LE910 Family Product Description

Preliminary

80421ST10587a  Rev.2 – 2013-10-08

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## APPLICABILITY TABLE

<table>
<thead>
<tr>
<th>PRODUCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>LE910 Series</td>
</tr>
</tbody>
</table>

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1. **Introduction**

1.1. **Scope**
Scope of this document is to give an overview of the Telit LE910 series, which can support LTE, with data/voice capabilities, and GSM/GPRS/UMTS/HSPA+ as fall-back technologies.

1.2. **Audience**
This document is intended for customers who are evaluating the LE910 series.

1.3. **Contact Information, Support**
For general contact, technical support, to report documentation errors and to order manuals, contact Telit Technical Support Center (TTSC) at:

   TS-EMEA@telit.com  
   TS-NORTHAMERICA@telit.com  
   TS-LATINAMERICA@telit.com  
   TS-APAC@telit.com

Alternatively, use:


For detailed information about where you can buy the Telit modules or for recommendations on accessories and components visit:

http://www.telit.com

To register for product news and announcements or for product questions contact Telit Technical Support Center (TTSC).

Our aim is to make this guide as helpful as possible. Keep us informed of your comments and suggestions for improvements.

Telit appreciates feedback from the users of our information.
1.4. Document Organization

This document contains the following chapters (sample):

“Chapter 1: “Introduction” provides a scope for this document, target audience, contact and support information, and text conventions.

“Chapter 2: “Overview” gives the information of product variants and the overview of the characteristics and features of the product.

“Chapter 3: “General Product Description” describes in details the characteristics of the product.

“Chapter 4: “Evaluation Kit” provides a brief description of the Telit Evaluation Kit (EVK2) as far as these modules are concerned.

“Chapter 5: “Software Features” provides an overview of the software features of the products.

“Chapter 6: “AT Commands” provides the information of compliant.

“Chapter 7: “Conformity Assessment” provides some fundamental hints about the conformity assessment that the final application might need.

“Chapter 8: “Safety Recommendation” provides some safety recommendations that must be follow by the customer in the design of the application that makes use of the LE910 family.

1.5. Text Conventions

Danger – This information MUST be followed or catastrophic equipment failure or bodily injury may occur.

Caution or Warning – Alerts the user to important points about integrating the module, if these points are not followed, the module and end user equipment may fail or malfunction.

Tip or Information – Provides advice and suggestions that may be useful when integrating the module.

All dates are in ISO 8601 format, i.e. YYYY-MM-DD.
1.6. Related Documents

- LE910 Hardware User Guide
- LE910 AT command User Guide
- Telit EVK2 User Guide,

1.7. Document History

<table>
<thead>
<tr>
<th>Revision</th>
<th>Date</th>
<th>Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>2012-11-28</td>
<td>First issue</td>
</tr>
<tr>
<td>1</td>
<td>2013-09-12</td>
<td>General Review of the document</td>
</tr>
<tr>
<td>2</td>
<td>2013-10-08</td>
<td>Product variants update</td>
</tr>
</tbody>
</table>
2. The LE910

2.1. Product Overview

The new Telit LE910 represents the next generation of Telit wireless connectivity with xE910 form factor.

The LE910 combines the two cutting edge technologies HSPA+ and LTE. As a matter of fact, LE910 is a 3.5G wireless data module offering HSPA+ connectivity with download speeds up to 42 Mbps, and a 4G M2M module at the same time, providing an ultra high-speed downlink at 100 Mbps.

The LE910 will be the first and smallest module in the market incorporating 2G/3G/4G solution.

Designed for use in the most demanding industrial and consumer applications, the LE910 offers LGA packaging with cost effective mating solution. Three LE910 regional versions are available, one for European, APAC and Latin American markets and two for the North American market (AT&T and Verizon configuration). All of them come with a multiband configuration, covering different sets of 3G and 4G bands. Developers can take advantage of Telit's xE910 Unified Form Factor that enables a “design once, use anywhere” strategy.

Due to its low profile, low consumption and advanced connectivity features, LE910 is particularly suitable for applications such as mobile computing devices, PDAs, smatphones, table PCS and cownsumer or industial electronics in general.

Design your application once and choose the technology that best fits the regional requirements for a truly seamless deployment. The LE910 is also fully backwards compatible to existing EDGE and GSM/GPRS networks through integrated quad-band radios. Additional features, such as integrated TCP/IP and UDP stack, DAC and ADC channels provide extended functionality, adding value to the final application with no additional costs.

Moreover LE910 is also available with embedded GPS/GLONASS receiver and Antenna Diversity. The extensive interface set, which includes USB, SPI, I2C and user definable GPIOs, provides ease of integration of peripherals and actuators.

As a part of Telit’s corporate policy of environmenta protection, LE910 as all Telit products comply with the RoHS (Restriction of Hazardous Substance) directive of the European Union (Eu Directive 2011/65/EU).
NOTE:
Some of the performances of the Telit modules depend on S/W version installed on the module itself. The Telit modules S/W group is continuously working in order to add new features and improve the overall performances. The Telit modules are easily upgraded by the developer using the Telit Flash Programmer.

NOTE:
In order to meet the competitive OEM and vertical market stringent requirements, Telit supports its customers with a dedicated Support Policy with:
- Telit Evaluation Kit EVK2 to help you to develop your application;
- A website with all updated information available;
- An high level specialist technical support to assist you in your development;

2.2. Target Market
The LE910 is designed and developed for applications requiring high throughput, devices requiring worldwide coverage and for applications in areas such as telematics for in-vehicle infotainment, video security and surveillance, outdoor signs and displays, business terminals and consumer products such as routers, mobile hot-spots, etc.

2.3. Product variants

<table>
<thead>
<tr>
<th>Variant</th>
<th>2G Frequencies (MHz)</th>
<th>WCDMA Frequencies (MHz/Band)</th>
<th>LTE Frequencies (MHz/Band)</th>
<th>HSPA+ Data – Rates DL/UL [Mbps]</th>
<th>LTE Data – Rates DL/UL [Mbps]</th>
</tr>
</thead>
<tbody>
<tr>
<td>LE910-EUG</td>
<td>850/900/1800/1900</td>
<td>900 (B8) 2100 (B1)</td>
<td>800 (B20) 1800 (B3) 2600 (B7)</td>
<td>42/5.7</td>
<td>100/50</td>
</tr>
<tr>
<td>LE910-NAG (AT&amp;T)</td>
<td>850/1900</td>
<td>850 (B5) 1900 (B2)</td>
<td>700 (B17) 850 (B5) AWS1700 (B4) 1900 (B2)</td>
<td>42/5.7</td>
<td>100/50</td>
</tr>
<tr>
<td>LE910-NAx (Verizon)</td>
<td>-</td>
<td>850 (B5) 1900 (B2)</td>
<td>700 (B13) AWS1700 (B4)</td>
<td>42/5.7</td>
<td>100/50</td>
</tr>
</tbody>
</table>
2.4. Product Features

- Dual/Quad-band EGSM class 10
- Multi-band UMTS/HSPA+  
  - 900/2100 MHz (EU variant)  
  - 850/1900 MHz (NAx variants)
- Multi-band LTE  
  - 850/1800/2100 MHz (EU variant)  
  - 700/850/AWS1700/1900 MHz (AT&T variant)  
  - 700/AWS1700 MHz (Verizon variant)
- 3GPP protocol stack release 9 compliant, LTE Cat.3
- Supply voltage range: 3.4 – 4.2 V DC (3.8 V DC nominal)
- Output power  
  - Class 4 (2 W, 33 dBm) @ GSM 900  
  - Class 1 (1 W, 30 dBm) @ GSM 1800  
  - Class E2 (0.5 W, 27 dBm) @ EDGE 900  
  - Class E2 (0.4 W, 26 dBm) @ EDGE 1800  
  - Class 3 (0.25 W, 24 dBm) @ UMTS  
  - Class 3 (0.2 W, 23 dBm) @ LTE
- Digital Audio and VoLTE (Voice over LTE)
- Control via AT commands according to 3GPP 27.005, 27.007 and Telit custom AT commands
- SIM Application Toolkit 3GPP TS 51.014
- SIM Access Profile
- IP stack with TCP and UDP protocol
- E-Call compliant
- Embedded GPS/Glonass
- Rx Diversity & MIMO
- Dimensions: 28.2 x 28.2 x 2.55 mm
- Weight: 9 grams
- RoHS compliant

Interfaces  
- 10 I/O ports
- Digital voice support
- USB 2.0 HS
- 1 UART
- SPI
- I2C
- 1.8V SIM Interface
Data transmission
- LTE Cat.3
  - DL up to 100 Mbps
  - UL up to 50 Mbps
- HSPA+: category 20 in downlink e category 6 in uplink
  - DL up to 42.0Mbps
  - UL up to 5.76Mbps
- WCDMA: up to 384kbps downlink/uplink
- EDGE: DL up to 236.8 kbps, UL up to 236.8 kbps
- GPRS: DL up to 85.6 kbps, UL up to 85.6kbps
- Asynchronous non-transparent CSD up to 9.6kbps
- EDGE Class 10, MS class B
- Coding scheme 1 to 4 (GPRS) & Modulation Coding scheme 1 to 9 (EDGE)

Audio
- Telephony
- Half rate, full rate, enhanced full rate and adaptive multi rate voice codecs (HR, FR, EFR, AMR)
- Superior echo cancellation & noise reduction
- DTMF

SMS
- Point-to-point mobile originated and mobile terminated SMS
- Concatenated SMS supported
- SMS cell broadcast
- Text and PDU mode
- SMS over GPRS

GPRS data
- GPRS class 10
- Mobile station class B
- Coding scheme 1 to 4
- PBCCH support
- GERAN Feature Package 1 support (NACC, Extended TBF)

GSM Supplementary Services
- Call forwarding
- Call barring
- Call waiting & call hold
- Advice of charge
- Calling line identification presentation (CLIP)
- Calling line identification restriction (CLIR)
- Unstructured supplementary services mobile originated data (USSD)
- Closed user group
Additional features

• SIM phonebook
• Fixed Dialling Number (FDN)
• Call control & status indication
• SIM phonebook
• Character management (IRA, UCS2, GSM)
• USIM 3GPP Rel.7
• Real Time Clock
• Automatic answer
• Alarm management
• Embedded TCP/IP stack, including TCP, IP, UDP, and FTP protocols
• CSD for Video Telephony support

Approvals

• Fully type approved conforming with R&TTE directive
• CE, GCF, FCC, PTCRB, IC
3. Product Description

3.1. Dimensions and 2D mechanical drawing

The LE910 has a Land-Grid-Array (LGA) package, with 144 pads. The overall dimensions of LE910 family are:

- Length: 28.2 mm
- Width: 28.2 mm
- Thickness: 2.55 mm

The lead-free alloy is Surface finishing Ni/Au for all solder pads.
3.2. **Weight**

The module weight of LE910 family is about 9 grams.

3.3. **Environmental requirements**

3.3.1. **Temperature range**

| Operating Temperature Range | $-40^\circ C \sim +85^\circ C$ |

3.3.2. **RoHS compliance**

As a part of Telit corporate policy of environmental protection, the HE863 family complies with the RoHS (Restriction of Hazardous Substances) directive of the European Union (EU directive 2011/65/EU).
### 3.4. Operating Frequency

The operating frequencies in GSM850, EGSM900, DCS1800, PCS1900, WCDMA modes are compliant to the 3GPP and WCDMA specifications.

<table>
<thead>
<tr>
<th>Mode</th>
<th>Freq. TX (MHz)</th>
<th>Freq. RX (MHz)</th>
<th>Channels</th>
<th>TX - RX offset</th>
</tr>
</thead>
<tbody>
<tr>
<td>EGSM900</td>
<td>890.0 ~ 915</td>
<td>935.0 ~ 959.8</td>
<td>0 ~ 124</td>
<td>45 MHz</td>
</tr>
<tr>
<td>DCS1800</td>
<td>1710.2 ~ 1784.8</td>
<td>1805.2 ~ 1879.8</td>
<td>512 ~ 885</td>
<td>95MHz</td>
</tr>
<tr>
<td>WCDMA2100 – B1</td>
<td>1922.4 ~ 1977.6</td>
<td>2112.4 ~ 2167.6</td>
<td></td>
<td>190MHz</td>
</tr>
<tr>
<td>WCDMA1900 – B2</td>
<td>1852.4 ~ 1907.6</td>
<td>1932.4 ~ 1987.6</td>
<td></td>
<td>80MHz</td>
</tr>
<tr>
<td>WCDMA1800 – B3</td>
<td>1710 ~ 1785</td>
<td>1805 ~ 1880</td>
<td></td>
<td>95MHz</td>
</tr>
<tr>
<td>WCDMA850 – B5</td>
<td>826.4 ~ 846.6</td>
<td>871.4 ~ 891.6</td>
<td></td>
<td>45MHz</td>
</tr>
<tr>
<td>WCDMA900 – B8</td>
<td>882.4 ~ 912.6</td>
<td>927.4 ~ 957.6</td>
<td></td>
<td>45MHz</td>
</tr>
<tr>
<td>LTE2100 – B1</td>
<td>1920 ~ 1980</td>
<td>2110 ~ 2170</td>
<td></td>
<td>190MHz</td>
</tr>
<tr>
<td>LTE1900 – B2</td>
<td>1850 ~ 1910</td>
<td>1930 ~ 1990</td>
<td></td>
<td>80MHz</td>
</tr>
<tr>
<td>LTE1800 – B3</td>
<td>1710 ~ 1785</td>
<td>1805 ~ 1880</td>
<td></td>
<td>95MHz</td>
</tr>
<tr>
<td>LTE1700 – B4</td>
<td>1710 ~ 1755</td>
<td>2110 ~ 2155</td>
<td></td>
<td>400MHz</td>
</tr>
<tr>
<td>LTE850 – B5</td>
<td>824 ~ 849</td>
<td>869 ~ 894</td>
<td></td>
<td>45MHz</td>
</tr>
<tr>
<td>LTE700 – B17</td>
<td>704 ~ 716</td>
<td>734 ~ 746</td>
<td></td>
<td>30MHz</td>
</tr>
</tbody>
</table>
3.5. **Antenna**

The antenna connection and board layout design are the most important parts in the full product design and they strongly reflect on the product’s overall performances. Read carefully and follow the requirements described in the Hardware User Guide.

3.6. **Supply voltage**

The external power supply must be connected to VBATT signal and must fulfill the following requirements:

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Supply Voltage</td>
<td>3.8V</td>
</tr>
<tr>
<td>Operating Voltage Range</td>
<td>3.4 ~ 4.2V</td>
</tr>
</tbody>
</table>

3.7. **The user interface**

The user interface is managed by AT commands according to ITU-T V.250, 3GPP 27.007 and 27.005 specifications. Moreover, custom AT commands are also available. Please refer to the AT Command User Guide for details.
3.8. **Input and Outputs**

3.8.1. **General Purpose I/Os**
10 pins of general purpose I/Os can be configured by AT command in three different ways as input, output and alternative function.

3.8.2. **Power on monitor (PWRMON)**
The PWRMON indicates the status of the module running properly.

3.8.3. **Power on/off control (ON_OFF)**
External power on/off control input. Refer to the LE910 family Hardware User Guide for more details of Power on timing.

3.8.4. **Auxiliary power output for accessory (VAUX)**
A regulated 1.8V power output is provided for an external device.

3.8.5. **SIM Reader**
The LE910 family supports 1 SIM/USIM at 1.8V ONLY with and external SIM connector. For 3V or 5V SIM, an external level translator can be added. Refer to the LE910 family Hardware User Guide.

3.8.6. **Serial ports**
Two serial ports are available.
- Full RS232-C
- Simplified serial port (RX/TX only) for debugging

3.8.7. **USB port**
The USB2.0 High Speed have a clock rate of 480MHz
3.9. **Converters**

3.9.1. **ADC Converter**

The LE910 has one on board ADC, which are 8-bit converters. It is able to read a voltage level in the range of 0÷2 volts applied on the ADC pin input, store and convert it into 8 bit word.

3.9.2. **DAC Converter**

The LE910 module provides a Digital to Analog Converter.

The on board DAC is in the range from 0 to 1023.

3.10. **Logic level specifications**

Where not specifically stated, all the interface circuits work at 1.8V CMOS logic levels. To get more detailed information about the logic level specifications used in the LE910, please check with the Hardware User Guide.

3.11. **Audio**

Future proof support to VoLTE (Voice over LTE). In addition the module automatically falls back to HSPA+ if it is unable to register onto an LTE network. The series supports CSFB (circuit switched fallback) allowing the modules to sustain voice services through automatic fallback to 3G or 2G when an LTE network is not present, when roaming, or if IMS (IP Multimedia Subsystem) is not supported by the network.

3.11.1. **Digital**

The LE910 offers the digital voice interface as well.

3.12. **Other features**

3.12.1. **Speech CODEC**

The LE910 supports the following voice codec:

- HR – Half Rate
- FR – Full Rate
- EFR – Enhanced Full Rate
- AMR-HR, AMR Half Rate
- AMR-FR, AMR Full Rate

3.12.2. **SMS**

The LE910 supports the following SMS types:

- Mobile Terminated (MT) class 0 – 3 with signalling of new incoming SMS, SIM full, SMS read.
- Mobile Originated class 0 – 3 with writing, saving in SIM and sending
- Cell broadcast compatible with CB DRX with signalling of new incoming SMS.
The LE910 also supports SMS over GPRS.

3.12.3. **Phonebook**
This function allows the storing of the telephone numbers in SIM memory. The capability depends on SIM version and its embedded memory.

3.12.4. **Call status indication**
The call status indication is supported.
3.13. Mounting the modules on your board

The modules have been designed in order to be compliant with a standard lead-free SMT process. For detailed information about PCB pad design and conditions to use in SMT process, please refer to the respective Hardware User Guide.

3.14. Packing system

According to SMT process, for picking & placing movement requirements, LE910 family is packaged on trays. Each tray contains 20 pieces in size of 176 x 329.

The level of moisture sensibility of LE910 family is “3”, according with standard IPC/JEDEC J-STD-020, take care of all the relative requirements for using this kind of components. Special care for handling is highly required.
4. Evaluation Kit

In order to assist the customer in the development of the application, Telit offers the EVK2 Evaluation Kit that can be ordered separately. The EVK2 has a SIM card holder, the RS 232 serial port level translator, a direct UART connection, audio and antenna connector.

The EVK2 provides a fully functional solution for a complete data or phone application. The standard serial RS232 9 pin connector placed on the Evaluation Kit allows the connection of the EVK2 system with a PC or other DTE.

The development of the applications utilizing the Telit LE910 family must present a proper design of all the interfaces towards and from the module (e.g. power supply, audio paths, level translators), otherwise a decrease in the performances will be introduced or, in the worst case, a wrong design can even lead to an operating failure of the module.

In order to assist the hardware designer in his project phase, the EVK2 board presents a family of different solutions, which will cover the most common design requirements on the market, and which can be easily integrated in the OEM design as building blocks or can be taken as starting points to develop a specific one.

For a detailed description of the Telit Evaluation Kit, please refer to the documentation provided with the respective Hardware User Guide and EVK2 User Manual.
5. **AT Commands**

The Telit LE910 module can be driven via the serial and USB interface using the standard AT commands. The module is compliant with:

1. Hayes standard AT command set, in order to maintain the compatibility with existing SW programs.
2. 3GPP 27.007 specific AT command and GPRS specific commands.
3. 3GPP 27.005 specific AT commands for SMS (Short Message Service) and CBS (Cell Broadcast Service)

Moreover the LE910 module supports also Telit proprietary AT commands for special purposes.

For a more information about AT commands supported by the LE910 module please refer to the document AT Commands Reference Guide.
6. Safety Recommendations

READ CAREFULLY

Be sure the use of this product is allowed in the country and in the environment required. The use of this product may be dangerous and has to be avoided in the following areas:

- Where it can interfere with other electronic devices in environments such as hospitals, airports, aircrafts, etc.
- Where there is risk of explosion such as gasoline stations, oil refineries, etc. It is responsibility of the user to enforce the country regulation and the specific environment regulation.

Do not disassemble the product; any mark of tampering will compromise the warranty validity. We recommend following the instructions of the hardware user guides for a correct wiring of the product. The product has to be supplied with a stabilized voltage source and the wiring has to be conforming to the security and fire prevention regulations. The product has to be handled with care, avoiding any contact with the pins because electrostatic discharges may damage the product itself. Same cautions have to be taken for the SIM, checking carefully the instruction for its use. Do not insert or remove the SIM when the product is in power saving mode.

The system integrator is responsible of the functioning of the final product; therefore, care has to be taken to the external components of the module, as well as of any project or installation issue, because the risk of disturbing the WCDMA/GSM network or external devices or having impact on the security. Should there be any doubt, please refer to the technical documentation and the regulations in force. Every module has to be equipped with a proper antenna with specific characteristics. The antenna has to be installed with care in order to avoid any interference with other electronic devices and has to guarantee a minimum distance from the body (20 cm). In case of this requirement cannot be satisfied, the system integrator has to assess the final product against the SAR regulation.

The European Community provides some Directives for the electronic equipments introduced on the market. All the relevant information’s are available on the European Community website:

http://ec.europa.eu/enterprise/sectors/rtte/documents/

The text of the Directive 99/05 regarding telecommunication equipments is available, while the applicable Directives (Low Voltage and EMC) are available at:

http://ec.europa.eu/enterprise/sectors/electrical/
7. List of acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3GPP</td>
<td>3rd Generation Partnership Project</td>
</tr>
<tr>
<td>ADC</td>
<td>Analog to Digital Converter</td>
</tr>
<tr>
<td>ADN</td>
<td>Abbreviated Dialing Number</td>
</tr>
<tr>
<td>A-GPS</td>
<td>Assisted GPS</td>
</tr>
<tr>
<td>AMR</td>
<td>Adaptive Multi Rate</td>
</tr>
<tr>
<td>AT</td>
<td>Attention Commands</td>
</tr>
<tr>
<td>AWS</td>
<td>Advanced Wireless Services</td>
</tr>
<tr>
<td>BER</td>
<td>Bit Error Rate</td>
</tr>
<tr>
<td>BGA</td>
<td>Ball Grid Array</td>
</tr>
<tr>
<td>CLIP</td>
<td>Calling Line Identification Presentation</td>
</tr>
<tr>
<td>CLIR</td>
<td>Calling Line Identification Restriction</td>
</tr>
<tr>
<td>CMOS</td>
<td>Complementary Metal-Oxide Semiconductor</td>
</tr>
<tr>
<td>CSD</td>
<td>Circuit Switched Data</td>
</tr>
<tr>
<td>DAC</td>
<td>Digital to Analog Converter</td>
</tr>
<tr>
<td>DARP</td>
<td>Downlink Advanced Receiver Performance</td>
</tr>
<tr>
<td>DTMF</td>
<td>Dual Tone Multi Frequency</td>
</tr>
<tr>
<td>FDN</td>
<td>Fixed Dialing Number</td>
</tr>
<tr>
<td>FTP</td>
<td>File Transfer Protocol</td>
</tr>
<tr>
<td>GSM</td>
<td>Global System for Mobile communication</td>
</tr>
<tr>
<td>GPRS</td>
<td>General Packet Radio Service</td>
</tr>
<tr>
<td>GPS</td>
<td>Global Positioning System</td>
</tr>
<tr>
<td>HSPA</td>
<td>High Speed Packet Access</td>
</tr>
<tr>
<td>HSUPA</td>
<td>High Speed Uplink Packet Access</td>
</tr>
<tr>
<td>H/W</td>
<td>Hardware</td>
</tr>
<tr>
<td>LED</td>
<td>Light Emitting Diode</td>
</tr>
<tr>
<td>MO</td>
<td>Mobile Originated</td>
</tr>
<tr>
<td>MT</td>
<td>Mobile Terminated</td>
</tr>
<tr>
<td>OEM</td>
<td>Other Equipment Manufacturer</td>
</tr>
<tr>
<td>PCB</td>
<td>Printed Circuit Board</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Description</td>
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<tr>
<td>--------------</td>
<td>------------------------------</td>
</tr>
<tr>
<td>PCM</td>
<td>Pulse Code Modulation</td>
</tr>
<tr>
<td>PDA</td>
<td>Personal Digital Assistant</td>
</tr>
<tr>
<td>PDU</td>
<td>Protocol Data Unit</td>
</tr>
<tr>
<td>PIN</td>
<td>Personal Identification Number</td>
</tr>
<tr>
<td>POS</td>
<td>Point Of Sales</td>
</tr>
<tr>
<td>PWM</td>
<td>Pulse Width Modulation</td>
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<tr>
<td>RF</td>
<td>Radio Frequency</td>
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<tr>
<td>RoHS</td>
<td>Restriction of Hazardous Substances</td>
</tr>
<tr>
<td>RTC</td>
<td>Real Time Clock</td>
</tr>
<tr>
<td>SAIC</td>
<td>Single Antenna Interface Cancellation</td>
</tr>
<tr>
<td>SIM</td>
<td>Subscriber Identity Module</td>
</tr>
<tr>
<td>SMD</td>
<td>Surface Mounted Device</td>
</tr>
<tr>
<td>SMS</td>
<td>Short Message Service</td>
</tr>
<tr>
<td>S/W</td>
<td>Software</td>
</tr>
<tr>
<td>TBD</td>
<td>To Be Determined</td>
</tr>
<tr>
<td>TCP/IP</td>
<td>Transmission Control Protocol/Internet Protocol</td>
</tr>
<tr>
<td>TTSC</td>
<td>Telit Technical Support Center</td>
</tr>
<tr>
<td>UART</td>
<td>Universal Asynchronous Receiver and Transmitter</td>
</tr>
<tr>
<td>USB</td>
<td>Universal Serial Bus</td>
</tr>
<tr>
<td>USIM</td>
<td>Universal Subscriber Identity Module</td>
</tr>
<tr>
<td>WCDMA</td>
<td>Wideband Code Division Multiple Access</td>
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</tbody>
</table>