

Appendix D: Test Results of Radiated Spurious Emissions_PCB

Antenna

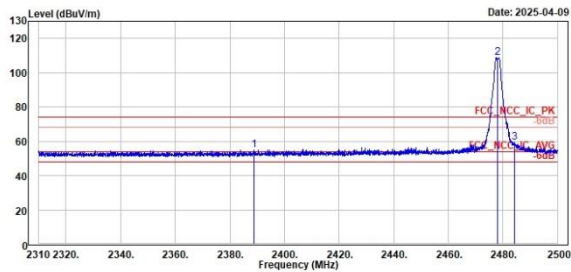
PIC32WM-BW1002UC, ANT 13, Main Source, MPA Mode
Band Edges, 2.31GHz ~ 2.5GHz

BLE_2M

High Channel (Horizontal) Peak



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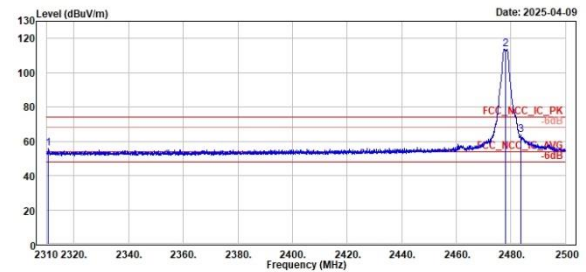


Peak	Freq	Level	Read	Level	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg				
1	2388.76	54.89	16.69	38.20	74.00	-19.11	128	307	Peak	Horizontal		
2 *	2478.00	108.59	70.00	38.59	74.00	34.59	128	307	Peak	Horizontal		
3	2484.14	59.48	20.88	38.60	74.00	-14.52	128	307	Peak	Horizontal		

High Channel (Vertical) Peak



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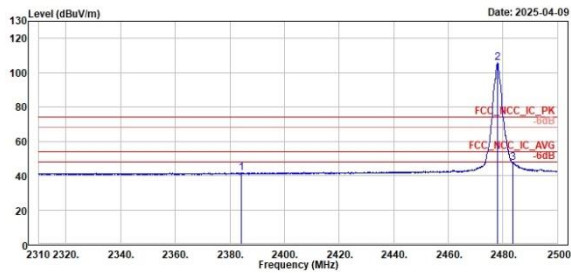
Peak	Freq	Level	Read	Level	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg				
1	2310.67	56.10	18.39	37.71	74.00	-17.90	203	306	Peak	Vertical		
2 *	2478.00	113.55	74.96	38.59	74.00	39.55	203	306	Peak	Vertical		
3	2483.52	63.73	25.13	38.60	74.00	-10.27	203	306	Peak	Vertical		

BLE_2M

High Channel (Horizontal) Average



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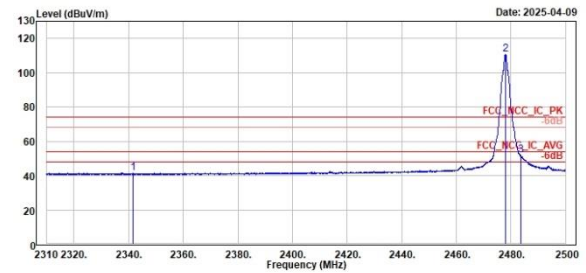


	Freq	Level	Read	Level	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	dB	cm	deg			
1	2384.05	41.57	3.42	38.15	54.00	-12.43	128	387	Average	Horizontal		
2 *	2478.00	105.68	67.89	38.59	54.00	51.68	128	387	Average	Horizontal		
3	2483.61	47.44	8.84	38.60	54.00	-6.56	128	387	Average	Horizontal		

High Channel (Vertical) Average



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	Freq	Level	Read	Level	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	dB	cm	deg			
1	2341.59	41.57	3.76	37.81	54.00	-12.43	283	306	Average	Vertical		
2 *	2478.00	110.67	72.88	38.59	54.00	56.67	283	306	Average	Vertical		
3 †	2483.57	51.67	13.07	38.60	54.00	-2.33	283	306	Average	Vertical		

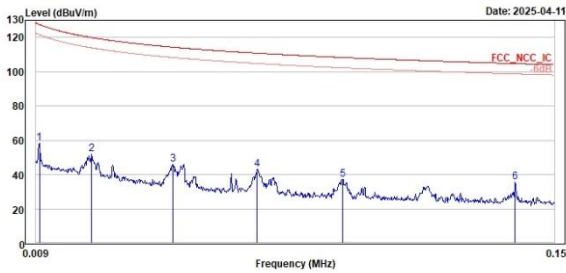
Spurious Emissions, Tx Mode, 9kHz ~ 30MHz

BLE_2M

Low Channel (Open) 9kHz~150kHz



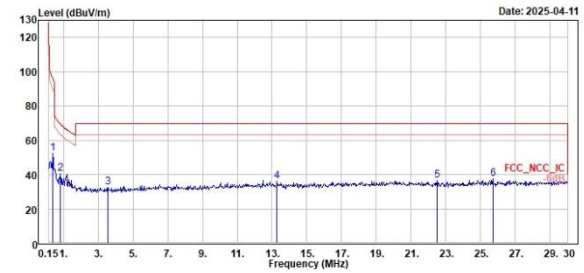
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	Freq	Level	Read	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	0.01	58.12	40.01	18.11	127.60	-69.48	100	329	Peak	Open	
2	0.02	51.68	31.96	19.72	119.90	-68.22	100	196	Peak	Open	
3	0.05	45.86	26.84	19.02	114.27	-68.41	100	212	Peak	Open	
4	0.07	43.08	24.61	18.47	110.79	-67.71	100	197	Peak	Open	
5	0.09	37.17	19.15	18.02	108.29	-71.12	100	200	Peak	Open	
6	0.14	35.56	17.29	18.27	104.72	-69.16	100	177	Peak	Open	



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	Freq	Level	Read	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	0.39	52.43	33.79	18.64	95.81	-43.38	100	192	Peak	Open	
2	0.84	40.41	21.48	18.93	69.15	-28.74	100	121	Peak	Open	
3	3.55	32.83	13.62	19.21	69.50	-36.67	100	239	Peak	Open	
4	13.28	35.94	14.37	21.57	69.50	-33.56	100	213	Peak	Open	
5	22.48	36.44	14.20	22.24	69.50	-33.06	100	224	Peak	Open	
6	25.70	37.58	14.62	22.96	69.50	-31.92	100	344	Peak	Open	

Spurious Emissions, Tx Mode, 30MHz ~ 1GHz

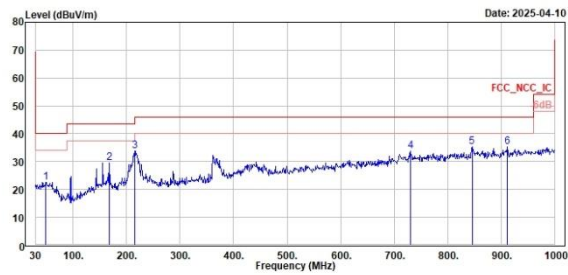
BLE_2M

Low Channel (Horizontal)

Low Channel (Vertical)



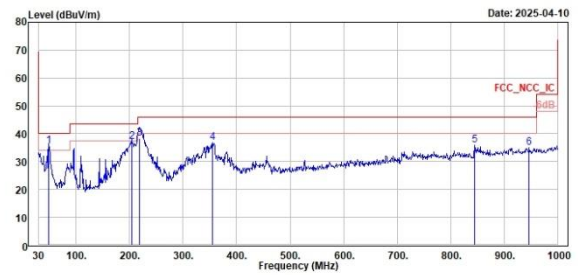
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	Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	49.48	22.59	28.35	-5.76	40.00	-17.41	100	335 Peak	Horizontal	
2	167.74	29.62	35.50	-5.88	43.50	-13.88	100	267 Peak	Horizontal	
3	215.27	33.90	42.20	-8.30	43.50	-9.60	100	182 Peak	Horizontal	
4	730.34	33.61	30.82	2.79	46.00	-12.39	100	167 Peak	Horizontal	
5	845.77	35.15	31.06	4.09	46.00	-10.85	100	95 Peak	Horizontal	
6	911.73	35.29	29.99	5.30	46.00	-10.71	100	327 Peak	Horizontal	



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	Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	48.43	35.72	41.49	-5.77	40.00	-4.28	100	23 QP	Vertical	
2	203.63	37.13	45.30	-8.17	43.50	-6.37	200	52 Peak	Vertical	
3	218.18	38.45	46.71	-8.26	46.00	-7.55	100	230 QP	Vertical	
4	354.95	36.93	41.17	-4.24	46.00	-9.07	117	360 Peak	Vertical	
5	844.80	35.80	31.73	4.07	46.00	-10.20	153	360 Peak	Vertical	
6	946.65	35.13	29.42	5.71	46.00	-10.87	142	360 Peak	Vertical	

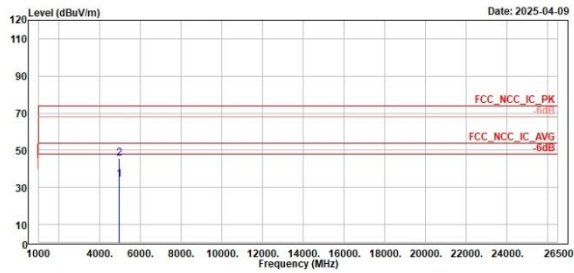
Spurious Emissions, Tx Mode, 1GHz ~ 26.5GHz

BLE_2M

High Channel (Horizontal)



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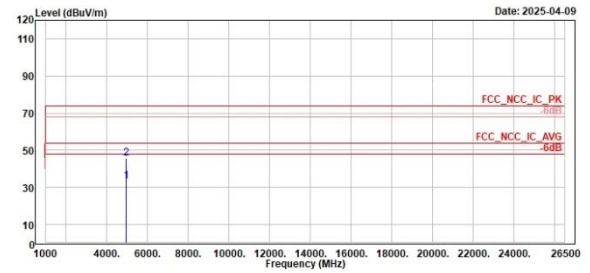


Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	4956.00	34.28	42.94	-8.66	54.00	-19.72	325	75 Average	Horizontal
2	4956.00	45.59	54.25	-8.66	74.00	-28.41	325	75 Peak	Horizontal

High Channel (Vertical)



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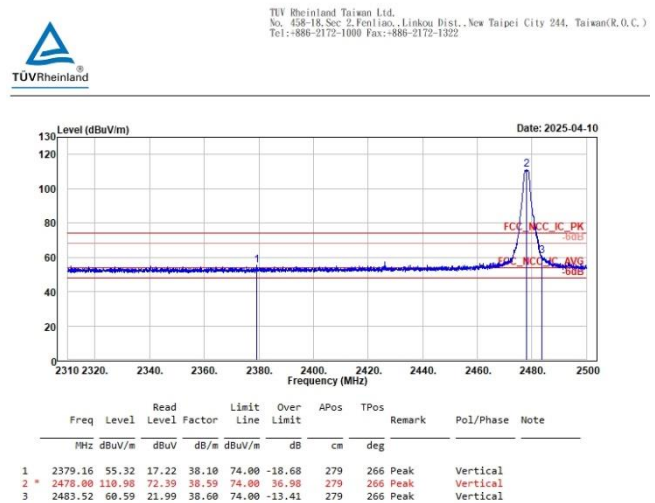
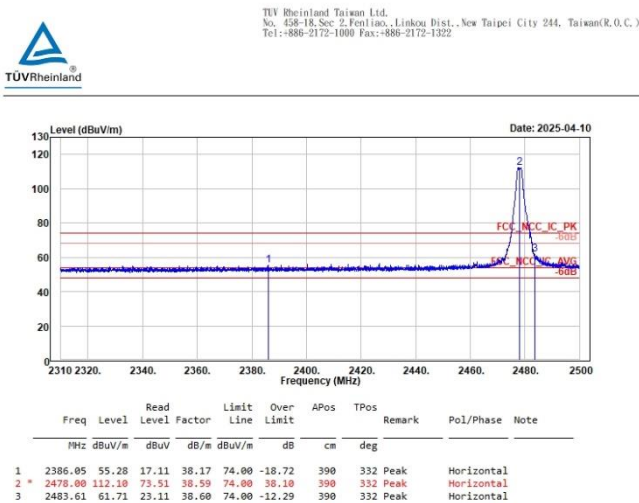
Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	4956.00	33.23	41.89	-8.66	54.00	-20.77	289	307 Average	Vertical
2	4956.00	45.42	54.08	-8.66	74.00	-28.58	289	307 Peak	Vertical

PIC32WM-BW1002UC, ANT 14, Main Source, MPA Mode
Band Edges, 2.31GHz ~ 2.5GHz

BLE_2M

High Channel (Horizontal) Peak

High Channel (Vertical) Peak

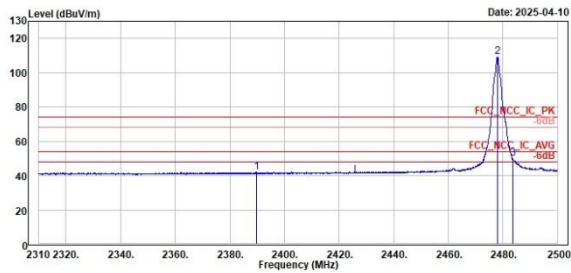


BLE_2M

High Channel (Horizontal) Average



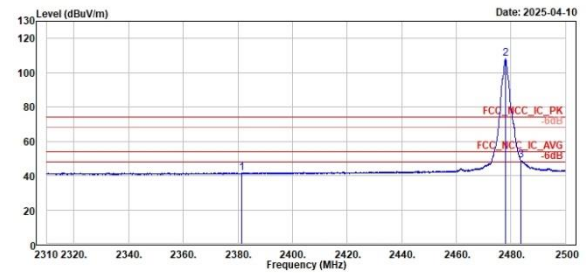
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	Freq	Level	Read	Level	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	dB	cm	deg			
1	2389.66	41.87	3.66	38.21	54.00	-12.13	390	332	Average	Horizontal		
2 *	2478.00	109.17	70.58	38.59	54.00	55.17	390	332	Average	Horizontal		
3 †	2483.47	49.82	11.22	38.60	54.00	-4.18	390	332	Average	Horizontal		



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	Freq	Level	Read	Level	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	dB	cm	deg			
1	2381.30	41.65	3.52	38.13	54.00	-12.35	279	266	Average	Vertical		
2 *	2478.00	100.00	69.49	38.59	54.00	54.00	279	266	Average	Vertical		
3 †	2483.50	48.99	10.39	38.60	54.00	-5.01	279	266	Average	Vertical		

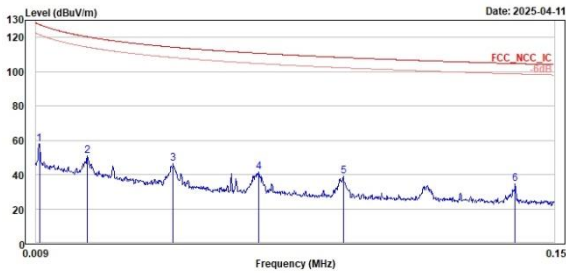
Spurious Emissions, Tx Mode, 9kHz ~ 30MHz

BLE_2M

Low Channel (Open) 9kHz~150kHz



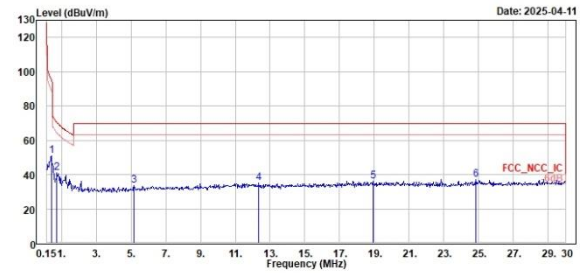
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	Freq	Level	Read	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	0.01	58.02	39.91	18.11	127.60	-69.58	100	261	Peak	Vertical	
2	0.02	50.82	31.15	19.67	120.32	-69.50	100	208	Peak	Vertical	
3	0.05	46.55	27.53	19.02	114.27	-67.72	100	201	Peak	Vertical	
4	0.07	41.66	23.17	18.49	110.76	-69.10	100	201	Peak	Vertical	
5	0.09	38.93	20.91	18.02	108.26	-69.33	100	206	Peak	Vertical	
6	0.14	34.78	16.51	18.27	104.72	-69.94	100	190	Peak	Vertical	



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	Freq	Level	Read	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	0.42	50.85	32.18	18.67	95.17	-44.32	100	105	Peak	Open	
2	0.75	40.80	21.94	18.86	70.14	-29.34	100	156	Peak	Open	
3	5.16	33.37	13.56	19.81	69.50	-36.13	100	184	Peak	Open	
4	12.36	35.16	13.48	21.68	69.50	-34.34	100	310	Peak	Open	
5	18.93	35.86	13.13	22.73	69.50	-33.64	100	47	Peak	Open	
6	24.84	37.17	14.03	23.14	69.50	-32.33	100	75	Peak	Open	

Spurious Emissions, Tx Mode, 30MHz ~ 1GHz

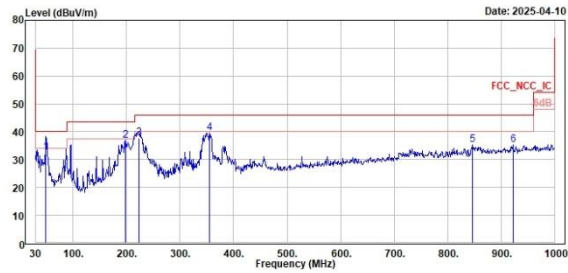
BLE_2M

Low Channel (Horizontal)

Low Channel (Vertical)



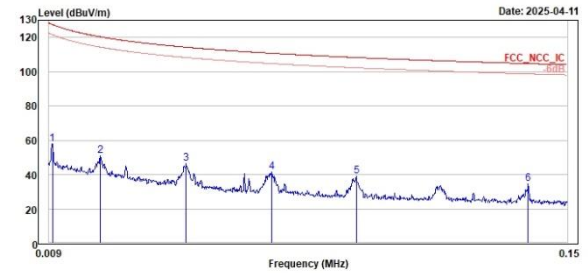
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	Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	49.40	32.43	38.19	-5.76	40.00	-7.57	100	6 QP	Vertical	
2	197.81	36.73	44.91	-8.18	43.50	-6.77	100	260 Peak	Vertical	
3	223.03	37.75	45.80	-8.05	46.00	-8.25	100	259 QP	Vertical	
4	354.95	39.62	43.86	-4.24	46.00	-6.38	100	223 Peak	Vertical	
5	846.74	35.18	31.07	4.11	46.00	-10.82	100	131 Peak	Vertical	
6	922.40	35.33	36.17	5.16	46.00	-10.67	117	360 Peak	Vertical	



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	Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	0.01	50.02	39.91	18.11	127.60	-69.58	100	261 Peak	Vertical	
2	0.02	50.82	31.15	19.67	120.32	-69.50	100	200 Peak	Vertical	
3	0.05	46.55	27.53	19.02	114.27	-67.72	100	201 Peak	Vertical	
4	0.07	41.66	23.17	18.49	110.76	-69.10	100	201 Peak	Vertical	
5	0.09	38.93	20.91	18.02	108.26	-69.33	100	205 Peak	Vertical	
6	0.14	34.78	16.51	18.27	104.72	-69.94	100	190 Peak	Vertical	

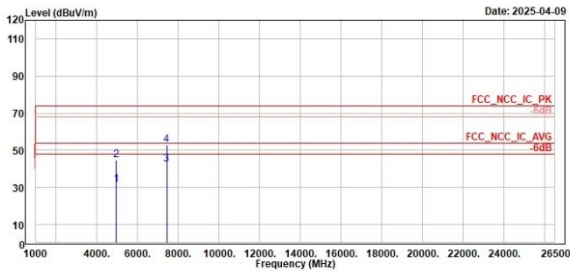
Spurious Emissions, Tx Mode, 1GHz ~ 26.5GHz

BLE_2M

High Channel (Horizontal)



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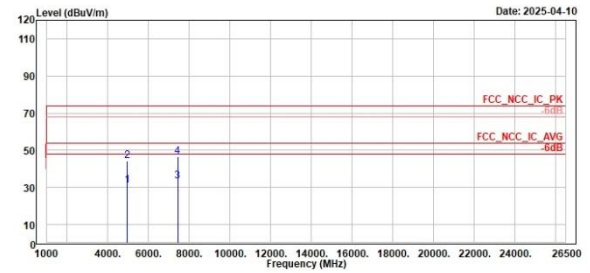


	Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	Level Factor	Line	Limit					
	MHz	dBuV/m	dB/m	dBuV/m	dB	cm	deg			
1	4956.00	31.59	40.25	-8.66	54.00	-22.41	100	71 Average	Horizontal	
2	4956.00	44.82	53.48	-8.66	74.00	-29.18	100	71 Peak	Horizontal	
3	7434.00	42.63	49.37	-6.74	54.00	-11.37	131	150 Average	Horizontal	
4	7434.00	53.01	59.75	-6.74	74.00	-20.99	131	150 Peak	Horizontal	

High Channel (Vertical)



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	Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	Level Factor	Line	Limit					
	MHz	dBuV/m	dB/m	dBuV/m	dB	cm	deg			
1	4956.00	31.14	39.00	-8.66	54.00	-22.86	100	12 Average	Vertical	
2	4956.00	44.41	53.07	-8.66	74.00	-29.59	100	12 Peak	Vertical	
3	7434.00	33.19	39.93	-6.74	54.00	-20.81	200	320 Average	Vertical	
4	7434.00	46.47	53.21	-6.74	74.00	-27.53	200	320 Peak	Vertical	