



FCC ID: 2A3E3-TAG360-SBM01

Design Review Smart Immobilizer



USA. Singapore. India

Proprietary Information

"This document and its attachments are confidential. Any unauthorized copying, disclosure or distribution of the material is strictly forbidden"

Requirements



	Submission documents	memo
1	Circuit Description	Slide: Circuit Description
2	Block Diagram	Slide: Block Diagram: TCI
3	User Manual	Attached
4	Operational Description	Slide: Operational Description
5	Label & Label location	Slide: Label Location
6	Antenna specification	OK(10/8)

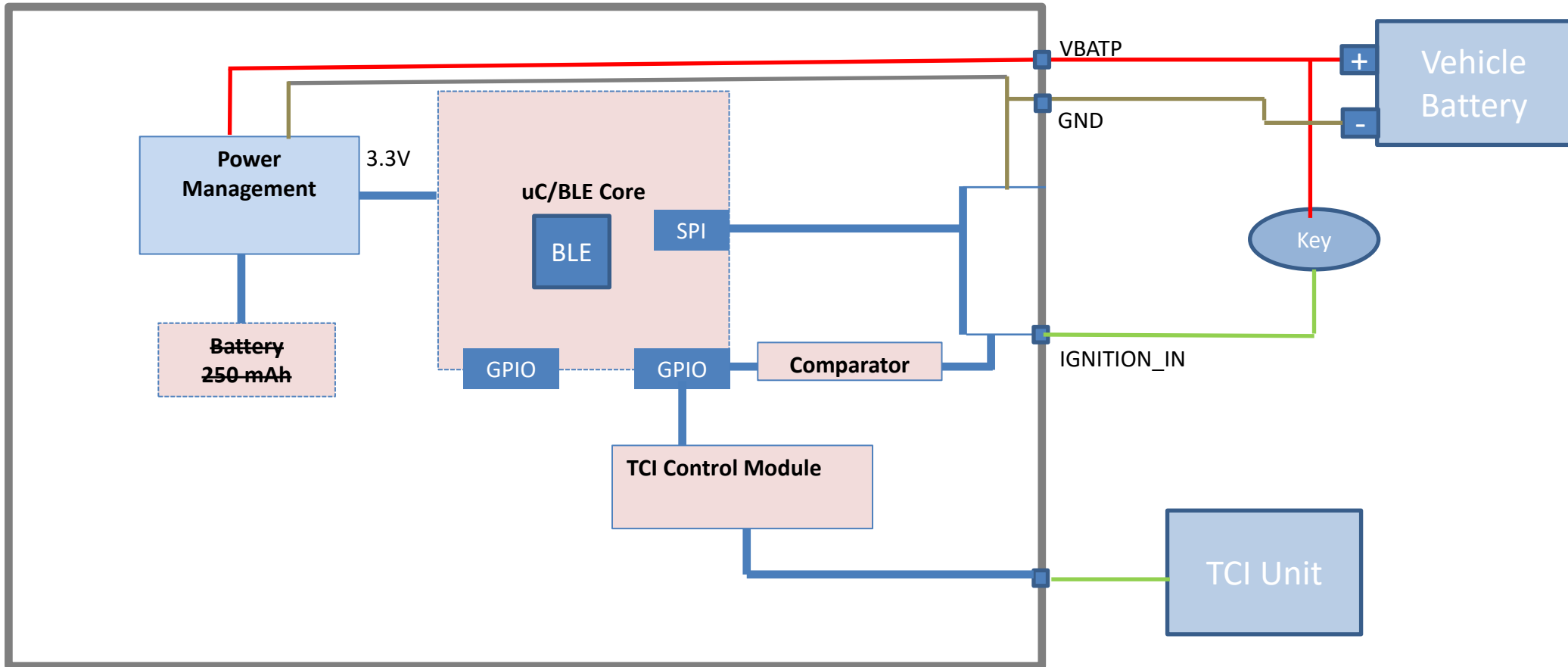
Circuit Description



Major Blocks in the circuit are described below (please refer Block Diagram)

- Power Management: Power Management Block consists of:
 - DC-DC Regulators to convert input 12V automotive bus to 3.3V, as required by remaining circuit blocks
 - It also consists of automotive supply transient protection circuits, as well as reverse voltage and short circuit protection circuits
- uC/BLE Core: Nordic nRF52833 ARM Cortex M4 main Bluetooth Microcontroller
 - The BLE SoC implements BLE radio, as well as control logic required for unit's operations.
 - BLE radios implemented communicate to corresponding BLE Keyfob unit to get user commands
 - A GPIO is configured to read Comparator output signaling presence of physical key
 - Based on Key presence and user command, the microcontroller sends a PWM pulse to TCI control module, which then level translates and communicates the command to external ECU unit
- TCI Controller block
 - This block implements level shifter and driver to drive one wire output to external TCI Unit

SBM Block Diagram: TCI



Operational Description



Smart Bike Module (SBM) enables remote mobilization and immobilization of a vehicle through wireless Bluetooth input, provided by a separate Bluetooth Keyfob

- The unit takes inputs from Keyfob through BLE communication
 - A button press on Keyfob toggles the vehicle state from ON to OFF or from OFF to ON
 - On keyfob, the programmed state is made visible through an LED indicator
- The SBM Unit works on 12V battery and is active all the time
- If Keyfob unit is in its vicinity and sends a mobilise command over Bluetooth:
 - The SBM unit checks for physical key's presence through IGNITION Sense line
 - If it detects the physical key, it sends a commands to Engine Control Unit (ECU) to mobilize the bike.
The communication between SBM and ECU is over a custom one-wire protocol
- If the Keyfob unit issues an immobilize command:
 - If the Bike's ignition is OFF, the immobilization command is sent to ECU immediately
 - If the Bike's ignition is ON, the SBM logs user request in its memory, but waits for vehicle's ignition to turn off before sending immobilization request to the ECU

Label Location

