

# UC864-E/G/WD/E-DUAL Product Description

UC864-E/G/WD/E-DUAL  
80281ST10034a Rev. 6 - 2010-05-27



## APPLICABLE PRODUCTS

| PRODUCT      |
|--------------|
| UC864-E      |
| UC864-G      |
| UC864-WD     |
| UC864-E-DUAL |







|   |           |
|---|-----------|
| <b>3.11 User Interface .....</b>                    | <b>26</b> |
| 3.11.1 Speech Coding.....                           | 26        |
| 3.11.2 SIM Reader.....                              | 27        |
| 3.11.3 SMS .....                                    | 27        |
| 3.11.4 Real Time Clock and Alarm.....               | 27        |
| 3.11.5 Data/fax Transmission .....                  | 27        |
| 3.11.6 Local security management.....               | 28        |
| 3.11.7 Call control.....                            | 28        |
| 3.11.8 Phonebook.....                               | 28        |
| 3.11.9 Characters management .....                  | 28        |
| 3.11.10 SIM related functions .....                 | 28        |
| 3.11.11 Call status indication.....                 | 28        |
| 3.11.12 Automatic answer (Voice, Data or FAX) ..... | 29        |
| 3.11.13 Supplementary services (SS).....            | 29        |
| 3.11.14 Acoustic signaling .....                    | 29        |
| 3.11.15 Buzzer output.....                          | 30        |
| 3.11.16 RF Transmission Monitor .....               | 30        |
| <b>3.12 Logic level specifications .....</b>        | <b>30</b> |
| 3.12.1 Reset signal.....                            | 30        |
| <b>3.13 Audio levels specifications.....</b>        | <b>32</b> |
| <b>3.14 Converters.....</b>                         | <b>33</b> |
| 3.14.1 ADC Converter.....                           | 33        |
| 3.14.2 DAC Converter.....                           | 33        |
| <b>3.15 Mounting UC864 on your board.....</b>       | <b>34</b> |
| UC864-G/WD/E-DUAL.....                              | 34        |
| UC864-E.....  | 35        |
| <b>3.16 Packing system .....</b>                    | <b>36</b> |
| <b>4 Evaluation Kit.....</b>                        | <b>37</b> |
| <b>5 Software Features .....</b>                    | <b>39</b> |
| <b>5.1 Enhanced Easy GPRS Extension .....</b>       | <b>39</b> |
| 5.1.1 Overview.....                                 | 39        |
| 5.1.2 Easy GPRS definition .....                    | 40        |
| <b>5.2 PFM (Premium FOTA Management) .....</b>      | <b>41</b> |
| 5.2.1 FOTA (Firmware Over-The-Air) .....            | 41        |
| <b>5.3 Drivers and Supported OS.....</b>            | <b>42</b> |
| <b>6 AT Commands.....</b>                           | <b>43</b> |
| <b>7 Conformity Assessment Issues .....</b>         | <b>44</b> |
| <b>7.1 UC864-E: RoHS Certificate.....</b>           | <b>46</b> |
| <b>7.2 UC864-G: RoHS Certificate .....</b>          | <b>47</b> |





# 1 Introduction

## 1.1 Scope

Scope of this document is to provide an overview of the technical aspects to consider while implementing audio functionalities onto applications integrating Telit modules specified in the aforementioned [Applicability Table](#).

## 1.2 Audience

This document is intended for customers who are evaluating the UC864 modules.

## 1.3 Contact Information, Support

For general contact, technical support, to report documentation errors and to order manuals, contact Telit's Technical Support Center (TTSC) at:

[TS-EMEA@telit.com](mailto:TS-EMEA@telit.com)  
[TS-NORTHAMERICA@telit.com](mailto:TS-NORTHAMERICA@telit.com)  
[TS-LATINAMERICA@telit.com](mailto:TS-LATINAMERICA@telit.com)  
[TS-APAC@telit.com](mailto:TS-APAC@telit.com)

Alternatively, use:

<http://www.telit.com/en/products/technical-support-center/contact.php>

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's 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:

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

Chapter 2: "Overview" gives an overview of the features of the product.

Chapter 3: "General product Description" describes in details the characteristics of the product, providing information such as operating frequencies, mechanical dimensions and interfaces specifics.

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" describes in details concepts involved in the software equipped on the modules.

Chapter 6: "AT Commands" provides specification of the AT commands supported by the modules.

Chapter 7: "Conformity Assessment Issues" 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 followed by the customer in the design of applications that makes use of the modules.

Chapter 9: "List of acronyms".

## 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.





## 1.7 Document History

| Revision | Date<br>[yyyy-mm-dd] | Changes  |
|----------|----------------------|--|
| 0 Draft  | 2007-11-07           | Initial issue  |
| 1        | 2008-08-08           | general revision of the document   |
| 2        | 2009-01-08           | <p>updated 2.1 Dimensions<br/>           updated 2.8 GPS features(only for UC864-G)<br/>           updated 2.8.2 GPS consumption<br/>           updated 2.9 Supply voltage<br/>           updated 2.10 WCDMA/GSM Power consumption<br/>           updated 2.13.1 Reset signal<br/>           updated 2.15.1 ADC Converter<br/>           updated 2.15.2 DAC Converter<br/>           updated 2.16 Mounting the UC864-E/G on your board<br/>           updated 2.17 Packing system<br/>           updated 13 Conformity Assessment Issues<br/>           Added §6 with:<br/>           UC864-E RoHS compliance,<br/>           UC864-G RoHS compliance,<br/>           UC864-E declaration of conformity<br/>           UC864-G declaration of conformity<br/>           UC864-E R&amp;TTE NBO opinion<br/>           UC864-G R&amp;TTE NBO opinion<br/>           UC864-G FCC Equipment Authorization<br/>           UC864-G IC Equipment Authorization<br/>           Updated UC864-G drawing<br/>           Updated 2.8 with GPS characteristics<br/>           Updated 2.7.3 for RF connectors identification</p> |
| 3        | 2009-01-29           | <p>Added 1.1 UC864-E/G/WD/WDU Product Specification table<br/>           Added UC864-WD/WDU characteristics</p>  |
| 4        | 2009-06-24           | <p>Added UC864-G GCF compliance declaration<br/>           Applied new layout, shifted chapter numbers accordingly<br/>           Added RoHS certificate for UC864-WD and UC864-WDU<br/>           Added Premium FOTA Management (PFM), Telit Over-The-Air firmware updating service description</p>   |
| 5        | 2009-11-25           | <p>updated UC864-E's P/N in Applicability Table<br/>           §3.4 updated Operation frequency<br/>           §5.2.1 FOTA service availability firmware release updated<br/>           §7.1 updated new UC864-E RoHS declaration<br/>           Added §5.3 containing driver's availability table<br/>           Applied new layout</p>   |
| 6        | 2010-04-16           | <p>§5.3 Added CMUX for WinCE6.0 to Driver drivers' availability table<br/>           Updated §1.6 "Related Documents"<br/>           Added UC864-E-DUAL features<br/>           Added Global Form Factor portfolio table<br/>           Removed §3.11 Embodied Battery charger<br/>           Removed UC864-WDU (EOL)</p>  |





## 2 Overview

The Telit UC864-E/G/WD/E-DUAL modules are small, lightweight, low power consumption and RoHS compliant devices that allow digital communication services wherever a WCDMA, HSDPA (HSDPA for UC864-E/G/E-DUAL only), GSM, GPRS and EGPRS network is present.

Telit UC864-E/G/E-DUAL support HSDPA7.2 and voice.

UC864-G is three band HSDPA7.2 (850/1900/2100 MHz) and quad band GSM (GSM 850/900, DCS 1800 and PCS 1900) with the addition of a full integrated 12-channel high sensitivity GPS for indoor fixes and simultaneous GPS with voice & data.

UC864-E is single band HSDPA7.2 (2100 MHz) and quad band GSM (GSM 850/900, DCS 1800 and PCS 1900).

UC864-E-DUAL is a dual-band UMTS/HSDPA7.2 (900/2100) MHz and dual-band GSM (900/DCS1800).

UC864-WD is a UMTS data only solution for medium to high quantity projects, where high data rate capability of the HSDPA is not required. The maximum throughput is therefore 384kb in both downlink and uplink directions. Voice capability on the UC864-WD is not supported. UC864-WD is dual band UMTS in 900/2100 MHz and dual band GSM/GPRS/EDGE in 900 and 1800 bands.

The UC864-E/G/WD/E-DUAL is provided with an 80-pin Molex board-to-board connector and a 50 Ohm Murata RF connector for GSM/WCDMA antenna on front side. The UC864-G is also provided with an additional 50 Ohm Murata RF connector for GPS antenna on the rear side.

The UC864-E/G/WD/E-DUAL module includes features like GPRS/EDGE CLASS 12, Voice, Circuit Switched Data transfer, Fax, Phonebook and SMS support, embedded TCP/IP stack and battery charging capabilities.

UC864-E/G/WD/E-DUAL benefits of Telit Unified Form Factor concept, a product family pin-to-pin compatible, sharing the same SW interface. Telit Global Form Factor product's portfolio covers a wide wireless technology spectrum, allowing customers to develop a unique application covering the most used wireless technologies. Global Form Factor Portfolio is detailed below:







**UC864-E/G/WD/E-DUAL Product Description**  
80281ST10034a Rev. 6 – 2010-05-27

## 2.1 UC864 Product Specification

| ITEM               | FEATURES  |  |  |   |
|--------------------|---|--|--|---|
|                    | UC864-E   | UC864-G  | UC864-E-DUAL   | UC864-WD  |
| Air interface      | <ul style="list-style-type: none"> <li>▪ Single-Band UMTS/HSDPA 7.2 2100MHz</li> <li>▪ Quad-Band GSM 850/900/1800/1900</li> </ul>   | <ul style="list-style-type: none"> <li>▪ Tri-band UMTS/HSDPA 7.2 2100/1900/850</li> <li>▪ Quad-Band GSM 850/900/1800/1900</li> <li>▪ Standalone GPS</li> </ul> | <ul style="list-style-type: none"> <li>▪ Dual-band UMTS/HSDPA 7.2 2100 /900</li> <li>▪ Dual-Band GSM 900/1800</li> </ul> | <ul style="list-style-type: none"> <li>▪ Dual-band UMTS/WEDGE 384k 2100 /900</li> <li>▪ Dual-Band GSM 900/1800</li> </ul> |
| Data Service       | HSDPA UL 384kbps, DL 7.2Mbps<br>WCDMA UL/DL 384kbps,<br>EDGE UL/DL 236.8Kbps,<br>GPRS UL/DL 85.6 Kbps, CSD 9.6Kbps  |  |  | WCDMA UL/DL 384kbps,<br>EDGE UL/DL 236.8Kbps, GPRS<br>UL/DL 85.6 Kbps, CSD 9.6Kbps  |
| Size               | 36.2(L)X30(W)X4.8(T)  | 45(L)X30(W)X4.8(T)   |  |   |
| Interface          | USB 2.0(AT command etc), 80 Pin Board to Board connector, SIM/RF connector  |  |  |   |
| Antenna            | External Antenna  |  |  |   |
| Memory             | 64MB SDRAM and 64MB Flash memory  |  |  |   |
| Voice              | <ul style="list-style-type: none"> <li>• Vocoder</li> <li>• GSM(FR/EFR/AMR) and UMTS(Static/Dynamic AMR)</li> <li>• Supplementary Service</li> </ul>  |  |  | NA  |
| Message            | SMS (MO/MT)   |  |  |   |
| SIM Card           | Support 1.8 and 3V UICC   |  |  |   |
| Security           | <ul style="list-style-type: none"> <li>▪ GPRS</li> <li>- Ciphering(GEA1/GEA2), Encryption(A5/1, A5/2), Authentication(PAP/CHAP)</li> <li>▪ UMTS</li> <li>- Encryption(UEA1), integrity UIA</li> <li>▪ IMEI Security, SIM lock</li> </ul>  |  |  |   |
| Internet Protocols | <ul style="list-style-type: none"> <li>▪ TCP/IP, UDP/IP, PPP protocol, V42Bis data compression</li> </ul>   |  |  |   |
| Applications       | <ul style="list-style-type: none"> <li>▪ SVD(Simultaneous Voice and Data)</li> <li>▪ SIM PBM(Phone Book Management)</li> <li>▪ FOTA (firmware Over The Air)</li> <li>▪ FDN dialing number</li> <li>▪ Service dialing number</li> <li>▪ Enhanced operator name string</li> </ul> |  |  |   |



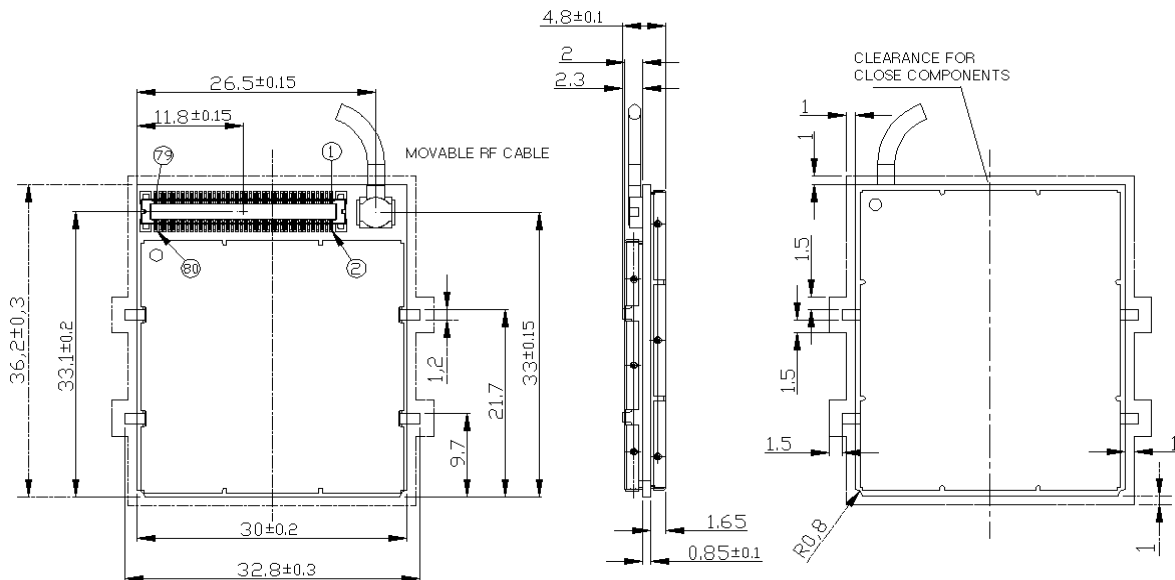


# 3 General Product Description

## 3.1 Dimensions

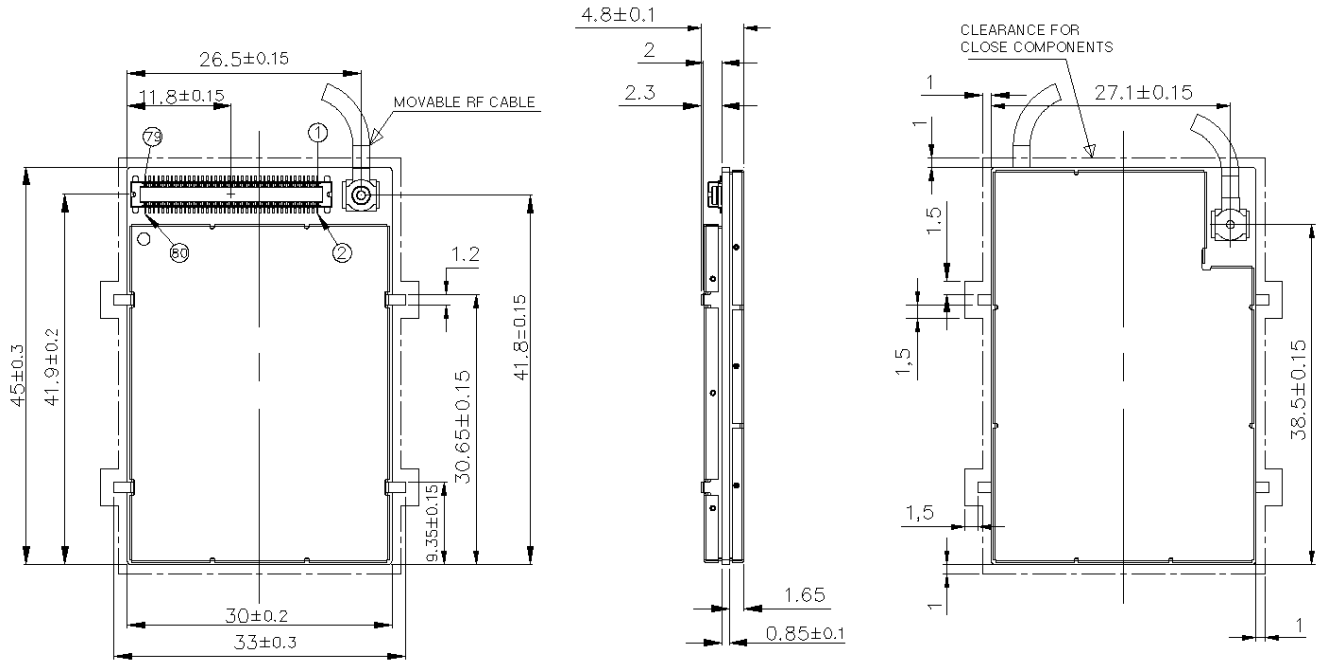
| Dimensions    | UC864-E | UC864-G/WD/E-DUAL |
|---------------|---------|-------------------|
| Length(mm)    | 36.2    | 45                |
| Width(mm)     | 30      | 30                |
| Thickness(mm) | 4.8     | 4.8               |

UC864-E drawing

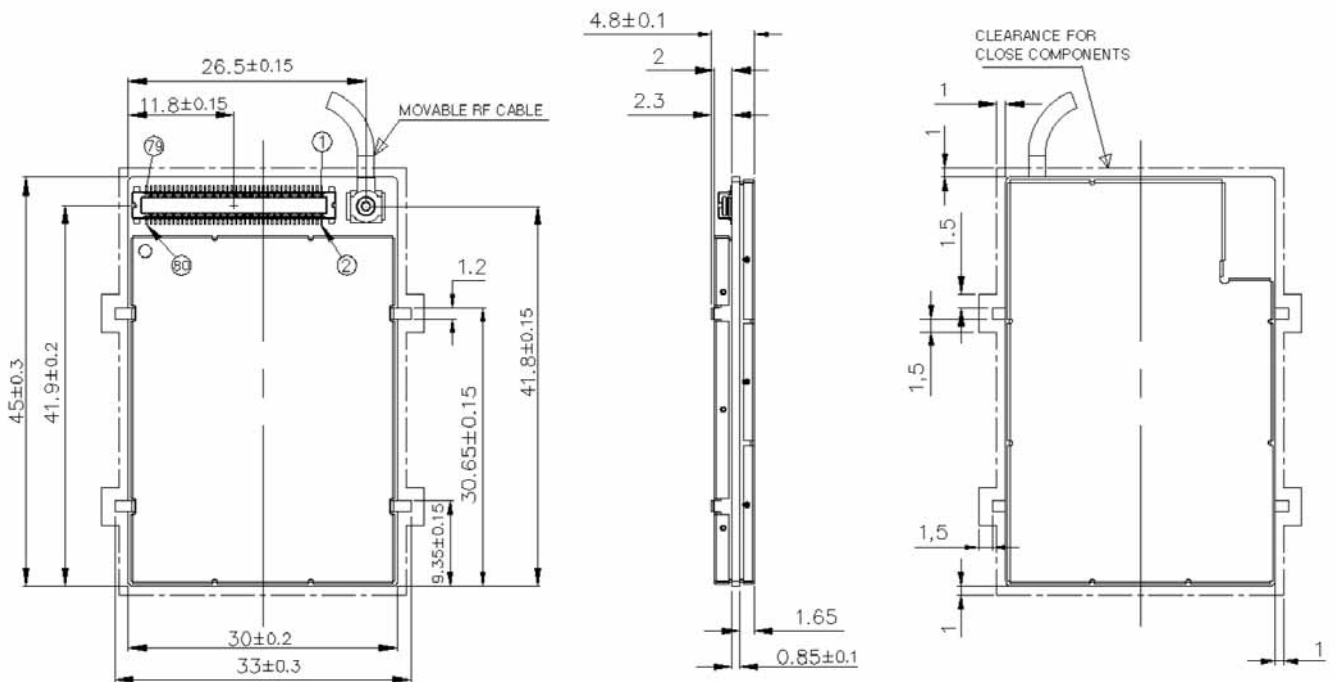


UC864-E/G/WD/E-DUAL Product Description  
80281ST10034a Rev. 6 – 2010-05-27

UC864-G drawing



UC864-WD/E-DUAL drawing



## 3.2 Weight

| Weight            |          |
|-------------------|----------|
| UC684-E           | 10 gr.   |
| UC864-G/WD/E-DUAL | 12.8 gr. |

## 3.3 Environmental requirements

The Telit UC864 family module is compliant with the applicable 3gpp reference documentation TS 25.101 Release 2004-03.

### 3.3.1 Temperature range

|   | UC864 family | Note  |
|---|--------------|---|
| Operating temperature                                 | -20 ~ +55°C  | The module is functional in all the temperature range, and it fully meets the ETSI specifications.  |
|   | -30 ~ +80°C  | The module is functional in all the temperature range. Temperatures outside the range -20°C ÷ +55°C, might slightly deviate from ETSI specifications. |
| Temperature in not functional conditions <sup>1</sup> | -40 ~ +85°C  |   |

#### Vibration Test (non functional)

- 10 ~12Hz ASD = 1.92m 2 /s 3
- 12 ~ 150Hz -3dB/oct

<sup>1</sup> Functional: the module is able to make and receive voice calls, data calls, SMS and make data traffic.



### 3.3.2 RoHS compliance

As a part of Telit corporate policy regarding environmental protection, the UC864 family complies with the RoHS (Restriction of Hazardous Substances) directive of the European Union (EU Directive 2002/95/EG).

## 3.4 Operating Frequency

The operating frequencies in WCDMA/HSDPA (HSDPA not available in UC864-WD), GSM850, EGSM900, DCS, PCS modes are conform to the WCDMA and 3gpp specifications.

| Mode       | Freq. TX (MHz)  | Freq. RX (MHz)  | Channels (ARFC)                    | TX – RX offset | Note                    |
|------------|-----------------|-----------------|------------------------------------|----------------|-------------------------|
| WCDMA-850  | 826.4-846.6     | 871.4-891.6     | Tx : 4132-4233<br>Rx : 4357-4458   | 45MHz          | For UC864-G             |
| WCDMA-900  | 882.4-912.6     | 927.4.-957.6    | Tx : 2712-2863<br>Rx : 2937-3088   | 45MHz          | For UC864-WD/E-DUAL     |
| WCDMA-1900 | 1852.4-1907.6   | 1932.4-1987.6   | Tx : 9262-9538<br>Rx : 9662-9938   | 80MHz          | For UC864-G             |
| WCDMA-2100 | 1922.4-1977.6   | 2112.4-2167.6   | Tx : 9612-9888<br>Rx : 10562-10838 | 190MHz         | For UC864-E/G/WD/E-DUAL |
| GSM-850    | 824.2-848.8     | 869.2-893.8     | 128-251                            | 45 MHz         | For UC864-E/G           |
| E-GSM-900  | 890.0 - 914.8   | 935.0 - 959.8   | 0 - 124                            | 45 MHz         | For UC864-E/G/WD/E-DUAL |
|            | 880.2 - 889.8   | 925.2 - 934.8   | 975 - 1023                         | 45 MHz         |                         |
| DCS-1800   | 1710.2 - 1784.8 | 1805.2 - 1879.8 | 512 - 885                          | 95 MHz         | For UC864-E/G/WD/E-DUAL |
| PCS-1900   | 1850.2 - 1909.8 | 1930.2 - 1989.8 | 512 - 810                          | 80 MHz         | For UC864-E/G           |

## 3.5 Transmitter output power

### WCDMA850/900/1900/2100

The Telit UC864 family transceiver modules in WCDMA-850/900/1900/2100 (2100 MHz for UC864-E/G/WD/E-DUAL, 850 and 1900 MHz for UC864-G and 900 MHz only for



## UC864-E/G/WD/E-DUAL Product Description

80281ST10034a Rev. 6 – 2010-05-27

UC864-WD/E-DUAL) operating mode are **class 3** in accordance with the specifications which determine the nominal 0.25W peak RF power (+24dBm) on 50 Ohm.

### **GSM850/900(GSM/GPRS mode)**

The Telit UC864 family transceiver modules in GSM850/900 (850, 900 MHz for UC864-E/G and 900 MHz only for UC864-WD/E-DUAL) operating mode are **class 4** in accordance with the specifications which determine the nominal 2W peak RF power (+33dBm) on 50 Ohm.

### **GSM850/900(EGPRS mode)**

The Telit UC864 family transceiver modules in GSM850/900(850 ,900 MHz for UC864-E/G, 900 MHz only for UC864-WD/E-DUAL) operating mode are **class E2** in accordance with the specifications which determine the nominal 0.5W peak RF power (+27dBm) on 50 Ohm.

### **DCS1800/PCS1900(GSM/GPRS mode)**

The Telit UC864 family transceiver modules in DCS1800/PCS1900 (1800 ,1900 MHz for UC864-E/G, 1800 MHz only for UC864-WD/E-DUAL) operating mode are **class 1** in accordance with the specifications which determine the nominal 1W peak RF power (+30dBm) on 50 Ohm.

### **DCS1800/PCS1900(EGPRS mode)**

The Telit UC864 family transceiver modules in DCS1800/PCS1900(1800 ,1900 MHz for UC864-E/G, 1800 MHz only for UC864-WD/E-DUAL) operating mode are **class E2** in accordance with the specifications which determine the nominal 0.4W peak RF power (+26dBm) on 50 Ohm.

## 3.6 Reference sensitivity

### **WCDMA850/900/1900/2100**

The sensitivity of the Telit UC864 family modules according to the specifications for the class 3 portable terminals WCDMA850/900/1900/2100 (2100 MHz for UC864-E/G/WD/E-DUAL, 850 and 1900 MHz for UC864-G and 900 MHz only for UC864-WD/E-DUAL) is **-108.2 dBm** typical in normal operating conditions.

### **GSM850/900**

The sensitivity of the Telit UC864 family modules according to the specifications for the class 4 GSM850/900 (850, 900 MHz for UC864-E/G, 900 MHz only for UC864-WD/E-DUAL) portable terminals is **-107 dBm** typical in normal operating conditions.





### 3.7.3 UC864 Antenna connectors

#### 3.7.3.1 GSM/WCDMA Applications

The UC864 family module is equipped with a 50 Ohm RF connector from Murata, GSC type P/N **MM9329-2700B**, located on the front side next to the 80-pin Molex. The suitable counterpart is Murata **MXTK92** Type or **MXTK88** Type.

#### 3.7.3.2 GPS Applications (only for UC864-G)

The UC864-G module is equipped with an additional 50 Ohm RF connector from Murata, GSC type P/N **MM9329-2700B**, located on the rear side. The suitable counterpart is Murata **MXTK92** Type or **MXTK88** Type.

## 3.8 GPS Features (only for UC864-G)

The UC864-G has an integrated 12 channels, low consumption & high sensitive, GPS receiver.

GPS receiver works in standalone mode, but the handset is ready to implement, if requested, also the Qualcomm gpsOne functionality (A-GPS: Assisted-GPS) that supports standalone GPS in real-time location in urban area and wherever a high sensitivity acquisition is needed.

This enables a wide variety of location-based services and applications, including points of interest, personal navigation, and friend finder.

In standalone mode, the handset demodulates the data directly from the GPS satellites and it requires no server interaction and works out of network coverage.

As main features of such GPS receiver, we can mention:

- Simultaneous GPS and Voice/Data
- High sensitivity for indoor reception, up to -157dBm (with active antenna)
- Extremely fast TTFF's at low signal levels
- Supports 12-Channel GPS L1 1575.42 MHz
- Accuracy: 3m (CEP68: 68% Circular Error Probable)
- GPS NMEA 0183 output format
- Date WGS-84



- Dedicated GPS AT commands
- Low power consumption

### 3.8.1 GPS Sensitivity\*

| Time to first fix |                  |
|-------------------|------------------|
| Hot start         | Autonomous < 1s  |
| Warm start        | Autonomous < 32s |
| Cold start        | Autonomous < 40s |
| Sensitivity       |                  |
| Tracking          | Up to -157 dBm   |



**\* NOTE:**

Performance will vary depending on environment, antenna type, signal conditions, satellite geometry, and handset implementation.

### 3.8.2 GPS Consumption\*

The typical current consumption of the GPS part of the **UC864-G** module is:

| UC864-G                               |             |                  |
|---------------------------------------|-------------|------------------|
| Mode                                  | Average(mA) | Mode description |
| IDLE mode with GPS ON full power mode |             |                  |
| AT+CFUN=1                             | WCDMA       | 117              |
|                                       | GSM         | 113              |
| AT+CFUN=4                             | WCDMA       | 109              |
|                                       | GSM         | 109              |



**\*NOTE:**

Except external active GPS antenna.



### 3.8.3 GPS Driving

The GPS functions are driven from the Base Band processor through a dedicated AT command set available in a separate specification.

### 3.8.4 GPS NMEA

The GPS data stream (NMEA 0183 format) is also available on the pin-out in USB data format.

### 3.8.5 NMEA sentences

The following GPS sentences are available:

**GGA** - Global positioning system fix data (provides 3D location and accuracy data)

**VTG** - Course over ground and ground speed

**GSA** - GPS DOP and active satellites

**RMC** - Recommended Minimum Specific GPS Data

**GLL** - Geographic Latitude and Longitude

## 3.9 Supply voltage

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

|                           |               |
|---------------------------|---------------|
| Nominal operating voltage | 3.8 V         |
| Operating voltage range   | 3.4 V – 4.2 V |



#### WARNING:

Operating voltage range must never be exceeded; care must be taken in order to fulfill min/max voltage requirements.





### 3.11.2 SIM Reader

The UC864 family supports R5 and R99 3gpp TS 31.114 - USIM 1.8V and 3V ONLY with an external SIM connector. For 5V SIM operation an external level translator can be added.

### 3.11.3 SMS

The UC864 family supports the following SMS types:

- Mobile Terminated (MT) class 0 – 3 with signaling of new incoming SMS, SIM full, SMS read
- Mobile Originated class 0 – 3 with writing, memorize in SIM and sending
- Cell Broadcast compatible with CB DRX with signaling of new incoming SMS.

### 3.11.4 Real Time Clock and Alarm

The UC864 family supports the Real Time Clock and Alarm functions through AT commands, furthermore an alarm output pin (GPIO6) can be configured to indicate the alarm with a hardware line output.

Furthermore the Voltage Output of the RTC power supply is provided so that a backup capacitor can be added to increase the RTC autonomy.

### 3.11.5 Data/fax Transmission

The UC864 family supports:

- WCDMA/HSDPA category 8, MS Class A Simultaneous Voice and Data for UC864-E/G/E-DUAL
- Basic UMTS (WEDGE) 384K for UC864-WD (data only)
- EGPRS/GPRS CLASS 12, MS Class B
- CSD up to 14.4 Kbps
- Fax service, Class 1 Group 3.





### 3.11.12 Automatic answer (Voice, Data or FAX)

After a specified number of rings, the module will automatically answer with a beep. The user can set the number of rings by means of the command `ATS0=<n>`.

### 3.11.13 Supplementary services (SS)

The following supplementary services are supported:

- Call Barring,
- Call Forwarding,
- Calling Line Identification Presentation (CLIP),
- Calling Line Identification Restriction (CLIR),
- Call Waiting, other party call Waiting Indication,
- Call Hold, other party Hold / Retrieved Indication,
- Closed User Group supplementary service (CUG),
- Advice of Charge,
- Unstructured SS Mobile Originated (MO)

### 3.11.14 Acoustic signaling

The acoustic signaling of the UC864 family on the selected acoustic device are the following:

- Call waiting;
- Ringing tone;
- SMS received tone;
- Busy tone;
- Power on/off tone;
- Off Hook dial tone;
- Congestion tone;
- Connected tone;
- Call dropped;
- No service tone;
- Alarm tone.







## 3.13 Audio levels specifications

The audio of the UC864 family is organized into two main paths:

- internal path (called also MT)
- external path (called also HF)

These two paths are meant respectively for handset and headset/hands-free use. The UC864 family has a built in echo canceller and a noise suppressor, tuned separately for the two audio paths; for the internal path the echo canceller parameters are suited to cancel the echo generated by a handset, while for the external audio path they are suited for a hands-free use.

For more information on the audio, refer to the **UC864-E/G/WD/E-DUAL** Hardware User Guide.

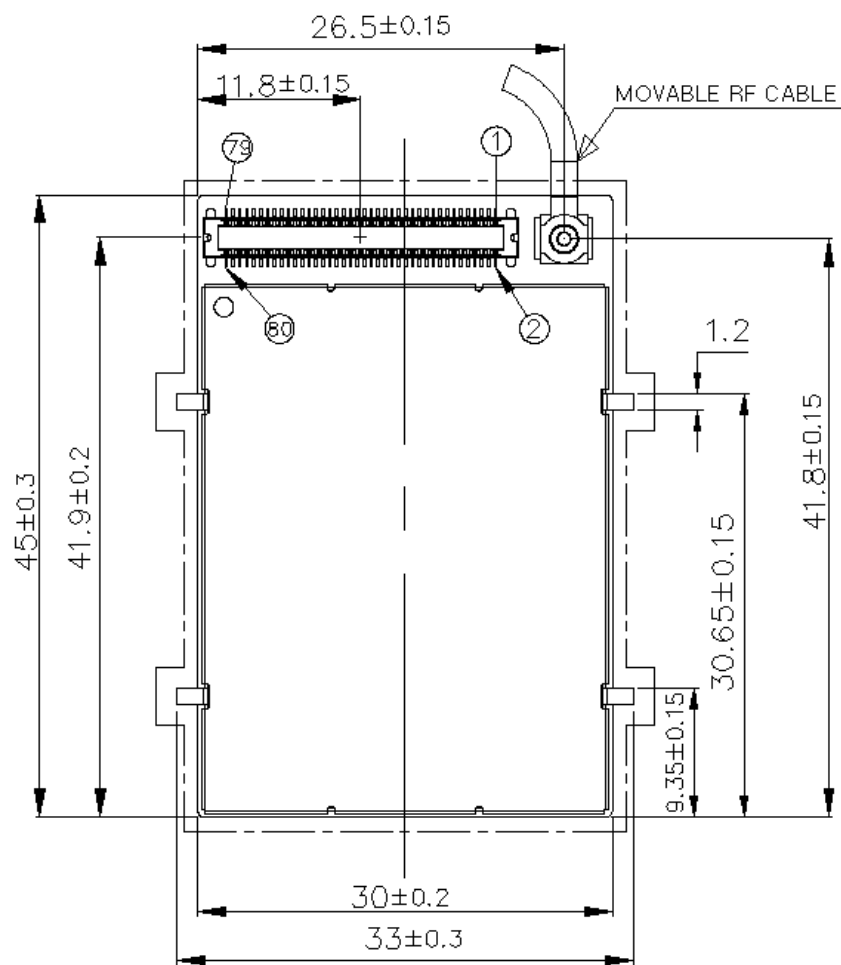




### 3.15 Mounting UC864 on your board

#### UC864-G/WD/E-DUAL

The position of the Molex board to board connector and the pin 1 are shown in the following picture.

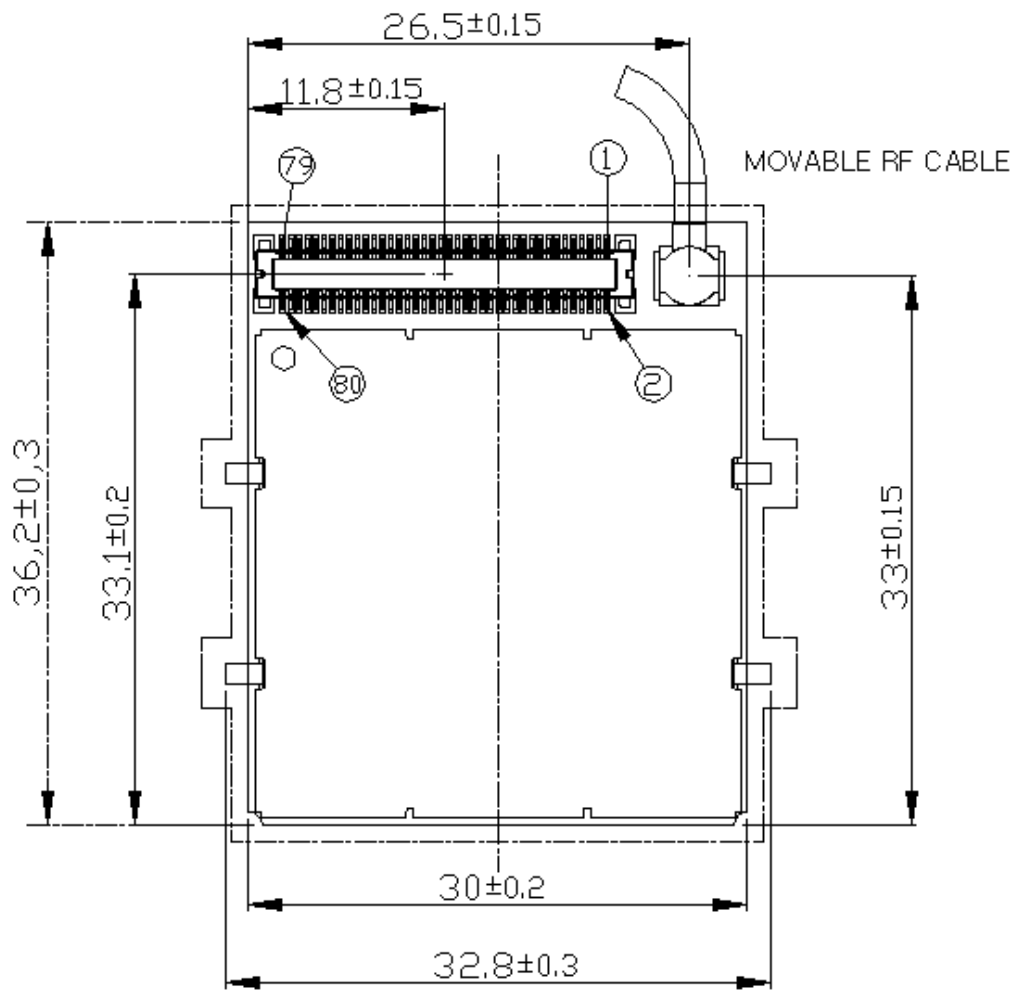


**NOTE:**

Metal tabs present on UC864-G/WD/E-DUAL should be connected to GND



UC864-E



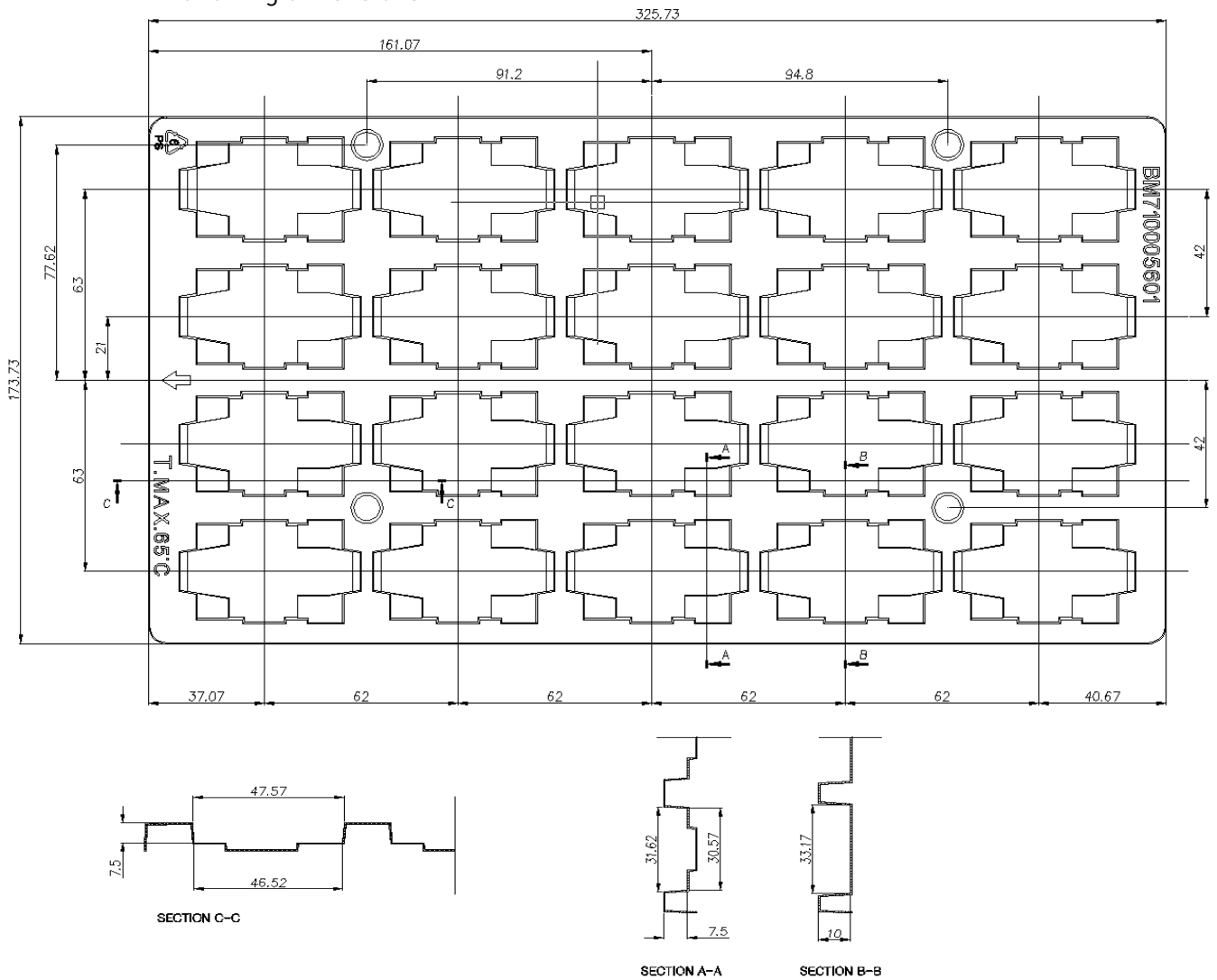
**NOTE:**

Metal tabs present on UC864-E should be connected to GND



### 3.16 Packing system

The Telit UC864 family is packaged on trays. Each tray contains 20 pieces with the following dimensions:



Size of the tray is 325.73 x 173.73mm



**WARNING:**

Trays can withstand the maximum temperature of 65° C.



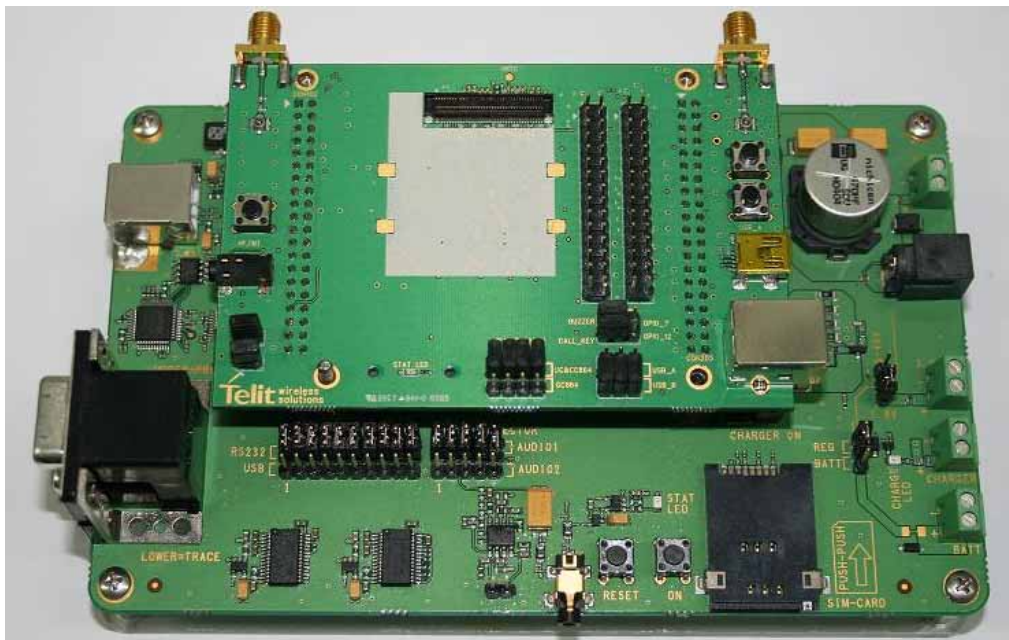
## 4 Evaluation Kit

In order to assist you in the development of your UC864 family module based application, Telit can supply the EVK2 Evaluation Kit with appropriate power supply, SIM card housing, RS 232 serial port level translator, direct UART connection, Handset, Headset and Hands-free (car kit) audio, antenna.

The **EVK2** provides a fully functional solution for a complete data/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 UC864 family module** 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 series 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.



Evaluation Kit



**UC864-E/G/WD/E-DUAL Product Description**  
80281ST10034a Rev. 6 – 2010-05-27

For a detailed description of the Telit Evaluation Kit refer to the documentation provided with the Telit UC864-E/G/WD/E-DUAL Hardware User Guide and EVK2 User Manual.



# 5 Software Features

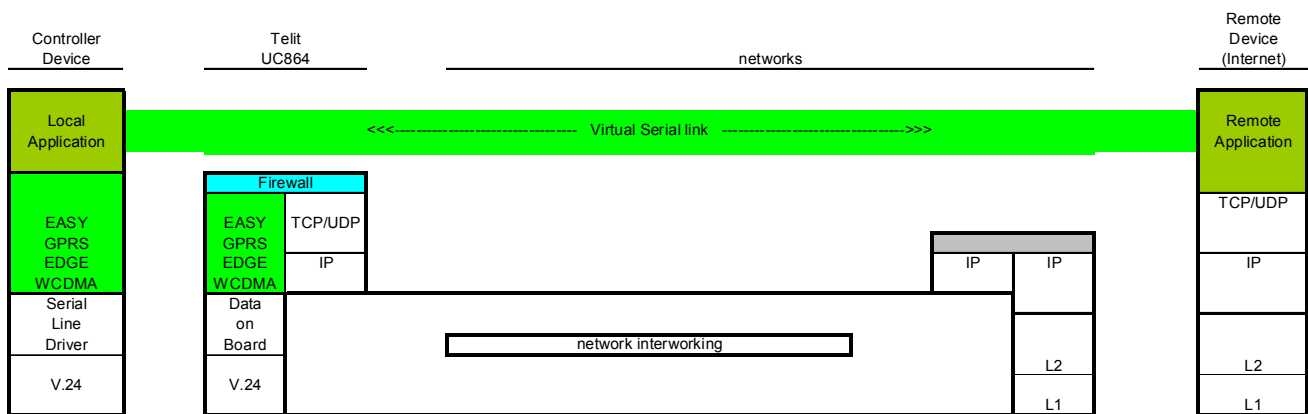
## 5.1 Enhanced Easy GPRS Extension

### 5.1.1 Overview

The Easy GPRS feature allows the **UC864 family module** user to contact a device in internet and establish with it a raw data flow over the WCDMA/EDGE/GPRS and Internet networks.

This feature can be seen as a way to obtain a "virtual" serial connection between the Application Software on the Internet machine involved and the controller of the **Telit UC864 family module**, regardless of all the software stacks underlying.

An example of the protocol stack involved in the devices is reported:



This particular implementation allows to the devices interfacing to the **Telit UC864 family module** the use of the WCDMA/EDGE/GPRS and Internet packet service without the need to have an internal TCP/IP stack since this function is embedded inside the module.



## UC864-E/G/WD/E-DUAL Product Description

80281ST10034a Rev. 6 – 2010-05-27

Easy GPRS overcomes some of the known limitations of the previous implementation and implements some new features such as:

- Keep the WCDMA/EDGE/GPRS context active even after the closing of a socket, allowing the application to keep the same IP address;
- Also Mobile terminated (incoming) connections can be made, now it is possible to receive incoming TCP connection requests;
- A new internal firewall has been implemented in order to guarantee a certain level of security on internet applications.

### 5.1.2 Easy GPRS definition

The Easy GPRS feature provides a way to replace the need of an Internet TCP/IP stack at the terminal equipment side. The steps that will be required to obtain a virtual serial connection (that is actually a socket) to the Internet peer are:

- configuring the WCDMA/EDGE/GPRS Access
- configuring the embedded TCP/IP stack behavior
- defining the Internet Peer to be contacted
- request the WCDMA/EDGE/GPRS and socket connections to be opened (host is connected)
- exchange raw data
- close the socket and WCDMA/EDGE/GPRS context

All these steps are achieved through AT commands.

As for common modem interface, two logical statuses are involved: command mode and data traffic mode.

- In Command Mode (CM), some AT commands are provided to configure the Data Module Internet stack and to start up the data traffic.
- In data traffic mode (Socket Mode, SKTM), the client can send/receive a raw data stream which will be encapsulated in the previously configured TCP / IP packets which will be sent to the other side of the network and vice versa. Control plane of ongoing socket connection is deployed internally to the module.

For more detailed information regarding WCDMA/EDGE/GPRS please consult Easy GPRS User Guide and AT Commands Reference Guide.



## 5.2 PFM (Premium FOTA Management)

Premium FOTA Management (PFM) provides a cost-effective, fast, secure and reliable way for wirelessly update the firmware on mobile devices, ensuring that embedded software is up-to-date with the latest enhancements and features.

Customers, who want to benefit from this service, must pass through the Telit certification program, where Telit will assist the customer in validating the correct implementation of FOTA.

### 5.2.1 FOTA (Firmware Over-The-Air)

Telit, which has signed a partnership agreement with the worldwide leader of Firmware OTA technology Red Bend, has integrated its unique vCurrent® Mobile client software for use in its m2m product portfolio. Telit is therefore able to upgrade its products by transmitting only a delta file, which represents the difference between one firmware version and another.

All Telit modules, support Over-the-Air firmware update. Note that this service will be enabled only after signing specific agreement with Telit.

See <http://www.telit.com/en/infinita-services.php> for details.







## 7 Conformity Assessment Issues

The **UC864-E/G** module is assessed to the R&TTE Directive as stand-alone products, so if in the WCDMA2100/GSM900/GSM1800. If the antenna connected to the module is installed in conformance with TELIT Installation instructions require no further evaluation under Article 3.2 of the R&TTE Directive and do not require further involvement of a R&TTE Directive Notified Body for the final product.

C € 0682

C € 0984

C € 0051

In all other cases, or if the manufacturer of the final product is in doubt then the equipment integrating the radio module must be assessed against Article 3.2 of the R&TTE Directive.

In all cases assessment of the final product must be made against the Essential requirements of the R&TTE Directive Articles 3.1(a) and (b), safety and EMC respectively, and any relevant Article 3.3 requirements.

The **UC864-E/G** module is conforming to the following European Union Directives:

- R&TTE Directive 99/05/EC (Radio Equipment & Telecommunications Terminal Equipments);
- Low Voltage Directive 73/23/EEC and product safety;
- Directive 89/336/EEC for conformity for EMC.

In order to satisfy the essential requisite of the R&TTE 99/05/EC directive, the UC864-E/G module is compliant with the following standards:

- Radio Spectrum, Standard: EN 301 511, EN 301 908-1, EN 301 908-2; 3GPP 51.010-1;
- EMC (Electromagnetic Compatibility). Standards: EN 301 489-1, EN 301 489-7 and EN 301 489-24;
- LVD (Low Voltage Directive) Standards: EN 60950-1:2001+A11:2004.



## UC864-E/G/WD/E-DUAL Product Description

80281ST10034a Rev. 6 – 2010-05-27

In this document and the Hardware User Guide, Software User Guide all the information you may need for developing a product meeting the R&TTE Directive is included.

The Telit UC864-G modules are FCC Approved as module to be installed in other devices.

These devices have to be used only for fixed and mobile applications. If the final product after integration is intended for portable use, a new application and FCC ID is required.

The Telit UC864-G modules are also conforming to the following US Directives:

- Use of RF Spectrum. Standards: FCC 47 Part 22;
- Use of RF Spectrum. Standards: FCC 47 Part 24;
- EMC (Electromagnetic Compatibility). Standards: FCC47 Part 15.

To meet the FCC's RF exposure rules and regulations:

- The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter;
- The antenna(s) used for this module must not exceed 3 dBi for mobile and fixed or mobile operating configurations.

Users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

Manufacturers of mobile, fixed or portable devices incorporating this module are advised to clarify any regulatory questions and to have their complete product tested and approved for FCC compliance.

Interference statement:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. this device may not cause harmful interference, and
2. this device must accept any interference received, including interference that may cause undesired operation.









## 7.4 UC864-E-DUAL: Rohs Certificate



**DECLARATION OF EU RoHS Compliance**

We,  
**TELIT WIRELESS Solutions Co., Ltd**

Of:  
**12<sup>th</sup>, 13<sup>th</sup> Fl., ShinYoung Security Annex Bld.,  
34-12, Yeouido-dong, Yeongdeungpo-Ku,  
Seoul, 150-716, KOREA**

Declare under our sole responsibility that the product

**UC864-E-DUAL (Commercial name)**

To which this declarations relates, is in full compliance with EU Directive 2002/95/EC and subsequent amendments, on restriction of the use of certain Hazardous Substances (including Deca-BDE) in electrical and electronic equipment (ROHS).

The technical documentation or information showing that electrical equipment which has put on the market, complies the requirements of regulation, will be held at :

**TELIT WIRELESS Solutions Co., Ltd**  
**12<sup>th</sup>, 13<sup>th</sup> Fl., ShinYoung Security Annex Bld.,  
34-12, Yeouido-dong, Yeongdeungpo-Ku,  
Seoul, 150-716, KOREA**  
**21<sup>st</sup> June 2010**

|  |   |
|--|---|
| <p><b>SWKim</b><br/>R&amp;D Director</p>  | <p><b>SWLee</b><br/>Quality manager</p>  |
|--|---|

Telit Wireless Solutions Co., Ltd  
12<sup>th</sup>, 13<sup>th</sup> Fl. ShinYoung Security Annex Bld., 34-12, Yeouido-dong, Yeongdeungpo-Ku, Seoul, 150-716, Korea

**Making machines talk.**





## 7.6 UC864-G: Declaration of Conformity



### DECLARATION OF CONFORMITY

We, **Telit Communications S.p.A**

Of: **Via Stazione di Prosecco, 5/b  
34010 Sgonico (TRIESTE)  
ITALY**

declare under our sole responsibility that the product:

**UC864-G**

**GSM900/1800(GPRS/EGPRS) / WCDMA2100 (HSDPA) Module**

to which this declaration relates is in conformity with all the essential requirements of the European Directive 1999/05/EC (R&TTE).

The conformity with the essential requirements of the European Directive 1999/05/EC has been verified against the following harmonized standards:

|   |  |
|---|--|
| RF spectrum efficiency (R&TTE art. 3.2) | EN 301 511 v9.0.2<br>EN 301 908-2 v.3.2.1    |
| EMC (R&TTE art. 3.1b)                   | EN 301 489-7 v1.3.1<br>EN 301 489-24 v.1.4.1 |
| Safety (R&TTE art. 3.1a)                | EN 60950-1:2001 + A11:2004<br>EN50385:2002   |

The conformity assessment procedure referred to in Article 10 and detailed in Annex IV of Directive 1999/5/EC has been followed with the involvement of the following Notified Body:

**CCS – Compliance Certification Inc. Taiwan-Head Office No.11, Wugong 6th Rd., Wugu Township, Taipei County 24891, Taiwan**

Identification mark: **0984**

The technical documentation relevant to the above equipment will be held at:

**Telit Wireless Solutions Co.,Ltd.**  
9<sup>th</sup> Floor, Daewoo Securities Bld.  
34-3, Yeouido-dong, Yeongdeung-po  
Seoul 150-176  
Korea

Trieste, **16th December 2008**

  
 VP Quality  
 Brian Tucker





## 7.8 UC864-E: R&TTE Compliance certificate

|   |  |  |                           |
|---|--|--|---------------------------|
| <b>CETECOM ICT Services GmbH</b><br>Notified Body   |  |           |                           |
| <small>CETECOM ICT Services GmbH • Postfach 10 04 45 • D-66004 Saarbrücken</small>  |  |  |                           |
| <b>Telit Wireless Solutions Co., Ltd.</b><br>9 <sup>th</sup> Floor Daewoo Securities Bld.<br>34-3 Yeouido-dong, Yeongdeung-po<br>Seoul 150-176<br>Korea   |  |  |                           |
| <small>provision via / copy to ATL Corp., Taiwan</small>  |  |  |                           |
| Your reference, your message from<br>Telit UC864-E<br>Order dated 17. December, 2007<br>by ATL Corp., Taiwan  | Our reference, our message from<br>WAH<br>M528539U-02-EO                             | Phone / Fax<br>+49 (0)2054 / 9519-237 /<br>+49 (0)2054 / 9519-997                            | Saarbrücken<br>19.12.2007 |
| <ul style="list-style-type: none"> <li> <b>Conformity Assessment acc. to Annex IV of Directive 99/05/EC (R&amp;TTE Directive)</b><br/> <b>assessment completion reg. safety aspect (art. 3.1a)</b><br/>           identification of the proceeding         </li> </ul>  |  |  |                           |
| Registration Number: <b>M528539U-02-EO</b>  |  |  |                           |
| Certificate Holder: <b>Telit Wireless Solutions Co., Ltd., Korea</b>  |  |  |                           |
| Product Designation: <b>Telit UC864-E, GSM(900&amp;1800MHz) / GPRS / EDGE / UTRA/FDD Band I / HSDPA Module</b>  |  |  |                           |
| Dear Sirs,<br>we have performed the conformity assessment acc. to the European Directive 99/05/EC (R&TTE) for the product as identified above. Please find enclosed the relating issue of our <b>Certificate "Expert Opinion"</b> with the registration number : <b>M528539U-02-EO</b><br><b>Notice:</b> The EC conformity marking (CE mark) of products as designated in the above given Expert Opinion shall be accompanied by our notified body identification number 0682 before the placing on the market. For other products than those designated in the related Expert Opinion our notified body identification number may not be used without our written permission.<br>Please pay attention to further formal provisions of the R&TTE Directive (99/05/EC) regarding product labelling, obligatory information to the user or to authorities that may apply. Guidance is available e.g. from the EC commission's R&TTE web pages.<br>The order is concluded herewith. We will charge for our services by a separate invoice. |  |  |                           |
| Yours faithfully<br><br>CETECOM ICT Services GmbH<br>i.A. Nikolaus Wahl  |  | <u>Enclosure</u><br>• Certificate "Expert Opinion"   |                           |
| <small>CETECOM ICT Services GmbH<br/>         Untertürkheimer Str. 6 - 10<br/>         D-66117 Saarbrücken<br/>         Germany<br/>         Telefon: +49 (0) 6 81 5 98 - 0<br/>         Telefax: +49 (0) 6 81 5 99 - 90 75<br/>         Internet: http://www.cetecom.de</small>  | <small>Sitz der Gesellschaft: Saarbrücken<br/>         HRB Saarbrücken 11288</small> | <small>Geschäftsführung:<br/>         Dr. Harald Ansoerg<br/>         Hans Peter May</small> |                           |



## 7.9 UC864-WD and E-DUAL: R&TTE Compliance Certificate

IMQ NOTIFIED BODY IDENTIFICATION NUMBER 0051 AUTHORIZED BY ITALIAN GOVERNMENT AS NOTIFIED BODY IN ACCORDANCE WITH THE R&TTE DIRECTIVE 1999/05/EC OF 09 MARCH 1999

### EXPERT OPINION

REGISTRATION No. : 0352 – ARAK00059  
*NUMERO DI REGISTRAZIONE*

PRODUCT : 2G/3G module  
*PRODOTTO*

APPLICANT : TELIT Communications S.p.A.  
Via Stazione di Prosecco, 5/B – 34010 Sgonico (TS)  
*RICHIEDENTE*

MANUFACTURER : TELIT Communications S.p.A.  
Via Stazione di Prosecco, 5/B – 34010 Sgonico (TS)  
*COSTRUTTORE*

TRADE MARK : Telit  
*MARCHIO*

MODEL/TYPE REF. : UC864-E-DUAL & UC864-WD  
*MODELLO/TIPO (E/VE)*

---

EXAMINATION RESULT  
*ESITO DELL'ESAME*

The technical construction file presented according to Annex IV of Directive 1999/05/EC demonstrates that the essential requirements of Article 3 of the Directive have been met.  
*Il Dossier Tecnico di fabbricazione presentato in accordo all'allegato IV della Direttiva 1999/05/EC dimostra che i requisiti essenziali dell'Articolo 3 della presente Direttiva sono stati soddisfatti.*

---

THE PRODUCT SHALL BE SIGNED WITH CE AND IMQ NOTIFIED BODY NUMBER AS SHOWN HERE: **CE0051**  
*IL PRODOTTO DOVE PRESENTARE IL MARCHIO CE E IL MARCHIO DI ORGANISMO NOTIFICATO DELL'IMQ, COME MOSTRATO QUI DI ESEMPLO.*

---

Number of annexes : 1 (2 pages)  
*NUMERO DI ALLEGATI*

Number of Revision : Rev. 0  
*NUMERO DI REVISIONE*

Place and date of issue : Milan, 2010-06-30  
*LUOGO E DATA DI EMERSIONE*

*Carlo De Felice*  
**IMQ**

The scope of this evaluation is limited to the submitted documents only. Only full reproductions of this Certificate are allowed without written permission of IMQ.  
Lo scopo di questa valutazione è limitato ai documenti presentati. Per le copie complete del certificato occorre autorizzazione scritta dell'IMQ.

---

**IMQ** ISO 9001

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Tassa Mi. 505984 - Registro Imprese: VI/0288407024 - C.F. 0289101024 - Capitale sociale 4.000.000,00 €







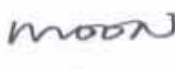

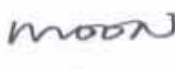

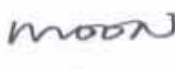







## 7.13 UC864-G: GCF Compliance Certificate

**REISSUED**

| <i>Certificate of Test</i>  |   |   |   |  |           |  |  |
|---|---|---|---|--|-----------|--|--|
| <b>Telecommunications Technology Association</b><br>Address: 267-2, Seohyeon - Dong, Bundang - Gu, Seongnam - Si,<br>Gyeonggi - Do, 463-824, Republic of Korea<br>Tel: +82-70-7780-0340 Fax: +82-31-724-0249<br>E-mail: <a href="mailto:ktca@ttta.or.kr">ktca@ttta.or.kr</a> <a href="http://www.ttta.or.kr">http://www.ttta.or.kr</a>  |   | <b>Certificate No.:</b><br>TTA-M-08-040-01(Rev. 11)   |   |  |           |  |  |
|   |   |    |   |  |           |  |  |
| <b>1. Manufacturer(Client):</b><br>o Name: Telit Communications S.p.A.<br>o Address: Via Stazione di Prosecco 5/B 34010 Sgonico (TS) – Italy<br>o Telephone: +82-2-368-4661   |   |   |   |  |           |  |  |
| <b>2. EUT(Equipment Under Test):</b> GSM/GPRS/EGPRS/UMTS Terminal Equipment (Type Name: UC864-G)  |   |   |   |  |           |  |  |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Hardware Version</th> <th style="width: 50%;">Software Version</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1.0</td> <td style="text-align: center;">08.01.105</td> </tr> </tbody> </table>   |   | Hardware Version  | Software Version  | 1.0  | 08.01.105 |  |  |
| Hardware Version  | Software Version  |   |   |  |           |  |  |
| 1.0   | 08.01.105   |   |   |  |           |  |  |
| <b>3. Applicable Scopes:</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">                     GCF-CC v3.30.1<br/>                     NAPRD.03 v3.14.0<br/>                     EN 301 511 v9.0.2<br/>                     EN 301 908-2 v3.2.1                 </td> </tr> </table>   |   |   |   | GCF-CC v3.30.1<br>NAPRD.03 v3.14.0<br>EN 301 511 v9.0.2<br>EN 301 908-2 v3.2.1 |           |  |  |
| GCF-CC v3.30.1<br>NAPRD.03 v3.14.0<br>EN 301 511 v9.0.2<br>EN 301 908-2 v3.2.1  |   |   |   |  |           |  |  |
| <b>4. Date of Test:</b><br>o Date of first test : March 24, 2008                      o Date of last test : September 26, 2008  |   |   |   |  |           |  |  |
| <b>5. Test Method Used:</b> All the tests were performed according to the test specifications which are listed in section 3.2 of the attached test report, of which Report No. is TTA-M-08-040-TR11.  |   |   |   |  |           |  |  |
| <b>6. Test Results:</b> TTA verifies that all the relevant tests as listed in section 3 of the attached test report, of which Report No. is TTA-M-08-040-TR11, have been performed with the tested GSM/UMTS terminal equipment type.  |   |   |   |  |           |  |  |
| Official Observer of<br>   |   | <br>LAB CODE 20040323-09                        |   |  |           |  |  |
| <b>Prepared By:</b><br><table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;"> <u>Mr. Hyunwook Ryu</u><br/> <br/>                     (Test Consultant)                 </td> <td style="width: 50%; padding: 5px;"> <u>Mr. Jason Moon</u><br/> <br/>                     (Technical Manager)                 </td> </tr> </table> |   | <u>Mr. Hyunwook Ryu</u><br><br>(Test Consultant) | <u>Mr. Jason Moon</u><br><br>(Technical Manager) | <b>Approved By:</b>  |           |  |  |
| <u>Mr. Hyunwook Ryu</u><br><br>(Test Consultant)   | <u>Mr. Jason Moon</u><br><br>(Technical Manager) |   |   |  |           |  |  |
| The above test certificate is the accredited test results by Korea Laboratory Accreditation Scheme, which signed the ILAC-MRA.  |   |   |   |  |           |  |  |
|   |   | <b>October 6, 2008</b><br>                     |   |  |           |  |  |
| <b>President</b><br><i>Telecommunications Technology Association</i>  |   |   |   |  |           |  |  |

TPG-0024-1(00)

Page(1) / (399)Pages



## 8 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.







