Prüfbericht-Nr.: *Test report no.*:	**CN24YFAT 002**	**Auftrags-Nr.:** *Order no.*:	168497793	Seite 1 von 8 *Page 1 of 8*
Kunden-Referenz-Nr.: *Client reference no.*:	N/A	**Auftragsdatum:** *Order date:*	2024-05-28	
Auftraggeber: *Client*:	**CompanyDeep Ltd** St John's Innovation Centre, Cowley Road, Cambridge, CB4 0WS, United Kingdom			
Prüfgegenstand: *Test item*:	IDC7 Bluetooth Module			
Bezeichnung / Typ-Nr.: *Identification / Type no.*:	IDC767, IDC777 (Trademark: IOT747)			
Auftrags-Inhalt: *Order content*:	Test Report			
Prüfgrundlage: *Test specification*:	47 CFR FCC Part 2.1091 RSS-102 Issue 6 FCC KDB Publication 447498 D01			

Wareneingangsdatum: *Date of sample receipt*:	2024-10-28	Please refer to Photo Document
Prüfmuster-Nr.: *Test sample no:*	A003610626	
Prüfzeitraum: *Testing period*:	2024-10-28 – 2024-12-12	
Ort der Prüfung: *Place of testing*:	TÜV Rheinland (Shenzhen) Co., Ltd.	
Prüflaboratorium: *Testing laboratory:*	TÜV Rheinland (Shenzhen) Co., Ltd.	
Prüfergebnis*: *Test result**:	Pass	

geprüft von: tested by:	X Signed by: Harry W. C. Wu	**genehmigt von:** *authorized by*:	X Signed by: Alex Lan
Datum: *Date:* 2025-01-15		**Ausstellungsdatum:** *Issue date:* 2025-01-15	
Stellung / Position:	Project Manager	**Stellung** / Position:	Authorizer

Sonstiges / *Other*:
FCC ID: 2A3WYIDC777
IC: 30237-IDC777
HVIN: IDC767, IDC777

Zustand des Prüfgegenstandes bei Anlieferung: Prüfmuster vollständig und unbeschädigt
Condition of the test item at delivery: *Test item complete and undamaged*

* Legende:	P(ass) = entspricht o.g. Prüfgrundlage(n)	F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
* *Legend:*	*P(ass) = passed a.m. test specification(s)*	*F(ail) = failed a.m. test specification(s)*	*N/A = not applicable*	*N/T = not tested*

Prüfbericht-Nr.: CN24YFAT 002
Test report no.:

Anmerkungen
Remarks

1	Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben. Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden. *The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system. Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.*
2	Wie vertraglich vereinbart, wurde dieses Dokument nur digital unterzeichnet. Der TÜV Rheinland hat nicht überprüft, welche rechtlichen oder sonstigen diesbezüglichen Anforderungen für dieses Dokument gelten. Diese Überprüfung liegt in der Verantwortung des Benutzers dieses Dokuments. Auf Verlangen des Kunden kann der TÜV Rheinland die Gültigkeit der digitalen Signatur durch ein gesondertes Dokument bestätigen. Diese Anfrage ist an unseren Vertrieb zu richten. Eine Umweltgebühr für einen solchen zusätzlichen Service wird erhoben. Informationen zur Verifizierung der Authentizität unserer Dokumente erhalten Sie auf folgender Webseite: go.tuv.com/digital-signature *As contractually agreed, this document has been signed digitally only. TUV Rheinland has not verified and unable to verify which legal or other pertaining requirements are applicable for this document. Such verification is within the responsibility of the user of this document. Upon request by its client, TUV Rheinland can confirm the validity of the digital signature by a separate document. Such request shall be addressed to our Sales department. An environmental fee for such additional service will be charged. For information on verifying the authenticity of our documents, please visit the following website: go.tuv.com/digital-signature*
3	Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben. Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt. *Test clauses with remark of * are subcontracted to qualified subcontractors and descripted under the respective test clause in the report.* *Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.*
4	Die Entscheidungsregel für Konformitätserklärungen basierend auf numerischen Messergebnisen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2021, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird. Zu weiteren Informationen bezueglich des Risikos durch diese Entscheidungsregel siehe ILAC G8:2019. *The decision rule for statements of conformity, based on numerical measurement results, in this test report is based on the “Zero Guard Band Rule” and “Simple Acceptance” in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report. For additional information to the resulting risk based of this decision rule please refer to ILAC G8:2019.*

TEST SUMMARY

3.1 ***Transmitter Requirements & Test Suites***

RESULT: *Pass*

Contents

1. Test Sites

1.1 Test Facilities

TÜV Rheinland (Shenzhen) Co., Ltd.
Unit 1, C3 Factory Building, No.1, Nuclear Power Industrial Park, Shijin Community, Fucheng Street, Longhua District, Shenzhen, China

FCC Accreditation Designation No.: CN1260

ISED wireless device testing laboratory: 25069

1.2 Traceability

All measurement equipment calibrations are traceable to NIST or where calibration is performed outside the United States, to equivalent nationally recognized standards organizations.

1.3 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basics using in house standards or comparisons.

1.4 Location of Original Data

The original copies of all test data taken during actual testing were attached at Appendixes of this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Shenzhen) file for certification follow-up purposes.

1.5 Status of Facility Used for Testing

The TÜV Rheinland (Shenzhen) Co., Ltd. facility located at Unit 1, C3 Factory Building, No.1, Nuclear Power Industrial Park, Shijin Community, Fucheng Street, Longhua District, Shenzhen, China is listed on the US Federal Communications Commission list of facilities approved to perform measurements.

2. General Product Information

2.1 General Description

The EUT is a Bluetooth module, which supports Bluetooth dual mode technology.

For details refer to the User Manual, Technical Description and Circuit Diagram.

2.2 Rating and System Details

Table 1: Technical Specification of EUT

General Information of EUT	Value
Kind of Equipment:	IDC7 Bluetooth Module
Type Designation:	IDC767, IDC777
Trade Mark	IOT747
FCC ID:	2A3WYIDC777
IC:	30237-IDC777
HVIN:	IDC767, IDC777
PMN:	IDC7 Bluetooth Module
Operating Voltage	DC 3.3V-4.7V for Bluetooth Module AC 100-120V/220-240V, 50/60Hz, 700W Max. for Host SA35 AC 100-120V/220-240V, 50/60Hz, 1000W Max. for Host SA45

Technical Specification of Classical Bluetooth	
Bluetooth Core Version	Bluetooth 5.4
Operating Frequency band	2402 ~ 2480 MHz
Channel Number	79 channels
Channel separation	1MHz
Modulation	GFSK, π/4DQPSK, 8DPSK
Antenna Type	integral antenna
Antenna Gain	0 dBi
Technical Specification of Bluetooth Low Energy	
Bluetooth Core Version	Bluetooth 5.4
Operating Frequency band	2402 ~ 2480 MHz
Channel Number	40 channels
Channel separation	2MHz
Data rate	1Mbps, 2Mbps
Modulation	GFSK
Antenna Type	integral antenna
Antenna Gain	0 dBi

3. Test Results

3.1 Transmitter Requirements & Test Suites

RESULT: **Pass**

Test standard : CFR47 FCC Part 2: Section 2.1091
RSS-102 Issue 6 December 2023
FCC KDB 447498 D01 General RF Exposure Guidance v06

Measurement Record:

The minimum distance for the module is more than 20cm.
This Bluetooth module ID767 with another Wi-Fi & BLE module ST1955 will be installed into a host SA35 & SA45, the host minimum distance is more than 20cm.

➢ **FCC requirements**

FCC requirement: Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 20cm normally can be maintained between the user and the device.

MPE Calculation Method according to FCC KDB 447498 D01 General RF Exposure Guidance v06

Power Density: $S_{(mW/cm^2)}$= $PG/4\pi R^2$ or $EIRP/4\pi R^2$

Where:

S = power density (mW/cm^2)

P = power input to the antenna (mW)

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna (cm)

From the peak RF output power, the minimum mobile separation distance, d=20 cm, as well as the antenna gain, the RF power density can be calculated as below:

$S_{(mW/cm^2)}$= $PG/4\pi R^2$

a) EUT RF Exposure Evaluation standalone operations

Test Mode	Maximum conducted Power		Antenna Gain (dBi)	Measured e.i.r.p		$S_{(mW/cm^2)}$= $PG/4\pi R^2$	Limit (mW/cm^2)
	(dBm)	(mW)		(dBm)	(mW)		
BT&BLE1 (IDC767)	12.46	17.62	0	12.46	17.62	0.0035	1.0
BLE2 (ST1955)	6.30	4.27	2.34	8.64	7.31	0.0015	1.0
2.4GHz band Wi-Fi (ST1955)	19.97	99.31	2.34	22.31	170.22	0.0339	1.0
5GHz band Wi-Fi (ST1955)	15.10	32.35	2.79	17.89	61.52	0.0122	1.0

b) EUT RF Exposure Evaluation simultaneous transmission operations

Simultaneous transmission mode	The sum of the ratios	Result
BT&BLE1 +BLE2+WIFI	(0.00355/1 + 0.0015/1 + 0.0339/1) < 1	Pass

The conducted power of BT&BLE1(IDC767) refer to test report xxx 001.
The conducted power of BLE2 (ST1955) & Wi-Fi (ST1955) refer to test report FG21-144, FG21-145, FG21-146, FG21-147 issued by TÜV AUSTRIA SERVICES GMBH

- **IC requirements:** The EUT shall comply with the requirement of RSS-102 section 6.6.

Exemption from Routine Evaluation Limits – RF Exposure Evaluation
RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2}\ f^{0.6834}$ W (adjusted for tune-up tolerance), where f is in MHz;

a) EUT RF Exposure Evaluation standalone operations:

Test Mode	Measured Peak Power		Antenna Gain (dBi)	Measured e.i.r.p (mW)		Limit
	(dBm)	(mW)		(dBm)	(mW)	(mW)
BT&BLE1 (IDC767)	12.46	17.62	0	12.46	17.62	2670
BLE2 (ST1955)	6.30	4.27	2.34	8.64	7.31	2670
2.4GHz band Wi-Fi (ST1955)	19.97	99.31	2.34	22.31	170.22	2684
5GHz band Wi-Fi (ST1955)	15.10	32.35	2.79	17.89	61.52	4525

b) EUT RF Exposure Evaluation simultaneous transmission operations

Simultaneous transmission mode	The sum of the ratios	Result
BT&BLE1+BLE2+WIFI	(17.62/2670 + 7.31/2670 + 170.22/2684) <1	Pass

The e.i.r.p. for BLE, DTSs and FHSs are less than the RF exposure evaluation exempted power. So RF exposure evaluation is not required.

"RF Radiation Exposure Statement Caution: This Transmitter must be installed to provide a separation distance of at least 20 cm from all persons."