LoRa End Device RF Module

LWM2-62

Datasheet

Document Version:

LINK-LOGIX/HW/RFMOD/LWM262/1.0

Table of Contents

1. Brief Description

LWM2-62 is a compact, low cost, low power wide area network (LPWAN) wireless module that supports the LoRaWAN® long range wireless protocol.

This new stand-alone module measures just 22x19 mm, is constructed in a metal shielded package and comprises a Semtech SX1262 ultra-long range spread spectrum wireless transceiver and STM32 series ARM Cortex-M0+ 32 Bit microcontroller (MCU). The LWM2-62 module complies with the latest LoRaWAN® Class A & C protocol specifications and with this module it is quite simple to access LoRaWAN® IoT platforms.

1.1 Features

- RF output power up-to +22 dBm.

- It supports LoRa® Point to Point communications as well as LoRaWAN® protocol. Different Firmware required.

- Built-in EEPROM, data kept unchanged even powered off.

- Small size (22*19 mm)

- Wide range of working voltage 3V to 3.6 V

- Sensitivity -137dBm

- Wide range of temperatures -40°C to +85°C.

1.2 Applications

Typical applications for this module include smart metering, wearables, tracking, M2M and internet of things (IoT) edge nodes.

The module's applications are as following -

- Automated Meters Reading

- Home and Building Automation

- Wireless Alarm and Security Systems

- Industrial Monitoring and Control

- Long Range Irrigation Systems

2. Module Overview:

LWM2-62 is an ultra-long range, high-performance, RF module for wireless communication. It operates in the license free 865-867 MHz ISM frequency band and includes all necessary passive components for wireless communication as depicted in the following figure.
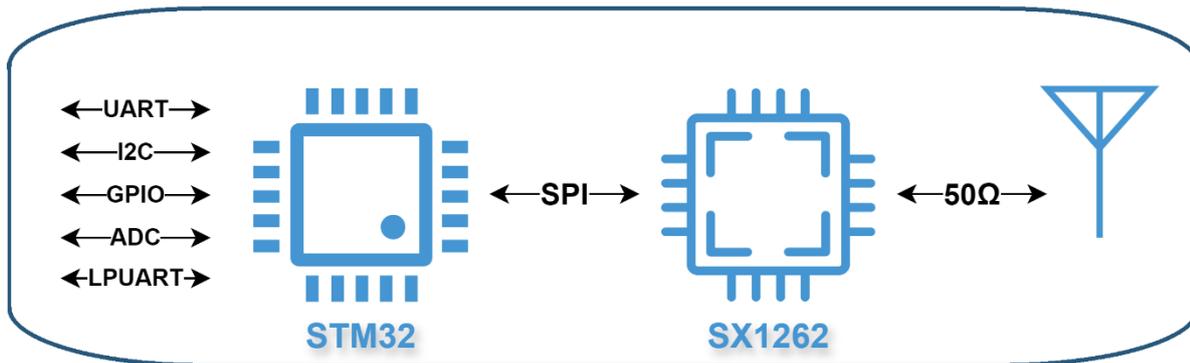
Frequency range	865 to 867 MHz
Modulation	LoRa® Spread-Spectrum
RF output power	Up to 22 dBm
Receiver sensitivity	-137 dBm (SF 12; SB 125 kHz, CR 4/6)
RF data rate	0.24 to 5 kbps
RF range	up to 5000 m (line of sight)
Operating voltage	3 V to 3.6 V
Current consumption	< 5 µA (module in sleep, RTC running) 17 mA (Rx) 130 mA (Tx mode)
Interfaces	UART, I2C
IO's	Digital IOs Analog Inputs
Dimension	22x19 mm

3. Electrical Characteristics

3.1 Maximum Ratings

Condition	Min	Typ.	Max	Unit
Supply Voltage (VDD)	3.0	3.4	3.6	V
Storage Temperature	-40	+25	+85	°C
Operating Temperature	-40	+25	+85	°C
RF Input Power	+10			dBm
ESD (Human Body Model)	2000			V
ESD (Charge Device Model)	500			V
Notes: 1) Unless otherwise noted, all voltages are with respect to GND				

3.2 General Electrical Characteristics

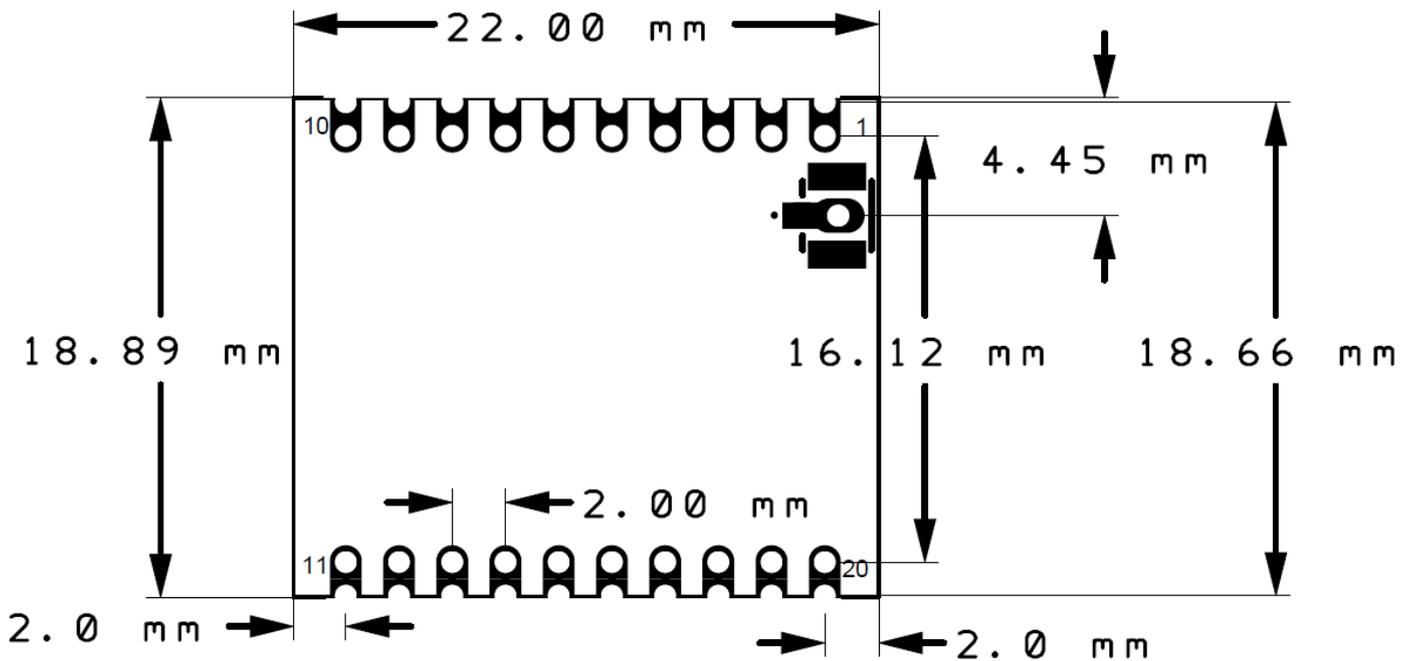| T = 25°C, VDD = 3.5 V (typ.) if nothing else stated					
Parameter	Condition	Min	Typ.	Max	Unit
Supply Voltage (VDD)		3	3.4	3.6	V
Current Consumption System IDLE	RF idle mode, MCU idle mode		5		µA
Current Consumption RECEIVE LoRa	RF receive mode, MCU sleep mode		17		mA
Current Consumption TRANSMIT	RF transmit mode, MCU Active mode, all MCU units on, max. RF power level		130		mA
MCU operation frequency		32 MHz & 32.768 KHz			

3.3 Module Interface Characteristics

Symbol	Parameter	Conditions	Min.	Max.	Unit
VOL	Output Low level voltage for an I/O pin	CMOS port, IIO = +8 mA 2.8V ≤ VDD ≤ 3.7V	-	0.4	V
VOH	Output High level voltage for an I/O pin		VDD - 0.4	-	
VOL	Output Low level voltage for an I/O pin	TTL port, IIO = +8 mA 2.8V ≤ VDD ≤ 3.7V	-	0.4	V
VOH	Output High level voltage for an I/O pin	TTL port IIO = -6 mA 2.8V ≤ VDD ≤ 3.7V	2.4	-	V
VOL	Output Low level voltage for an I/O pin	IIO = +15 mA 2.8V ≤ VDD ≤ 3.7V	-	1.3	V
VOH	Output High level voltage for an I/O pin	IIO = -15 mA 2.8V ≤ VDD ≤ 3.7V	VDD-1.3	-	V
VOL	Output Low level voltage for an I/O pin	IIO = +4 mA 1.65V ≤ VDD ≤ 3.7V	-	0.45	V
VOH	Output High level voltage for an I/O pin	IIO = -4 mA 1.65V ≤ VDD ≤ 3.7V	VDD-0.45	-	V
VOLFM+	Output low level voltage for an FTf I/O pin in FM+ mode	IIO = 20 mA 2.8V ≤ VDD ≤ 3.7V	-	0.4	V
		I_{IO} = 10mA 1.65V ≤ V_{DD} ≤ 3.7V	-	0.4	

3.4 Transmitter RF Characteristics

T = 25°C, VDD = 3.4 V (typ.), 866 MHz if nothing else stated					
Parameter	Condition	Min	Typ.	Max	Unit
Frequency Range		865	-	867	MHz
RF Output Power - 865 MHz Band		-8	21.6	22	dBm
Modulation Techniques			LoRa®		
TX Frequency Variation vs. Temperature	-40 to +85°C	-	±10	-	kHz
TX Power Variation vs. Temperature		-	±0.5	-	dB

4. Module Package

4.1 Module Dimension

Ø 0.8 mm, All Holes

Top View

LINK⇌LOGiX

18.66 mm

4.50 mm

Pin 1

KeepOut
Area

No Copper

Pin 20

6.25 mm

2.00 mm

18.00 mm

Pin 10 ⌶ 1.00 mm

1.60 mm

Pin 11

**SMT PCB Footprint
Top View**

16.12 mm

4.50 mm

Pin 1

KeepOut
Area

No Copper

Pin 20

5.33 mm

2.00 mm

18.00 mm

Pin 10 ⌶ 0.8 mm

1.60 mm

Pin 11

**Through Hole PCB Footprint
Top View**
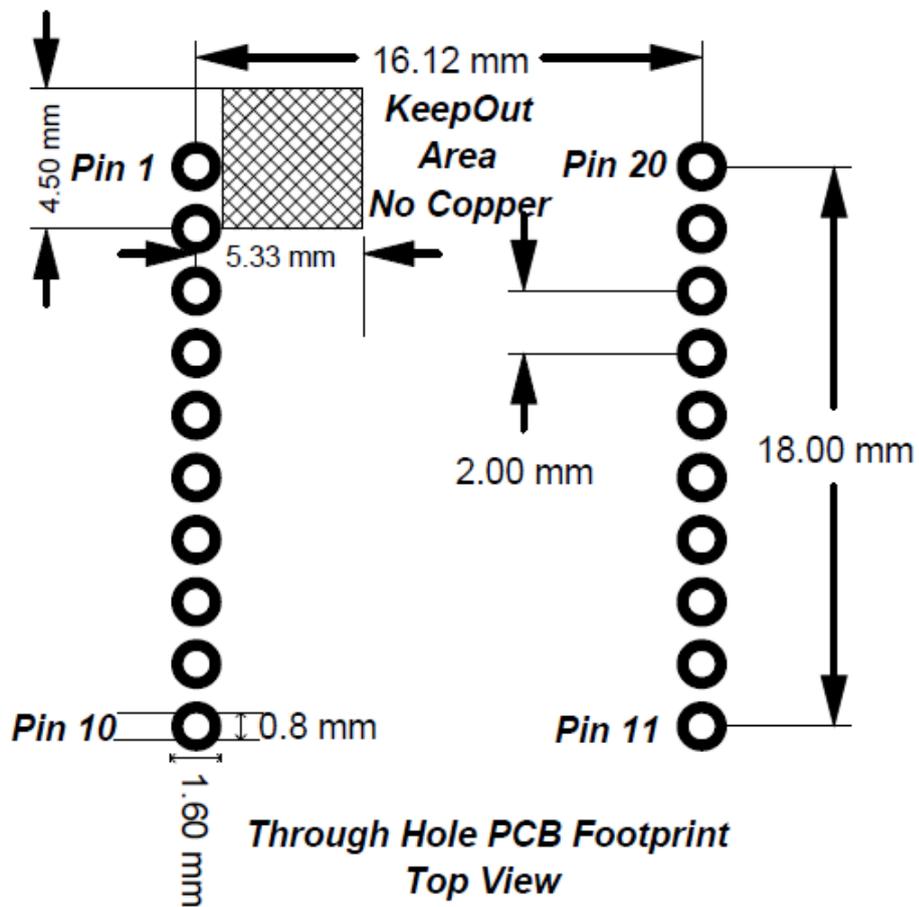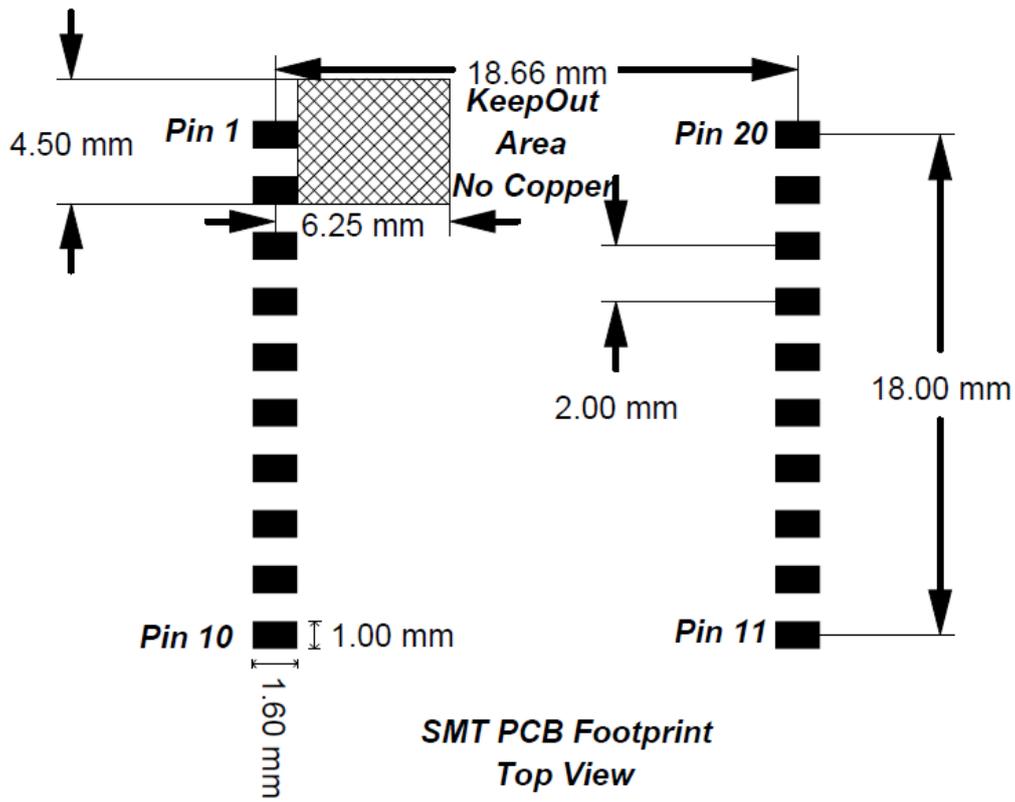
4.2 Pinout Description

| PIN	PIN Name	PIN Type	Primary Function	5 V Tolerance	Alternate Function
1	NC				
2	AGND	Antenna GND			Supply Ground
3	PGND	Supply GND			
4	VDDI	Input Supply	3 to 3.7V DC Input	No	Input DC Supply
5	PA2	D I/O	USART2_TX /LPUART1_TX	Yes	ADC IN2
6	PA3	D I/O	USART2_RX/LPUART1_RX	Yes	ADC IN3
7	BOOT0	D IN	Bootloader	No	
8	NRST	D IN	Module Reset	No	
9	PA0	D I/O	USART4_TX	No	ADC_IN0/WKUP1
10	PA1	D I/O	USART4_RX	Yes	ADC_IN1
11	PA13	D I/O	SWDIO -Module Program Pin	Yes	LPUART1_RX
12	PA14	D I/O	SWCLK - Module Program Pin	Yes	LPUART1_TX
13	PA8	D I/O	General Purpose Digital I/O	Yes	N/A
14	PA9	D I/O	USART1_TX	Yes	I2C1_SCL (Ext. 3.3V pullup required)
15	PA10	D I/O	USART1_RX	Yes	I2C1_SDA (Ext. 3.3V pullup required)
16	PB6	D I/O	I2C1_SCL	Yes	Ext. 3.3V pullup required
17	PB7	D I/O	I2C1_SDA	Yes	Ext. 3.3V pullup required
18	PB5	D I/O	General Purpose Digital I/O	Yes	N/A
19	TXEN	D Out	RF TX Notification	No	N/A
20	PA11	D I/O	General Purpose Digital I/O	Yes	N/A

5. RF Test Report (Conducted Measurement)

EUT Test Configuration: - Transmit on Max power on each 125 KHz Channel, Transmission on 1st, Mid and Last channel in each 15 minutes.

EUT Height: - 0.8m from Ground (EUT placed on nonconductive table).

Voltage: -   + 3.4 VDC

EUT antenna port connected to RF connector.

5.1 Max Conducted RF Power
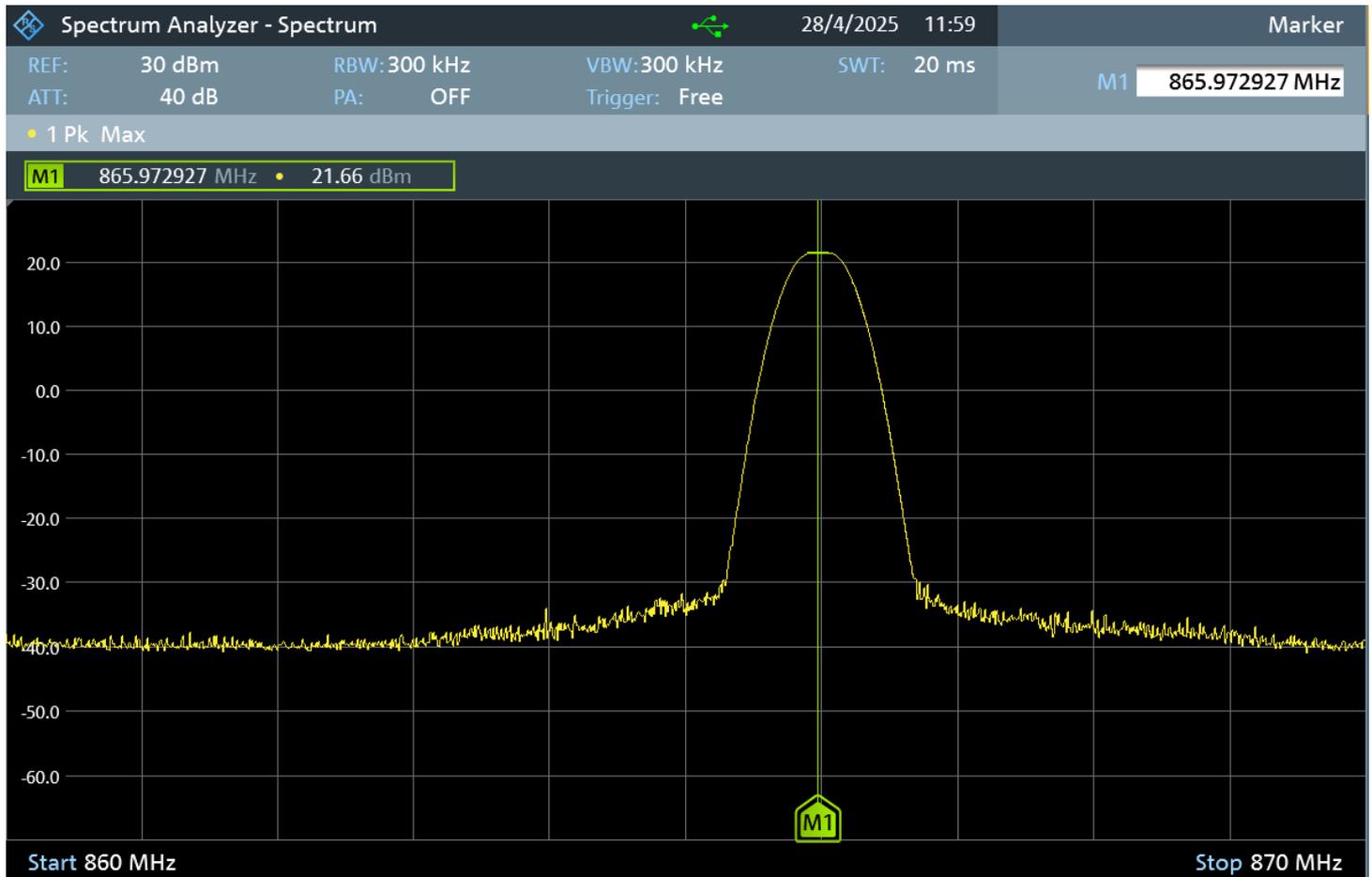
Observation Table: -

Channel Frequency (MHz)	Conducted Power Measured (dBm) (A)	Cable Loss (dB) (B)	Max Conducted Power (dBm)	EIRP Test Status
865.975	21.66	0.23	21.89	Pass

6. Antenna Mounting Options

To serve the propose of multiple antenna requirement, LWM2-62 comes with multiple options. Below are the LWM2-62 Antenna options:

1. Connect an external antenna thru the UFL connector mounted on PCB. It can be Simply connected thru a UFL Pigtail to antenna of your choice. Here 50Ω impedance matched antenna will work.
2. Through Hole Spring Helical antenna can also be used if antenna needs to be integral part of module. Just unmount the UFL connector and used through hole beneath the UFL connector pad to connect Spring Helical or other wire antenna. The recommend thick ness of wire is 0.7 to 0.9 mm to get it mounted in the PCB hole. Here a separate mention is required in customer order as this option is not available as by default.

3. LWM2-62 has LGA pad at Pin1 to extend the RF signals on Daughter Board PCB and antenna can be mounted separately on DB PCB. Here needs to take care the 50Ω impedance characteristics of the RF track and a separate mention is required in customer order as this option is not available as by default.

7. Important Notice

7.1 Disclaimer

Avaguru Technologies Pvt. Ltd. (referred also as ATPL) points out that all information in this document is given on an "as is" basis. No guarantee, neither explicit nor implicit is given for the correctness at the time of publication. ATPL reserves all rights to make corrections, modifications, enhancements, and other changes to its products and services at any time and to discontinue any product or service without prior notice. It is recommended for customers to refer to the latest relevant information before placing orders and to verify that such information is current and complete. All products are sold and delivered subject to "General Terms and Conditions" of ATPL, supplied at the time of order acknowledgment.

ATPL assumes no liability for the use of its products and does not grant any licenses for its patent rights or for any other of its intellectual property rights or third-party rights. It is the customer's duty to bear responsibility for compliance of systems or units in which products from ATPL are integrated with applicable legal regulations. Customers should provide adequate design and operating safeguards to minimize the risks associated with customer products and applications. The products are not approved for use in life supporting systems or other systems whose malfunction could result in personal injury to the user. Customers using the products within such applications do so at their own risk.

Any reproduction of information in datasheets of ATPL is permissible only if reproduction is without alteration and is accompanied by all given associated warranties, conditions, limitations, and notices. Any resale of ATPL products or services with statements different from or beyond the parameters stated by ATPL for that product/solution or service is not allowed and voids all express and any implied warranties. The limitations on liability in favour of ATPL shall also affect its employees, executive personnel, and bodies in the same way. ATPL is not responsible or liable for any such wrong statements.

Copyright © 2025, Avaguru Technologies Pvt. Ltd.

7.2 Contact Information

Avaguru Technologies Pvt. Ltd. (ATPL)
26A, S B Vihar, Swej Farm,
New Sanganer Road, Sodala,
Jaipur-302019, Rajasthan, India

T: +91-141-4525001 M: +91 7073254485
Email: link-logix@avaguru.in
Web: https://link-logix.in/

7.3 Document Revision History

V1.0 – First Version