HF RFID Reader/Writer Data sheet
LXRFZZHAAA-026-EVAL

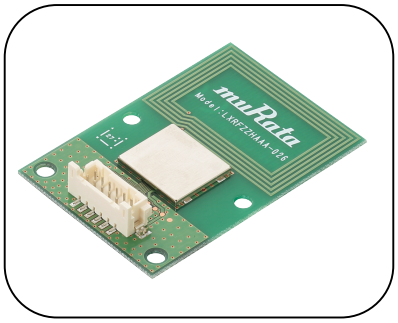
Scope

This data sheet, is applied to HF RFID reader/writer device.

-Specific applications: To evaluate Murata's HF RFID tag products as a part of LXRFZZHAAA-028-KIT.

-Unsuitable Application: It is not allowed to install on/in any products which are released to the market.

1. General Descriptions



LXRFZZHAAA-026-EVAL is HF RFID Reader/Writer Device utilizing TRF7970A (Texas Instruments).

This product complies with ISO14443A, ISO15693 and Felica standards.

[Features]

-Optimized antenna design for Murata tag

-FCC / IC / ETSI / Japan Radio law certified device

(FCC ID : VPYLXRF026 , IC : 772C-LXRF026 , CE Mark acquired)

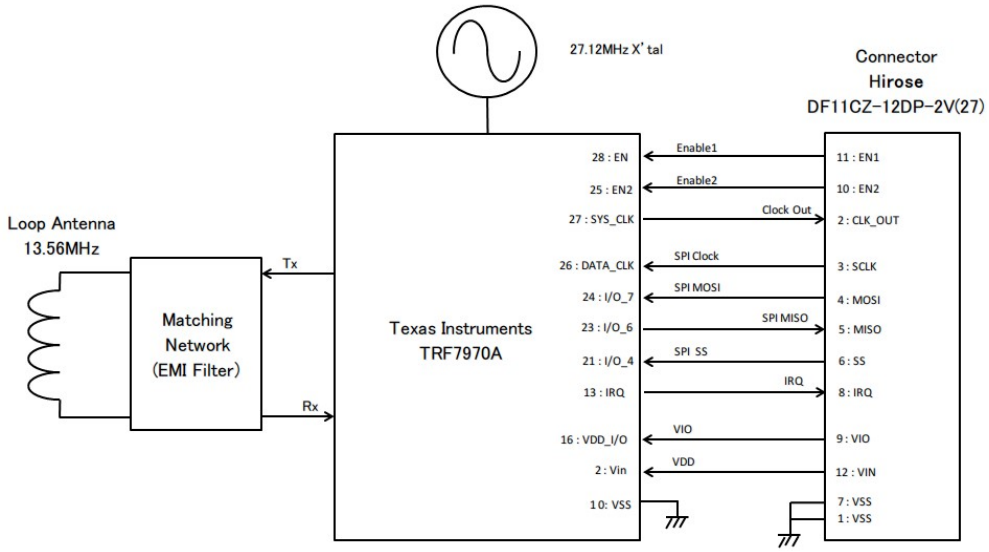
-Low cost

-Host interface : 4-Wire SPI

-Evaluation kit (LXRFZZHAAA-028-KIT) is available

-100% green material for RoHS compliance

2. Block Diagram



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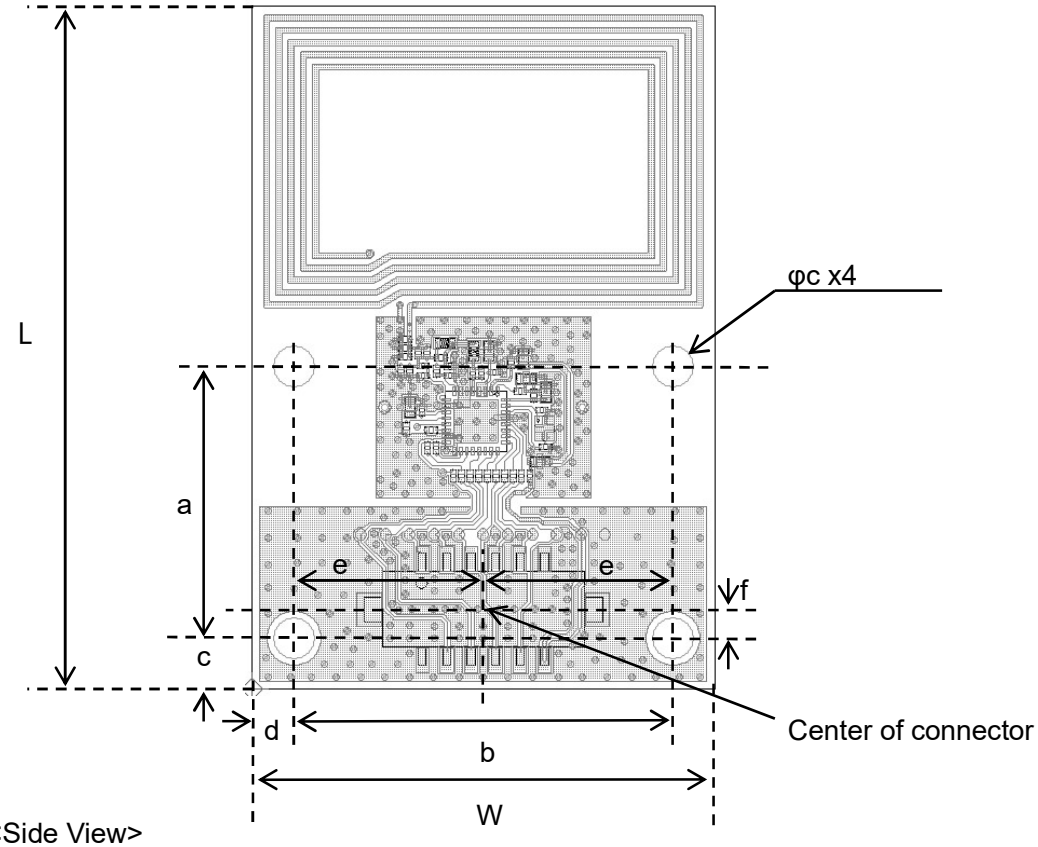
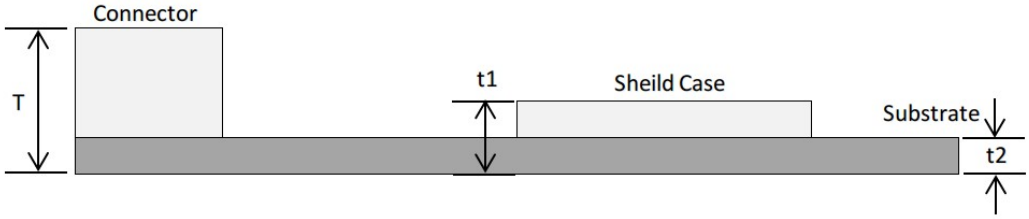
3. Mechanical Information

3-1. Dimensions

<Top View>



<Side View>



Unit:mm

Mark	Size	Mark	Size	Mark	Size
L	56.0 +/- 0.4	c	4.20 +/- 0.4	φc	3.5 +/- 0.1
W	38.0 +/- 0.4	d	3.50 +/- 0.4	T	8.2 +0.5 / -0.4
a	22.5 +/- 0.2	e	15.5 +/- 0.6	t1	2.6 +0.2 / -0.1
b	31.0 +/- 0.2	f	2.35 +/- 0.6	t2	1.0 +0.2 / -0.1

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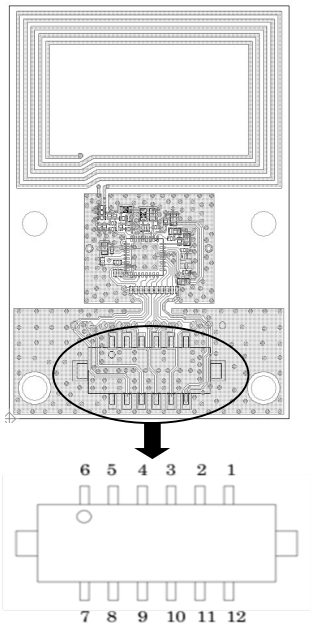
3-2. Pin description

No	Pin Name	Type	Description
1	VSS	Supply pad	GND reference
2	CLK_OUT	Digital Output	Clock output for External MCU
3	SCLK	Digital Input	SPI clock input
4	MOSI	Digital Input	SPI data input
5	MISO	Digital Output	SPI data output
6	SS	Digital Input	SPI chip select
7	VSS	Supply pad	GND reference
8	IRQ	Digital Output	Interrupt request
9	VIO	Supply pad	I/O voltage
10	EN2	Digital input	Enable input 2
11	EN1	Digital input	Enable input 1
12	VIN	Supply pad	Input Voltage

<Top View>



※ Connector : Hirose DF11CZ012DP-2V(27).

Counterpart connector : Hirose DF11 Series Receptacle 12pin.

DF11CZ-12DS-2V, Hirose DF11-12DS-2C, etc.

4. Characteristics

4-1. Basic configuration

LXRFZZHAAA-026-EVAL is the HF RFID reader writer device utilizing TRF7970A(TI).

Please refer the following data sheet for a functional description.

< TRF7970A data sheet>

TRF7970A Multiprotocol Fully Integrated 13.56-MHz RFID and Near Field Communication (NFC) Transceiver IC

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※In case the data sheet has been updated, please refer the latest version.

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4-2. Ratings

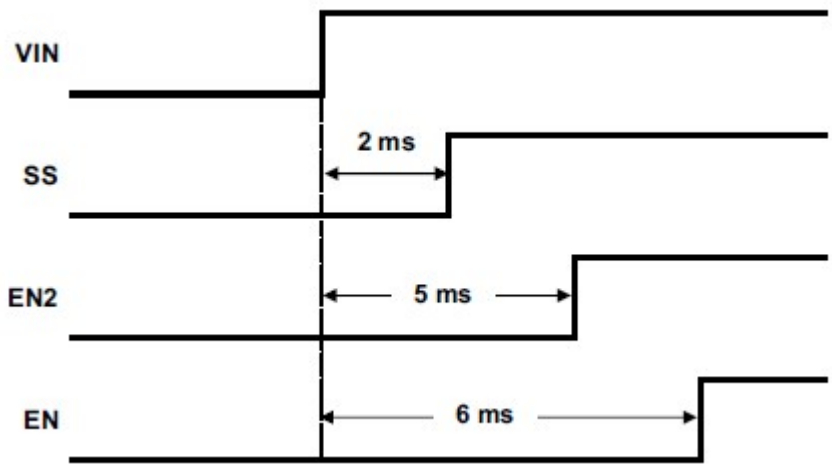
4-2-1. Limiting values

parameter	Symbol	Limiting values		Unit
		Min	Max	
Power Supply Voltage	V_{IN}	-0.3	5.8	V
Maximum current	I_{IN}		150	mA
Storage temperature	T_{STG}	-25	+85	ºC

4-2-2. Operation condition

Parameter	Symbol	Min	Typ	Max	Unit
Power Supply Voltage	V_{IN}	4.5	5	5.5	V
Ambient Temperature	T_{amb}	-25	25	+65	ºC
I/O Voltage	V_{IO}	1.8		V_{DD}	V
I/O Voltage – logic low	V_{IL}			0.2 x V_{IO}	V
I/O Voltage – logic high	V_{IH}	0.8 x V_{IO}			V

4-3. Start-up sequence



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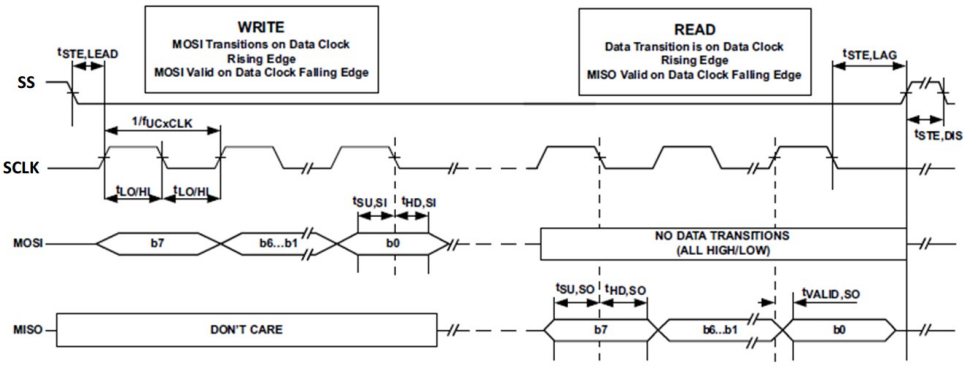
4-4.SPI Specification

SPI Mode1 (CPOL = 0, CPHA = 1).

Recommended SCLK speed is less than 2MHz.



Parameter	Min	Typ	Max	Unit
$t_{LO/HI}$ (SCKL 50% duty)	250	62.5	50	ns
$t_{STE,LEAD}$ (SS low to clock)		200		ns
$t_{STE,LAG}$ (Last clock to SS high)		200		ns
$t_{STE,DIS}$ (SS rising edge to next SS falling edge)	300			ns
$t_{SU,SI}$ (MOSI input data setup time)	15			ns
$t_{HD,SI}$ (MOSI input data hold time)	15			ns
$t_{SU,SO}$ (MISO input data setup time)	15			ns
$t_{HD,SO}$ (MISO input data hold time)	15			ns
$t_{VALID,SO}$ (MISO input data valid time)	30	50	75	ns

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4-5. Electrical Characteristics

Without notice; Ambient Temperature (T_{amb} = +25ºC), Operational voltage ranges.

	Parameter		Symbol	Conditions	Min	Typ	Max.	Unit	Remarks
1	Frequency		F	Standard :13.56MHz All Ambient Temperrature	-50		50	ppm	Japanese radio law: Within+/-50ppm
2	Current Consumption1		I_{STBY}	Standby mode			5.0	mA	
3	Current Consumption2		I_{CW}	Non-modulated continuous wave output			150	mA	
4	Output Power		P	Non-modulated continuous wave output		22	24	dBm	
5	Harmonics		H	Second(27.12MHz)			50	uW	Japanese radio law : Not over 50uW
				Third(40.68MHz)			50	uW	Japanese radio law : Not over 50uW
6	Spurious Emission	Japanese radio law	S_J	13.56MHz			47.544	mV/m	Japanese radio law : Not over 47.544mV/m
				13.41MHz - 13.553MHz, 13.567MHz - 13.71MHz			1.061	mV/m	Japanese radio law : Not over 1.061.mV/m
				13.11MHz – 13.41MHz, 13.71MHz - 14.01MHz			316	uV/m	Japanese Radio law : Not over 316uV/m
				Except above frequency			150	uV/m	Japanese radion law : Not over 150V/m
		ETSI	S_E	30MHz -1000MHz			250	nW e.r.p.	EN302 291-1 : Not over 250 nW e.r.p
				47MHz - 74MHz, 87.5MHz – 118MHz, 174MHz – 230MHz, 470MHz – 862MHz			4	nW e.r.p.	EN302 291-1 : Not over 4nW e.r.p.

4-6. Applicable standards

LXRFZZHAAA-026-EVAL is approved by the following standards.

- R&TTE/ RE directive (EN 302 291series, EN 301 489series)
- FCC Part 15 Sub partC and RSS-210
- Japanese radio law

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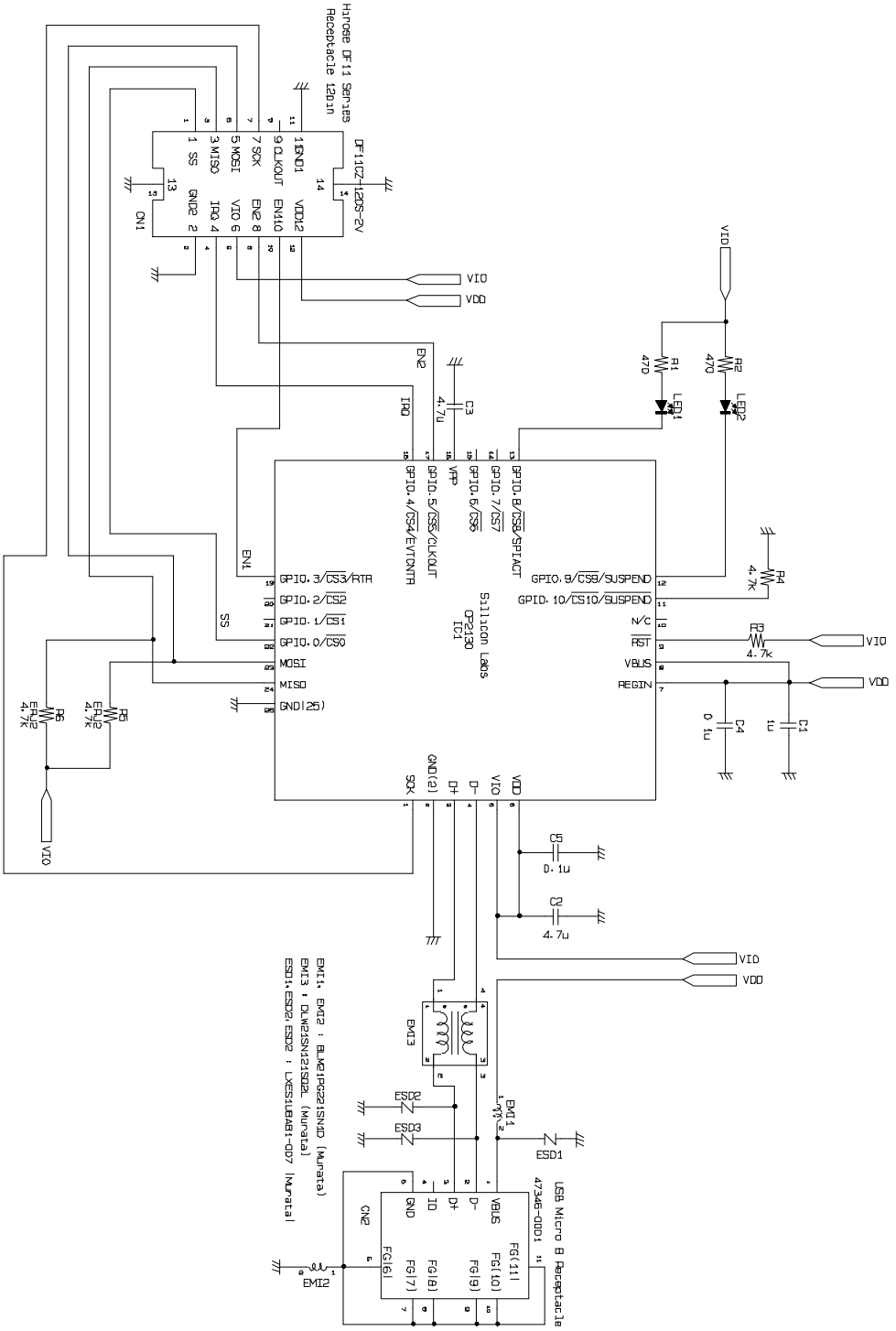
5. Application Circuit

The circuit of USB-SPI bridge to control R/W device is shown as an example.

Using this circuit, you can control R/W device by the PC.

This circuit is available in the evaluation kit (LXRFZHAAA-028-KIT).



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6. Contact window

URL: http://www.murata.com/en-global/products/rfid

Email: magicstrap@murata.com

For any inquiries, please feel free to contact us.

NOTICE

1. Storage Conditions:

To avoid damaging, be sure to observe the following points.

- Store products where the ambient temperature is 15 to 35 °C and humidity 45 to 75% RH.
  (Packing materials, In particular, may be deformed at the temperature over 40 °C.).
- Store products in non corrosive gas (Cl_2, NH_3,SO_2, No_x, etc.).
- Stored products should be used within 6 months of receipt.

2. Handling Conditions:

Be careful in handling or transporting products because excessive stress or mechanical shock may break products.

⚠ Note:

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