

EMF TEST REPORT

Test Report No. : OT-253-RWD-034

Reception No. : 2501000161

Applicant : TELICA Inc.

Address : Tower A-411, 40 Imi-ro, Uiwang-Si, Gyeonggi-do, 16006, Korea

Manufacturer : TELICA Inc.

Address : Tower A-411, 40 Imi-ro, Uiwang-Si, Gyeonggi-do, 16006, Korea

Type of Equipment : ESL 2.7inch Tag

FCC ID. : 2BN7U-TE-27R-Q2N

Model Name : TE-27R-Q2N

Multiple Model Name : TE-27M-Q2N, TE-27C-Q2N, TE-27F-Q2N

Serial number : N/A

Total page of Report : 7 pages (including this page)

Date of Incoming : February 06, 2025

Date of issue : March 20, 2025

SUMMARY

The equipment complies with the regulation; *FCC CFR 47 PART 1.1310*

This test report only contains the result of a single test of the sample supplied for the examination.

It is not a generally valid assessment of the features of the respective products of the mass-production.

This report is not correlated with the "KS Q ISO/IEC 17025 and KOLAS accreditation" of Korean Laboratory Accreditation Scheme.



Tested by
Si-eon Lee / Senior Project Engineer
ONETECH Corp.



Reviewed by
Tae-Ho, Kim / Chief Engineer
ONETECH Corp.



Approved by
Jae-Ho, Lee / Director
ONETECH Corp.

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Revision History

Rev. No.	Issue Report No.	Issued Date	Revisions	Section Affected
0	OT-253-RWD-034	March 20, 2025	Initial Release	All

1. VERIFICATION OF COMPLIANCE

Applicant : TELICA Inc.
Address : Tower A-411, 40 Imi-ro, Uiwang-Si, Gyeonggi-do, 16006, Korea
Contact Person : Aaron, Kim / Principal Research Engineer
Telephone No. : +82-10-9580-1067
FCC ID : 2BN7U-TE-27R-Q2N
Model Name : TE-27R-Q2N
Brand Name : Crebee
Serial Number : N/A

EQUIPMENT CLASS	DTS – DIGITAL TRNSMISSION SYSTEM
E.U.T. DESCRIPTION	ESL 2.7inch Tag
THIS REPORT CONCERNS	Original Grant
MEASUREMENT PROCEDURES	KDB 447498 D01 General RF Exposure Guidance v06
TYPE OF EQUIPMENT TESTED	Pre-Production
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	Certification
Modifications on the Equipment to Achieve Compliance	None

-. The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

2. GENERAL INFORMATION

2.1 Product Description

The TELICA Inc., Model TE-27R-Q2N (referred to as the EUT in this report) is a ESL 2.7inch Tag. The product specification described herein was obtained from product data sheet or user’s manual.

DEVICE TYPE	ESL 2.7inch Tag
OPERATING FREQUENCY	2 405 MHz ~ 2 480 MHz
MODULATION TYPE	DSSS
RF OUTPUT POWER	2.46 dBm
ANTENNA TYPE	PCB Antenna
ANTENNA GAIN	1.81 dBi
List of each Osc. or crystal Freq.(Freq. >= 1 MHz)	32 MHz
RATED SUPPLY VOLTAGE	DC 3.0 V

2.2 Alternative type(s)/model(s); also covered by this test report.

-. The following lists consist of the added model and their differences.

Model Name	Differences	Tested
TE-27R-Q2N	Basic Model	<input checked="" type="checkbox"/>
TE-27M-Q2N, TE-27C-Q2N, TE-27F-Q2N	The color of the EPD that makes up the product is different	<input type="checkbox"/>

Note: 1. Applicant consigns only basic model to test. Therefore, this test report just guarantees the units, which have been tested.

2. The Applicant/manufacturer is responsible for the compliance of all variants.

3. EUT MODIFICATIONS

-. None

4. MAXIMUM PERMISSIBLE EXPOSURE

4.1 RF Exposure Calculation

According to the FCC rule 1.1310 table 1B, the limit for the maximum permissible RF exposure for an uncontrolled environment are $f/1500 \text{ mW/cm}^2$ for the frequency range between 300 MHz and 1 500 MHz and 1.0 mW/cm^2 for the frequency range between 1 500 MHz and 100 000 MHz.

The electric field generated for a 1 mW/cm^2 exposure is calculated as follows:

$$E = \sqrt{(30 * P * G) / d}, \text{ and } S = E^2 / Z = E^2 / 377, \text{ because } 1 \text{ mW/cm}^2 = 10 \text{ W/m}^2$$

Where

S = Power density in mW/cm^2 , Z = Impedance of free space, 377Ω

E = Electric field strength in V/m, G = Numeric antenna gain, and d = distance in meter

Combining equations and rearranging the terms to express the distance as a function of the remaining variable

$$d = \sqrt{(30 * P * G) / (377 * 10 S)}$$

Changing to units of mW and cm, using $P (\text{mW}) = P (\text{W}) / 1 000$, $d (\text{cm}) = 0.01 * d (\text{m})$

$$d = 0.282 * \sqrt{(P * G) / S}$$

Where

d = distance in cm, P = Power in mW, G = Numeric antenna gain, and S = Power density in mW/cm^2

4.2 EUT Description

Kind of EUT	ESL 2.7inch Tag
Device Category	<input type="checkbox"/> Portable (< 20 cm separation) <input checked="" type="checkbox"/> Mobile (> 20 cm separation) <input type="checkbox"/> Others
Exposure Evaluation Applied	<input checked="" type="checkbox"/> MPE <input type="checkbox"/> SAR <input type="checkbox"/> N/A

4.3 Calculated MPE Safe Distance

According to above equation, the following result was obtained.

Operating Freq. Band (MHz)	Operating Mode	Target Power W/tolerance	Max tune up power		Antenna Gain		Safe Distance (cm)	Power Density (mW/cm ²) @ 20 cm Separation	Limit (mW/cm ²)
		(dBm)	(dBm)	(mW)	Log	Linear			
2 405	Zigbee	2.46 ± 1.0	3.46	2.22	1.81	1.52	0.52	0.000 669	1.00

According to above table, for 2 400 ~ 2 483.5 MHz Band, safe distance,

$$D = 0.282 * \sqrt{(2.22 * 1.52)/1.00} = 0.52 \text{ cm}$$

For getting power density at 20 cm separation in above table, following formula was used.

$$S = P * G / (4\pi * R^2) = 2.22 * 1.52 / (4 * 3.14 * 20^2) = 0.000 669$$

Where:

S = Power Density,

P = Power input to the external antenna (Output power from the EUT antenna port (dBm) – cable loss (dB)),

G = Gain of Transmit Antenna (linear gain), R = Distance from Transmitting Antenna