

EMI/EMC Testing | EMI/EMC Design Consultancy | EMI/EMC Test Equipment Calibration

 **SAMEER** Centre for Electromagnetics

EMC Division

Society for Applied Microwave Electronics Engineering & Research

प्रायोगिक सूक्ष्मतरंग इलेक्ट्रॉनिक अभियांत्रिकी तथा अनुसन्धान संस्थान

(An Institution Set up by Ministry of Electronics and Information Technology, Government of India)
2nd Cross Road, CIT Campus, Taramani, Chennai, India. 600113. web: <http://www.scemcd.gov.in/>

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Equipment Under Test (EUT)	:	LoRaWAN GPRS GATEWAY
Model Number of EUT	:	SP1FC101
Serial Number of EUT	:	1024GW-0001
Manufactured by	:	M/s. Spowerz Solutions Pvt. Ltd., Chennai

**EMI/EMC TEST REPORT FOR LoRaWAN GPRS GATEWAY
MANUFACTURED BY
M/S. SPOWERZ SOLUTIONS PVT LTD, CHENNAI**

Test Request Particulars

1. Test Request From : M/s. Spowerz Solutions Pvt Ltd., Chennai
2. Equipment Under Test (EUT) : LoRaWAN GPRS GATEWAY
3. Number of Test Sample(s) : One
4. Types of Tests Requested
(Applicable Standard) : a. Measurement of Operating Frequency
b. Measurement of Occupied Bandwidth
c. Measurement of Adjacent Channel Power
d. Measurement of Power Spectral Density
e. Measurement of 3dB Bandwidth
f. Measurement of Effective Isotropic Radiated Power
5. Manufacturer by : M/s. Spowerz Solutions Pvt. Ltd., Chennai
6. Model Number of EUT : SP1FC101
7. Serial Number of EUT : 1024GW-0001
8. Test Plan Concurred by
(Customer Representative) : Mr. S. Ragupathy, Testing Engineer
9. EUT Arrived On : November 20, 2024
10. Tested On : November 20 & 21, 2024
11. Test Venue : SAMEER-CEM, Chennai
12. Status of the EUT on Receipt : Functional

Certified that the data reported in this report are valid only for the test sample mentioned above at the time of and under the stated conditions of measurement. Particulars on Manufacturer / Supplier, given in this report, are based on the information given by the customer, along with test request and SAMEER-CEM does not assume any responsibility for the correctness of that information for the above mentioned equipment under test.

Test Plan & Reviewed by:

Approved by:


(K. Naresh Kumar)
Scientist -D


(Dr. Sanjay Baisakhiya)
Head, EMC Division



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EMI/EMC TEST REPORT FOR LORAWAN GPRS GATEWAY

Sl. No	Name of the Test	Standard Used	Mode of Test
a.	Measurement of Operating Frequency	ETSI EN 300 220-1 V3.1.1 (2017-02)	Conducted
b.	Measurement of Occupied Bandwidth	ETSI EN 300 220-1 V3.1.1 (2017-02)	Conducted
c.	Measurement of Adjacent Channel Power	ETSI EN 300 220-1 V3.1.1 (2017-02)	Conducted
d.	Measurement of Power Spectral Density	ETSI EN 300 220-1 V3.1.1 (2017-02)	Conducted
e.	Measurement of 3dB Bandwidth	ETSI EN 300 220-1 V3.1.1 (2017-02)	Conducted
f.	Measurement of Effective Isotropic Radiated Power	ETSI EN 300 220-1 V3.1.1 (2017-02)	Radiated



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1. Measurements in Conducted Mode

1.1 Applicable Standard: Based on ETSI EN 300220-1 V3.1.1 (2017-02)

1.2 Test Instrumentation:

Description	Make	Model Number	Serial Number
Spectrum Analyzer	Agilent	E4446A	US44300450

1.3 Test Observations:

a. Measurement of Operating Frequency

The frequency range is 866.036 MHz – 866.162 MHz

b. Measurement of Occupied Bandwidth

The operational bandwidth is 125.35 kHz

c. Measurement Adjacent Channel Power:

The frequency is 866.142 MHz

Adjacent Channel Power -62.61 dBm/ 125 kHz

d. Measurement of Power Spectral Density

Power Spectral Density: -113.58 dBm/Hz at 866.142 MHz

e. Measurement of 3dB Bandwidth

3dB Bandwidth: 125.35 kHz

1.3 Enclosed Documents

Plot - 3 - 6 : Measurements in Conducted Mode.

Annexure-2 : Photograph of the EUT and test setup.



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2. Measurement of Effective Radiated Power

2.1 Applicable Standard: Based on ETSI EN 300 220-1 V3.1.1 (2017-02)

2.2 Test Instrumentation:

Description	Make	Model Number	Serial Number
Spectrum Analyzer	Agilent	N9917A	MY61272587
Log Periodic Antenna	Electrometrics	LPA 25	1463
Ultra log Antenna	R&S	HL562	100100
Signal Generator	Agilent	N5183B	MY59101125
RF Power Amplifier	PRANA	MT400D	1603-1829

2.3 Test Procedure:

The Effective Radiated Power Measurement was carried out inside a shielded semi anechoic chamber with the (EUT) kept at a distance of 3m from the receiving antenna and the signal level was noted down. The EUT was replaced by substitution antenna and connected to the signal generator. The signal generator level was adjusted until signal level was detected by the measuring receiver that was equal to the level which was noted down. The measurement was carried out using peak detector at operating frequencies of the antenna.

2.4 Test Observation:

The measurement of Effective Radiated Power (ERP) at vertical and Horizontal polarization was given in the table below.

Frequency (MHz)	EUT Level (dBm)	Signal Generator P_s (dBm)	Log periodic Antenna Gain (dBi) (G_t)	Amplifier Gain G_A (dBm)	EIRP= $P_s+G_t+G_A$ (dBm)
866.16	-7.55	-30.74	7.1	51.86	22.07

Frequency (MHz)	EUT Level (dBm)	Signal Generator P_s (dBm)	Log periodic Antenna Gain (dBi) (G_t)	Amplifier Gain G_A (dBm)	EIRP= $P_s+G_t+G_A$ (dBm)
866.16	-7.38	-31.33	7.1	51.86	21.48



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2.5 Enclosed Documents:

Plot - 1-2 : Measurement of Effective Radiated Power from the EUT.

Annexure-2 : Photograph of the EUT and test setup.

Test Conducted by:

M. Nandhini

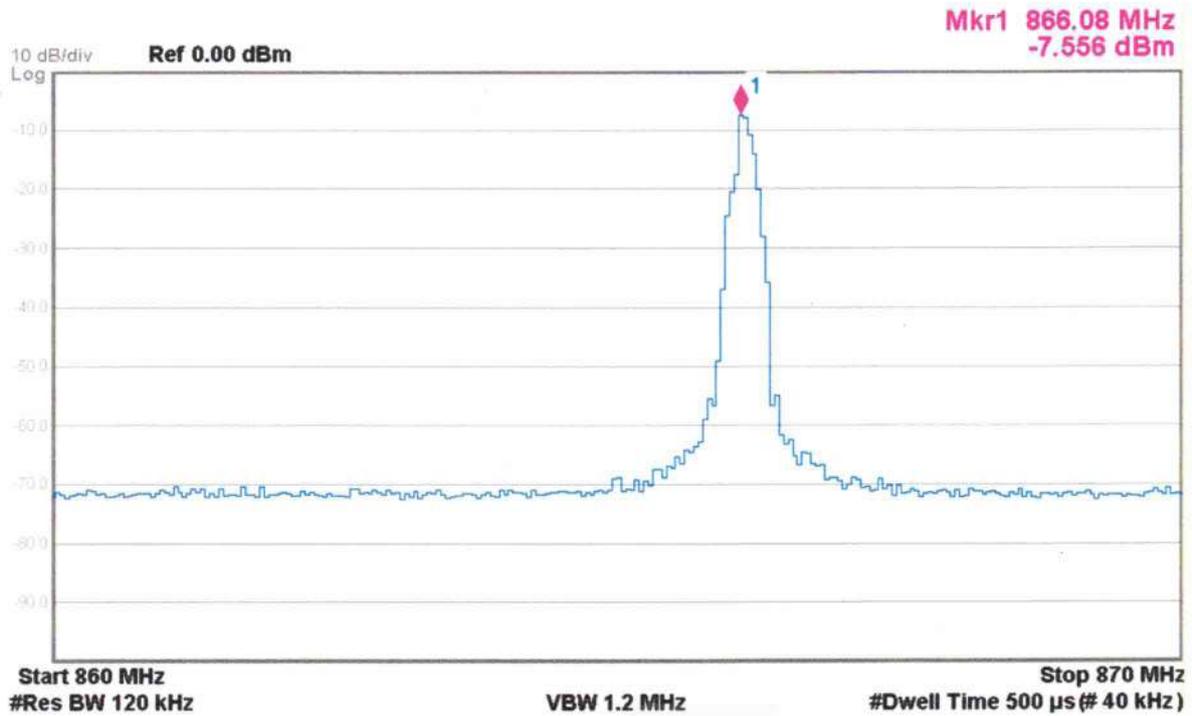
(M. Nandhini)
Project Assistant-A

SAMEER



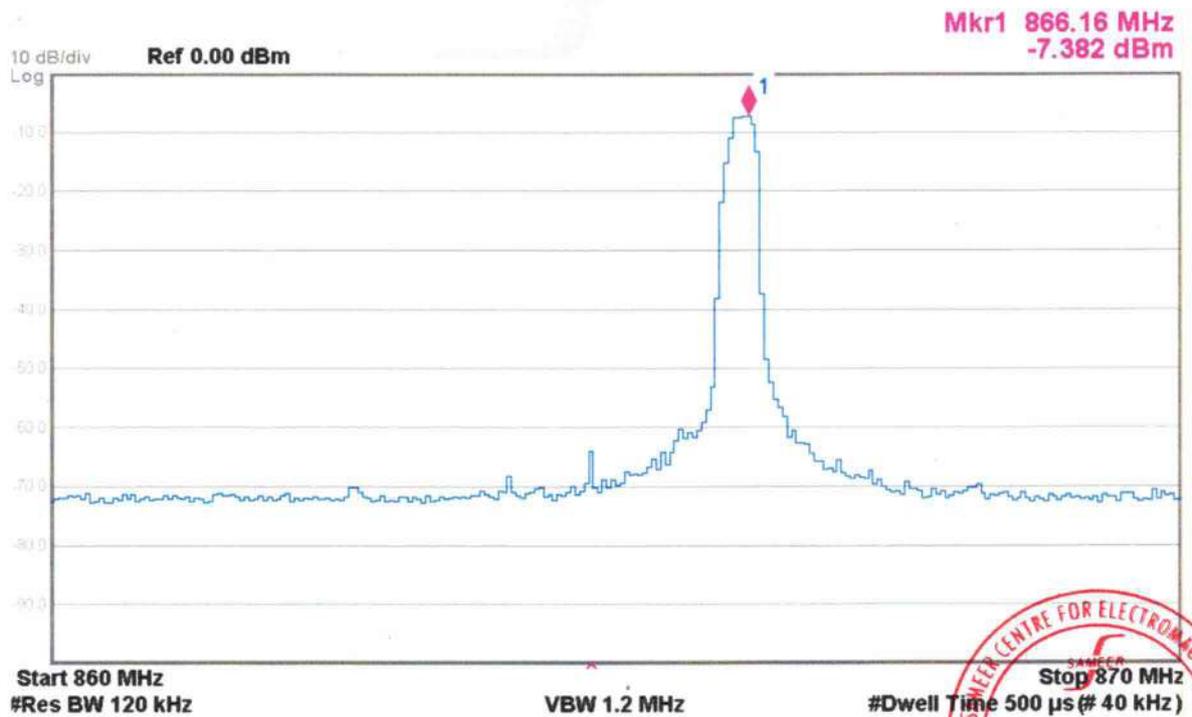
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PLOT - 1



Measurement of Effective Radiated Power (Vertical polarization)

PLOT - 2

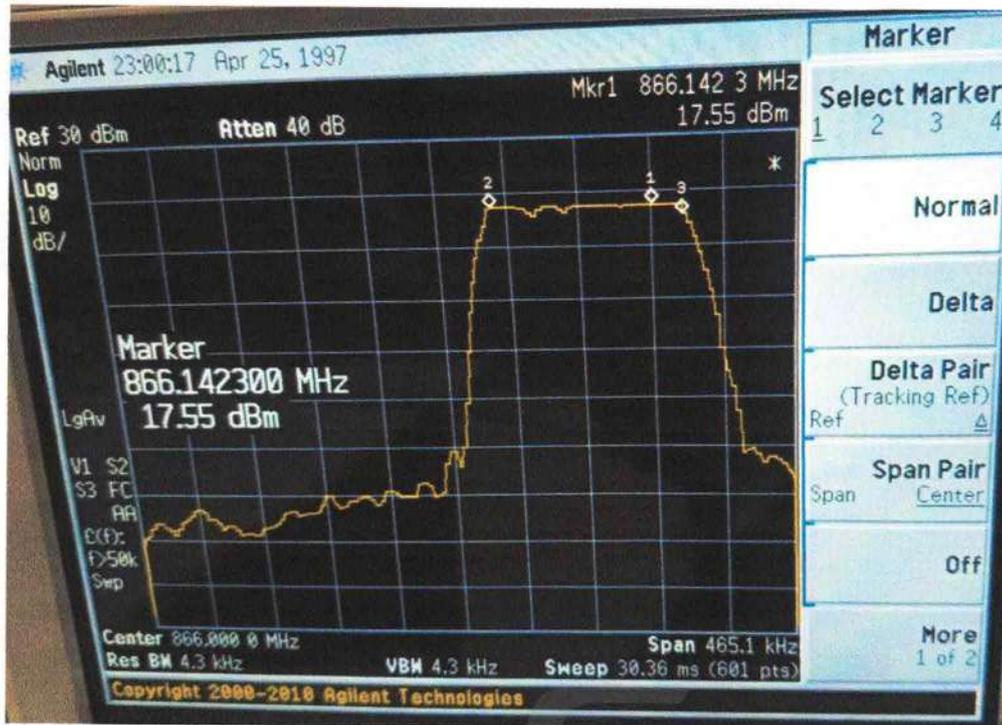


Measurement of Effective Radiated Power (Horizontal polarization)



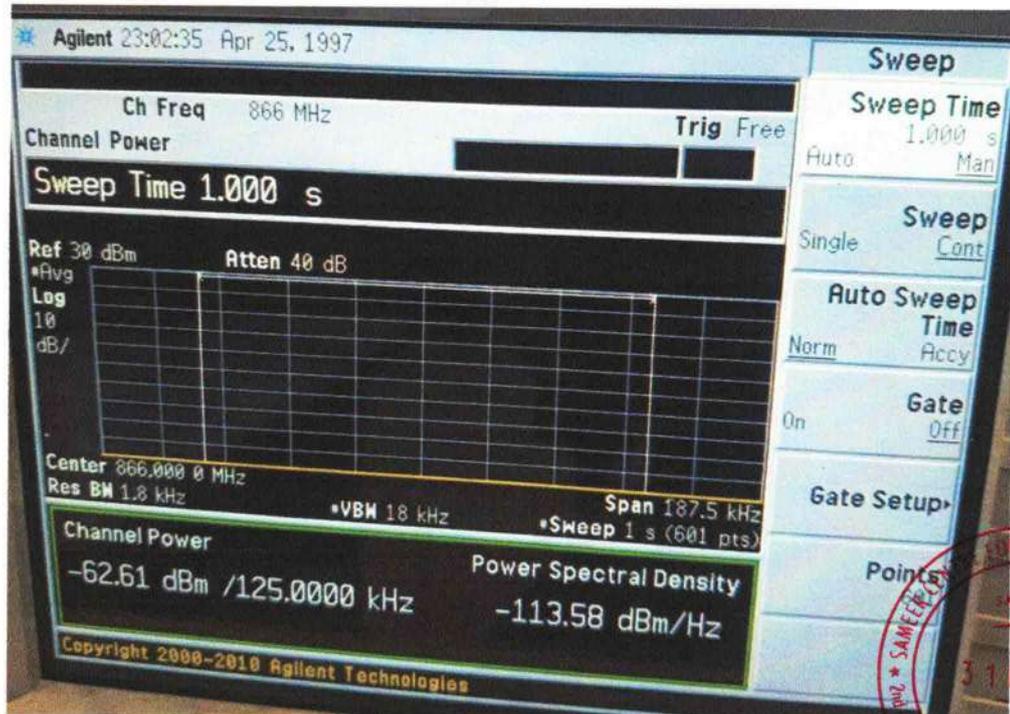
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PLOT - 3



Measurement of Occupied Bandwidth

PLOT - 4

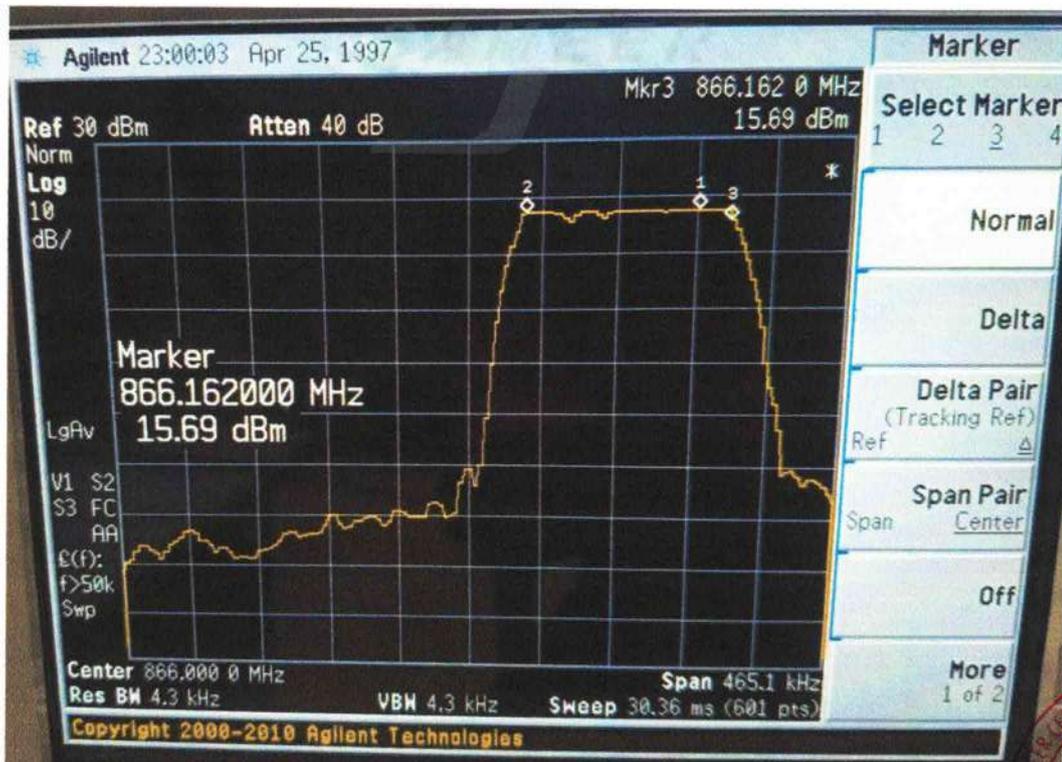
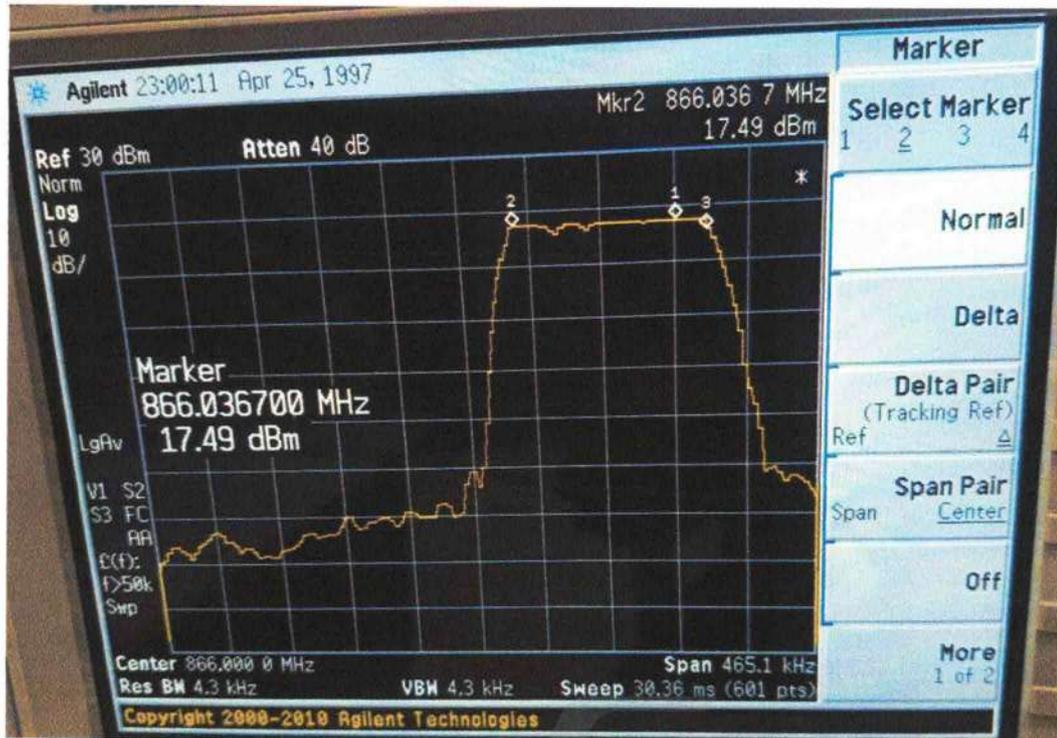


Measurement of Adjacent Channel Power and Power Spectral Density



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PLOT - 5

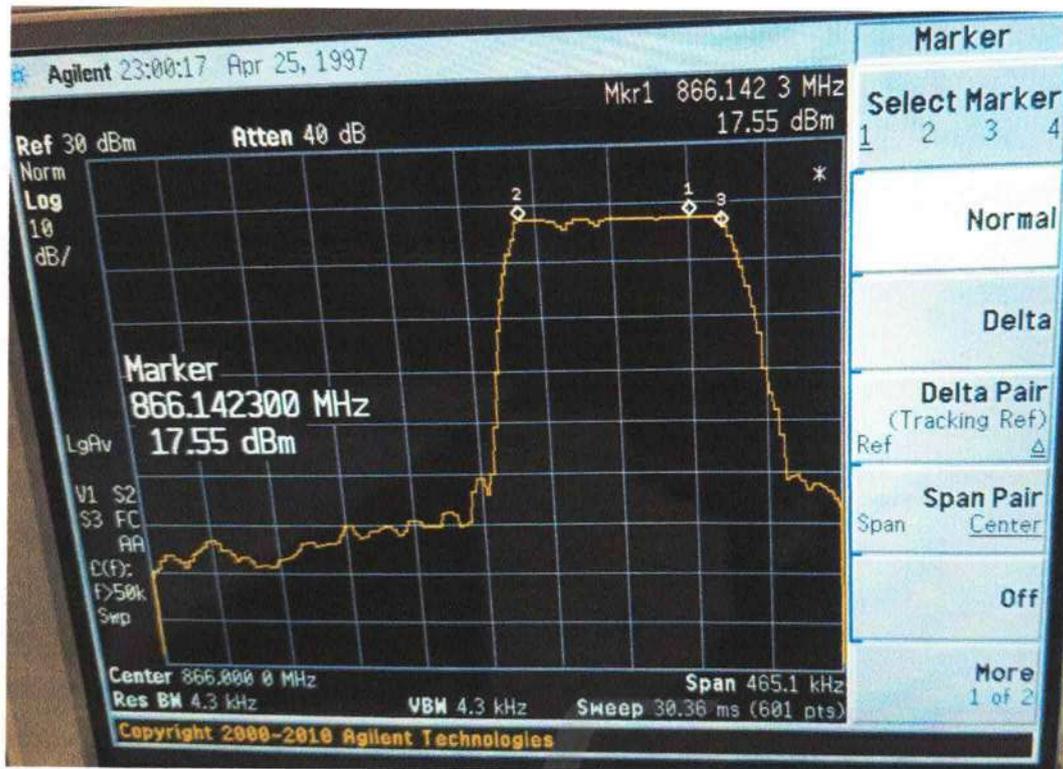


Measurement of Operating Frequency



Equipment Under Test (EUT)	:	LoRaWAN GPRS GATEWAY
Model Number of EUT	:	SP1FC101
Serial Number of EUT	:	1024GW-0001
Manufactured by	:	M/s. Spowerz Solutions Pvt. Ltd., Chennai

PLOT - 6



Measurement of 3dB Bandwidth



Equipment Under Test (EUT)	:	LoRaWAN GPRS GATEWAY	
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Manufactured by	:	M/s. Spowerz Solutions Pvt. Ltd., Chennai	

Annexure – 1

EUT Description:

The EUT (LoRaWAN GPRS GATEWAY) uses to collect data from node and sends to the remote server using GPRS.

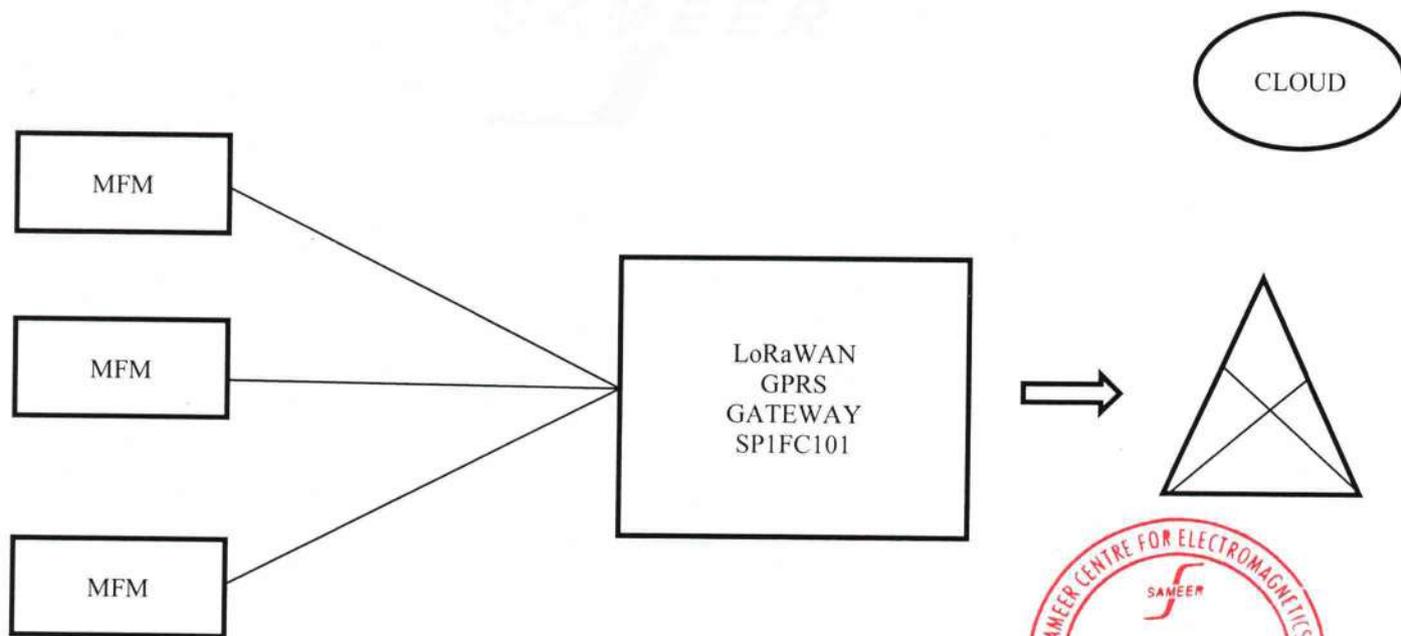
EUT Configuration:

1. Power supply Given- 230V AC to SMPS
2. 12V DC Supply is given to RCU
3. 12V DC Convert to 3.9V & 3.3V using Regulator

For GPRS & RF Module Circuit

EUT Application:

Collecting Multifunction Meter Data

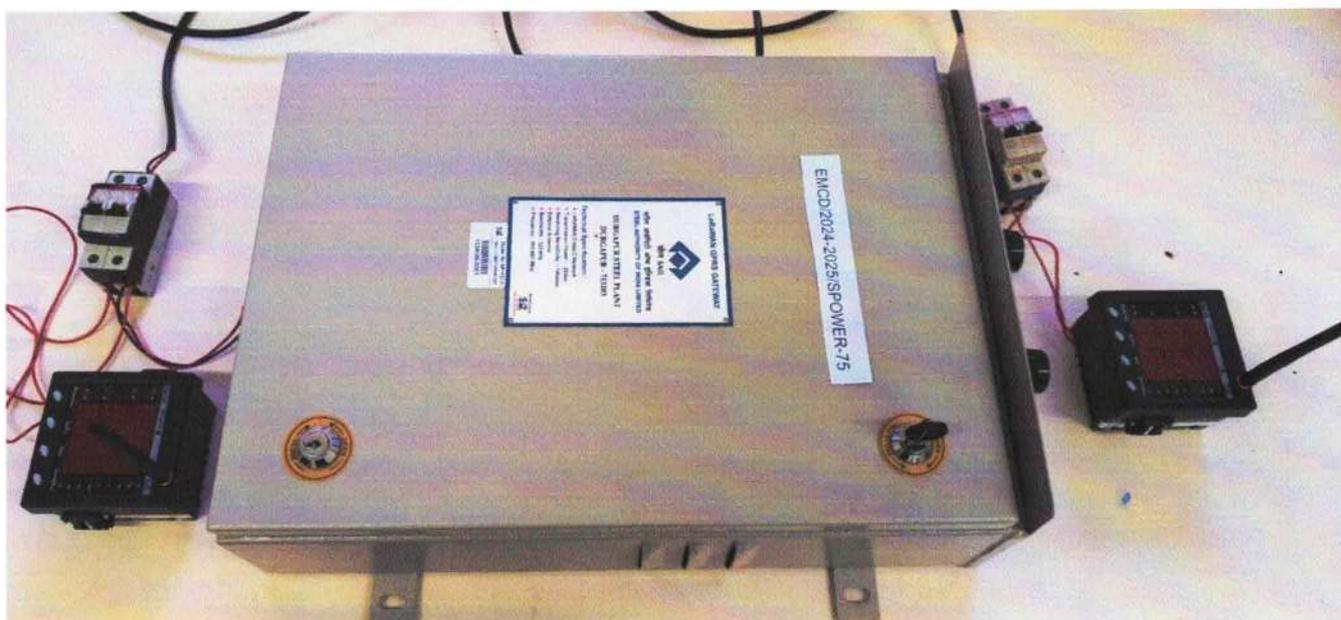


Block Diagram



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Annexure – 2



Photograph of the EUT



Model & Serial Number of EUT

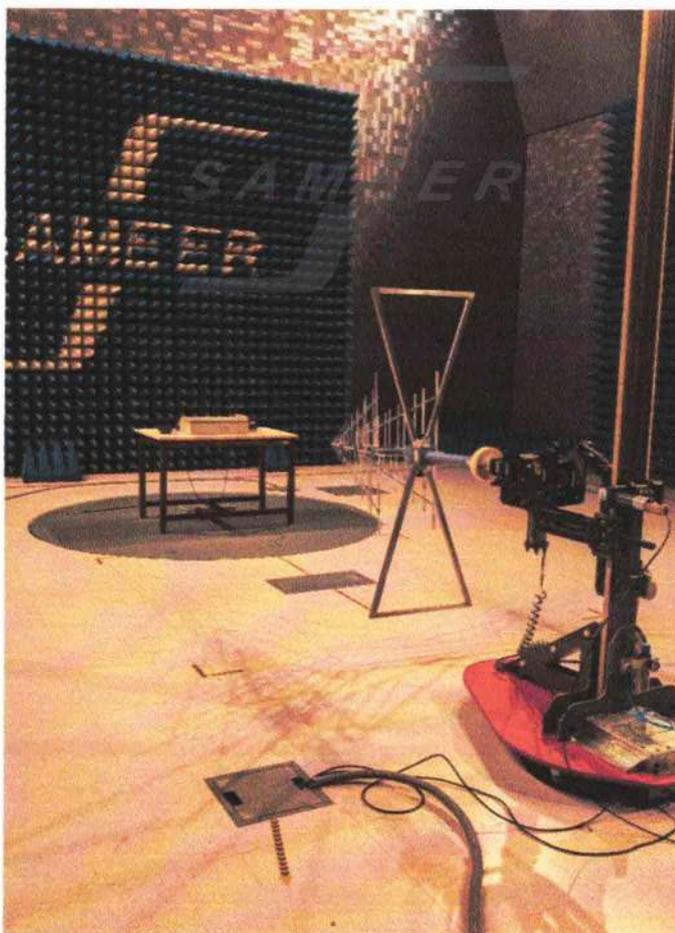


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Annexure - 2



Measurement Setup for Conducted Emission



**Measurement Setup of Effective Radiated Power
30MHz to 1GHz (Vertical Polarization)**





Government of India
Ministry of Communications
Department of Telecommunications
WPC Wing
Sanchar Bhawan, New Delhi-110001.

[Generation of Equipment Type Approval (ETA) through self-declaration issued under O.M. No. ETA-WPC /Policy/2018-19 dated 26 February, 2019].

THIS ETA IS ISSUED FOR A SINGLE MODEL WITH MODEL NAME SP1FC101

Registration No: ETA-SD-20250100475

Date: 21-01-2025

I). Details of Applicant and Parameters of Equipment:

1.	Name & Address of the first Applicant. (Indian Manufacturer/ Authorised Indian representative for foreign manufacturer)	SPOWERZ SOLUTIONS PRIVATE LIMITED, F1, Krishna Flats, No.4, 3rd Street Govindasamy nagar, madipakkam, null, Chennai, Tamil nadu, India, Kanchipuram,TAMIL NADU,600091
2.	Equipment category	LoRaWAN GPRS Gateway
3.	Make	SPowerZ Solutions Pvt Ltd,India
4.	Model	SP1FC101
5.	Frequency range(s) of Equipment	1. 865-867 MHz
6.	Max output power/Field strength/PSD	1. Effective Radiated Power 0.0191 (Watt).

7.	Applicable Gazette Notification(s)	1. 853 (E) Dated 10-12-2021	
8.	RF Test Report details:-		
	Name&Address /Country of accredited laboratory issuing the RF test report	Accreditation Certificate Reference/Number	Test Report No. and Date
	SAMEER & 2nd Cross Road, CIT Campus, Taramani, Chennai, India. 600113	NABL CC-3728	S-CEM/EMCD/TR/2024-2025/SPOWER-75 & 20-11-2024

II). Terms and Conditions

- (i). This certificate will not be valid in case any change in the above parameters and not conforming to the Gazette Notification mentioned in sl.no 7 above.
- (ii). Use of such equipment has been exempted from licensing requirement vide Gazette Notification mentioned in sl. no. 7, on Non-interference,Non-protectionand sharing (non-exclusive) basis.
- (iii). Use of such equipment in case not conforming to above notification will require a specific wireless operating license, as applicable from this Ministry.
- (iv). Field units of WPC Wing reserve the right for sample check/audit carried out for the purpose of RF analysis/spectrum monitoring in view to avoid interference to other wireless users and ensure compliance of technical parameters mentioned in sl no. 5,6&7.
- (v). This certificate is valid only for equipment which are exempted from import licensing requirements as per the Import Policy of DGFT and for import of such device, a self-declaration based, system generated (Saralsanchar) Import undertaking/ permission is required.
- (vi). The applicant is liable for prosecution under Indian Law in case of any wrong declaration/ submission of ingenuine RF test report(s) for issue of ETA through Self-Declaration.

Note:

1. Once ETA through self-declaration is generated for a model, subsequently it may be utilized by other person(s) for import/usage purpose in India.
2. The importers of above model shall comply with other import related requirements, if any, with Customs.

This is Self-generated certificate. Hence, no signature is required. It may be downloaded/verified from the website <https://saralsanchar.gov.in>.