

# Test Report No.50050028 001

## Appendix D: Radiated and Mains Spurious Emission Data

(File: 50050028AppendixD)

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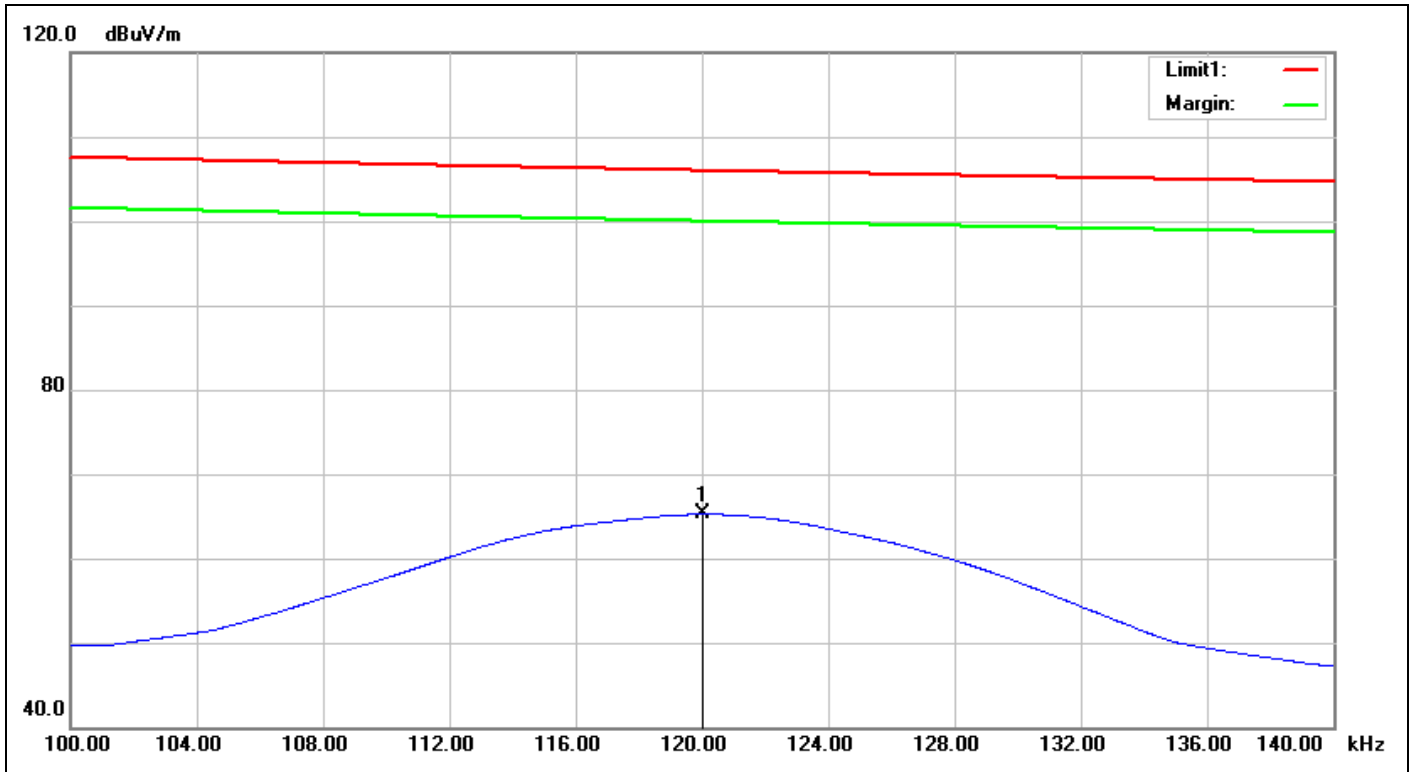
# Emissions, Fundamental



**TUV Taiwan**

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Service No.:	114052380-FCC	Test Distance:	3m
Test Standard:	FCC15.209_9k-1G_3m	Ant. Polarization:	Vertical
Test item:	Radiation Emission	Test Time:	2016/7/11 10:26:55
Applicant:	Nedap	Test Rating:	DC 12V
Product:	MACE reader	Temp.(°C)/Hum.(%):	24.8(°C)/50%
Model No.:	MACE READER MM QR	Test Engineer:	George Yang
Test Mode:	Fundamental-120kHz		
Remark:			

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	0.1200	19.24	46.00	65.24	105.98	-40.74	peak	100	360	

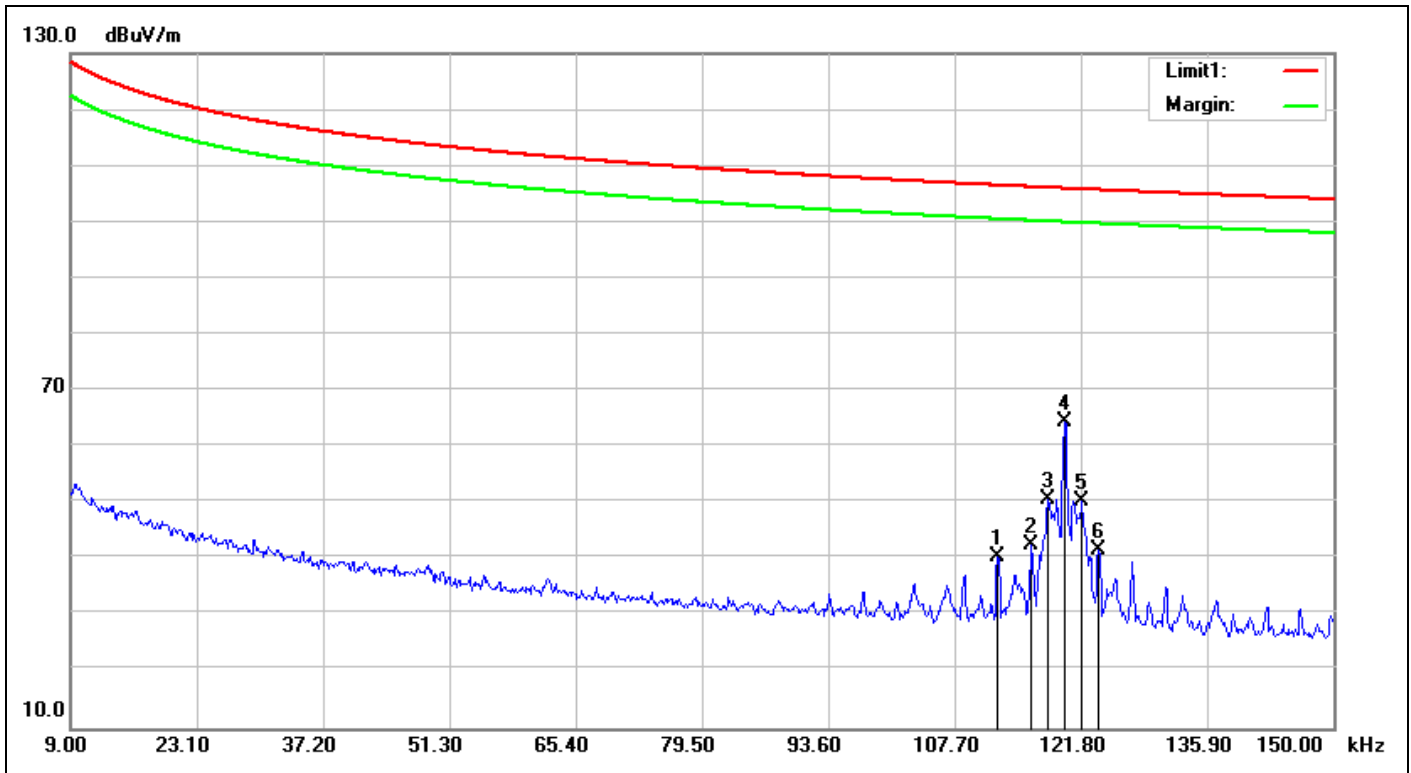
## Spurious Emissions, TX Mode, 9-150 kHz



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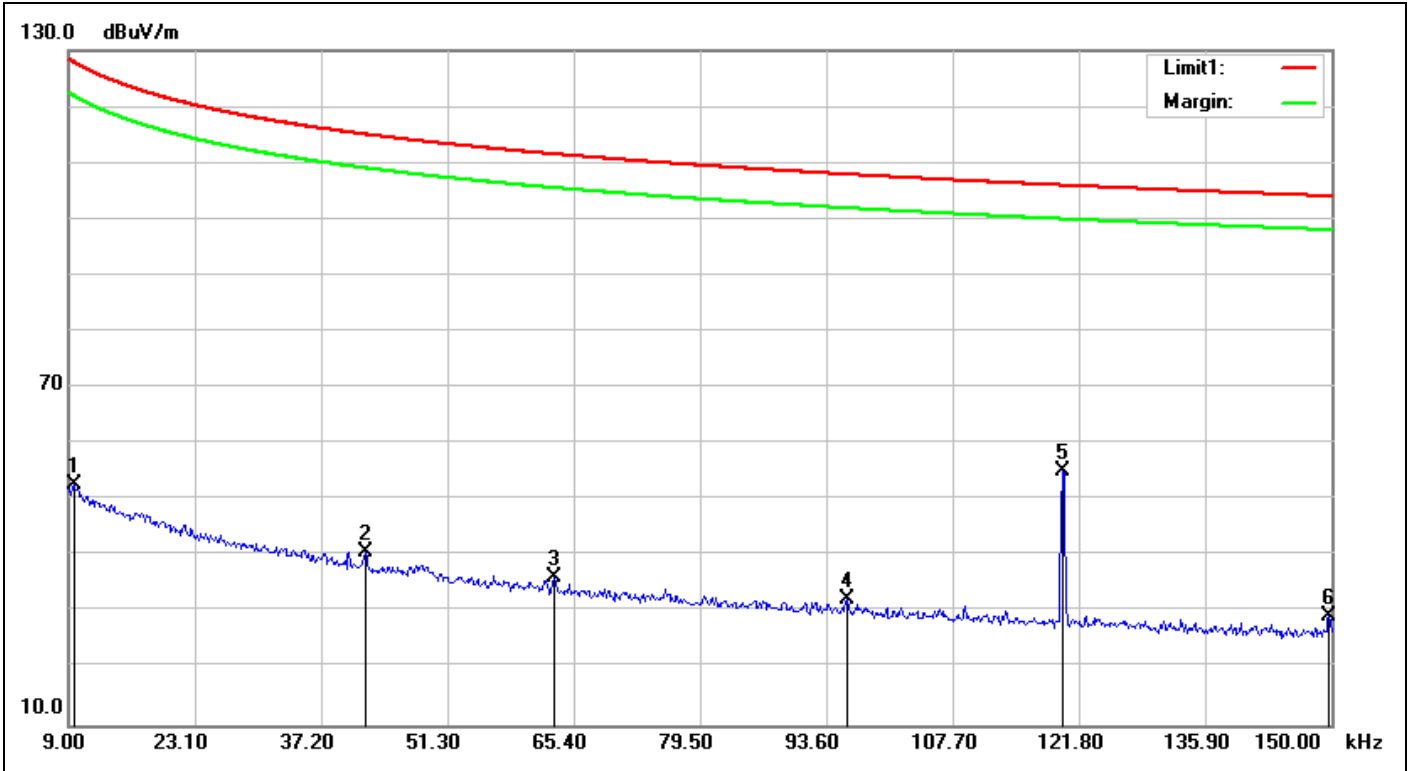


Service No.:	114052380-FCC	Test Distance:	3m
Test Standard:	FCC15.209_9k-1G_3m	Ant. Polarization:	
Test item:	Radiation Emission	Test Time:	2016/7/11 10:21:42
Applicant:	Nedap	Test Rating:	DC 12V
Product:	MACE reader	Temp.(°C)/Hum.(%):	24.8(°C)/50%
Model No.:	MACE READER MM QR	Test Engineer:	George Yang
Test Mode:	120kHz , with RFID Tag (120kHz with RFID)		

**Remark:**

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	0.1125	19.24	21.25	40.49	106.54	-66.05	QP	100	1	
2	0.1163	19.24	23.43	42.67	106.25	-63.58	QP	100	357	
3	0.1181	19.24	31.40	50.64	106.12	-55.48	QP	100	3	
4	0.1200	19.24	45.07	64.31	105.98	-41.67	QP	100	6	
5	0.1219	19.24	30.99	50.23	105.84	-55.61	QP	100	360	
6	0.1238	19.24	22.48	41.72	105.71	-63.99	QP	100	6	

## Spurious Emissions, TX Mode 9-150 kHz



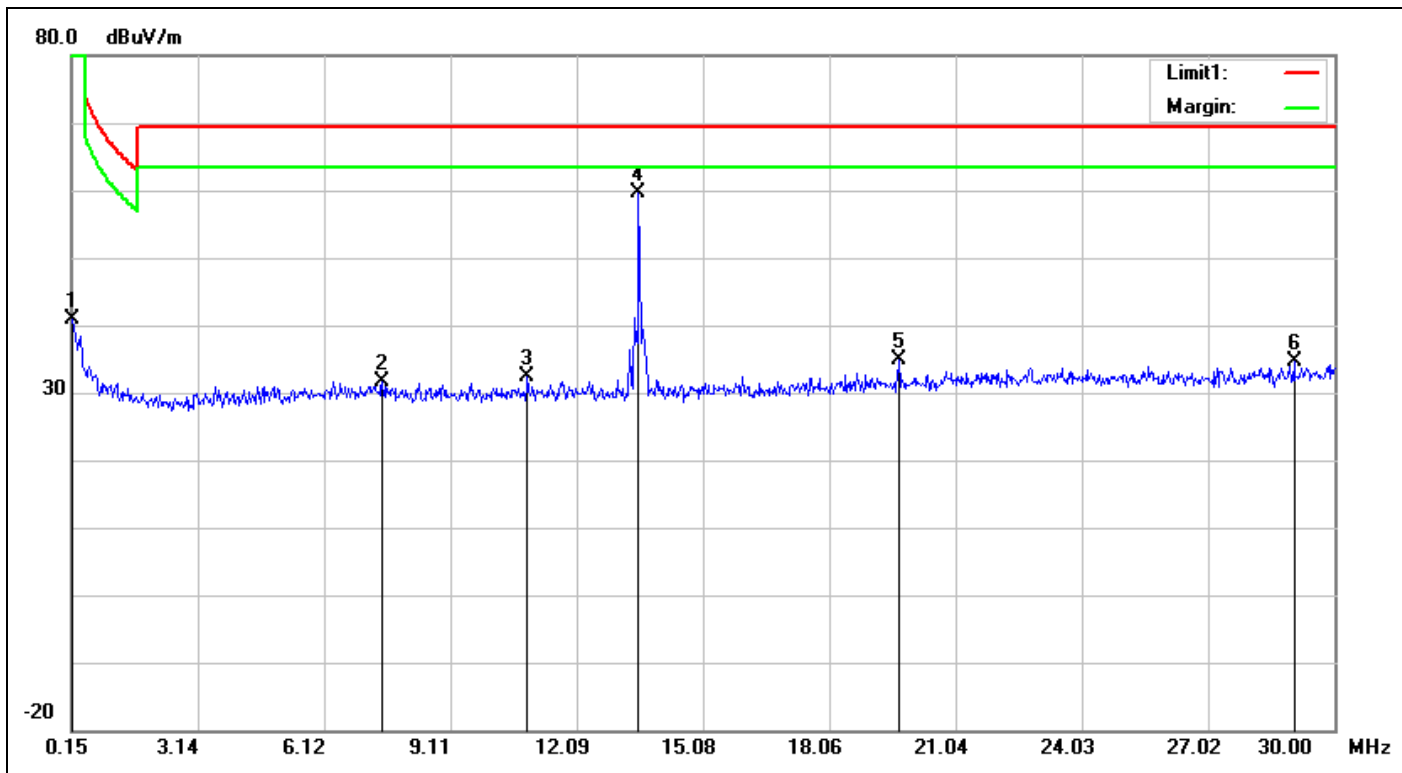
<b>Service No.:</b>	114052380-FCC	<b>Test Distance:</b>	3m
<b>Test Standard:</b>	FCC15.209_9k-1G_3m	<b>Ant. Polarization:</b>	
<b>Test item:</b>	Radiation Emission	<b>Test Time:</b>	2016/7/11 10:19:05
<b>Applicant:</b>	Nedap	<b>Test Rating:</b>	DC 12V
<b>Product:</b>	MACE reader	<b>Temp.(°C)/Hum.(%):</b>	24.8(°C)/50%
<b>Model No.:</b>	MACE READER MM QR	<b>Test Engineer:</b>	George Yang
<b>Test Mode:</b>	Tag: NFC		
<b>Remark:</b>			

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	0.0096	20.31	32.36	52.67	127.84	-75.17	QP	100	94	
2	0.0421	19.93	20.89	40.82	115.05	-74.23	QP	100	163	
3	0.0633	19.52	16.82	36.34	111.52	-75.18	QP	100	46	
4	0.0960	19.27	13.08	32.35	107.91	-75.56	QP	100	359	
5	0.1200	19.24	35.77	55.01	105.98	-50.97	QP	100	349	
6	0.1497	19.25	10.21	29.46	104.06	-74.60	QP	100	43	

# Spurious Emissions, TX Mode, 150 kHz -30MHz



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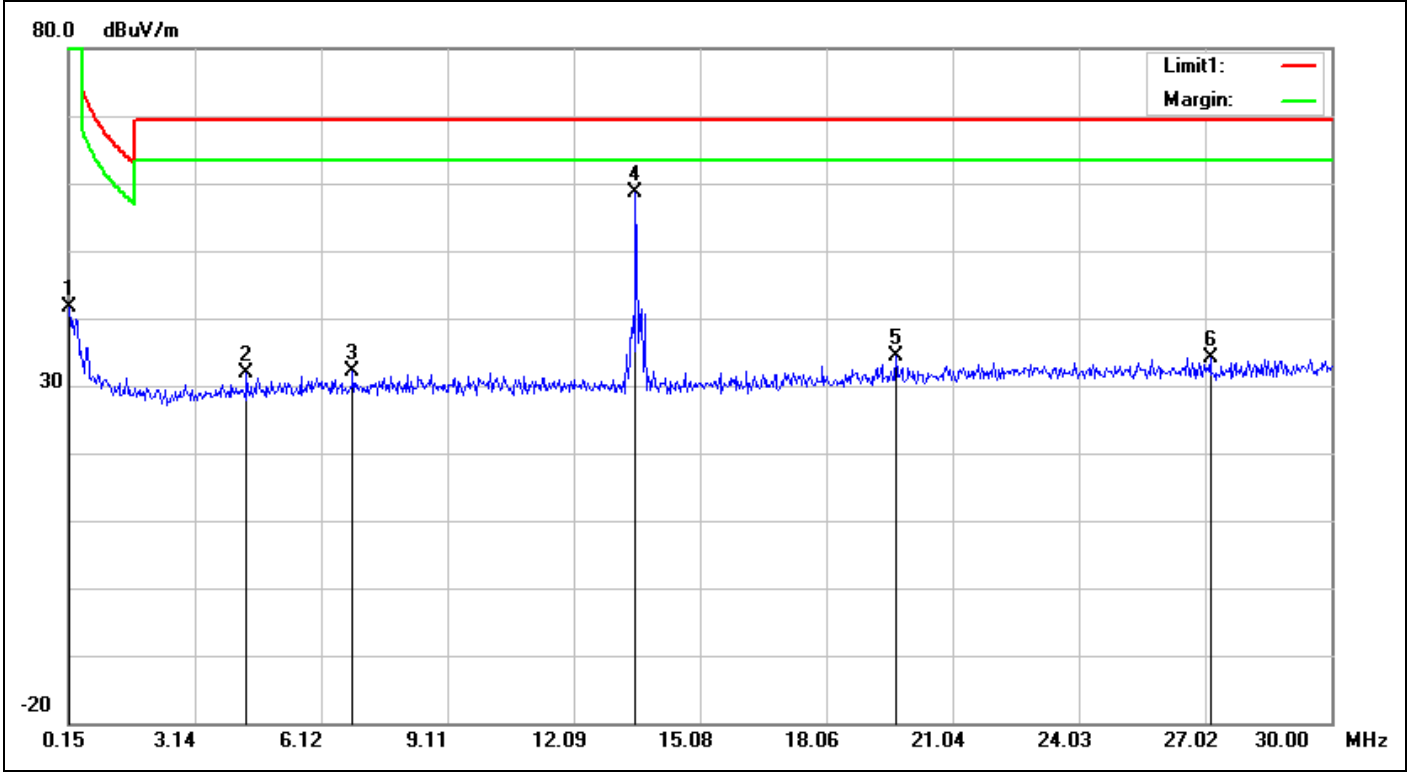


<b>Service No.:</b>	114052380-FCC	<b>Test Distance:</b>	3m
<b>Test Standard:</b>	FCC15.209_9k-1G_3m	<b>Ant. Polarization:</b>	
<b>Test item:</b>	Radiation Emission	<b>Test Time:</b>	2016/7/11 10:14:55
<b>Applicant:</b>	Nedap	<b>Test Rating:</b>	DC 12V
<b>Product:</b>	MACE reader	<b>Temp.(°C)/Hum.(%):</b>	24.8(°C)/50%
<b>Model No.:</b>	MACE READER MM QR	<b>Test Engineer:</b>	George Yang
<b>Test Mode:</b>	TAG: NFC		
<b>Remark:</b>			

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	0.1500	19.25	21.56	40.81	104.05	-63.24	QP	100	187	
2	7.4931	20.10	11.60	31.70	69.50	-37.80	QP	100	14	
3	10.9259	20.61	11.74	32.35	69.50	-37.15	QP	100	144	
4	13.5526	20.94	38.57	59.51	69.50	-9.99	QP	100	3	
5	19.7018	21.71	13.09	34.80	69.50	-34.70	QP	100	99	
6	29.0448	22.23	12.37	34.60	69.50	-34.90	QP	100	113	



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<b>Service No.:</b>	114052380-FCC	<b>Test Distance:</b>	3m
<b>Test Standard:</b>	FCC15.209_9k-1G_3m	<b>Ant. Polarization:</b>	
<b>Test item:</b>	Radiation Emission	<b>Test Time:</b>	2016/7/11 10:10:35
<b>Applicant:</b>	Nedap	<b>Test Rating:</b>	DC 12V
<b>Product:</b>	MACE reader	<b>Temp.(°C)/Hum.(%):</b>	24.8(°C)/50%
<b>Model No.:</b>	MACE READER MM QR	<b>Test Engineer:</b>	George Yang
<b>Test Mode:</b>	120kHz , with RFID Tag (120kHz with RFID)		
<b>Remark:</b>			

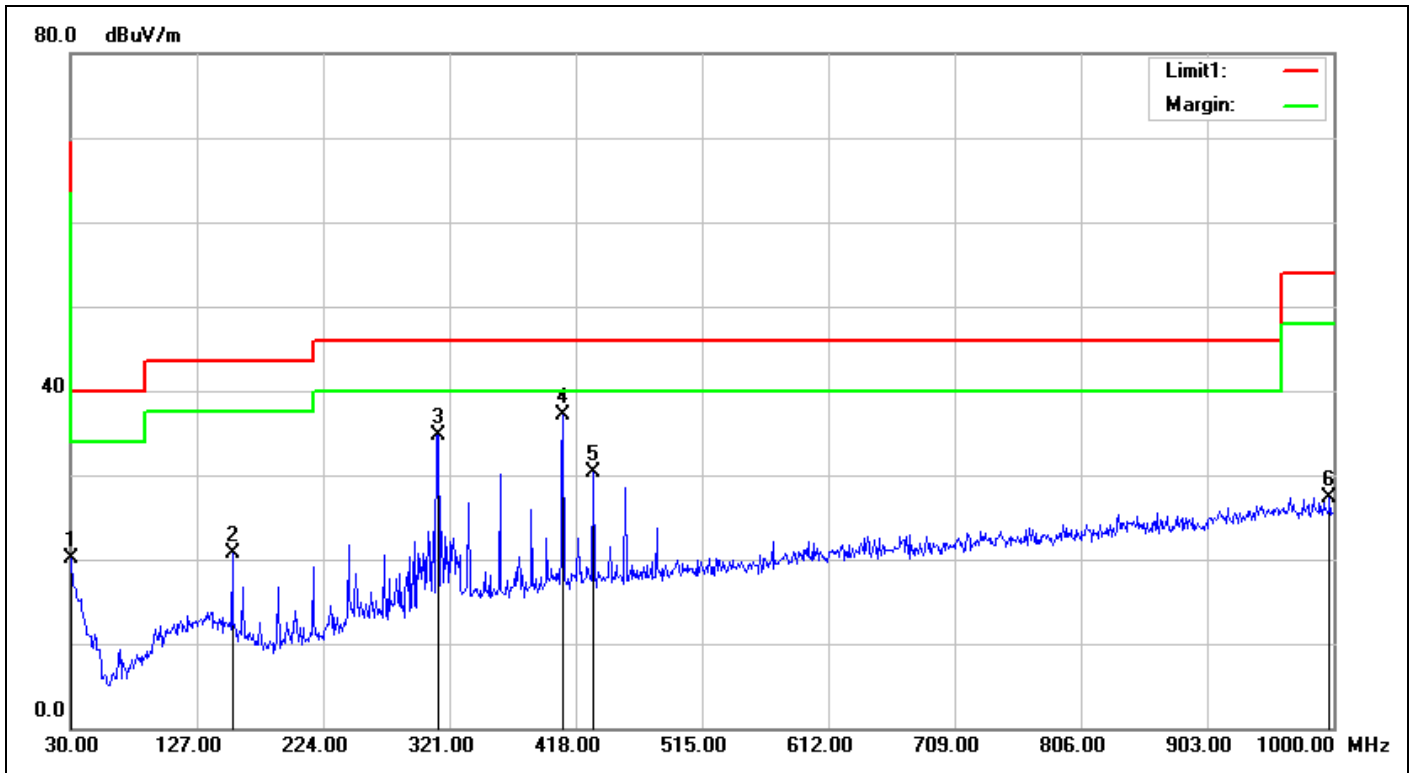
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	0.1799	19.25	22.37	41.62	102.47	-60.85	QP	100	224	
2	4.3589	19.50	12.48	31.98	69.50	-37.52	QP	100	266	
3	6.8662	20.00	12.18	32.18	69.50	-37.32	QP	100	141	
4	13.5526	20.94	37.71	58.65	69.50	-10.85	QP	100	0	
5	19.7018	21.71	12.60	34.31	69.50	-35.19	QP	100	253	
6	27.1344	22.13	12.10	34.23	69.50	-35.27	QP	100	14	

Spurious Emissions, TX Mode 150 kHz -30MHz

# Spurious Emissions, TX Mode, 30MHz-1GHz



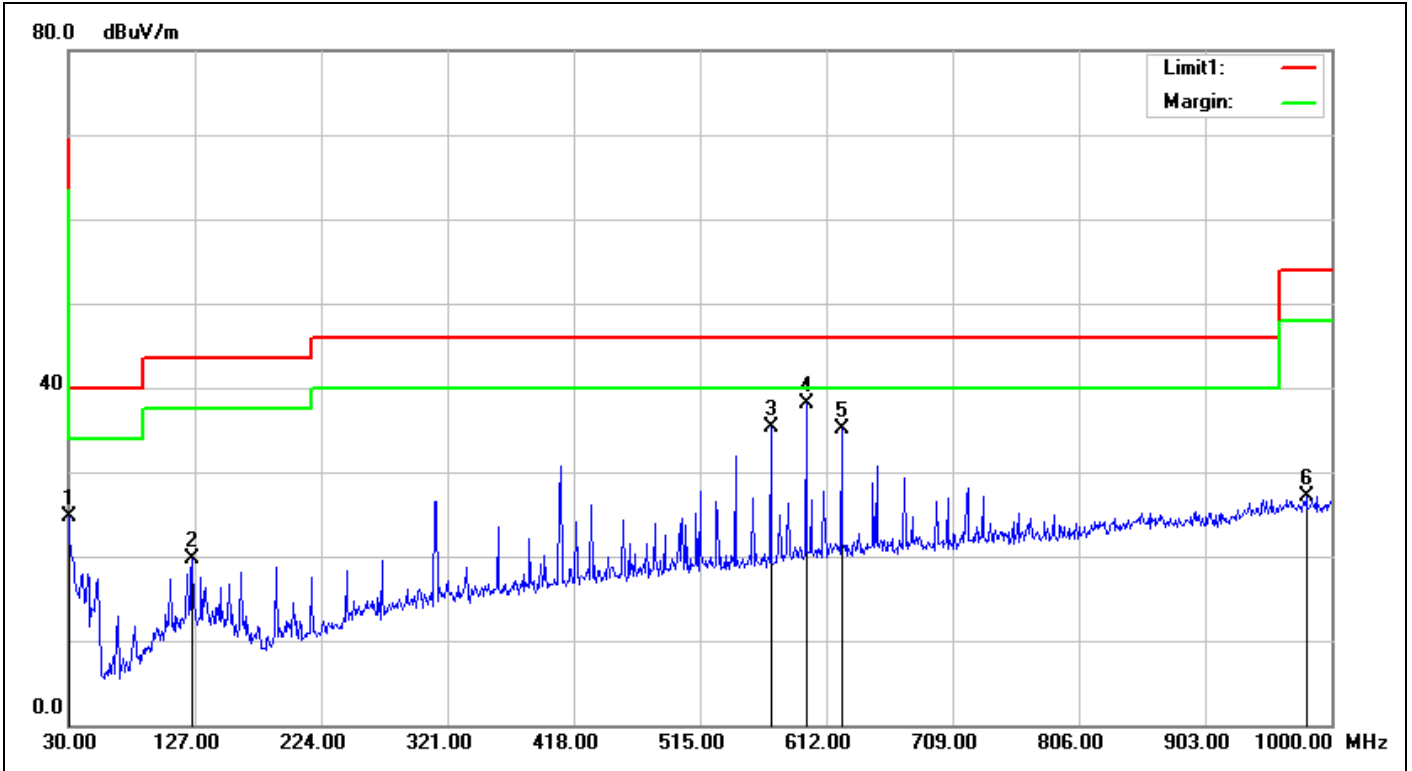
**TUV Taiwan**  
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 Tel:+886-2172-7000 fax:+886-2528-0018



<b>Service No.:</b>	<b>114052380-FCC</b>	<b>Test Distance:</b>	<b>3m</b>
<b>Test Standard:</b>	<b>FCC15.209_9k-1G_3m</b>	<b>Ant. Polarization:</b>	<b>Horizontal</b>
<b>Test item:</b>	<b>Radiation Emission</b>	<b>Test Time:</b>	<b>2016/7/11 09:57:02</b>
<b>Applicant:</b>	<b>Nedap</b>	<b>Test Rating:</b>	<b>DC 12V</b>
<b>Product:</b>	<b>MACE reader</b>	<b>Temp.(°C)/Hum.(%):</b>	<b>24.8(°C)/50%</b>
<b>Model No.:</b>	<b>MACE READER MM QR</b>	<b>Test Engineer:</b>	<b>George Yang</b>
<b>Test Mode:</b>	<b>TAG: NFC</b>		
<b>Remark:</b>			

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	30.9699	-6.39	26.59	20.20	40.00	-19.80	QP	100	359	
2	154.1599	-13.51	34.18	20.67	43.50	-22.83	QP	100	237	
3	312.2699	-10.21	44.90	34.69	46.00	-11.31	QP	100	134	
4	408.3000	-8.57	45.76	37.19	46.00	-8.81	QP	100	227	
5	431.5799	-8.27	38.66	30.39	46.00	-15.61	QP	100	224	
6	997.0900	-0.03	27.39	27.36	54.00	-26.64	QP	100	245	

## Spurious Emissions, TX Mode, 30M-1GHz



<b>Service No.:</b>	<b>114052380-FCC</b>	<b>Test Distance:</b>	<b>3m</b>
<b>Test Standard:</b>	<b>FCC15.209_9k-1G_3m</b>	<b>Ant. Polarization:</b>	<b>Vertical</b>
<b>Test item:</b>	<b>Radiation Emission</b>	<b>Test Time:</b>	<b>2016/7/11 09:58:06</b>
<b>Applicant:</b>	<b>Nedap</b>	<b>Test Rating:</b>	<b>DC 12V</b>
<b>Product:</b>	<b>MACE reader</b>	<b>Temp.(°C)/Hum.(%):</b>	<b>24.8(°C)/50%</b>
<b>Model No.:</b>	<b>MACE READER MM QR</b>	<b>Test Engineer:</b>	<b>George Yang</b>
<b>Test Mode:</b>	<b>TAG: NFC</b>		
<b>Remark:</b>			

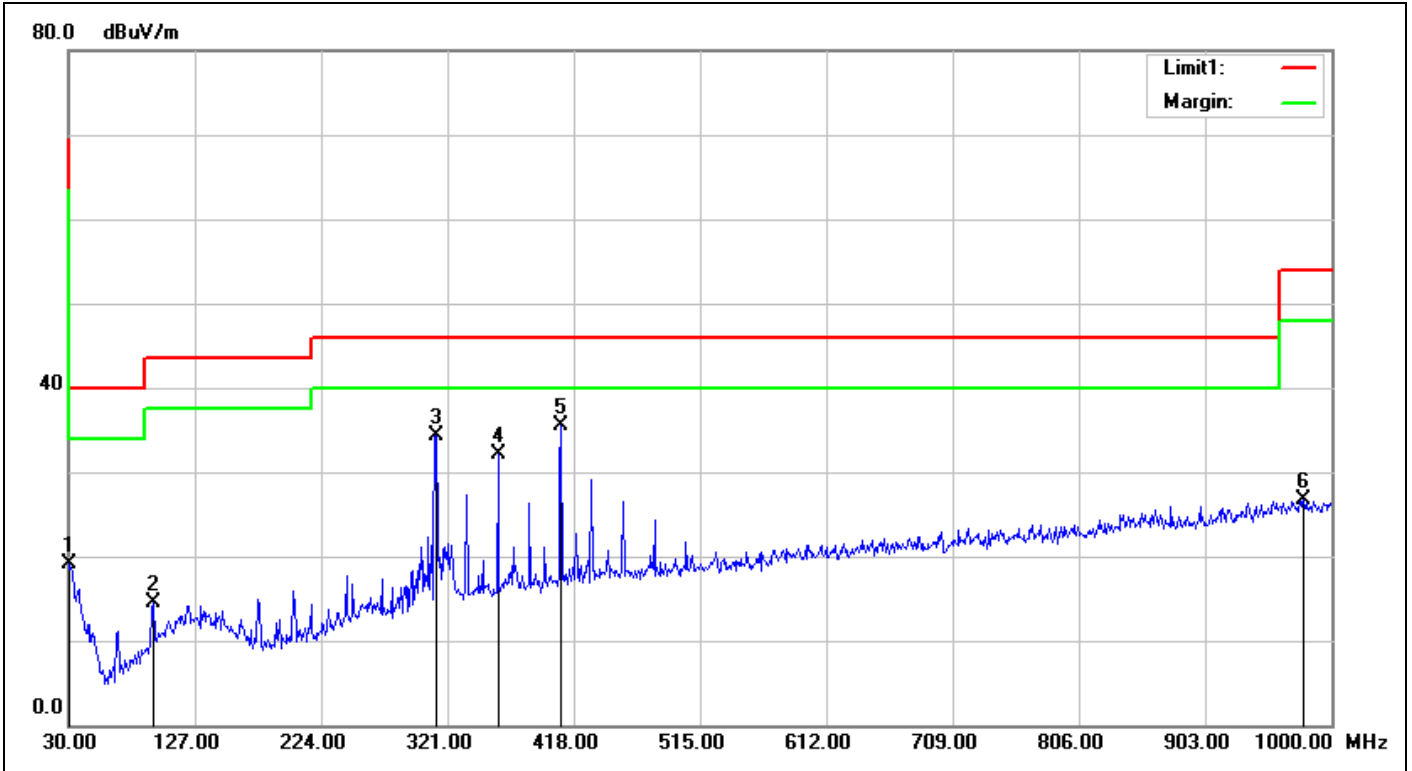
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	30.0000	-5.85	30.62	24.77	40.00	-15.23	QP	100	336	
2	125.0600	-12.84	32.56	19.72	43.50	-23.78	QP	100	197	
3	569.3200	-6.61	41.99	35.38	46.00	-10.62	QP	100	343	
4	596.4800	-6.06	44.18	38.12	46.00	-7.88	QP	100	343	
5	623.6400	-5.71	40.74	35.03	46.00	-10.97	QP	100	360	
6	980.6000	-0.20	27.36	27.16	54.00	-26.84	QP	100	85	

**Spurious Emissions, TX Mode, 30M-1GHz**





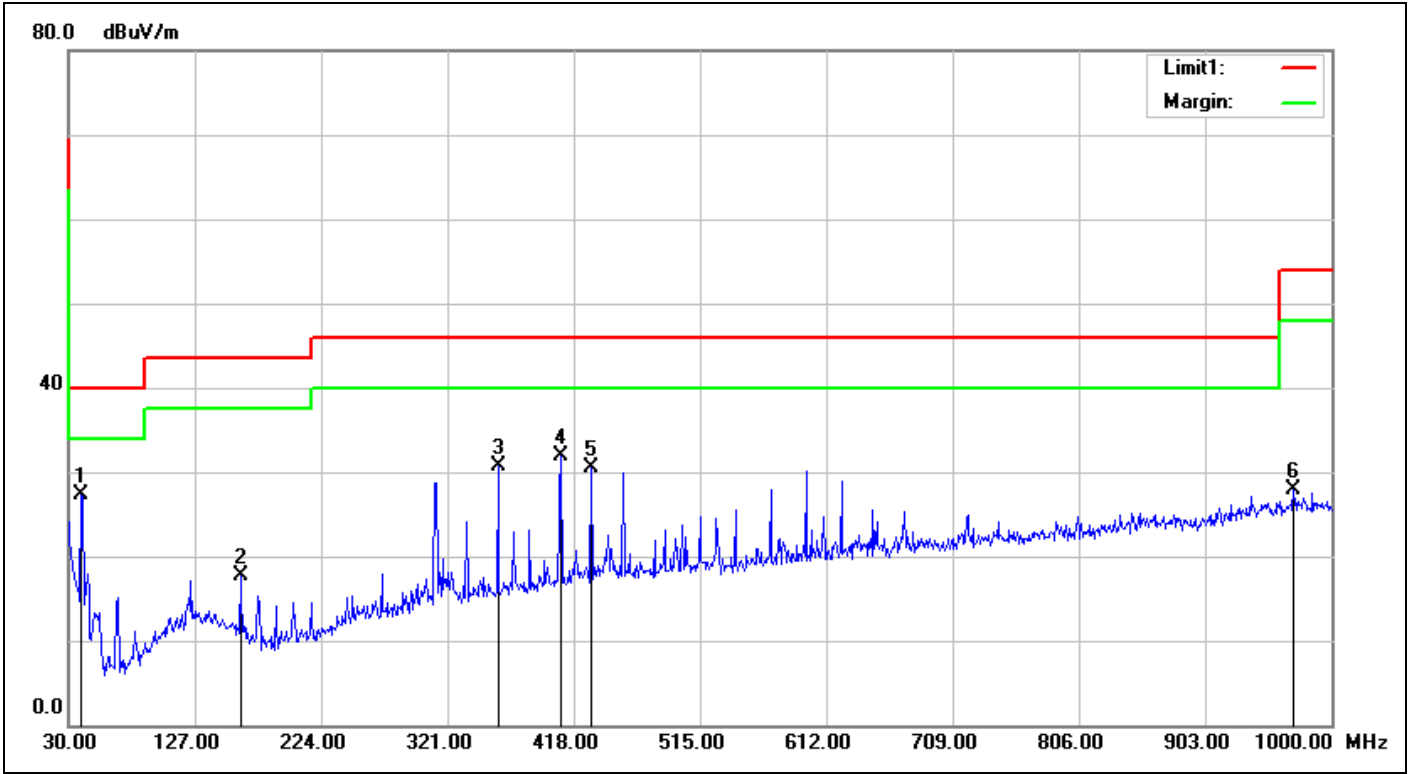
**TUV Taiwan**  
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<b>Service No.:</b>	114052380-FCC	<b>Test Distance:</b>	3m
<b>Test Standard:</b>	FCC15.209_9k-1G_3m	<b>Ant. Polarization:</b>	Horizontal
<b>Test item:</b>	Radiation Emission	<b>Test Time:</b>	2016/7/11 09:36:09
<b>Applicant:</b>	Nedap	<b>Test Rating:</b>	DC 12V
<b>Product:</b>	MACE reader	<b>Temp.(°C)/Hum.(%):</b>	24.8(°C)/50%
<b>Model No.:</b>	MACE READER MM QR	<b>Test Engineer:</b>	George Yang
<b>Test Mode:</b>	120kHz , with RFID Tag (120kHz with RFID)		
<b>Remark:</b>			

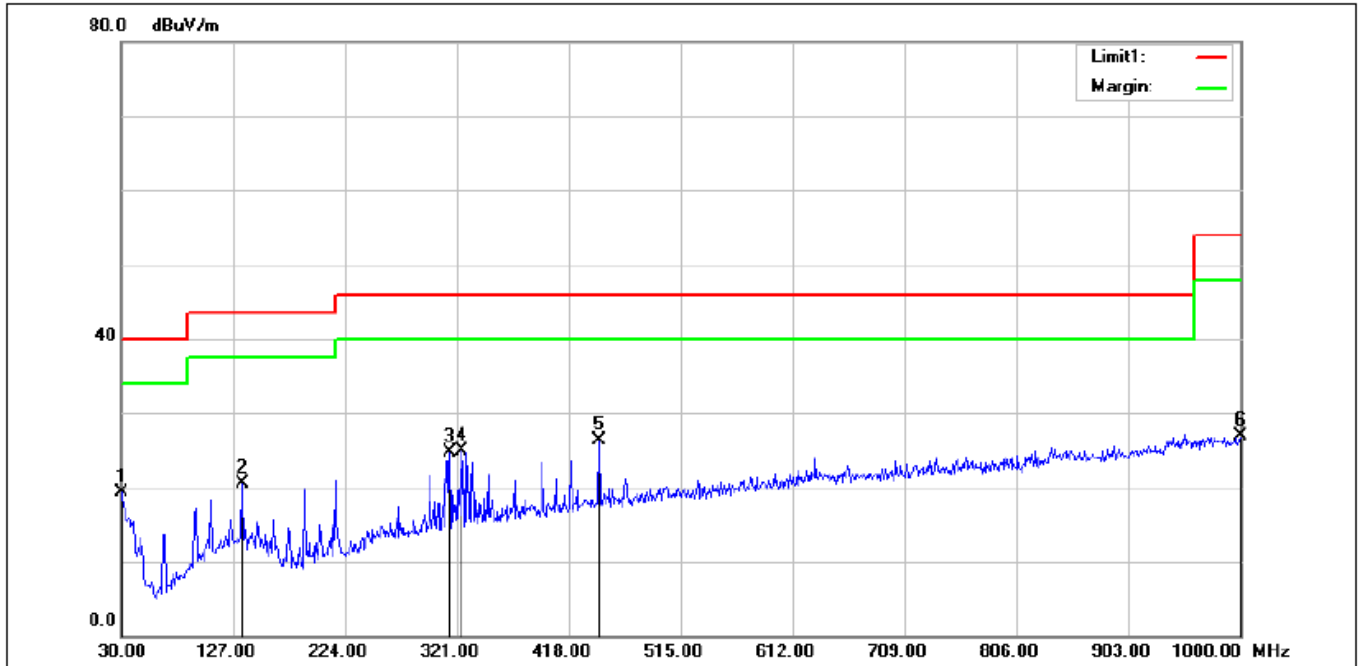
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	30.0000	-5.85	25.01	19.16	40.00	-20.84	QP	100	360	
2	94.9899	-15.64	30.15	14.51	43.50	-28.99	QP	100	282	
3	312.2699	-10.21	44.60	34.39	46.00	-11.61	QP	100	149	
4	359.8000	-9.24	41.36	32.12	46.00	-13.88	QP	100	139	
5	408.3000	-8.57	44.07	35.50	46.00	-10.50	QP	100	141	
6	978.6599	-0.22	26.96	26.74	54.00	-27.26	QP	100	115	

Spurious Emissions, TX Mode, 30M-1GHz



<b>Service No.:</b>	114052380-FCC	<b>Test Distance:</b>	3m
<b>Test Standard:</b>	FCC15.209_9k-1G_3m	<b>Ant. Polarization:</b>	Vertical
<b>Test item:</b>	Radiation Emission	<b>Test Time:</b>	2016/7/11 09:37:12
<b>Applicant:</b>	Nedap	<b>Test Rating:</b>	DC 12V
<b>Product:</b>	MACE reader	<b>Temp.(°C)/Hum.(%):</b>	24.8(°C)/50%
<b>Model No.:</b>	MACE READER MM QR	<b>Test Engineer:</b>	George Yang
<b>Test Mode:</b>	120kHz , with RFID Tag (120kHz with RFID)		
<b>Remark:</b>			

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	39.7000	-11.32	38.53	27.21	40.00	-12.79	QP	100	280	
2	161.9200	-14.06	31.81	17.75	43.50	-25.75	QP	100	22	
3	359.8000	-9.24	39.96	30.72	46.00	-15.28	QP	100	232	
4	408.3000	-8.57	40.57	32.00	46.00	-14.00	QP	100	282	
5	431.5800	-8.27	38.68	30.41	46.00	-15.59	QP	100	16	
6	970.9000	-0.29	28.13	27.84	54.00	-26.16	QP	100	341	

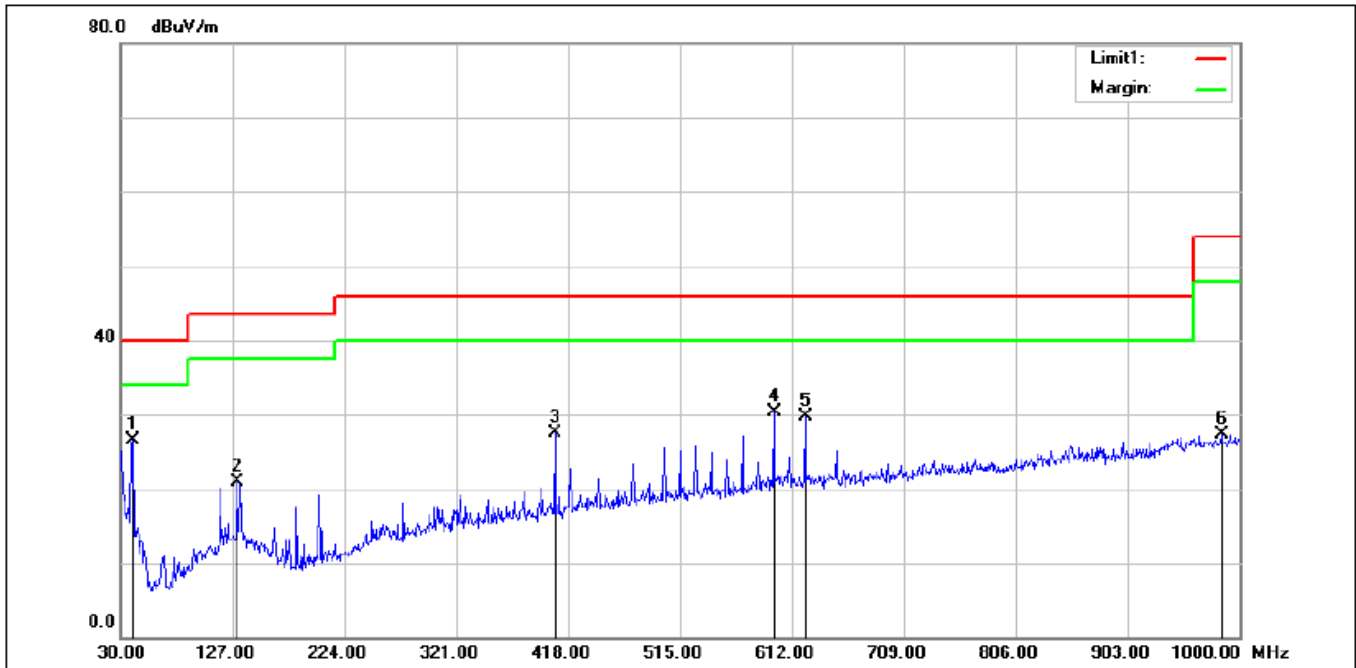


Service No.: 114052380(QR)  
 Test Standard: FCC Class B 3M Radiation  
 Test item: Radiation Emission  
 Applicant: Nedap  
 Product: MACE READER  
 Model No.: MACE READER MM

Test Distance: 3m  
 Ant. Polarization: Horizontal  
 Temp.(°C)/Hum.(%): 21.6(°C) / 52 %  
 Test Rating: DC 24V  
 Test Engineer: George Yang

Test Mode: (a) 120kHz + RFID  
 Remark:

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (°)	P/F	Remark
1	30.0000	-5.85	25.16	19.31	40.00	-20.69	QP	200	6	P	
2	134.7600	-12.68	33.11	20.43	43.50	-23.07	QP	200	158	P	
3	315.1800	-10.14	34.82	24.68	46.00	-21.32	QP	100	102	P	
4	324.8800	-9.93	34.77	24.84	46.00	-21.16	QP	100	102	P	
5	444.1900	-8.11	34.43	26.32	46.00	-19.68	QP	100	229	P	
6	1000.0000	0.01	26.85	26.86	54.00	-27.14	QP	200	360	P	



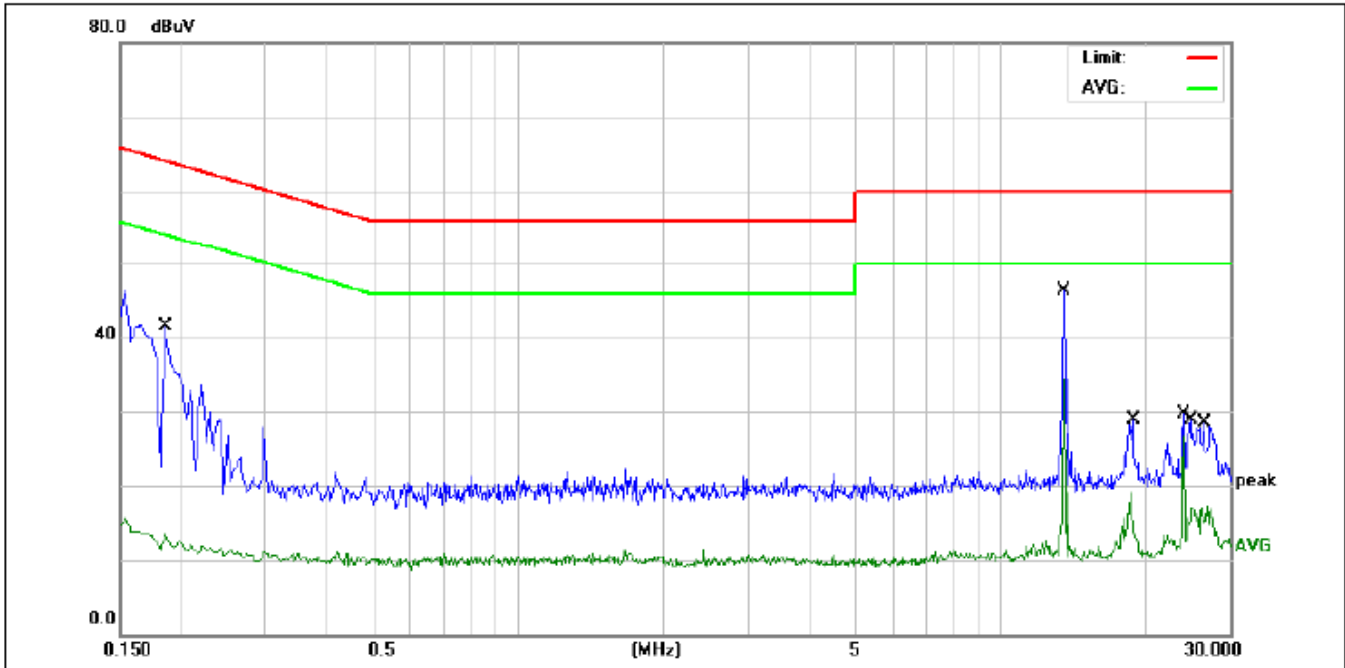
Service No.: 114052380(QR)  
 Test Standard: FCC Class B 3M Radiation  
 Test item: Radiation Emission  
 Applicant: Nedap  
 Product: MACE READER  
 Model No.: MACE READER MM

Test Distance: 3m  
 Ant. Polarization: Vertical  
 Temp.(°C)/Hum.(%): 21.6(°C) / 52 %  
 Test Rating: DC 24V  
 Test Engineer: George Yang

Test Mode: (a) 120kHz + RFID  
 Remark:

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (°)	P/F	Remark
1	40.6700	-11.86	38.44	26.58	40.00	-13.42	QP	100	237	P	
2	130.8800	-12.67	33.67	21.00	43.50	-22.50	QP	100	160	P	
3	406.3600	-8.61	36.12	27.51	46.00	-18.49	QP	200	216	P	
4	596.4800	-6.06	36.44	30.38	46.00	-15.62	QP	100	22	P	
5	623.6400	-5.71	35.49	29.78	46.00	-16.22	QP	100	285	P	
6	984.4800	-0.15	27.45	27.30	54.00	-26.70	QP	200	0	P	

# Mains Spurious Emissions

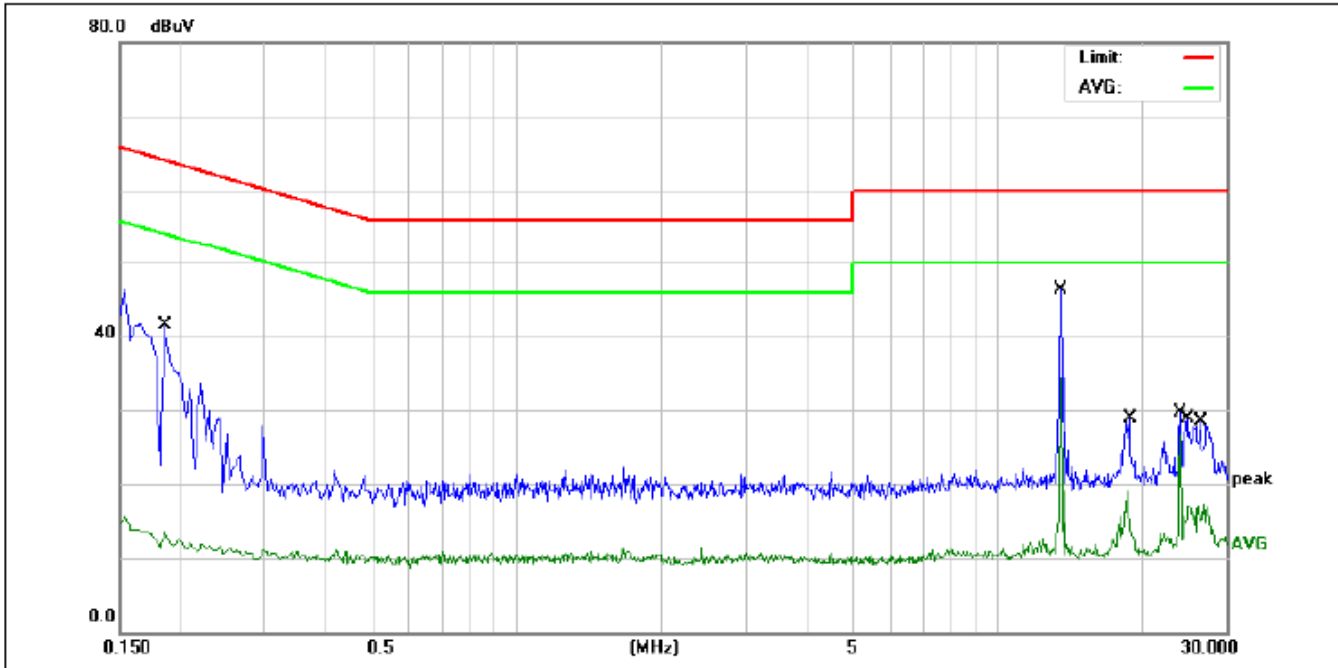


Service No.: 114052380  
 Test Standard: FCC Class B Conduction(QP)  
 Test item: Conducted Emission  
 Applicant: Nedap  
 Product: MACE READER  
 Model No.: MACE READER MM QR

Phase: N  
 Temp.(°C)/Hum.(%): 23.4(°C) / 41 %  
 Power Rating: AC 120V (DC 12V)  
 Test Engineer: George Yang

Test Mode: (a) QR code + 120kHz + RFID  
 Remark:

No.	Frequency (MHz)	Factor ( )	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1860	9.70	23.77	33.47	64.21	-30.74	QP	P	
2	0.1860	9.70	2.96	12.66	54.21	-41.55	AVG	P	
3	13.5660	9.88	31.55	41.43	60.00	-18.57	QP	P	
4	13.5660	9.88	12.30	22.18	50.00	-27.82	AVG	P	
5	18.9020	9.90	12.98	22.88	60.00	-37.12	QP	P	
6	18.9020	9.90	5.09	14.99	50.00	-35.01	AVG	P	
7	24.0220	10.03	17.64	27.67	60.00	-32.33	QP	P	
8	24.0220	10.03	16.41	26.44	50.00	-23.56	AVG	P	
9	24.8860	10.03	12.40	22.43	60.00	-37.57	QP	P	
10	24.8860	10.03	3.60	13.63	50.00	-36.37	AVG	P	
11	26.4180	10.04	10.83	20.87	60.00	-39.13	QP	P	
12	26.4180	10.04	4.74	14.78	50.00	-35.22	AVG	P	



Service No.: 114052380  
 Test Standard: FCC Class B Conduction(QP)  
 Test item: Conducted Emission  
 Applicant: Nedap  
 Product: MACE READER  
 Model No.: MACE READER MM QR

Phase: N  
 Temp.(°C)/Hum.(%): 23.4(°C) / 41 %  
 Power Rating: AC 120V (DC 12V)  
 Test Engineer: George Yang

Test Mode: (a) QR code + 120kHz + RFID  
 Remark:

No.	Frequency (MHz)	Factor ()	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1860	9.70	23.77	33.47	64.21	-30.74	QP	P	
2	0.1860	9.70	2.96	12.66	54.21	-41.55	AVG	P	
3	13.5660	9.88	31.55	41.43	60.00	-18.57	QP	P	
4	13.5660	9.88	12.30	22.18	50.00	-27.82	AVG	P	
5	18.9020	9.90	12.98	22.88	60.00	-37.12	QP	P	
6	18.9020	9.90	5.09	14.99	50.00	-35.01	AVG	P	
7	24.0220	10.03	17.64	27.67	60.00	-32.33	QP	P	
8	24.0220	10.03	16.41	26.44	50.00	-23.56	AVG	P	
9	24.8860	10.03	12.40	22.43	60.00	-37.57	QP	P	
10	24.8860	10.03	3.60	13.63	50.00	-36.37	AVG	P	
11	26.4180	10.04	10.83	20.87	60.00	-39.13	QP	P	
12	26.4180	10.04	4.74	14.78	50.00	-35.22	AVG	P	