

TEST REPORT

Report Number: 15107858-E23V3

Applicant : Google LLC
1600 Amphitheatre Parkway
Mountain View, CA 94043 U.S.A.

Model : GZC4K,GQ57S

FCC ID : A4RGZC4K

EUT Description : Phone

Test Standard(s) : FCC 47 CFR PART 15 SUBPART C, E, F

Date Of Issue:
2024-05-13

Prepared by:
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REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	2024-05-07	Initial Issue	---
V2	2024-05-10	Revised section 5.2, 5.4	Tina Chu
V3	2024-05-13	Revised section 5.3	Henry Lau

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Google LLC
 1600 Amphitheater pkwy
 Mountain View, CA 94043 U.S.A.

EUT DESCRIPTION: Phone

MODEL: GZC4K,GQ57S

SERIAL NUMBER: 41101FDAS000GA , 41101FDAS0009C, 43111FDAS00008 ,
 43111FDAS0002G (Radiated),
 41111FDAS002H (Conducted)

SAMPLE RECEIPT DATE: 2024-03-20

DATE TESTED: 2024-03-25 TO 2024-05-10

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C, E, F (partially tested)	Complies

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document.

Approved & Released For
UL Verification Services Inc. By:



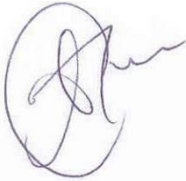
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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with;

- FCC CFR 47 Part 2
- FCC CFR 47 Part 15
- FCC KDB 558074 D01 v05r02 15.247 Meas Guidance
- ANSI C63.10-2013
- KDB 662911 Measurement of Transmitters with Multiple Output, MIMO
- KDB 414788 D01 Radiated Test Site
- KDB 291074 D02 EMC Measurement v01 for 5.9GHz Device
- FCC KDB 789033 D02 UNII Test Procedures New Rules
- FCC KDB 987594 D01 U-NII 6GHz General Requirements
- FCC KDB 987594 D02 U-NII 6 GHz EMC Measurement
- KDB 484596 D01 Referencing Test Data v02r03
- KDB 393764 D01 UWB FAQ v02r01

3. FACILITIES AND ACCREDITATION

UL Verification Services Inc. is accredited by A2LA, Certificate Number 0751.05, for all testing performed within the scope of this report. Testing was performed at the locations noted below.

	Address	ISED CABID	ISED Company Number	FCC Registration
<input type="checkbox"/>	Building 1: 47173 Benicia Street, Fremont, CA 94538, USA	US0104	2324A	550739
<input checked="" type="checkbox"/>	Building 2: 47266 Benicia Street, Fremont, CA 94538, USA			
<input type="checkbox"/>	Building 3: 843 Auburn Court, Fremont, CA 94538, USA			
<input checked="" type="checkbox"/>	Building 4: 47658 Kato Rd, Fremont, CA 94538, USA			
<input checked="" type="checkbox"/>	Building 5: 47670 Kato Rd, Fremont, CA 94538, USA			

4. DECISION RULES AND MEASUREMENT UNCERTAINTY

4.1. METROLOGICAL TRACEABILITY

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, with a maximum time between calibrations of one year or the manufacturers' recommendation, whichever is less, and where applicable is traceable to recognized national standards.

4.2. DECISION RULES

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4:2012 Clause 8.2. (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	U_{Lab}
Radio Frequency (Spectrum Analyzer)	141.16 Hz
Occupied Bandwidth	1.22%
Power Spectral Density	2.47 dB
RF Power Measurement Direct Method Using Power Meter	1.3 dB (PK) / 0.45 dB (AV)
RF Power Measurement Using Spectrum Analyzer	0.33dB
Unwanted Emissions, Conducted	1.94 dB
Worst Case Conducted Disturbance, 9kHz to 0.15 MHz	3.78 dB
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.40 dB
Worst Case Radiated Disturbance, 9kHz to 30 MHz	2.87 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	6.01 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.73 dB
Time Domain Measurements	3.39%
Temperature	0.57°C
Humidity	3.39%
DC Supply Voltages	0.57%

Uncertainty figures are valid to a confidence level of 95%.

4.4. SAMPLE CALCULATION

RADIATED EMISSIONS

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

$$36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} = 28.9 \text{ dBuV/m}$$

$$\begin{aligned} \text{EIRP (dBm)} &= \text{Meter Reading (dBm)} + \text{Antenna Factor (dB/m)} + \text{Pre-Amp Gain/Cbl Loss (dB)} \\ &\quad + \text{dBm-to-dBm Unit Conversion Factor @ 3m} \\ &= -60 \text{ dBm} + 28 \text{ dB/m} + (-27) \text{ dB} + 11.8 \\ &= -47.2 \text{ dBm} \end{aligned}$$

MAINS CONDUCTED EMISSIONS

Where relevant, the following sample calculation is provided:

Final Voltage (dBuV) = Measured Voltage (dBuV) + Cable Loss (dB) + Limiter Factor (dB) + LISN Insertion Loss.

$$36.5 \text{ dBuV} + 0 \text{ dB} + 10.1 \text{ dB} + 0 \text{ dB} = 46.6 \text{ dBuV}$$

5. EQUIPMENT UNDER TEST

5.1. EUT DESCRIPTION

The EUT is a phone.

5.2. MODEL DIFFERENCES

The manufacturer hereby declares the following for models GGX8B and GZC4K/ GQ57S.

GGX8B and GZC4K/CQ57S are highly similar, with the only differences being listed on the table below.

They have the same PCB layout, design, common components, antennas, antenna locations and housing cases.

Spot check verification has been done on model GZC4K in accordance with the test plan approved via KDB inquiry. Comparison of the models, upper deviation is within 1.5dB to 3dB range and all tests are under FCC Technical Limits. The results documented for model GGX8B may be applied as representative to models GZC4K/GQ57S.

Model	FCC ID	Model Changes
GGX8B	A4RGGX8B	Reference model:5G NR n79 depopulated. FR2 mmW populated.
GZC4K, GQ57S	A4RGZC4K	Variant model: Disabled LTE B29, 5G NR n29, n48, n70, n79 from the reference model via software. NR band n79 for non-US carriers, and the Reference model does not, n79 will not be part of FCC certification and therefore there will be no impact to FCC testing. FR2 mmWave depopulated. The GZC4K and GQ57S are identical in Hardware / Software to each other. The only difference lies in the model names, which serve marketing purposes. All test samples used are Model GZC4K.

5.3. INTRODUCTION OF TEST DATA REUSE

This application for certification is leveraging the data reuse procedures from KDB 484596 D01 based on reference model FCC ID: A4RGGX8B to cover variant model FCC ID: A4RGZC4K.

Based on their similarity, the following FCC equipment class reuse the reference model result and spot check on the variants.

Equipment Class	Reference FCC ID	Frequency Range (MHz)	Reference Report	Report Title/Section
DSS	A4RGGX8B	2402-2480	15107858-E6	BT_BLE channel sounding mode2 DSS
DTS	A4RGGX8B	2402-2480	15107858-E7	BT_BLE Channel Sounding Mode0 DTS
DTS	A4RGGX8B	2405-2480	15107858-E8	802.15.4 Thread
DTS	A4RGGX8B	2412-2472	15107858-E9	2.4G DTS WLAN
NII	A4RGGX8B	5180-5885	15107858-E10	5G UNII WLAN
6CD	A4RGGX8B	5955-7095	15107858-E12, 15107858-E13	6G UNII WLAN, CBP
DXX	A4RGGX8B	13.56	15107858-E14	NFC
DCD	A4RGGX8B	110kHz-148.5kHz	15107858-E15	WPT
UWB	A4RGGX8B	3100-10600	15107858-E16	UWB

*Note that DFS was full retested against the variant model, refer to report 15107858-E11.

5.4. SPOT CHECK VERIFICATION RESULT SUMMARY

Test Item	Equipment Class	Technologies	Antenna	Mode	FCC ID: A4RGGX8B Reference	FCC ID: A4RGZC4K Variant	Delta (dB)
					Total Conducted Avg Power (dBm)	Total Conducted Avg Power (dBm)	
Power	DSS	BT GFSK	2	Beamforming, GFSK 2480MHz	23.06	21.97	1.09
		BLE Channel Sounding Mode 2, ASK modulation	Tx1	2Mbps, 2478MHz	19.56	19.65	-0.09
	DTS	BT DQPSK/8PSK	2	Beamforming, 8PSK 2480MHz	21.68	21.1	0.58
		BLE 1Mbps/2Mbps	2	Beamforming, 1Mbps 2480MHz	21.69	21.6	0.09
		BLE Channel Sounding Mode 0, GFSK modulation	Tx0	2Mbps, 2440MHz	20.00	19.49	0.51
		BLE Channel Sounding Mode 0, GFSK modulation	Tx1	2Mbps, 2478MHz	19.87	19.62	0.25
		802.15.4 Thread	Tx0	2480MHz High Power	18.5	18.35	0.15
		2.4G WLAN DTS	Tx0	b mode, 2412MHz	20.46	21.42	-0.96
			Tx1	b mode, 2472MHz	19.5	19.26	0.24
	NII	UNII Band 1	2	EHT80, 996T, 5210MHz	12.43	11.84	0.59
		UNII Band 2A	2	VHT80, 5290MHz	17.21	16.32	0.89
		UNII Band 2C	2	11n HT40, 5670MHz	22.95	21.35	1.6
		UNII Band 3	2	VHT80, 5775MHz	23.55	22.26	1.29
		UNII Band 4	2	11n HT40, 5875MHz	23.13	23.46	-0.33
	Equipment Class	Technologies	Antenna	Mode	Conducted Avg EIRP Power (dBm)	Conducted Avg EIRP Power (dBm)	Delta (dB)
	6CD	UNII Band 5	2	EHT80, 996T, RU Index 67, 5985MHz, SP	19.87	19.5	0.37
		UNII Band 8	2	EHT40, 484T, RU Index 65, 7085MHz, LP	9.04	7.65	1.39
	Equipment Class	Technologies	Antenna	Mode	Average Power EIRP (dBm)	Average Power EIRP (dBm)	Delta (dB)
	UWB	UWB	Common	BPSK, Mode 7, CH5, CFG1	-41.34	-43.72	2.38
	Equipment Class	Technologies	Antenna	Mode	Field Strength(dBuV/m)	Field Strength(dBuV/m)	Delta (dB)
DXX	NFC	loop	Type A 106kbps	30.32	30.36	-0.04	
DCD	WPT	coil	charging mode	-6.42	-8.01	1.59	

Test Item	Equipment Class	Technologies	Antenna	Mode	FCC ID: A4RGGX8B Reference	FCC ID: A4RGZC4K Variant	Bandedge Delta (dB)	FCC ID: A4RGGX8B Reference	FCC ID: A4RGZC4K Variant	RSE 1-18G Delta (dB)	
					Bandedge margin to the limit	Bandedge margin to the limit		RSE 1-18G margin to the limit	RSE 1-18G margin to the limit		
Radiated (dBuV/m)	DSS	BT GFSK	2	Beamforming, GFSK 2480MHz	-8.88	-9.32	0.44	-15.49	-13.45	-2.04	
		BLE Channel Sounding Mode 2, ASK modulation	Tx1	2Mbps, 2478MHz	-9.8	-9.97	0.17	-16.19	*-13.04	-3.15	
	DTS	BT DQPSK/8PSK	2	Beamforming, 8PSK 2480MHz	-5.23	-4.37	-0.86	-6.51	-11.89	5.38	
		BLE 1Mbps/2Mbps	2	Beamforming, 1Mbps 2480MHz	-6.45	-6.53	0.08	-5.84	-9.52	3.68	
		BLE Channel Sounding Mode 0, GFSK modulation	Tx0	2Mbps, 2440MHz				-3.65	-3.84	0.19	
		BLE Channel Sounding Mode 0, GFSK modulation	Tx1	2Mbps, 2478MHz	-2.48	-2.45	-0.03				
		802.15.4 Thread	Tx0	2480MHz High Power	-10.72	-12.96	2.24	-17.56	-17.2	-0.36	
		2.4G WLAN DTS	Tx0	b mode, 2412MHz				-3.99	*-20.51	16.52	
			Tx1	b mode, 2472MHz	-1.59	-11.8	10.21				
	NII	UNII Band 1	2	EHT80, 996T, 5210MHz	-1.52	-0.3	-1.22	-11.2	-10.04	-1.16	
		UNII Band 2A	2	VHT80, 5290MHz	-1.62	-1.37	-0.25	-9.83	-8.86	-0.97	
		UNII Band 2C	2	11n HT40, 5670MHz	-1.52	-3.35	1.83	-8.62	-10.9	2.28	
		UNII Band 3	2	VHT80, 5775MHz	-1.57	-7.59	6.02	-14.18	*-10.89	-3.29	
		UNII Band 4	2	11n HT40, 5875MHz	-1.61	-1.63	0.02	-12.22	-9.87	-2.35	
	6CD	UNII Band 5	2	EHT80, 996T, RU Index 67, 5985MHz, SP	-1.96	-1.31	-0.65	-9.64	-9.73	0.09	
		UNII Band 8	2	EHT40, 484T, RU Index 65, 7085MHz, LP	-1.68	-1.79	0.11	-7.25	-7.88	0.63	
		Equipment Class	Technologies	Antenna	Mode	Bandedge margin to the limit	Bandedge margin to the limit	Bandedge Delta (dB)	RSE 1-18G margin to the limit	RSE 1-18G margin to the limit	RSE 1-18G Delta (dB)
		UWB	UWB	Common	BPSK, Mode 7, CH5, CFG1				Reference model and variant model all emissions are more than 20dB below limit		
	dBuV/m or dBuA/m	Equipment Class	Technologies	Antenna	Mode	Below 30MHz Field Strength margin to the limit					
		DXX	NFC	loop	Type A 106kbps	Reference model and variant model all emissions are more than 20dB below limit					
		DCD	WPT	coil	charging mode						

The spot check plan, approved by the FCC inquiry, allows for data reuse from the reference model where the variant model data meets the limits and has not increased by more than 3dB compared to the reference model. For all cases in the table above, with the exception of *, this criteria has been met.

For the cases indicated by * the higher/lower signal levels were noise floor measurements with more than 10dB of margin relative to the limit, since those are noise floor measurement, the variant model spot check also met compliance limits even some spot check delta increased by more than 3dB compared to the reference model, thus no additional measurements were made.

6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST					
Description	Manufacturer	Model	ID Num	Cal Due	Last Cal
Antenna, Horn 1-18GHz (Chamber T)	ETS-Lindgren	3117	226673	2024-08-31	2022-08-08
Antenna, Horn 1-18GHz (Chamber I)	ETS-Lindgren	3117	84797	2024-09-30	2023-09-25
Antenna, Horn 1-18GHz (Chamber J)	ETS-Lindgren	3117	222741	2024-08-31	2022-08-22
RF Filter Box, 1-18GHz (Chamber T)	UL-FR1	RATS 2	226781	2024-09-30	2023-09-30
RF Filter Box, 1-18GHz (Chamber I)	UL-FR1	NA	171389	2024-05-31	2023-05-15
RF Filter Box, 1-18GHz (Chamber J)	UL-FR1	NA	171875	2024-05-31	2023-05-30
EMI TEST RECEIVER (Chamber T)	Rohde & Schwarz	ESW44	169935	2025-02-28	2024-02-11
EMI TEST RECEIVER (Chamber I)	Rohde & Schwarz	ESW44	201497	2025-02-28	2024-02-11
EMI TEST RECEIVER (Chamber J)	Rohde & Schwarz	ESW44	171875	2024-05-31	2023-05-30
Filter, LPF 0-5400MHz Ch5/9 5.4G LPF	Wainwright Instruments Gmbh	WLKX12-5400-5913-18000-60ST	204843	2024-11-30	2023-11-14
10dB Fixed Attenuator, up to 26GHz	Pasternack Enterprises	PE7087-10	236189	Verified/characterized before use	
PXA Signal Analyzer	Keysight Technologies Inc	N9030B	222073	2024-08-31	2023-08-14
PXA Signal Analyzer	Keysight Technologies Inc	N9030B	222074	2024-08-31	2023-08-14
Power Meter, P-series single channel	Keysight Technologies Inc	N1921A	90731	2025-01-31	2024-01-25
Power Sensor, P - series, 50MHz to 18GHz, Wideband	Keysight Technologies Inc	N1911A	90388	2024-06-30	2023-06-23
UL TEST SOFTWARE LIST					
Radiated Software	UL	UL EMC	Ver 2023-01-18, 2023-03-03, 2023-05-01		
Antenna Port Software	UL	UL RF	Ver 2022-08-16		

Appendix A - Reference Test Report

Attached are the test reports number containing the reference data of the reference reports as indicated on Section 5.3 of this test report.

END OF TEST REPORT