



SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

Report No.: SZOA2603000055AT01
Rev.: 01
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ANTENNA PASSIVE TEST REPORT

Application No. SZOA2603000055AT
Applicant BEIJING SIEMENS CERBERUS ELECTRONICS LTD.
Manufacturer Siemens Switzerland Ltd
Product Name Multi-interface Converter
Model No. QCF300
Standards ANSI/IEEE Std 149-2021
Date Initial Sample(s) Received Mar 20, 2026
Testing Start Date Mar 23, 2026
Testing Finish Date Mar 23, 2026
Report Issue Date Apr 13, 2026

* In the configuration tested, the EUT detailed in this report complied with the standards specified above.

Yuanyu Luo

Ervin Li

Prepared by: Yuanyu Luo/ Test Engineer

Approved by: Ervin Li/ Technical Manager



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Revision History

Revision	Issue Date	Description
01	Apr 13, 2026	Initial creation of report



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1 General Information

1.1 Testing Laboratory

Test Lab	SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch
Address	No. 1 Workshop, M-10, Middle section, Science & Technology Park, Nanshan District, Shenzhen, Guangdong, China 518057
Contact	Ervin Li
Tel.	+86 18823369694
Fax	+86-755-25328600
E-mail	Ervin.Li@sgs.com

1.2 Details of Applicant

Applicant's Name	BEIJING SIEMENS CERBERUS ELECTRONICS LTD.
Applicant's Address	Theilerstrasse 1a, CH-6300 Zug, Switzerland
Contact	N/A
Tel.	N/A
Fax	N/A
E-mail	N/A

1.3 Details of Manufacturer

Manufacturer's Name	Siemens Switzerland Ltd
Manufacturer's Address	Theilerstrasse 1a, CH-6300 Zug, Switzerland
Contact	N/A
Tel.	N/A
Fax	N/A
E-mail	N/A



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1.4 General Description of EUT

Device Description:	Multi-interface Converter
Device Manufacturer:	Siemens Switzerland Ltd
Device Model:	QCF300
Hardware Version:	N/A
Software Version:	N/A
Air Interface Supported	N/A
Antenna type:	PCB Antenna

1.5 Test Procedure

Testing is performed according to the **ANSI/IEEE Std 149-2021**.



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1.6 Test Specification

Identity	Document Title
ANSI/IEEE Std 149-2008	IEEE Standard Test Procedures for Antennas

1.7 Laboratory Environment

Temperature	Min. =19°C , Max. = 25°C	
Relative humidity	Min. =40% , Max. =72%	
Shield effect	0.7-6GHz	> 100dB
Ground resistance	<0.5Ω	



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2 OTA Measurements System Configuration

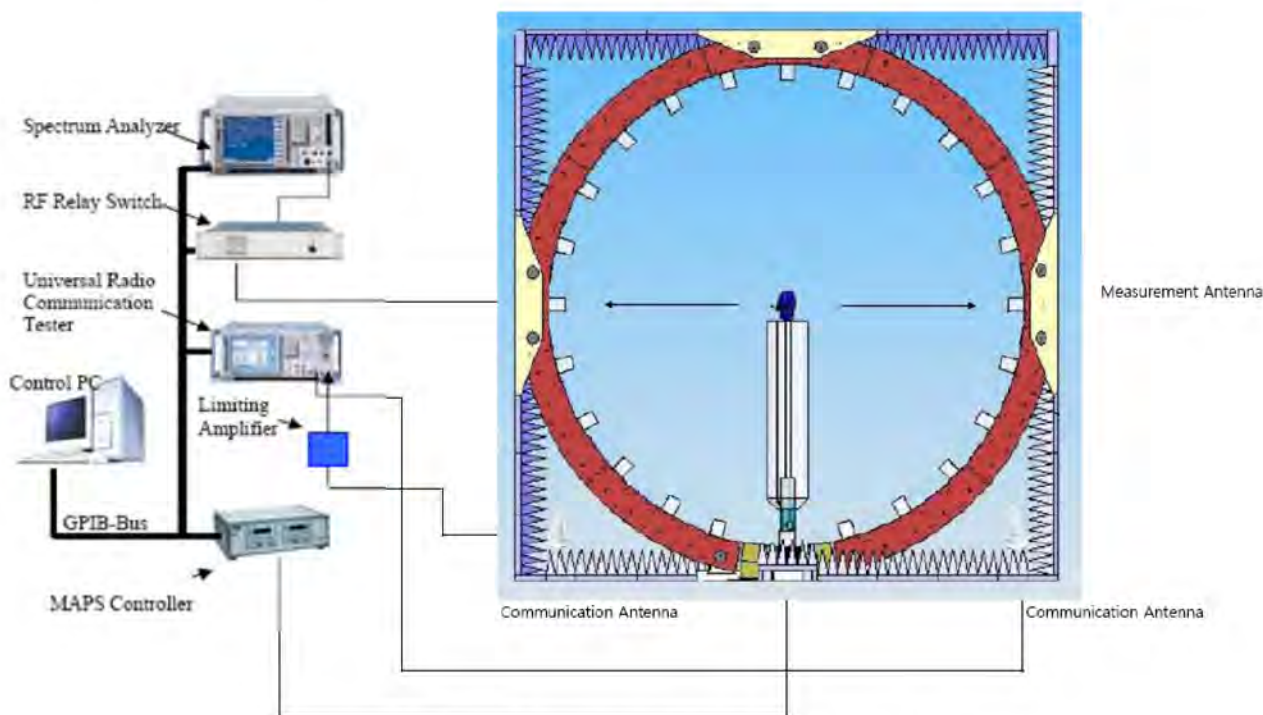
2.1 Test Configuration

Testing Condition:

- Temperature: $22 \pm 3^\circ\text{C}$
- Humidity: $< 80\%$

Measurement Facility:

Great-Circle-Cut method is used to measure the antenna 3D GAIN of EUT in OTA qualified anechoic chamber. Equipment Under Test (EUT) geometry centre vertical projection at the centre of platform, the distance from EUT to measurement antenna is 1.95m



F-1. OTA Measurement System Configuration



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3 Test Equipment List

Type of Equipment	Model Number	Manufacture	Calibration Date	Valid Period
Network Analyzer	E5071C S/N MY46523591	Keysight	2025/12/15	2026/12/14
Quad-Ridge Horn Antenna 700 MHz-10 GHz	EMCO 3164-08 S/N 161915	ETS-Lindgren L.P.	N/A	N/A
MAPS Controller	EMCENTER S/N 160485	ETS-Lindgren L.P.	N/A	N/A
SAM V4.5BS Head Phantom	Head Phantom S/N 3609	SPEAG	NCR	NCR

Definition of Acronyms:

NCR: No Calibration Requirement.



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4 Measurement Uncertainty

Item	2400-2500 MHz (dB)
Gain	0.88
Efficiency	0.88
Measurement Uncertainty (95% CONFIDENCE INTERVAL) K=2	



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5 Test Results

BLE(For CC2340)			
Frequency (MHz)	Efficiency (dB)	Efficiency (%)	Gain (dBi)
2400	-3.52	44.49	2.33
2402	-3.60	43.70	2.17
2405	-3.56	44.09	2.26
2410	-3.58	43.89	2.13
2415	-3.44	45.24	2.20
2420	-3.51	44.60	1.83
2425	-3.37	45.98	2.22
2430	-3.47	45.03	2.13
2435	-3.27	47.05	2.26
2440	-3.40	45.72	2.03
2441	-3.40	45.75	1.92
2445	-3.15	48.42	2.02
2450	-3.38	45.97	1.84
2455	-3.48	44.90	1.49
2460	-3.68	42.87	1.34
2465	-3.48	44.87	1.27
2470	-3.40	45.66	1.48
2475	-3.52	44.50	1.25
2480	-3.67	42.94	0.82
2482	-3.69	42.71	0.78
2485	-3.73	42.40	0.85
2490	-3.91	40.65	0.72
2495	-3.81	41.55	1.10
2500	-3.61	43.58	1.16

BT/WIFI(For ESP32-S3-WROOM-2)			
Frequency (MHz)	Efficiency (dB)	Efficiency (%)	Gain (dBi)
2400	-2.14	61.13	3.16
2402	-2.29	58.97	2.97
2405	-2.39	57.62	2.92
2410	-2.67	54.03	2.54
2415	-2.70	53.71	2.69
2420	-2.82	52.24	2.24
2425	-2.68	53.89	2.66
2430	-2.73	53.32	2.43
2435	-2.60	55.01	2.69
2440	-2.91	51.11	2.19
2441	-2.96	50.63	2.00
2445	-2.92	51.08	1.85
2450	-3.18	48.11	1.50
2455	-3.22	47.69	1.46
2460	-3.33	46.40	1.49
2465	-3.20	47.85	1.46
2470	-3.34	46.31	1.31
2475	-3.59	43.74	0.96
2480	-3.84	41.28	0.70
2482	-3.86	41.15	0.82
2485	-3.86	41.13	0.71
2490	-3.93	40.44	0.72
2495	-3.80	41.67	0.85
2500	-3.65	43.19	0.84



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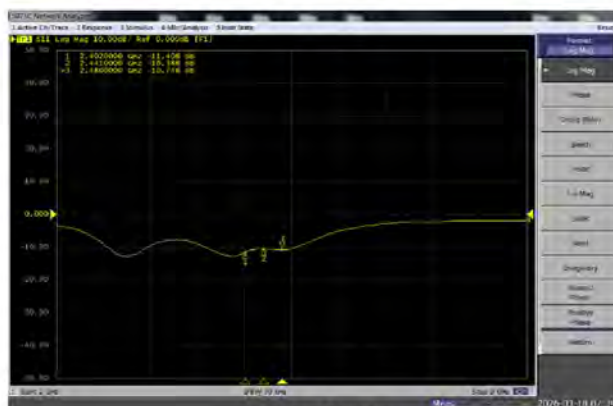
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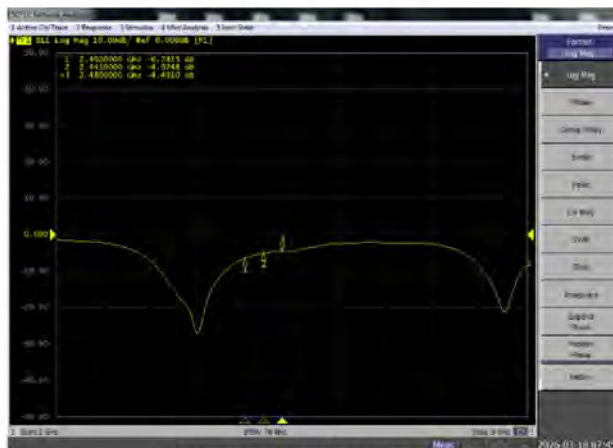
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6 Pattern Plots

6.1 Return Loss



BLE(For CC2340)



BT/WIFI(For ESP32-S3-WROOM-2)



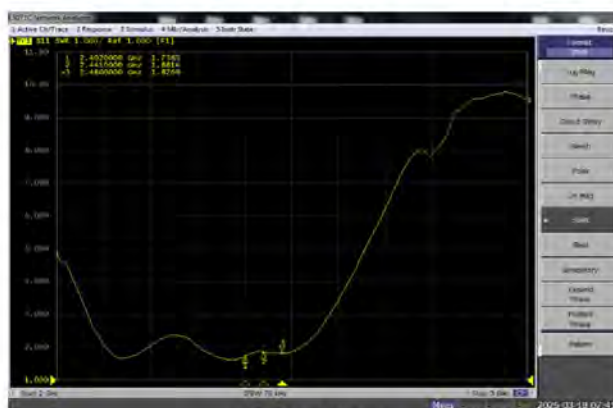
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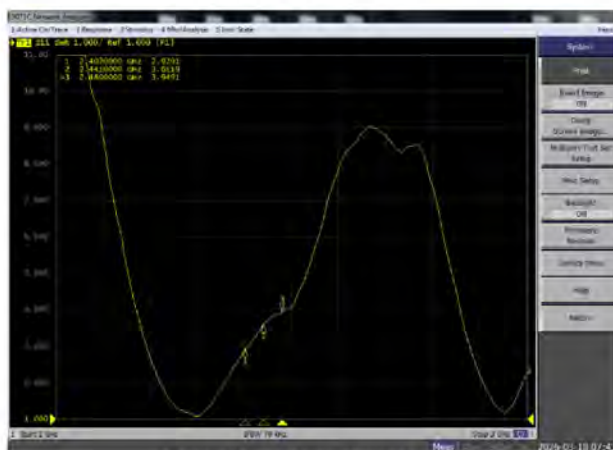
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6.2 VSWR



BLE(For CC2340)



BT/WIFI(For ESP32-S3-WROOM-2)



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6.3 Stimulus



BLE(For CC2340)



BT/WIFI(For ESP32-S3-WROOM-2)

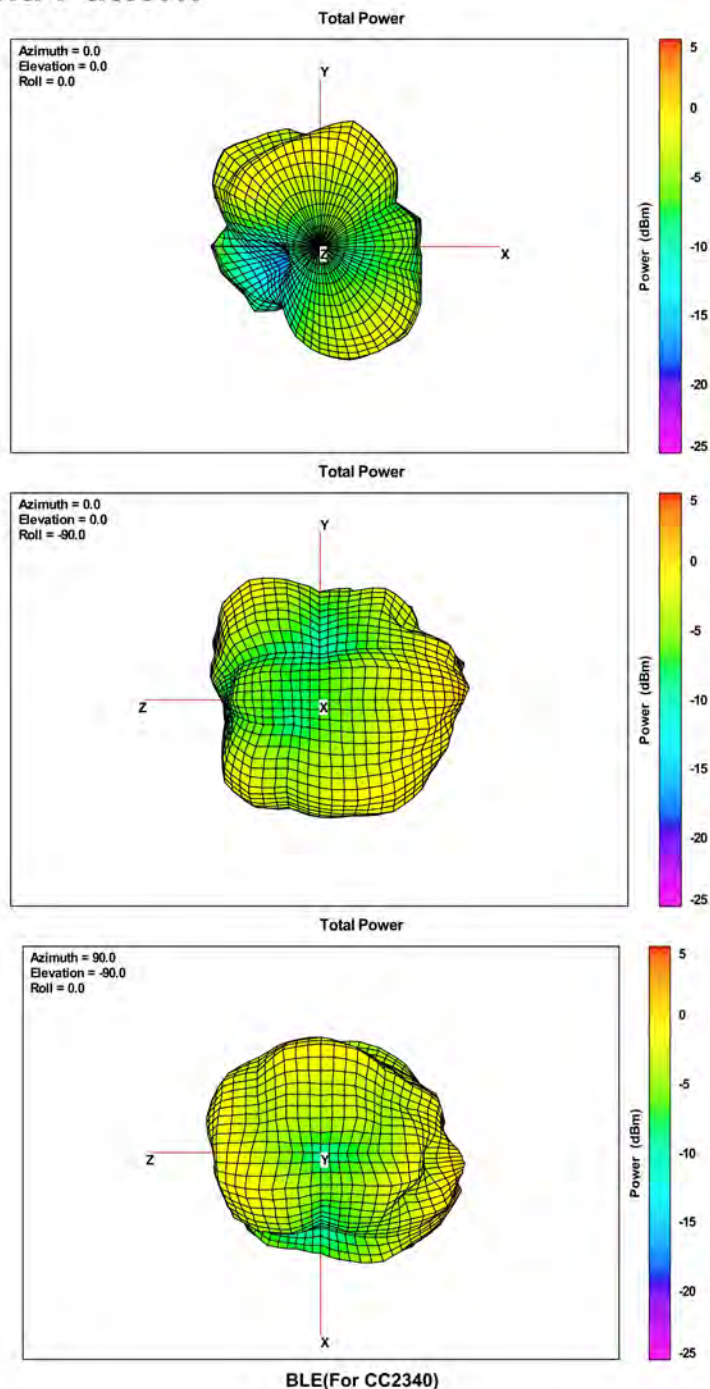


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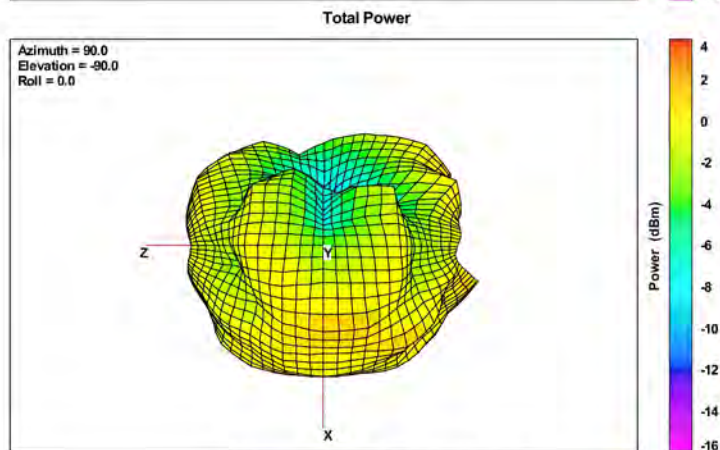
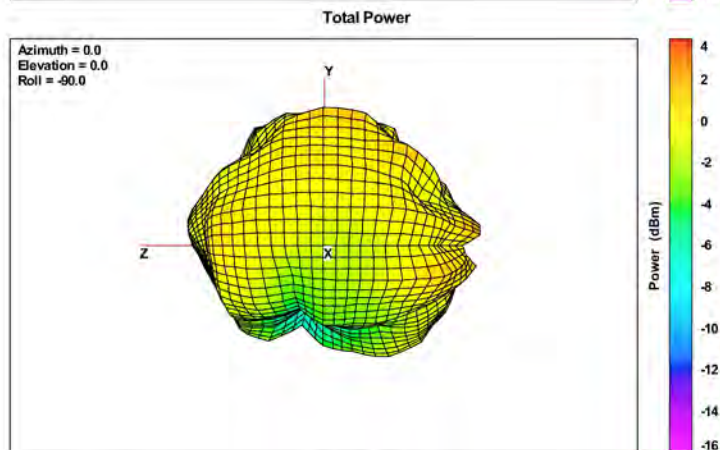
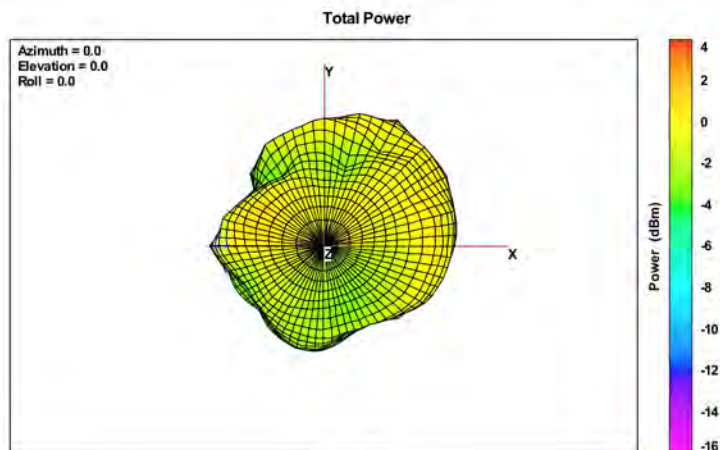
7 3-D Antenna Pattern



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BT/WIFI(For ESP32-S3-WROOM-2)

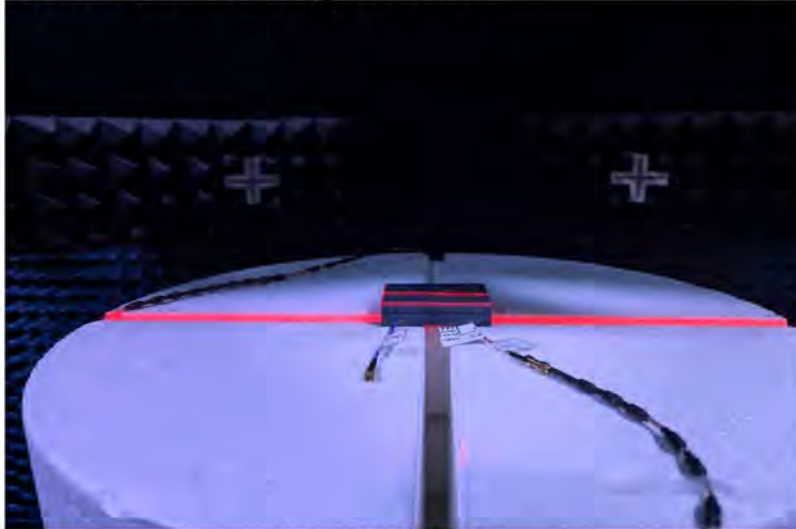


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8 The EUT and Test Configuration



Free Space View

---END---



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