



APPENDIX J

: ANTENNA SPECIFICATION



Order Number : GETEC-C1-21-725
Test Report Number : GETEC-E3-21-101

FCC Part 15 subpart C

WIFI & BT Antenna

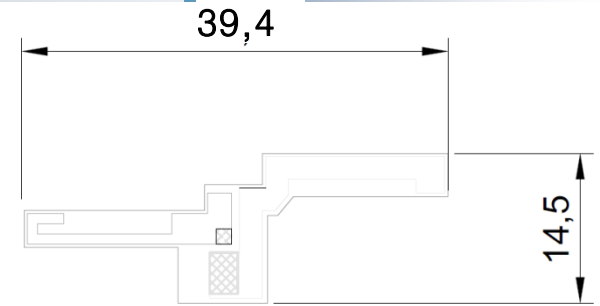
EUT Type: RF Remote Controller

FCC ID.: OZ5URCMX1400I

1. Test Condition

대 외 비 CONFIDENTIAL

1.1 Photo of VSWR Test

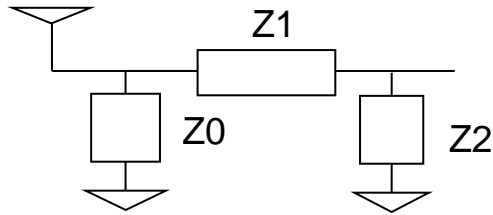


- Antenna Size : 39.4mmX14.5mm
- Cable Length : 90mm

1.2 Photo of Radiation Test

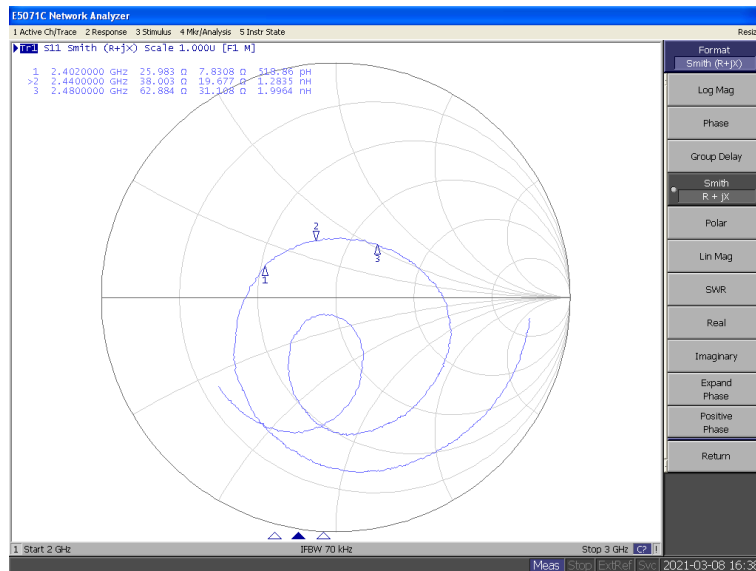


• Antenna & matching

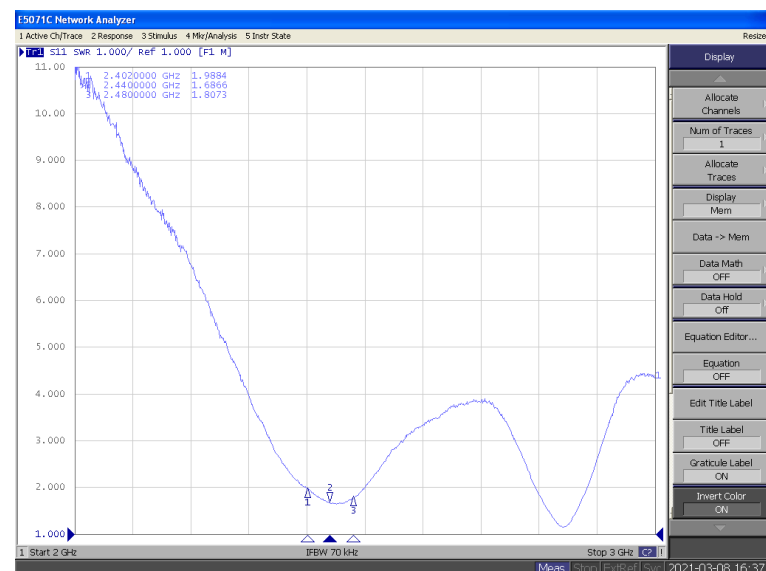


Ant	Sample Ant		
Matching value	Z0	Z1	Z2

• Smith Chart & VSWR



Smith chart



VSWR

- Passive Efficiency

	1	2	3	4	5	6	7	8	9	10	11
Frequency [MHz]	2400	2410	2420	2430	2440	2450	2460	2470	2480	2490	2500
Efficiency [dB]	-3.59	-3.64	-3.26	-3.25	-3.24	-3.23	-3.12	-3.10	-3.16	-3.11	-3.45
Efficiency [%]	43.8	43.2	47.2	47.3	47.4	47.5	48.7	49.0	48.3	48.9	45.2
TRG _g [dB]	-4.87	-4.75	-4.49	-4.42	-4.35	-4.35	-4.24	-4.32	-4.26	-4.15	-4.53
Gain _{g, Peak} [dB]	0.42	0.84	0.79	0.80	0.59	1.00	0.77	0.85	1.28	0.90	0.88
Gain _{g, Min} [dB]	-25.29	-24.23	-29.02	-26.09	-27.15	-35.59	-29.40	-32.55	-26.41	-29.00	-21.39
TRG _p [dB]	-9.51	-10.11	-9.34	-9.54	-9.72	-9.67	-9.55	-9.21	-9.67	-9.80	-10.04
Gain _{p, Peak} [dB]	-4.59	-5.37	-4.39	-4.53	-4.49	-4.26	-4.77	-4.58	-4.41	-5.13	-5.65
Gain _{p, Min} [dB]	-25.33	-22.78	-26.19	-40.54	-22.86	-28.57	-24.37	-26.48	-27.39	-30.98	-25.34
UHRG [dB]	-7.39	-7.32	-6.95	-6.94	-6.94	-6.94	-6.69	-6.64	-6.68	-6.63	-7.06
UHRG/TRG [%]	41.6	42.9	42.7	42.7	42.7	42.6	44.0	44.2	44.5	44.5	43.6
H-Plane	-3.50	-3.27	-3.34	-3.04	-3.00	-3.14	-3.34	-2.98	-3.11	-2.89	-3.25
E1-Plane, AVG [dB]	-4.63	-4.80	-4.31	-4.16	-4.28	-4.29	-4.30	-4.12	-4.29	-4.23	-4.83
E2-Plane, AVG [dB]	-6.29	-6.04	-5.72	-5.90	-5.85	-5.60	-5.48	-5.70	-5.94	-5.48	-5.90
Peak Gain [dB]	0.97	1.27	1.51	1.67	1.08	1.40	1.40	1.57	1.84	1.87	1.09
Directivity [dB]	4.56	4.91	4.77	4.92	4.32	4.64	4.52	4.66	5.00	4.97	4.54
Minimum Gain [dB]	-15.13	-14.14	-18.27	-16.80	-16.84	-16.48	-14.03	-18.00	-17.57	-17.35	-15.97
Test Condition	FS										
Antenna Type											
Average Efficiency	-3.28 dB		46.96 %								

Total Radiated Power(TRP, 30deg)					Total Isotropic Sensitivity(TIS)				
Standard	11g	11g	11g		Standard	11g	11g	11g	
Channel	1	6	11		Channel	1	6	11	
TX Frequency(MHz)	2412	2437	2462		RX Frequency(MHz)	2412	2437	2462	
Data Rate(Mbps)	6.0	6.0	6.0		Data Rate(Mbps)	54.0	54.0	54.0	
Frame Type	Ack	Ack	Ack		PER Threshold(%)	10	10	10	
PPDU Type(MHz)	20	20	20		Packet Length(bytes)	1024	1024	1024	
					Packet Interval(ms)	0	0	0	
					Payload	PN7	PN7	PN7	
				Average	PPDU Type(MHz)	20	20	20	Average
TRP(dBm)	9.32	9.49	9.38	9.40	TIS(dBm)	-64.45	-64.48	-49.48	-62.77
TRP Limit(dBm)					TIS Limit(dBm)				
Pass/Fail					Pass/Fail				
TRP _{oh} /TRP _{avg} (dB)	-0.07	0.09	-0.02		TIS _{oh} /TIS _{avg} (dB)	1.68	1.71	-13.30	
Limit(dB)					Limit(dB)				
Pass/Fail					Pass/Fail				
Conducted Power(dBm)					Conducted Sensitivity(dBm)				
TRP _{metz} (dBm)	8.46	8.70	8.61	8.59	TIS _{metz} (dBm)	-63.61	-63.81	-48.78	-62.02
TRP _{pm} (dBm)	1.89	1.70	1.48	1.69	TIS _{pm} (dBm)	-56.91	-56.04	-41.18	-54.80
UHRP(dBm)	5.65	5.77	5.69	5.70	UHS(dBm)	-60.78	-60.74	-45.67	-59.07
Peak EIRP(dBm)	14.14	14.27	13.82	14.08	Peak EIS(dBm)	-69.51	-69.31	-54.16	-67.72
Directivity(dBi)	4.82	4.78	4.45	4.69	Directivity(dBi)	5.06	4.83	4.68	4.86
Efficiency(dB)					Efficiency(dB)				
Efficiency(%)					Efficiency(%)				
Gain(dBi)					Gain(dBi)				
NHRP±30(π/6)(dBm)	6.87	6.99	6.81	6.89	NHPIS±30(π/6)(dBm)	-62.02	-62.01	-46.88	-60.32
NHRP±45(π/4)(dBm)	8.10	8.25	8.14	8.16	NHPIS±45(π/4)(dBm)	-63.26	-63.27	-48.20	-61.57
Minimum Power(dBm)	-3.98	-3.41	-3.06	-3.47	Minimum Sensitivity(dBm)	-50.84	-50.68	-36.08	-49.07
Test Condition	FS	FS	FS		Test Condition	FS	FS	FS	
Antenna Type					Antenna Type				



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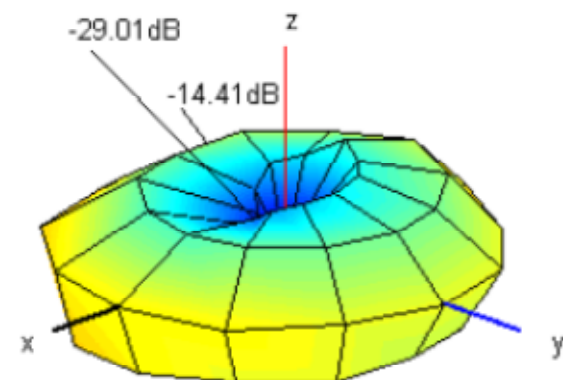
RF 433.92 MHz Antenna

EUT Type: RF Remote Controller

FCC ID.: OZ5URCMX1400I

- Passive Efficiency & Radiation Pattern

	1	2	3	
Frequency [MHz]	428	433	438	
Efficiency [dB]	-17.32	-17.61	-17.81	
Efficiency [%]	1.9	1.7	1.7	
TRG _g [dB]	-17.48	-17.79	-18.01	
Gain _{g Peak} [dB]	-14.41	-14.60	-14.89	
Gain _{g Min} [dB]	-27.86	-29.06	-26.93	
TRG _p [dB]	-31.58	-31.47	-31.29	
Gain _{p Peak} [dB]	-26.80	-25.99	-26.10	
Gain _{p Min} [dB]	-57.69	-49.65	-50.52	
UHRG [dB]	-21.22	-21.53	-21.78	
UHRG/TRG [%]	40.7	40.5	40.1	
H-Plane	-15.09	-15.51	-15.77	
E1-Plane, AVG [dB]	-18.74	-18.90	-19.16	
E2-Plane, AVG [dB]	-18.84	-19.20	-19.34	
Peak Gain [dB]	-14.21	-14.41	-14.72	
Directivity [dB]	3.11	3.20	3.09	
Minimum Gain [dB]	-27.67	-29.01	-26.58	
Test Condition	FS			
Antenna Type				
Average Efficiency	-17.57 dB		1.75 %	



< 433MHz >