

Prüfbericht-Nr.: Test Report No.:		JP21P907 001		Auftrags-Nr.: Order No.:		150247120		Seite 1 von 82 Page 1 of 82	
Kunden-Referenz-Nr.: Client Reference No.:		N/A		Auftragsdatum: Order Date:		2021-08-31			
Auftraggeber: Client:		Panasonic Corporation 4261 Ikonobe-cho, Tsuzuki-ku, Yokohama-shi, Kanagawa-ken 224-8520, Japan							
Prüfgegenstand: Test Item:		Car Navigation							
Bezeichnung / Typ-Nr.: Identification / Type No.:		AT2201		Serien-Nr.: Serial No.:		No. 002			
Auftrags-Inhalt: Order Content:		EMC Testing							
Prüfgrundlage: Test Specification:		FCC 47 CFR Part 15, Subpart B							
Wareneingangsdatum: Date of Sample Receipt:		2021-09-06		-/-					
Prüfmuster-Nr.: Test Sample No.:		A003125761, A003125757							
Prüfzeitraum: Testing Period:		2021-10-06 to 2021-10-18							
Ort der Prüfung: Place of Testing:		Yokohama EMC Laboratory							
Prüflaboratorium: Testing Laboratory:		TÜV Rheinland Japan Ltd.							
Prüfergebnis*: Test Result*:		Pass							
zusammengestellt von: compiled by:				genehmigt von: authorized by:					
									
Datum: Date:		2022-02-18		Ausstellungsdatum: Issue date:		2022-02-18		Pin Zhang	
Stellung / Position:		Inspector		Stellung / Position:		Reviewer			
Sonstiges / Other:									
Zustand des Prüfgegenstandes bei Anlieferung: Condition of the Test Item at Delivery:									
Prüfmuster vollständig und unbeschädigt					Test item complete and undamaged				
* Legende: P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet * Legend: P(ass) = passed a.m. test specification(s) F(ail) = failed a.m. test specification(s) N/A = not applicable N/T = not tested									
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. This test report relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.									

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REVISIONS

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JP21P9O7 001	2022-02-18	Original document

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1. General Remarks

1.1 Test Specifications

Table 1: Test Summary

Test	Specifications	Result
Emission: FCC 47 CFR Part 15, Subpart B		
Conducted Emission on Power Ports FCC 15.107 ANSI C63.4-2014 IEEE Std. 187™-2018	150kHz - 30MHz Class B Not applicable since the EUT is not the device that is designed to be connected to the public utility (AC) power line.	N/A
Radiated Emission FCC 15.109 ANSI C63.4-2014 IEEE Std. 187™-2018	30MHz – 40GHz Class B	Pass
Antenna Power Conduction for Receivers FCC 15.111 ANSI C63.4-2014 IEEE Std. 187™-2018	30MHz – 40GHz	Pass

1.2 Test Report Purpose

The purpose of this test report is to show compliance of the EUT (Equipment Under Test) with the requirements of the standards listed in section 1.1.

1.3 Complementary Materials

There is no attachment to this test report.

2. Test Sites

2.1 Test Facilities

TÜV Rheinland Japan Ltd. – Global Technology Assessment Center
4-25-2 Kita-Yamata, Tsuzuki-ku, Yokohama 224-0021, Japan

The test facility is accredited by VLAC (member of ILAC) under number VLAC-017-1 according to ISO/IEC 17025:2017.

The test facility is recognized by the Federal Communications Commission (FCC) as a Conformity Assessment Body under designation number JP0017 and test firm registration number 386498.

2.2 List of Test and Measurement Instruments

Table 2: List of Test and Measurement Equipment

Kind of Equipment	Manufacturer	Model Name	Serial Number	Equip. ID	Cal. Interval	Cal. Date	Next Cal.
For Antenna Power Conduction for Receivers							
EMI Receiver	Rohde & Schwarz	ESW 44	101751	RF-0809	1 year	2021-09-27	2022-09-27
50Ω-75Ω Converter (N type)	Stack	-	B0019	-	1 year	2021-10-06	2022-10-06
50Ω-75Ω Converter (N type)	Stack	-	B0020	-	1 year	2021-10-06	2022-10-06
10dB Attenuator	Huber + Suhner	6610_SMA-50-1/199_NE	-	RF-0762	1 year	2021-03-17	2022-03-17
For Radiated Emission (RE)							
Radiated Emission Measurement Soft-ware (above 30MHz)	Toyo Corporation	EP7/RE	VER. 8.0.90	RF-0026	1 year	2021-02-16	2022-02-16
EMI Receiver	Rohde & Schwarz	ESU 8	100025	RF-0020	1 year	2021-03-12	2022-03-12
EMI Receiver	Rohde & Schwarz	ESU 40	100029	RF-0021	1 year	2021-08-25	2022-08-25
RF Selector (10m Chamber)	Toyo Corporation	NS4900	0703-182	RF-0029	1 year	2021-02-16	2022-02-16
Loop Antenna with Amplifier, 9kHz-30MHz	Rohde & Schwarz	HFH2-Z2	100139	RF-0048	1 year	2021-04-27	2022-04-27
Trilog Antenna No. 2, 30-1000MHz	Schwarzbeck	VULB 9168	9168-475	RF-0462	1 year	2021-05-18	2022-05-18

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Kind of Equipment	Manufacturer	Model Name	Serial Number	Equip. ID	Cal. Interval	Cal. Date	Next Cal.
5dB Attenuator	Pasternack	PE7047-5	-	RF-0731	1 year	2021-05-18	2022-05-18
Low Noise Preamplifier, 9kHz-1GHz	TSJ	MLA-10K01-B01-35	1370750	RF-0253	1 year	2021-01-06	2022-01-06
Low Pass Filter, DC-1GHz	R&K	LP1000CH 3	12104001	RF-0515	1 year	2021-01-06	2022-01-06
Horn Antenna, 1-8GHz	Schwarzbeck	BBHA 9120 D	1059	RF-0553	1 year	2021-04-03	2022-04-03
Microwave Preamplifier, 1-8GHz	Toyo Corporation	TPA0108-40	0634	RF-0052	1 year	2021-01-06	2022-01-06
Band Reject Filter, 1-8GHz	Nitsuki	NF-49BT	027	RF-0131	1 year	2021-01-06	2022-01-06
Horn Antenna with Preamplifier, 8-18GHz (RX)	Toyo Corporation	HAP06-18W	00000025	RF-0065	1 year	2021-04-03	2022-04-03
High Pass Filter, 8-18GHz	Micro-Tronics	HPM50107	006	RF-0334	1 year	2021-04-03	2022-04-03
Horn Antenna with Preamplifier, 18-26.5GHz (RX)	Toyo Corporation	HAP18-26N	00000010	RF-0070	1 year	2021-04-03	2022-04-03
Horn Antenna with Preamplifier, 26.5 -40GHz (RX)	Toyo Corporation	HAP26-40N	00000007	RF-0069	1 year	2021-04-03	2022-04-03
20dB Attenuator	Weinschel Associates	WA54-20-12	-	RF-0560	1 year	2021-07-15	2022-07-15
Band Reject filter	MICRO-TRONICS	BRM50702	G488	RF-0933	1 year	2021-09-14	2022-09-14
Band Reject filter	MICRO-TRONICS	BRC50703	027	RF-0408	1 year	2021-07-16	2022-07-16
Constant Voltage Constant Frequency Stabilizers and Power Accessories							
CVCF (10m Chamber)	NF Corporation	ES2000U	9067307	RF-0212	1 year	2021-03-12	2022-03-12
CVCF Booster (10m Chamber)	NF Corporation	ES2000B	9074408	RF-0213	1 year	2021-03-12	2022-03-12
DC Power Supply	Kikusui	PWR800L	NA003235	PV-0039	N/A	N/A	N/A
True RMS Multimeter	Fluke	87V	97680445	RF-0281	1 year	2020-12-15	2021-12-15
True RMS Multimeter	Fluke	87V	97680450	RF-0282	1 year	2021-03-23	2022-03-23
True RMS Multimeter	Fluke	87V	16110176	RF-0414	1 year	2021-06-10	2022-06-10
AC,DC Power Source	NF Corporation	EC1000SA	9364678	RF-0940	1 year	2021-09-21	2022-09-21

Conformance of the used measurement and test equipment with the requirements of ISO/IEC 17025 has been confirmed before testing.

2.3 Measurement Uncertainty

Table 3: Measurement Uncertainty

Measurement Type	Frequency	Uncertainty
Conducted Emission on Power Ports	9kHz - 30MHz	±2.0dB
Antenna Port Conducted Emission	20Hz - 40GHz	±1.5dB
Radiated Emission	30MHz - 1GHz	±3.8dB at 3m ±5.0dB at 10m
Radiated Emission	Above 1GHz	±4.5dB

3. General Product Information

3.1 Product Function and Intended Use

The **EUT** (**E**quipment **U**nder **T**est) is a car navigation to be installed in vehicles with wireless connectivity of Bluetooth, WLAN (2.4GHz and 5GHz) and GNSS. It can receive analog and digital FM radio broadcast with two receiving antennas (Main and Sub).

3.2 Ratings and System Details

FM Radio Broadcast Receiving:

Frequency Range: 87.75 - 107.9MHz

Antenna Type: External

Antenna Number: 2 (Main and Sub)

Broadcast Type: Analog or Digital

Rated temperature: -30 to +65°C

Rated voltage: DC 12V

Rated input Current: 13.11A (Max.)

Protection class: III

Test voltage: DC 13.2V for radio testing

3.3 Noise Generating and Noise Suppressing Parts

The highest frequency generated or used by the EUT is 5825MHz as intentional radiator portion.

3.4 Submitted Documents and Information

Following documents have been submitted by the client:

Following information provided in this test report has been submitted by the client:

- client name and address;
- EUT identification, ratings, system details, and description of product function and intended use;

information related to noise generating and noise suppressing parts (if any).

4. Test Set-up and Operation Modes

4.1 Test Methodology

The test methodology used is based on the requirements of 47 CFR Part 15, Sections 15.31, 15.33, 15.35, 15.107 and 15.109.

The test methods, which have been used, are based on ANSI C63.4.

For details, see under each test item.

4.2 Operation Modes

The basic operation modes used for testing are:

- A1. Receiving Analog FM Broadcast at the lowest frequency (87.75MHz).
- A2. Receiving Analog FM Broadcast at the middle frequency (97.9MHz).
- A3. Receiving Analog FM Broadcast at the highest frequency (107.9MHz).
- D1. Receiving Digital FM Broadcast at the lowest frequency (87.75MHz).
- D2. Receiving Digital FM Broadcast at the middle frequency (97.9MHz).
- D3. Receiving Digital FM Broadcast at the highest frequency (107.9MHz).

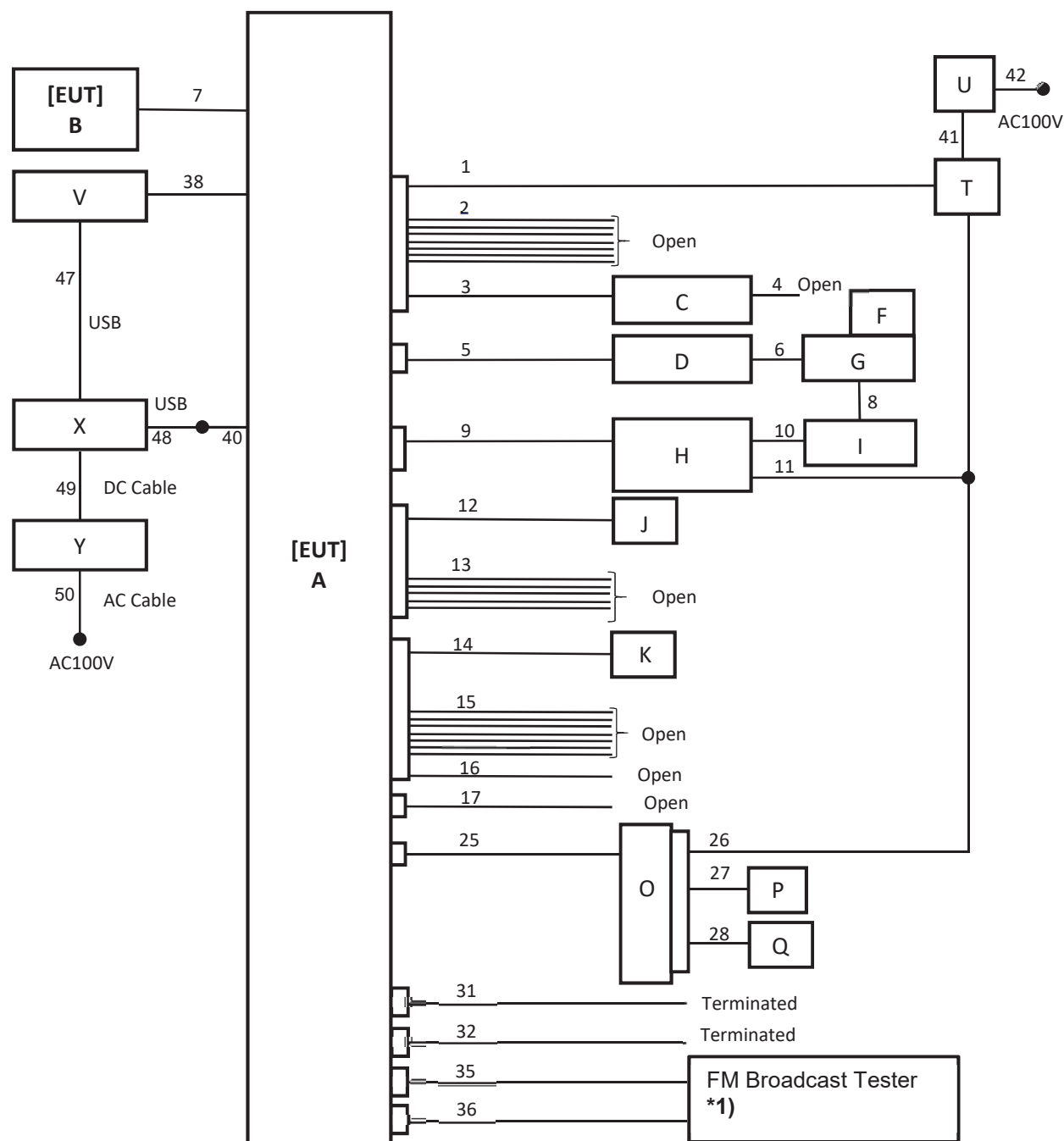
Note: Standard test signals of Analog and Digital FM Broadcast are provided by a test transmitter (FM Broadcast Tester) to the EUT antenna terminals.

4.3 Physical Configuration for Testing

The test system was configured in a typical fashion (as a customer would normally use it).

The justification and manipulation of cables and equipment in order to simulate a worst-case behavior of the test setup has been carried out as prescribed in ANSI C63.4.

Figure 1: Block Diagram



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Table 4: The System consists of the Following Units

No.	Item	Model No.	Serial Number	Manufacturer	Remark
A	Car Navigation	AT2201	No. 002	Panasonic Corporation	EUT
B	GNSS Antenna	3498778-10	06D30023	Panasonic Corporation	EUT
C	Steering Switch	-/-	1143	Panasonic Corporation	-/-
D	IF Box	DEP32-10078	035	Panasonic Corporation	-/-
F	USB memory	RUF3-KS	-/-	Buffalo Inc.	-/-
G	USB Hub	U3H-A422BX	0600235	ELECOM	-/-
H	JIG Board	GVIF2HDJIG	15	Panasonic Corporation	-/-
I	Separate Display	ON-LAP 11021	-/-	TEKWIND	-/-
J	Mic	GP-SDA3510A	0DC062856	Panasonic Corporation	-/-
K	Mic	GP-SDA3510A	0DC062519	Panasonic Corporation	-/-
O	MOST AMP	CL-DL47X2AJ Rev.A	513263	Panasonic Corporation	-/-
P	Speaker	TS-X180	-/-	Pioneer	-/-
Q	Dummy load	-/-	Unspecified	Panasonic Corporation	-/-
T	Terminal Block	-/-	-/-	-/-	-/-
U	Power Supply (DC)	EC1000SA	9364678	NF Corporation	-/-
V	Jig board	WR12-3224	-/-	WESTEK	-/-
X	Laptop PC	20U2S5M60Q	PF2YP1PV	Lenovo	-/-

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No.	Item	Model No.	Serial Number	Manufacturer	Remark
Y	AC Adapter for Laptop PC	ADLX65YDC2 D	8SSA10R16918D1S G 16B0 1H7	Lenovo	-/-
FM Broadcast Tester	Test Transmitter	SFE100	013441	Rohde & Schwarz	-/-

Table 5: Interfaces present on the EUT

No.	Name	Length(m)	Shield		Remarks
			Cable	Connector	
1	DC cable	2.0m	Unshielded	Unshielded	-
2	Signal cable	2.0m	Unshielded	Unshielded	-
3	Signal cable	2.0+0.1m	Unshielded	Unshielded	-
4	IF Box Power	0.3m	Unshielded	Unshielded	-
5	Signal cable	1.0m	Shielded	Shielded	-
6	USB cable	0.07m	Shielded	Shielded	-
7	GPS cable	3.7m	Shielded	Shielded	-
8	USB cable	1.2m	Shielded	Shielded	-
9	GBIF (Separate Display)	1.9m	Shielded	Shielded	-
10	HDMI cable	1.2m	Shielded	Shielded	-
11	DC cable	2.0+0.5m	Unshielded	Unshielded	-
12	Mic	2.0m	Unshielded	Unshielded	-
13	Signal cable	2.0m	Unshielded	Unshielded	-
14	Mic	2.0m	Unshielded	Unshielded	-
15	Signal cable	2.0m	Unshielded	Unshielded	-
16	Signal cable	2.0m	Unshielded	Unshielded	-
17	RSE	2.0m	Shielded	Shielded	-
25	MOST AMP	2.5m	Unshielded	Unshielded	-
26	DC cable	1.0m	Unshielded	Unshielded	-
27	Speaker cable	1.0+4.8m	Unshielded	Unshielded	-
28	Speaker cable	1.0m	Unshielded	Unshielded	-
31	A2B	3.0m	Unshielded	Unshielded	-
32	DCM	3.0m	Unshielded	Unshielded	-
35	FM	2.0m	Shielded	Shielded	-
36	FM	2.0m	Shielded	Shielded	-
38	Signal cable	0.1m	Unshielded	Unshielded	*2)
40	UART	0.3m	Unshielded	Unshielded	*2)
47	USB	1.1m	Shielded	Shielded	*2)
48	UART-USB	1.8m	Shielded	Shielded	*2)
49	DC cable of AC adapter	1.8m	Shielded	Shielded	*2)
50	AC cable of AC adapter	1.0m	Unshielded	Unshielded	*2)

Note:

*1) Either interface No. 35 (Main) or No.36 (Sub) was fed with FM broadcast signal while the other one was terminated.

*2) This cable was for testing and was not included with products.

For more details, refer to section: Photographs of the Test Setup.

4.4 Test Software

The EUT was provided by the manufacturer with suitable software to allow operation in all the required modes.

4.5 Special Accessories and Auxiliary Equipment

The product has been tested together with the following additional accessories:

1. Product: Laptop PC
Manufacturer: Lenovo
Model: 20U2S5M60Q
Rated Voltage: DC 20V
Input Current: 2.25A
Protection Class: III
Serial Number: PF2YP1PV
2. Product: AC Adapter for Laptop PC
Manufacturer: Lenovo
Model: ADLX65YDC2D
Rated Voltage: AC 100-240V
Input Current: 1.8A
Frequency: 50-60Hz
Protection Class: II
Serial Number: 8SSA10R16918D1SG 16B0 1H7
3. Product: Steering Switch
Manufacturer: Panasonic Corporation
Protection Class: III
Serial Number: 1143

Note: See section 6 for more details of this Steering Switch as test jig.

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4. Product: IF Box
Manufacturer: Panasonic Corporation
Model: DEP32-10078
Protection Class: III
Serial Number: 035
5. Product: USB Memory
Manufacturer: Buffalo Inc.
Model: RUF3-KS
Protection Class: III
6. Product: USB Hub
Manufacturer: ELECOM
Model: U3H-A422BX
Protection Class: III
Serial Number: 0600235
7. Product: JIG Board
Manufacturer: Panasonic Corporation
Model: GVIF2HDJIG
Protection Class: III
Serial Number: 15
8. Product: Separate Display
Manufacturer: TEKWIND
Model: ON-LAP 11021
Rated Voltage: DC 5V
Input Current: 1.7A
Protection Class: III
9. Product: Mic
Manufacturer: Panasonic Corporation
Model: GP-SDA3510A
Protection Class: III
Serial Number: 0DC062856
10. Product: Mic
Manufacturer: Panasonic Corporation
Model: GP-SDA3510A
Protection Class: III
Serial Number: 0DC062519
11. Product: MOST AMP
Manufacturer: Panasonic Corporation
Model: CL-DL47X2AJ Rev.A
Protection Class: III
Serial Number: 513263

12. Product: Speaker
Manufacturer: Pioneer
Model: TS-X180
Protection Class: III

13. Product: Dummy Load for Speaker
Manufacturer: Panasonic Corporation

Note: See section 6 for more details of this Dummy Load as test jig.

14. Product: Jig board
Manufacturer: WESTEK
Model: WR12-3224
Protection Class: III

15. Product: Test Transmitter (FM Broadcast Tester)
Manufacturer: Rohde & Schwarz
Model: SFE100
Rated Voltage: AC 100V
Frequency: 50/60Hz
Protection Class: I
Serial Number: 013441

4.6 Countermeasures to achieve Compliance

No additional measures were employed to achieve compliance.

5. Test Results EMISSION

5.1 AC Power Line Conducted Measurements

5.1.1 AC Power Line Conducted Emission

RESULT:**N/A**

Requirements:

FCC 15.107

The AC power line conducted emission on any frequency within the band 150kHz to 30MHz shall not exceed the limits specified in FCC 15.107(a).

Test procedure:

ANSI C63.4 §7

Note:

Not applicable since the EUT is not the device that is designed to be connected to the public utility (AC) power line.

5.2 Radiated Measurements

5.2.1 Radiated Emission

RESULT:**PASS**

Date of testing: 2021-10-06, 2021-10-07, 2021-10-08

Ambient temperature: 24, 23, 23°C

Relative humidity: 52, 60, 58%

Atmospheric pressure: 1013, 1017, 1016hPa

Frequency range: 30MHz - 40GHz

Equipment classification: Class B

Measurement distance: 3m

Kind of test site: Semi Anechoic Chamber

Test mode applied: A1, A2, A3, D1, D2, D3

Requirements:

FCC 15.109

The emission from the unintentional radiator portion of the EUT shall not exceed the field strength specified in FCC 15.109(a).

Test procedure:

ANSI C63.4 §8

The EUT was placed on a nonconductive turntable 0.8m above the ground plane. Before final measurements of radiated emissions were performed, the EUT was scanned to determine its emission spectrum profile. The physical arrangement of the test system, the associated cabling were varied in order to ensure that maximum emission amplitudes were attained.

The spectrum was examined from 30MHz to 40GHz. Final radiated emission measurements were made at 3m distance.

At each frequency selected for final measurement, the EUT was rotated 360° and the antenna was raised and lowered from 1 to 4m in order to determine the emission's maximum level. Measurements were taken using both horizontal and vertical antenna polarizations.

For emissions between 30MHz and 1GHz, measurements were performed with a receiver operating in the CISPR quasi-peak detection mode. The receiver's 6dB bandwidth was set to 120kHz. For emissions above 1GHz, measurements were performed with a spectrum analyzer using the following settings: for peak field strength: RBW = 1MHz & VBW ≥ 1MHz; for average field strength: RBW = 1MHz & VBW = 10Hz.

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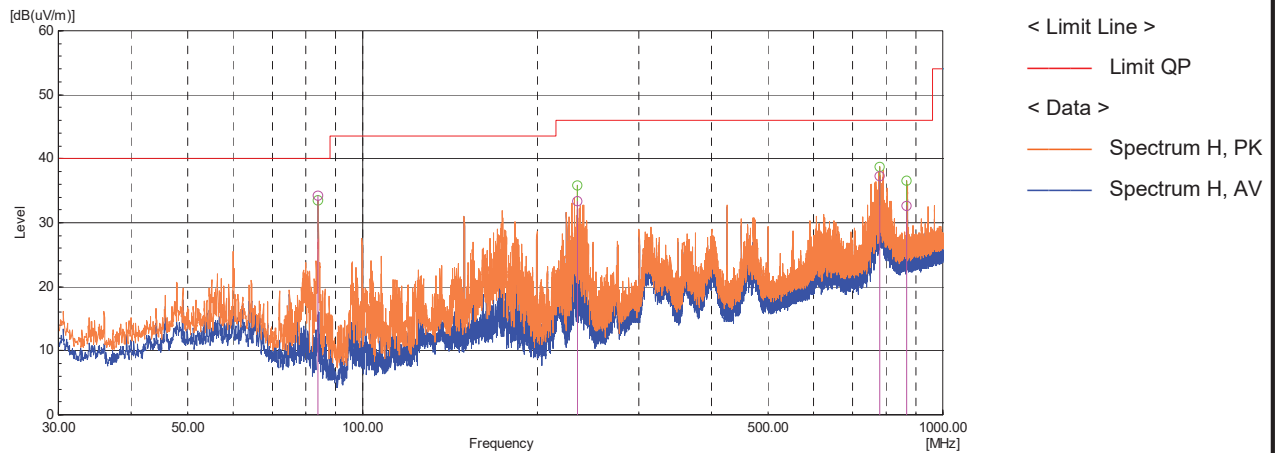
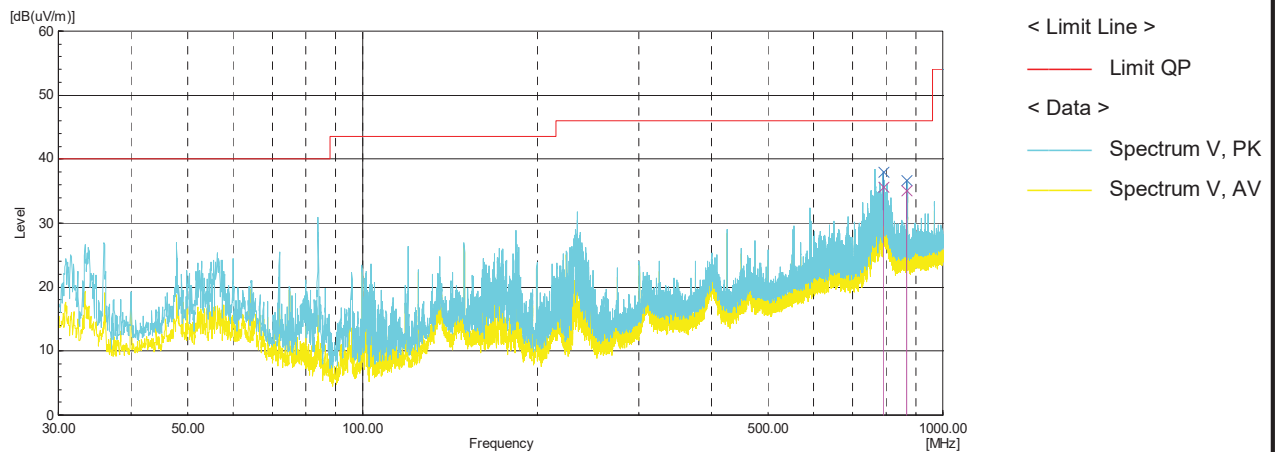
Absorbers have been placed on the floor between the EUT and the measuring antenna for testing above 1GHz.

Prechecks have been performed to compare the results of the 2 receiving ports: Main and Sub. Final measurement was performed for the worst receiving port only (Main).

The highest emission amplitudes relative to the appropriate limit were recorded in this report. Emissions other than those mentioned are small or not detectable.

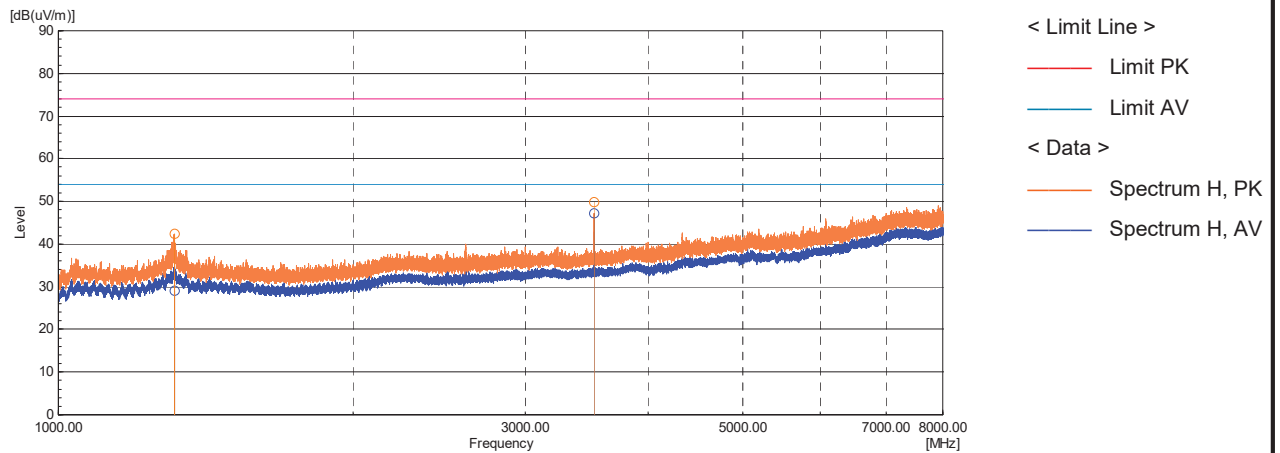
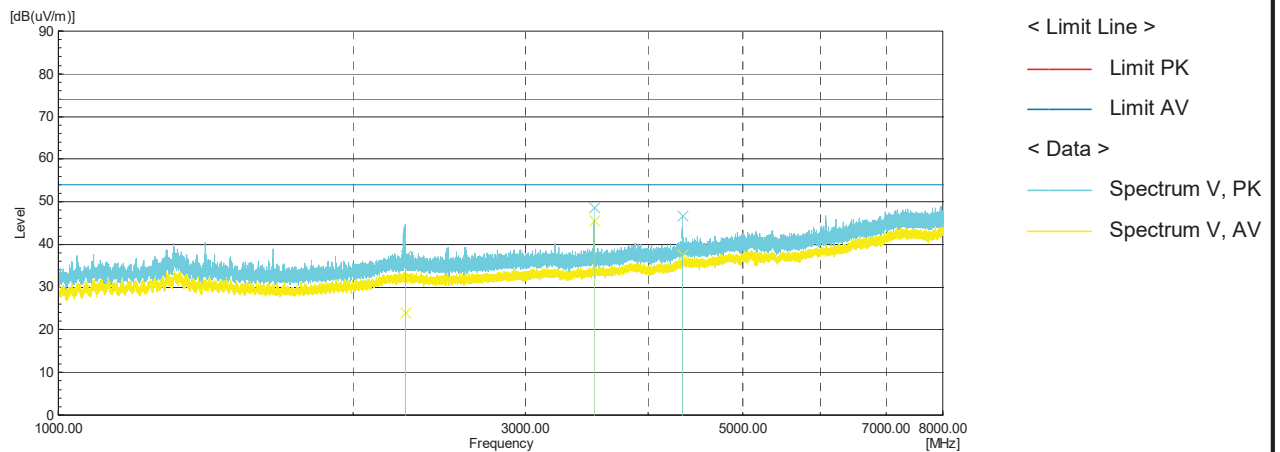
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Page 21 of 82**Figure 2: Radiated Emission, Spectral Diagram, 30MHz - 1GHz, Horizontal Antenna Orientation, Mode A1****Figure 3: Radiated Emission, Spectral Diagram, 30MHz - 1GHz, Vertical Antenna Orientation, Mode A1**

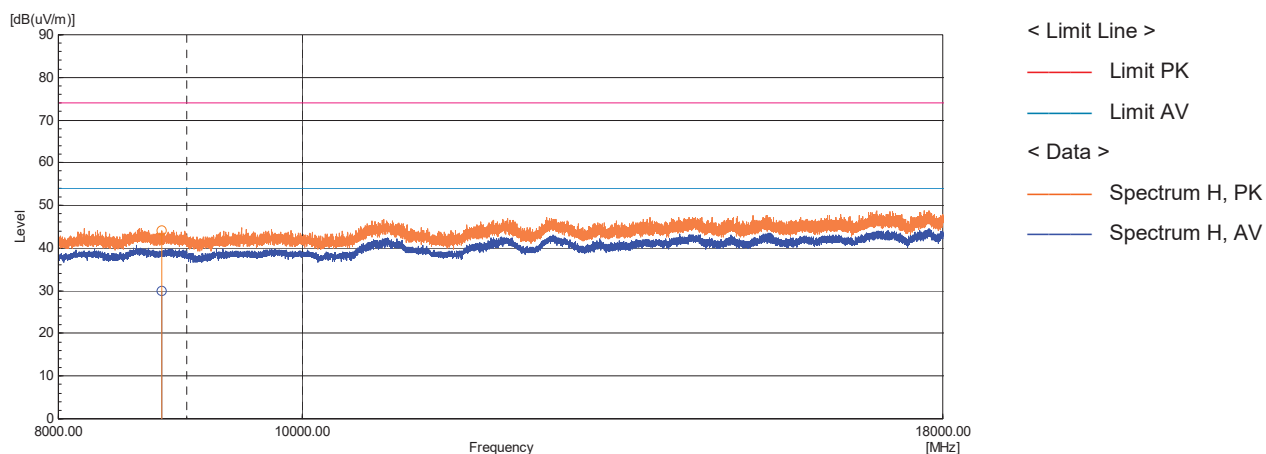
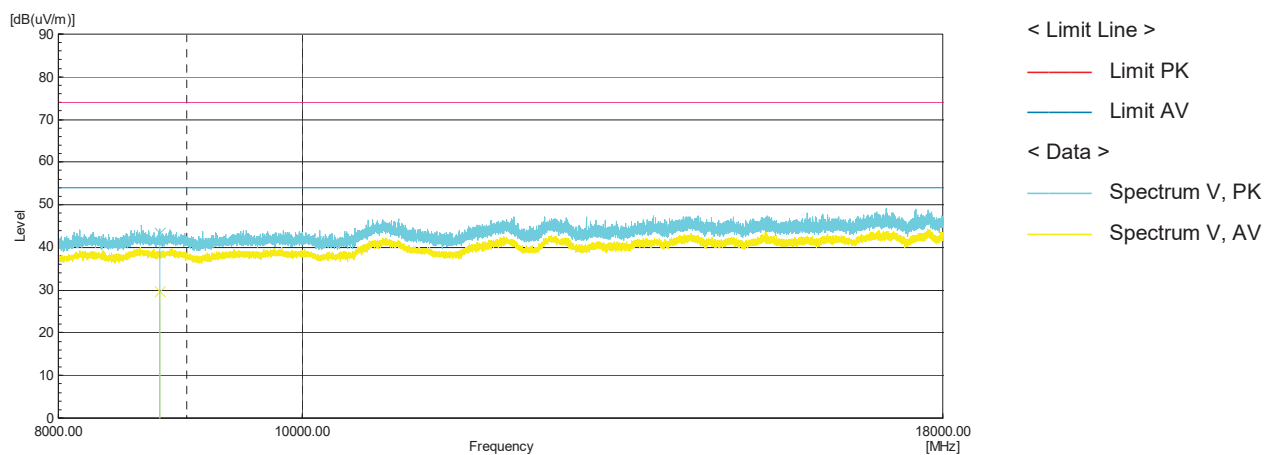
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Page 22 of 82**Figure 4: Radiated Emission, Spectral Diagram, 1 - 8GHz, Horizontal Antenna Orientation, Mode A1****Figure 5: Radiated Emission, Spectral Diagram, 1 - 8GHz, Vertical Antenna Orientation, Mode A1**

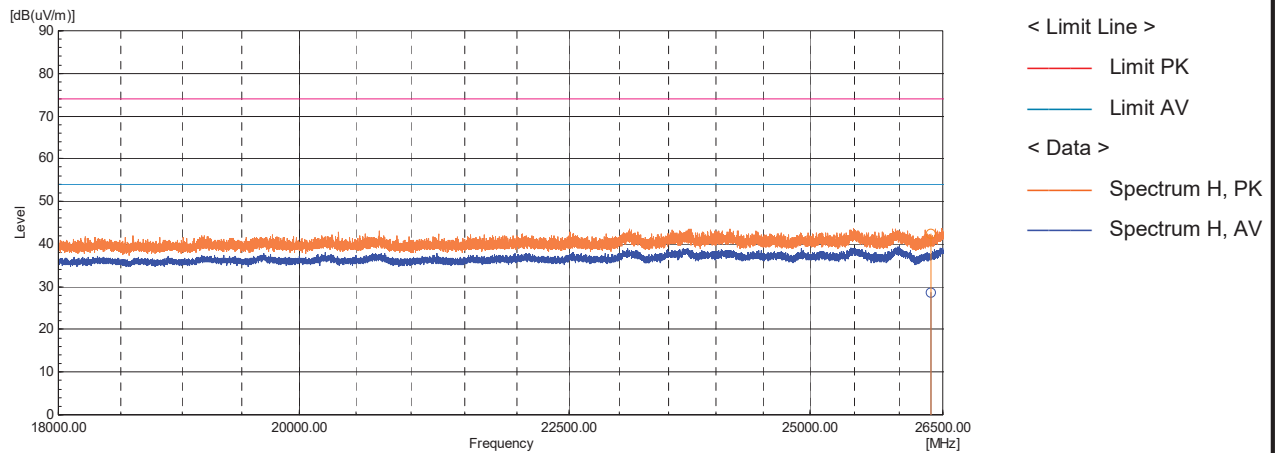
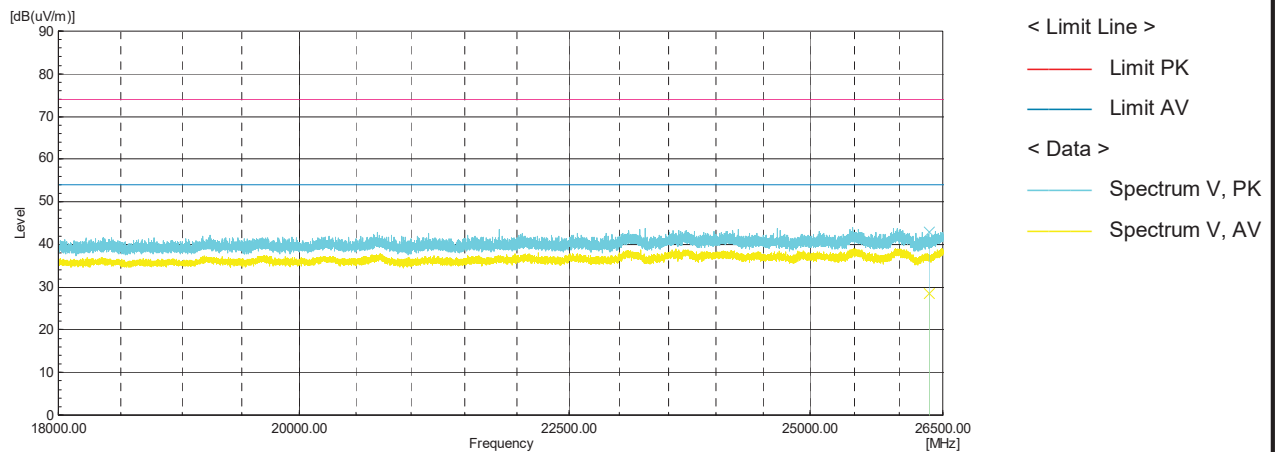
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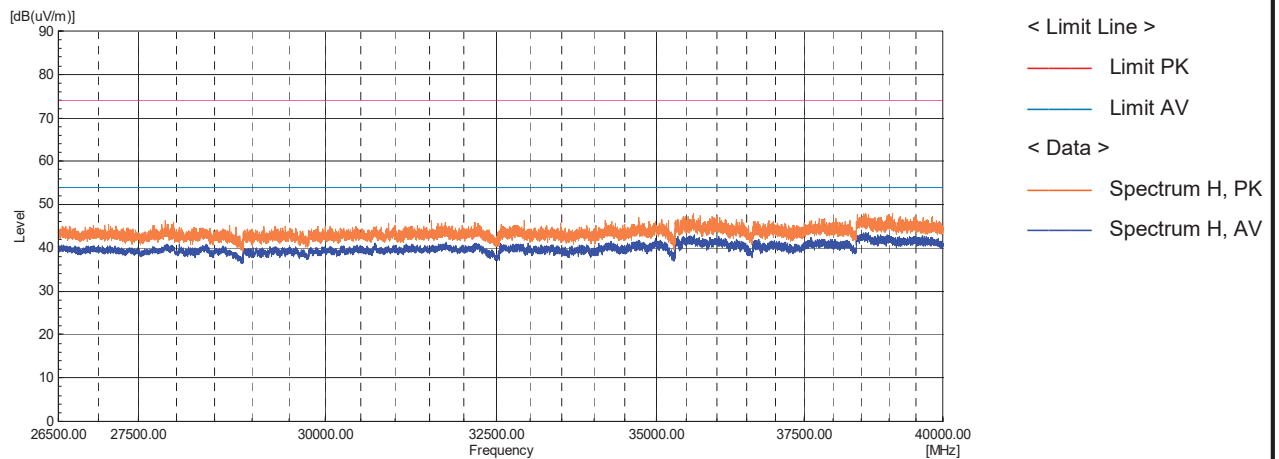
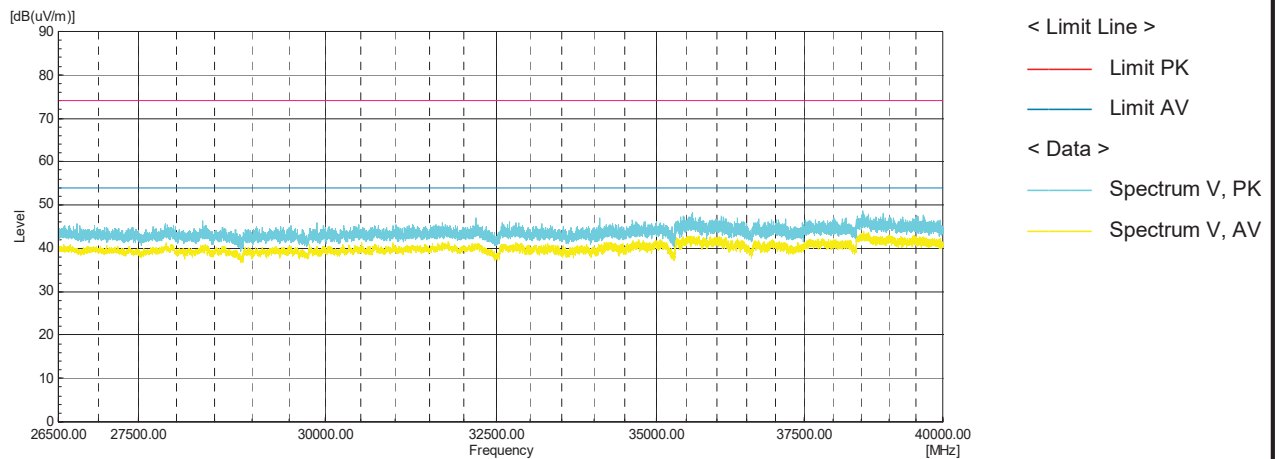
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Seite 23 von 82
Page 23 of 82**Figure 6: Radiated Emission, Spectral Diagram, 8 - 18GHz, Horizontal Antenna Orientation, Mode A1****Figure 7: Radiated Emission, Spectral Diagram, 8 - 18GHz, Vertical Antenna Orientation, Mode A1**

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Page 24 of 82**Figure 8: Radiated Emission, Spectral Diagram, 18 - 26.5GHz, Horizontal Antenna Orientation, Mode A1****Figure 9: Radiated Emission, Spectral Diagram, 18 - 26.5GHz, Vertical Antenna Orientation, Mode A1**

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Page 25 of 82**Figure 10: Radiated Emission, Spectral Diagram, 26.5 - 40GHz, Horizontal Antenna Orientation, Mode A1****Figure 11: Radiated Emission, Spectral Diagram, 26.5 - 40GHz, Vertical Antenna Orientation, Mode A1**

Prüfbericht-Nr.:
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Page 26 of 82**Table 6: Radiated Emission, Quasi Peak Data, 30MHz - 1GHz, Horizontal and Vertical Antenna Orientations, Mode A1**

Freq. [MHz]	Antenna Orientation	Reading QP [dBμV]	Factor [dB(1/m)]	Level QP [dBμV/m]	Limit [dBμV/m]	Margin QP [dB]	Height [cm]	Angle [°]
84.006	H	60.4	-26.2	34.2	40.0	5.8	379	121
234.497	H	55.6	-22.3	33.3	46.0	12.7	139	251
777.464	H	47.1	-9.8	37.3	46.0	8.7	100	76
789.279	V	45.2	-9.6	35.6	46.0	10.4	128	185
867.001	V	43.8	-8.7	35.1	46.0	10.9	101	1
867.189	H	41.3	-8.7	32.6	46.0	13.4	295	223

Note: Level QP = Reading QP + Factor
 $\text{dB}(\mu\text{V/m}) = 20 \times \log(\mu\text{V/m})$

Table 7: Radiated Emission, Average Data, 1 - 40GHz, Horizontal and Vertical Antenna Orientations, Mode A1

Freq. [MHz]	Antenna Orientation	Reading AV [dBμV]	Factor [dB(1/m)]	Level AV [dBμV/m]	Limit [dBμV/m]	Margin AV [dB]	Height [cm]	Angle [°]
1313.181	H	46.6	-17.6	29.0	54.0	25.0	149	185
2259.124	V	39.4	-15.3	24.1	54.0	29.9	100	297
3525.390	H	61.1	-13.8	47.3	54.0	6.7	183	185
3525.758	V	59.5	-13.8	45.7	54.0	8.3	159	199
4336.403	V	48.8	-11.3	37.5	54.0	16.5	191	349
8776.121	V	38.7	-8.9	29.8	54.0	24.2	114	108
8791.002	H	38.8	-8.9	29.9	54.0	24.1	189	325
26336.108	V	41.2	-12.6	28.6	54.0	25.4	197	349
26358.966	H	41.1	-12.6	28.5	54.0	25.5	107	314

Note: Level AV = Reading AV + Factor

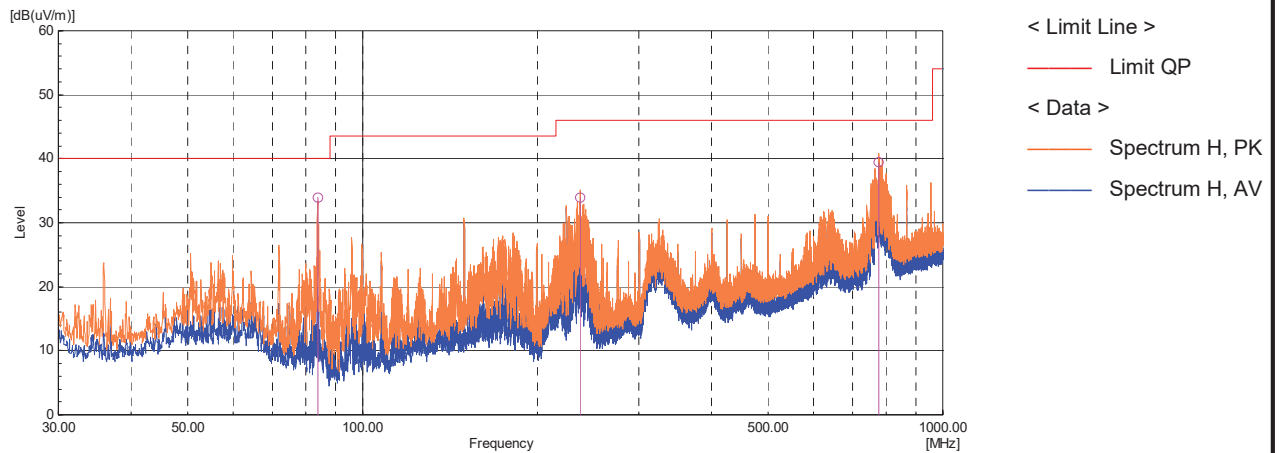
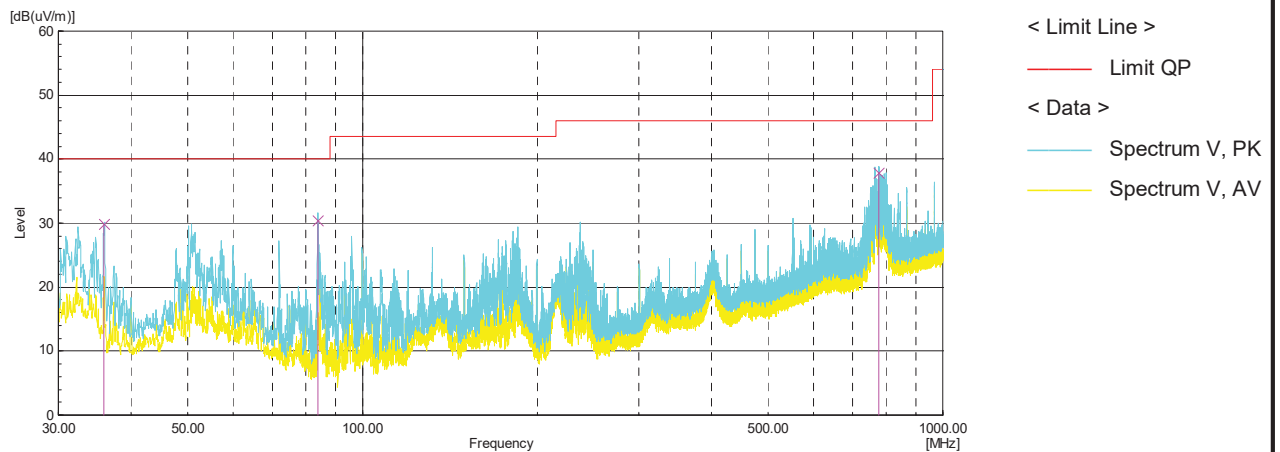
Table 8: Radiated Emission, Peak Data, 1 - 40GHz, Horizontal and Vertical Antenna Orientations, Mode A1

Freq. [MHz]	Antenna Orientation	Reading PK [dBμV]	Factor [dB(1/m)]	Level PK [dBμV/m]	Limit [dBμV/m]	Margin PK [dB]	Height [cm]	Angle [°]
1313.181	H	60.0	-17.6	42.4	74.0	31.6	149	185
2259.124	V	52.7	-15.3	37.4	74.0	36.6	100	297
3525.390	H	63.6	-13.8	49.8	74.0	24.2	183	185
3525.758	V	62.4	-13.8	48.6	74.0	25.4	159	199
4336.403	V	58.0	-11.3	46.7	74.0	27.3	191	349
8776.121	V	52.4	-8.9	43.5	74.0	30.5	114	108
8791.002	H	53.0	-8.9	44.1	74.0	29.9	189	325
26336.108	V	55.6	-12.6	43.0	74.0	31.0	197	349
26358.966	H	55.0	-12.6	42.4	74.0	31.6	107	314

Note: Level PK = Reading PK + Factor

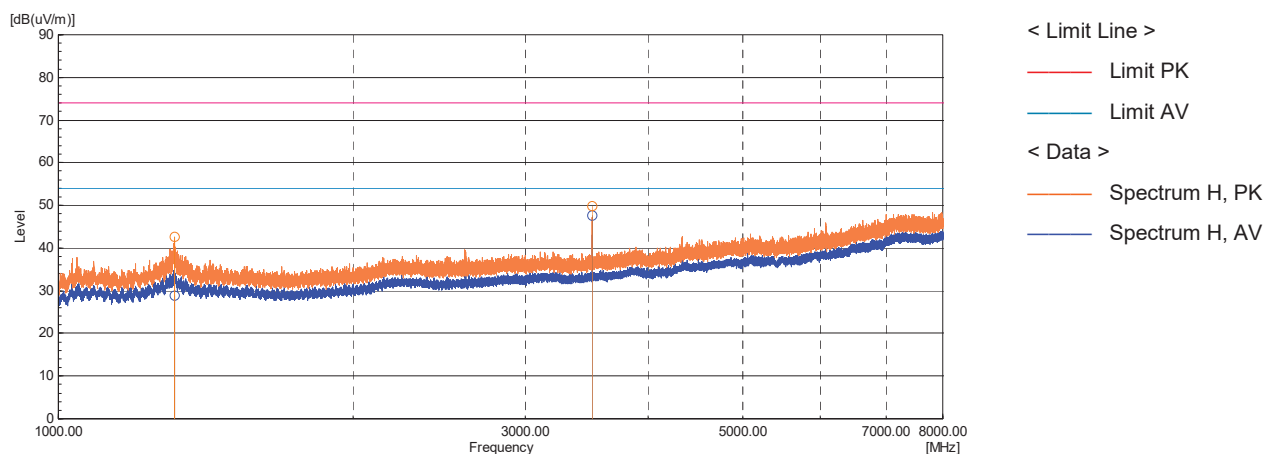
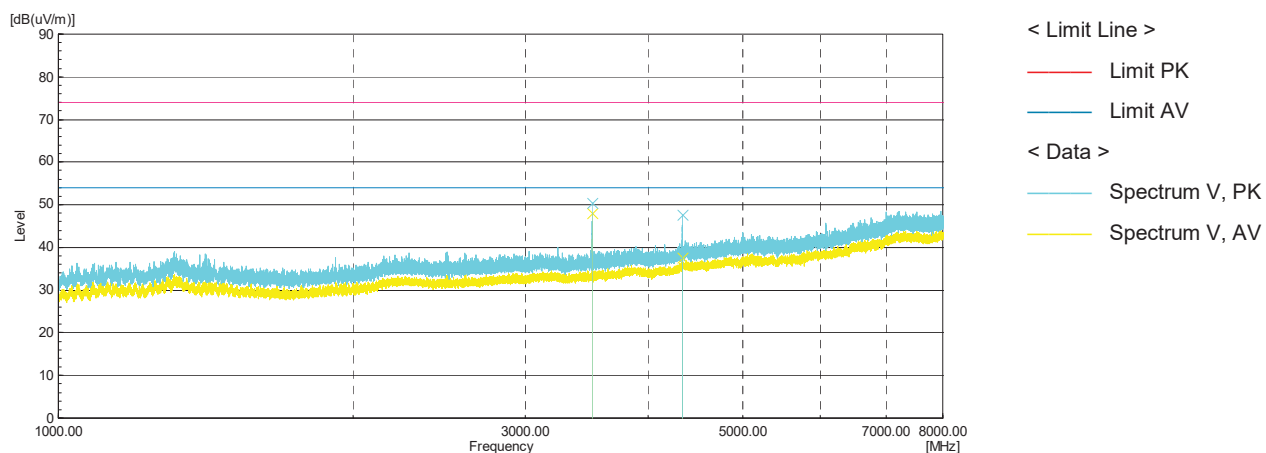
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Seite 27 von 82
Page 27 of 82**Figure 12: Radiated Emission, Spectral Diagram, 30MHz - 1GHz, Horizontal Antenna Orientation, Mode A2****Figure 13: Radiated Emission, Spectral Diagram, 30MHz - 1GHz, Vertical Antenna Orientation, Mode A2**

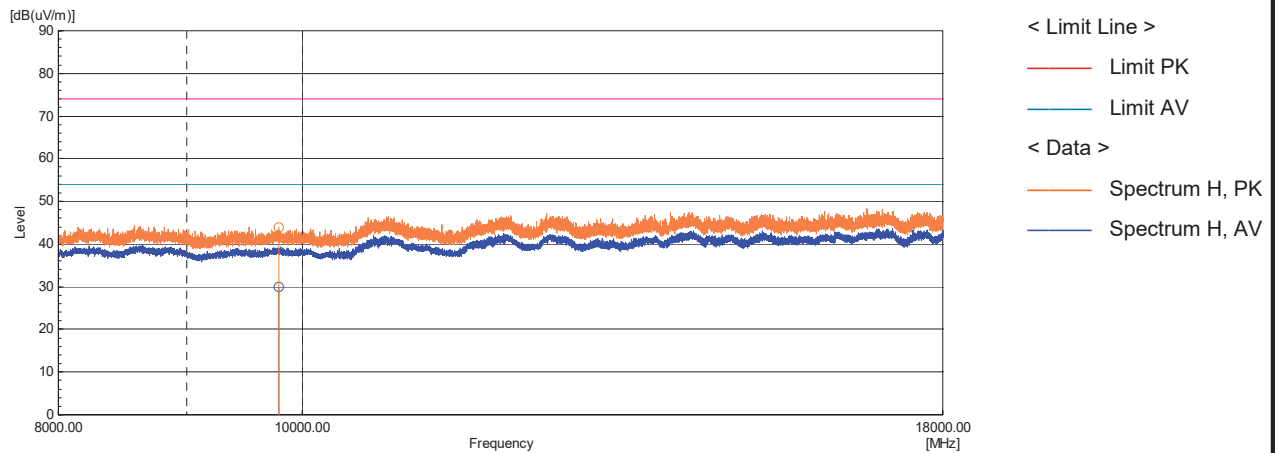
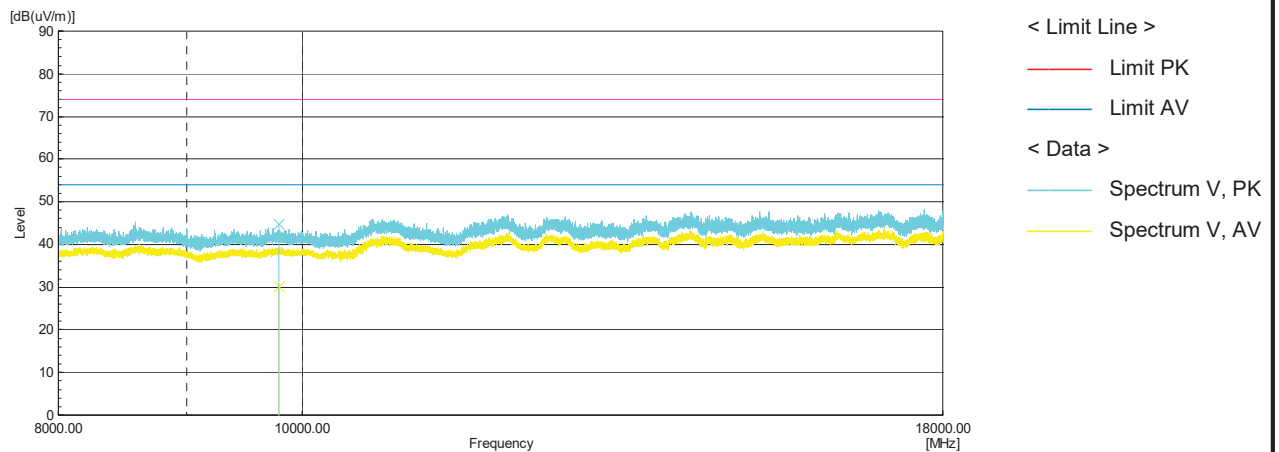
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Page 28 of 82**Figure 14: Radiated Emission, Spectral Diagram, 1 - 8GHz, Horizontal Antenna Orientation, Mode A2****Figure 15: Radiated Emission, Spectral Diagram, 1 - 8GHz, Vertical Antenna Orientation, Mode A2**

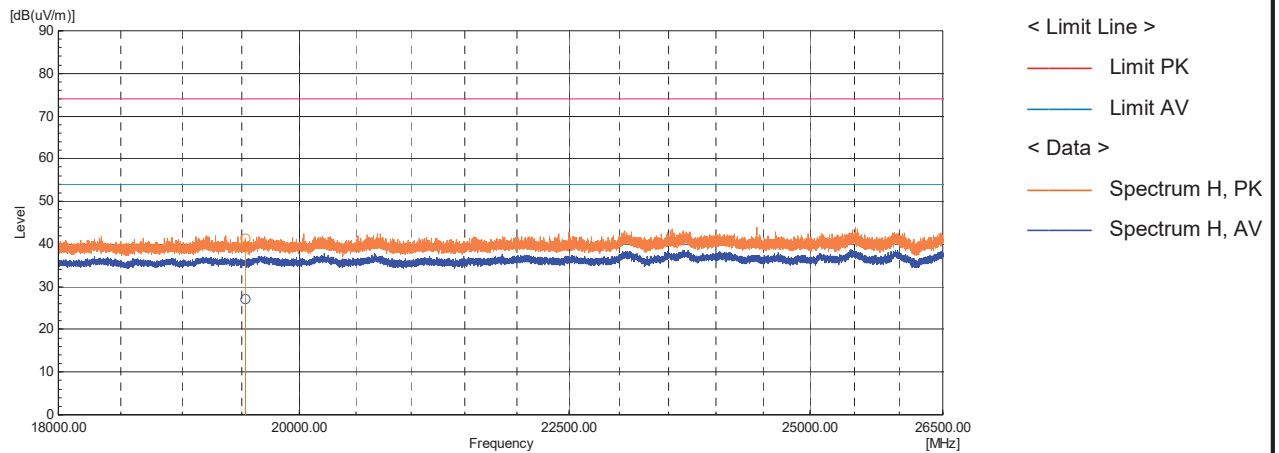
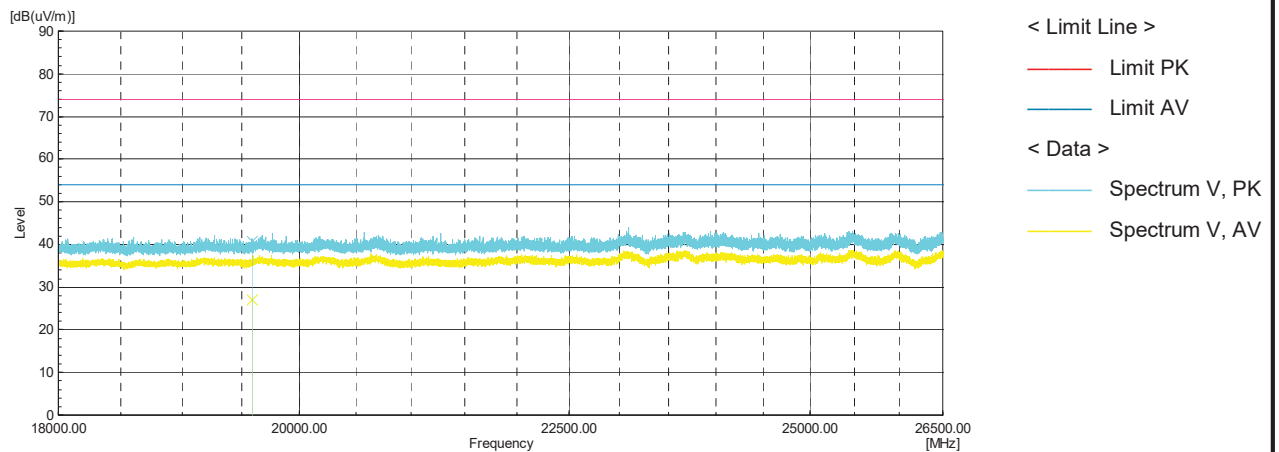
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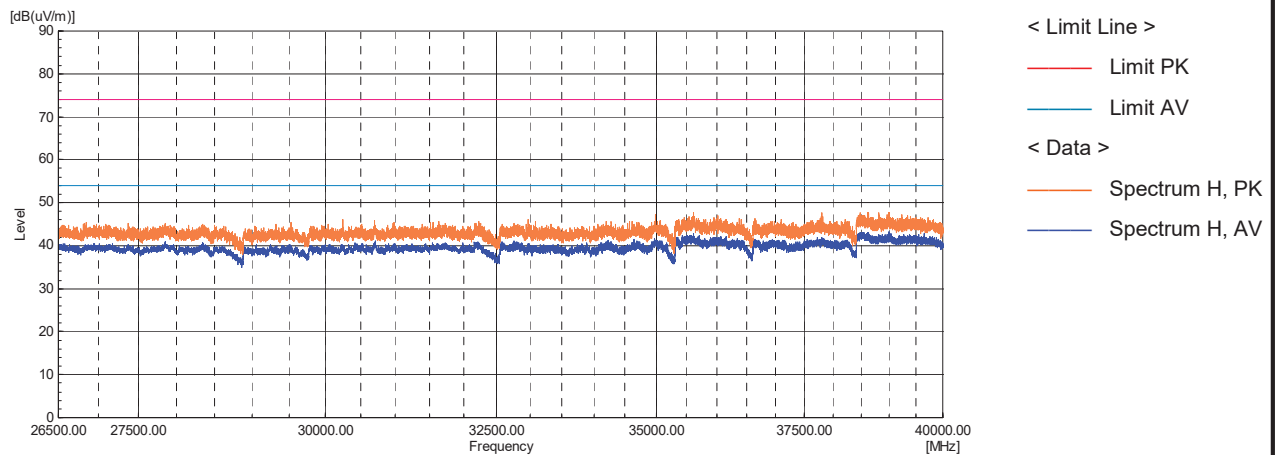
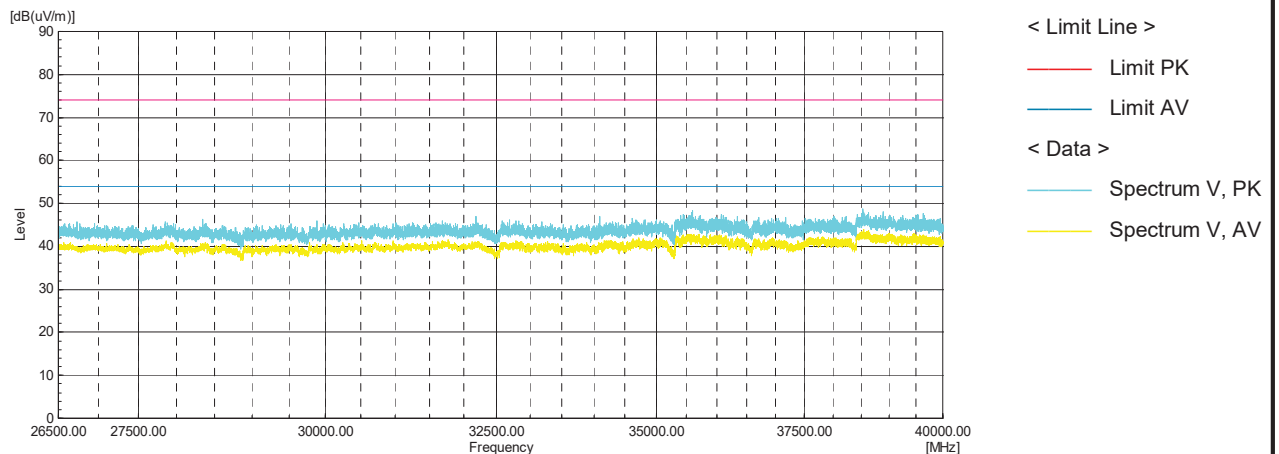
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Seite 29 von 82
Page 29 of 82**Figure 16: Radiated Emission, Spectral Diagram, 8 - 18GHz, Horizontal Antenna Orientation, Mode A2****Figure 17: Radiated Emission, Spectral Diagram, 8 - 18GHz, Vertical Antenna Orientation, Mode A2**

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Page 30 of 82**Figure 18: Radiated Emission, Spectral Diagram, 18 - 26.5GHz, Horizontal Antenna Orientation, Mode A2****Figure 19: Radiated Emission, Spectral Diagram, 18 - 26.5GHz, Vertical Antenna Orientation, Mode A2**

Prüfbericht-Nr.:
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Page 31 of 82**Figure 20: Radiated Emission, Spectral Diagram, 26.5 - 40GHz, Horizontal Antenna Orientation, Mode A2****Figure 21: Radiated Emission, Spectral Diagram, 26.5 - 40GHz, Vertical Antenna Orientation, Mode A2**

Prüfbericht-Nr.:
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Page 32 of 82**Table 9: Radiated Emission, Quasi Peak Data, 30MHz - 1GHz, Horizontal and Vertical Antenna Orientations, Mode A2**

Freq. [MHz]	Antenna Orientation	Reading QP [dBμV]	Factor [dB(1/m)]	Level QP [dBμV/m]	Limit [dBμV/m]	Margin QP [dB]	Height [cm]	Angle [°]
35.989	V	52.1	-22.3	29.8	40.0	10.2	100	81
83.982	H	60.1	-26.2	33.9	40.0	6.1	362	183
84.025	V	56.7	-26.2	30.5	40.0	9.5	216	354
237.811	H	56.1	-22.1	34.0	46.0	12.0	144	262
776.103	H	49.2	-9.8	39.4	46.0	6.6	122	86
776.540	V	47.6	-9.8	37.8	46.0	8.2	134	180

Note: Level QP = Reading QP + Factor
 $\text{dB}(\mu\text{V}/\text{m}) = 20 \times \log(\mu\text{V}/\text{m})$

Table 10: Radiated Emission, Average Data, 1 - 40GHz, Horizontal and Vertical Antenna Orientations, Mode A2

Freq. [MHz]	Antenna Orientation	Reading AV [dBμV]	Factor [dB(1/m)]	Level AV [dBμV/m]	Limit [dBμV/m]	Margin AV [dB]	Height [cm]	Angle [°]
1313.888	H	46.5	-17.6	28.9	54.0	25.1	109	158
3510.308	V	62.0	-13.8	48.2	54.0	5.8	169	198
3510.387	H	61.3	-13.8	47.5	54.0	6.5	114	183
4339.403	V	48.8	-11.3	37.5	54.0	16.5	113	161
9790.132	V	37.1	-7.0	30.1	54.0	23.9	158	169
9790.450	H	37.0	-7.0	30.0	54.0	24.0	100	214
19531.902	H	38.5	-11.4	27.1	54.0	26.9	153	349
19585.692	V	38.5	-11.4	27.1	54.0	26.9	100	141

Note: Level AV = Reading AV + Factor

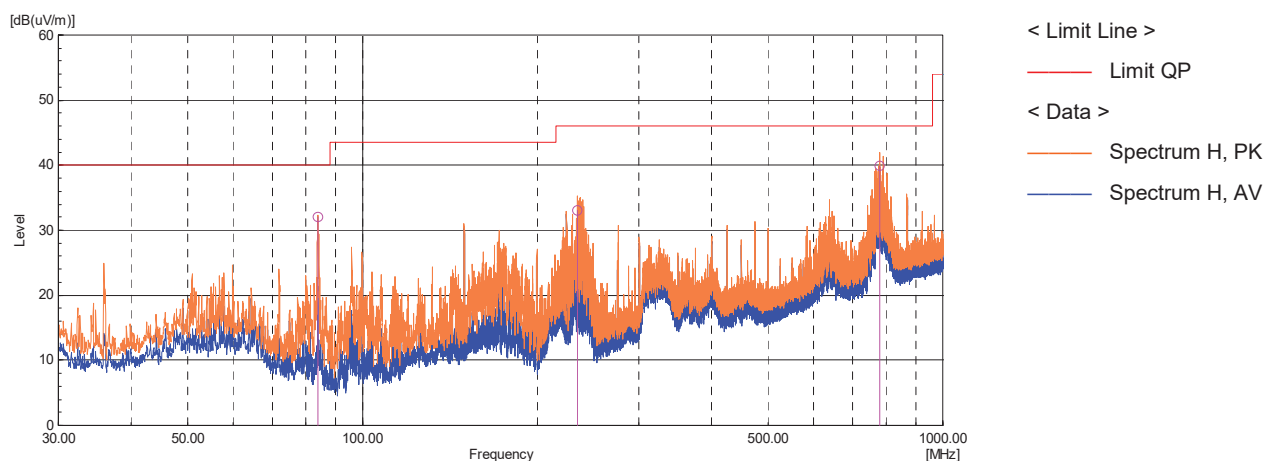
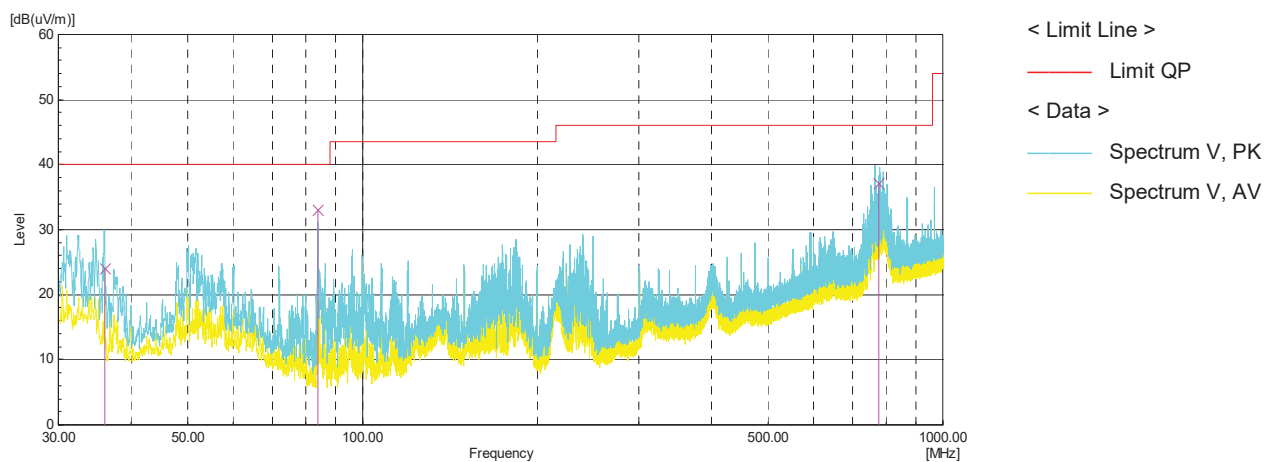
Table 11: Radiated Emission, Peak Data, 1 - 40GHz, Horizontal and Vertical Antenna Orientations, Mode A2

Freq. [MHz]	Antenna Orientation	Reading PK [dBμV]	Factor [dB(1/m)]	Level PK [dBμV/m]	Limit [dBμV/m]	Margin PK [dB]	Height [cm]	Angle [°]
1313.888	H	60.3	-17.6	42.7	74.0	31.3	109	158
3510.308	V	64.3	-13.8	50.5	74.0	23.5	169	198
3510.387	H	63.7	-13.8	49.9	74.0	24.1	114	183
4339.403	V	58.9	-11.3	47.6	74.0	26.4	113	161
9790.132	V	51.7	-7.0	44.7	74.0	29.3	158	169
9790.450	H	50.9	-7.0	43.9	74.0	30.1	100	214
19531.902	H	52.7	-11.4	41.3	74.0	32.7	153	349
19585.692	V	52.2	-11.4	40.8	74.0	33.2	100	141

Note: Level PK = Reading PK + Factor

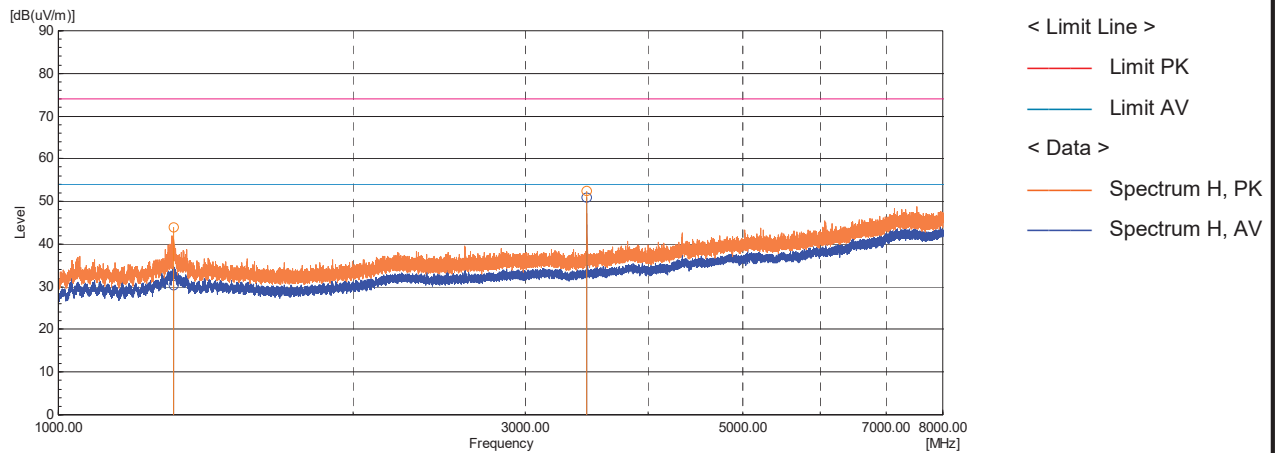
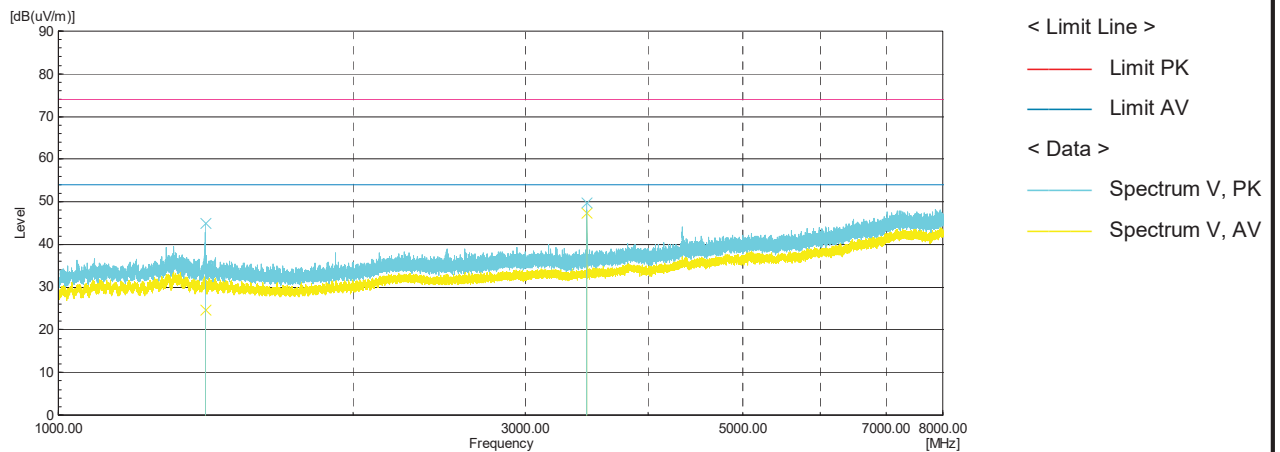
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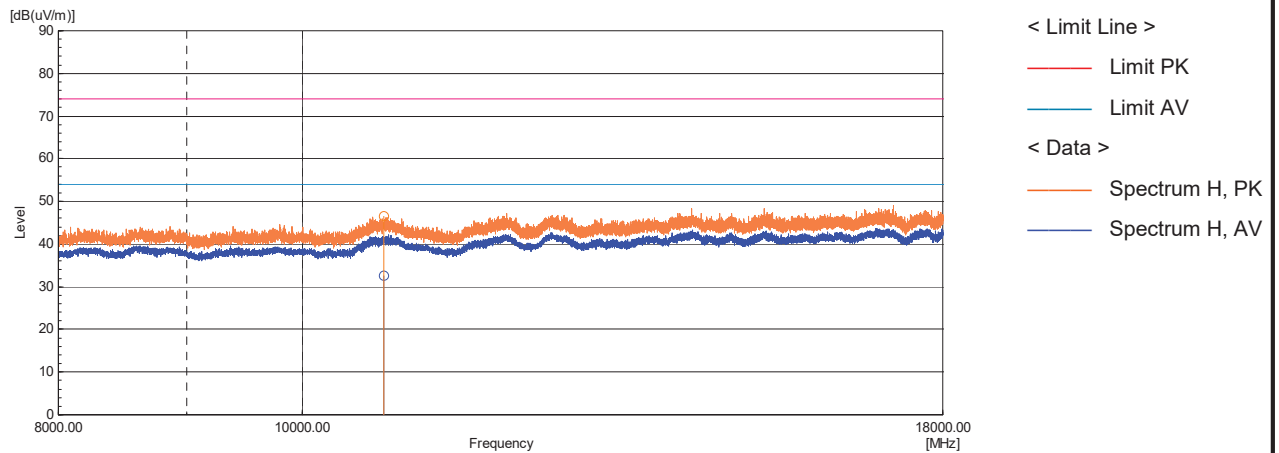
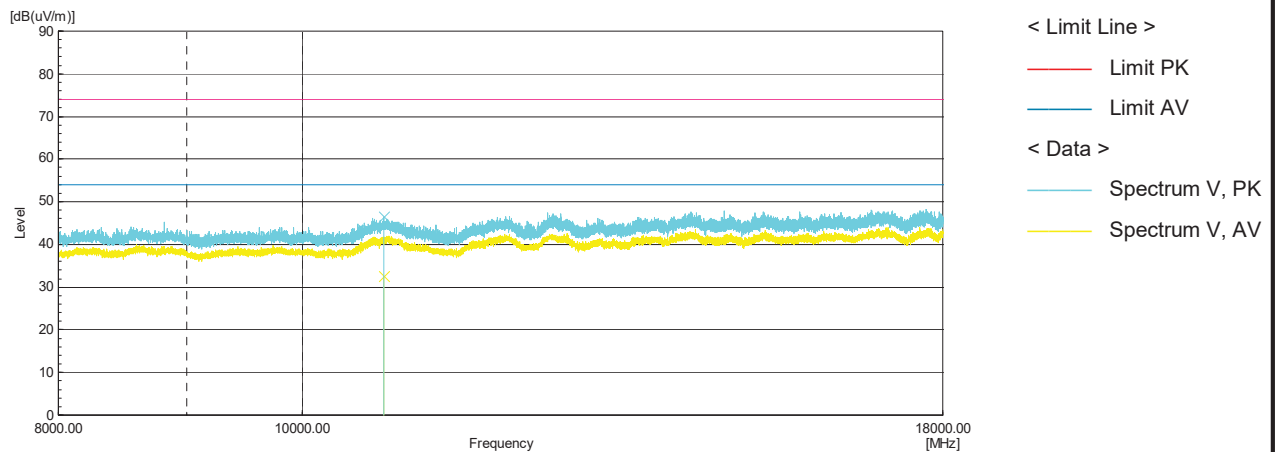
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Seite 33 von 82
Page 33 of 82**Figure 22: Radiated Emission, Spectral Diagram, 30MHz - 1GHz, Horizontal Antenna Orientation, Mode A3****Figure 23: Radiated Emission, Spectral Diagram, 30MHz - 1GHz, Vertical Antenna Orientation, Mode A3**

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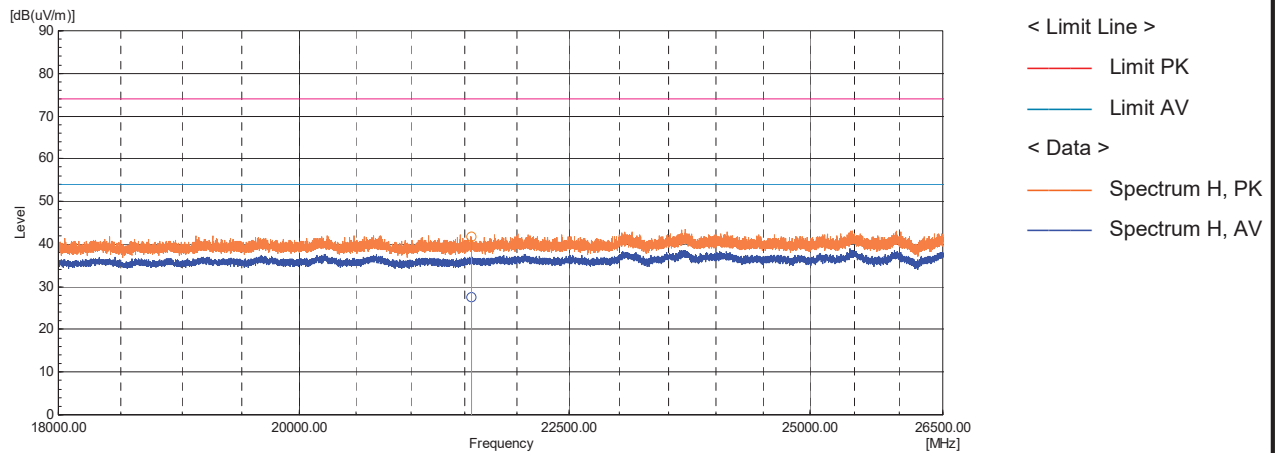
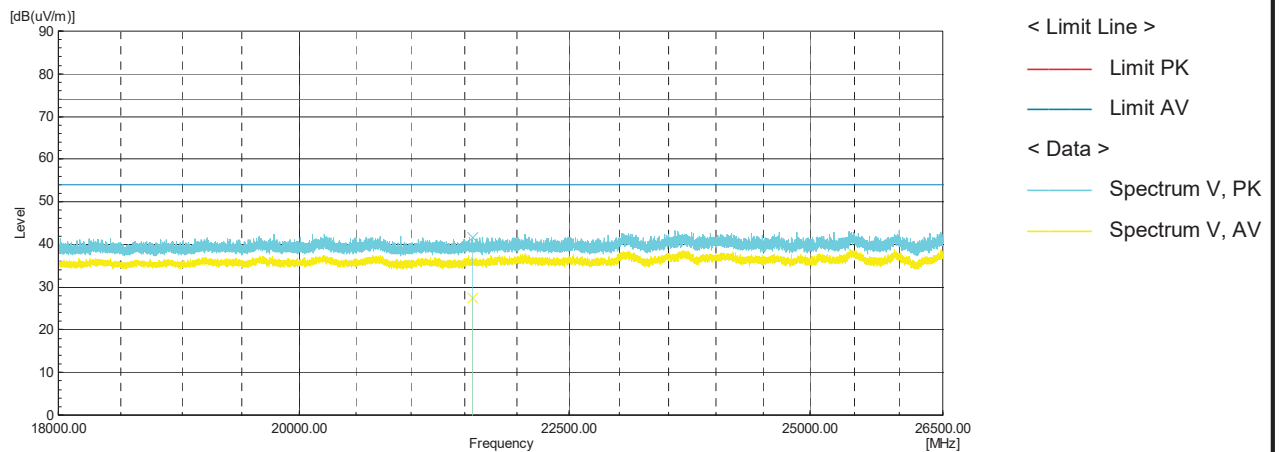
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Seite 34 von 82
Page 34 of 82**Figure 24: Radiated Emission, Spectral Diagram, 1 - 8GHz, Horizontal Antenna Orientation, Mode A3****Figure 25: Radiated Emission, Spectral Diagram, 1 - 8GHz, Vertical Antenna Orientation, Mode A3**

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Page 35 of 82**Figure 26: Radiated Emission, Spectral Diagram, 8 - 18GHz, Horizontal Antenna Orientation, Mode A3****Figure 27: Radiated Emission, Spectral Diagram, 8 - 18GHz, Vertical Antenna Orientation, Mode A3**

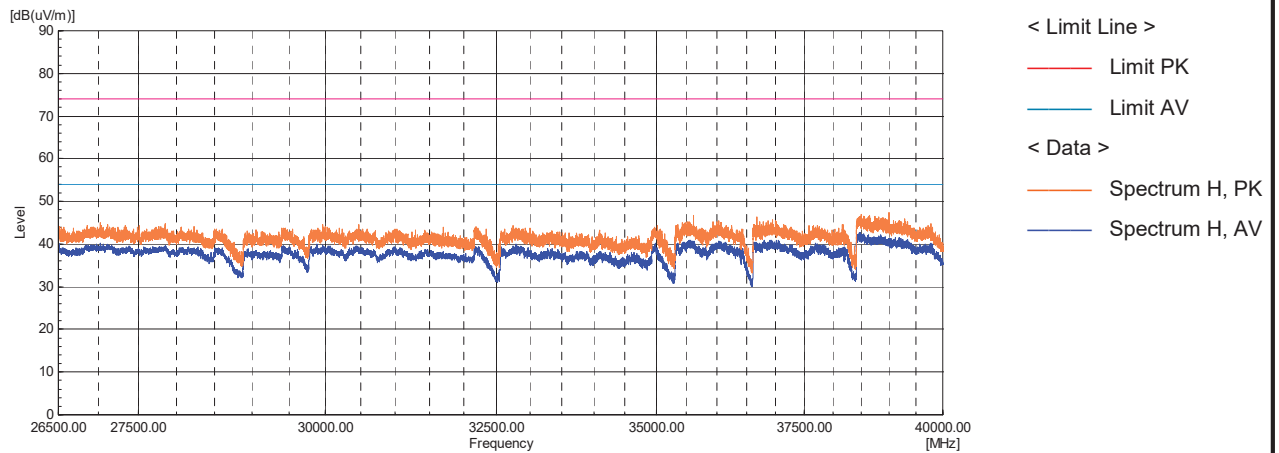
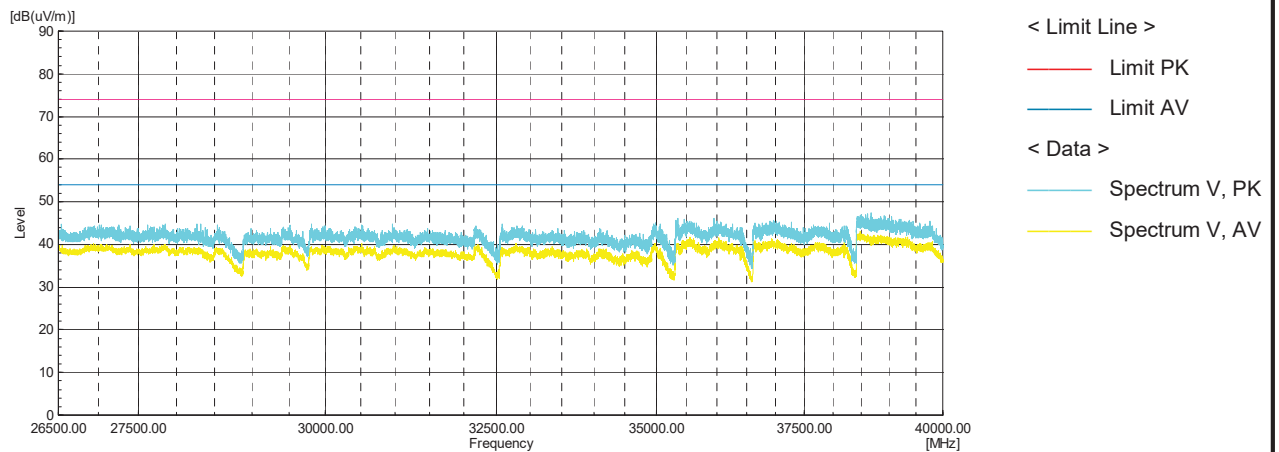
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Page 36 of 82**Figure 28: Radiated Emission, Spectral Diagram, 18 - 26.5GHz, Horizontal Antenna Orientation, Mode A3****Figure 29: Radiated Emission, Spectral Diagram, 18 - 26.5GHz, Vertical Antenna Orientation, Mode A3**

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Page 37 of 82**Figure 30: Radiated Emission, Spectral Diagram, 26.5 - 40GHz, Horizontal Antenna Orientation, Mode A3****Figure 31: Radiated Emission, Spectral Diagram, 26.5 - 40GHz, Vertical Antenna Orientation, Mode A3**

Prüfbericht-Nr.:
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Page 38 of 82**Table 12: Radiated Emission, Quasi Peak Data, 30MHz - 1GHz, Horizontal and Vertical Antenna Orientations, Mode A3**

Freq. [MHz]	Antenna Orientation	Reading QP [dBμV]	Factor [dB(1/m)]	Level QP [dBμV/m]	Limit [dBμV/m]	Margin QP [dB]	Height [cm]	Angle [°]
36.007	V	46.3	-22.3	24.0	40.0	16.0	100	48
84.003	V	59.2	-26.2	33.0	40.0	7.0	206	359
84.021	H	58.2	-26.2	32.0	40.0	8.0	379	181
234.866	H	55.4	-22.3	33.1	46.0	12.9	144	262
776.797	V	46.9	-9.8	37.1	46.0	8.9	127	177
777.574	H	49.6	-9.8	39.8	46.0	6.2	121	85

Note: Level QP = Reading QP + Factor
 $\text{dB}(\mu\text{V/m}) = 20 \times \log(\mu\text{V/m})$

Table 13: Radiated Emission, Average Data, 1 - 40GHz, Horizontal and Vertical Antenna Orientations, Mode A3

Freq. [MHz]	Antenna Orientation	Reading AV [dBμV]	Factor [dB(1/m)]	Level AV [dBμV/m]	Limit [dBμV/m]	Margin AV [dB]	Height [cm]	Angle [°]
1311.034	H	47.9	-17.6	30.3	54.0	23.7	108	156
1413.429	V	42.2	-17.5	24.7	54.0	29.3	131	185
3464.936	V	61.6	-14.1	47.5	54.0	6.5	179	199
3465.098	H	65.0	-14.1	50.9	54.0	3.1 (*)	186	178
10784.373	V	37.4	-4.8	32.6	54.0	21.4	146	14
10784.523	H	37.4	-4.8	32.6	54.0	21.4	181	155
21560.180	H	38.0	-10.6	27.4	54.0	26.6	140	202
21568.270	V	38.2	-10.6	27.6	54.0	26.4	181	76

Note: Level AV = Reading AV + Factor

(*) The measured result is below the specification limit by a margin less than the measurement uncertainty; it is therefore not possible to determine compliance at a level of confidence of 95%. However, the measured result indicates a high probability that the tested product complies with the specification limit.

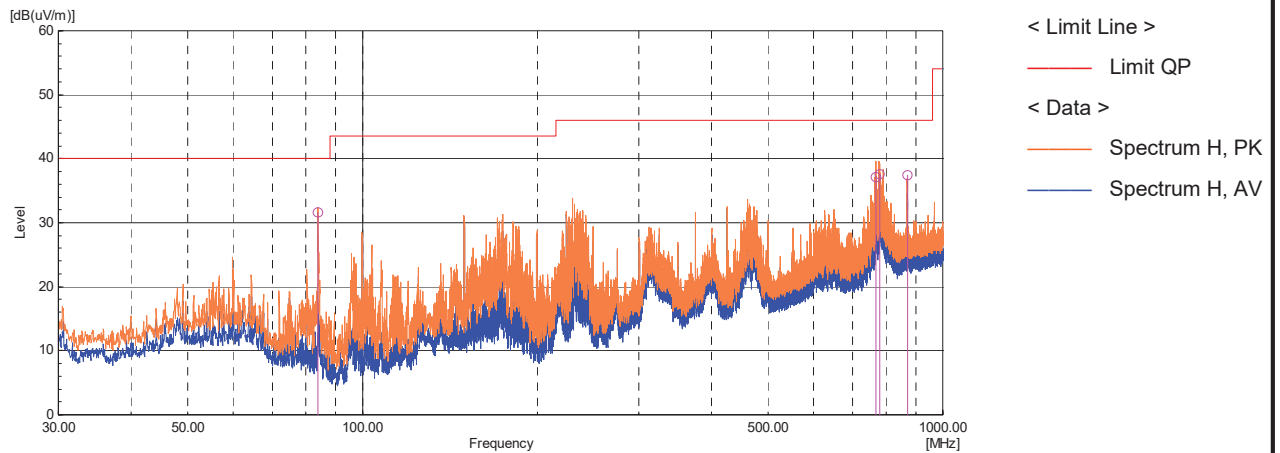
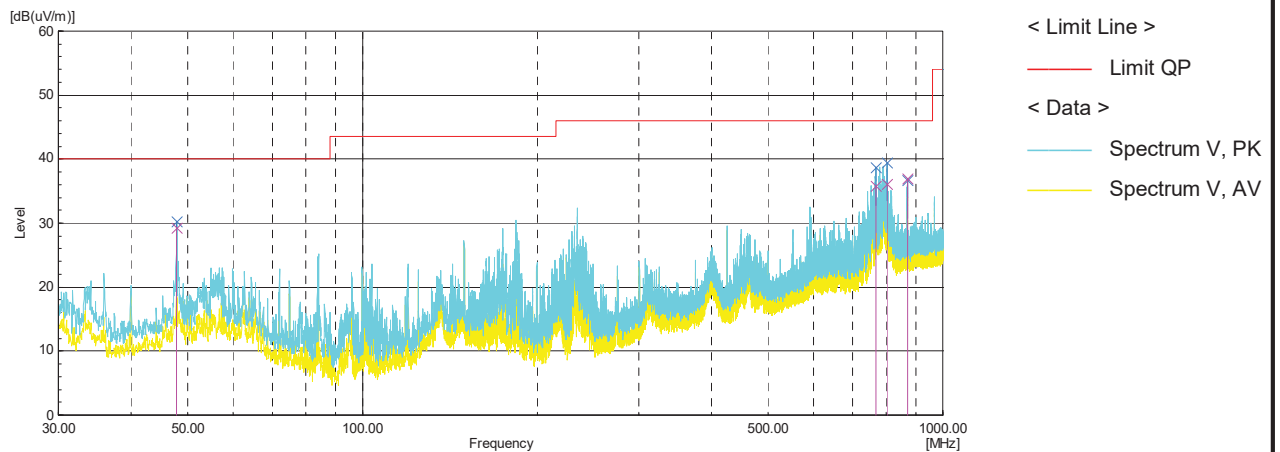
Table 14: Radiated Emission, Peak Data, 1 - 40GHz, Horizontal and Vertical Antenna Orientations, Mode A3

Freq. [MHz]	Antenna Orientation	Reading PK [dBμV]	Factor [dB(1/m)]	Level PK [dBμV/m]	Limit [dBμV/m]	Margin PK [dB]	Height [cm]	Angle [°]
1311.034	H	61.6	-17.6	44.0	74.0	30.0	108	156
1413.429	V	62.4	-17.5	44.9	74.0	29.1	131	185
3464.936	V	63.8	-14.1	49.7	74.0	24.3	179	199
3465.098	H	66.5	-14.1	52.4	74.0	21.6	186	178
10784.373	V	51.3	-4.8	46.5	74.0	27.5	146	14
10784.523	H	51.2	-4.8	46.4	74.0	27.6	181	155
21560.180	H	52.4	-10.6	41.8	74.0	32.2	140	202
21568.270	V	52.4	-10.6	41.8	74.0	32.2	181	76

Note: Level PK = Reading PK + Factor

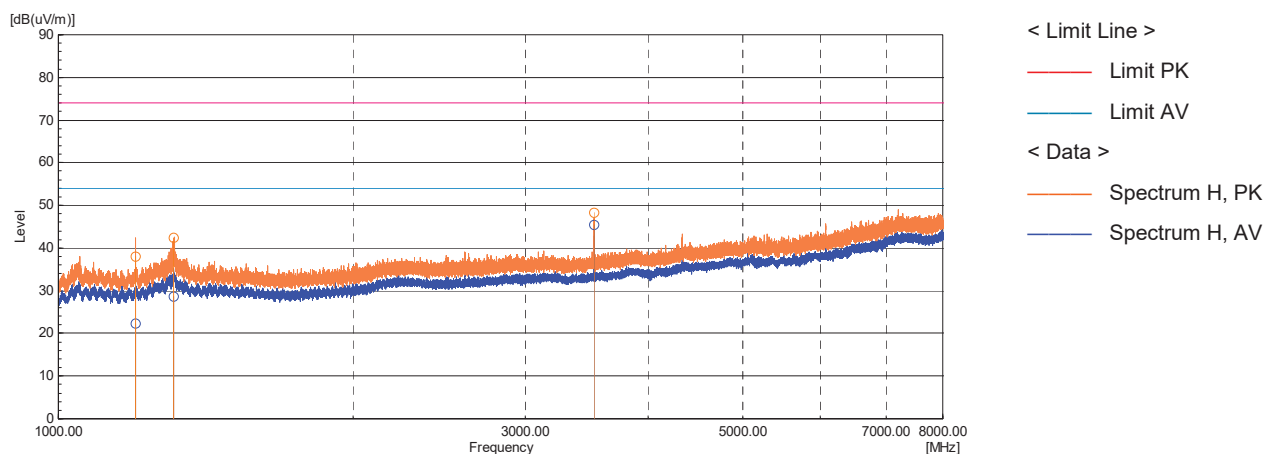
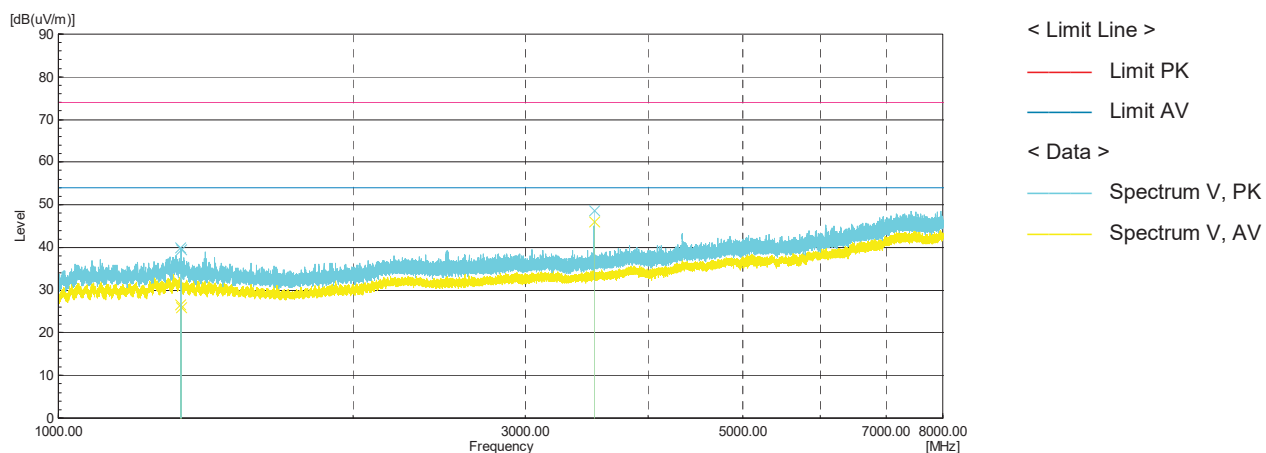
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Seite 39 von 82
Page 39 of 82**Figure 32: Radiated Emission, Spectral Diagram, 30MHz - 1GHz, Horizontal Antenna Orientation, Mode D1****Figure 33: Radiated Emission, Spectral Diagram, 30MHz - 1GHz, Vertical Antenna Orientation, Mode D1**

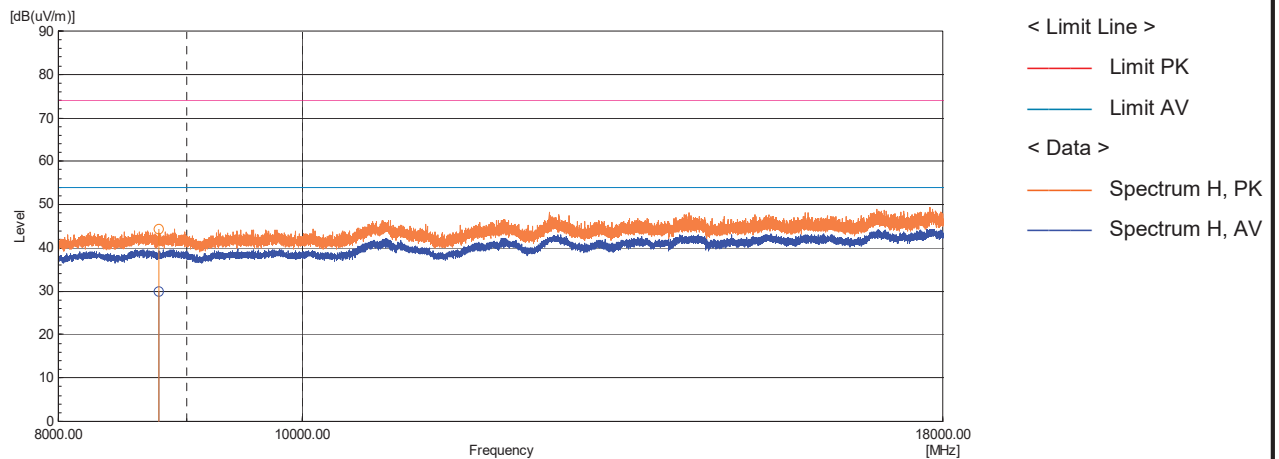
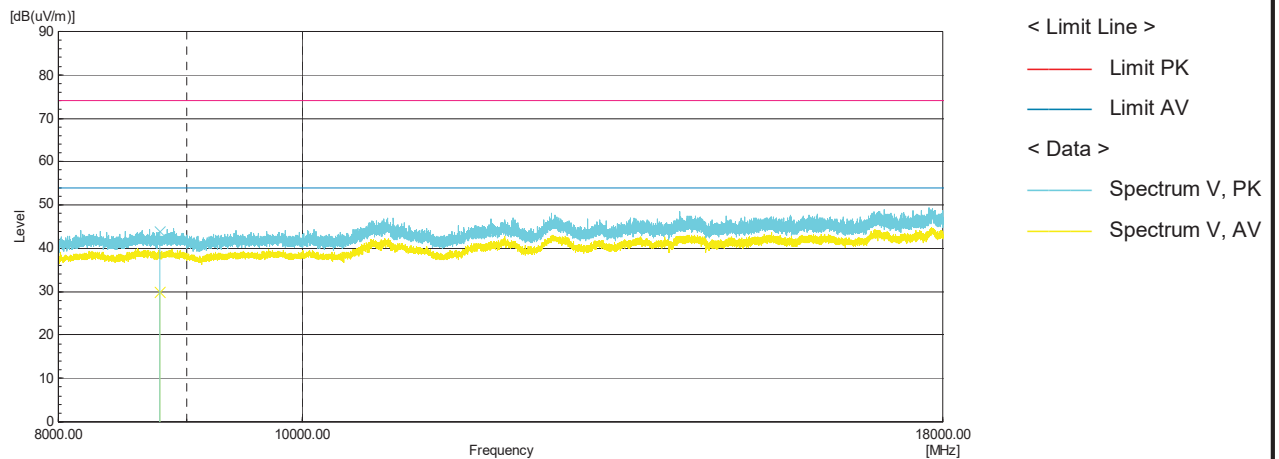
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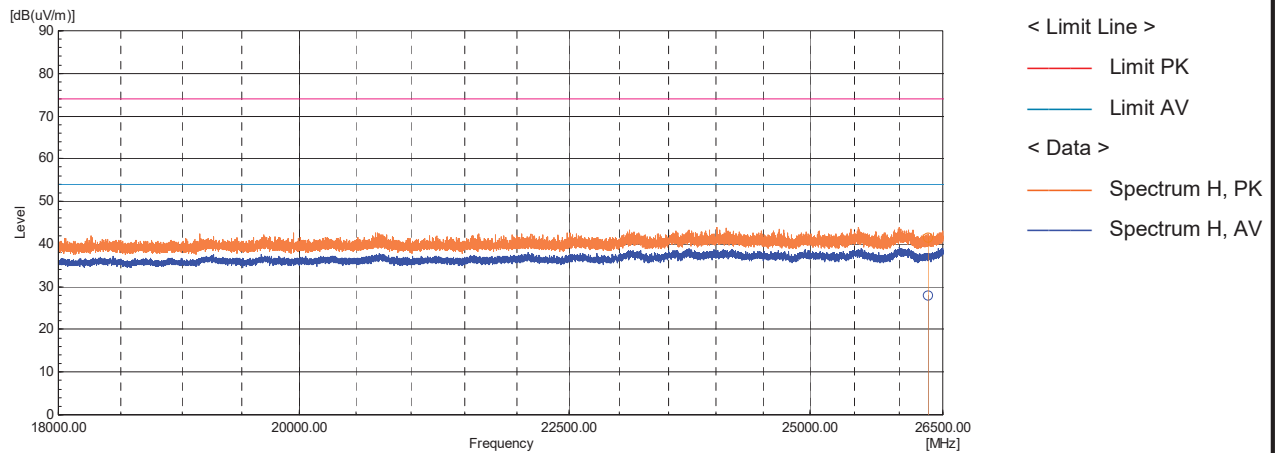
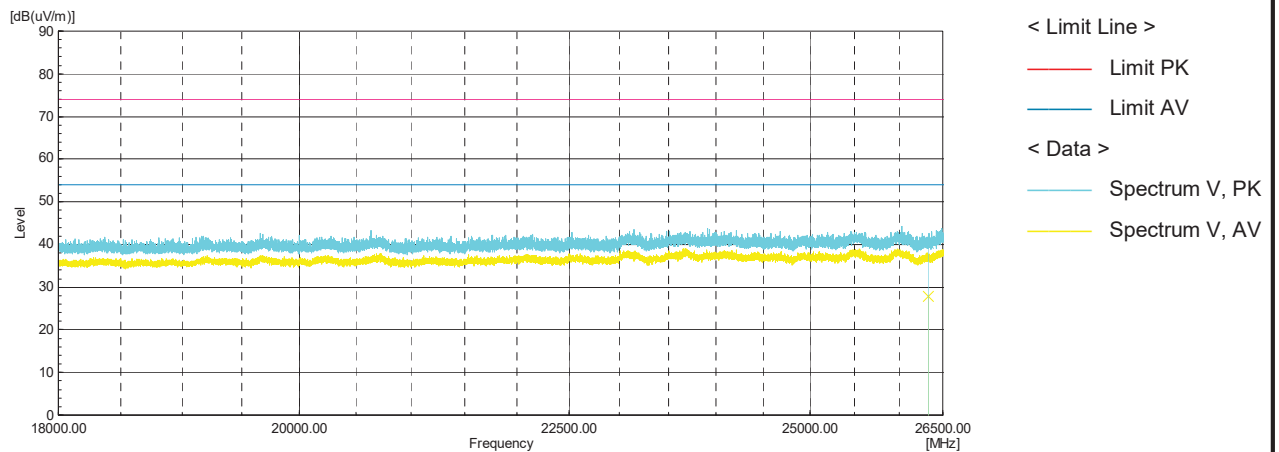
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Seite 40 von 82
Page 40 of 82**Figure 34: Radiated Emission, Spectral Diagram, 1 - 8GHz, Horizontal Antenna Orientation, Mode D1****Figure 35: Radiated Emission, Spectral Diagram, 1 - 8GHz, Vertical Antenna Orientation, Mode D1**

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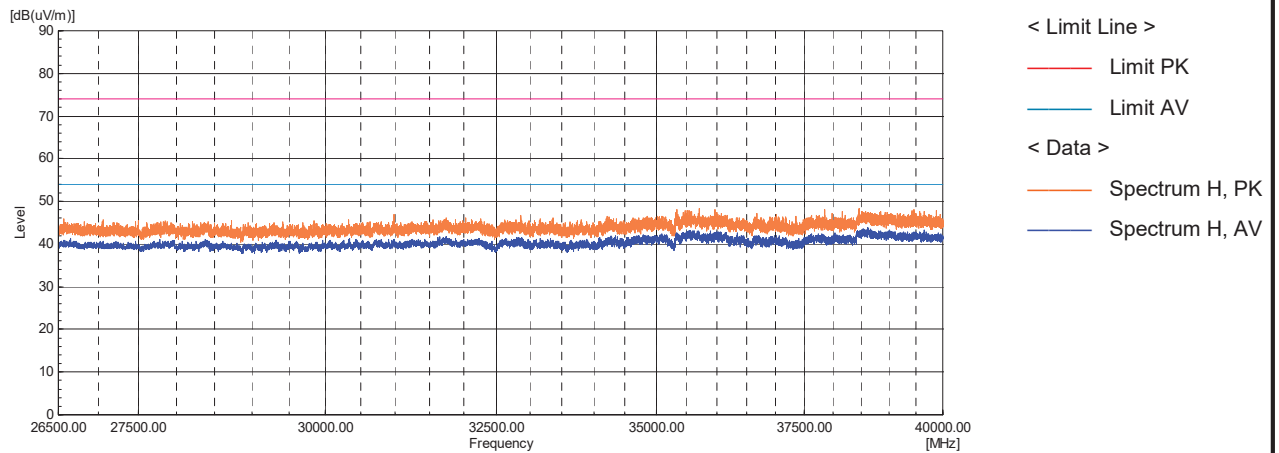
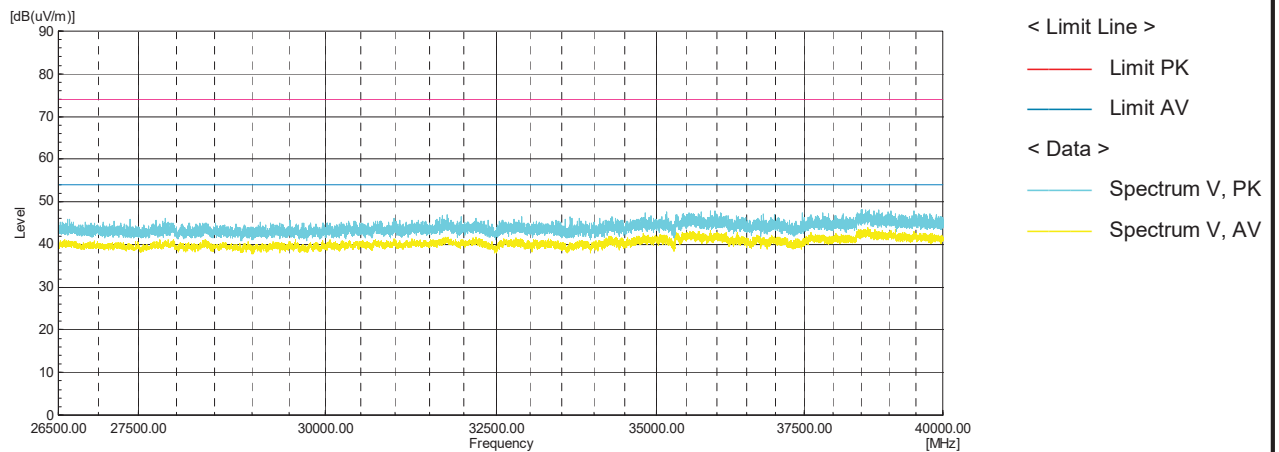
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Seite 41 von 82
Page 41 of 82**Figure 36: Radiated Emission, Spectral Diagram, 8 - 18GHz, Horizontal Antenna Orientation, Mode D1****Figure 37: Radiated Emission, Spectral Diagram, 8 - 18GHz, Vertical Antenna Orientation, Mode D1**

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Page 42 of 82**Figure 38: Radiated Emission, Spectral Diagram, 18 - 26.5GHz, Horizontal Antenna Orientation, Mode D1****Figure 39: Radiated Emission, Spectral Diagram, 18 - 26.5GHz, Vertical Antenna Orientation, Mode D1**

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Page 43 of 82**Figure 40: Radiated Emission, Spectral Diagram, 26.5 - 40GHz, Horizontal Antenna Orientation, Mode D1****Figure 41: Radiated Emission, Spectral Diagram, 26.5 - 40GHz, Vertical Antenna Orientation, Mode D1**

Prüfbericht-Nr.:
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Page 44 of 82**Table 15: Radiated Emission, Quasi Peak Data, 30MHz - 1GHz, Horizontal and Vertical Antenna Orientations, Mode D1**

Freq. [MHz]	Antenna Orientation	Reading QP [dBμV]	Factor [dB(1/m)]	Level QP [dBμV/m]	Limit [dBμV/m]	Margin QP [dB]	Height [cm]	Angle [°]
48.000	V	50.5	-21.2	29.3	40.0	10.7	100	355
84.001	H	57.8	-26.2	31.6	40.0	8.4	367	236
765.714	V	45.8	-10.0	35.8	46.0	10.2	144	230
765.927	H	47.2	-10.0	37.2	46.0	8.8	100	78
777.326	H	47.4	-9.8	37.6	46.0	8.4	101	81
801.033	V	45.5	-9.4	36.1	46.0	9.9	105	188
867.805	H	46.1	-8.7	37.4	46.0	8.6	122	18
867.813	V	45.6	-8.7	36.9	46.0	9.1	101	195

Note: Level QP = Reading QP + Factor
 $\text{dB}(\mu\text{V/m}) = 20 \times \log(\mu\text{V/m})$

Table 16: Radiated Emission, Average Data, 1 - 40GHz, Horizontal and Vertical Antenna Orientations, Mode D1

Freq. [MHz]	Antenna Orientation	Reading AV [dBμV]	Factor [dB(1/m)]	Level AV [dBμV/m]	Limit [dBμV/m]	Margin AV [dB]	Height [cm]	Angle [°]
1199.031	H	41.0	-18.6	22.4	54.0	31.6	120	292
1312.401	H	46.2	-17.6	28.6	54.0	25.4	100	203
1332.402	V	44.3	-17.6	26.7	54.0	27.3	191	330
1334.852	V	43.5	-17.6	25.9	54.0	28.1	183	328
3525.465	V	59.9	-13.8	46.1	54.0	7.9	134	187
3525.508	H	59.3	-13.8	45.5	54.0	8.5	116	153
8775.193	H	38.8	-8.9	29.9	54.0	24.1	144	106
8775.817	V	38.8	-8.9	29.9	54.0	24.1	182	90
26325.000	H	40.6	-12.6	28.0	54.0	26.0	166	106
26325.000	V	40.5	-12.6	27.9	54.0	26.1	128	206

Note: Level AV = Reading AV + Factor

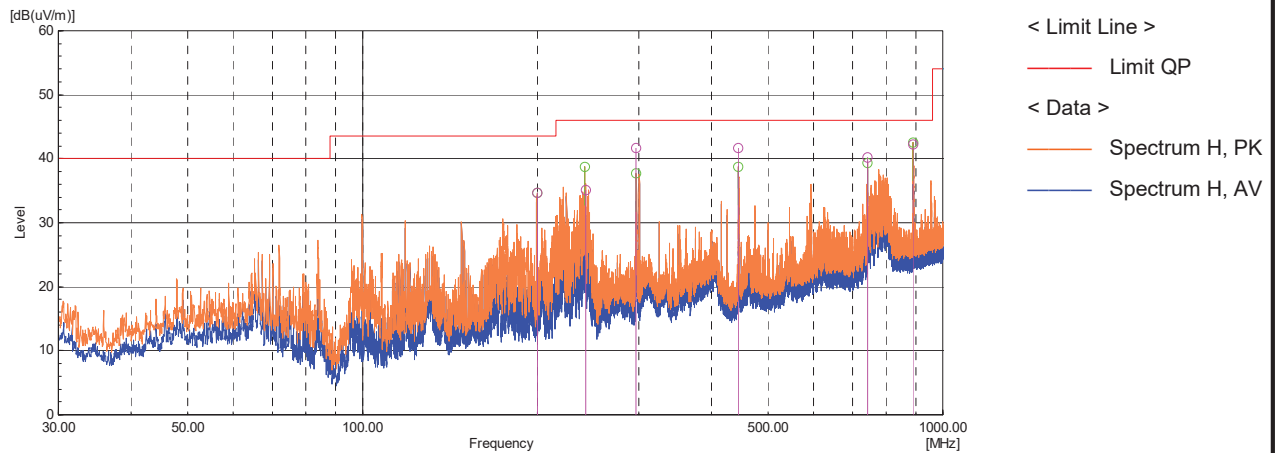
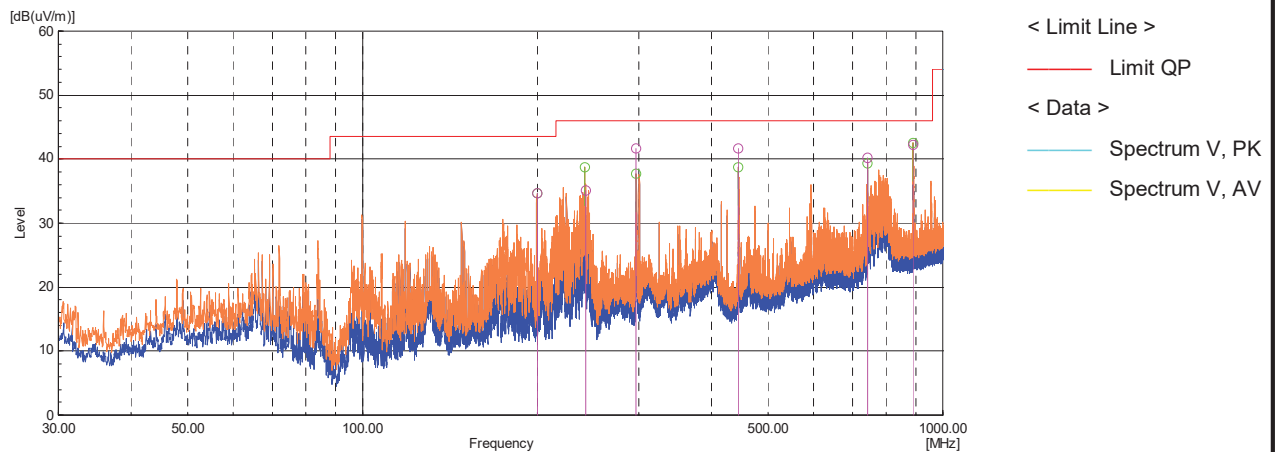
Table 17: Radiated Emission, Peak Data, 1 - 40GHz, Horizontal and Vertical Antenna Orientations, Mode D1

Freq. [MHz]	Antenna Orientation	Reading PK [dBμV]	Factor [dB(1/m)]	Level PK [dBμV/m]	Limit [dBμV/m]	Margin PK [dB]	Height [cm]	Angle [°]
1199.031	H	56.7	-18.6	38.1	74.0	35.9	120	292
1312.401	H	60.0	-17.6	42.4	74.0	31.6	100	203
1332.402	V	57.5	-17.6	39.9	74.0	34.1	191	330
1334.852	V	57.2	-17.6	39.6	74.0	34.4	183	328
3525.465	V	62.6	-13.8	48.8	74.0	25.2	134	187
3525.508	H	62.1	-13.8	48.3	74.0	25.7	116	153
8775.193	H	53.2	-8.9	44.3	74.0	29.7	144	106
8775.817	V	52.9	-8.9	44.0	74.0	30.0	182	90
26325.000	H	54.2	-12.6	41.6	74.0	32.4	166	106
26325.000	V	53.1	-12.6	40.5	74.0	33.5	128	206

Note: Level PK = Reading PK + Factor

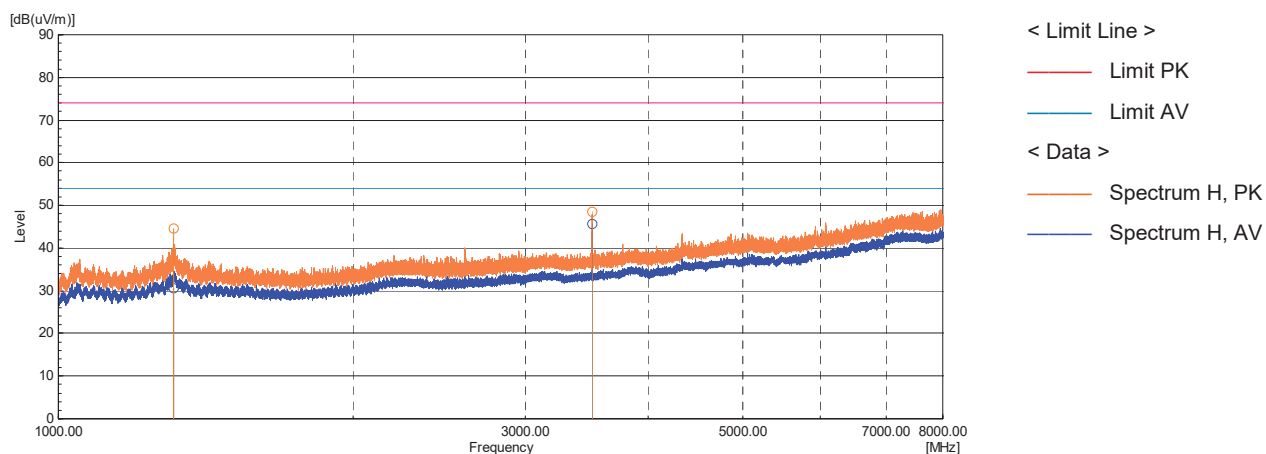
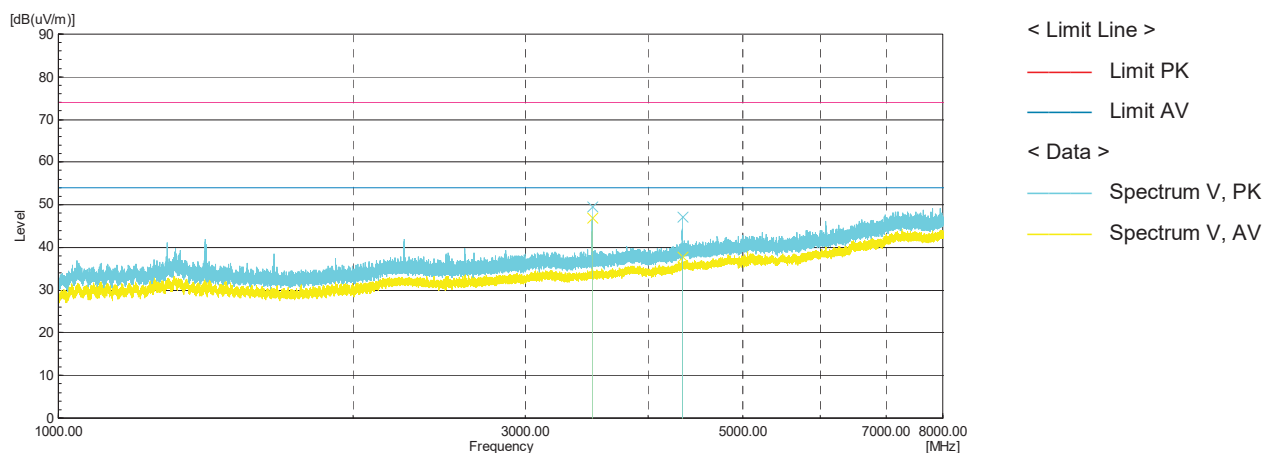
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Page 45 of 82**Figure 42: Radiated Emission, Spectral Diagram, 30MHz - 1GHz, Horizontal Antenna Orientation, Mode D2****Figure 43: Radiated Emission, Spectral Diagram, 30MHz - 1GHz, Vertical Antenna Orientation, Mode D2**

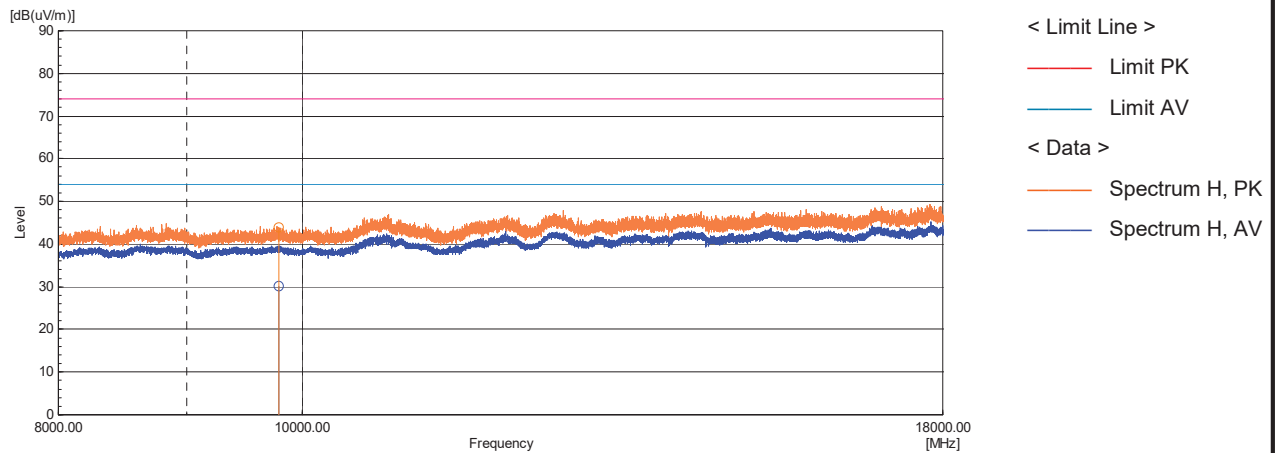
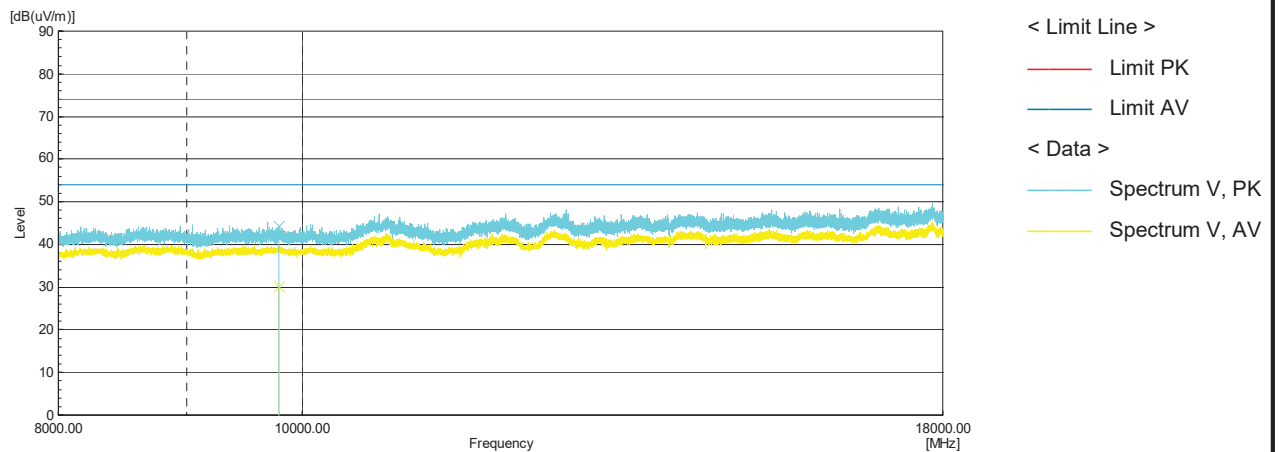
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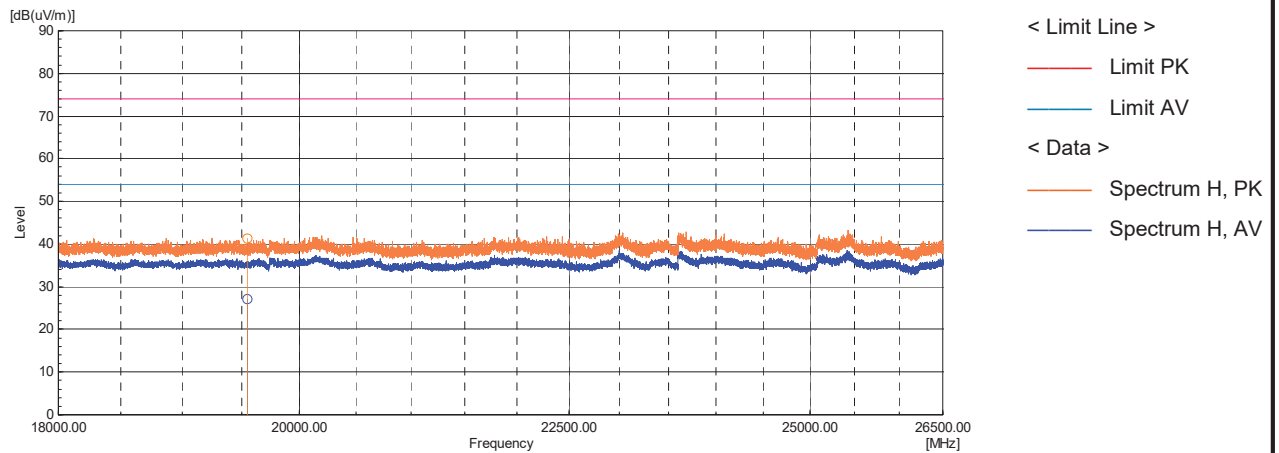
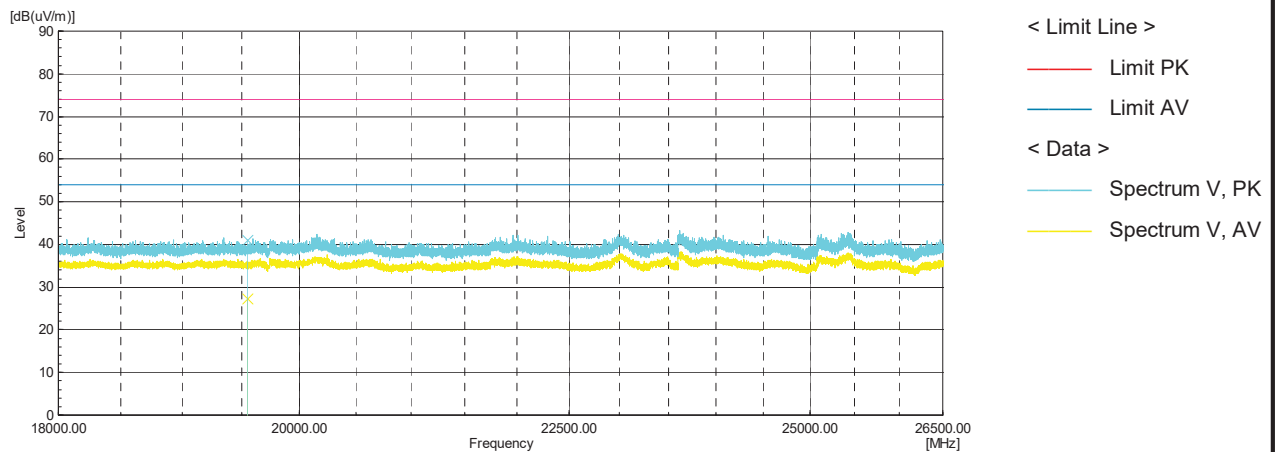
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Page 47 of 82**Figure 46: Radiated Emission, Spectral Diagram, 8 - 18GHz, Horizontal Antenna Orientation, Mode D2****Figure 47: Radiated Emission, Spectral Diagram, 8 - 18GHz, Vertical Antenna Orientation, Mode D2**

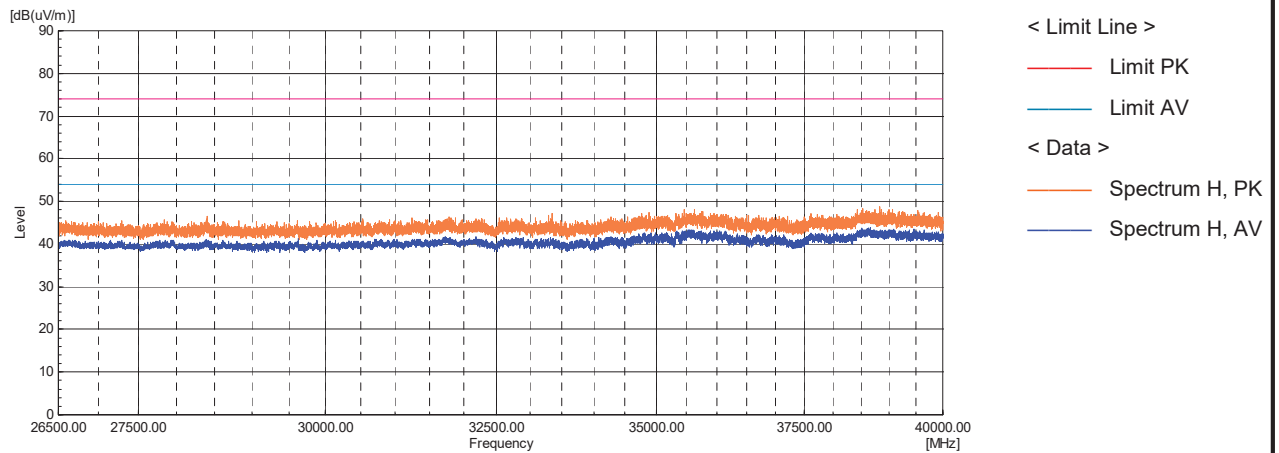
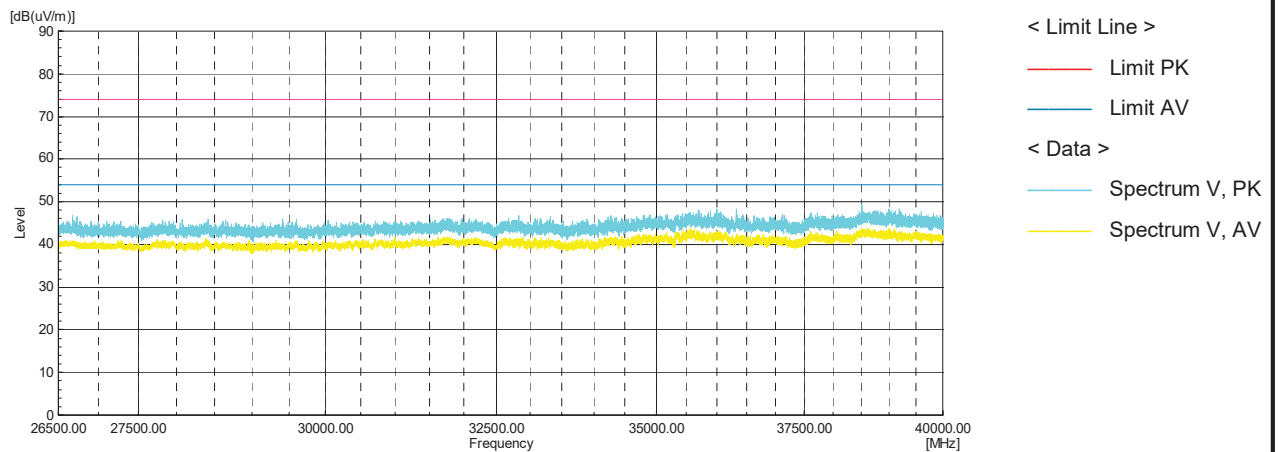
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Page 48 of 82**Figure 48: Radiated Emission, Spectral Diagram, 18 - 26.5GHz, Horizontal Antenna Orientation, Mode D2****Figure 49: Radiated Emission, Spectral Diagram, 18 - 26.5GHz, Vertical Antenna Orientation, Mode D2**

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Page 49 of 82**Figure 50: Radiated Emission, Spectral Diagram, 26.5 - 40GHz, Horizontal Antenna Orientation, Mode D2****Figure 51: Radiated Emission, Spectral Diagram, 26.5 - 40GHz, Vertical Antenna Orientation, Mode D2**

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Page 50 of 82**Table 18: Radiated Emission, Quasi Peak Data, 30MHz - 1GHz, Horizontal and Vertical Antenna Orientations, Mode D2**

Freq. [MHz]	Antenna Orientation	Reading QP [dBμV]	Factor [dB(1/m)]	Level QP [dBμV/m]	Limit [dBμV/m]	Margin QP [dB]	Height [cm]	Angle [°]
118.817	V	57.5	-23.4	34.1	43.5	9.4	100	258
200.006	H	58.4	-23.7	34.7	43.5	8.8	177	188
242.599	H	57.0	-22.0	35.0	46.0	11.0	138	253
296.682	H	61.0	-19.4	41.6	46.0	4.4	105	170
445.033	H	56.9	-15.2	41.7	46.0	4.3	100	146
741.722	H	50.5	-10.3	40.2	46.0	5.8	122	140
741.729	V	48.5	-10.3	38.2	46.0	7.8	155	321
764.165	V	45.8	-10.0	35.8	46.0	10.2	100	141
890.067	H	50.7	-8.4	42.3	46.0	3.7 (*)	100	140
890.075	V	51.0	-8.4	42.6	46.0	3.4 (*)	144	124

Note: Level QP = Reading QP + Factor
 $\text{dB}(\mu\text{V/m}) = 20 \times \log(\mu\text{V/m})$

(*) The measured result is below the specification limit by a margin less than the measurement uncertainty; it is therefore not possible to determine compliance at a level of confidence of 95%. However, the measured result indicates a high probability that the tested product complies with the specification limit.

Table 19: Radiated Emission, Average Data, 1 - 40GHz, Horizontal and Vertical Antenna Orientations, Mode D2

Freq. [MHz]	Antenna Orientation	Reading AV [dBμV]	Factor [dB(1/m)]	Level AV [dBμV/m]	Limit [dBμV/m]	Margin AV [dB]	Height [cm]	Angle [°]
1312.798	H	48.1	-17.6	30.5	54.0	23.5	100	156
3510.196	V	60.8	-13.8	47.0	54.0	7.0	172	198
3510.504	H	59.5	-13.8	45.7	54.0	8.3	200	205
4336.141	V	49.2	-11.3	37.9	54.0	16.1	123	161
9790.090	V	37.2	-7.0	30.2	54.0	23.8	187	263
9790.400	H	37.2	-7.0	30.2	54.0	23.8	120	226
19547.526	H	38.6	-11.4	27.2	54.0	26.8	146	286
19547.574	V	38.6	-11.4	27.2	54.0	26.8	118	121

Note: Level AV = Reading AV + Factor

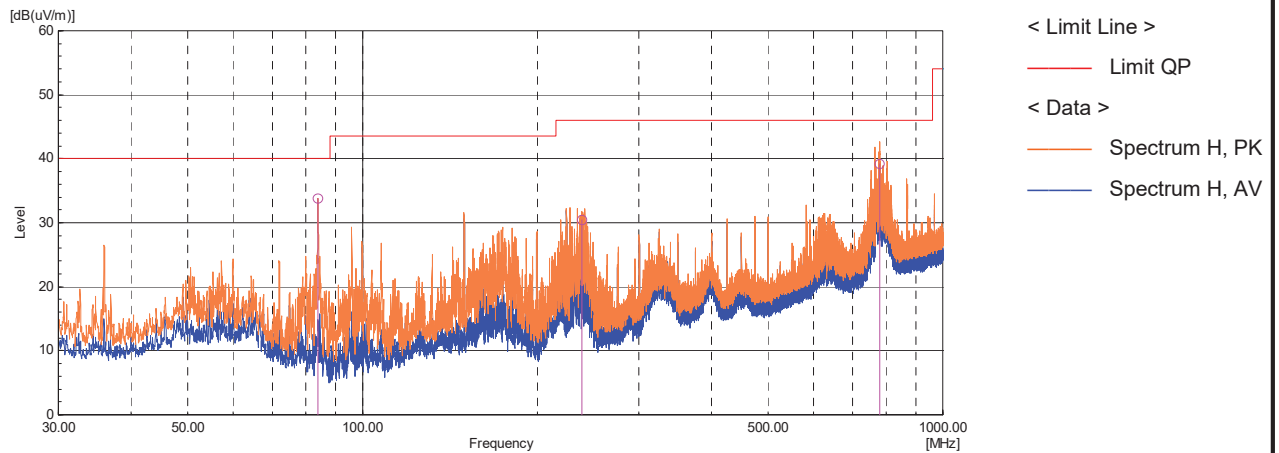
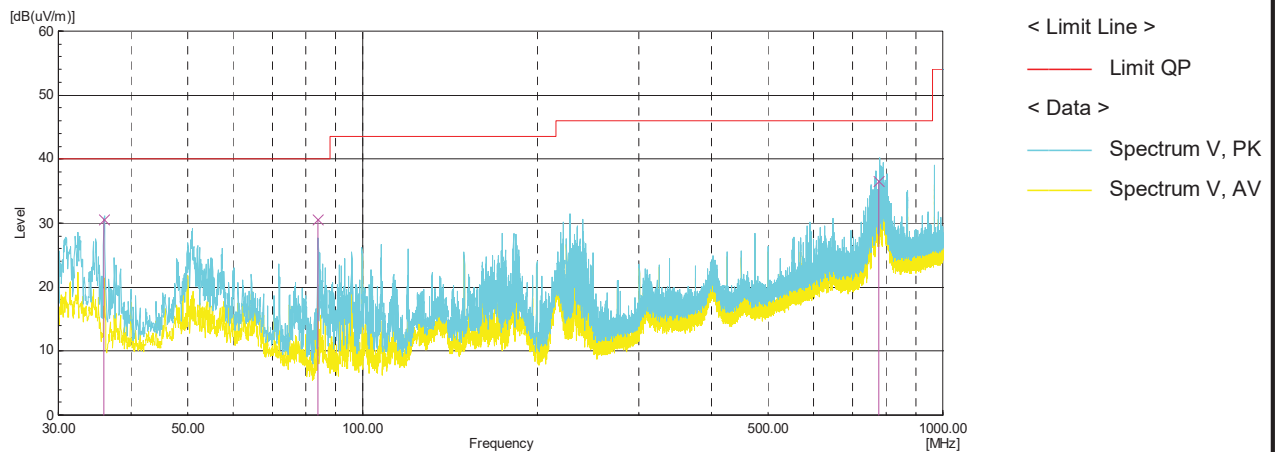
Table 20: Radiated Emission, Peak Data, 1 - 40GHz, Horizontal and Vertical Antenna Orientations, Mode D2

Freq. [MHz]	Antenna Orientation	Reading PK [dBμV]	Factor [dB(1/m)]	Level PK [dBμV/m]	Limit [dBμV/m]	Margin PK [dB]	Height [cm]	Angle [°]
1312.798	H	62.1	-17.6	44.5	74.0	29.5	100	156
3510.196	V	63.4	-13.8	49.6	74.0	24.4	172	198
3510.504	H	62.3	-13.8	48.5	74.0	25.5	200	205
4336.141	V	58.6	-11.3	47.3	74.0	26.7	123	161
9790.090	V	51.4	-7.0	44.4	74.0	29.6	187	263
9790.400	H	51.0	-7.0	44.0	74.0	30.0	120	226
19547.526	H	52.7	-11.4	41.3	74.0	32.7	146	286
19547.574	V	52.6	-11.4	41.2	74.0	32.8	118	121

Note: Level PK = Reading PK + Factor

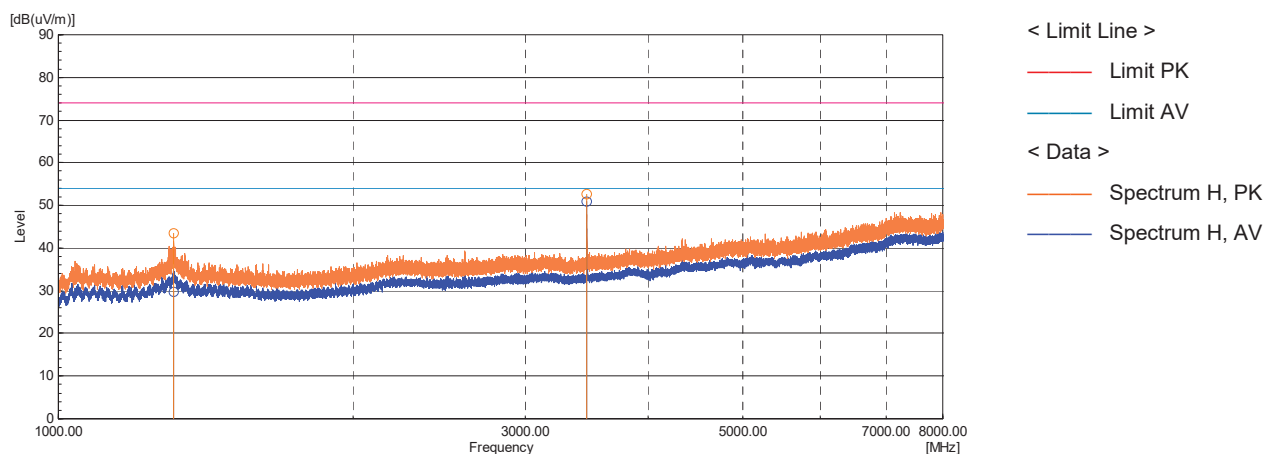
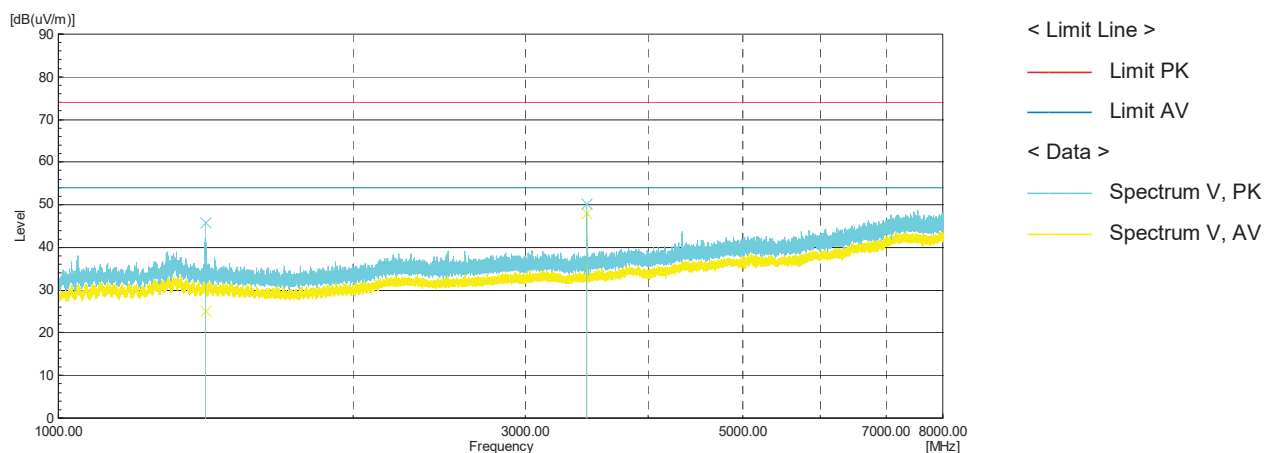
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Seite 51 von 82
Page 51 of 82**Figure 52: Radiated Emission, Spectral Diagram, 30MHz - 1GHz, Horizontal Antenna Orientation, Mode D3****Figure 53: Radiated Emission, Spectral Diagram, 30MHz - 1GHz, Vertical Antenna Orientation, Mode D3**

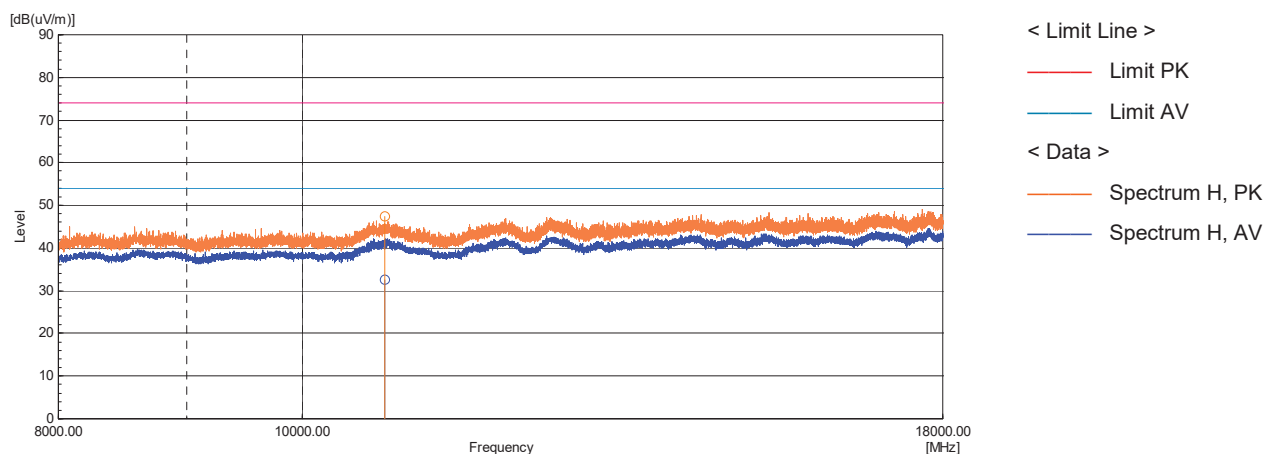
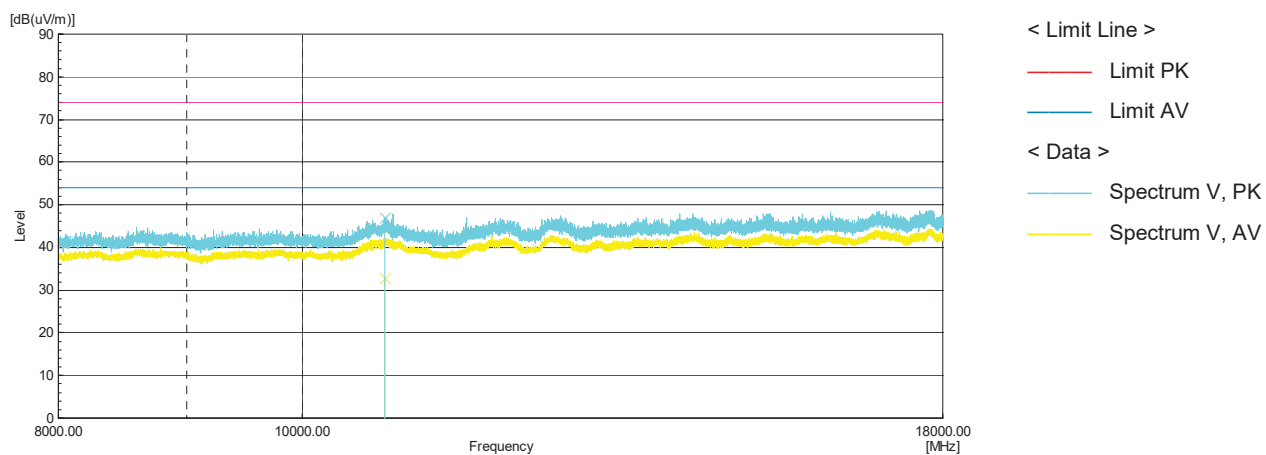
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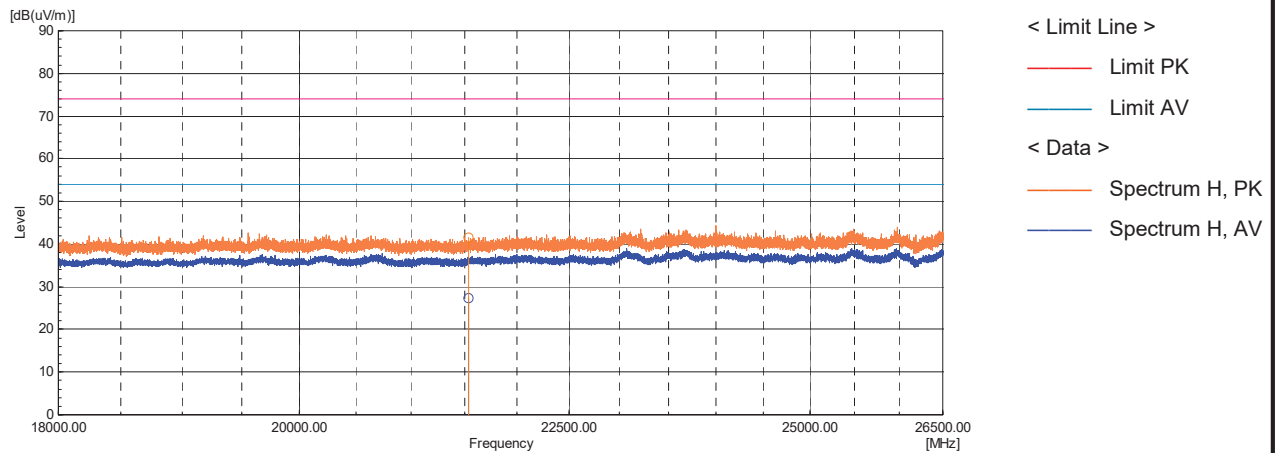
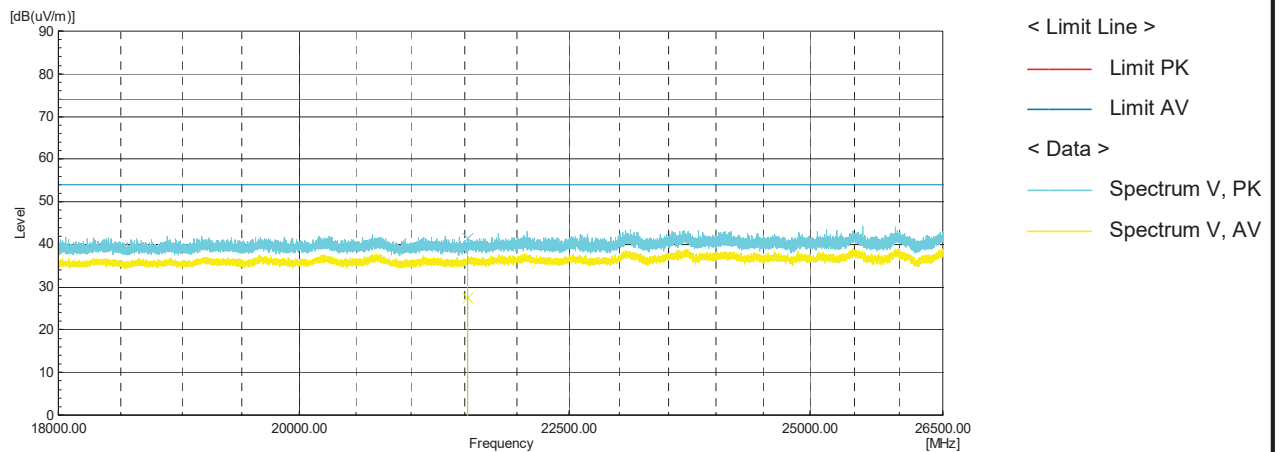
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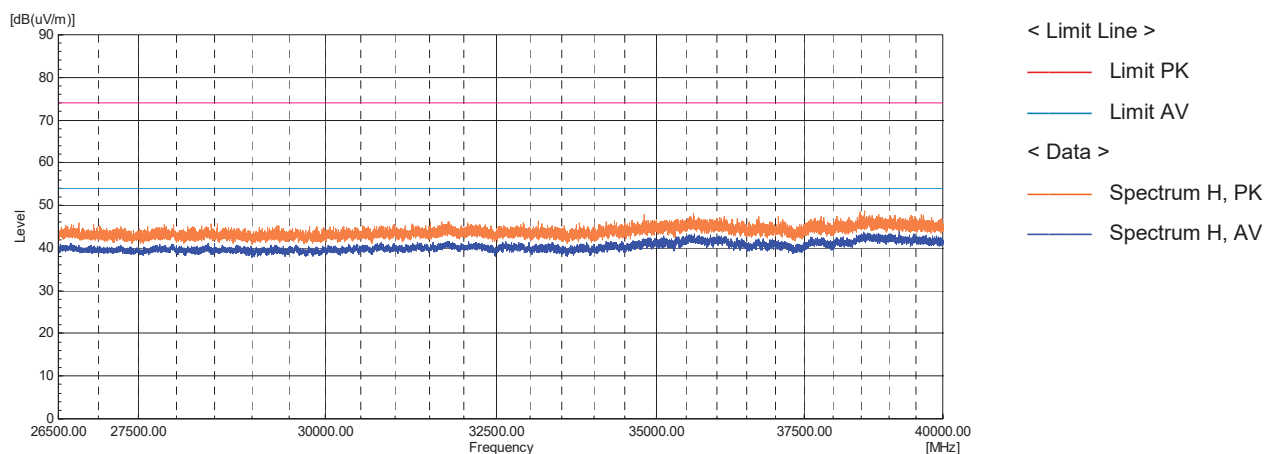
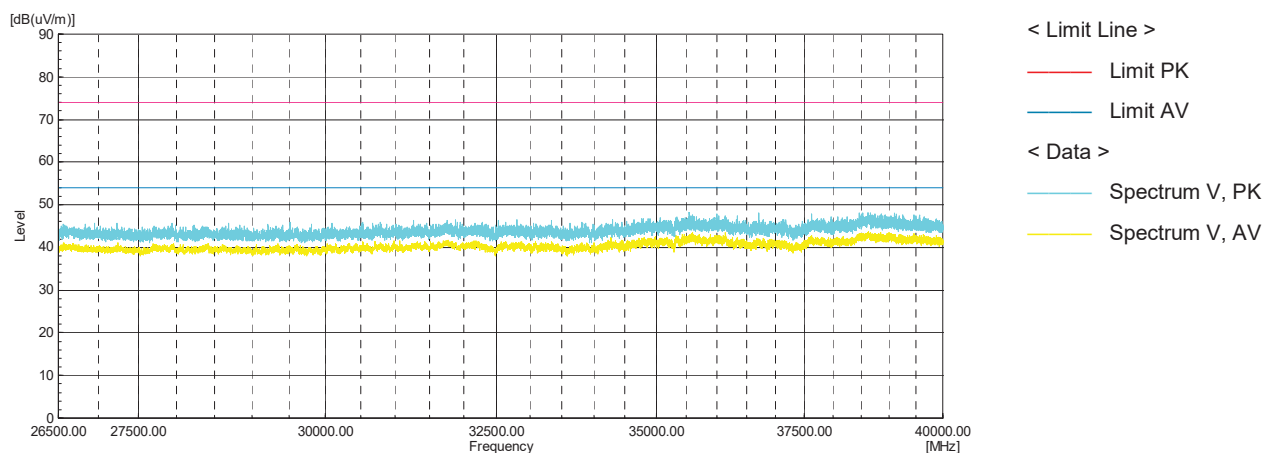
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Page 53 of 82**Figure 56: Radiated Emission, Spectral Diagram, 8 - 18GHz, Horizontal Antenna Orientation, Mode D3****Figure 57: Radiated Emission, Spectral Diagram, 8 - 18GHz, Vertical Antenna Orientation, Mode D3**

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Page 55 of 82**Figure 60: Radiated Emission, Spectral Diagram, 26.5 - 40GHz, Horizontal Antenna Orientation, Mode D3****Figure 61: Radiated Emission, Spectral Diagram, 26.5 - 40GHz, Vertical Antenna Orientation, Mode D3**

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Page 56 of 82**Table 21: Radiated Emission, Quasi Peak Data, 30MHz - 1GHz, Horizontal and Vertical Antenna Orientations, Mode D3**

Freq. [MHz]	Antenna Orientation	Reading QP [dBμV]	Factor [dB(1/m)]	Level QP [dBμV/m]	Limit [dBμV/m]	Margin QP [dB]	Height [cm]	Angle [°]
35.987	V	52.8	-22.3	30.5	40.0	9.5	105	66
83.990	H	60.0	-26.2	33.8	40.0	6.2	362	184
84.017	V	56.8	-26.2	30.6	40.0	9.4	100	137
239.429	H	52.6	-22.1	30.5	46.0	15.5	133	262
776.245	V	46.4	-9.8	36.6	46.0	9.4	133	188
776.848	H	49.0	-9.8	39.2	46.0	6.8	116	85

Note: Level QP = Reading QP + Factor
 $\text{dB}(\mu\text{V/m}) = 20 \times \log(\mu\text{V/m})$

Table 22: Radiated Emission, Average Data, 1 - 40GHz, Horizontal and Vertical Antenna Orientations, Mode D3

Freq. [MHz]	Antenna Orientation	Reading AV [dBμV]	Factor [dB(1/m)]	Level AV [dBμV/m]	Limit [dBμV/m]	Margin AV [dB]	Height [cm]	Angle [°]
1310.915	H	47.3	-17.6	29.7	54.0	24.3	113	156
1413.110	V	42.5	-17.5	25.0	54.0	29.0	101	190
3465.045	V	62.3	-14.1	48.2	54.0	5.8	170	199
3465.226	H	65.0	-14.1	50.9	54.0	3.1 (*)	163	131
10791.960	H	37.4	-4.8	32.6	54.0	21.4	200	125
10792.023	V	37.5	-4.8	32.7	54.0	21.3	113	359
21531.104	V	38.0	-10.6	27.4	54.0	26.6	116	302
21538.660	H	38.0	-10.6	27.4	54.0	26.6	156	276

Note: Level AV = Reading AV + Factor

(*) The measured result is below the specification limit by a margin less than the measurement uncertainty; it is therefore not possible to determine compliance at a level of confidence of 95%. However, the measured result indicates a high probability that the tested product complies with the specification limit.

Table 23: Radiated Emission, Peak Data, 1 - 40GHz, Horizontal and Vertical Antenna Orientations, Mode D3

Freq. [MHz]	Antenna Orientation	Reading PK [dBμV]	Factor [dB(1/m)]	Level PK [dBμV/m]	Limit [dBμV/m]	Margin PK [dB]	Height [cm]	Angle [°]
1310.915	H	61.0	-17.6	43.4	74.0	30.6	113	156
1413.110	V	63.4	-17.5	45.9	74.0	28.1	101	190
3465.045	V	64.3	-14.1	50.2	74.0	23.8	170	199
3465.226	H	66.8	-14.1	52.7	74.0	21.3	163	131
10791.960	H	52.2	-4.8	47.4	74.0	26.6	200	125
10792.023	V	51.7	-4.8	46.9	74.0	27.1	113	359
21531.104	V	52.1	-10.6	41.5	74.0	32.5	116	302
21538.660	H	52.1	-10.6	41.5	74.0	32.5	156	276

Note: Level PK = Reading PK + Factor

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5.3 Antenna Port Conducted Measurement

5.3.1 Antenna Power Conduction for Receivers

RESULT:**PASS**

Date of testing: 2021-10-18

Ambient temperature: 22°C

Relative humidity: 49%

Atmospheric pressure: 1018hPa

Frequency range: 30MHz - 40GHz

Test mode applied: A1, A2, A3, D1, D2, D3

Requirements:

FCC 15.111(a)

The power at the antenna terminal at any frequency within the range of measurements shall not exceed 2.0 nanowatts (51.7 dBμV/75Ω).

Test procedure:

ANSI C63.4 §12.2.6 and IEEE Std. 187™-2018

The spectrum was examined from 30MHz to 40GHz.

The FM receiver antenna port was connected to an EMI receiver via a 75Ω - 50Ω converter for up to 10GHz or via a 10dB attenuator for above 10GHz.

For emissions between 30MHz and 1GHz, measurements were performed with a receiver operating in the CISPR quasi-peak detection mode. The receiver's 6dB bandwidth was set to 120kHz.

For emissions above 1GHz, measurements were performed with a spectrum analyzer using the following settings: Peak detector, RBW = 1MHz & VBW = 3MHz.

Prechecks have been performed to compare the results of the 2 receiving ports: Main and Sub. The final measurement was performed for the worst receiving port only (Main).

Figure 62: Antenna Power Conduction, Spectral Diagram, 30MHz - 1GHz, Mode A1

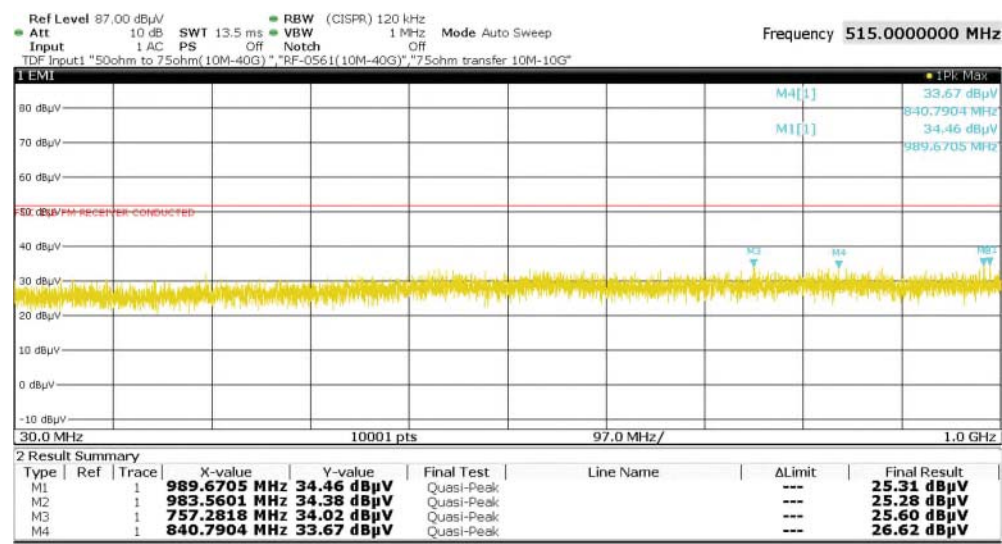


Figure 63: Antenna Power Conduction, Spectral Diagram, 1 - 10GHz, Mode A1

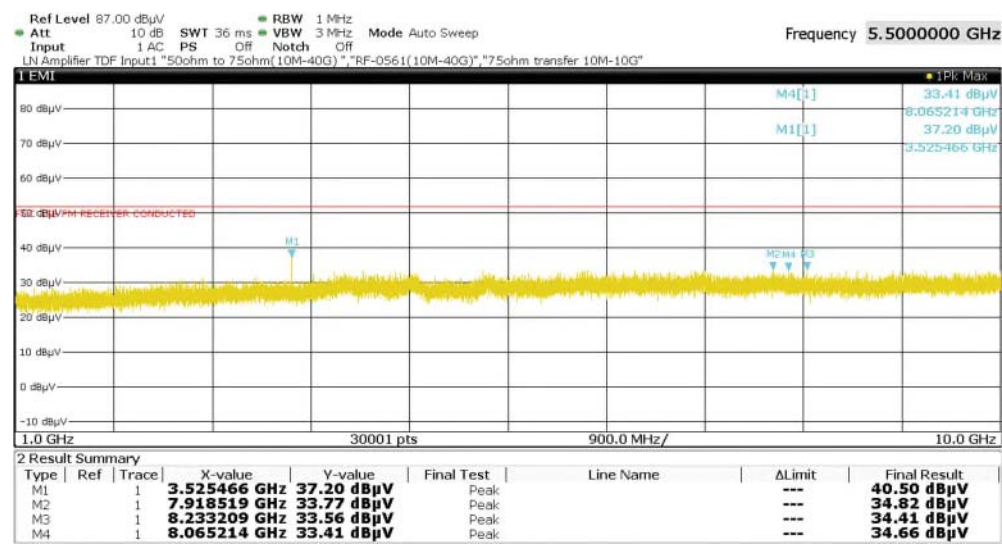
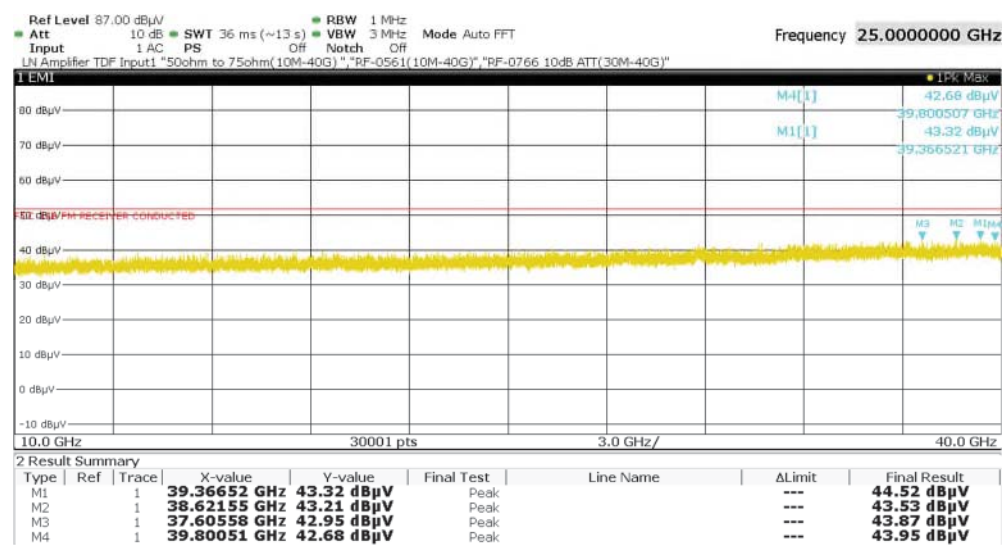


Figure 64: Antenna Power Conduction, Spectral Diagram, 10 - 40GHz, Mode A1



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Freq. [MHz]	Level QP [dBμV/75Ω]	Limit [dBμV/75Ω]	Margin QP [dB]
757.282	25.60	51.7	26.10
840.790	26.62	51.7	25.08
983.560	25.28	51.7	26.42
989.671	25.31	51.7	26.39

Note: The loss of cable, attenuator and 75Ω - 50Ω converter and the conversion factor from 75Ω - 50Ω (1.76dB) have been compensated for Level QP.

Table 25: Antenna Power Conduction, Peak Data, 1 - 40GHz, Mode A1

Freq. [GHz]	Level PK [dBμV/75Ω]	Limit [dBμV/75Ω]	Margin PK [dB]
3.525	40.50	51.7	11.20
7.913	34.82	51.7	16.88
8.065	34.66	51.7	17.04
8.233	34.41	51.7	17.29
37.606	43.87	51.7	7.83
38.622	43.53	51.7	8.17
39.366	44.52	51.7	7.18
39.801	43.95	51.7	7.75

Note: The loss of cable, attenuator and 75Ω - 50Ω converter and the conversion factor from 75Ω - 50Ω (1.76dB) have been compensated for Level PK.

Figure 65: Antenna Power Conduction, Spectral Diagram, 30MHz - 1GHz, Mode A2

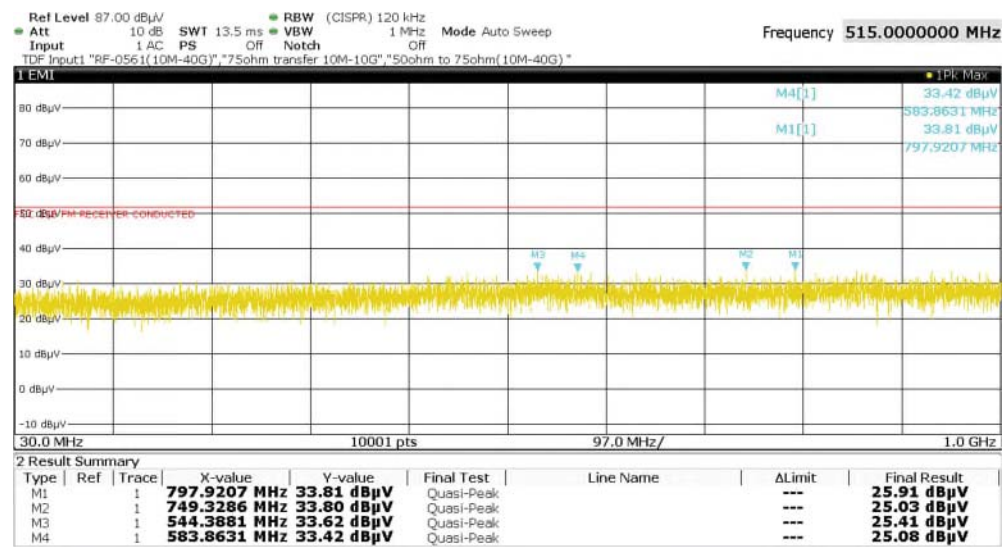


Figure 66: Antenna Power Conduction, Spectral Diagram, 1 - 10GHz, Mode A2

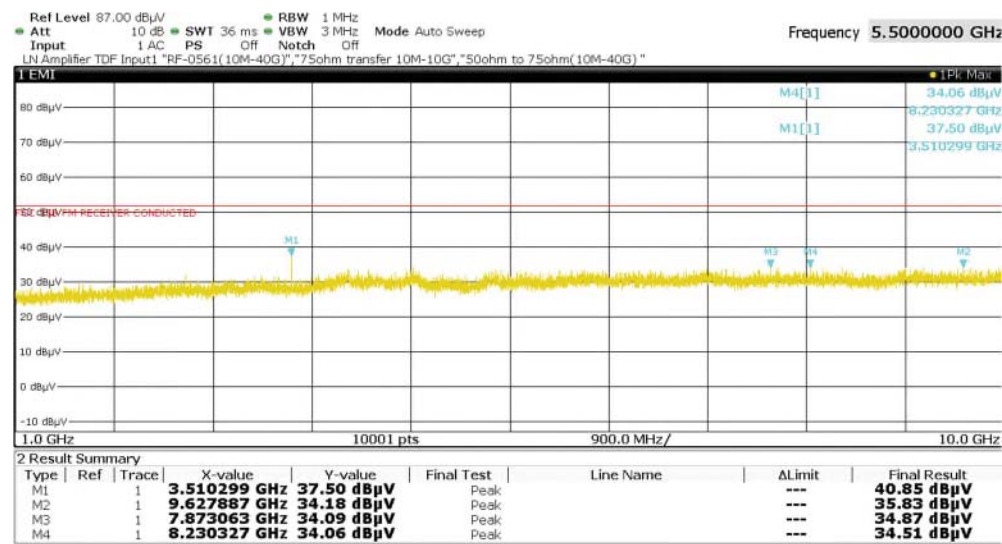
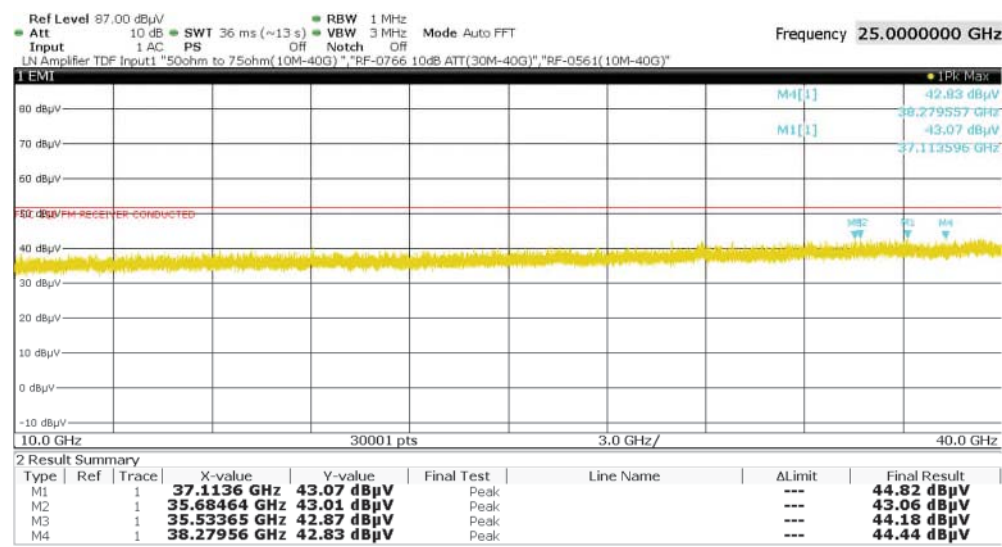


Figure 67: Antenna Power Conduction, Spectral Diagram, 10 - 40GHz, Mode A2



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Table 26: Antenna Power Conduction, Quasi Peak Data, 30MHz - 1GHz, Mode A2

Freq. [MHz]	Level QP [dBμV/75Ω]	Limit [dBμV/75Ω]	Margin QP [dB]
544.388	25.41	51.7	26.29
583.863	25.08	51.7	26.62
749.329	25.03	51.7	26.67
797.921	25.91	51.7	25.79

Note: The loss of cable, attenuator and 75Ω - 50Ω converter and the conversion factor from 75Ω - 50Ω (1.76dB) have been compensated for Level QP.

Table 27: Antenna Power Conduction, Peak Data, 1 - 40GHz, Mode A2

Freq. [GHz]	Level PK [dBμV/75Ω]	Limit [dBμV/75Ω]	Margin PK [dB]
3.510	40.85	51.7	10.85
7.873	34.87	51.7	16.83
8.230	34.51	51.7	17.19
9.627	35.83	51.7	15.87
35.534	44.18	51.7	7.52
35.685	43.06	51.7	8.64
37.114	44.82	51.7	6.88
38.280	44.44	51.7	7.26

Note: The loss of cable, attenuator and 75Ω - 50Ω converter and the conversion factor from 75Ω - 50Ω (1.76dB) have been compensated for Level PK.

Figure 68: Antenna Power Conduction, Spectral Diagram, 30MHz - 1GHz, Mode A3

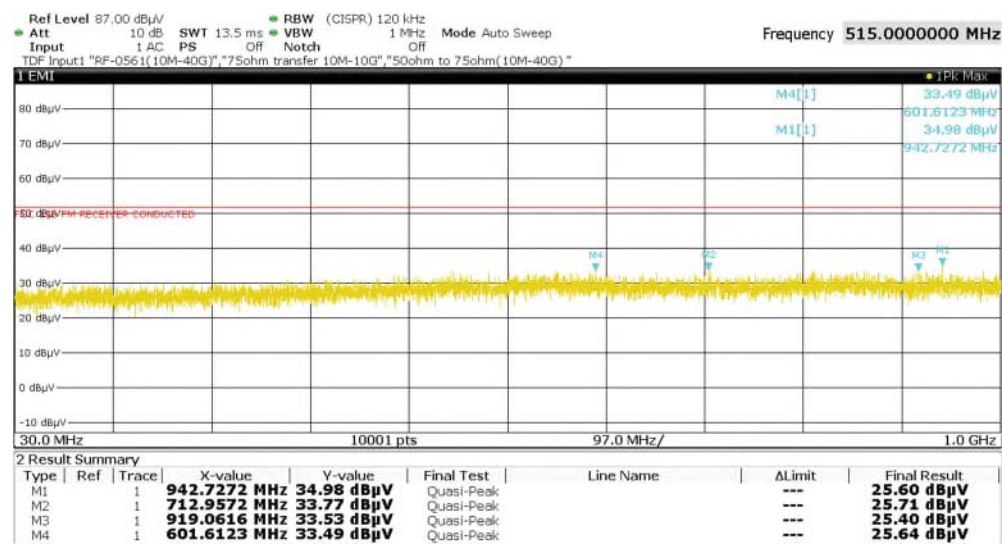


Figure 69: Antenna Power Conduction, Spectral Diagram, 1 - 10GHz, Mode A3

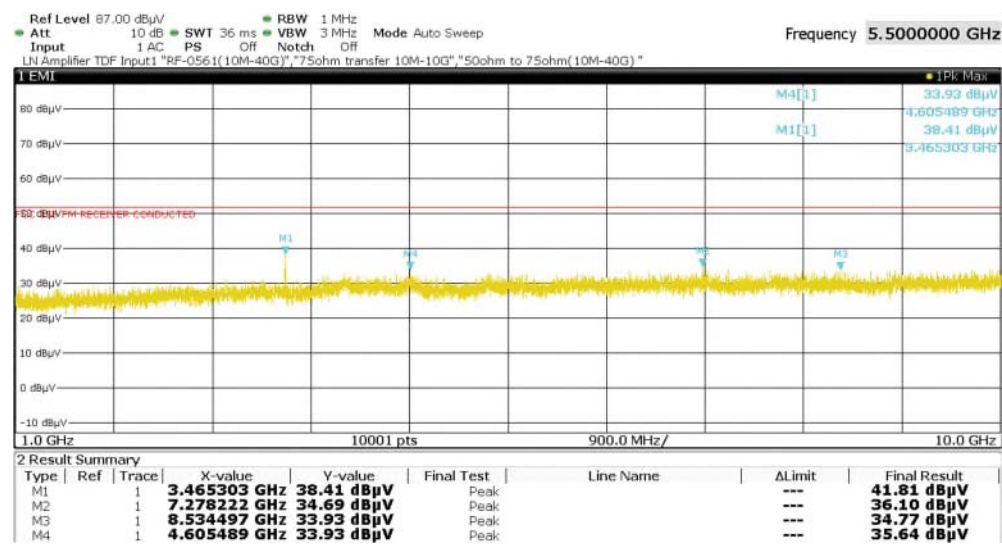
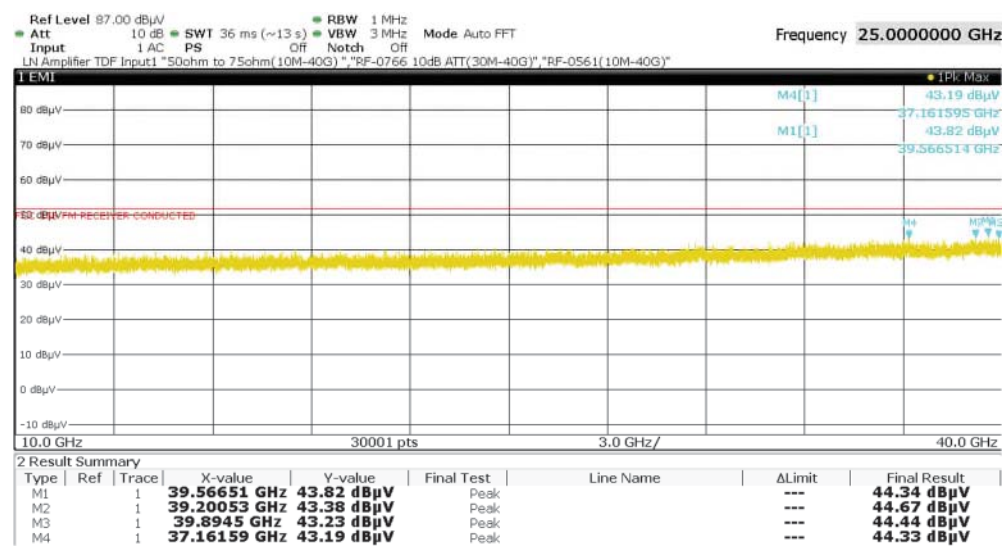


Figure 70: Antenna Power Conduction, Spectral Diagram, 10 - 40GHz, Mode A3



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Table 28: Antenna Power Conduction, Quasi Peak Data, 30MHz - 1GHz, Mode A3

Freq. [MHz]	Level QP [dBμV/75Ω]	Limit [dBμV/75Ω]	Margin QP [dB]
601.612	25.64	51.7	26.06
712.957	25.71	51.7	25.99
919.062	25.40	51.7	26.30
942.727	25.60	51.7	26.10

Note: The loss of cable, attenuator and 75Ω - 50Ω converter and the conversion factor from 75Ω - 50Ω (1.76dB) have been compensated for Level QP.

Table 29: Antenna Power Conduction, Peak Data, 1 - 40GHz, Mode A3

Freq. [GHz]	Level PK [dBμV/75Ω]	Limit [dBμV/75Ω]	Margin PK [dB]
3.465	41.81	51.7	9.89
4.605	35.64	51.7	16.06
7.278	36.10	51.7	15.60
8.534	34.77	51.7	16.93
37.162	44.33	51.7	7.37
39.201	44.67	51.7	7.03
39.567	44.34	51.7	7.36
39.895	44.44	51.7	7.26

Note: The loss of cable, attenuator and 75Ω - 50Ω converter and the conversion factor from 75Ω - 50Ω (1.76dB) have been compensated for Level PK.

Figure 71: Antenna Power Conduction, Spectral Diagram, 30MHz - 1GHz, Mode D1

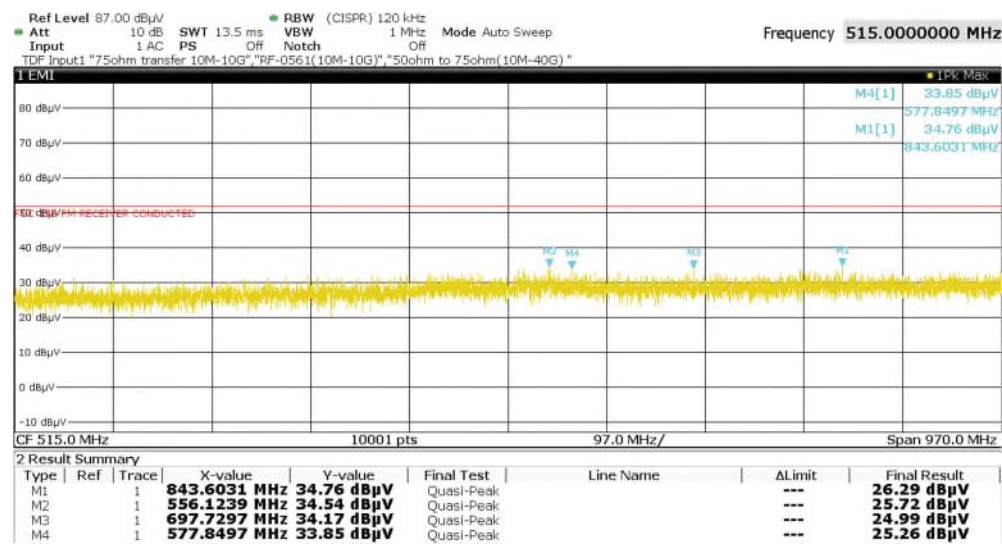


Figure 72: Antenna Power Conduction, Spectral Diagram, 1 - 10GHz, Mode D1

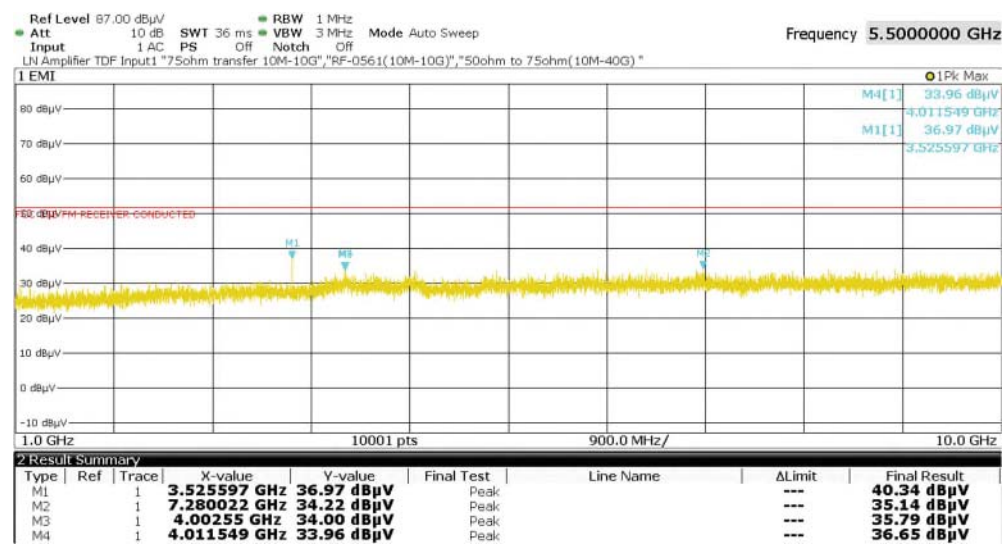
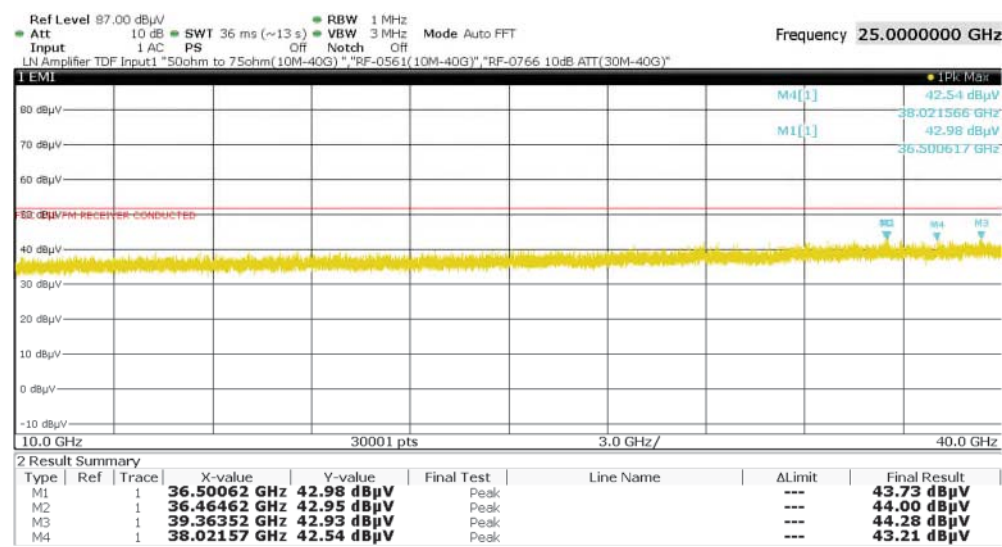


Figure 73: Antenna Power Conduction, Spectral Diagram, 10 - 40GHz, Mode D1



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Table 30: Antenna Power Conduction, Quasi Peak Data, 30MHz - 1GHz, Mode D1

Freq. [MHz]	Level QP [dBμV/75Ω]	Limit [dBμV/75Ω]	Margin QP [dB]
556.124	25.72	51.7	25.98
577.850	25.26	51.7	26.44
697.730	24.99	51.7	26.71
843.603	26.29	51.7	25.41

Note: The loss of cable, attenuator and 75Ω - 50Ω converter and the conversion factor from 75Ω - 50Ω (1.76dB) have been compensated for Level QP.

Table 31: Antenna Power Conduction, Peak Data, 1 - 40GHz, Mode D1

Freq. [GHz]	Level PK [dBμV/75Ω]	Limit [dBμV/75Ω]	Margin PK [dB]
3.526	40.34	51.7	11.36
4.003	35.79	51.7	15.91
4.012	36.65	51.7	15.05
7.280	35.14	51.7	16.56
36.465	44.00	51.7	7.70
36.500	43.73	51.7	7.97
38.022	43.21	51.7	7.49
39.364	44.28	51.7	7.32

Note: The loss of cable, attenuator and 75Ω - 50Ω converter and the conversion factor from 75Ω - 50Ω (1.76dB) have been compensated for Level PK.

Figure 74: Antenna Power Conduction, Spectral Diagram, 30MHz - 1GHz, Mode D2

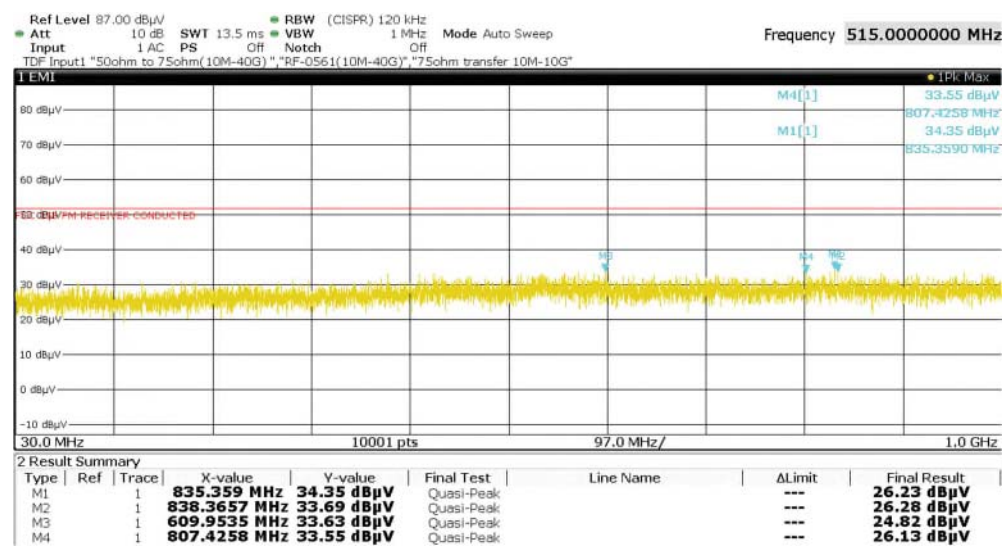


Figure 75: Antenna Power Conduction, Spectral Diagram, 1 - 10GHz, Mode D2

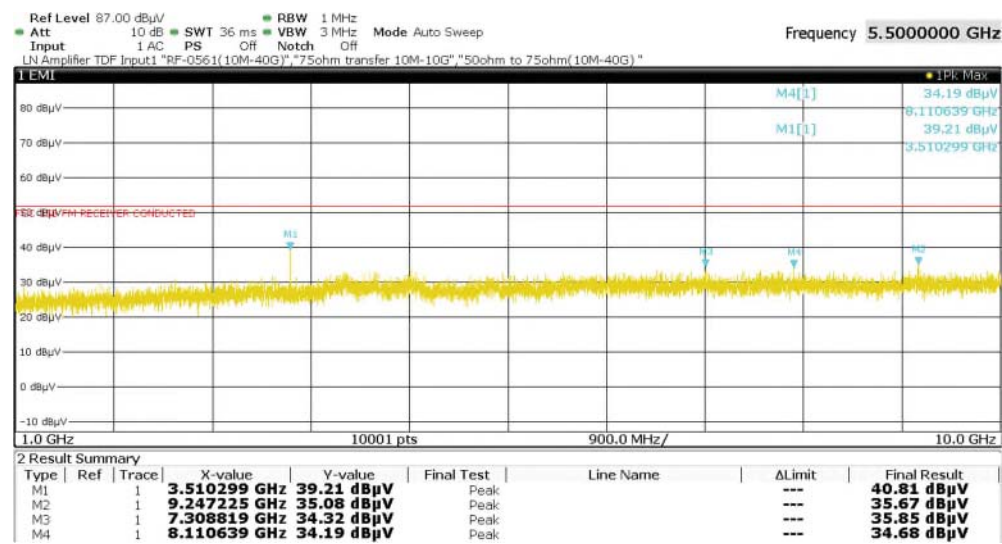
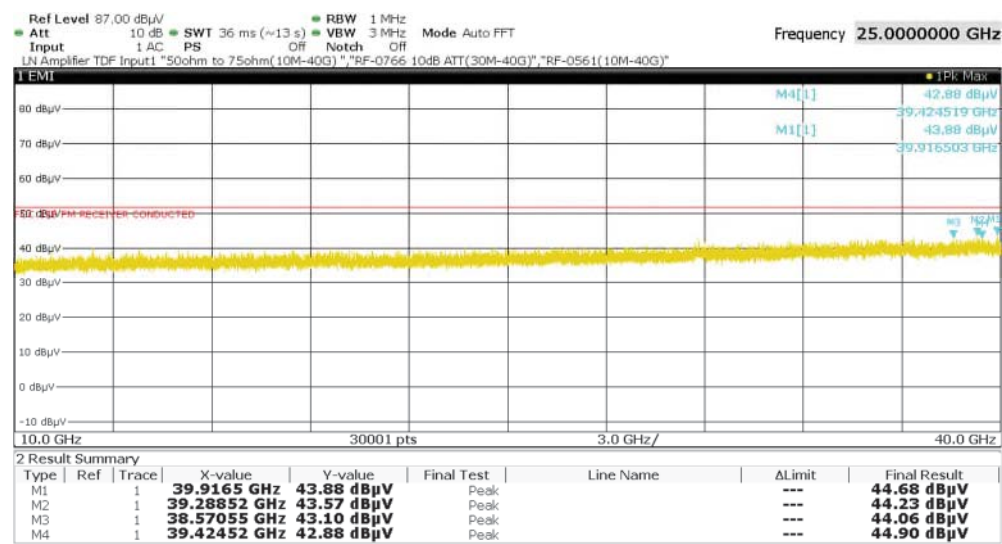


Figure 76: Antenna Power Conduction, Spectral Diagram, 10 - 40GHz, Mode D2



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Table 32: Antenna Power Conduction, Quasi Peak Data, 30MHz - 1GHz, Mode D2

Freq. [MHz]	Level QP [dBμV/75Ω]	Limit [dBμV/75Ω]	Margin QP [dB]
609.954	24.82	51.7	26.88
807.426	26.13	51.7	25.57
835.359	26.23	51.7	25.47
838.366	26.28	51.7	25.42

Note: The loss of cable, attenuator and 75Ω - 50Ω converter and the conversion factor from 75Ω - 50Ω (1.76dB) have been compensated for Level QP.

Table 33: Antenna Power Conduction, Peak Data, 1 - 40GHz, Mode D2

Freq. [GHz]	Level PK [dBμV/75Ω]	Limit [dBμV/75Ω]	Margin PK [dB]
3.510	40.81	51.7	10.89
7.309	35.85	51.7	15.85
8.111	34.68	51.7	17.02
9.247	35.67	51.7	16.03
38.571	44.06	51.7	7.64
39.289	44.23	51.7	7.47
39.425	44.90	51.7	6.80
39.917	44.68	51.7	7.02

Note: The loss of cable, attenuator and 75Ω - 50Ω converter and the conversion factor from 75Ω - 50Ω (1.76dB) have been compensated for Level PK.

Figure 77: Antenna Power Conduction, Spectral Diagram, 30MHz - 1GHz, Mode D3

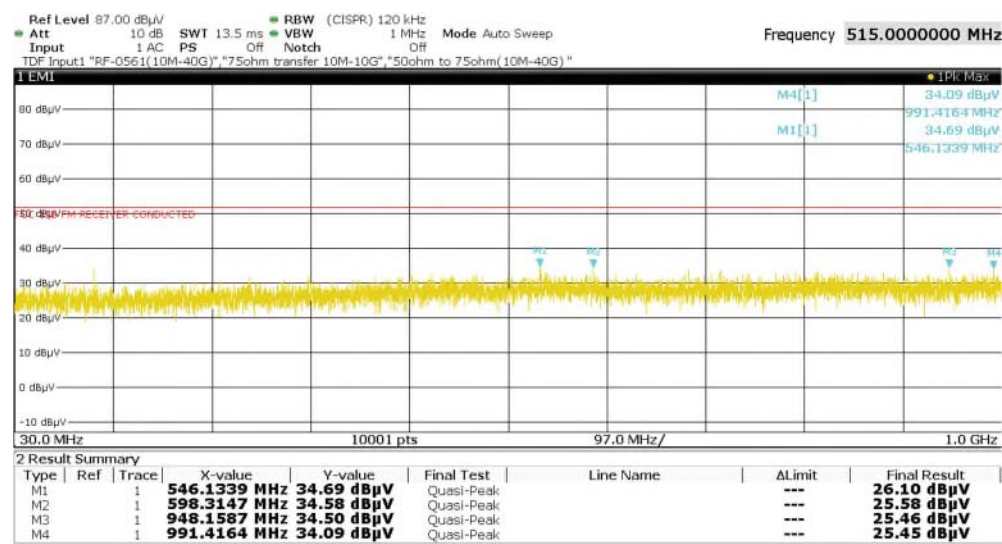


Figure 78: Antenna Power Conduction, Spectral Diagram, 1 - 10GHz, Mode D3

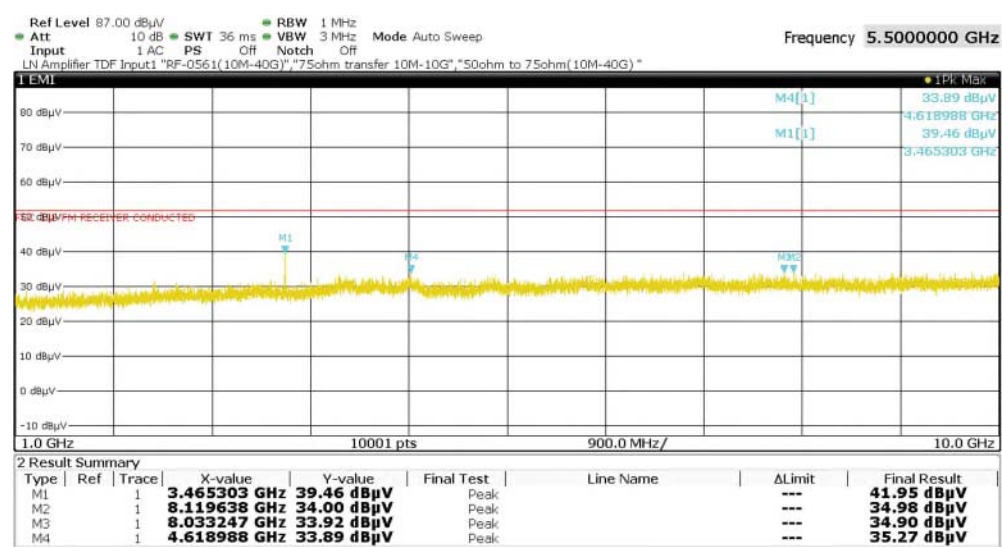
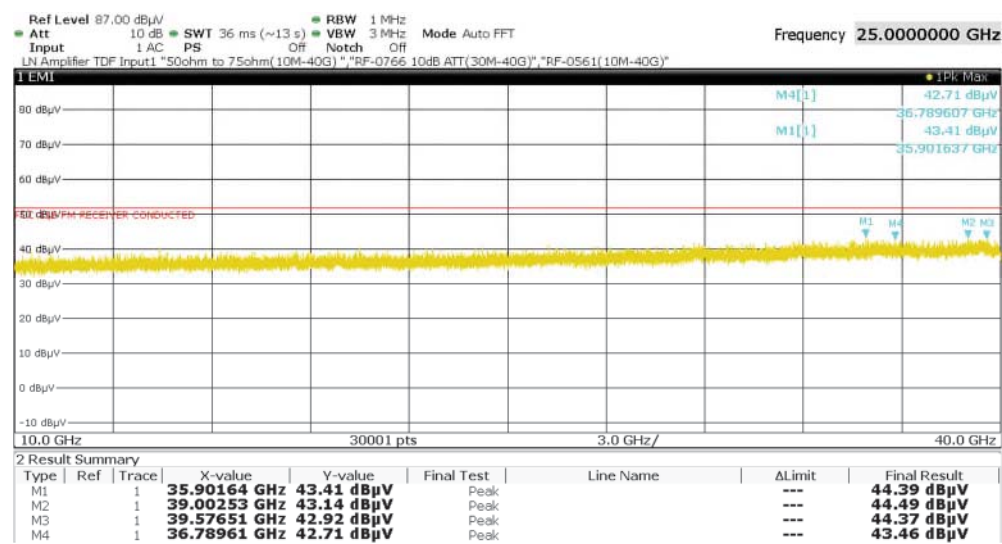


Figure 79: Antenna Power Conduction, Spectral Diagram, 10 - 40GHz, Mode D3



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Table 34: Antenna Power Conduction, Quasi Peak Data, 30MHz - 1GHz, Mode D3

Freq. [MHz]	Level QP [dBμV/75Ω]	Limit [dBμV/75Ω]	Margin QP [dB]
546.134	26.10	51.7	25.60
598.315	25.58	51.7	26.12
948.159	25.46	51.7	26.24
991.416	25.45	51.7	26.25

Note: The loss of cable, attenuator and 75Ω - 50Ω converter and the conversion factor from 75Ω - 50Ω (1.76dB) have been compensated for Level QP.

Table 35: Antenna Power Conduction, Peak Data, 1 - 40GHz, Mode D3

Freq. [GHz]	Level PK [dBμV/75Ω]	Limit [dBμV/75Ω]	Margin PK [dB]
3.465	41.95	51.7	9.75
4.619	35.27	51.7	16.43
8.033	34.90	51.7	16.80
8.120	34.98	51.7	16.72
35.902	44.39	51.7	7.31
36.790	43.46	51.7	8.24
39.003	44.49	51.7	7.21
39.577	44.37	51.7	7.33

Note: The loss of cable, attenuator and 75Ω - 50Ω converter and the conversion factor from 75Ω - 50Ω (1.76dB) have been compensated for Level PK.

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