REPORT No. : SZ16060158S02

RF EXPOSURE EVALUATION REPORT

APPLICANT	:	Nomura Engineering Co., Ltd.
PRODUCT NAME	:	Radio Module
MODEL NAME	:	TS02FE-F
TRADE NAME	:	N/A
BRAND NAME	:	N/A
FCC ID	:	2AIXL-TS02FE90
STANDARD(S)	:	47CFR Part 2.1091 47CFR Part 1.1310
ISSUE DATE	:	2016-12-26

SHENZHEN MORLAB COMMUNICATIONS TECHNOLOGY Co., Ltd.

MORLAB GROUP
FL1-3, Building A, FeiYang Science Park, No.8 LongChang Road, Block67, BaoAn District, ShenZhen , GuangDong Province, P. R. China
Tel: 86-755-36698555 Fax: 86-755-36698525
Http://www.morlab.com E-mail: service@morlab.cn

DIRECTORY

Change History		
Issue	Date	Reason for change
1.0	2016-12-26	First edition

TEST REPORT DECLARATION

Applicant	Nomura Engineering Co., Ltd.
Applicant Address	1-7-2 Shibuya, Yamato City, Kanagawa, 242-0023 Japan
Manufacturer	Nomura Engineering Co., Ltd.
Manufacturer Address	1-7-2 Shibuya, Yamato City, Kanagawa, 242-0023 Japan
Product Name	Radio Module
Model Name	TS02FE-F
Brand Name	N/A
HW Version	P5-3
SW Version	0040
Test Standards	47CFR Part 2.1091; 47CFR Part 1.1310
Issue Date	2016-12-26

Tested by : Chen Shengkui
Chen Shengkui

Reviewed by : Liu Jun
Liu Jun

Approved by : Peng Huarui
Peng Huarui

1. TECHNICAL INFORMATION

Note: the following data is based on the information by the applicant.

1.1. Identification of Applicant

Company Name:	Nomura Engineering Co., Ltd.
Address:	1-7-2 Shibuya, Yamato City, Kanagawa, 242-0023 Japan

1.2. Identification of Manufacturer

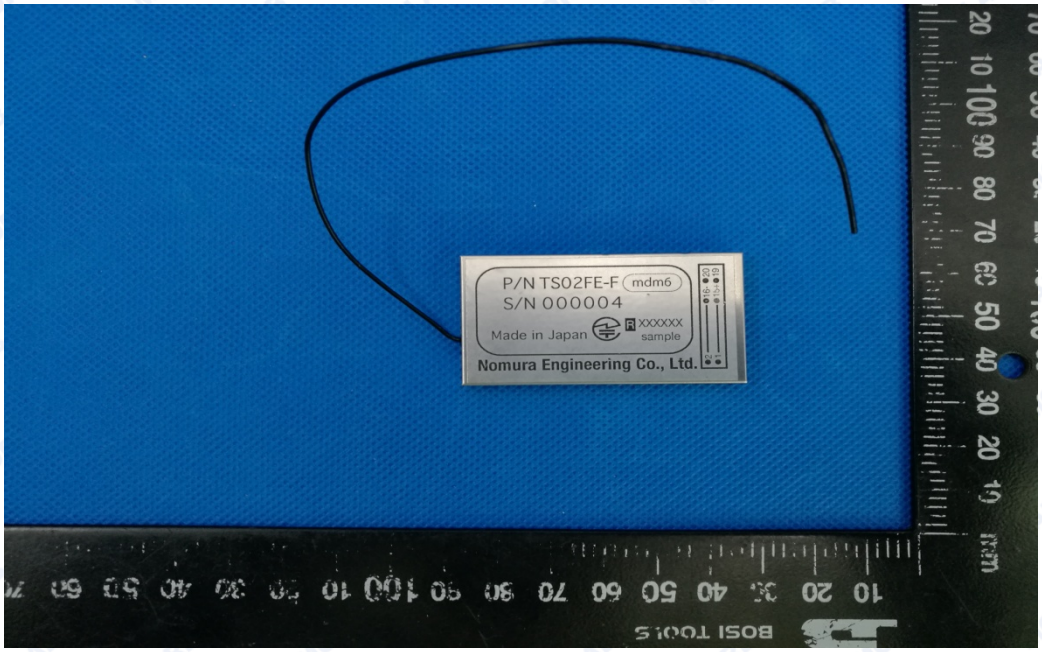
Company Name:	Nomura Engineering Co., Ltd.
Address:	1-7-2 Shibuya, Yamato City, Kanagawa, 242-0023 Japan

1.3. Equipment Under Test (EUT)

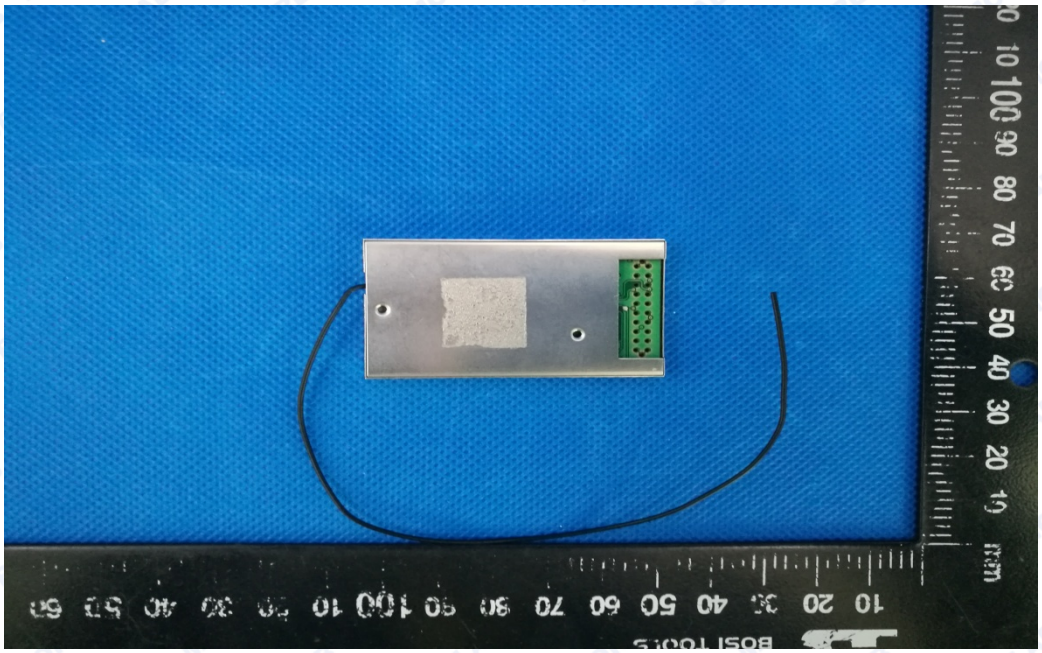
Model Name:	TS02FE-F
Trade Name:	N/A
Brand Name:	N/A
Hardware Version:	P5-3
Software Version:	0040
Frequency Bands:	434.05MHz-434.5375MHz
Modulation Mode:	FSK
Antenna type:	λ/4 antenna

1.3.1. Photographs of the EUT

1. EUT front view



2. EUT rear view



1.3.2. Identification of all used EUT

The EUT identity consists of numerical and letter characters, the letter character indicates the test sample, and the following two numerical characters indicate the software version of the test sample.

EUT Identity	Hardware Version	Software Version
1#	P5-3	0040

1.4. Applied Reference Documents

Leading reference documents for testing:

No.	Identity	Document Title
1	**47 CFR§2.1091**	Radiofrequency Radiation Exposure Evaluation: mobile devices
2	**47 CFR§1.1310**	Radiofrequency radiation exposure limits
3	**KDB 447498 D01v06**	General RF Exposure Guidance
4	**KDB 996369 D01v02**	Module Certification Guide

2. DEVICE CATEGORY AND RF EXPOSURE LIMIT

Per user manual, this device is a Module. Based on 47CFR 2.1091, this device belongs to mobile device category with General Population/Uncontrolled exposure.

Mobile Devices:

47CFR 2.1091(b)

For purposes of this section, a mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. In this context, the term “fixed location” means that the device is physically secured at one location and is not able to be easily moved to another location. Transmitting devices designed to be used by consumers or workers that can be easily re-located, such as wireless devices associated with a personal computer, are considered to be mobile devices if they meet the 20 centimeter separation requirement.

GENERAL POPULATION / UNCONTROLLED EXPOSURE

The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity. Warning labels placed on low-power consumer devices such as cellular telephones are not considered sufficient to allow the device to be considered under the occupational/controlled category, and the general population/uncontrolled exposure limits apply to these devices.

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*($180/f^2$)	30
30-300	27.5	0.073	0.2	30
300-1500	-	-	f/1500	30
1500-100,000	-	-	1.0	30

f = frequency in MHz * = Plane-wave equivalent power density

3. MEASUREMENT OF CONDUCTED PEAK OUTPUT POWER

1. Radio Average output power

Band	Frequency (MHz)	Output Power(dBm)
FSK	434.05	8.54
	434.2875	8.80
	434.5375	9.06

4. MPE EVALUATION

Standalone transmission MPE evaluation

Bands	Frequency (MHz)	Antenna Gain (dBi)	Conducted Power (dBm)	Time-averaging EIRP (mW)	Power density (mW/cm²)	Limit for MPE (mW/cm²)
FSK	434.5375	2.14	9.06	13.18	0.026	0.29

Note:

1. MPE calculation method

$$\text{Power Density} = EIRP/4\pi R^2$$

Where: EIRP = P·G

P = Peak out power

G = Antenna gain

R = Separation distance (20cm)

ANNEX C GENERAL INFORMATION

1. Identification of the Responsible Testing Laboratory

Company Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Department:	Morlab Laboratory
Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China
Responsible Test Lab Manager:	Mr. Su Feng
Telephone:	+86 755 36698555
Facsimile:	+86 755 36698525

2. Identification of the Responsible Testing Location

Name:	Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory
Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China

***** END OF REPORT *****