

PRODUCT	Optic Transceiver
DUT MODEL	OPT-CANHS-A1 (V2.4)
Ref. STANDARD	CISPR 25 ed.4
TEST ITEM	RE (150k-6GHz)
TEST LEVEL	Class 5
TEST SETUP	Quar-OPTs method (see Page 2)
TEST SOFTWARE	PEAK
TEST LAB	TMTest
TEST DATE	07.Apr.2020

Description:

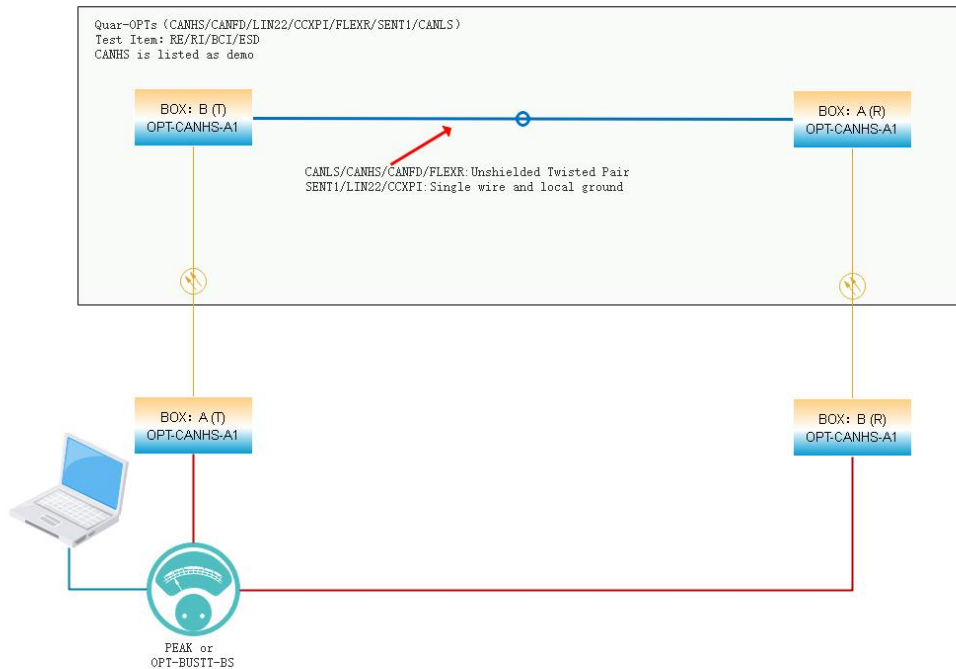
- 1, Cable between two optic transceivers in the chamber is UTP (Unshielded Twist Pair).
- 2, 2.5GHz-6GHz has no limit, RBW was 1MHz in this range. 150kHz-2.5GHz, RBW was set according to CISPR 25.
- 3, 500kbps is classic and popular, all tests are performed with 500kbps.
- 4, Interval between two commands was set as 1ms, this setting is critical. In practise, this setting is 50ms or longer.
- 5, BUS Impedance was set as 60ohms, each side optic transceiver in the chamber was set as 120ohms.

Quar-OPTs method

It is a method to evaluate the performance of optic transceivers, four optic transceivers could create a test loop.

The advantage of this method is:

- 1, No affect from DUT or EUT, all test results are related to employed optic transceivers.
- 2, The layout is identical with real tests.
- 3, Repeatability is good.
- 4, Easy to build test layout.



Equipment List

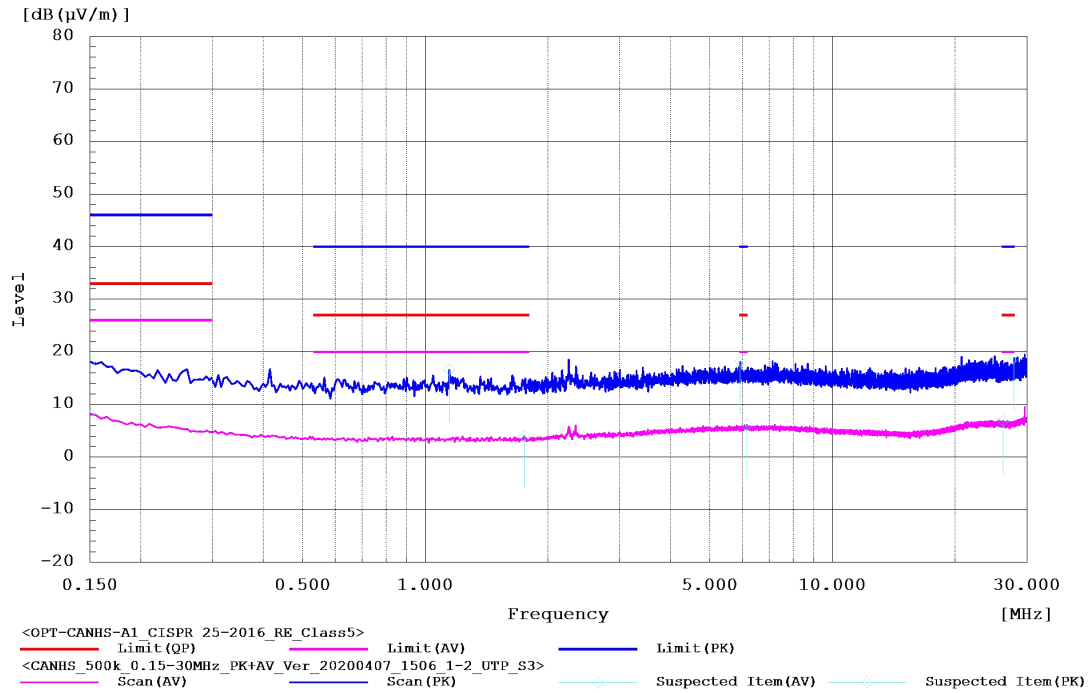
Equipment	Model	SN	Manufacturer	Next Cal. Date
Anechoic Chamber 1	SAC1 (7m*6m*4m)	GZEC-FA-A001	Albatross Projects	2020.10.17
Support($\epsilon_r < 1.4$)	LF225	--	CHANGEN	--
Support($\epsilon_r < 1.4$)	LF525	--	CHANGEN	--
Test Software	EP9VE	Version4.0.040	TOYO	--
EMI Receiver	ESR7	101180	ROHDE&SCHWARZ	2020.07.08
Pre-Amplifier	EMC 003835B	980350	EMCI	2020.07.08
Monopole Antenna	VAMP 9423 B	1200	SCHWARZBECK	2020.07.13
Bi-Conical Antenna	VHBB 9124+BBA 9106	01003	SCHWARZBECK	2020.07.13
Log Antenna	VUSLP 9111B	00382	SCHWARZBECK	2020.07.13
Horn Antenna	BBHA 9120 E	791	SCHWARZBECK	2020.10.21

Test Photos



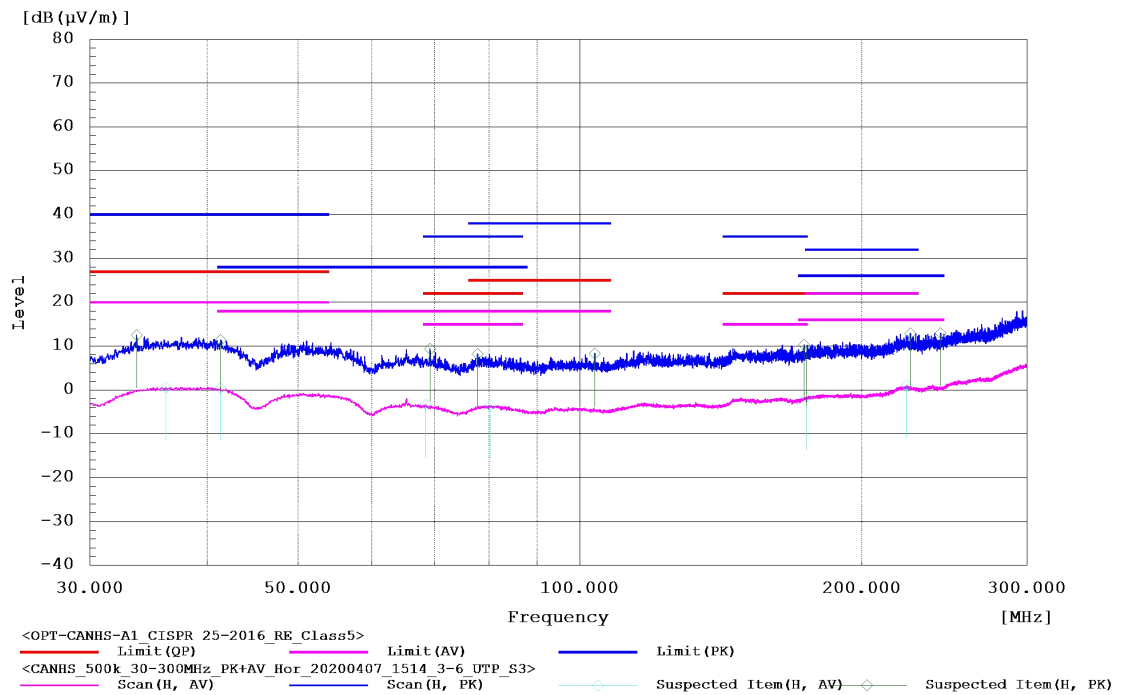


Test Results



Suspected List

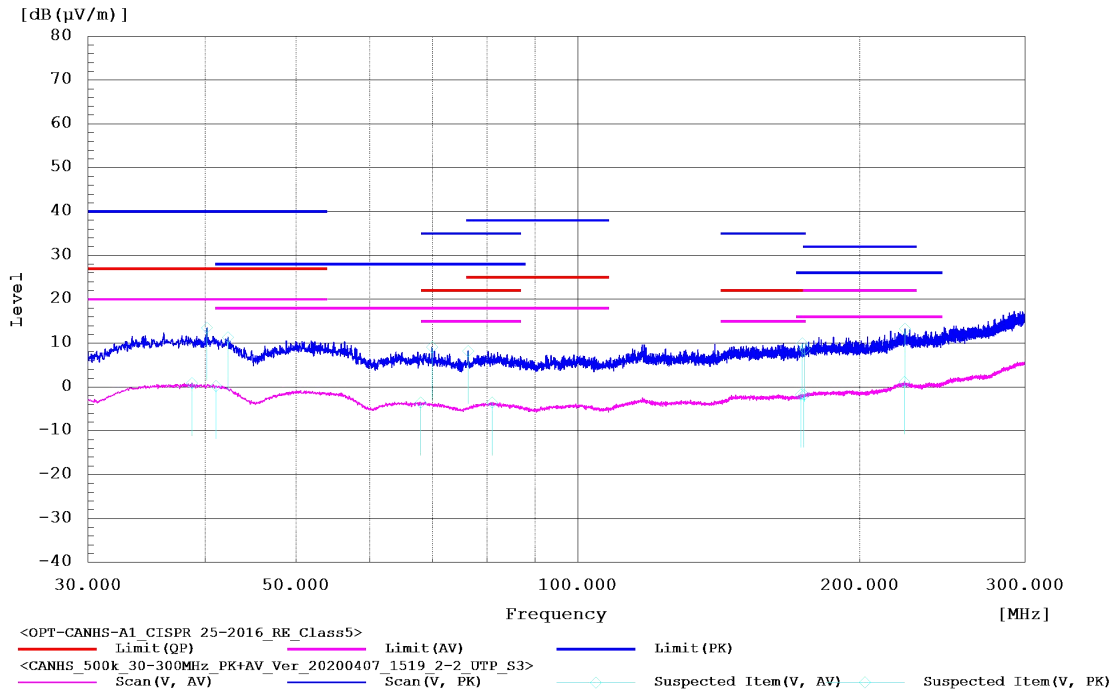
Frequency MHz	Pol	Reading			Factor	Level			Limit			Margin			
		dB(µV)				dB(1/m)	dB(µV/m)			dB(µV/m)			dB		
		QP	AV	PK			QP	AV	PK	QP	AV	PK	QP	AV	PK
0.1500			-1.67		9.94		8.27			26.0			17.7		
0.1500				8.20	9.94			18.14			46.0			27.9	
1.1450				6.94	9.66			16.60			40.0			23.4	
1.7500			-5.59		9.61		4.02			20.0			16.0		
5.9350				8.49	9.62			18.11			40.0			21.9	
6.1650			-3.51		9.62		6.11			20.0			13.9		
26.2350			-3.14		10.03		6.89			20.0			13.1		
27.9250				8.80	10.06			18.86			40.0			21.1	



Suspected List

Frequency MHz	Pol	Reading			Factor	Level			Limit			Margin			
		dB(µV)				dB(1/m)	dB(µV/m)			dB(µV/m)			dB		
		QP	AV	PK			QP	AV	PK	QP	AV	PK	QP	AV	PK
33.6500	H			38.71	-26.21			12.50			40.0			27.5	
36.1500	H		26.75		-26.13		0.62			20.0			19.4		
41.3500	H		26.39		-25.96		0.43			18.0			17.6		
41.3500	H			37.33	-25.96			11.37			28.0			16.6	
68.5000	H		24.14		-27.50		-3.36			15.0			18.4		
68.5000	H		24.14		-27.50		-3.36			15.0			18.4		
69.2000	H			36.88	-27.50			9.38			28.0			18.6	
69.2000	H			36.88	-27.50			9.38			28.0			18.6	
77.8000	H			35.10	-26.92			8.18			28.0			19.8	
80.2500	H		23.31		-26.83		-3.52			15.0			18.5		
80.2500	H		23.31		-26.83		-3.52			15.0			18.5		
103.7500	H			34.84	-26.48			8.36			38.0			29.6	
173.6000	H			33.27	-22.97			10.30			26.0			15.7	
173.6000	H			33.27	-22.97			10.30			26.0			15.7	
174.4500	H		21.28		-22.88		-1.60			15.0			16.6		
174.4500	H		21.28		-22.88		-1.60			15.0			16.6		
174.4500	H		21.28		-22.88		-1.60			15.0			16.6		
174.6000	H			31.44	-22.87			8.57			26.0			17.4	
223.3500	H		21.34		-20.30		1.04			16.0			15.0		

Frequency	Pol	Reading			Factor	Level			Limit			Margin		
MHz		dB(μ V)			dB(1/m)	dB(μ V/m)			dB(μ V/m)			dB		
		QP	AV	PK		QP	AV	PK	QP	AV	PK	QP	AV	PK
223.3500	H		21.34		-20.30		1.04			16.0			15.0	
225.3500	H			33.06	-20.18			12.88			26.0			13.1
242.7000	H			33.08	-20.08			13.00			26.0			13.0

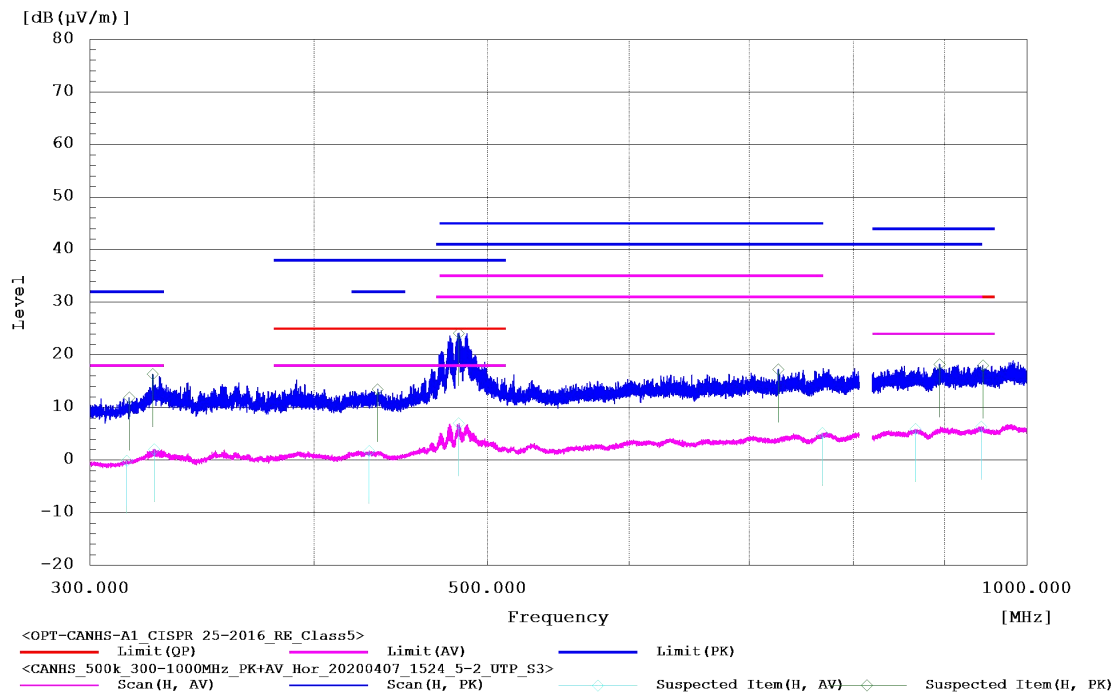


Suspected List

Frequency MHz	Pol	Reading			Factor	Level			Limit			Margin			
		dB(μV)				dB(1/m)	dB(μV/m)			dB(μV/m)			dB		
		QP	AV	PK			QP	AV	PK	QP	AV	PK	QP	AV	PK
38.7500	V		27.00		-26.13		0.87			20.0			19.1		
40.2000	V			39.55	-26.04		13.51			40.0			26.5		
41.1000	V		26.20		-25.98		0.22			18.0			17.8		
42.3500	V			37.21	-25.90		11.31			28.0			16.7		
68.0000	V		23.98		-27.50		-3.52			15.0			18.5		
68.0000	V		23.98		-27.50		-3.52			15.0			18.5		
69.9000	V			36.59	-27.48		9.11			28.0			18.9		
69.9000	V			36.59	-27.48		9.11			28.0			18.9		
76.4000	V			35.22	-27.03		8.19			28.0			19.8		
76.4000	V			35.22	-27.03		8.19			28.0			19.8		
81.0000	V		23.28		-26.83		-3.55			15.0			18.6		
81.0000	V		23.28		-26.83		-3.55			15.0			18.6		
173.1000	V		21.32		-23.04		-1.72			15.0			16.7		
173.1000	V		21.32		-23.04		-1.72			15.0			16.7		
173.7000	V			32.92	-22.96		9.96			26.0			16.0		
173.7000	V			32.92	-22.96		9.96			26.0			16.0		
174.3500	V		21.14		-22.89		-1.75			15.0			16.8		
174.5500	V			31.61	-22.87		8.74			26.0			17.3		

Frequency	Pol	Reading			Factor	Level			Limit			Margin		
MHz		dB(μ V)			dB(1/m)	dB(μ V/m)			dB(μ V/m)			dB		
		QP	AV	PK		QP	AV	PK	QP	AV	PK	QP	AV	PK
223.2000	V		21.50		-20.31		1.19			16.0			14.8	
223.2000	V		21.50		-20.31		1.19			16.0			14.8	
223.5000	V			33.53	-20.29			13.24			26.0			12.8
223.5000	V			33.53	-20.29			13.24			26.0			12.8

500kbps / Interval: 1ms

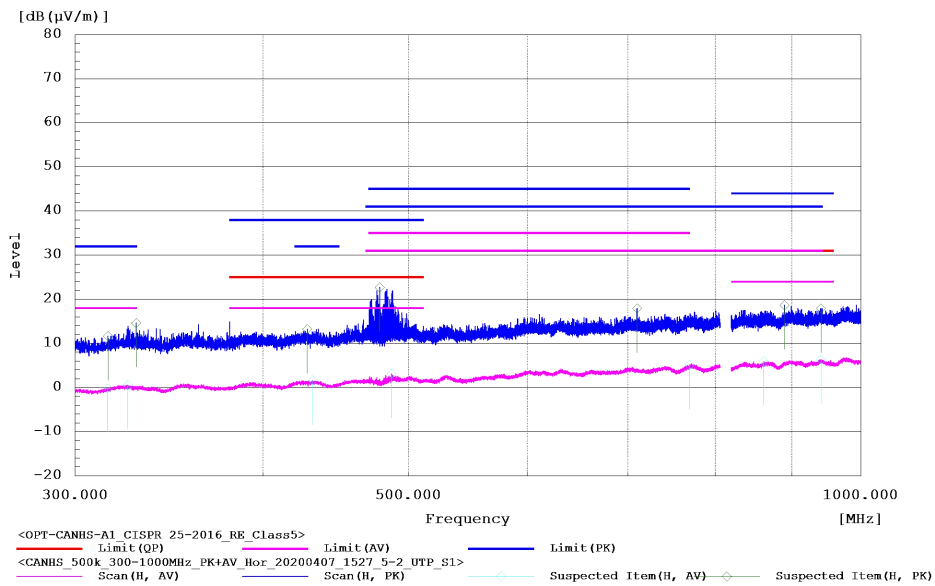


Suspected List

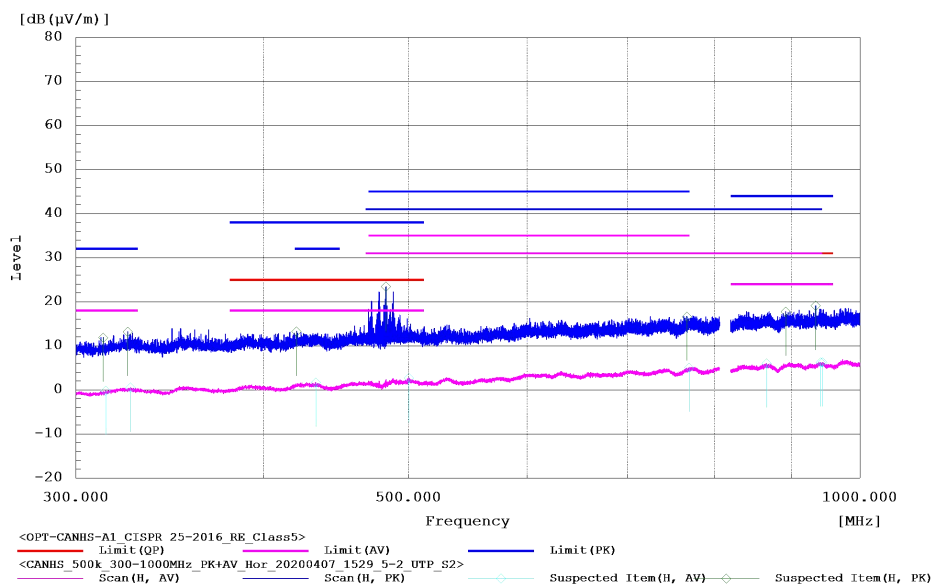
Frequency MHz	Pol	Reading			Factor	Level			Limit			Margin			
		dB(µV)				dB(1/m)	dB(µV/m)			dB(µV/m)			dB		
		QP	AV	PK			QP	AV	PK	QP	AV	PK	QP	AV	PK
314.5500	H		20.29		-20.41		-0.12			18.0			18.1		
315.5500	H			32.24	-20.36			11.88			32.0			20.1	
325.2500	H			36.08	-19.75			16.33			32.0			15.7	
325.8500	H		21.79		-19.75		2.04			18.0			16.0		
429.4500	H		20.05		-18.31		1.74			18.0			16.3		
434.3000	H			31.93	-18.51			13.42			32.0			18.6	
482.0000	H		25.40		-18.41		6.99			18.0			11.0		
482.0000	H		25.40		-18.41		6.99			18.0			11.0		
482.0000	H		25.40		-18.41		6.99			18.0			11.0		
482.0000	H			42.52	-18.41			24.11			38.0			13.9	
482.0000	H			42.52	-18.41			24.11			38.0			13.9	
482.0000	H			42.52	-18.41			24.11			38.0			13.9	
726.6000	H			32.60	-15.38			17.22			41.0			23.8	
769.0500	H		19.51		-14.41		5.10			31.0			25.9		
866.5500	H		19.46		-13.56		5.90			24.0			18.1		
894.0000	H			31.81	-13.57			18.24			41.0			22.8	
894.0000	H			31.81	-13.57			18.24			41.0			22.8	
894.0000	H			31.81	-13.57			18.24			41.0			22.8	
943.2500	H		19.69		-13.33		6.36			24.0			17.6		

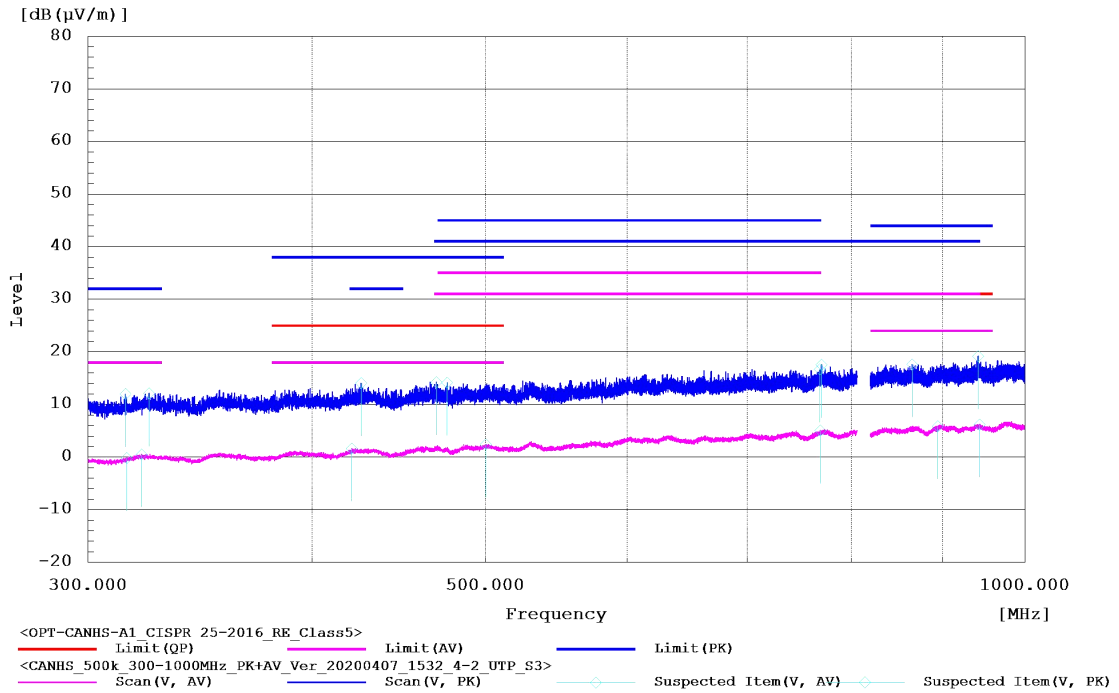
Frequency	Pol	Reading			Factor	Level			Limit			Margin		
MHz		dB(μV)			dB(1/m)	dB(μV/m)			dB(μV/m)			dB		
		QP	AV	PK		QP	AV	PK	QP	AV	PK	QP	AV	PK
943.2500	H		19.69		-13.33		6.36			24.0			17.6	
943.2500	H		19.69		-13.33		6.36			24.0			17.6	
945.3000	H			31.36	-13.38			17.98			44.0			26.0

500kbps / Interval: 20ms



500kbps / Interval: 50ms

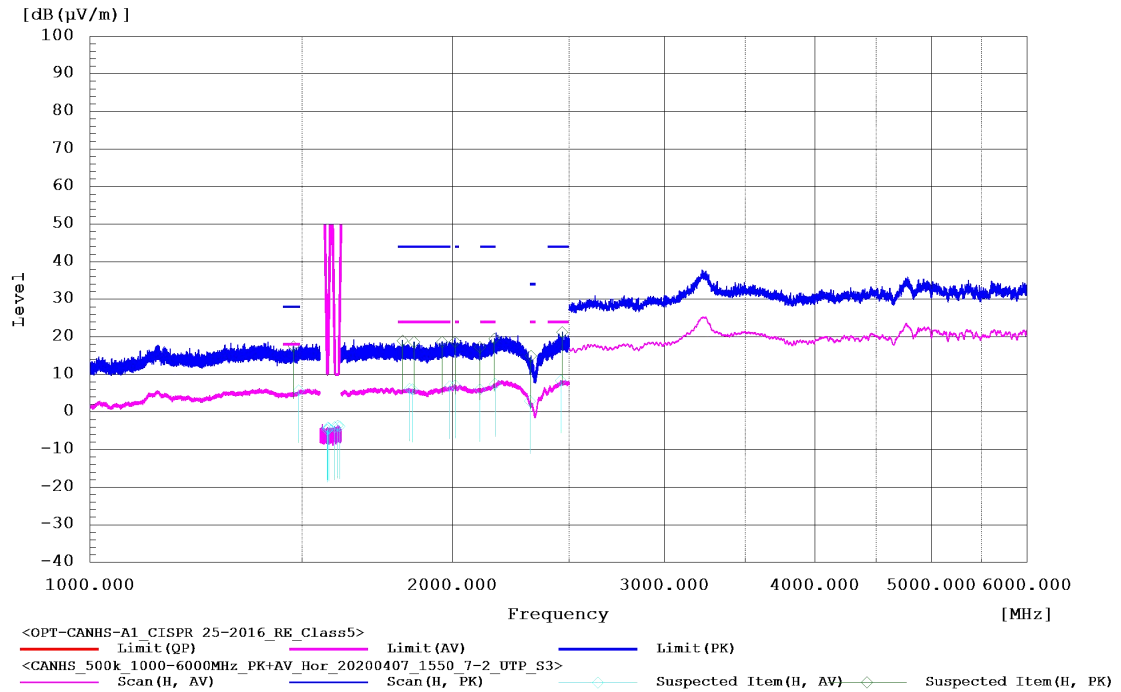




Suspected List

Frequency MHz	Pol	Reading			Factor	Level			Limit			Margin			
		dB(µV)				dB(1/m)	dB(µV/m)			dB(µV/m)			dB		
		QP	AV	PK			QP	AV	PK	QP	AV	PK	QP	AV	PK
314.8500	V			32.37	-20.40			11.97			32.0			20.0	
315.4000	V		20.22		-20.36		-0.14			18.0			18.1		
321.4500	V		20.38		-19.85		0.53			18.0			17.5		
324.5500	V			31.87	-19.76			12.11			32.0			19.9	
421.0500	V		20.24		-18.57		1.67			18.0			16.3		
426.2500	V			32.34	-18.30			14.04			32.0			18.0	
469.5500	V			32.43	-18.16			14.27			38.0			23.7	
476.0000	V			32.64	-18.47			14.17			38.0			23.8	
500.3500	V		19.76		-17.35		2.41			18.0			15.6		
500.3500	V		19.76		-17.35		2.41			18.0			15.6		
500.3500	V		19.76		-17.35		2.41			18.0			15.6		
768.5000	V			31.14	-14.46			16.68			41.0			24.3	
768.8000	V		19.48		-14.43		5.05			31.0			25.9		
770.1500	V			31.91	-14.34			17.57			41.0			23.4	
865.4500	V			31.23	-13.60			17.63			41.0			23.4	
894.2000	V		19.45		-13.56		5.89			24.0			18.1		
941.9000	V			32.49	-13.31			19.18			41.0			21.8	
941.9000	V			32.49	-13.31			19.18			41.0			21.8	

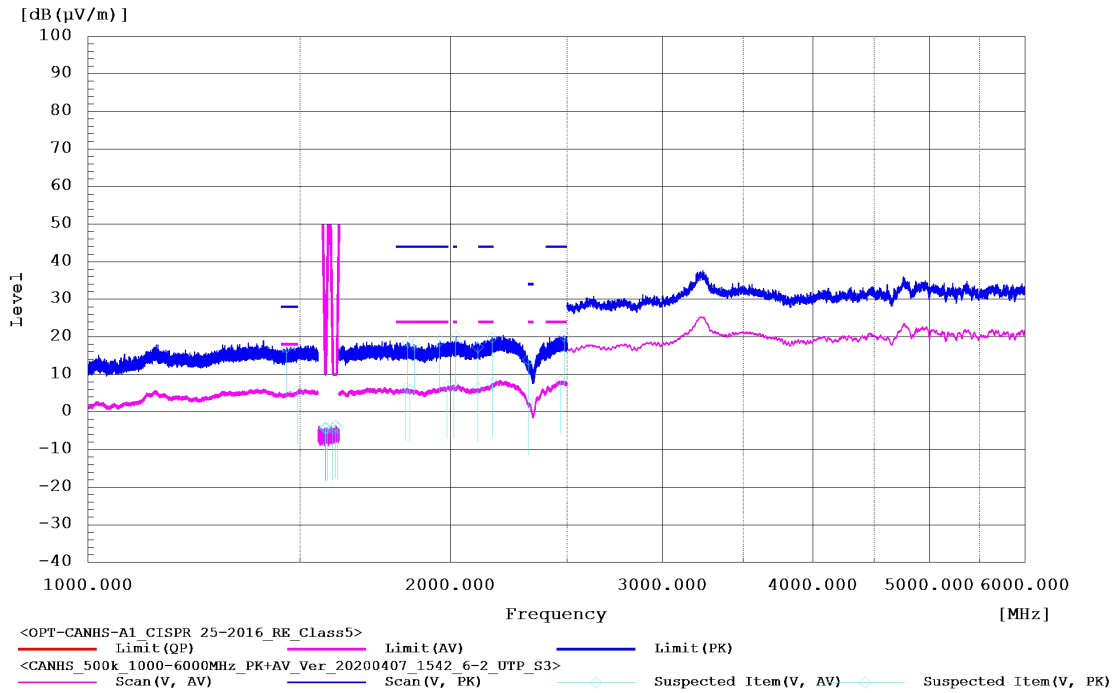
Frequency	Pol	Reading			Factor	Level			Limit			Margin		
MHz		dB(μ V)			dB(1/m)	dB(μ V/m)			dB(μ V/m)			dB		
		QP	AV	PK		QP	AV	PK	QP	AV	PK	QP	AV	PK
941.9000	V			32.49	-13.31			19.18			41.0			21.8
943.5500	V		19.57		-13.33		6.24			24.0			17.8	
943.5500	V		19.57		-13.33		6.24			24.0			17.8	
943.5500	V		19.57		-13.33		6.24			24.0			17.8	



Suspected List

Frequency MHz	Pol	Reading			Factor	Level			Limit			Margin			
		dB(µV)				dB(1/m)	dB(µV/m)			dB(µV/m)			dB		
		QP	AV	PK			QP	AV	PK	QP	AV	PK	QP	AV	PK
1476.0500	H			31.47	-13.97			17.50			28.0			10.5	
1491.0500	H		19.36		-13.62		5.74			18.0			12.3		
1574.3130	H		9.20		-13.89		-4.69			10.6			15.3		
1575.0930	H		9.70		-13.89		-4.19			10.0			14.2		
1579.2680	H		9.48		-13.84		-4.36			26.3			30.7		
1596.6110	H		9.60		-13.61		-4.01			16.7			20.7		
1605.7960	H		9.92		-13.57		-3.65			10.0			13.7		
1611.7210	H		9.72		-13.58		-3.86			22.2			26.1		
1817.7440	H			32.28	-13.28			19.00			44.0			25.0	
1843.1440	H		19.31		-13.07		6.24			24.0			17.8		
1852.5500	H		19.23		-13.16		6.07			24.0			17.9		
1858.9000	H			31.85	-13.23			18.62			44.0			25.4	
1961.6000	H			31.18	-12.53			18.65			44.0			25.3	
1961.6000	H			31.18	-12.53			18.65			44.0			25.3	
1989.7500	H		19.13		-12.24		6.89			24.0			17.1		
1989.7500	H		19.13		-12.24		6.89			24.0			17.1		
2010.5500	H			30.75	-12.00			18.75			44.0			25.2	
2011.5500	H		19.05		-11.99		7.06			24.0			16.9		
2108.1500	H		18.86		-12.75		6.11			24.0			17.9		

Frequency	Pol	Reading			Factor	Level			Limit			Margin		
MHz		dB(μ V)			dB(1/m)	dB(μ V/m)			dB(μ V/m)			dB		
		QP	AV	PK		QP	AV	PK	QP	AV	PK	QP	AV	PK
2108.3500	H			29.99	-12.74			17.25			44.0			26.8
2167.8000	H			30.82	-11.28			19.54			44.0			24.5
2170.5500	H		18.71		-11.18		7.53			24.0			16.5	
2320.0500	H		14.16		-11.23		2.93			24.0			21.1	
2324.9000	H			26.11	-11.19			14.92			34.0			19.1
2461.3500	H		18.47		-10.13		8.34			24.0			15.7	
2468.1500	H			31.35	-10.08			21.27			44.0			22.7



Suspected List

Frequency MHz	Pol	Reading			Factor	Level			Limit			Margin			
		dB(µV)				dB(1/m)	dB(µV/m)			dB(µV/m)			dB		
		QP	AV	PK			QP	AV	PK	QP	AV	PK	QP	AV	PK
1462.3000	V			31.45	-14.30			17.15			28.0			10.9	
1493.7000	V		19.20		-13.57		5.63			18.0			12.4		
1573.6480	V		9.67		-13.90		-4.23			14.4			18.6		
1575.6230	V		9.62		-13.88		-4.26			10.0			14.3		
1580.7280	V		9.51		-13.82		-4.31			34.6			38.9		
1596.7410	V		9.34		-13.61		-4.27			15.9			20.2		
1606.0410	V		9.89		-13.57		-3.68			10.0			13.7		
1612.2660	V		9.49		-13.59		-4.10			25.3			29.4		
1837.3940	V		19.33		-13.07		6.26			24.0			17.7		
1843.3440	V			31.66	-13.07			18.59			44.0			25.4	
1851.3500	V		19.13		-13.15		5.98			24.0			18.0		
1865.9500	V			31.22	-13.32			17.90			44.0			26.1	
1959.4000	V			31.49	-12.56			18.93			44.0			25.1	
1959.4000	V			31.49	-12.56			18.93			44.0			25.1	
1987.6500	V		19.06		-12.26		6.80			24.0			17.2		
1987.6500	V		19.06		-12.26		6.80			24.0			17.2		
2013.7000	V		19.11		-11.97		7.14			24.0			16.9		
2021.5500	V			32.14	-11.95			20.19			44.0			23.8	

Frequency	Pol	Reading			Factor	Level			Limit			Margin		
MHz		dB(μ V)			dB(1/m)	dB(μ V/m)			dB(μ V/m)			dB		
		QP	AV	PK		QP	AV	PK	QP	AV	PK	QP	AV	PK
2108.3000	V		18.91		-12.74		6.17			24.0			17.8	
2109.2000	V			30.04	-12.73			17.31			44.0			26.7
2167.2000	V			31.12	-11.30			19.82			44.0			24.2
2168.7000	V		18.82		-11.24		7.58			24.0			16.4	
2320.7000	V			25.14	-11.22			13.92			34.0			20.1
2321.0000	V		13.67		-11.22		2.45			24.0			21.6	
2468.3500	V		18.36		-10.08		8.28			24.0			15.7	
2486.0500	V			30.36	-10.14			20.22			44.0			23.8