

Wireless Sensor Endpoint

Sensor Connectivity Solution

WSE-1340



Connectivity

- Cellular Cat M1/NB-IoT
- Bluetooth® 5
- NFC
- 802.15.4

Features

- Cortex M4F 32-bit application processor with 1MB flash memory / 256K RAM
- 4MB external flash memory
- GPS receiver included in cellular radio
- LED indicator
- Lithium-Ion Polymer battery pack

Sensors

- Relative Humidity and Temperature
- 9-axis Inertial Measurement Unit
- Microphone





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The PCTEL® Wireless Sensor Endpoint (WSE) family are versatile Industrial IoT products that offer multiple radio connectivity options including cellular, Bluetooth® 5, NFC as well as 802.15.4 support.

In addition to several radios, the PCTEL WSE family includes several sensors to monitor a variety of physical conditions. These sensors can detect temperature, relative humidity, acceleration, angular rate of change, magnetic field, and sound.

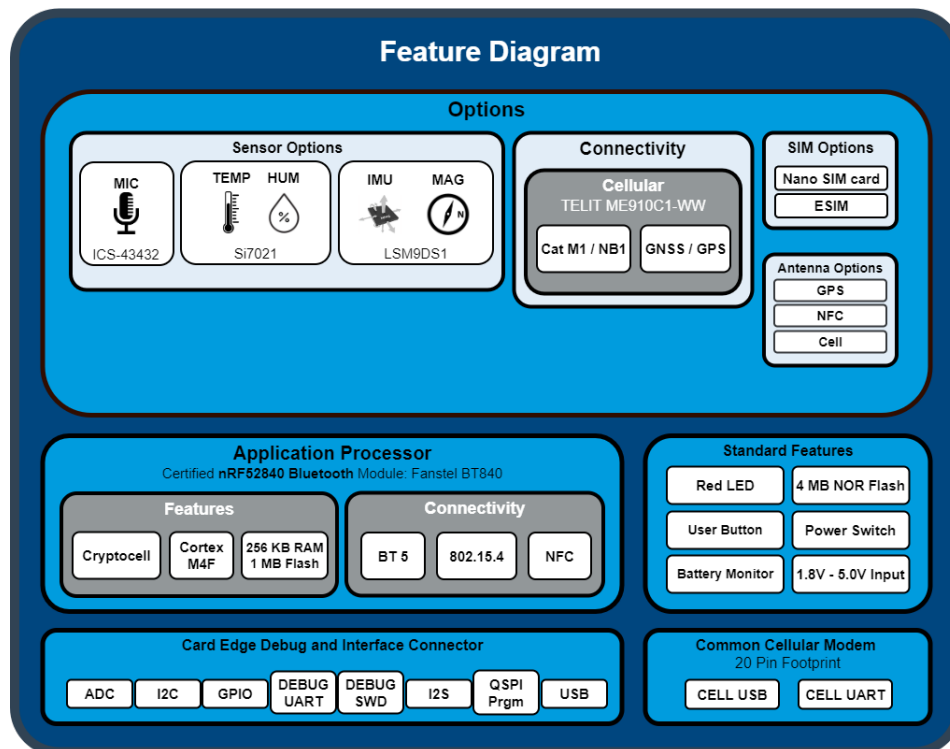
The PCTEL WSE is powered by a high capacity Lithium-Ion Polymer battery pack. The enclosure also has two mounting tabs for easy installation.

Wireless Sensor Endpoint

Sensor Connectivity Solution

Features and Benefits

Feature	Benefit
ARM Mbed Enabled	Faster time to market leveraging ARM Mbed OS to accelerate application software development.
Internal Radio Antennas	No external connections with each radio having an individual antenna.
Rechargeable Battery Pack	Easily recharge the battery via USB Micro-B connector.
Mounting Tabs	Enclosure with two integrated tabs for easy installation.
Integrated Debug Interface	Ease of software development using the Wireless Sensor Development System.
Nano-Sim Card Holder	Easy installation of preferred cellular provider SIM card.
Power Switch	WSE can be turned on and off as needed.
Push Button	User defined operation.



Wireless Sensor Endpoint

Sensor Connectivity Solution

General Specifications

Parameter	Specification
Operating Temperature	-20°C to +60°C
Charging Temperature	0°C to +45°C
Storage Temperature	-20°C to +45°C (1-month) -20°C to +35°C (6-months)
Battery Pack	Li-Ion Polymer, 3.7V @ 4400mAh
Dimensions	60mm x 103mm x 43mm

Sensor Specifications

Device	Specification
Relative Humidity / Temperature	±3% RH (max) 0-80% RH / ±0.4°C (max) -10°C to +85°C
9-Axis Inertial Measurement Unit	3-axis Accelerometer: ±2/±4/±8/±16 g (linear) 3-axis Angular rate: ±245/±500/±2000 dps 3-axis Magnetic position: ±4/±8/±12/±16 gauss
Microphone	Frequency response: 50 Hz to 20 kHz SNR: 65 dBA, Sensitivity -26 dB FS

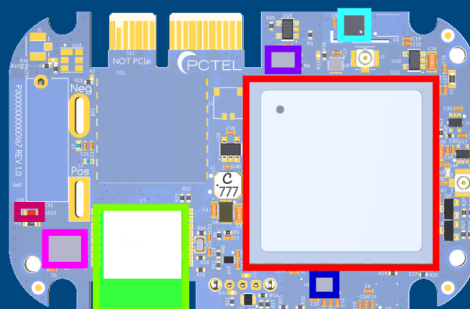
Wireless Sensor Endpoint

Sensor Connectivity Solution

Component Identification Diagram

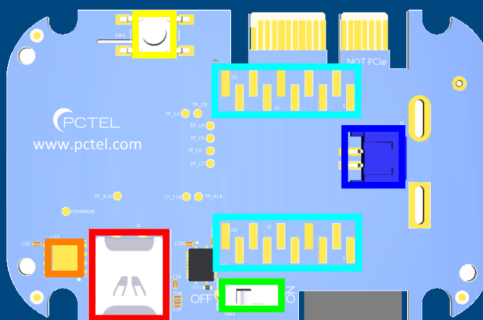
Top

Component	Function	COLOR
Telit ME910C1-WW	Cat-M1 / NB-IoT / GNSS	Red
BT840	MCU - BT5 - 802.15.4 - NFC	Yellow
SI7021	Temp - Humidity	Green
ST LSM9DS1	Accel - Gyro - Mag	Blue
TDK ICS-43432	Microphone	Purple
Winbond	4MB QSPI NOR Flash	Magenta
RED LED	Indicator	Red



Bottom

Component	Function	COLOR
Nano-SIM Holder	Size 4FF	Red
eSIM	Embedded SIM IC	Yellow
Push Button	User button	Green
Power Switch	Slide Switch	Blue
Battery Connector	JST	Blue
Modem Connector	Common Footprint for Cellular	Cyan



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Wireless Sensor Endpoint

Sensor Connectivity Solution

WSE-1330



Connectivity

- Cellular Cat M1/NB-IoT
- Bluetooth® 5
- NFC
- 802.15.4

Features

- Cortex M4F 32-bit application processor with 1MB flash memory / 256K RAM
- 4MB external flash memory
- GPS receiver included in cellular radio
- LED indicator
- Lithium-Ion Polymer battery pack

Sensors

- 9-axis Inertial Measurement Unit
- Gas, Air Quality, Pressure, Temperature and Humidity
- Microphone





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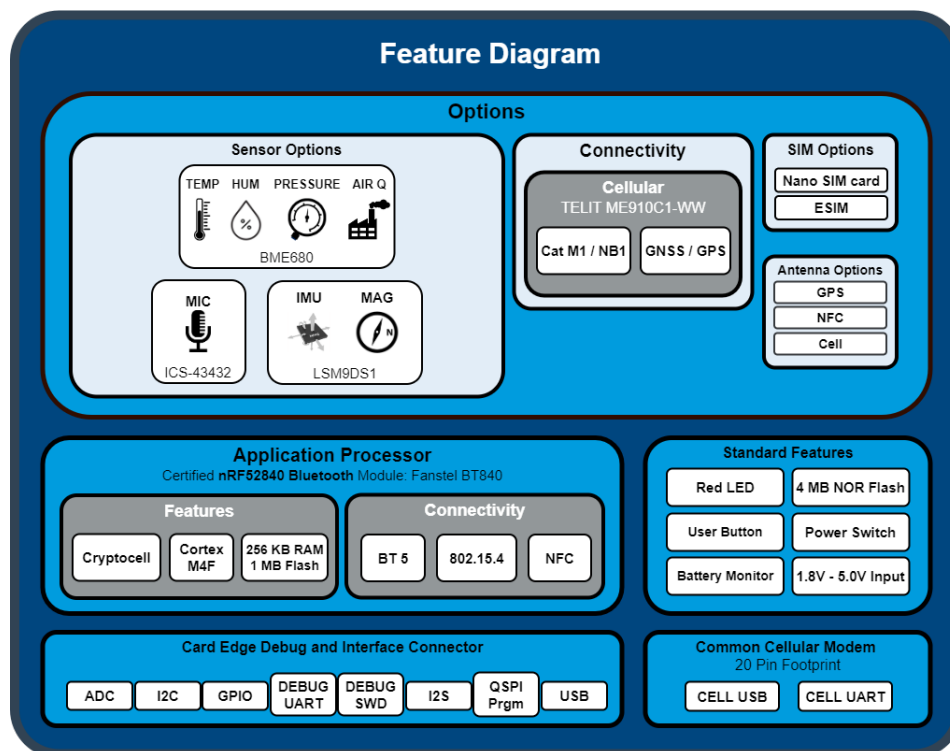
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Wireless Sensor Endpoint

Sensor Connectivity Solution

Features and Benefits

Feature	Benefit
ARM Mbed Enabled	Faster time to market leveraging ARM Mbed OS to accelerate application software development.
Internal Radio Antennas	No external connections with each radio having an individual antenna.
Rechargeable Battery Pack	Easily recharge the battery via USB Micro-B connector.
Mounting Tabs	Enclosure with two integrated tabs for easy installation.
Integrated Debug Interface	Ease of software development using the Wireless Sensor Development System.
Nano-Sim Card Holder	Easy installation of preferred cellular provider SIM card.
Power Switch	WSE can be turned on and off as needed.
Push Button	User defined operation.



Wireless Sensor Endpoint

Sensor Connectivity Solution

General Specifications

Parameter	Specification
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Charging Temperature	0°C to +45°C
Storage Temperature	-20°C to +45°C (1-month) -20°C to +35°C (6-months)
Battery Pack	Li-Ion Polymer, 3.7V @ 4400mAh
Dimensions	60mm x 103mm x 43mm

Sensor Specifications

Device	Specification
9-Axis Inertial Measurement Unit	3-axis Accelerometer: $\pm 2/\pm 4/\pm 8/\pm 16$ g (linear) 3-axis Angular rate: $\pm 245/\pm 500/\pm 2000$ dps 3-axis Magnetic position: $\pm 4/\pm 8/\pm 12/\pm 16$ gauss
Microphone	Frequency response: 50 Hz to 20 kHz SNR: 65 dBA, Sensitivity -26 dB FS
Environmental Gas / Air Quality	Gas (VOC): 20% tolerance; 5% accuracy
	Pressure: 300 to 1100 hPa (± 0.6 hPa)
	Humidity: 10% to 90% RH ($\pm 3\%$) at 0°C to +65°C
	Temperature: -40°C to +85°C ($\pm 1^\circ\text{C}$), 25°C ($\pm 0.5^\circ\text{C}$)
	Air Quality Score: 0 to 500 ($\pm 15\%$)

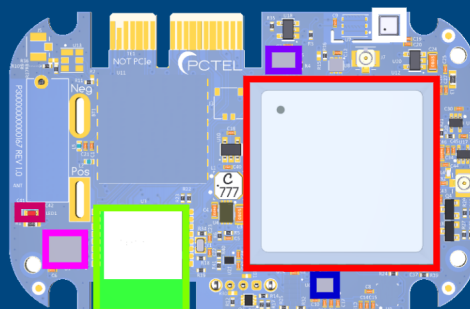
Wireless Sensor Endpoint

Sensor Connectivity Solution

Component Identification Diagram

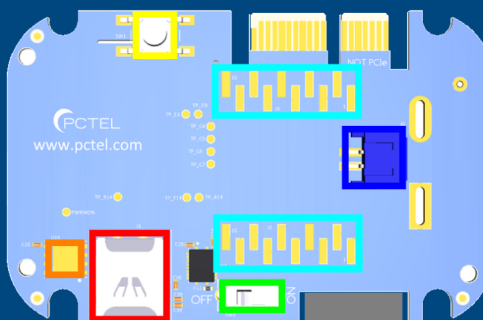
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Component	Function	COLOR
Telit ME910C1-WW	Cat-M1 / NB-IoT / GNSS	Red
		Yellow
BT840	MCU - BT5 - 802.15.4 - NFC	Green
BOSCH BME680	Temp - Hum - Pres - Air Q	Cyan
		Blue
ST LSM9DS1	Accel - Gyro - Mag	Purple
TDK ICS-43432	Microphone	Magenta
Winbond	4MB QSPI NOR Flash	Pink
RED LED	Indicator	Red



Bottom

Component	Function	COLOR
Nano-SIM Holder	Size 4FF	Red
eSIM	Embedded SIM IC	Orange
Push Button	User button	Yellow
Power Switch	Slide Switch	Green
Battery Connector	JST	Blue
Modem Connector	Common Footprint for Cellular	Cyan



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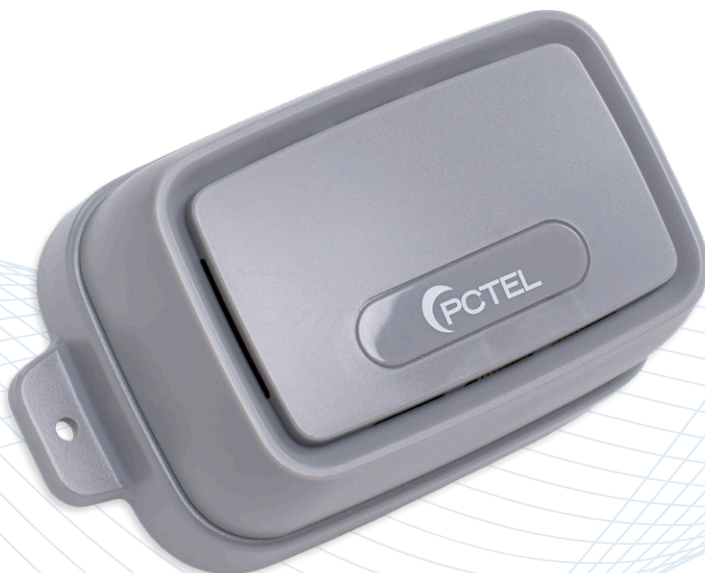
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Wireless Sensor Endpoint

Sensor Connectivity Solution

WSE-1320



Connectivity

- Cellular Cat M1/NB-IoT
- Bluetooth® 5
- NFC
- 802.15.4

Features

- Cortex M4F 32-bit application processor with 1MB flash memory / 256K RAM
- 4MB external flash memory
- GPS receiver included in cellular radio
- LED indicator
- Lithium-Ion Polymer battery pack

Sensors

- Relative Humidity and Temperature
- 6-axis Inertial Measurement Unit
- Microphone





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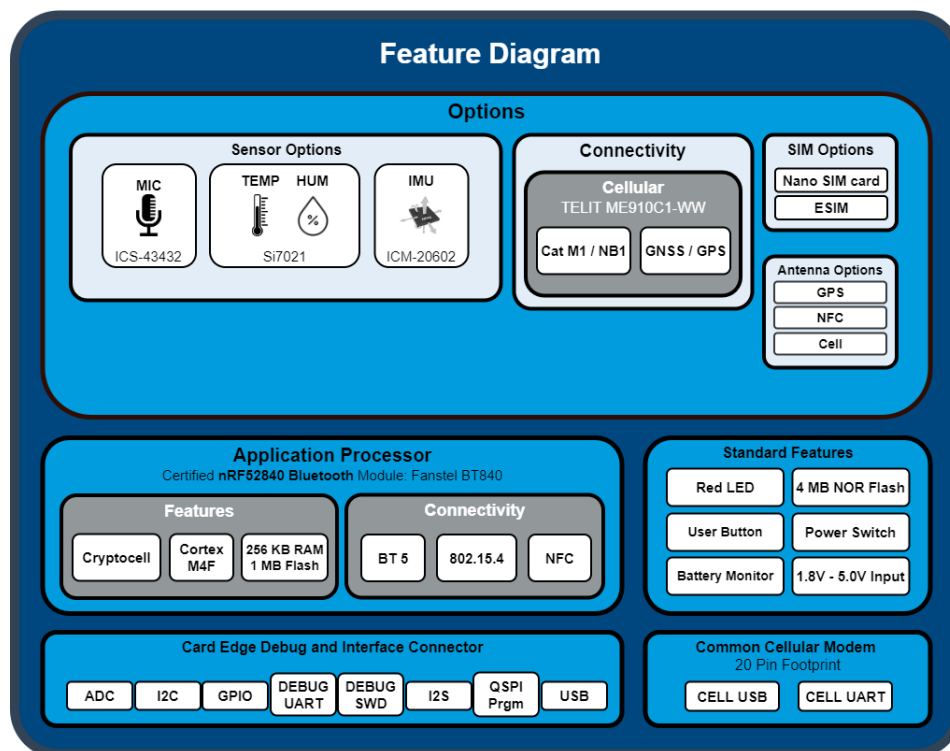
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Wireless Sensor Endpoint

Sensor Connectivity Solution

Features and Benefits

Feature	Benefit
ARM Mbed Enabled	Faster time to market leveraging ARM Mbed OS to accelerate application software development.
Internal Radio Antennas	No external connections with each radio having an individual antenna.
Rechargeable Battery Pack	Easily recharge the battery via USB Micro-B connector.
Mounting Tabs	Enclosure with two integrated tabs for easy installation.
Integrated Debug Interface	Ease of software development using the Wireless Sensor Development System.
Nano-Sim Card Holder	Easy installation of preferred cellular provider SIM card.
Power Switch	WSE can be turned on and off as needed.
Push Button	User defined operation.



Wireless Sensor Endpoint

Sensor Connectivity Solution

General Specifications

Parameter	Specification
Operating Temperature	-20°C to +60°C
Charging Temperature	0°C to +45°C
Storage Temperature	-20°C to +45°C (1-month) -20°C to +35°C (6-months)
Battery Pack	Li-Ion Polymer, 3.7V @ 4400mAh
Dimensions	60mm x 103mm x 43mm

Sensor Specifications

Device	Specification
Relative Humidity / Temperature	±3% RH (max) 0-80% RH / ±0.4°C (max) -10°C to +85°C
6-Axis IMU Motion Tracking Device	3-axis Accelerometer: ±2/±4/±8/±16 g linear 3-axis Gyroscope: ±250/±500/±1000/±2000 dps
Microphone	Frequency response: 50 Hz to 20 kHz SNR: 65 dBA, Sensitivity -26 dB FS

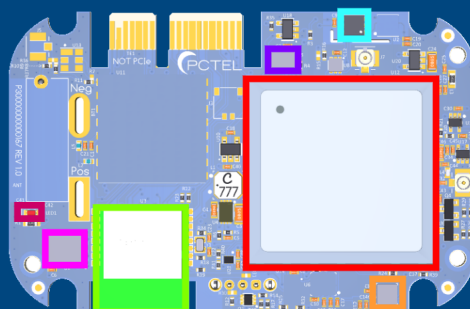
Wireless Sensor Endpoint

Sensor Connectivity Solution

Component Identification Diagram

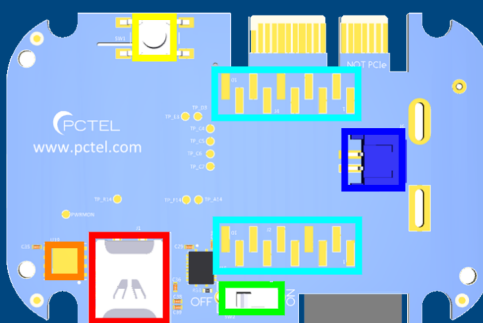
Top

Component	Function	COLOR
Telit ME910C1-WW	Cat-M1 / NB-IoT / GNSS	Red
TDK ICM-20602	Accelerometer - Gyro	Yellow
BT840	MCU - BT5 - 802.15.4 - NFC	Green
SI7021	Temp - Humidity	Cyan
TDK ICS-43432	Microphone	Blue
Winbond	4MB QSPI NOR Flash	Purple
RED LED	Indicator	Magenta



Bottom

Component	Function	COLOR
Nano-SIM Holder	Size 4FF	Red
eSIM	Embedded SIM IC	Orange
Push Button	User button	Yellow
Power Switch	Slide Switch	Green
Battery Connector	JST	Blue
Modem Connector	Common Footprint for Cellular	Cyan



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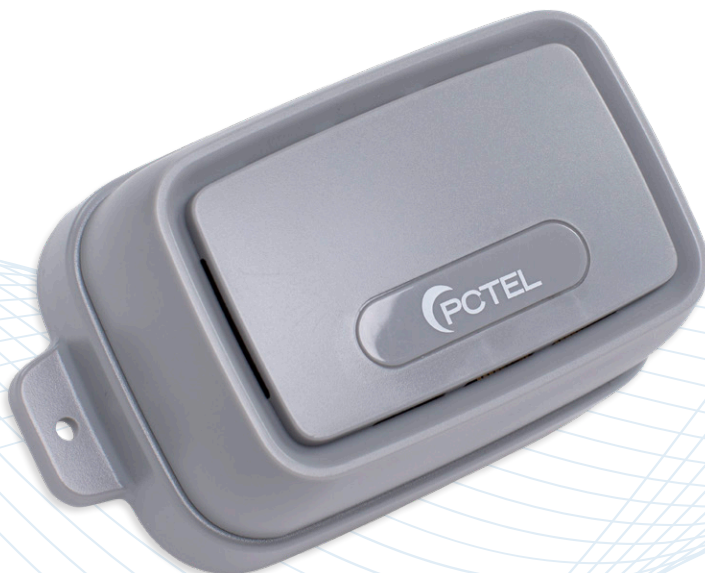
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Wireless Sensor Endpoint

Sensor Connectivity Solution

WSE-1310



Connectivity

- Cellular Cat M1/NB-IoT
- Bluetooth® 5
- NFC
- 802.15.4

Features

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- 4MB external flash memory
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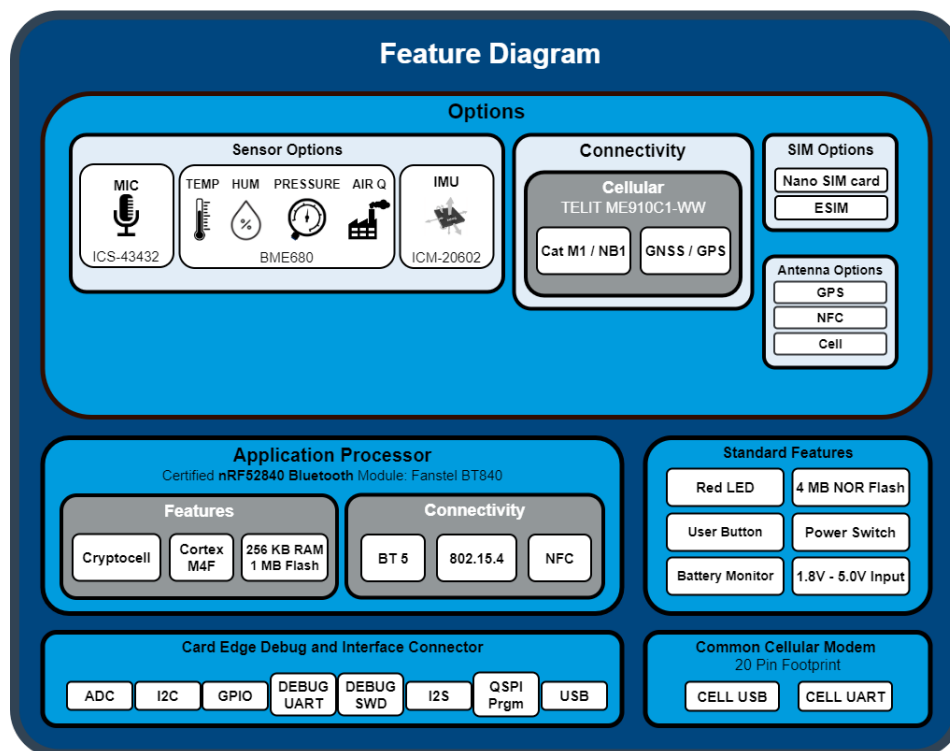
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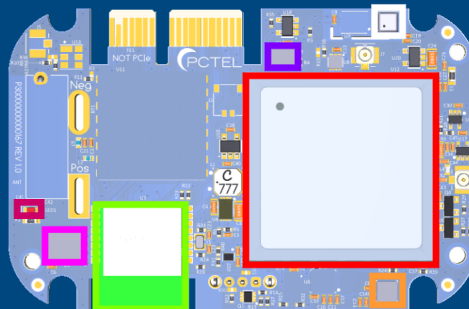
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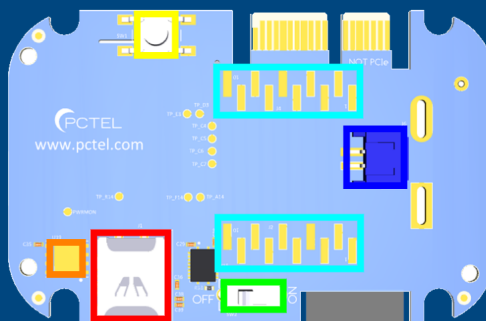
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Component	Function	COLOR
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