

Operational description

SIEMENS VDO Automotive SAS

SV C IC

GENERAL INFORMATION

1. SCOPE OF DOCUMENT

This homologation report is written by SV SE (Siemens VDO automotive System Engineering) to describe the preparation of the homologation for LF sub-system to answer FCC US LF regulation.

1.1. SHORT DESCRIPTION OF THE COMPLETE SV I-KEY SYSTEM

The I Key system is an integrated system which includes:

- LF Antennas
- RF Tuners
- Body Control Module
- Key Fob
- Key Fob Reader

The system interacts with other modules such as:

- Push Engine Start
- ESCL
- USM

The main functions performed by the system are:

- RKE functions (key less features)
- Hand Free functions for vehicle access and engine start
- Immobilizer
- LF antennas management

The second bundle regroup different vehicle for which the D-platform system is carried over.

In the case of the LF sub-system,

- The LF Antennas are full carry over
- The BCM has some modifications.

1.2. SHORT DESCRIPTION OF THE LF SUB-SYSTEM TO HOMOLOGATE

The I Key system homologation board is an integrated system which includes:

- LF Antennas
- Body Control Module

1.4. PASSIVE ENTRY AND START FUNCTIONALITY

1.4.1. I-Key Passive entry function (figure 1)

When the button on the door handle is pressed the Intelligent Key Unit (BCM) sends out an inductive signal at 125 kHz via the Door handle Antennas, which are driven by the ATIC 64. The ID (Key Fob) receives the signal and answers via RF at a frequency depending on the product's destination (table 1). The response is received by the external RF receiver connected to the Intelligent Key Unit. After checking the response the doors are unlocked and the user can open the door by pulling the door handle.

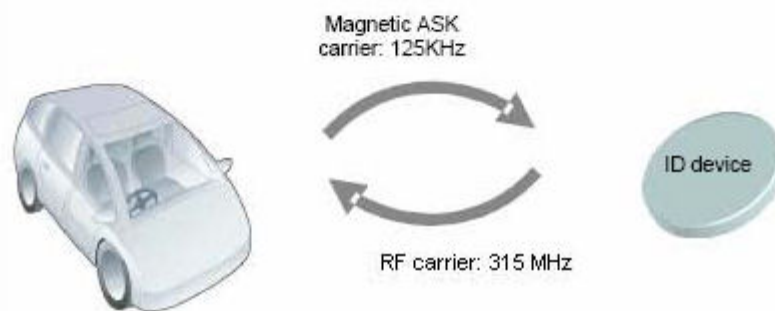


Figure 1: System description

1.4.2. I-Key Passive start function

After triggering the system by pressing the start/stop button, the Intelligent Key Unit (BCM) sends out an inductive signal at 125 kHz via the Room Antennas, which are driven by the ATIC 64. The ID (Key Fob) receives the signal and answers via RF at a frequency depending on the product's destination (**table 1**). The response is received by the external RF receiver connected to the Intelligent Key Unit. After checking the response the Intelligent Key Unit sends a release signal to the steering lock unit. At the same time the Immobilizer will be released too.

The blocking of the steering column is considered to be managed by the steering lock unit. SV is not responsible for this component but we consider that it is in conformance with local regulations.

The learning of the Intelligent Keys to the vehicle is performed in the same way as learning defined for the today's transponder. This is possible because we use an SV integrated circuit which is able to handle the LF communication for the transponder mode as well as the LF communication for the hands free functionality.

SIEMENS VDO Automotive SAS

SV C IC

1.7. TECHNICAL DESCRIPTION:

LF communication:

LF frequency (I-Key) = 125 kHz +/- 1%

Field strength < 101.5 dB μ V/m at 3m

Type of modulation 100% OOK

LF data baud rate (I-Key) = 3.9 Kbit/s +/-1 %

Method of frequency generation digital sinus generator

Number of channels 1

Inductive Transmission range < 3m

RF communication (not considered for homologation)

RF frequency	Destination category (as defined by Nissan)
314.85 MHz	JPN / THI / GOM / SIN / MLY / HNK
315 MHz	TWN / GCC / PRC / GOM
433.92 MHz	EUR / AUS / NZL
315 MHz	KOR

Table 1

I-Key LF Antennas:

Inductance: 145 μ H +/- 6%

Maximum Vpp: 170 Vpp max

Maximum Ipp: 1.5 App max

Fixing orientation: refer to each platform definition

Maximum Nominal voltage for external antennas: 135V peak to peak

SIEMENS VDO Automotive SAS

SV C IC

2. LABEL DESIGN CANADA, USA

Siemens VDO

S122736011
IC:267T-S122736011
FCC ID:KR5S122736011

Siemens VDO

S122736012
IC:267T-S122736011
FCC ID:KR5S122736011

Siemens VDO

S122736021
IC:267T-S122736011
FCC ID:KR5S122736011

Siemens VDO

S122736025
IC:267T-S122736011
FCC ID:KR5S122736011

User Manual:

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.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Canada:

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.

END OF DOCUMENT
