

User Manual

Product Name : NFC Reader for EVC

Model Name : EAX70191101

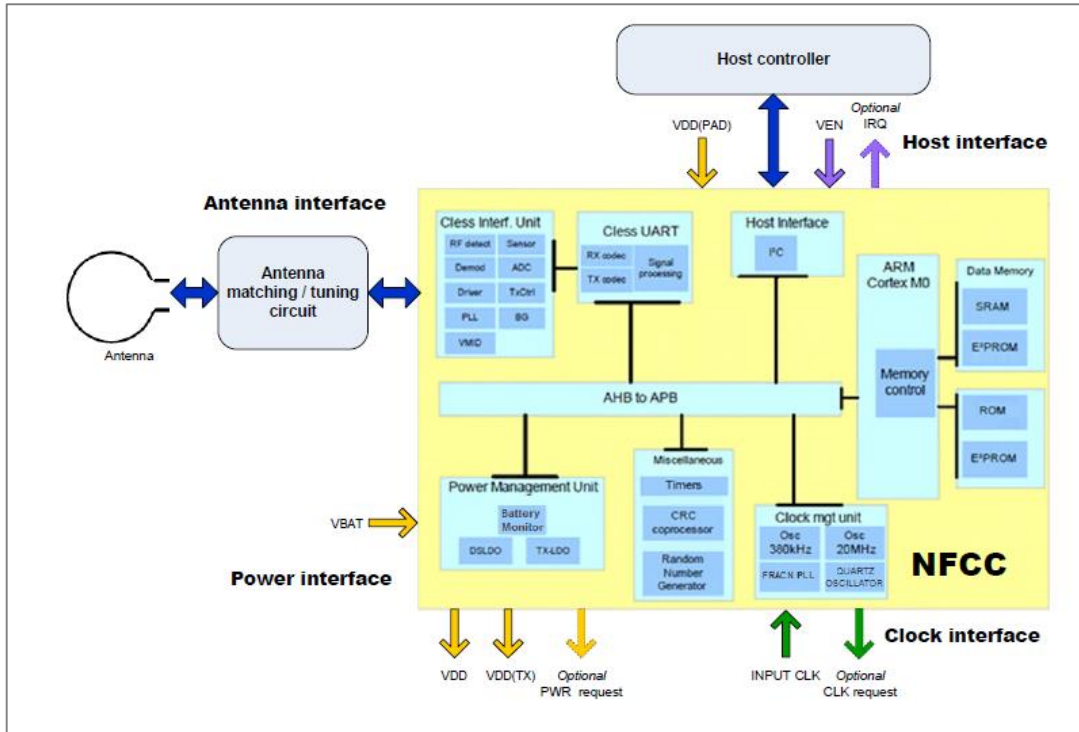
Index

No	Description	Page
1	Features	2
2	Block Diagram	3
3	Absolute Maximum Ratings	4
4	Operating Conditions	5
5	Pin Description	6
6	Pin characteristics	7
7	Outline Drawing	9

1. Features

- Includes NXP ISO/IEC14443-A intellectual property licensing rights
- RF protocols supported
 - NFCIP-1, NFCIP-2 protocol
 - ISO/IEC 14443A, NFC Forum T4T modes via host interface
 - NFC Forum T3T via host interface
 - ISO/IEC 14443A, designed according to NFC Forum digital protocol T4T platform and ISO-DEP
 - FeliCa PCD mode
 - MIFARE Classic PCD encryption mechanism (MIFARE Classic 1K/4K)
 - NFC Forum tag 1 to 5 (MIFARE Ultralight, Jewel, Open FeliCa tag, MIFARE DESFire)
 - ISO/IEC 15693/ICODE VCD mode
- Supported host interfaces
 - NCI protocol interface according to NFC Forum standardization
 - I2C-bus High-speed mode
- Integrated power management unit
 - 3.0 V to 3.6 V voltage supply range
 - Support different Hard Power-Down/Standby states activated by firmware
 - Autonomous mode when host is shut down
- Automatic wake-up via RF field, internal timer and I2C-bus interface
- Integrated non-volatile memory to store data and executable code for customization

2. Block Diagram



3. Absolute Maximum Ratings

Parameter	Min	Max	Unit
Storage Temperature	-40	70	°C
Storage Humidity		95	%

4. Operating Conditions

Parameter	Min	typ	Max	Unit
Ambient Temperature	-35	-	55	°C
Ambient Humidity (40°C)	-	-	95	%
Supply Voltage	3.0	3.3	3.6	Vdc

5. Pin Description

no	Pin Name	I/O	Pin Description
1	+33VD	-	supply voltage
2	SDA	I/O	I ² C-bus data line
3	SCL	I	I ² C-bus clock line
4	IRQ	O	interrupt request output
5	VEN	I	reset pin. Set the device in Hard Power Down
6	GND	-	ground

6. Pin characteristics

6-1 VEN

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{IH}	HIGH-level input voltage		1.1	-	V_{BAT}	V
V_{IL}	LOW-level input voltage		0	-	0.4	V
I_{IH}	HIGH-level input current	VEN voltage = V_{BAT}	-1	-	+1	μA
I_{IL}	LOW-level input current	VEN voltage = 0 V	-1	-	+1	μA
C_i	input capacitance		-	5	-	pF

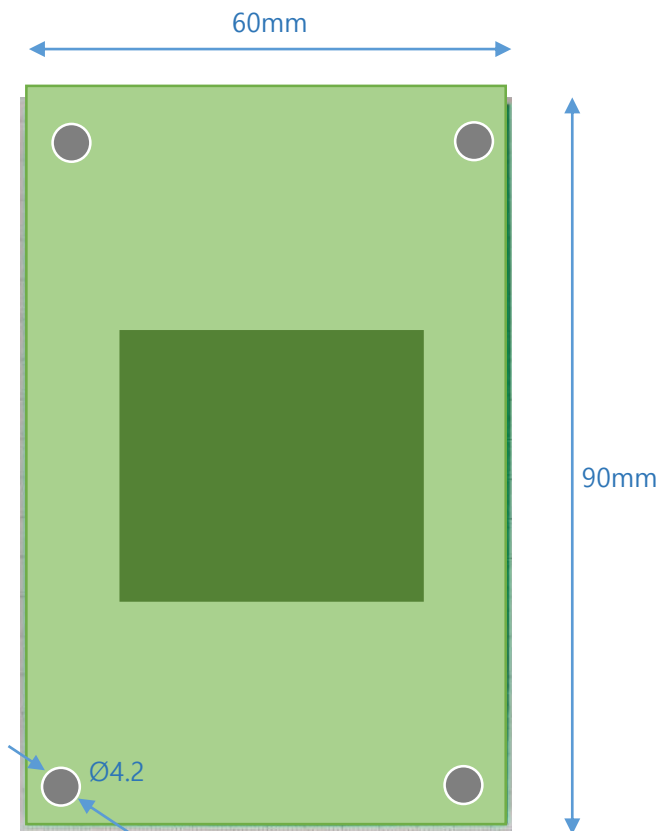
6-2 IRQ

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{OH}	HIGH-level output voltage	$I_{OH} < 3 \text{ mA}$	$V_{DD(PAD)} - 0.4$	-	$V_{DD(PAD)}$	V
V_{OL}	LOW-level output voltage	$I_{OL} < 3 \text{ mA}$	0	-	0.4	V
C_L	load capacitance		-	-	20	pF
t_f	fall time	$C_L = 12 \text{ pF max}$				
		• high speed	1	-	3.5	ns
		• slow speed	2	-	10	ns
t_r	rise time	$C_L = 12 \text{ pF max}$				
		• high speed	1	-	3.5	ns
		• slow speed	2	-	10	ns
R_{pd}	pull-down resistance		[1] 0.35	-	0.85	M Ω

6-3 I2C SCL, SDA

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{OL}	LOW-level output voltage	$I_{OL} < 3 \text{ mA}$	[1]	0	-	0.4	V
C_L	load capacitance			-	-	10	pF
t_f	fall time	$C_L = 100 \text{ pF}; R_{pull-up} = 2 \text{ k}\Omega$; Standard and Fast mode	[1]	30	-	250	ns
t_f	fall time	$C_L = 100 \text{ pF}; R_{pull-up} = 1 \text{ k}\Omega$; High-speed mode	[1]	80	-	110	ns
t_r	rise time	$C_L = 100 \text{ pF}; R_{pull-up} = 2 \text{ k}\Omega$; Standard and Fast mode	[1]	30	-	250	ns

7. Outline Drawing



FCC Regulatory Statement

- **FCC Part 15.19 Statements**

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

- **FCC Part 15.105 statement(Class B)**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

- **FCC Part 15.21 statement**

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. This device must not be co-located or operating in conjunction with any other antenna or transmitter.

- **RF Exposure Statement (MPE)**

The antenna(s) must be installed such that a minimum separation distance of at least 20 cm is maintained between the radiator (antenna) and all persons at all times.

- **Responsible Party Information (Supplier's Declaration of Conformity)**

Supplier's Declaration of Conformity
47 CFR § 2.1077 Compliance Information

Responsible Party – U.S. Contact Information

LG Electronics USA

1000 Sylvan Avenue Englewood Cliffs New Jersey, United States, 07632

Phone: 201-470-2696

• End Product Labeling

The module is labeled with its own FCC ID and IC Certification Number. If the FCC ID and IC Certification Number are not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. In that case, the final end product must be labeled in a visible area with the following:

"Contains FCC ID: BEJEAX70191101

"Contains IC: 2703H-EAX70191101

**• Regulatory notice to host manufacturer according to KDB 996369 D03 OEM Manual
This module has been granted modular approval as below listed FCC rule parts.**

-FCC Rule parts 15C(15.225)

Summarize the specific operational use conditions

-The OEM integrator should use equivalent antennas which is the same type and equal or less gain than an antenna listed below this instruction manual.

RF exposure considerations

-The module has been certified for integration into products only by OEM integrators under the following condition: -The antenna(s) must be installed such that a minimum separation distance of at least 20 cm is maintained between the radiator (antenna) and all persons at all times.

-The transmitter module must not be co-located or operating in conjunction with any other antenna or transmitter except in accordance with FCC multi-transmitter product procedures.

-Mobile use

As long as the three conditions above are met, further transmitter testing will not be required. OEM integrators should provide the minimum separation distance to end users in their end-product manuals.

Antennas list

This module is certified with the following integrated antenna.

: Internal PCB Antenna

Any new antenna type, higher gain than listed antenna should be met the requirements of FCC rule 15.203 and 2.1043 as permissive change procedure.

Information on test modes and additional testing requirements

-OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, additional transmitter in the host, etc.).

Additional testing, Part 15 Subpart B disclaimer

-The final host product also requires Part 15 subpart B compliance testing with the modular transmitter installed to be properly authorized for operation as a Part 15 digital device.

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ISED Regulatory Statement

- **Licensed-exempt Statement**

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

- (1) l'appareil ne doit pas produire de brouillage, et
- (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

- **RF Exposure Statement (MPE)**

The antenna(s) must be installed such that a minimum separation distance of at least 20 cm is maintained between the radiator (antenna) and all persons at all times.

l'exposition aux RF L'antenne (ou les antennes) doit être installée de façon à maintenir à tout instant une distance minimum de au moins 20 cm entre la source de radiation (l'antenne) et toute personne physique

- **End product labeling**

Étiquetage du produit final (IC)

Le module est étiqueté avec sa propre identification FCC et son propre numéro de certification IC. Si l'identification FCC et le numéro de certification IC ne sont pas visibles lorsque le module est installé à l'intérieur d'un autre dispositif, la partie externe du dispositif dans lequel le module est installé devra également présenter une étiquette faisant référence au module inclus. Dans ce cas, le produit final devra être étiqueté sur une zone visible avec les informations suivantes :

Contient module émetteur IC : 2703H-LGSRFR1 / 2703H-LGSRFT1