

PRODUCT SPECIFICATION

P102W-U

LTE Standard Module Datasheet

Version:v0.1



P102W-U Module Datasheet

	Part NO.	Description
Ordering Information	FGP102WUXX-00	P102W-U, module that supports 4G LTE CAT1 and multi-GNSS , ASR1602, USB, UART, PCM, USIM, LCC48+LGA61,17.7x15.8mm

Customer: _____

Customer P/N: _____

Signature: _____

Date: _____

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1. General Description

1.1 Introduction

P102W-U is a highly integrated LTE CAT1 and multi-GNSS module which supports both LTE-FDD and LTE TDD bands and GNSS.

It features application processing subsystem, communication subsystem, and SoC embedded pSRAM. Both MCU and AP subsystem are able to run RTOS and user applications.

This compact module is a perfect choice for varies M2M application, such as security system, routers, wireless POS, PDA

1.2 Description

Model Name	P102W-U
Product Description	Support LTE CAT1 applications and multi-GNSS
Dimension	L x W x H: 15.8 x 17.7 x2.4 mm
Interface	LTE, USB2.0, UART, PCM, (U)SIM, LCD, GPIO
OS supported	Android /Linux/ Windows
Operating temperature	-35°C to 75°C
Extended operating	-40°C to 85°C
Storage temperature	-40°C to 90°C

2. Features

SOC

- ASR1602 highly cost-efficient System on Chip
- Application Processor ARM Cortex-R5 up to 614MHz clock. 64KB ROM and 32KB on-chip SRAM for application usage.
- Embedded 8bit Octal-SPI pSRAM, support DDR mode. Up to 400Mbyte/s bandwidth
- Embedded flash with XIP (eXecute In Place) and QSPI mode support, up to 102MHz.

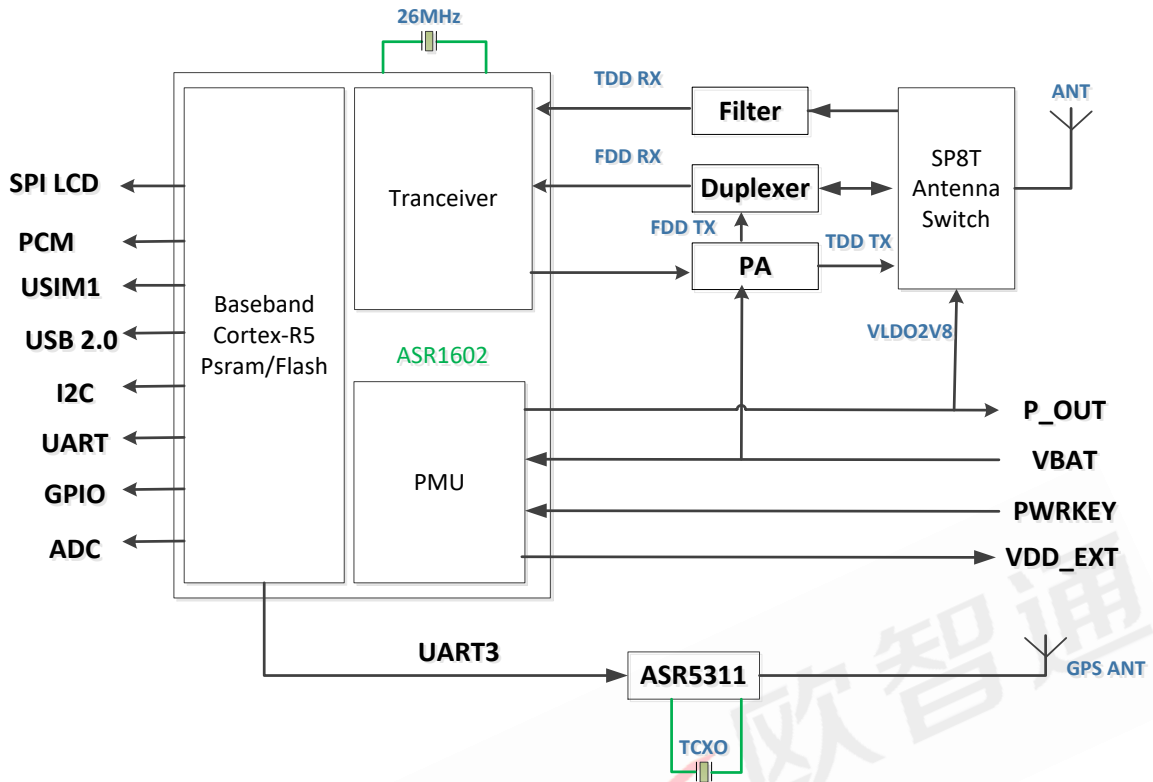
Modem

- FDD/TDD LTE CAT1
- FDD B1/B3/B5/B7/B8/B20/B28
- TDD B34/B38/B39/B40/B41
- TDD B34/B38/B39/B40/B41
- GPS L1
- BeiDou B1
- GLONASS L1
- QZSS L1

Peripheral interfaces

- 1 x USB2.0 Device
- 3 x UART interface
- 1 x PCM master for external audio CODEC*
- 2 x I2C
- 1 x USIM
- SPI LCD*
- ADC

3. Block Diagram



4. General Specification

4.1 RF Transmit Specification

Frequency band	Max. TX power	Min TX power
LTE-FDD B1/B3/B5/B7/B8/B20/B28	23 ±2 dBm	< -39 dBm
LTE-TDD B34/B38/B39/B40/B41	23 ±2 dBm	< -39 dBm

Note: The RF specification will be updated in future version.

4.2 RF Receive Sensitivity

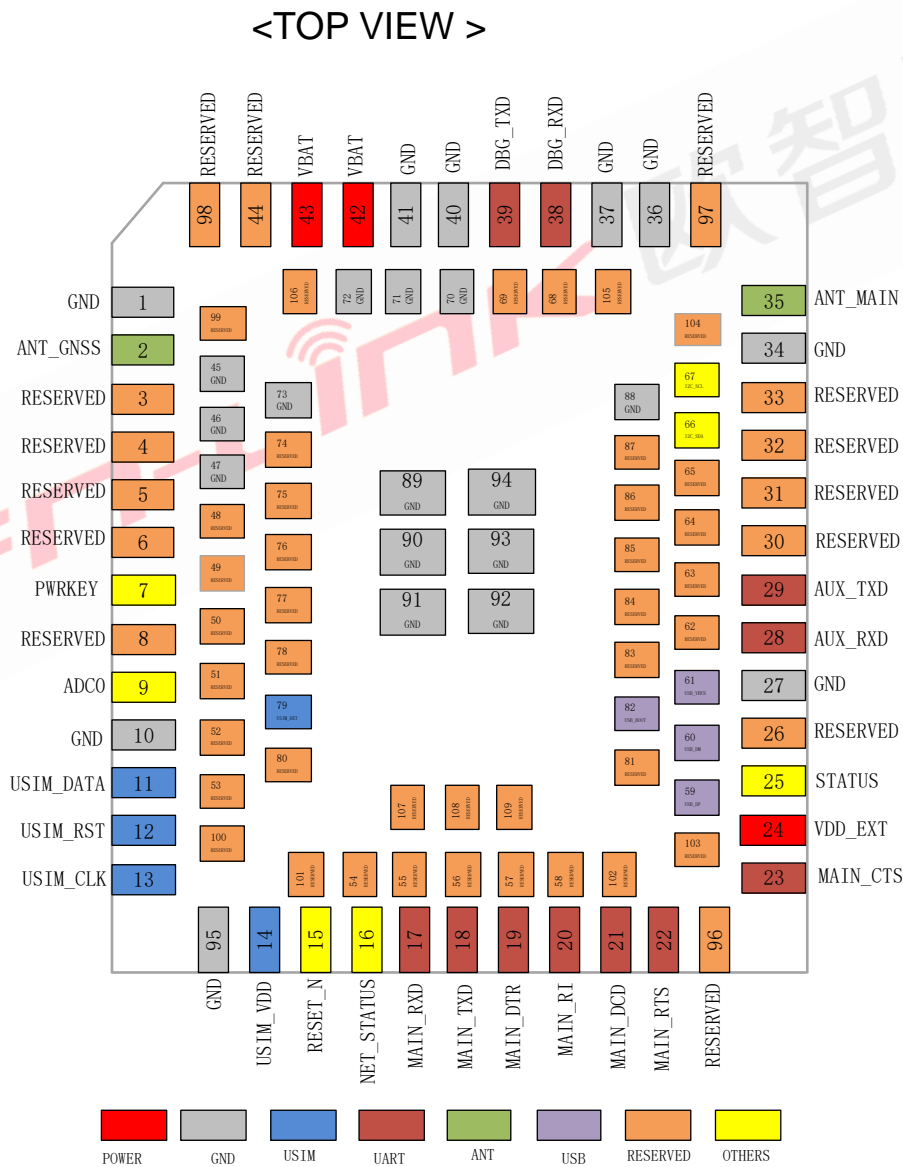
Frequency band	RX Sensitivity			3GPP Standard
	PRX	DRX	PRX+DRX	3GPP (PRX+DRX)
LTE-FDD B1 (10 MHz)	-99	N/A	N/A	-96.3 dBm
LTE-FDD B3 (10 MHz)	-97.5	N/A	N/A	-93.3 dBm
LTE-FDD B5 (10 MHz)	-98.5	N/A	N/A	-94.3 dBm
LTE-FDD B7 (10 MHz)	-97	N/A	N/A	-94.3 dBm

LTE-FDD B8 (10 MHz)	-98.5	N/A	N/A	-93.3 dBm
LTE-FDD B20 (10 MHz)	-98.5	N/A	N/A	-93.3dBm
LTE-FDD B28 (10 MHz)	-98	N/A	N/A	-93.3 dBm
LTE-TDD B34 (10 MHz)	-99.5	N/A	N/A	-96.3 dBm
LTE-TDD B38 (10 MHz)	-99	N/A	N/A	-96.3 dBm
LTE-TDD B39 (10 MHz)	-99.5	N/A	N/A	-96.3 dBm
LTE-TDD B40 (10 MHz)	-99	N/A	N/A	-96.3 dBm
LTE-TDD B41 (10 MHz)	-99	N/A	N/A	-94.3 dBm

Note: The RF specification will be updated in future version.

5. Pin Definition

5.1 Pin Outline



Note: About Pin Definition, please refer to the description in the table

5.2 Pin Definition details

NO.	Name	Type	Power Domain	Functional Description
1	GND	P		Ground connections
2	RESERVED	-		Floating
3	RESERVED	-		Floating
4	RESERVED	-		Floating
5	RESERVED	-		Floating
6	RESERVED	-		Floating
7	PWRKEY	DI	3V	Module turn on/off
8	RESERVED	-		Floating
9	ADC	AI	1.2V	AUXADC channel1 input, 1.2V MAX
10	GND	P		Ground connections
11	USIM_DATA	IO	1.8V/3.0V	USIM card data
12	USIM_RSTN	DO	1.8V/3.0V	USIM card reset
13	USIM_CLK	DO	1.8V/3.0V	USIM card clock signal
14	USIM_VDD	PO	1.8V/3.0V	USIM 3.3v/1.8v power supply
15	RESET_N	DI	1.8V	Module reset input, NC if not use
16	NET_STATUS	DO	1.8V	Indicator of working status
17	MAIN_RXD	DI	1.8V	Main UART input
18	MAIN_TXD	DO	1.8V	Main UART output
19	MAIN_DTR	DI	1.8V	Main UART Data terminal ready, sleep mode control
20	MAIN_RI	IO	1.8V	Main UART Ring indicator
21	MAIN_DCD	IO	1.8V	Main UART Data carrier detection
22	MAIN_RTS	DO	1.8V	Main UART Request To Send
23	MAIN_CTS	DI	1.8V	Main UART Clear To Send
24	VDD_EXT	PO	1.8V	Power for external 1.8V for IO
25	STATUS	DO	1.8V	Indicator of working status
26	RESERVED	-		Floating
27	GND	P		Ground connections
28	AUX_RXD	IO	1.8V	UART for BT or GPS
29	AUX_TXD	IO	1.8V	UART for BT or GPS
30	RESERVED	-		Floating
31	RESERVED	-		Floating

32	RESERVED	-		Floating
33	RESERVED	-		Floating
34	GND	P		Ground connections
35	ANT	AIO		Main antenna interface
36	GND	P		Ground connections
37	GND	P		Ground connections
38	DBG_RXD	DI	1.8V	Dubug UART for module
39	DBG_TXD	DO	1.8V	Dubug UART for module
40	GND	P		Ground connections
41	GND	P		Ground connections
42	VBAT	PI	3.8V typ.	Power supply of module
43	VBAT	PI	3.8V typ.	Power supply of module
44	RESERVED	-		Floating
45~48	GND	P		Ground connections
49	RESERVED	-		Floating
50	RESERVED	-		Floating
51	RESERVED	-		Floating
52	RESERVED	-		Floating
53	RESERVED	-		Floating
54	RESERVED	-		Floating
55	RESERVED	-		Floating
56	RESERVED	-		Floating
57	RESERVED	-		Floating
58	RESERVED	-		Floating
59	USB_DP	AIO	3.0V	USB data+
60	USB_DN	AIO	3.0V	USB data-
61	USB_VBUS	AI	5V	USB detection
62	RESERVED	-		Floating
63	RESERVED	-		Floating
64	RESERVED	-		Floating
65	RESERVED	-		Floating
66	I2C_SDA	IO	1.8V	I2C serial data, for external device, require external pull-up 4.7k resister
67	I2C_SCL	DI	1.8V	I2C serial clock, for external device, require external pull-up 4.7k resister
68	RESERVED	-		Floating
69	RESERVED	-		Floating

70~73	GND	P		Ground connections
74	RESERVED	-		Floating
75	RESERVED	-		Floating
76	RESERVED	-		Floating
77	USIM_CD	DI	1.8V	USIM card insertion detection, NC if not use
78	RESERVED	-		Floating
79	RESERVED	-		Floating
80	RESERVED	-		Floating
81	RESERVED	-		Floating
82	USB Boot ^{Note1}	DO	1.8V	when the module power on, this pin is detected low, it will enter emergency download mode
83	RESERVED	-		Floating
84	RESERVED	-		Floating
85	RESERVED	-		Floating
86	RESERVED	-		Floating
87	RESERVED	-		Floating
88~95	GND	P		Ground connections
96~109	RESERVED	-		Floating

P:POWER I:INPUT O:OUTPUT

Note1: It is recommended to use USB Boot+GND way in the production

6. Electrical Specifications

6.1 Absolute Maximum Ratings

Symbol	Min.	Max.	unit
VBAT	-0.3	6	V
USB_VBUS	-0.3	5.5	V
Current of VBAT	0	1.5	A
VIO	-0.3	2.3	V

6.2 Operating Conditions

Symbol	Description	Condition	Min.	Typ.	Max.	Unit
VBAT	VBAT_BB and VBAT_RF	Input voltage must be within this range	3.4	3.8	4.5	V
IVBAT	Peak current	At max. transmitting	TBD	-	TBD	A

		power				
USB_VBUS	USB power supply	-	3.0	5.0	5.25	V
VOH	High level output voltage	High = -500uA	0.8*VDD		VDD ^{Note}	V
VOL	Low level output voltage	Low = 500uA	0		0.2*VDD	
VIH	High level input voltage		0.7*VDD		VDD+0.3	V
VIL	Low level input voltage		-0.3		0.48	V

Note: VDD = 1.8V.

7. Size reference

7.1 Module Picture

L x W : 17.7 x 15.8 (+0.3/-0.1) mm	TBD
H: 2.4 (±0.2) mm	TBD
Weight	TBD

7.2 Marking Description



7.3 Physical Dimensions

<BOTTOM View>
TBD

7.4 Layout Recommendation

TBD

8. The Key Material List

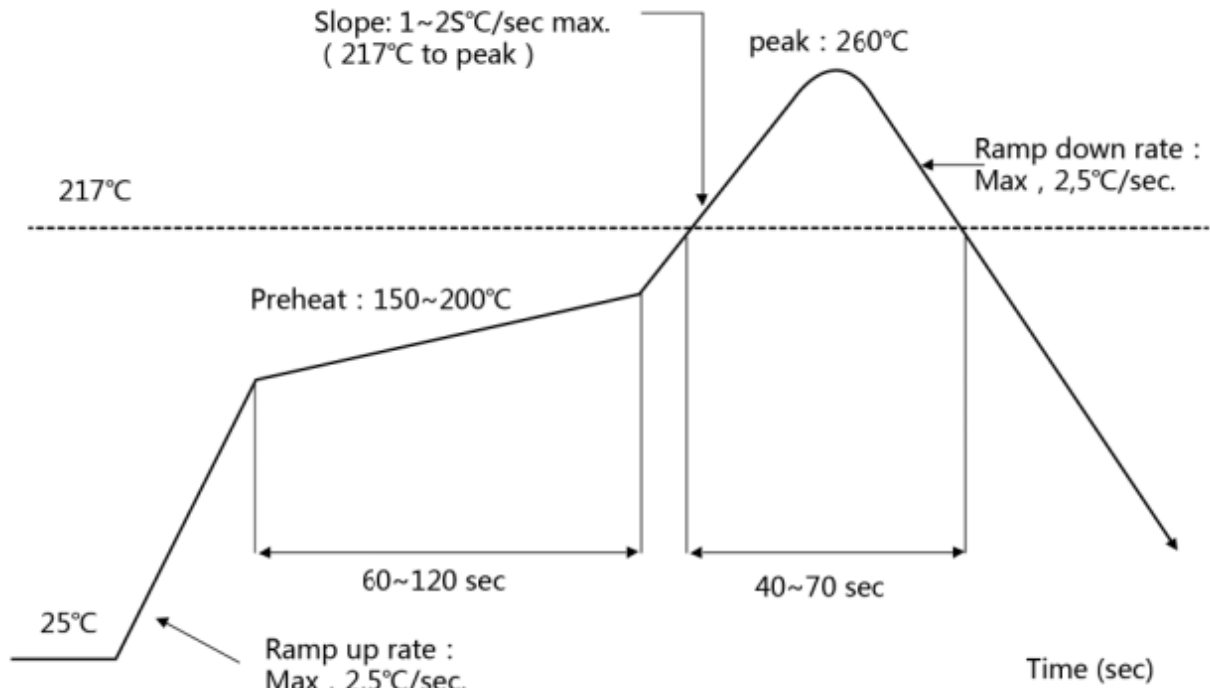
Item	Part Name	Description	Manufacturer
1	PCB	P102W-U,HDI 6L,FR4,17.7X15.8X0.8mm	XY-PCB, GDKX, Sunlord, SLPCB
2	Crystal	2016 26MHz ±8ppm 9pF	ECEC, Hosonic, TKD, JWT
3	Chipset	ASR1602, SoC, BGA148	ASR
4	Shielding	P102W-U Shielding	Suntech, JLT

9. Recommended Reflow Profile

Referred to IPC/JEDEC standard.

Peak Temperature : <260°C

Number of Times : ≤2 times

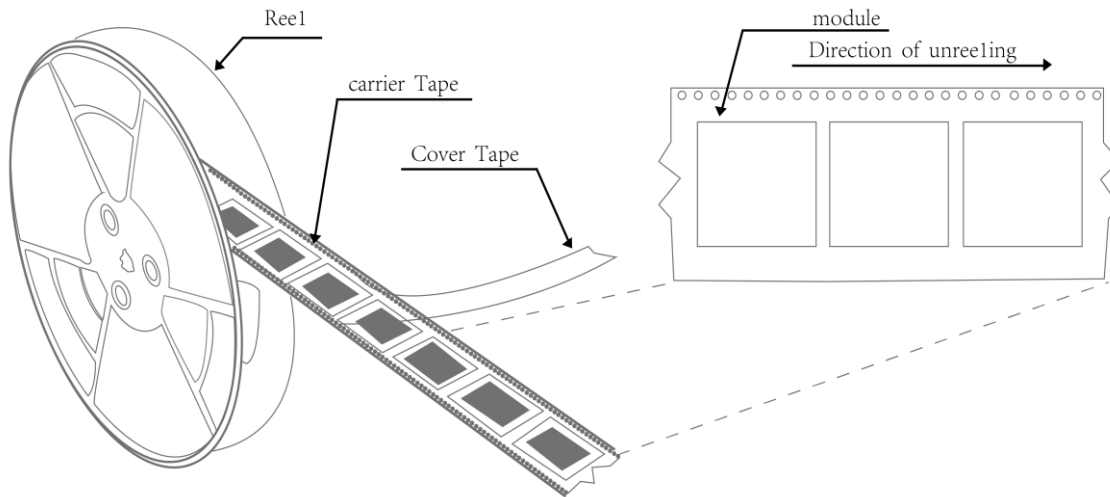


10. RoHS compliance

All hardware components are fully compliant with EU RoHS directive

11. Package

11.1 Reel



Note:Packaging details will be updated in the next version

12. Moisture sensitivity

The Modules is a Moisture Sensitive Device level 3, in according with standard IPC/JEDEC J-STD-020, take care

all the relatives requirements for using this kind of components.

Moreover, the customer has to take care of the following conditions:

- a) Calculated shelf life in sealed bag: 12 months at <math><40^{\circ}\text{C}</math> and <math><90\%</math> relative humidity (RH)
- b) Environmental condition during the production: - c) The maximum time between the opening of the sealed bag and the reflow process must be 168 hours if condition
- d) "IPC/JEDEC J-STD-033A paragraph 5.2" is respected
- e) Baking is required if conditions b) or c) are not respected
- f) Baking is required if the humidity indicator inside the bag indicates 10% RH or more