humidity : 52%rH; Temperature: 21°C
EUT Setup:	Standing
Verdict:	Passed

EUT Information

PMT number:	17-1-01338S283
Manufacturer:	WITTE - Velbert GmbH & Co. KG
Product:	NFC reader
Model:	Daimler OSDH (Outer Side Door Handle)
Config:	with phone
Connected Interfaces:	control unit
Power Supply:	Car battery
Comments:	S283



Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Pol	Azimuth (deg)	Corr. (dB)
13.560000	24.19	84.00	59.81	9.000	V	291.0	-11.4

1.3. Transmitter spurious emissions

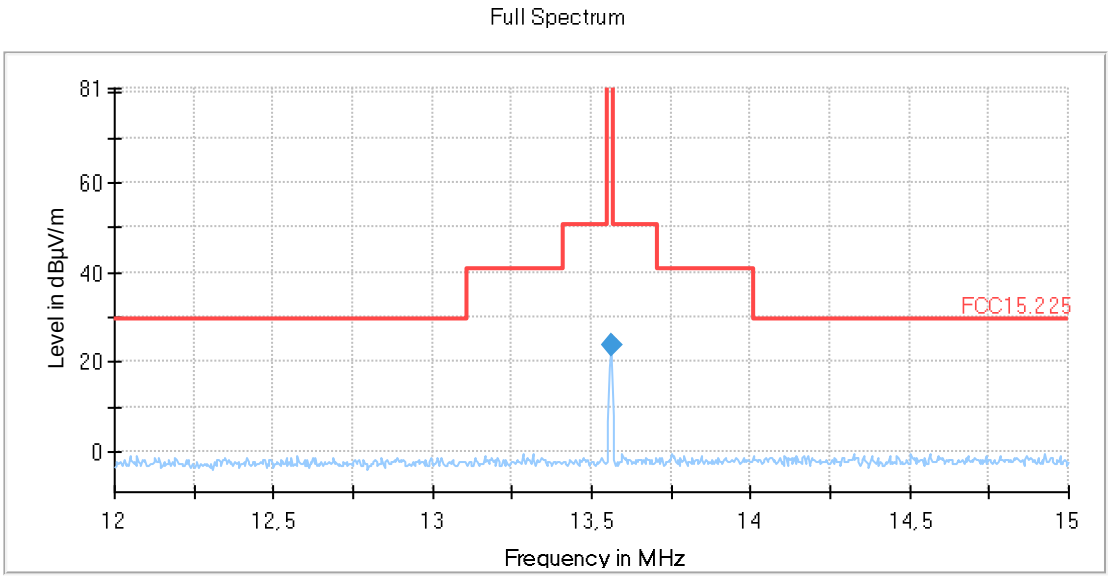
2.02_H_Field_TX_lying

Common Information

Test Description:	Magnetic Field Strength Measurement related to 30 m distance
Test Site Location:	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
Version of Testsoftware:	EMC32 V9.25.0
Test Standard:	FCC 15.225; RSS-Gen: Issue 5
Operator:	GHu
Operating Mode:	TX CW
Power during tests:	fully loaded battery
Comment 1:	with Phone
Environmental Conditions::	Humidity : 56%rH; Temperature: 21°C
EUT Setup:	Lying
Verdict:	Passed

EUT Information

PMT number:	17-1-01338S283
Manufacturer:	WITTE - Velbert GmbH & Co. KG
Product:	NFC reader
Model:	Daimler OSDH (Outer Side Door Handle)
Config:	with phone
Serial number:	
Connected Interfaces:	control unit
Power Supply:	Car battery
Comments:	S283



Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Pol	Azimuth (deg)	Corr. (dB)
13.560000	23.76	84.00	60.24	9.000	V	143.0	-11.4

1.3.1. Frequency 9kHz to 30MHz (TX-Mode)

2.05_RSE_TX_standing

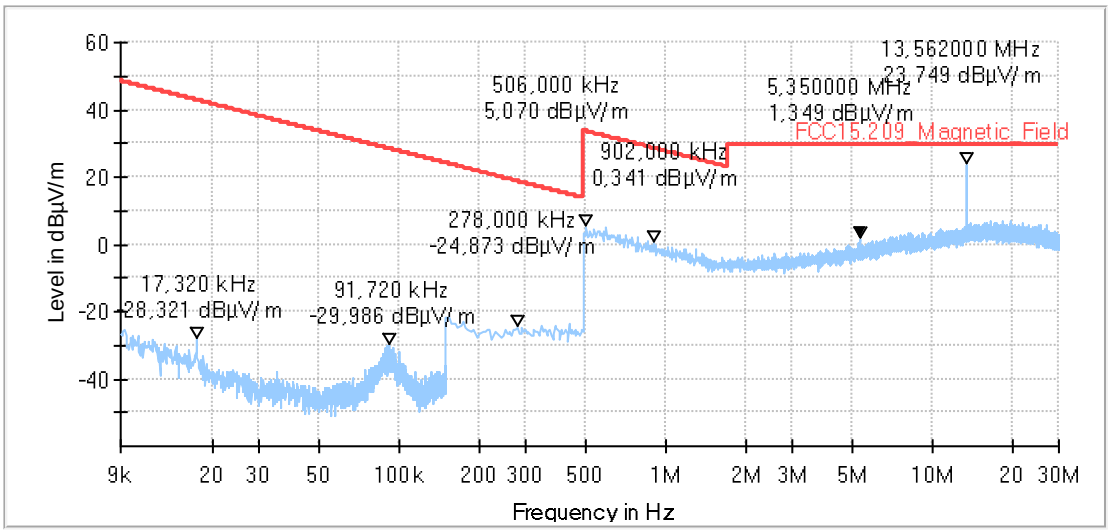
Common Information

Test Description:	Magnetic Field Strength Measurement related to 30/300 m distance
Test Site Location:	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
Version of Testsoftware:	EMC32 V9.25.0
Test Standard:	FCC 15.205 § 15.209; RSS-Gen: Issue 5
Operator:	GHu
Operating Mode:	TX CW
Power during tests:	fully loaded batteries
Comment 1:	-
Environmental Conditions::	Humidity : 56%rH; Temperature: 21°C
EUT Setup:	standing
Verdict:	Passed

EUT Information

PMT number:	17-1-01338S283
Manufacturer:	WITTE - Velbert GmbH & Co. KG
Product:	NFC reader
Model:	Daimler OSDH (Outer Side Door Handle)
Config:	with phone
Connected Interfaces:	control unit
Power Supply:	Car battery
Comments:	S283

Full Spectrum



1.3.2. Frequency 30MHz to 1000MHz (TX Mode)

3.01_RSE_TX_standing

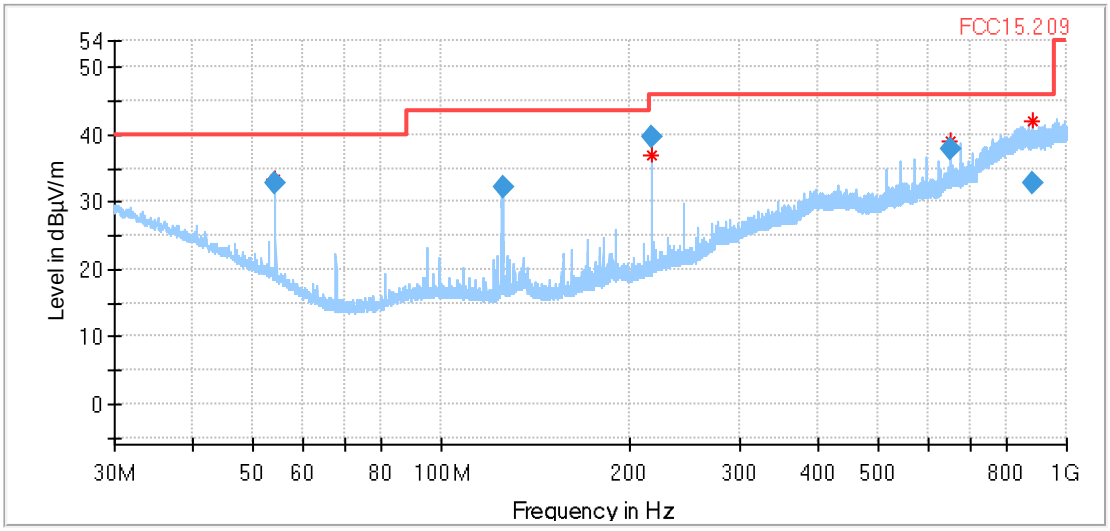
Common Information

Test Description:	Electric Field Strength Measurement
Test Site Location:	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
Version of Testsoftware:	EMC32 V9.25.0
Test Standard.:	FCC 15.209; RSS-Gen: Issue 5
Operator:	GHu
Operating Mode:	TX CW
Comment 1:	With phone
Environmental Conditions::	Humidity : 52%rH; Temperature: 21°C
EUT Setup:	standing
Verdict:	Passed

EUT Information

PMT number:	17-1-01338S283
Manufacturer:	WITTE - Velbert GmbH & Co. KG
Product:	NFC reader
Model:	Daimler OSDH (Outer Side Door Handle)
Config:	with phone
Connected Interfaces:	control unit
Power Supply:	Car battery
Comments:	S283

Full Spectrum



Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
54.240000	32.78	40.00	7.22	120.000	193.0	V	18.0	11.4
125.256000	32.21	43.50	11.29	120.000	105.0	V	348.0	8.2
216.964000	39.58	46.00	6.42	120.000	105.0	H	295.0	12.0
650.888000	37.84	46.00	8.16	120.000	120.0	H	0.0	23.2
881.380000	32.75	46.00	13.25	120.000	292.0	V	149.0	26.9

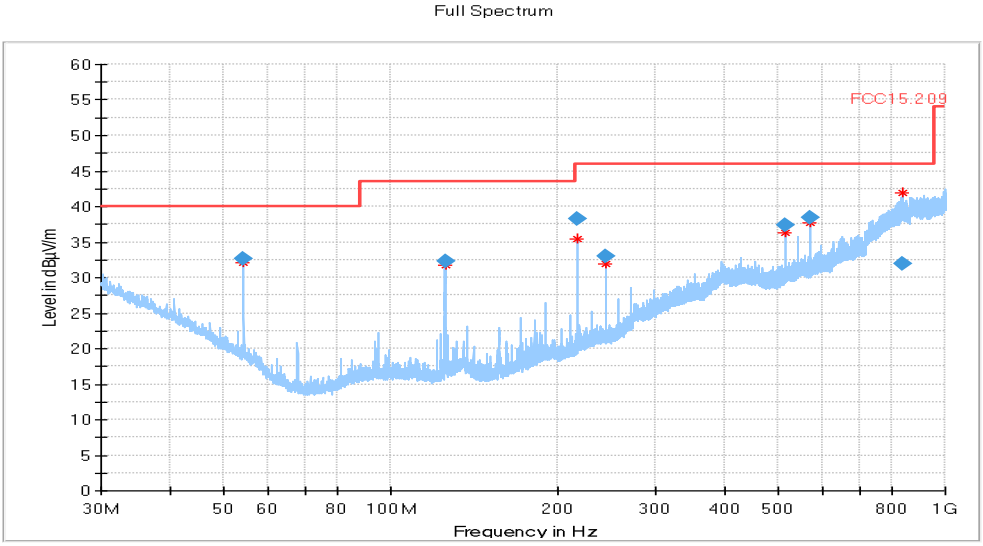
3.02_RSE_TX_lying

Common Information

Test Description:	Electric Field Strength Measurement
Test Site Location:	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
Version of Testsoftware:	EMC32 V9.25.0
Technical Data:	please see page 2 for detailed data of measurement setup
Test Standard.:	FCC 15.209; RSS-Gen: Issue 3
Operator:	GHu
Operating Mode:	TX CW
Power during tests:	Car Battery
Environmental Conditions::	Humidity : 56%rH; Temperature: 21°C
EUT Setup:	Lying
Verdict:	Passed
Comment:	With phone

EUT Information

PMT number:	17-1-01338S283
Manufacturer:	WITTE - Velbert GmbH & Co. KG
Product:	NFC reader
Model:	Daimler OSDH (Outer Side Door Handle)
Config:	with phone
Connected Interfaces:	control unit
Power Supply:	Car battery
Comments:	S283



Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
54.240000	32.72	40.00	7.28	120.000	175.0	V	282.0	11.4
125.224000	32.37	43.50	11.13	120.000	105.0	V	175.0	8.2
216.964000	38.31	46.00	7.69	120.000	121.0	H	305.0	12.0
244.084000	32.96	46.00	13.04	120.000	109.0	H	161.0	13.1
515.288000	37.31	46.00	8.69	120.000	153.0	H	158.0	20.4
569.528000	38.47	46.00	7.53	120.000	105.0	V	108.0	21.4
836.256000	31.95	46.00	14.05	120.000	137.0	V	225.0	26.0

1.4. Frequency tolerance of the carrier signal due temperature variation (§15.255(e))

1.4.1. T_{NOM}, V_{NOM}

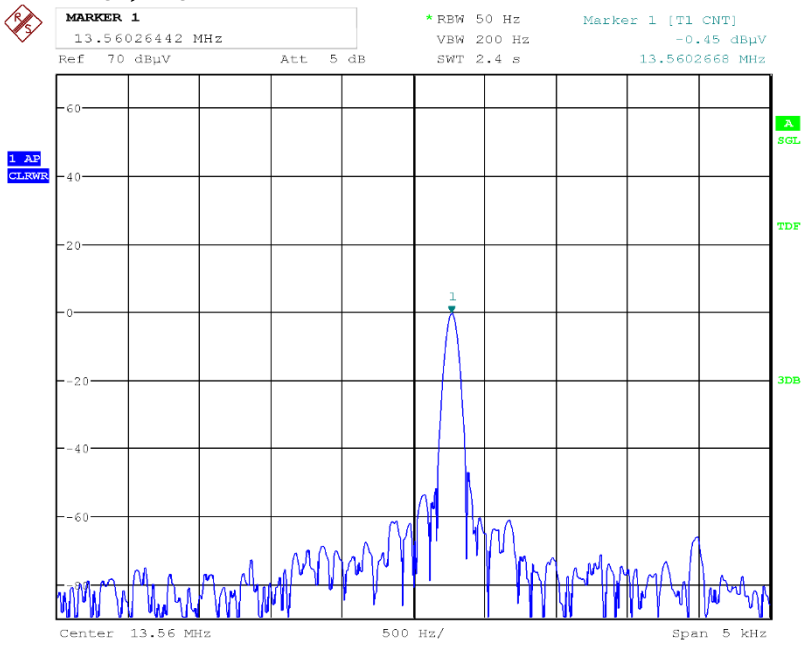


Diagram 2: Frequency error - reference

1.4.2. T=+85°C, VNOM

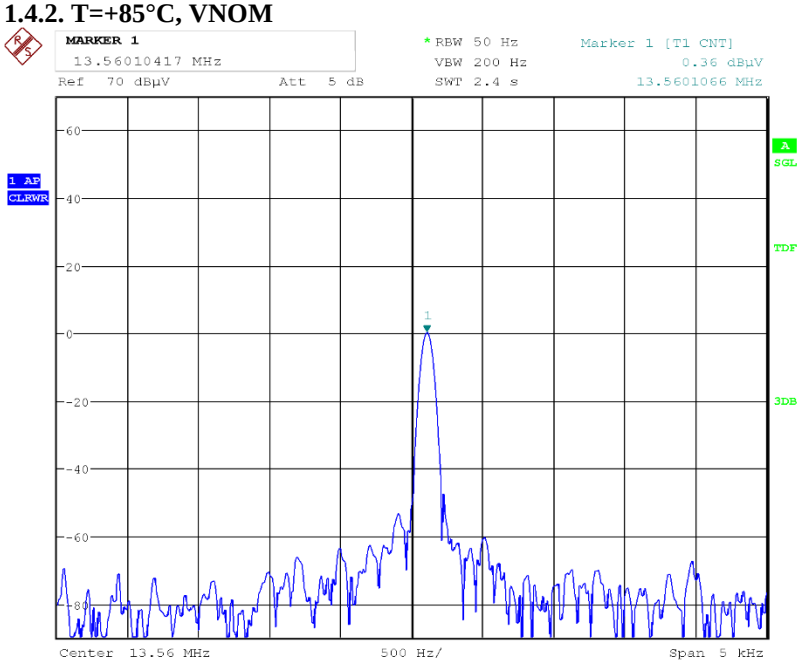
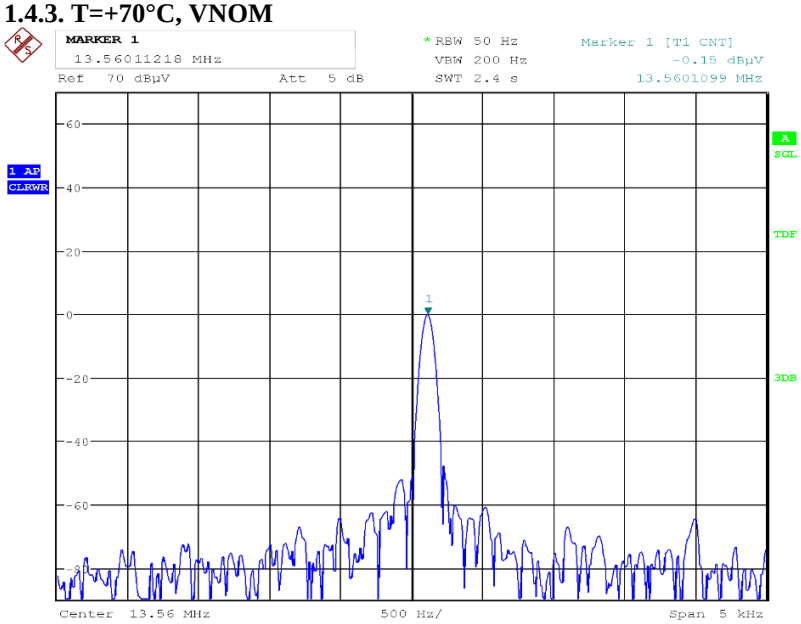


Diagram 3: Max. Frequency error at +85°C

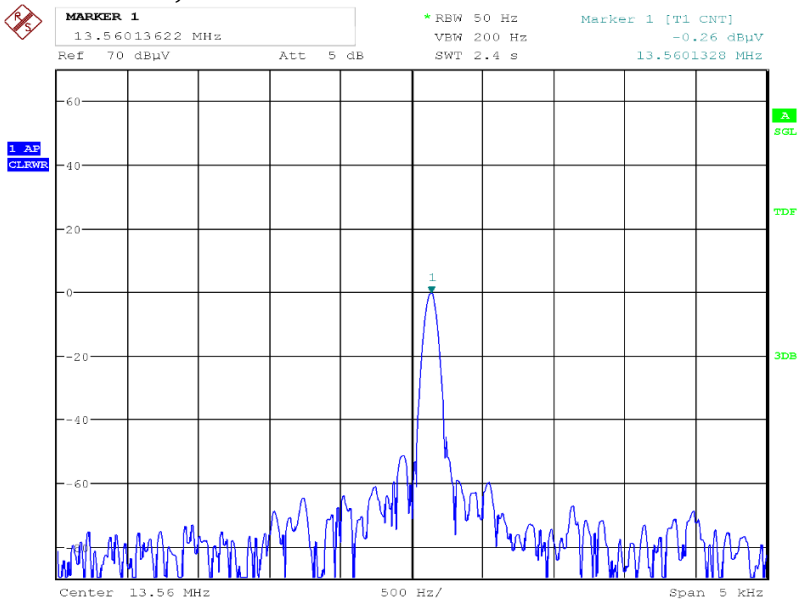
1.4.3. T=+70°C, VNOM



Date: 10.OCT.2019 16:14:10

Diagram 4: Max. Frequency error at +70°C

1.4.4. T=+60°C, VNOM



Date: 10.OCT.2019 15:56:01

Diagram 5: Max. Frequency error at +60°C

1.4.5. T=+50°C, VNOM

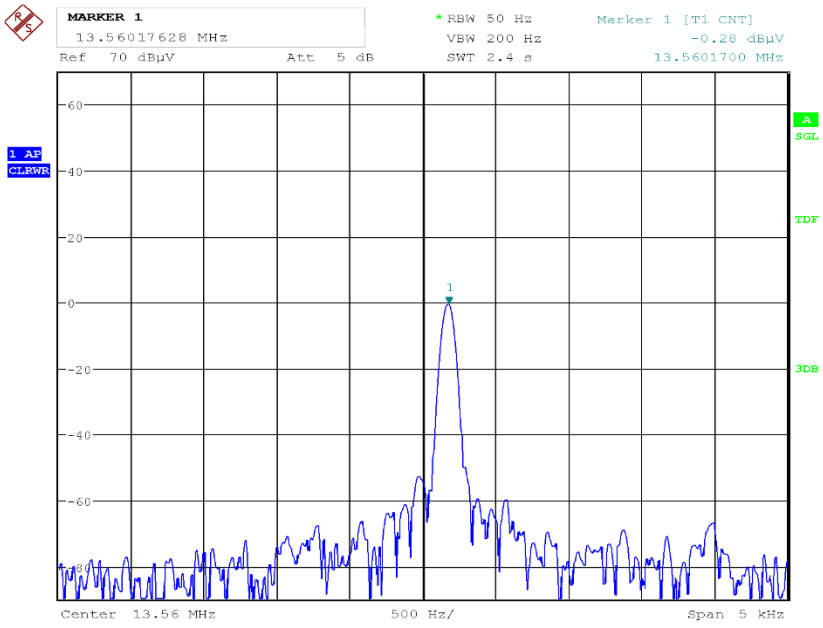


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Diagram 6: Max. Frequency error at +50°C

1.4.6. T=+40°C, VNOM

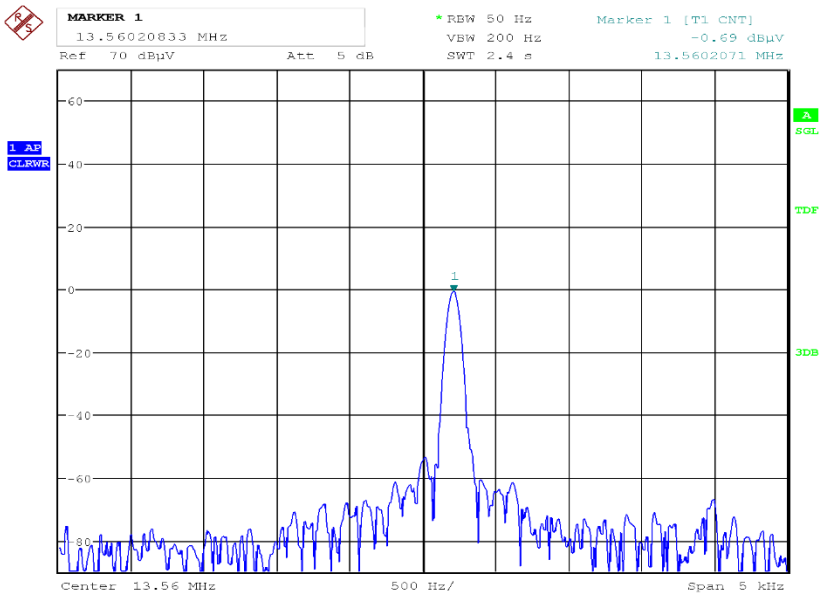

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Diagram 7: Max. Frequency error at +40°C

1.4.7. T=+30°C, VNOM

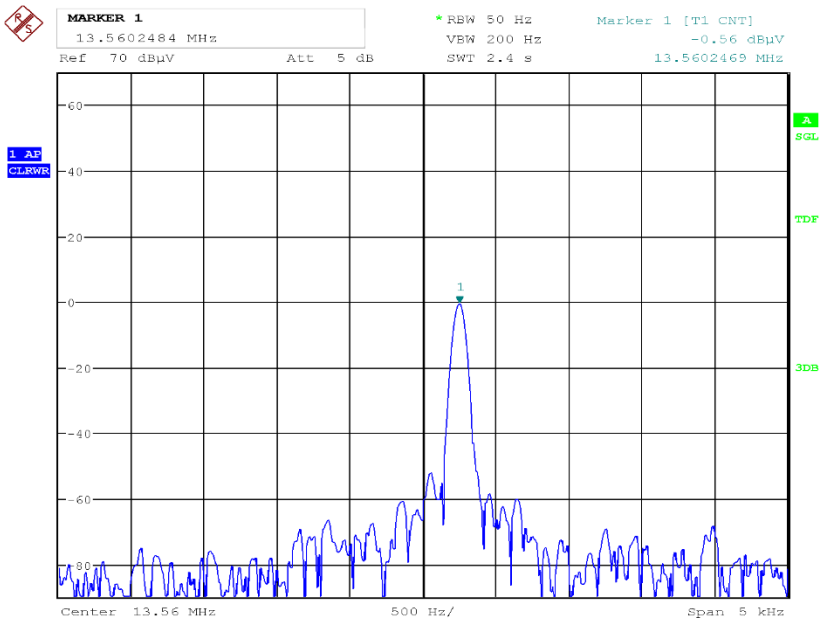

Diagram 8: Max. Frequency error at +30°C

1.4.8. T=+10°C, VNOM

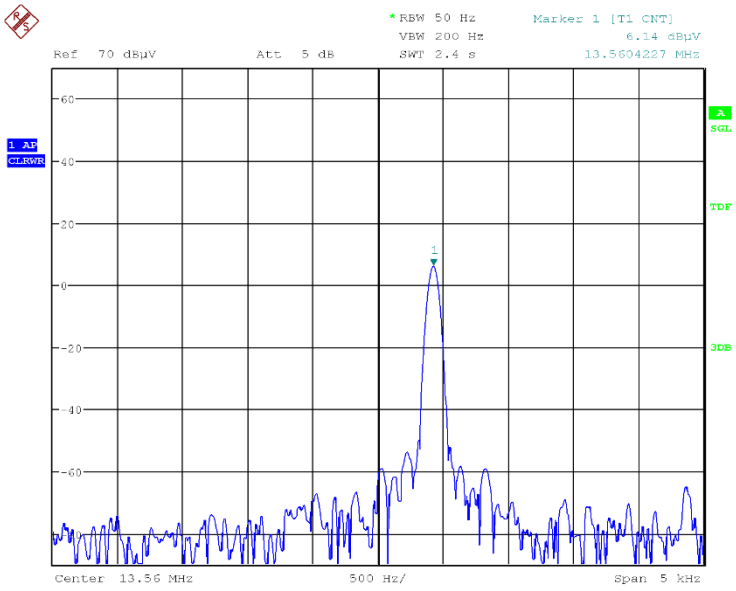

Diagram 9: Max. Frequency error at +10°C

1.4.9. T=0°C, VNOM

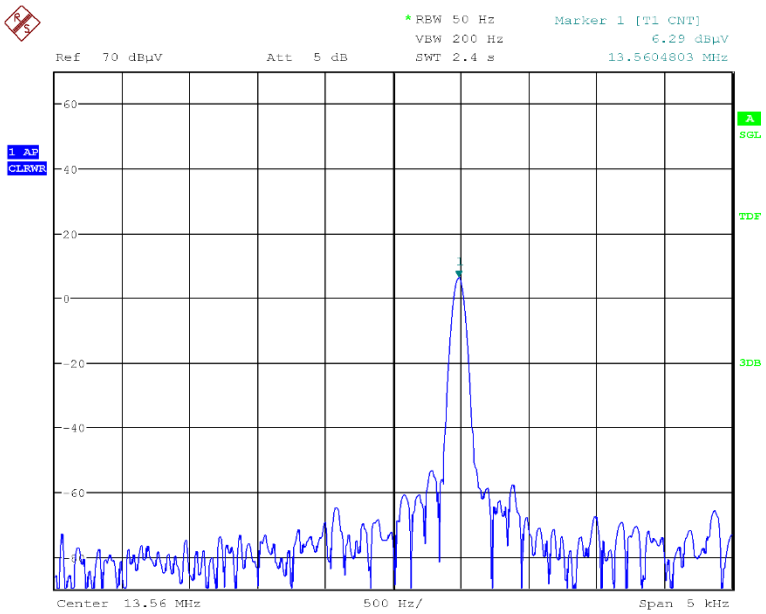

Diagram 10: Max. Frequency error at 0°C

1.4.10. T=-10°C, VNOM

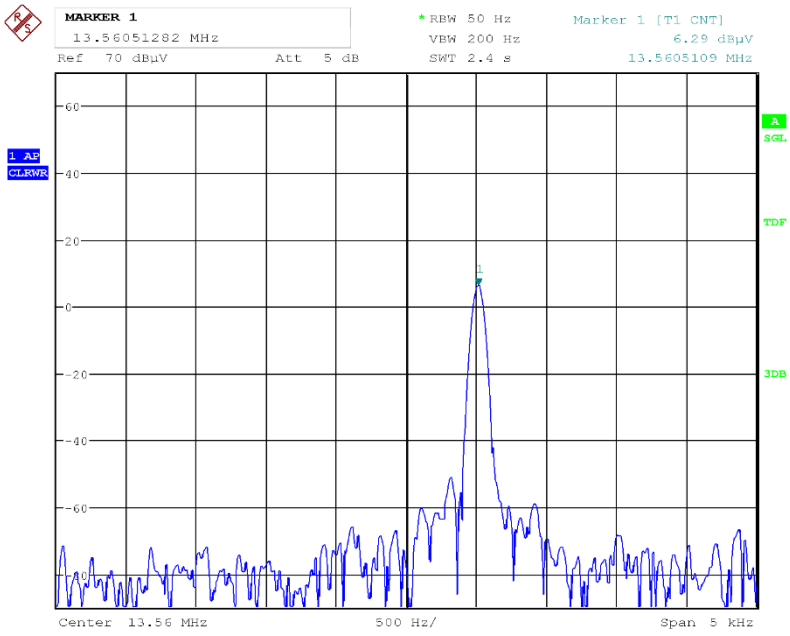

Diagram 11: Max. Frequency error at -10°C

1.4.11. T=-20°C, VNOM

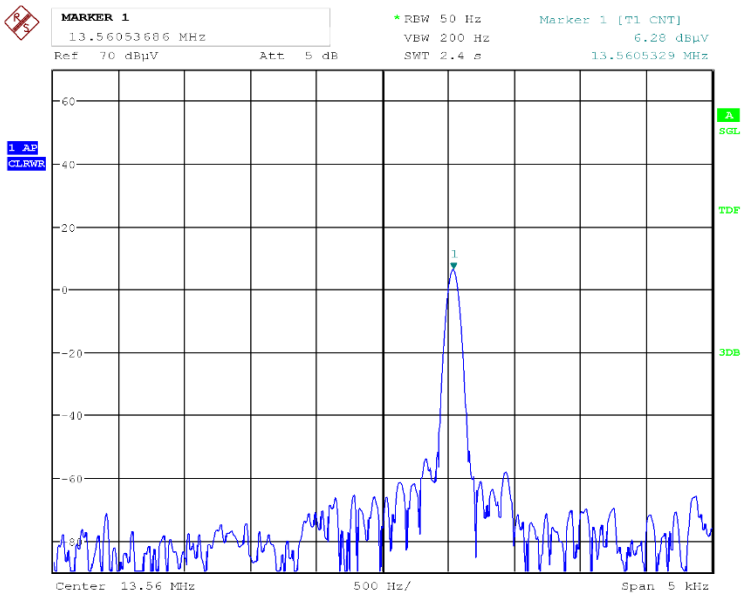

Diagram 12: Max. Frequency error at -20°C

1.4.12. T=-30°C, VNOM

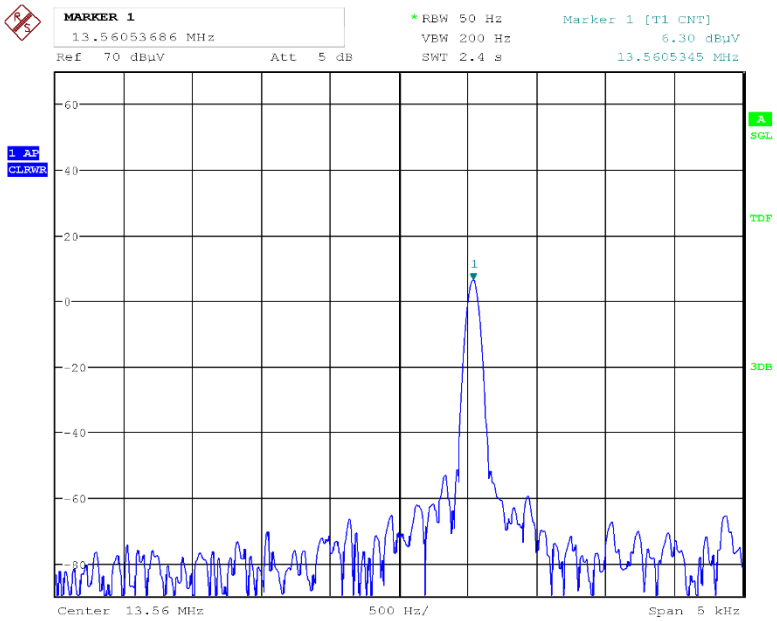

Diagram 13: Max. Frequency error at -30°C

1.4.13. T=-40°C, VNOM

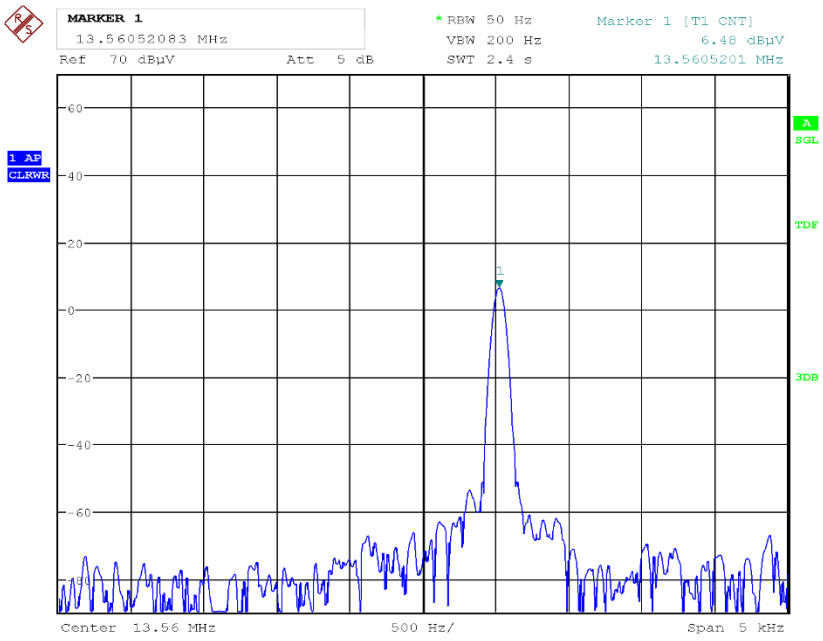

Diagram 14: Max. Frequency error at -40°C

1.5. Frequency tolerance of the carrier signal due voltage variations (§15.255(e))

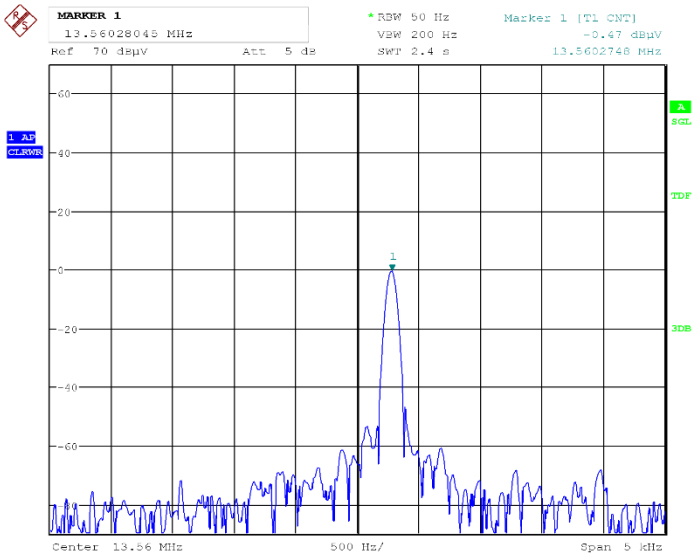

Diagram 15: Frequency error at V_{MIN}

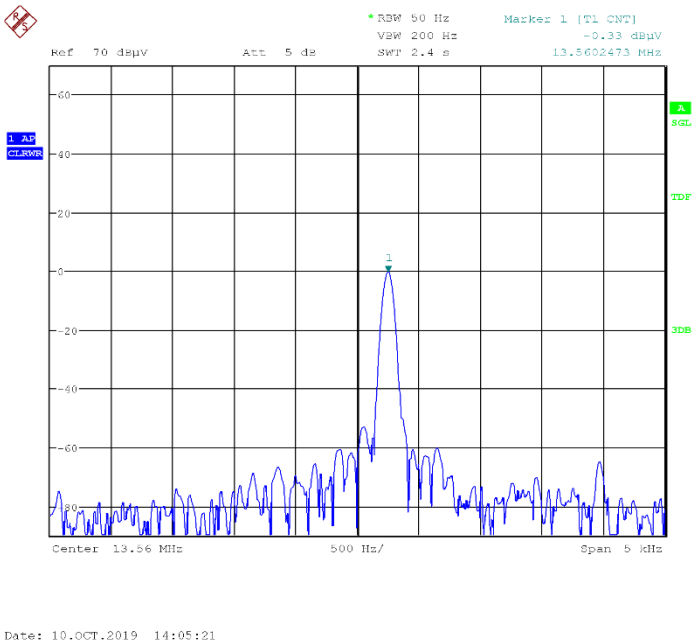

Diagram 16: Frequency error at V_{MAX}

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