Technical Description

Key 5WK4 9046

IC: 267T-5WK49046 FCC ID:KR55WK49046

User Manual

of the

Siemens VDO

Remote Control Transmitter

Type:

Designkey

General description of the Designkey "Keyless Go"

The Designkey incorporates two main functional features.

1. RF remote control system : activation by button press
2. Keyless go system : activation by an external LF-signal source.

In both activation modes the Designkey answers with the available RF (radio frequency) interface. For remote control function additionally IR (infra red) communication is in use.
In regular application the RF receiver is located within the control unit which is mounted in the car interior. The Designkey RF transmitter antenna is mechanically integrated in the key head. The RF transmitter is used to transmit different information by a unidirectional transmission line to the RF receiver within the control unit.

In regular application the following functions are provided by the Designkey :

- Lock the car
- Unlock the car
- Unlock the trunk of the car
- Driver authentication (Keyless Go)
- Panic activation (USA only)

Power supply

The transmitter is provided with 2 Lithium batteries (CR 2025) that both gives a power supply of +3V.

Buttons

There are three buttons which enable to lock and unlock the doors and to unlock the trunk and an extra button in case of required panic function (USA only).
During activation, by button press the microcontroller port is forced to ground via a “pull-up” within the microcontroller.

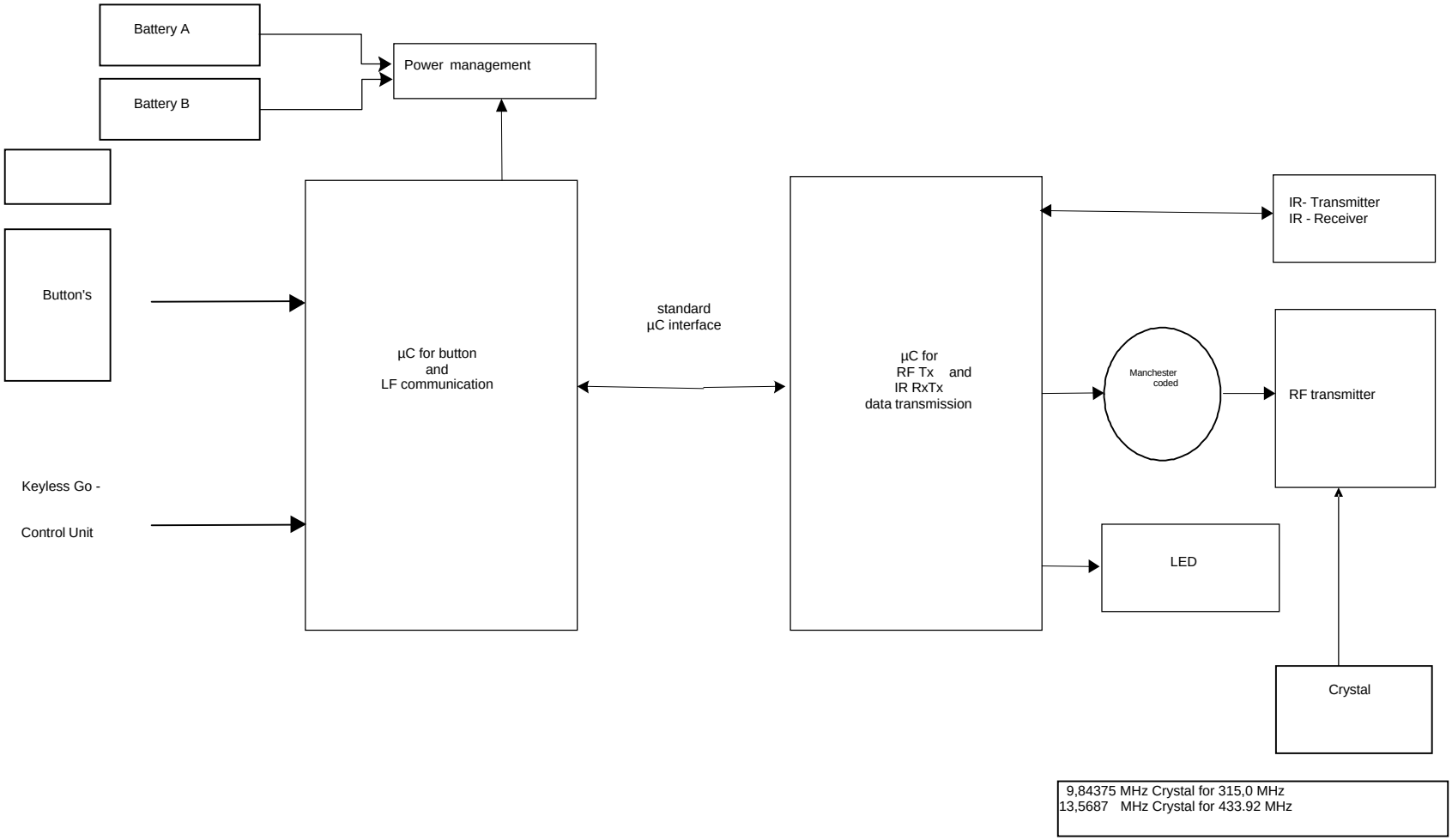
Typical usage pattern (for Europe only)

96 lock/unlock operations in 24 hours with typical transmission duration of 0.8 seconds
→ 4 lock/unlock operations with one hour

Transmitter ON	3.2	seconds / hour
Transmitter OFF	3,596.8	seconds / hour

Duty Cycle: $T_{ON} / T_{(ON+OFF)}$ x 100% = 3.2 / 3,600 x 100 % = 0.08 %

Block diagrams of the transmitter



Variants

Model	Description
5WK4 9045	433.92 MHz variant for Europe
5WK4 9046	315.00 MHz variant for USA

Technical Data

Carrier frequency model 5WK4 9045:		433.92 MHz ± 0.05%
Carrier frequency model 5WK4 9046:		315.00 MHz ± 0.05%
Output power model 5KW49045	:	< 10 mW
Field strength model 5WK49046	:	< 6000µV/m @ 3m
Type of modulation:		FSK
Method of frequency generation:		PLL
Number of channels:		1
Power supply:		battery (2x CR 2025)
Type of battery:		lithium
Transmission range:		<10 m

NOTE:
Changes or modifications not expressly approved by the manufacturer could void the users authority to operate the equipment.

Label design

Europe: (433.92 MHz)

Siemens VDO
5WK4 9045
CE

USA/CAN: (315 MHz)

Siemens VDO
5WK4 9046
IC: 267T-5WK4 9046
FCC ID: KR55WK49046

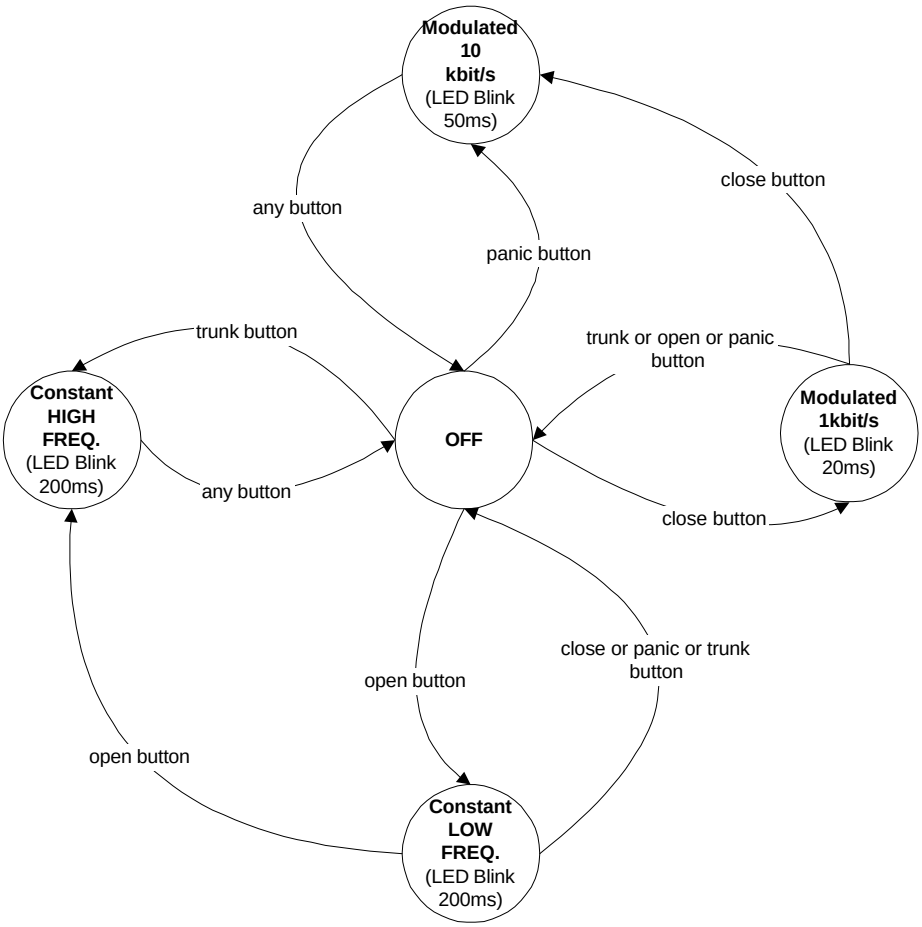
This device complies with part 15 of the FCC Rules and RSS-210. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept interference received, including interference that may cause undesired operation.

Homologation functionality

For homologation use the Designkey samples are programmed with a special software which allows to set the RF transmission in following modes :

1) Constant carrier high frequency
2) Constant carrier low frequency
3) 1 kBit Modulation
4) 10 kBit Modulation

The following diagram shows how to activate the different homologation modes.



4.11 Activate RF radio approval test mode

Key status: Normal key, a special software for the ATIC37Full is needed for this functionality.

	Preamble	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
Input	VS(IR)	FC_DIAGN_KEY	SC_SETHFTEST	0x2A	0xA5	0x13	0x73	0xEF	0xB7

Description: This diagnosis function activates the RF radio approval testmode. This is required in the RF –hardware development and for the radio approval test.
No telegram output is generated.

If the RF Part is activated, the LED flashes red with the defined blink timing. The RF radio approval testmode can be ended through the Diagnosis telegram with the sub function Code SC_CLRHFTEST, via personalization or through initialization.

The following state chart shows how to activate the different RF modes and the feedback of the LED, so that the user is able to distinguish the different states. LED blink has a duty cycle of 50%: e.g. 50ms = 25ms on time, 25ms off time.

The SW is compatible to variants with:

4 buttons: open, close, trunk, panic
3 buttons: open, close, trunk
2 buttons: open, close

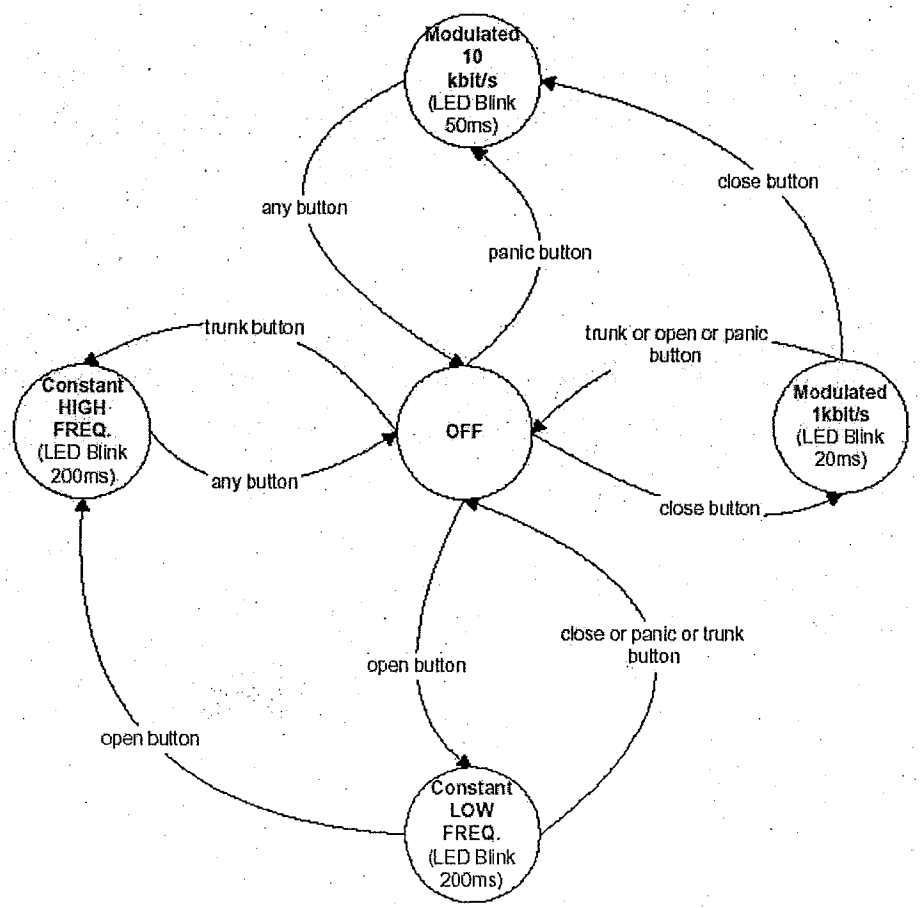


Figure 4: State chart RF test