KDB 865664 D01 SAR Measurement 100MHz to 6GHz
FCC 47 CFR part 2 (2.1093)

SAR EVALUATION REPORT

For

CB Radio

Model Name/Number: CB272, CB272A
FCC ID: UUPNF-CB272

REPORT NUMBER UL-SAR-RP14701062JD03A V4.0
ISSUE DATE: 14 FEBUARY 2024

Prepared for

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WAN AN TANG XI INDUSTRIAL AREA,
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REVISION HISTORY

Ver.	Issue Date	Revisions	Revised By
1.0	21 July 2023	Initial Issue	--
2.0	15 Nov 2023	Updated in accordance with certification team feedback	Muhammad Kunnumal
3.0	24 Nov 2023	Updated in accordance with certification team feedback	Muhammad Kunnumal
4.0	14 Feb 2024	Updated in accordance with certification team feedback	Muhammad Kunnumal

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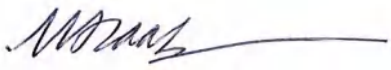
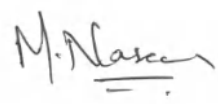
1. Attestation of Test Results

Applicant Name:	XINWEI ELECTRONIC CO., LTD QUANZHOU						
Model Name/Number:	CB272, CB272A						
Test Device is	A representative test sample						
Device category	CB Radio						
Date Tested	12 May 2023 to 10 June 2023						
ICNIRP Guidelines Limits for SAR Exposure Characteristics	General Population/Localised SAR (Head/Body-worn/In Front of Mouth) – 1g-SAR limit 1.6 W/kg General Population/Localised SAR (Extremity) – 10g-SAR limit 4.0 W/kg						
The highest reported SAR values for Localized SAR	RF Exposure Conditions		Equipment Class				
			Licensed	TNF	DTS	U-NII	DSS
	Standalone	Body-worn	N/A	0.060W/kg	N/A	N/A	N/A
		In Front of Mouth	N/A	0.004W/kg	N/A	N/A	N/A
		Extremity	N/A	0.035W/kg	N/A	N/A	N/A
	Simultaneous Transmission	Body-worn	N/A	N/A	N/A	N/A	N/A
		In Front of Mouth	N/A	N/A	N/A	N/A	N/A
		Extremity	N/A	N/A	N/A	N/A	N/A
Applicable Standards	FCC 47 CFR part 2 (2.1093) FCC KDB publication						
Test Results	Pass						

UL International (UK) Ltd. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL International (UK) Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties are in accordance with the above standard and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample(s), under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL International (UK) Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL International (UK) Ltd. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by UKAS. This report is written to support regulatory compliance of the applicable standards stated above.

Issued By:	Prepared By:
	
Masood Khan Senior Test Engineer	Naseer Mirza Operations Leader

2.Test Specification, Methods and Procedures

2.1.Test Specification

Reference:	KDB Publication Number: 865664 D01 SAR Measurement 100 MHz to 6 GHz
Title:	SAR Measurement Requirements for 100 MHz to 6 GHz
Introduction:	The SAR Measurement procedures for 100MHz to 6GHz are described in this document. Field probes, tissue dielectric properties, SAR scans, measurement accuracy and variability of the measured results are discussed. The field probe and SAR scan requirements are derived from criteria considered in standard IEC/IEEE 62209-1528:2020. The wireless product and technology specific procedures in applicable KDB publications are required to be used unless further guidance has been approved by the FCC.
Purpose of Test:	To determine if the Equipment Under Test complies with the Specific Absorption Rate for general population/uncontrolled exposure limit of 1.6 W/kg as specified in FCC 47 CFR part 2 (2.1093).

2.2.Methods and Procedures Reference Documentation

The methods and procedures used were as detailed in:

IEEE 1528:2013
IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communication Devices: Measurement Techniques.

IEC/IEEE 62209-1528: 2020
Measurement procedure for the assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices.

FCC KDB Publication:
KDB 447498 D03 Supplement C Cross-Reference v01
KDB 447498 D04 Interim General RF Exposure Guidance v01
KDB 643646 D01 SAR Test for PTT Radios v01r03
KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04
KDB 865664 D02 RF Exposure Reporting v01r02

2.3.Definition of Measurement Equipment

The measurement equipment used complied with the requirements of the standards referenced in the methods & procedures section above. Section 4.3 contains a list of the test equipment used.

3.Facilities and Accreditation

The measurement facilities used to collect data are located at

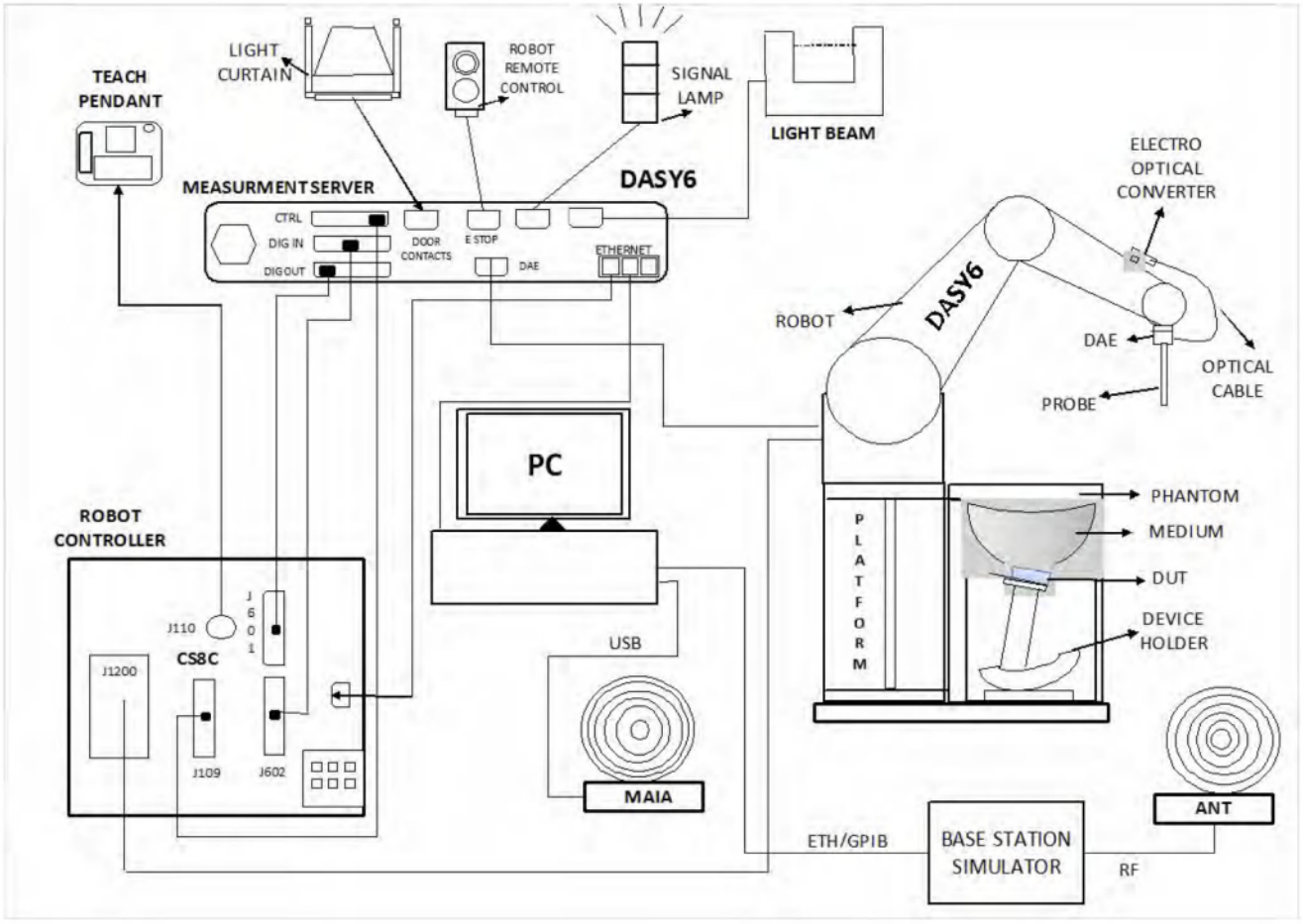
Horizon Unit 1-4, Wade Road, Kingsland Business Park, Basingstoke, Hampshire, RG24 8AH, UK	Facility Type
SAR Lab 65	Controlled Environment Chamber

UL International (UK) Ltd is accredited by UKAS (United Kingdom Accreditation Service, Accredited to ISO/IEC 17025:2017), Laboratory UKAS Code 5772.

4. SAR Measurement System & Test Equipment

4.1. SAR Measurement System

The DASY test systems used for performing compliance tests consists of the following items:



- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic Field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running Win10 with DASY software installed.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

4.2. SAR Measurement Procedure

4.2.1. Normal SAR Measurement Procedure

The following procedure shall be performed for each of the test conditions

a) Measure the local SAR at a test point within 8 mm of the phantom inner surface that is closest to the DUT.

b) Measure the two-dimensional SAR distribution within the phantom (area scan procedure). The boundary of the measurement area shall not be closer than 20 mm from the phantom side walls. The distance between the measurement points should enable the detection of the location of local maximum with an accuracy of better than half the linear dimension of the tissue cube after interpolation. A maximum grid spacing of 20 mm for frequencies below 3 GHz and (60/f [GHz]) mm for frequencies of 3 GHz and greater is recommended. The maximum distance between the geometrical centre of the probe detectors and the inner surface of the phantom shall be 5 mm for frequencies below 3 GHz and δ ln(2)/2 mm for frequencies of 3 GHz and greater, where δ is the plane wave skin depth and ln(x) is the natural logarithm. The maximum variation of the sensor-phantom surface distance shall be ± 1 mm for frequencies below 3 GHz and ± 0,5 mm for frequencies of 3 GHz and greater. At all measurement points the angle of the probe with respect to the line normal to the surface should be less than 5°. If this cannot be achieved for a measurement distance to the phantom inner surface shorter than the probe diameter, additional uncertainty evaluation is needed.

c) From the scanned SAR distribution, identify the position of the maximum SAR value, in addition identify the positions of any local maxima with SAR values within 2 dB of the maximum value that will not be within the zoom scan of other peaks; additional peaks shall be measured only when the primary peak is within 2 dB of the SAR compliance limit (e.g., 1 W/kg for 1,6 W /kg 1 g limit, or 1,26 W/kg for 2 W /kg, 10 g limit).

d) Measure the three-dimensional SAR distribution at the local maxima locations identified in step c) (zoom For frequencies at or below 3 GHz, the following procedure shall be applied: The horizontal grid step shall be 8 mm or less. The grid step in the vertical direction shall be 5 mm or less if uniform spacing is used. If variable spacing is used in the vertical direction, the maximum spacing between the two closest measured points to the phantom shell (M1 and M2) shall be 4 mm or less and the spacing between farther points shall increase by a factor of 1,5 or less. The minimum size of the zoom scan volume shall be 30 mm by 30 mm by 30 mm

For frequencies above 3 GHz, the minimum size of the zoom scan volume may be reduced to 22 mm by 22 mm by 22 mm. The horizontal grid step shall be (24/*f* [GHz]) mm or less. If uniform spacing in the vertical direction is used, the grid step in the vertical direction shall be (10/(*f* [GHz] − 1)) mm or less. If variable spacing is used in the vertical direction, the maximum spacing between the two measured points closest to the phantom shell shall be (12/*f* [GHz]) mm or less and the spacing between further points shall increase by a factor of 1,5 or less. For other parameters, see Zoom Scan Parameters table.

When the highest 1 g or 10 g cube is touching the boundary of a zoom-scan volume, the entire zoom scan shall be repeated with the new centre located at the maximum psSAR location indicated by the preceding zoom scan measurement. If the zoom scan measured as defined above complies with both of the following criteria, or if the peak spatial-average SAR is below 0,1 W/kg, no additional measurements are needed:

1) the smallest horizontal distance from the local SAR peaks to all points 3 dB below the SAR peak shall be larger than the horizontal grid steps in both *x* and y directions (Δ*x*, Δ*y*). This shall be checked for the measured zoom scan plane conformal to the phantom at the distance z_{M1}. The minimum distance shall be recorded in the SAR test report;

2) the ratio of the SAR at the second measured point (M2) to the SAR at the closest measured point (M1) at the *x*-*y* location of the measured maximum SAR value shall be at least 30 %. This ratio (in %) shall be recorded in the SAR test report.

If one or both of the above criteria are not met, the zoom scan measurement shall be repeated using a finer resolution while keeping the other zoom scan parameters compatible with Zoom Scan Parameters table. New horizontal and vertical grid steps shall be determined from the measured SAR distribution so that the above criteria are met. Compliance with the above two criteria shall be demonstrated for the new measured zoom scan. The size of the higher resolution zoom scan and other parameters of Zoom Scan Parameters table shall apply. The closest point to the phantom shell shall be 2 mm or less for graded grids and the grading factor shall be 1,5 or less.

Uncertainties due to field distortion between the media boundary and the dielectric enclosure of the probe should also be minimized, which is achieved if the distance between the phantom surface and physical tip of the probe is larger than the probe tip diameter. Other methods may utilize correction procedures to compensate for boundary effects that enable high precision measurements closer than half the probe diameter. For all measurement points, the angle of the probe normal to the flat phantom surface shall be less than 5º.

Zoom Scan Parameters

Parameter	DUT transmit frequency being tested	
	$f \leq 3$ GHz	3 GHz < $f \leq 6$ GHz
Maximum distance between the closest measured points and the phantom surface (z_{M1} in Figure 14 and Table 2, in mm)	5	$\delta \ln(2)/2$ [a]
Maximum angle between the probe axis and the flat phantom surface normal (α in Figure 14)	5°	5°
Maximum spacing between measured points in the x- and y-directions (Δx and Δy, in mm)	8	$24/f$ [b,c]
For uniform grids: Maximum spacing between measured points in the direction normal to the phantom shell (Δz_1 in Figure 14, in mm)	5	$10/(f - 1)$
For graded grids: Maximum spacing between the two closest measured points in the direction normal to the phantom shell (Δz_1 in Figure 14, in mm)	4	$12/f$
For graded grids: Maximum incremental increase in the spacing between measured points in the direction normal to the phantom shell ($R_z = \Delta z_2/\Delta z_1$ in Figure 14)	1,5	1,5
Minimum edge length of the zoom scan volume in the x- and y-directions (L_z in 7.2.5.3, in mm)	30	22
Minimum edge length of the zoom scan volume in the direction normal to the phantom shell (L_h in 7.2.5.3, in mm)	30	22
Tolerance in the probe angle	1°	1°
[a] δ is the penetration depth for a plane-wave incident normally on a planar half-space. [b] This is the maximum spacing allowed, which may not work for all circumstances. [c] f is the frequency in GHz.		

e) Use post processing (e.g. interpolation and extrapolation) procedures to determine the local SAR values at the spatial resolution needed for mass averaging.

f) The local SAR should be measured at the same location as in Step a). SAR drift is assessed and reported in the uncertainty budget.

In the event that the evaluation of measurement drift exceeds the 5 % tolerance, it is required that SAR be reassessed following guidelines contained within this standard.

If the drift is larger than 5 %, then the measurement drift shall be considered a bias, not an uncertainty. A correction shall be applied to the measured SAR value. It is not necessary to record the drift in the uncertainty budget (i.e. ui = 0 %). The uncertainty budget reported in a measurement report should correspond to the highest SAR value reported (after correction, if applicable). Alternatively, the uncertainty budget reported should cover all measurements, i.e., it should report a conservative value.

4.3. Test Equipment

Measuring equipment used to perform the tests is documented in this report and has been calibrated in accordance with UKAS' recommendations and is traceable to recognized national standards.

UL Asset No.	Instrument Name	Manufacturer	Type	Serial No.	Date Last Calibrated	Cal. Interval (Months)
131773	E-Field Probe	SPEAG	ES3DV3	3335	05 Jun 2023	12
134031	Data Acquisition Equipment	SPEAG	DAE4	1435	15 Feb 2023	12
234943	Phantom	SPEAG	ELI V8	2140	Cal. as part of system	-
175662	Dipole Antenna	SPEAG	CLA-30	1008	12 Jan 2023	12
133881	Dual Channel Power Meter	Rohde & Schwarz	NRVD	844860/040	24 Feb 2023	12
133890	Power Sensor	Rohde & Schwarz	NRV-Z1	831430/003	24 Feb 2023	12
133891	Power Sensor	Rohde & Schwarz	NRV-Z1	831430/004	24 Feb 2023	12
168830	Signal Generator	Rohde & Schwarz	SMB 100A	175325	20 Apr 2023	12
216707	Amplifier	Pasternack	PE15A5029F	V00122104272017466	Cal. as part of system	-
PRE0134801	DC Power Supply	ISO Tech	IPS 2303	227B058G2	Cal. as part of system	-
216706	Directional Coupler	Pasternack	PE2CP1000	2143	Cal. as part of system	-
PRE0151453	RF Coax Cable	Stability	SC-35-MM-60	16 36 216	Cal. as part of system	-
PRE0176939	RF Coax Cable	Huber+Suhner	SF126	503314/126	Cal. as part of system	-
PRE0176843	RF Coax Cable	Huber+Suhner	Superflex 126	503326	Cal. as part of system	-
PRE0179708	Body Handset Positioner	SPEAG	MD4HACV5	None	Cal. not required	-
PRE0179703	Head Handset Positioner	SPEAG	MD4HHTV5	None	Cal. not required	-
PRE0178118	Measurement Server	SPEAG	SE UMS 028 BB	1572	Cal. not required	-
PRE0179699	Phantom Support Structure	SPEAG	Phantom Table	-	Cal. not required	-
PRE0178112	Robot Arm	Staubli	TX60 L	F17/5ENYG1/A/01	Cal. not required	-
PRE0178122	Robot Power Supply	SPEAG	CS8C	F17/5ENYG1/C/01	Cal. not required	-
166282	Power Sensor	Rohde & Schwarz	NRP-Z51	103031-NV	16 Feb 2023	12
133925	Power Sensor	Rohde & Schwarz	NRP-Z51	103246	14 Mar 2023	12
166281	Power Sensor	Rohde & Schwarz	NRP-Z51	104649-JG	16 Feb 2023	12
133453	Power Sensor	Agilent	U8481A	MY53040008	20 Mar 2023	12
147741	Vector Network Analyser	Rohde & Schwarz	ZND 132.5170K92	100151	15 Feb 2023	12
PRE0177850	DAK 12 Fluid Probe	SPEAG	QA DAK 12	1131	Cal. before use	-
PRE0135306	Digital Camera	Nikon	S3600	41010357	Cal. not required	-
PRE0195838	RF Coax Cable	Taoglas	CAB.721		Cal. not required	-
PRE0195840	RF Coax Cable	Taoglas	CAB.721		Cal. not required	-
PRE0136931	RF Coax Cable	-	70530/4PE	-	Cal. not required	-
PRE0140096	RF Coax Cable	Huber+Suhner	ST18/SMAm/Nm/36	-	Cal. not required	-

4.3.1. SAR System Specifications

Robot System		
Positioner:	Stäubli Unimation Corp. Robot Model: TX-60L	
Repeatability:	±0.030 mm	
No. of Axes:	6	
Serial Number:	F17/5ENYG1/A/01	
Reach:	920 mm	
Payload:	2.0 kg	
Control Unit:	CS8C	
Programming Language:	V+	
Data Acquisition Electronic (DAE) System		
Serial Number:	DAE4 SN: 1435	
PC Controller		
PC:	HP EliteDesk800	
Operating System:	Windows 10	
Data Card:	DASY Measurement Server	
Data Converter		
Features:	Signal Amplifier, multiplexer, A/D converted and control logic.	
Software:	DASY6 PRO Software	
Connecting Lines:	Optical downlink for data and status info. Optical uplink for commands and clock.	
PC Interface Card		
Function:	24 bit (64 MHz) DSP for real time processing Link to DAE4 16 bit A/D converter for surface detection system serial link to robot direct emergency stop output for robot.	
Phantom		
Phantom:	ELI Phantom	
Shell Material:	Fibreglass	
Thickness:	2.0 ±0.1 mm	
E-Field Probe		
Model:	EX3DV4	ES3DV3
Serial No:	None Used	3335
Construction:	Triangular core	Triangular core
Frequency:	4 MHz to > 10 GHz	4 MHz to > 4 GHz
Linearity:	±0.2 dB (4 MHz to 10 GHz)	±0.2 dB (4 MHz to 4 GHz)
Probe Length (mm):	337	337
Probe Diameter (mm):	10	10
Tip Length (mm):	9	10
Tip Diameter (mm):	2.5	4
Sensor X Offset (mm):	1	2
Sensor Y Offset (mm):	1	2
Sensor Z Offset (mm):	1	2

5. Measurement Uncertainty

No measurement or test can ever be perfect and the imperfections give rise to error of measurement in the results. Consequently, the result of a measurement is only an approximation to the value of the measurand (the specific quantity subject to measurement) and is only complete when accompanied by a statement of the uncertainty of the approximation.

The expression of uncertainty of a measurement result allows realistic comparison of results with reference values and limits given in specifications and standards.

The uncertainty of the result may need to be taken into account when interpreting the measurement results.

The reported expanded uncertainties below are based on a standard uncertainty multiplied by an appropriate coverage factor, such that a confidence level of approximately 95% is maintained. For the purposes of this document “approximately” is interpreted as meaning “effectively” or “for most practical purposes”.

Test Name	Confidence Level	Calculated Uncertainty
Uncertainty- Freq. 4 MHz - 300 MHz Head & Body Configuration 1g	95%	±25.42%
Uncertainty- Freq. 4 MHz - 300 MHz Head & Body Configuration 10g	95%	±25.30%

The methods used to calculate the above uncertainties are in line with those recommended within the various measurement specifications. Where measurement specifications do not include guidelines for the evaluation of measurement uncertainty, the published guidance of the appropriate accreditation body is followed.

5.1.Uncertainty – Freq. 4 MHz - 300 MHz Head & Body Configuration 1g

Type	Source of uncertainty	+ Value	- Value	Probability Distribution	Divisor	$c_{i\ (1g)}$	Standard Uncertainty		υ_i or υ_{eff}
							+ u (%)	- u (%)	
B	Probe calibration	13.300	13.300	normal (k=2)	2.0000	1.0000	6.650	6.650	∞
B	Probe calibration drift	1.700	1.700	Rectangular	1.7321	1.0000	0.981	0.981	∞
B	Probe Linearity and Detection Limits	4.700	4.700	Rectangular	1.7321	1.0000	2.714	2.714	∞
B	Broadband Signal	0.800	0.800	Rectangular	1.7321	1.0000	0.462	0.462	∞
B	Probe Isotropy	7.600	7.600	Rectangular	1.7321	1.0000	4.388	4.388	∞
B	Data Acquisition	0.300	0.300	normal (k=1)	1.0000	1.0000	0.300	0.300	∞
B	RF Ambient conditions	0.260	0.260	normal (k=1)	1.0000	1.0000	0.260	0.260	∞
B	Probe Positioning	0.600	0.600	normal (k=1)	1.0000	0.0800	0.048	0.048	∞
B	Data Processing Errors	2.000	2.000	Rectangular	1.7321	1.0000	1.155	1.155	∞
B	Uncertainty in SAR correction for deviations in permittivity and conductivity	1.900	1.900	normal (k=1)	1.0000	1.0000	1.900	1.900	∞
B	Liquid Conductivity (measured value)	2.500	2.500	normal (k=2)	2.0000	0.7800	0.975	0.975	∞
B	Liquid Permittivity (measured value)	2.500	2.500	normal (k=2)	2.0000	0.0000	0.000	0.000	∞
B	Liquid Conductivity (temperature uncertainty)	3.300	3.300	Rectangular	1.7321	0.7800	1.486	1.486	∞
B	Liquid Permittivity (temperature uncertainty)	0.310	0.310	Rectangular	1.7321	0.0000	0.000	0.000	∞
A	Phantom Shell Permittivity	14.000	14.000	Rectangular	1.7321	0.0000	0.000	0.000	∞
A	Distance DUT - TSL	2.000	2.000	normal (k=1)	1.0000	2.0000	4.000	4.000	∞
B	Test Sample Positioning	4.240	4.240	normal (k=1)	1.0000	1.0000	4.240	4.240	25
B	Device Holder uncertainty	6.090	6.090	normal (k=1)	1.0000	1.0000	6.090	6.090	5
B	DUT Modulation	2.400	2.400	Rectangular	1.7321	1.0000	1.386	1.386	∞
B	Drift of output power	5.000	5.000	Rectangular	1.7321	1.0000	2.887	2.887	∞
	Combined standard uncertainty			t-distribution			12.71	12.71	90
	Expanded uncertainty			k = 2			25.42	25.42	90

5.2.Uncertainty – Freq. 4 MHz - 300 MHz Head & Body Configuration 10g

Type	Source of uncertainty	+ Value	- Value	Probability Distribution	Divisor	$c_{i\ (10g)}$	Standard Uncertainty		υ_i or υ_{eff}
							+ u (%)	- u (%)	
B	Probe calibration	13.300	13.300	normal (k=2)	2.0000	1.0000	6.650	6.650	∞
B	Probe calibration drift	1.700	1.700	Rectangular	1.7321	1.0000	0.981	0.981	∞
B	Probe Linearity and Detection Limits	4.700	4.700	Rectangular	1.7321	1.0000	2.714	2.714	∞
B	Broadband Signal	0.800	0.800	Rectangular	1.7321	1.0000	0.462	0.462	∞
B	Probe Isotropy	7.600	7.600	Rectangular	1.7321	1.0000	4.388	4.388	∞
B	Data Acquisition	0.300	0.300	normal (k=1)	1.0000	1.0000	0.300	0.300	∞
B	RF Ambient conditions	0.260	0.260	normal (k=1)	1.0000	1.0000	0.260	0.260	∞
B	Probe Positioning	0.600	0.600	normal (k=1)	1.0000	0.0800	0.048	0.048	∞
B	Data Processing Errors	2.000	2.000	Rectangular	1.7321	1.0000	1.155	1.155	∞
B	Uncertainty in SAR correction for deviations in permittivity and conductivity	1.900	1.900	normal (k=1)	1.0000	0.8400	1.596	1.596	∞
B	Liquid Conductivity (measured value)	2.500	2.500	normal (k=2)	2.0000	0.7100	0.888	0.888	∞
B	Liquid Permittivity (measured value)	2.500	2.500	normal (k=2)	2.0000	0.0000	0.000	0.000	∞
B	Liquid Conductivity (temperature uncertainty)	3.300	3.300	Rectangular	1.7321	0.7100	1.353	1.353	∞
B	Liquid Permittivity (temperature uncertainty)	0.310	0.310	Rectangular	1.7321	0.0000	0.000	0.000	∞
A	Phantom Shell Permittivity	14.000	14.000	Rectangular	1.7321	0.0000	0.000	0.000	∞
A	Distance DUT - TSL	2.000	2.000	normal (k=1)	1.0000	2.0000	4.000	4.000	∞
B	Test Sample Positioning	4.240	4.240	normal (k=1)	1.0000	1.0000	4.240	4.240	25
B	Device Holder uncertainty	6.090	6.090	normal (k=1)	1.0000	1.0000	6.090	6.090	5
B	DUT Modulation	2.400	2.400	Rectangular	1.7321	1.0000	1.386	1.386	∞
B	Drift of output power	5.000	5.000	Rectangular	1.7321	1.0000	2.887	2.887	∞
	Combined standard uncertainty			t-distribution			12.65	12.65	90
	Expanded uncertainty			k = 2			25.30	25.30	90

6. Equipment Under Test (EUT)

6.1. Description of Equipment Under Test (EUT)

Serial Number:	Conducted Sample(s)	None Stated
	Radiated Sample(s)	None Stated
Hardware Version Number:	V1.8	
Software Version Number:	V1.2	
Firmware Version Number:	0272	
Country of Manufacture:	China	
Date of Receipt:	20 March 2023	
DUT Description:	The Device Under Test is a CB 27 MHz AM/FM Handheld Transceiver. The DUT supports AM and FM radio, it allows the end user to connect to multi-channel operations. To activate the transceiver, end user needs to press push- to-talk (PTT) button.	
Operating Configurations	Body-worn In-Front-of-Mouth Extremity	
Device dimension	Overall (Width x Height x Depth): 59 (W) x 138 (H) x 39 (D) mm (without external antenna) 59 (W) x 250 (H) x 39 (D) mm (with external antenna)	
Battery Type	☒ Standard – Lithium-ion battery ☐ Extended (large capacity)	

6.2.Wireless Technologies

Wireless technologies	Frequency bands	Duty Cycle
AM[1]	27 MHz	100%
FM[1]	27 MHz	100%

Note:
1. As per KDB 447498 D04, the reported SAR is scaled down to 75% duty factor.

Wireless technologies	Channel	Frequency (MHz)	Channel	Frequency (MHz)
AM / FM	1	26.965	21	27.215
	2	26.975	22	27.225
	3	26.985	23	27.255
	4	27.005	24	27.235
	5	27.015	25	27.245
	6	27.025	26	27.265
	7	27.035	27	27.275
	8	27.055	28	27.285
	9	27.065	29	27.295
	10	27.075	30	27.305
	11	27.085	31	27.315
	12	27.105	32	27.325
	13	27.115	33	27.335
	14	27.125	34	27.345
	15	27.135	35	27.355
	16	27.155	36	27.365
	17	27.165	37	27.375
	18	27.175	38	27.385
	19	27.185	39	27.395
	20	27.205	40	27.405

Additional Information Related to Testing:

Antenna Type:	External
Antenna Lengths:	As specified in **Appendix 12.1**

Number of Antennas:	**Antenna Description**	**Type**
	AM /FM	1 fixed (External)

Note: There is an antenna extension coaxial line inside the CB RADIO, hence SAR radiation is spread within CB Radio.

6.3.Nominal and Maximum Output power:

6.3.1.AM / FM

RF Air interface	Mode	Channel Nos.	Target + Max. Tolerances (dBm)
AM / FM	AM	All	36.00
	FM	All	36.00

Note(s):

7. RF Exposure Conditions (Test Configurations)

7.1. Configuration Consideration

Technology Port	Configuration	DUT-to-User Separation	Position	Antenna-to-Edge Separation (mm)	Evaluation Considered
AM / FM	Body-worn	0mm	Front	< 25	Yes
			Back	< 25	Yes
			Top	> 25	No
			Bottom	< 25	Yes
			Left	< 25	Yes
			Right	> 25	No
	In-Front-of-Mouth	10mm	Front	< 25	Yes
	Extremity	0mm	Front	< 25	Yes
			Back	< 25	Yes
			Top	> 25	No
			Bottom	< 25	Yes
			Left	< 25	Yes
			Right	> 25	No

Notes

1. The Antenna to edge separation distances are indicated in the 'Antenna Schematics' located in Section 12.1 of this report.

7.2. SAR Test Exclusion Consideration

Frequency Band	Configuration(s)
	Body-worn / In-Front-Of-Mouth / Extremity
AM	No
FM	No

Note:

1. As per KDB 4474898 D04, the frequency bands with rated power including upper tolerance, which qualify for Standalone Test Exclusion, are as per the above table.
2. The details for the Maximum Rated Power and tolerance(s) can be found in section 6.

8.Conducted output power measurements

8.1. RF Output Average Power Measurement:

Band / Mode	Channel	Frequency (MHz)	Avg Power (dBm)
AM	1	26.965	35.54
	19	27.185	35.59
	40	27.405	35.54
FM	1	26.965	35.54
	19	27.185	35.59
	40	27.405	35.54

Note(s):

9. Dielectric Property Measurements & System Check

9.1.Tissue Dielectric Parameters

The temperature of the tissue-equivalent medium used during measurement must also be within 18°C to 25°C and within ± 2°C of the temperature when the tissue parameters are characterized.
The dielectric parameters must be measured before the tissue-equivalent medium is used in a series of SAR measurements. The parameters should be re-measured after each 3 – 4 days of use; or earlier if the dielectric parameters can become out of tolerance; for example, when the parameters are marginal at the beginning of the measurement series.
Tissue dielectric parameters were measured at the low, middle and high frequency of each operating frequency range of the test device.

IEC/IEEE 62209-1528:2020

Target Frequency (MHz)	Head	
	ε_r	σ (S/m)
4	55.00	0.75
13	55.00	0.75
30	55.00	0.75
150	52.30	0.76
300	45.30	0.87
450	43.50	0.87
750	41.90	0.89
835	41.50	0.90
900	41.50	0.97
915	41.50	0.98
1450	40.50	1.20
1500	40.40	1.23
1610	40.30	1.29
1640	40.20	1.31
1750	40.10	1.37
1800	40.00	1.40
1900	40.00	1.40
2000	40.00	1.40
2100	39.80	1.49
2300	39.50	1.67
2450	39.20	1.80
2600	39.00	1.96
3000	38.50	2.40
3500	37.90	2.91
4000	37.40	3.43
4500	36.80	3.94
5000	36.20	4.45
5100	36.10	4.55
5200	36.00	4.66
5250	35.90	4.71
5300	35.90	4.76
5400	35.80	4.86
5500	35.60	4.96
5600	35.50	5.07
5700	35.40	5.17
5750	35.40	5.22
5800	35.30	5.27
6000	35.10	5.48
6500	34.50	6.07
7000	33.90	6.65
7500	33.30	7.24
8000	32.70	7.84
8500	32.10	8.46
9000	31.60	9.08
9500	31.00	9.71
10000	30.40	10.40

NOTE: For convenience, permittivity and conductivity values at some frequencies that are not part of the original data from Drossos et al. [B60] or the extension to 5800 MHz are provided (i.e., the values shown in italics). These values were linearly interpolated between the values in this table that are immediately above and below these values, except the values at 6000 MHz that were linearly extrapolated from the values at 3000 MHz and 5800 MHz.

9.2. System Check

SAR system verification is required to confirm measurement accuracy, according to the tissue dielectric media, probe calibration points and other system operating parameters required for measuring the SAR of a test device. The system verification must be performed for each frequency band and within the valid range of each probe calibration point required for testing the device. The same SAR probe(s) and tissue-equivalent media combinations used with each specific SAR system for system verification must be used for device testing. When multiple probe calibration points are required to cover substantially large transmission bands, independent system verifications are required for each probe calibration point. A system verification must be performed before each series of SAR measurements using the same probe calibration point and tissue-equivalent medium. Additional system verification should be considered according to the conditions of the tissue-equivalent medium and measured tissue dielectric parameters, typically every three to four days when the liquid parameters are re-measured or sooner when marginal liquid parameters are used at the beginning of a series of measurements.

9.3. Numerical SAR Target Values

The numerical SAR target values are obtained from the reference standards. The measured values are normalised to 1 Watt.

System Dipole	Freq. (MHz)	Numerical SAR Target Values (W/kg)	
		1g/10g	Head
CLA30	27	1g	1.45
		10g	0.903

9.4. Dielectric Property Measurements & System Check Results

The 1-g SAR and 10-g SAR measured with a reference dipole, using the required tissue-equivalent medium at the test frequency, must be within ±10% of the manufacturer calibrated dipole SAR target and ±15% of the numerical target.

Site 65

30 Head
Date: 08 Jun 2023
Reference Dipole Antenna: CLA-30 - SN1008

Simulant	Frequency (MHz)	Room Temp (℃)	Liquid Temp (℃)	Parameters	Measured Value	Target Type	Target Value	Deviation (%)	Limit (%)
Head	30	21.4	20.8	ε_r	54.13	Numerical	55.00	-1.58	10
				σ (S/m)	0.73	Numerical	0.75	-2.41	10
				1g (W/kg)	1.36	Experimental	1.45	-6.25	10
						Numerical	1.41	-3.59	15
				10g (W/kg)	0.85	Experimental	0.90	-6.27	10
						Numerical	0.88	-3.82	15

10. Measurements, Examinations and Derived Result

10.1. Specific Absorption Rate - Test Results

10.1.1. AM/FM Body-Worn 1g

Max Reported SAR = 0.060 (W/kg)

					Power (dBm)		1g: SAR Results (W/kg)				
Mode	Dist. (mm)	EUT Position	Channel Number	Freq (MHz)	Tune Up Limit	Meas.	Meas. SAR Level	Reported SAR	Power Drift	Notes	Plot No.
AM	0	Front	19	27.185	36.00	35.59	0.026	0.024	-0.58	1, 4	
	0	Back	19	27.185	36.00	35.59	0.047	0.046	-0.72	1, 4	
	0	Left	19	27.185	36.00	35.59	0.027	0.025	-0.52	1, 4	
	0	Bottom	19	27.185	36.00	35.59	0.048	0.041	-0.20	1, 4	
	0	Back	1	26.965	36.00	35.54	0.062	0.060	-0.63	1, 4	001
	0	Back	40	27.405	36.00	35.54	0.046	0.042	-0.35	1, 4	
	0	Back	1	26.965	36.00	35.54	0.008	0.008	-0.72	1, 2, 4	
FM	0	Back	1	26.965	36.00	35.54	0.053	0.054	-0.84	1, 3, 4	

Note(s):

1. Power Drift correction applied. (Approved by FCC via KDB inquiry)
2. Worst-case configuration repeated with belt clip on.
3. Spot check on 'FM' mode applied on overall worst-case configuration from 'AM' mode.
4. Testing was carried out at 100% Duty cycle, as per KDB 447498 D04, the reported SAR is scaled down to 75% duty factor.

10.1.2. AM/FM In-Front-Of-Mouth 1g

Max Reported SAR = 0.004 (W/kg)

					Power (dBm)		1g: SAR Results (W/kg)				
Mode	Dist. (mm)	EUT Position	Channel Number	Freq (MHz)	Tune Up Limit	Meas.	Meas. SAR Level	Reported SAR	Power Drift	Notes	Plot No.
AM	10	Front	19	27.185	36.00	35.59	0.004	0.004	-0.75	1, 3	
	10	Front	1	26.965	36.00	35.54	0.004	0.004	-1.01	1, 3	002
	10	Front	40	27.405	36.00	35.54	0.004	0.004	-0.47	1, 3	
FM	10	Front	1	26.965	36.00	35.54	0.004	0.004	-0.91	1, 2, 3	

Note(s):

1. Power Drift correction applied. (Approved by FCC via KDB inquiry)
2. Spot check on 'FM' mode applied on overall worst-case configuration from 'AM' mode.
3. Testing was carried out at 100% Duty cycle, as per KDB 447498 D04, the reported SAR is scaled down to 75% duty factor.

10.1.3. AM/FM Extremity 10g

Max Reported SAR = 0.035 (W/kg)

					Power (dBm)		10g: SAR Results (W/kg)				
Mode	Dist. (mm)	EUT Position	Channel Number	Freq (MHz)	Tune Up Limit	Meas.	Meas. SAR Level	Reported SAR	Power Drift	Notes	Plot No.
AM	0	Front	19	27.185	36.00	35.59	0.016	0.015	-0.58	1, 4	
	0	Back	19	27.185	36.00	35.59	0.029	0.028	-0.72	1, 4	
	0	Left	19	27.185	36.00	35.59	0.012	0.011	-0.52	1, 4	
	0	Bottom	19	27.185	36.00	35.59	0.019	0.016	-0.20	1, 4	
	0	Back	1	26.965	36.00	35.54	0.036	0.035	-0.63	1, 4	001
	0	Back	40	27.405	36.00	35.54	0.027	0.024	-0.35	1, 4	
	0	Back	1	26.965	36.00	35.54	0.004	0.004	-0.72	1, 2, 4	
FM	0	Back	1	26.965	36.00	35.54	0.031	0.031	-0.84	1, 3, 4	

Note(s):

1. Power Drift correction applied. (Approved by FCC via KDB inquiry)
2. Worst-case configuration repeated with belt clip on.
3. Spot check on 'FM' mode applied on overall worst-case configuration from 'AM' mode.
4. Testing was carried out at 100% Duty cycle, as per KDB 447498 D04, the reported SAR is scaled down to 75% duty factor.

10.2.SAR Measurement Variability

In accordance with published RF Exposure KDB procedure 865664 D01 SAR measurement 100 MHz to 6 GHz. These additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

1g-SAR (Body-worn)

1) Repeated measurement is not required when the original highest measured SAR is < 0.8 W/Kg; steps 2) through 4) do not apply.
2) When the original highest measured 1g-SAR is ≥ 0.80 W/Kg, repeat that measurement once.
3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg (~ 10% from the 1g-SAR limit).
4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥ 1.50 W/Kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

Note: Since the 1g measured SAR for none of the runs was > 0.8 W/Kg, repeat measurements were not performed on Extremity.

1g-SAR (In-Front-Of-Mouth)

1) Repeated measurement is not required when the original highest measured SAR is < 0.8 W/Kg; steps 2) through 4) do not apply.
2) When the original highest measured 1g-SAR is ≥ 0.80 W/Kg, repeat that measurement once.
3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg (~ 10% from the 1g-SAR limit).
4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥ 1.50 W/Kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

Note: Since the 1g measured SAR for none of the runs was > 0.8 W/Kg, repeat measurements were not performed on Extremity.

10g-SAR (Extremity)

1) Repeated measurement is not required when the original highest measured SAR is < 2.0 W/Kg; steps 2) through 4) do not apply.
2) When the original highest measured 10g-SAR is ≥ 2.00 W/Kg, repeat that measurement once.
3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 3.625 W/kg (~ 10% from the 10g-SAR limit).
4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥ 3.75 W/Kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

Note: Since the 10g measured SAR for none of the runs was > 2.0 W/Kg, repeat measurements were not performed on Extremity.

11.Highest Standalone SAR and Simultaneous Transmission

11.1.Highest Standalone Reported SAR

Individual Transmitter Evaluation per Band:

Exposure Configuration	Technology Band	Reported 1g - SAR (W/Kg)	Equipment Class	Highest Reported 1g -SAR (W/Kg)
Body-Worn (Separation Distance 0mm)	AM	0.060	TNF	0.060
	FM	0.054	TNF	0.054

Exposure Configuration	Technology Band	Reported 1g - SAR (W/Kg)	Equipment Class	Highest Reported 1g -SAR (W/Kg)
In-Front-Of-Mouth (Separation Distance 10mm)	AM	0.004	TNF	0.004
	FM	0.004	TNF	0.004

Exposure Configuration	Technology Band	Reported 10g - SAR (W/Kg)	Equipment Class	Highest Reported 10g -SAR (W/Kg)
EXTREMITY (Separation Distance 0mm)	AM	0.035	TNF	0.035
	FM	0.031	TNF	0.031

11.2.Simultaneous Transmission analysis

Simultaneous transmission SAR test exclusion is determined for each operating configuration and exposure condition according to the *reported* standalone SAR of each applicable simultaneous transmitting antenna. The worst-case simultaneous transmission analysis is considered for the following cases:

Note: No simultaneous transmission analysis is evaluated as this feature is not supported.