FCC ID:WP3GB540
IC:1467C-GB540

GB-540 product description

The GB-540 is a ZigBee acoustic glass-break detector that can be used with any ZigBee Home Automation 1.2 enabled home security panel. You can mount the detector on walls or ceilings to detect the breaking of framed glass on any exterior wall. The detector senses the sound of breaking plate, tempered, laminated, wired, coated, and sealed insulated glass. The detector is pre-calibrated, requires no adjustment during the installation, and supports the measurement of ambient room temperature and light level.
Device support OTA (over the air) firmware upgrades.

Operational description of GB-540

Battery input
Circuit supply is from a 3V CR123A lithium battery connected to clips B1/B2.
Q1 protects the circuit from reverse polarity connection.

Circuit power supply
3V rail supplies voltage to most circuit parts: processor U3, Flash memory U2, ZigBee module.
LDO U1 supply 2.5V rail to microphone circuit and also as a reference voltage for U3 ADC measurements.

Processor
Processor U3 controls all circuit operation using its factory programmed firmware.
Timing is provided by internal oscillators working at 32Khz (low frequency) and 26Mhz (high frequency). Crystal X1 is used for periodic calibration of the internal oscillators.

Microphone circuit
U10 supplies 2.5V switched voltage to electret microphone MIC1. The microphone signal is stored at capacitor C25 using Sample-and-Hold circuit implements by Q6/C25/Q5.
C25 continuous audio signal is filtered and amplified using 2 amplification channels: operational amplifier U5 (Low frequency) and operational amplifier U4 (high frequency).
U4 and U5 output signals are fed to processor U3 for ADC conversion. The converted digital samples are processed and analyzed for glass break decision.

User indication and controls
Events visual indication is provided by Bi-color LED LD1.
S2 pushbutton enables Enrolling the detector to the system Control Panel during installation.

Tyco Security Products
24 Habarzel Street
Tel-Aviv 69710, Israel

Tele: +972 3 6456 789
Fax: +972 3 6456 788
www.tycosecurityproducts.com

Tamper security

S3 contact is activated during cover open (front Tamper) or by removal from mounting surface (back Tamper).

Self-Test

Periodic short "beeps" are generated by buzzer BUZ2. These beeps are intercepted by microphone MIC1 and analyzed by processor U3. Incorrect operation will generate Self-Test Trouble message to the Control Panel.

Battery test

At periodic intervals processor U3 activate Q3 and load the battery by resistors R11/R12. The battery voltage is sampled by ADC input of U3. Low battery condition is reported to CP.

Flash memory

U2 is a non-volatile SPI flash memory used to store downloaded firmware during OTA (over the air) upgrades.

NTC circuit (temperature measurement)

At periodic intervals the processor U3 enables power to the NTC sensor R49 by an I/O port. The NTC output voltage is sampled by ADC input of U3. The measured sample is converted to a temperature value.

Light sensor circuit

At periodic intervals the processor U3 enables power to the light sensor U6 circuit by an I/O port. The light sensor output voltage is sampled by ADC input of U3. The measured sample is converted to light value.

RF module

The Zigbee transceiver module is connected to J3 header. Processor U3 controls the RF module trough 3 lines: one power line to switch its power by Q4, and two UART communication lines.