

User Manual

of the Continental

Body Control Module

Model:
E3HCP422

1. General function description

1.1.1 System description

The FBS system is used for the Passive Start- and Entry-System (PASE), Remote Keyless Entry (RKE) and Immobilization

It consists of

- HCP4 control unit with integrated FBS blocks (LF transmitter and RF transceiver)
- inductive LF antennas
- key.

A vehicle unlock/lock request is triggered via capacitive touch sensors around the car (e.g. at the door handles).

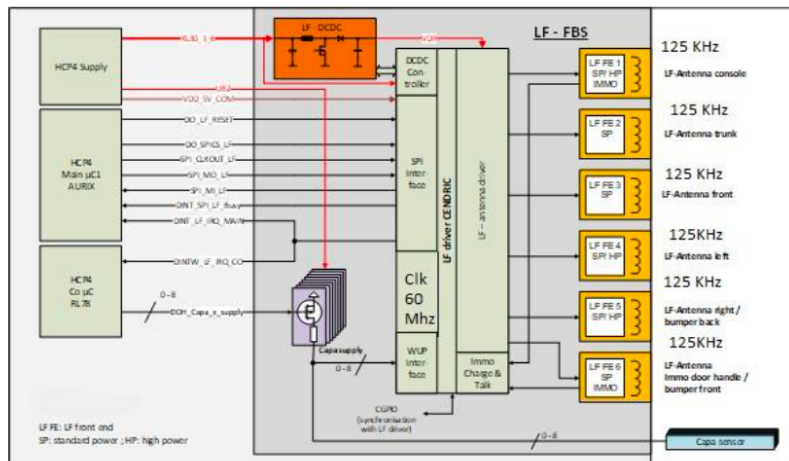
The car will be unlocked / locked after a successful authentication of the key outside the vehicle.

The engine can be started by pushing the Start Stop Button at the center console after authentication of a valid key inside the passenger compartment.

Summarized the ECU allows comfortable operation of the vehicle (access, start and immobilization) without using the key actively. The vehicle communicates with the key inductively via ferrite- antennas, which are placed around the car body (amount and position depending on the carline). These ferrite antennas are driven by the LF-driver of the FBS system with 125 kHz. Within the specified range the key responds via Radio Frequency (RF) telegrams, which are received by the integrated RF-transceiver. If the key is located on the right position, the RF transceiver transmits a RF telegram (challenge). The Key answers with a 2nd RF telegram (Response) The RF answer of the key are evaluated by the HCP4 control module.

1.1.2 With a valid key, dependent of the user request, doors are unlocked, locked or the engine is started after key authentication.

1.2 Block diagram LF driver



1.2.1 Power supply

The E3HCP422 is supplied via the vehicle battery

Positive: 7 module pins (KI30_2, KI30_2, KI30_3, KI30_4, KI30_4, KI30_6, KI30 secure)

Negative: 2 module pins (KI31_1, KI31_2)

1.2.2 LF- driver DCDC converter

A step-up-converter (DC/DC) generates a stabilized voltage to supply the LF antenna driver CENDRIC during the LF transmission.

1.2.3 LF driver CENDRIC (short specification)

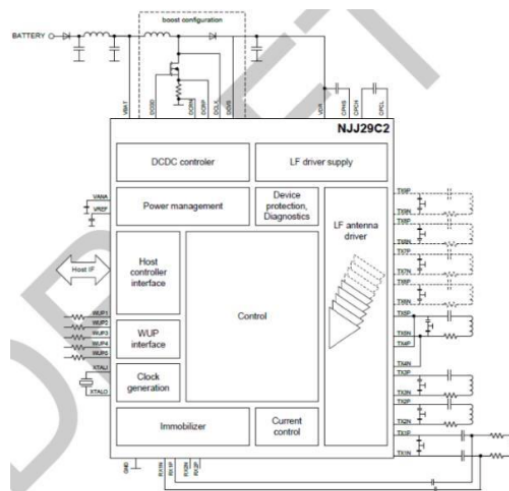
Applications:
charge & talk immobilizer

- PASE LF driver
- Immobilizer

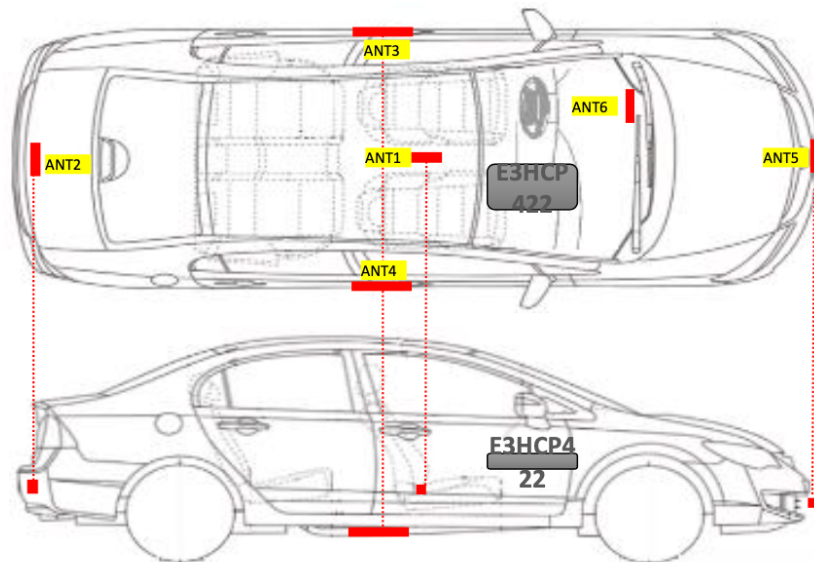
Features:

- Single driver current capability: 1.25 A peak
- LF frequency: 125 kHz
- Load modulation and charge and talk transponder receiver
- SPI interface to host μ C
- Boost or Buck/Boost DCDC converter control (V_{out} max. 35 V)
- 8 door handle interfaces
- Autonomous polling and wake-up handling
- SLoc compliant current control

typ. Application circuit with

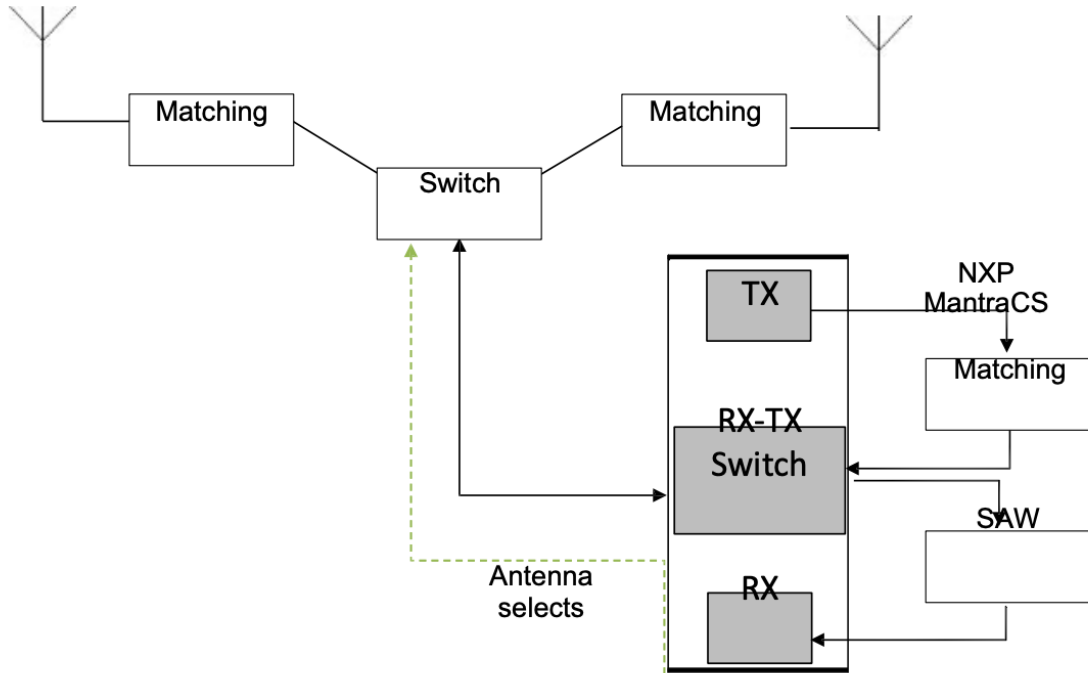


1.2.4. Installation Position Diagram



2. Technical description RF

2.1 Block diagram



Block diagram:

The RF block consist of two antennas a switch for selecting one of them and a RF module with a Transmitter-Receiver integrated with Matching a SAW- Filter.

2.2 RF Communication

RKE communication:

For an RKE access the Key transmits a Telegram (Request) to the Car and is answered with a Telegram from the Car to the Key (Challenge) followed by another Telegram from the Key (Response) the communication is ended with the last Telegram (Acknowledge)

If the communication is not successful or interrupted, it is retried two more times on the other channels.

PASE communication

During a PASE event e.g. a door handle is pulled the communication is triggered with LF and the Key sends a Telegram to the Car (Challenge) and is answered with a Telegram (Response)

2.3 RF Parameter

Antenna type: Two PCB monopole antenna

Nominal supply voltage: 13.5V±0.5V

Operating voltage range: 9 V ... 16 V

Modulation: 2FSK

2.3.1 TRX 315 MHz RKE Japan

Centre frequency, channel A: 314.0MHz

Centre frequency, channel B: 314.4MHz

Centre frequency, channel C: 314.9MHz

Used Channels RX /TX: A, B, C

Frequency deviation: Centre frequency ± 10 kHz

Data rate: 9.6 kbps

Tx Power: Japan

2.3.2 TRX 315 MHz PASE Japan

Centre frequency, channel A: 314.0MHz

Centre frequency, channel B: 314.4MHz

Centre frequency, channel C: 314.9MHz

Used Channels RX /TX: A, B, C

Frequency deviation: Centre frequency ± 25 kHz

Data rate: 25 kbps

Tx Power: Japan

2.3.3 TRX 433 MHz RKE EU

Centre frequency, channel A: 433.47MHz

Centre frequency, channel B: 433.92MHz

Centre frequency, channel C: 434.37MHz

Used Channels RX /TX: A, B, C

Frequency deviation: Centre frequency ± 10 kHz

Data rate: 9.6 kbps

Tx Power: EU

2.3.4 TRX 433 MHz PASE EU

Centre frequency, channel A: 433.47MHz
Centre frequency, channel B: 433.92MHz
Centre frequency, channel C: 434.37MHz
Used Channels RX /TX: A, B, C
Frequency deviation: Centre frequency \pm 25 kHz
Data rate: 25 kbps
Tx Power: EU

2.3.5 TRX 433 MHz RKE US and Canada

Centre frequency, channel A: 433.47MHz
Centre frequency, channel B: 433.92MHz
Centre frequency, channel C: 434.37MHz
Used Channels RX /TX: A, B, C
Frequency deviation: Centre frequency \pm 10 kHz
Data rate: 9.6 kbps
Tx Power: US

2.3.6 TRX 433 MHz PASE US and Canada

Centre frequency, channel A: 433.47MHz
Centre frequency, channel B: 433.92MHz
Centre frequency, channel C: 434.37MHz
Used Channels RX /TX: A, B, C
Frequency deviation: Centre frequency \pm 25 kHz
Data rate: 25 kbps
Tx Power: US

2.3.7 TRX 433 MHz RKE Korea

Centre frequency, channel B: 433.92MHz
Used Channels RX /TX: B
Frequency deviation: Centre frequency \pm 10 kHz
Data rate: 9.6 kbps
Tx Power: Korea

TRX 433 MHz PASE Korea

Centre frequency, channel B: 433.92MHz
Used Channels RX /TX: B
Frequency deviation: Centre frequency \pm 25 kHz
Data rate: 25 kbps
Tx Power: Korea

Operating temperature: -40 to +85

2.4 RF RKE / PASE TX transmission Description

2.4.1 RKE

Scenario 1: Challenge access

As part of the RKE communication the E3HCP422 transmits its longest packet this can be trigger via the Switch configuration see Tables in chapter:
Operation description of the RF measurement setup

Telegram description:

Total length of the RKE Challenge Auth1 telegram:
RF_PHY_Frame2: 27bit
RF_DLL_Frame2: 8bit
DLL Payload: 128bit

Total: 163 bits (16,98ms @ 9,6kbs)

2.4.2 PASE

Scenario 2: Challenge access or go

During a PASE access or go scenario the E3HCP422 transmits the longest packet.

This can be trigger via the Switch configuration see Tables in chapter:
Operation description of the RF measurement setup

Telegram description:

E3HCP422->Key
Total length of the Pase Challenge Service Key telegram:
RF_PHY_Frame2: 27bit
RF_DLL_Frame2: 8bit
DLL Payload: 176bit

Total: 211 bits (8,44ms @ 25kbs)

Label USA/ Canada

Continental
E3HCP422
FCC ID:KR5E3HCP422
IC:7812D- E3HCP422

Owner Manual Canada**IC:7812D-E3HCP422**

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.

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 :



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.

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un Environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps. Ce transmetteur ne doit pas être placé au même endroit ou utilisé simultanément avec un autre transmetteur ou antenne."

Owner Manual USA

FCC ID:KR5E3HCP422

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.

Radiofrequency radiation exposure Information: This equipment complies with FCC and IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20 cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

EU

This equipment should be installed and operated with minimum distance of 20 cm between the radiator and your body

Maximum Output Powers:

TX Power: EU

433 MHz = 8.51dBm (EIRP)

125 kHz = 2.96dBm (EIRP)

TX Power: US & Canada

433 MHz = -17.95 dBm (EIRP mean)

125 kHz = -0.23 dBm (EIRP mean)

TX Power: Japan

315 MHz = -2dBm (50 Ohm, conducted)