

Prüfbericht-Nr.: <i>Test report no.:</i>	CN22N92T 001	Auftrags-Nr.: <i>Order no.:</i>	168374470	Seite 1 von 15 <i>Page 1 of 15</i>	
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	2022-05-26		
Auftraggeber: <i>Client:</i>	Intelbras Industria de Telecomunicacao Eletronica Brasileira Rodovia BR 101 KM 210 Area Industrial Sao Jose Brazil				
Prüfgegenstand: <i>Test item:</i>	Smart terminal				
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	TI5000				
Auftrags-Inhalt: <i>Order content:</i>	Test Report				
Prüfgrundlage: <i>Test specification:</i>	FCC CFR Title 47, Part 15, Subpart B				
Wareneingangsdatum: <i>Date of sample receipt:</i>	2022-06-27	Please refer to Photo Document			
Prüfmuster-Nr.: <i>Test sample no.:</i>	A003285007-001 A003285010-001 A003285800-001~013				
Prüfzeitraum: <i>Testing period:</i>	2022-07-26 – 2022-08-03				
Ort der Prüfung: <i>Place of testing:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.				
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.				
Prüfergebnis*: <i>Test result*:</i>	Pass				
geprüft von: <i>tested by:</i>			genehmigt von: <i>authorized by:</i>		
Datum: <i>Date:</i>	2022-08-30 Signed by: Bell Hu		Ausstellungsdatum: <i>Issue date:</i>	2022-08-30 Signed by: Lin Lin	
Stellung / Position:	Project Manager		Stellung / Position:	Reviewer	
Sonstiges / Other:	FCC ID: 2A76R-TI5000				
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>			Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>		
* Legende:	1 = sehr gut P(ass) = entspricht o.g. Prüfgrundlage(n)	2 = gut 3 = befriedigend F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	4 = ausreichend N/A = nicht anwendbar	5 = mangelhaft N/T = nicht getestet	
* Legend:	1 = very good P(ass) = passed a.m. test specification(s)	2 = good 3 = satisfactory F(ail) = failed a.m. test specification(s)	4 = sufficient N/A = not applicable	5 = poor N/T = not tested	
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>					

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Test Summary

5.1.1 RADIATED EMISSIONS
RESULT: Pass

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1 General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix A: Photographs of the Test Set-up

2 Test Sites

2.1 Test Facilities

TÜV Rheinland (Shenzhen) Co., Ltd.

362 Huanguan Road Middle Longhua District, Shenzhen 518110 People's Republic of China

FCC Accreditation Designation No.: CN1260

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Radiated Emission (3m chamber)				
Equipment	Manufacturer	Model No.	Serial No.	Cal. Until
3m SAC	ETS-Lindgren	SAC3	CT001632-Q1362	2024-04-26
EMI Test Receiver	R&S	ESR7	102111	2022-12-01
Horn Antenna	R&S	HF907	102706	2022-08-07
Preamplifier (1-18GHz)	FIT	SCU-18F	180077	2022-08-13
Trilog-Broadband antenna	SCHWARZBECK	VULB9168	0945	2022-12-12
EMC32 test software	R&S	EMC32(Ver.10.50.00)	N/A	N/A

2.3 Traceability

All measurement equipment calibrations are traceable to NIM (National Institute of Metrology) or where calibration is performed in other countries, to equivalent nationally recognized standards organizations.

2.4 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 basis using in house standards or comparisons.

2.5 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements as below table.

Parameter	Uncertainty
Radiated Emission (3m SAC), 30MHz to 1000MHz	± 4.52 dB
Radiated Emission (3m SAC), above 1000MHz	± 4.37 dB

2.6 Location of Original Data

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

2.7 Status of Facility Used for Testing

The TÜV Rheinland (Shenzhen) Co., Ltd. Test facility located at 362 Huanguan Road Middle Longhua District, Shenzhen 518110 People's Republic of China is listed on the US Federal Communications Commission list of facilities approved to perform measurements.

3 General Product Information

3.1 Product Function and Intended Use

The EUT is a Smart terminal.

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

3.2 Ratings and System Details

Table 2: Technical Specification of EUT

General Information of EUT	Value
Kind of Equipment:	Smart terminal
Type Designation:	TI5000
FCC ID:	2A76R-TI5000
Operating Voltage:	-24 V DC to -36 V DC
Operating Temperature Range:	0 °C ~ +37 °C
Equipment Class	Class B Digital device (JAB)

3.3 Independent Operation Modes

The basic operation modes are:

- A. On, Normal working
- B. Off

3.4 Noise Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

3.5 Submitted Documents

- User Manual
- ID Label and Location Info
- Schematics
- Operation Description
- Block Diagram
- PCB Layout

4 Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Test operation refers to test setup in chapter 5. All tests were performed according to the procedures in ANSI C63.4: 2014.

According to clause 3.1, all tests were performed on model TI5000 in this report.

4.3 Special Accessories and Auxiliary Equipment

Table 3: Auxiliary Equipment Used during Test

Description	Manufacturer	Model	S/N	Remark
Impacts exchanges	Intelbras	Impacta 220	N/A	Buliding a call between exchange and Smart terminal TI5000

4.4 Countermeasures to Achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Technical Construction File (TCF).

No additional measures were employed to achieve compliance.

4.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test (Below 1GHz)

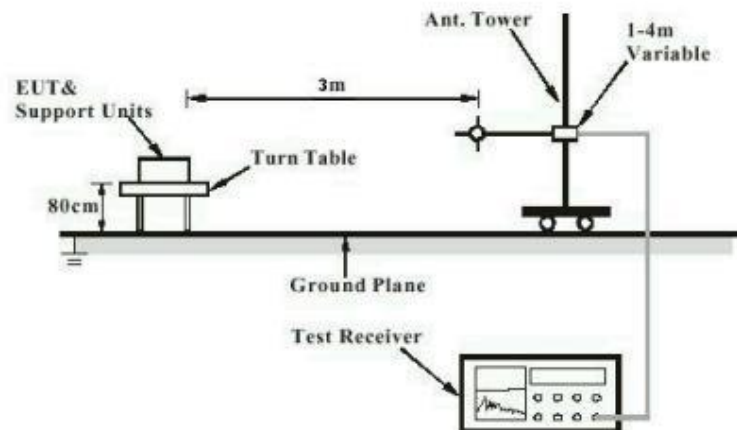
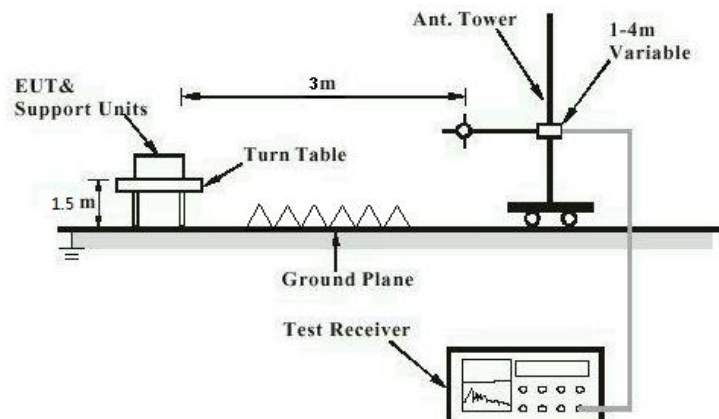


Diagram of Measurement Configuration for Radiation Test (Above 1GHz)



5 Test Results

5.1.1 Radiated Emissions

RESULT:**Pass****Test Specification**

Test standard	: FCC Part 15.109(a)
Basic standard	: ANSI C63.4:2014
Frequency range	: 30MHz to 5 th harmonic of the highest frequency
Classification	: Class B
Limits	: FCC Part 15.109(a)
Kind of test site	: 3m Semi-anechoic Chamber

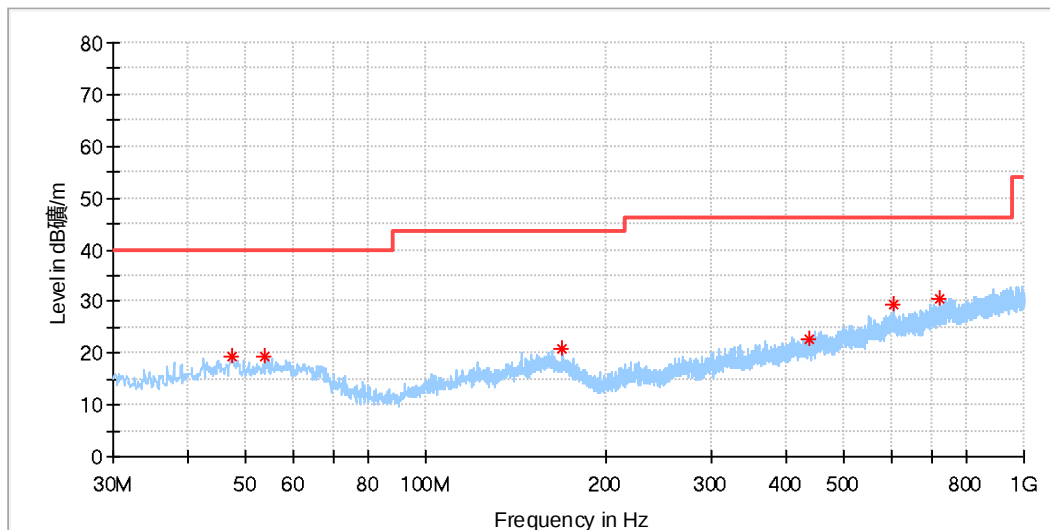
Test Setup

Date of testing	: 2022-07-26 to 2022-08-03
Input voltage	: Powered by Impacts exchanges
Operation mode	: A
Ambient temperature	: Refer to test result
Relative humidity	: Refer to test result
Atmospheric pressure	: 101 kPa

For the measurement records, refer to the following plots.
As for above 6GHz, only the noise-floors, thus no record for it.

EUT Information

EUT Name: Smart terminal
 Order No: 168374467 30
 Model: TI5000
 Test Mode: ON, Normal working
 Test Voltage: Powered by Impacts exchanges
 Standard: FCC Part 15B
 Test By:/Review By: Kevin Zhou/Gary Chen
 Tem./Hum./Pressure: 24.1°C/50.8%/101kPa
 Remark: 3m chamber

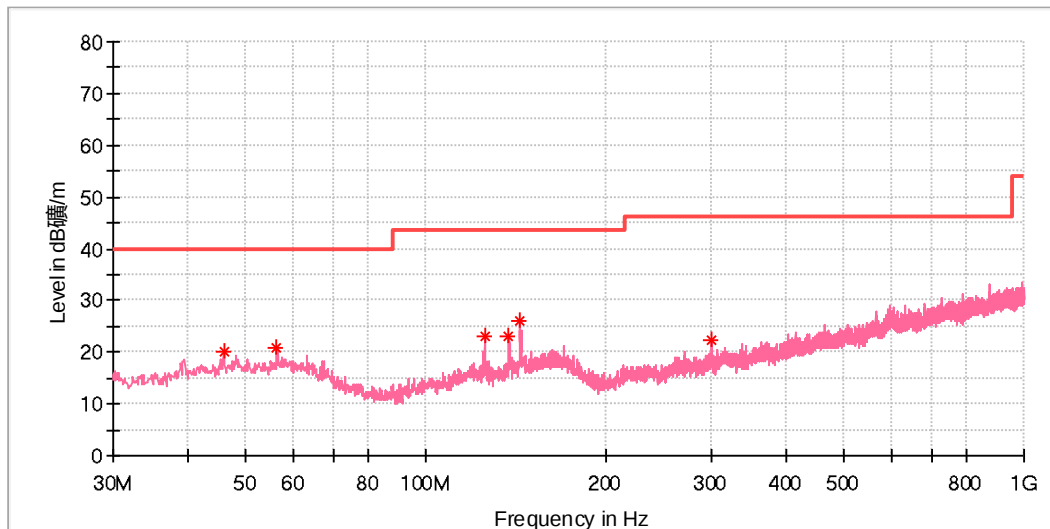


Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
47.557000	19.41	40.00	20.59	200.0	H	55.0	21.3
53.862000	19.52	40.00	20.48	100.0	H	0.0	21.0
169.389000	20.86	43.50	22.64	100.0	H	126.0	21.7
437.788000	22.55	46.00	23.45	100.0	H	298.0	23.8
605.113000	29.27	46.00	16.73	100.0	H	181.0	27.9
724.617000	30.61	46.00	15.39	200.0	H	358.0	29.5

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 Remark: 3m chamber

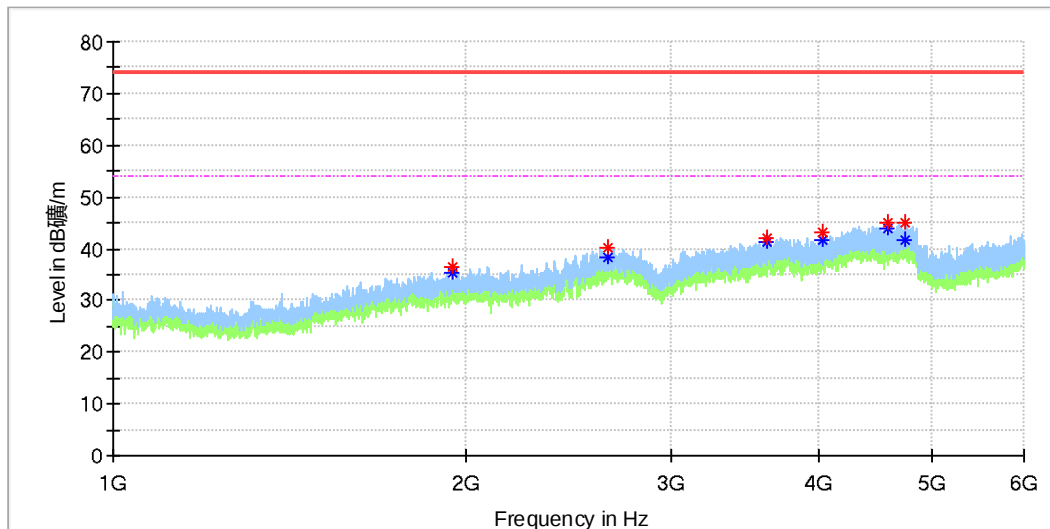


Critical Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
45.908000	20.24	40.00	19.76	100.0	V	154.0	20.9
56.384000	20.69	40.00	19.31	100.0	V	232.0	21.2
125.448000	23.08	43.50	20.42	100.0	V	244.0	19.1
137.767000	23.24	43.50	20.26	100.0	V	240.0	20.0
143.684000	26.14	43.50	17.36	100.0	V	234.0	20.2
300.921000	22.47	46.00	23.53	100.0	V	354.0	20.7

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 Standard: FCC Part 15B
 Test By:/Review By: Kevin Zhou/Gary Chen
 Tem./Hum./Pressure: 24.1°C/51.3%/101kPa
 Remark: 3m chamber

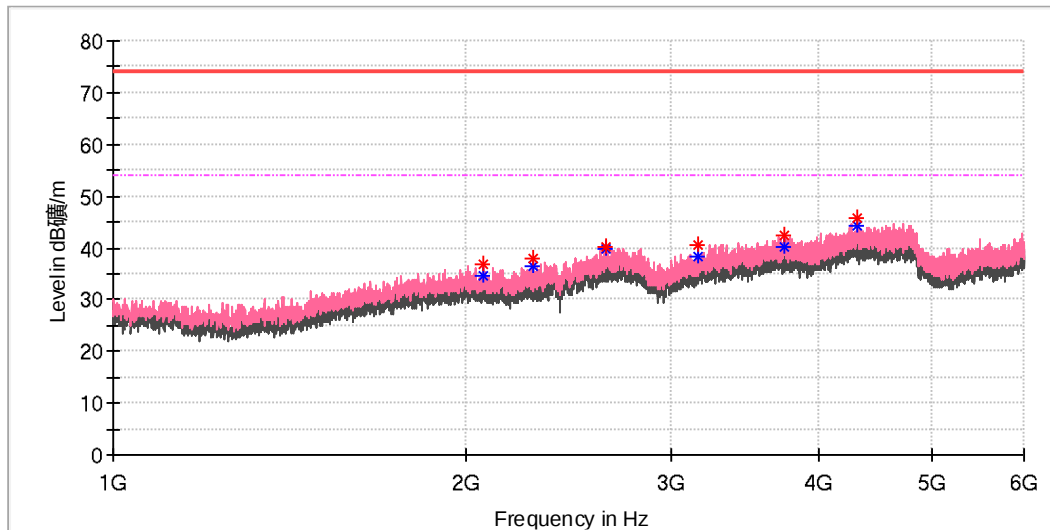


Critical Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1950.000000	36.32	---	74.00	37.68	100.0	H	356.0	-7.6
1950.000000	---	35.38	54.00	18.62	100.0	H	356.0	-7.6
2645.500000	40.32	---	74.00	33.68	100.0	H	305.0	-3.3
2645.500000	---	38.50	54.00	15.50	100.0	H	305.0	-3.3
3620.000000	42.07	---	74.00	31.93	100.0	H	3.0	-0.4
3620.000000	---	41.37	54.00	12.63	100.0	H	3.0	-0.4
4031.000000	43.17	---	74.00	30.83	100.0	H	33.0	0.3
4031.000000	---	41.51	54.00	12.49	100.0	H	33.0	0.3
4588.500000	45.15	---	74.00	28.85	100.0	H	91.0	1.9
4588.500000	---	43.80	54.00	10.20	100.0	H	91.0	1.9
4752.000000	45.06	---	74.00	28.94	100.0	H	0.0	2.9
4752.000000	---	41.74	54.00	12.26	100.0	H	0.0	2.9

EUT Information

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Model: TI5000
Test Mode: ON, Normal working
Test Voltage: Powered by Impacts exchanges
Standard: FCC Part 15B
Test By:/Review By: Kevin Zhou/Gary Chen
Tem./Hum./Pressure: 24.1°C/51.3%/101kPa
Remark: 3m chamber



Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2072.000000	36.66	---	74.00	37.34	100.0	V	193.0	-7.2
2072.000000	---	34.49	54.00	19.51	100.0	V	193.0	-7.2
2281.500000	37.92	---	74.00	36.08	100.0	V	193.0	-6.7
2281.500000	---	36.44	54.00	17.56	100.0	V	193.0	-6.7
2633.000000	40.24	---	74.00	33.76	100.0	V	266.0	-3.5
2633.000000	---	39.74	54.00	14.26	100.0	V	266.0	-3.5
3157.500000	40.44	---	74.00	33.56	100.0	V	124.0	-2.6
3158.500000	---	38.32	54.00	15.68	100.0	V	358.0	-2.6
3738.000000	42.56	---	74.00	31.44	100.0	V	112.0	0.2
3738.000000	---	40.02	54.00	13.98	100.0	V	112.0	0.2
4319.500000	45.65	---	74.00	28.35	100.0	V	193.0	2.2
4319.500000	---	44.13	54.00	9.87	100.0	V	193.0	2.2

6 Photographs of the Test Set-Up

For photographs of the test set-up, refer to the appendix A.

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