User Manual

S122736001

SIEMENS VDO
Automotive

Functional description of

Homologation Board

for S.E.S function

Project: **S E S (I-Key) system for Nissan L42A/L53A**

Document maturity: V2

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Engineering change order-No.:

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1. Check:					
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VERSIONS LIST

Version	Date	Author	Comment, Description
1.0	2006.04.20	G. Vallet	First version
2.0	2006.05.03	G. Vallet	Updated version

ABBREVIATION REGISTER

Abbreviation	Description
As	**As**sistant
BCM	**B**ody **C**ontrol **M**odule
CW	**C**ontinuous **W**ave
DR	**Dr**iver
FCC	**F**ederal **C**ommunication **C**ommission
LF	**L**ow **F**requency
I-Key	**Intelligent Key** (Nissan name for Hand free access and Hand free start system)
SES	**S**mart **E**ntry and **S**tart (Siemens VDO name for Hand free access and Hand free start system)

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VERSIONS LIST
ABBREVIATION REGISTER

1 GENERAL INFORMATION

1.1 SCOPE OF DOCUMENT
1.2 SHORT DESCRIPTION OF THE COMPLETE SV I-KEY SYSTEM
1.3 SHORT DESCRIPTION OF THE LF SUB-SYSTEM TO HOMOLOGATE
1.4 PART NUMBERS
1.5 PASSIVE ENTRY AND START FUNCTIONALITY
1.5.1 I-Key Passive entry function (figure 1)
1.5.2 I-Key Passive start function
1.6 PHYSICAL CHARACTERISTICS:

2 HOMOLOGATION BOARD

2.1 BLOCK DIAGRAM HOMOLOGATION BOARD
2.2 FUNCTIONAL DESCRIPTION OF HOMOLOGATION BOARD

3 LABEL SAMPLE VIEW

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1 General Information

1.1 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.

1.2 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

1.3 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

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1.4 Part Numbers

component	description	Part number
Antenna	room 1, room 3 and bumper trunk	5WK48776
Antenna	room 2	5WK48775
Antenna	Door	5WK48774
BCM	BCM L53a US	S122736002
BCM	BCM L42a US	S122736001

1.5 Passive entry and start functionality

1.5.1 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.

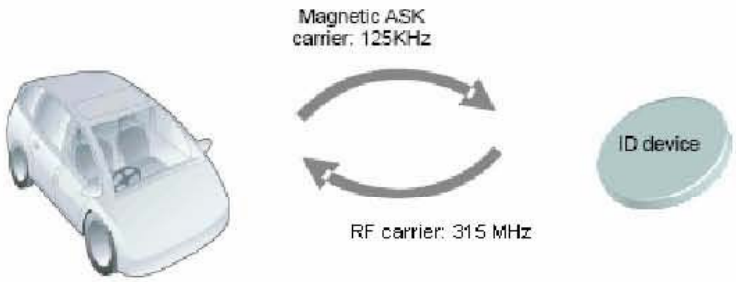

Figure 1: System description

1.5.2 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.

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1.6 Physical characteristics:

LF communication:

LF frequency (I-Key) = 125 kHz +/- 1%
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
Type of modulation 100% OOK
Field strength < 101.5 dBµV/m at 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: 145µH +/- 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

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2 Homologation board

2.1 Block diagram homologation board

BCM connection (B sample or C-sample reference)	Name of connection	Antenna connected
CS2-8A	ROOM_ANT_1_A	Room antenna 1
CS2-7A	ROOM_ANT_1_B	
CS2-2A	ROOM_ANT_2_A	Room antenna 2
CS2-1A	ROOM_ANT_2_B	
BS-4A	TRUNK_ANT_1_A	Room antenna 3
BS-3A	TRUNK_ANT_1_B	
BS-8A	BACK_DOOR_ANT_A	Back door antenna
BS-7A	BACK_DOOR_ANT_B	
CS2-6A	DR_DOOR_ANT_A	Driver door antenna
CS2-5A	DR_DOOR_ANT_B	
CS2-4A	AS_DOOR_ANT_A	Assistant door antenna
CS2-3A	AS_DOOR_ANT_B	

BCM connection (B sample or C-sample reference)	Name of connection	
EP-1	BAT_POWER_F/L	Battery +
CP-8	BAT_BCM_FUSE	Battery +
CP-9	GND2	Battery -
CP-10	GND1	Battery -

In addition, a function box is connected for other purposes. This function is not required for Homologation tests.

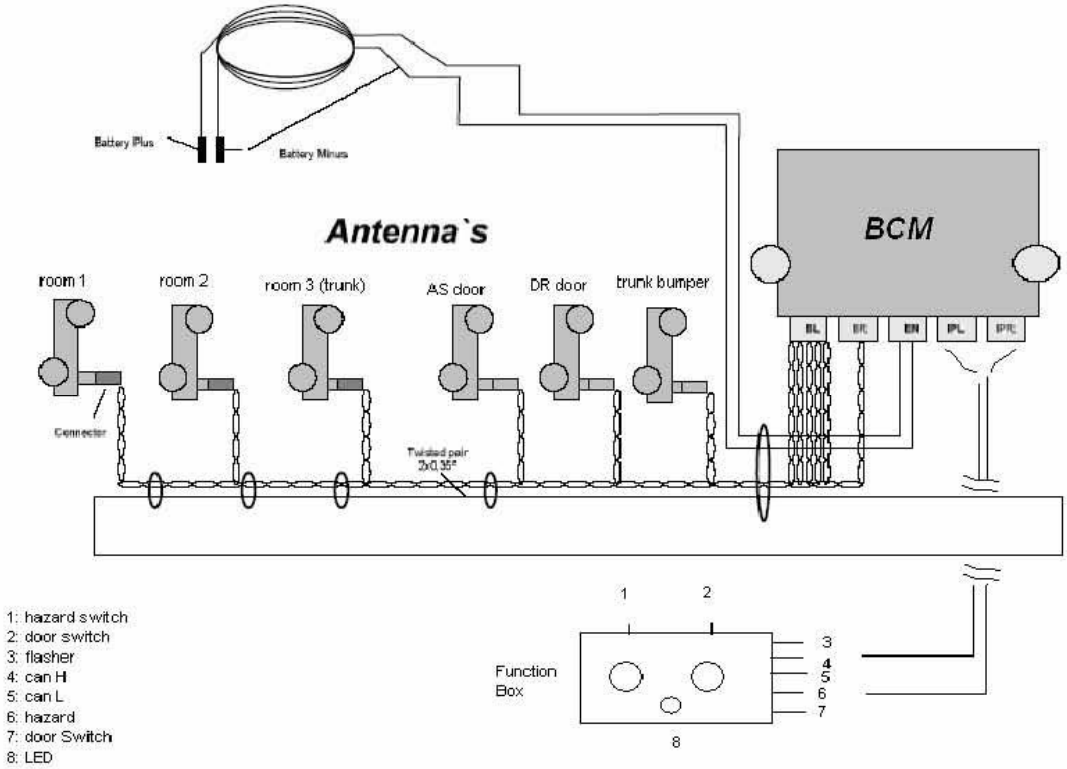


Figure 1: Schematic of Homologation Board

2.2 Functional description of homologation board

The homologation board is performed to activate different functions of the BCM Module via Software.

You must only connect the plus and the minus plug to a battery pin (normal operating voltage is UB = 12.8 V ± 0.2 V) or a power supply and the ECU starts sending the LF telegrams in the following order:

The 6 antennas are driven one by one, in the following order: AS Door, DR Door, Trunk, Room1 (Front), Room2 (Central), Room3 (Rear)

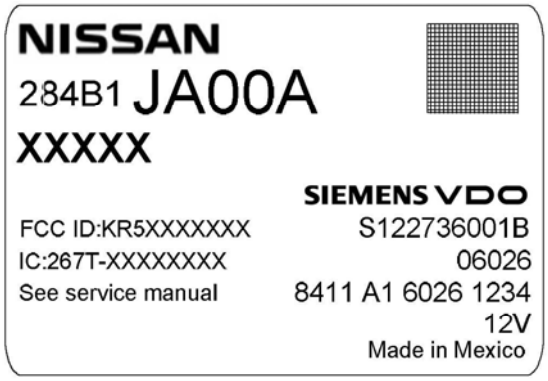
In order to avoid noise for measurement, LF telegram contain only one frame LF0 with

- output voltage for data = 0 (1Vpp) and
- output voltage continuous wave = 24 (25Vpp)
- phase is 180°

Every antenna has a time slot of 200ms. After this time, the Software changes automatically from one antenna to the other.
In case of malfunction, disconnect the power supply, wait 3 seconds and connect it again.

3 Label sample view

Double click to edit under Microsoft Visio.



Additional information:
Siemens VDO
S122736001
FCC ID:KR5S122736001

Owner manual USA, Canada: warning statement

This device complies with Part 15 of the FCC Rules and RSS-210. Operation is subject to the following two conditions:

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

Caution:
Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

END OF DOCUMENT