

Annex 1: Measurement diagrams to
TEST REPORT
No.: 18-1-0210103T08a

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

BMW G3x NFC
ODH NFC Module Left

FCC-ID: V2T030816
ISED-ID: 7575A-030816

Laboratory Accreditation and Listings



accredited according to DIN EN ISO/IEC 17025

CETECOM GmbH

Laboratory Radio Communications & Electromagnetic Compatibility
Im Teelbruch 116 • 45219 Essen • Germany
Registered in Essen, Germany, Reg. No.: HRB Essen 8984
Tel.: + 49 (0) 20 54 / 95 19-954 • Fax: + 49 (0) 20 54 / 95 19-964
E-mail: info@cetecom.com • Internet: www.cetecom.com

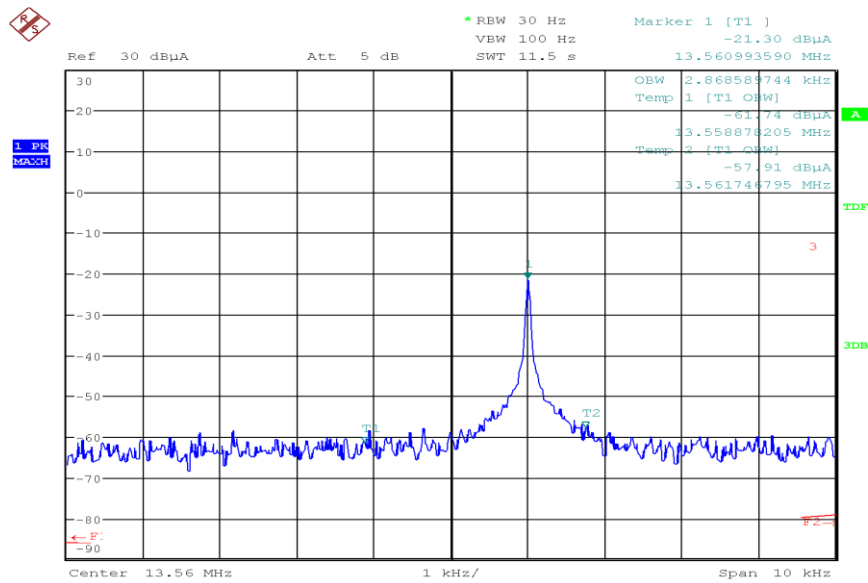
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1. Measurement diagrams

1.1. Operating frequency ranges (99% OBW)

1.1.1. T_{NOM}, V_{NOM}



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Diagram 1: OBW 99%

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

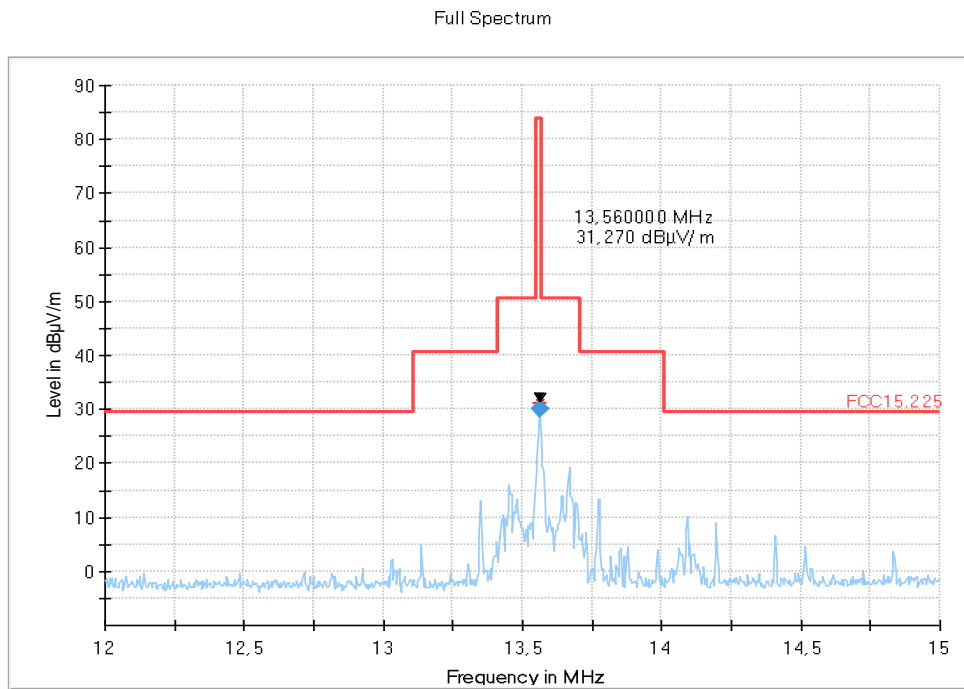


Diagram 2: EUT standing

Max-Value: 31.27dBµV/m

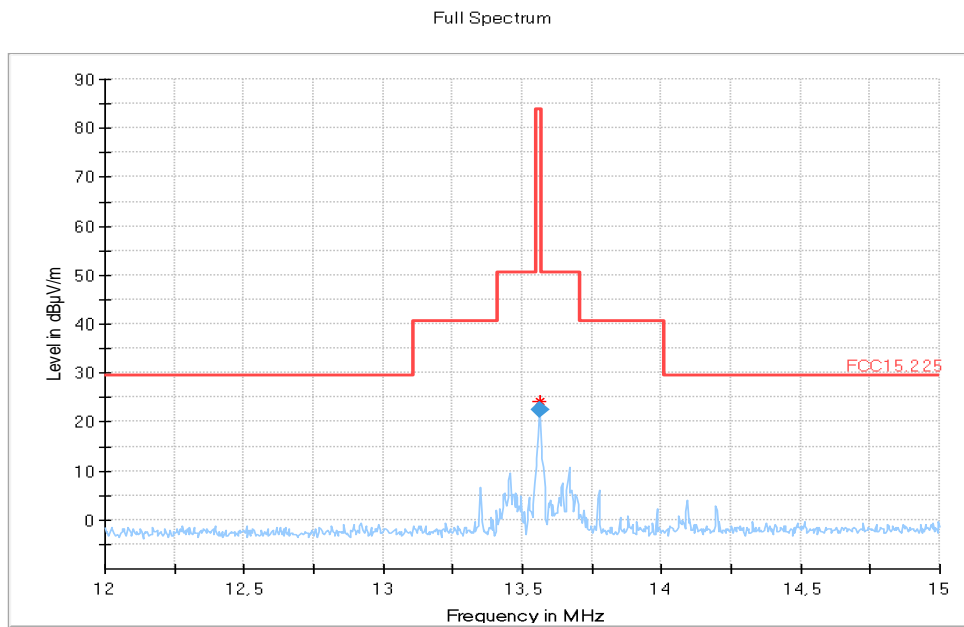


Diagram 3: EUT lying

Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Pol	Azimuth (deg)	Corr. (dB)
13.560000	22.45	84.00	61.55	9.000	V	178.0	-11.4

1.3. Transmitter spurious emissions

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

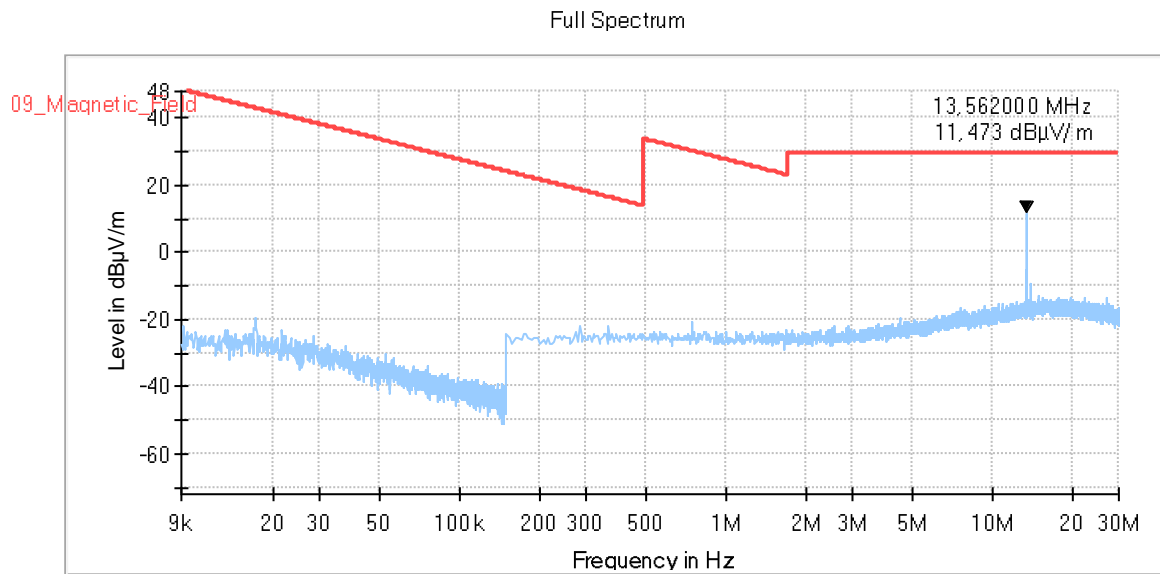


Diagram 4: TX spurious emissions up to 30MHz, EUT standing

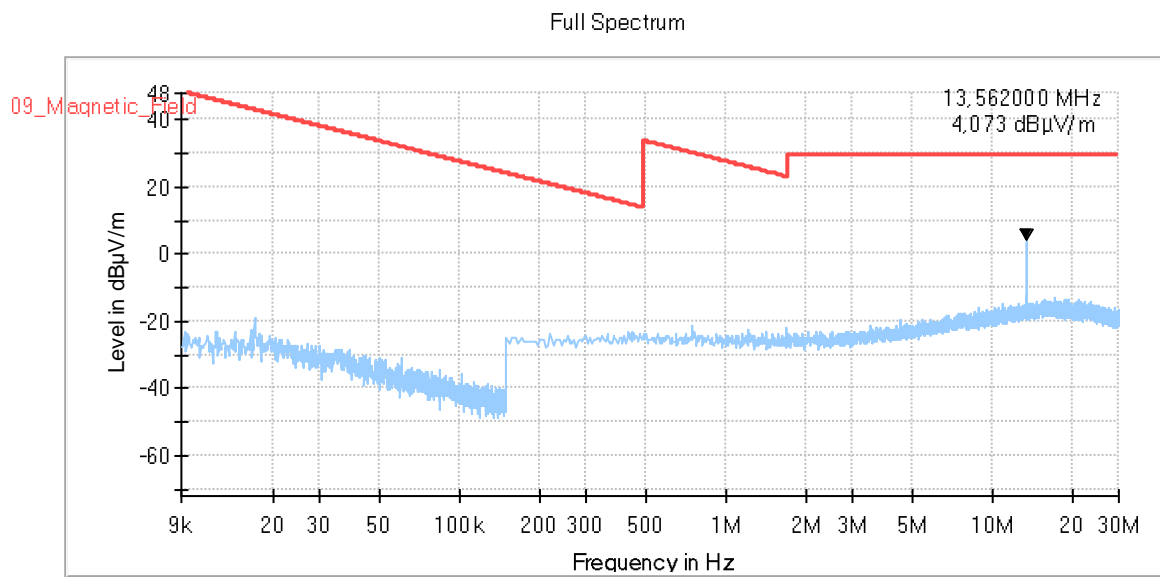


Diagram 5: TX spurious emissions up to 30MHz, EUT lying

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

Full Spectrum

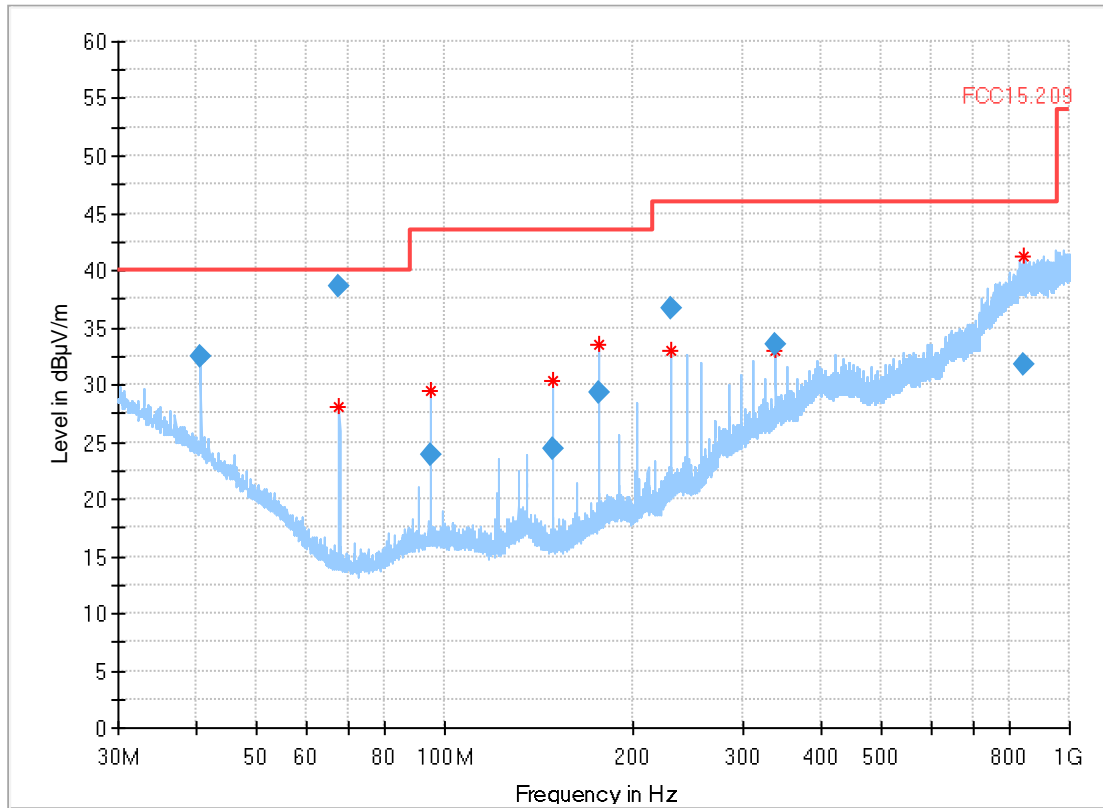


Diagram 6: E-Field measurements, EUT standing

Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
40.680000	32.43	40.00	7.57	120.000	108.0	V	278.0	16.8
67.804000	38.60	40.00	1.40	120.000	139.0	V	0.0	6.8
94.924000	23.83	43.50	19.67	120.000	118.0	V	223.0	8.2
149.164000	24.40	43.50	19.10	120.000	120.0	V	324.0	8.6
176.292000	29.30	43.50	14.20	120.000	142.0	H	53.0	10.5
230.536000	36.73	46.00	9.27	120.000	109.0	H	28.0	12.9
339.016000	33.59	46.00	12.41	120.000	117.0	H	21.0	16.4
844.816000	31.73	46.00	14.27	120.000	257.0	V	53.0	26.1

Full Spectrum

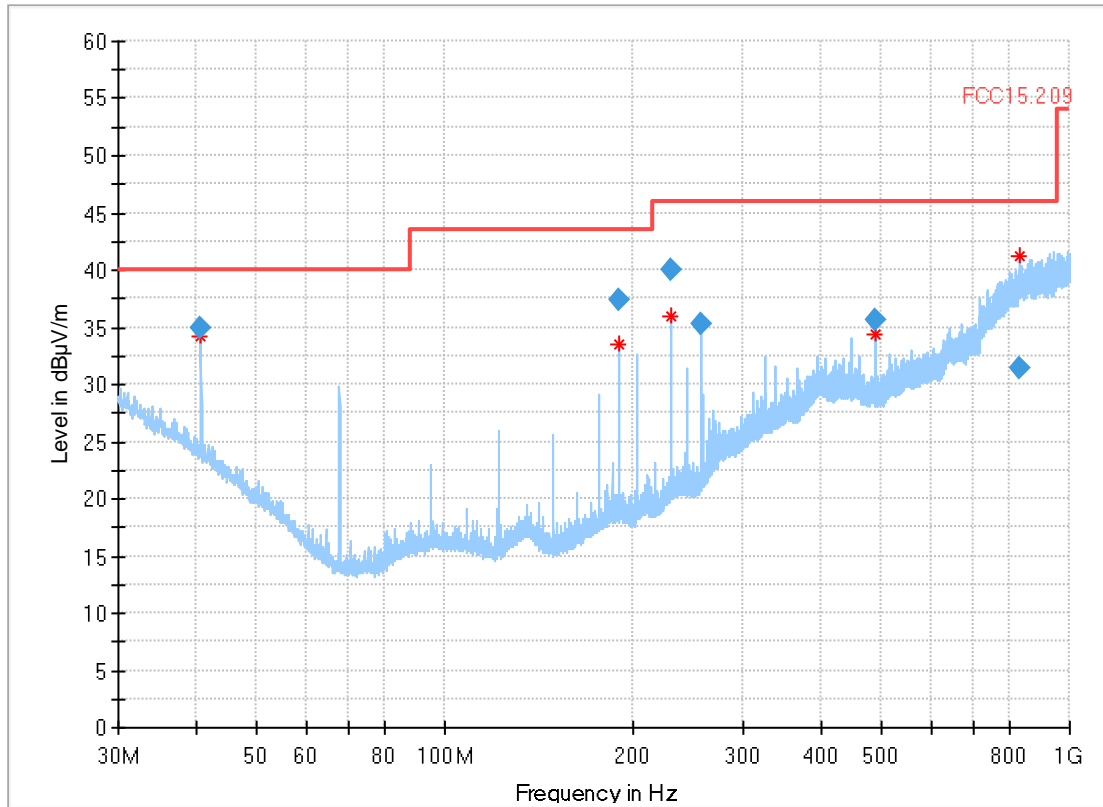


Diagram 7: E-Field measurements, EUT lying

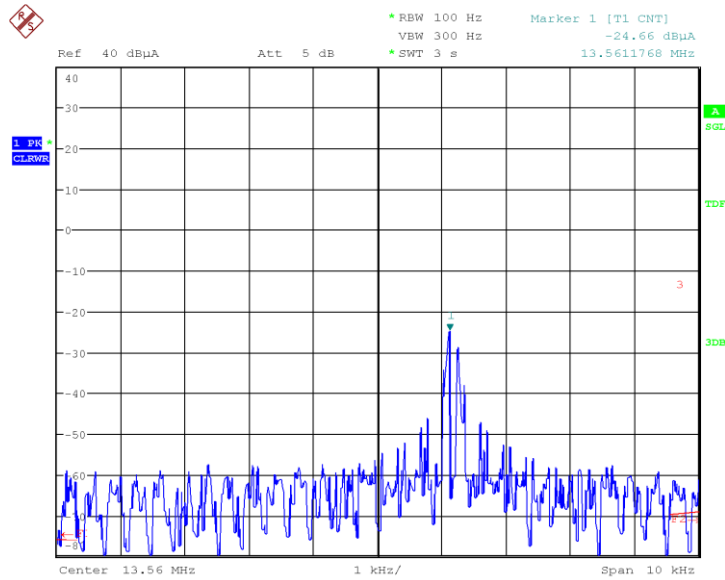
Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
40.684000	34.88	40.00	5.12	120.000	256.0	H	251.0	16.8
189.856000	37.29	43.50	6.21	120.000	175.0	H	343.0	11.4
230.536000	40.04	46.00	5.96	120.000	117.0	H	117.0	12.9
257.660000	35.28	46.00	10.72	120.000	114.0	H	0.0	13.5
488.192000	35.66	46.00	10.34	120.000	158.0	H	302.0	19.4
829.848000	31.49	46.00	14.51	120.000	154.0	H	337.0	26.1

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

Only reference and worst-case measurement diagrams are shown.

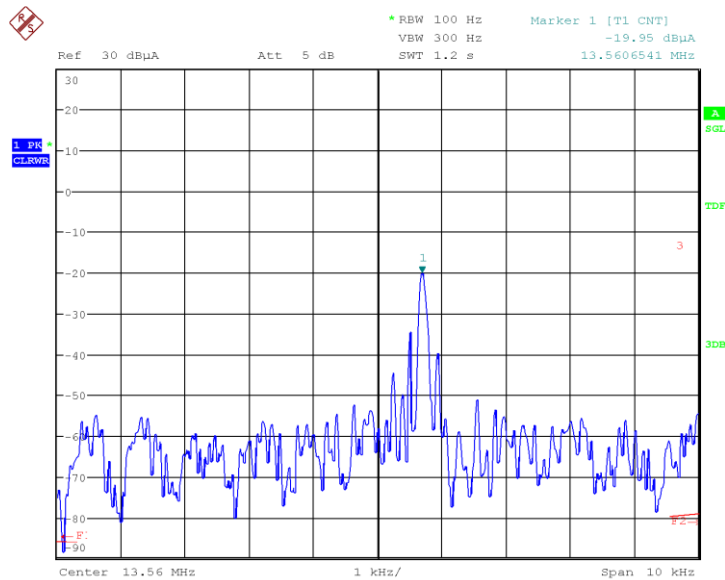
1.4.1. T_{NOM}, V_{NOM}



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Diagram 8: Frequency error (reference for all other measurements)

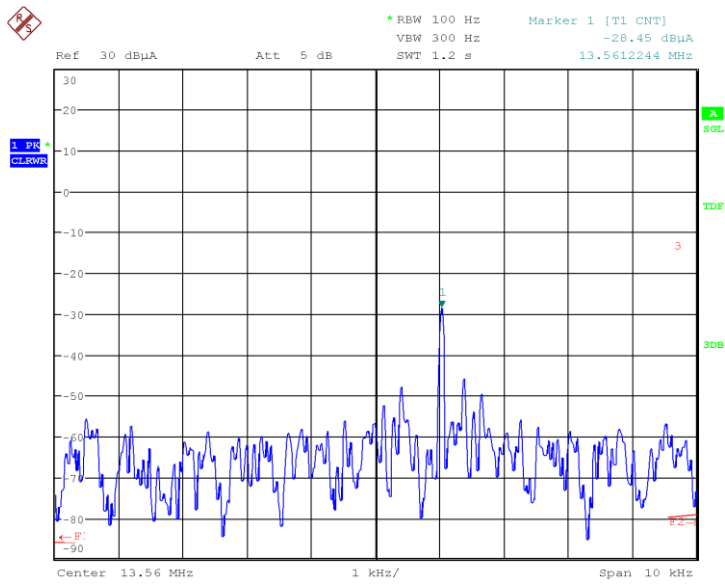
1.4.2. T=80°C, V_{NOM} (Worst case)



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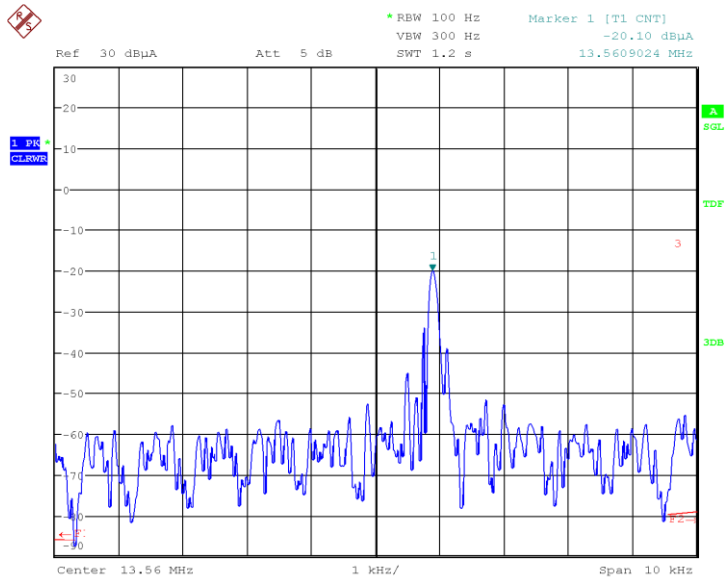
Diagram 9: Frequency error at -20°C, at 10 min after start up

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



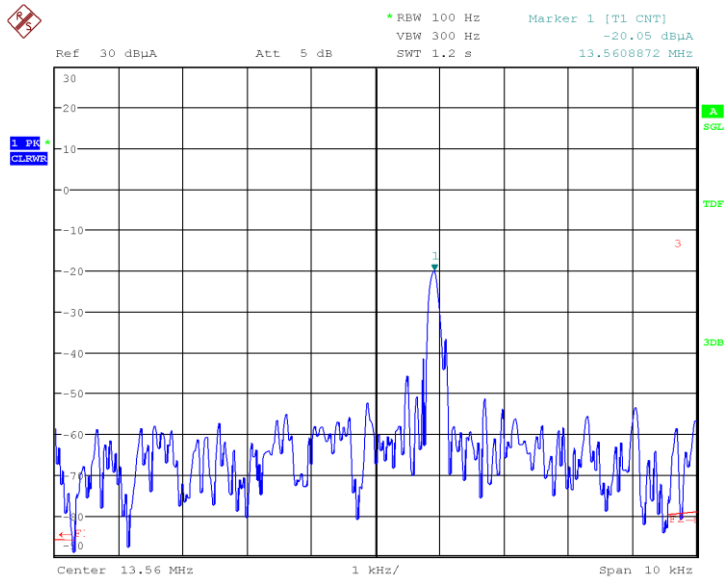
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Diagram 10: Frequency error at 10.8V (minimum voltage)



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Diagram 11: Frequency error at 15.1V (maximum voltage)



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Diagram 12: Frequency error at 12.2V (maximum deviation)