



FCC ID: 2A3E3-TAG360-SBM01

Design Review Smart Immobilizer



USA. Singapore. India

Proprietary Information

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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)

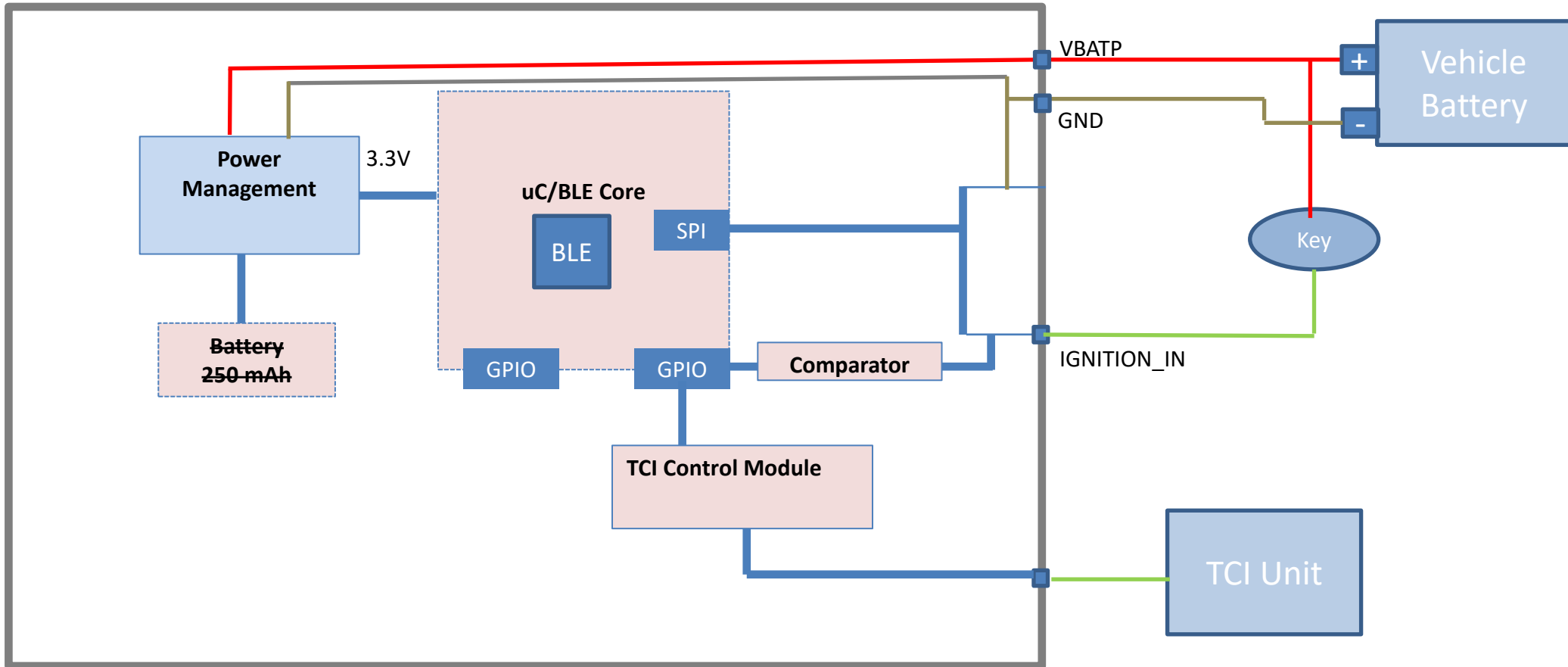
Circuit Description



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

