

PRODUCT SPECIFICATION

P106W-U

LTE Standard Module Datasheet

Version:v0.2



P106W-U Module Datasheet

	Part NO.	Description
Ordering Information	FGP106WUXX-00	P106W-U, module that supports 4G LTE CAT1 , ASR1606, USB, UART, PCM, USIM, LCC48+LGA61,17.7x15.8mm

Customer: _____

Customer P/N: _____

Signature: _____

Date: _____

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Revision History

Version	Date	Contents of Revision Change	Draft	Checked	Approved
V0.1	2023/11/02	Initial version	Ruimeiguo/Peng chongfan		
V0.2	2023/12/26	Set GNSS as optional	Ruimeiguo/Peng chongfan		

1. General Description

1.1 Introduction

P106W-U is a highly integrated LTE CAT1 and multi-GNSS module which supports both LTE-FDD and LTE TDD bands .

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	P106W-U
Product Description	Support LTE CAT1 applications
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

- ASR1606 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

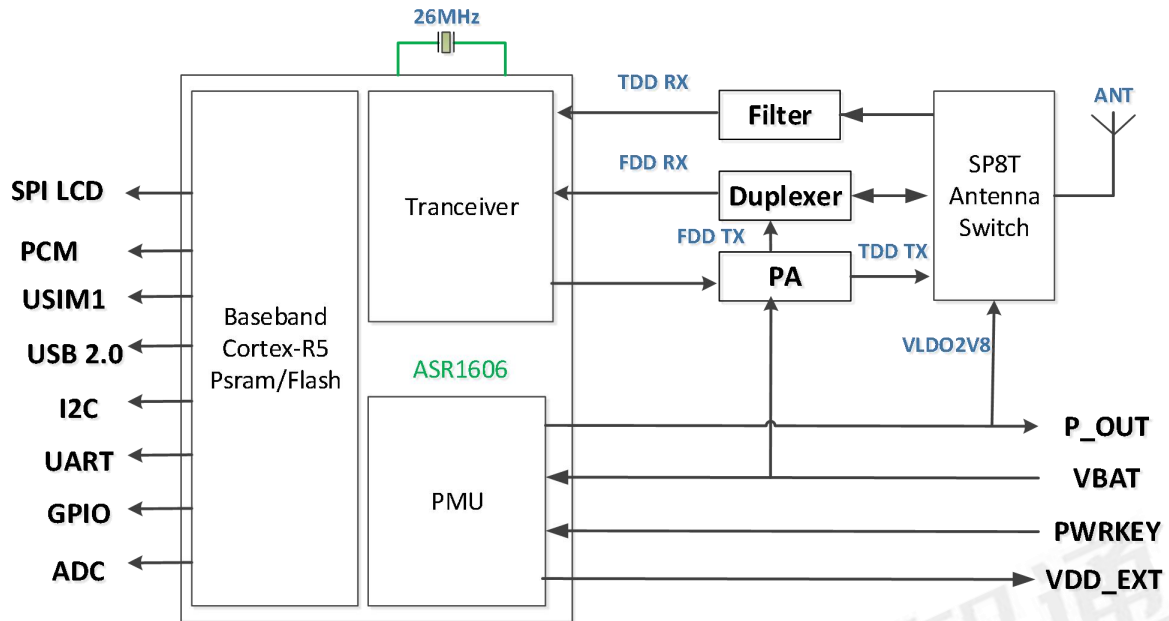
FDD/TDD LTE CAT1

- FDD B1/B3/B5/B8
- TDD B34/B38/B39/B40/B41

Peripheral interfaces

- 1 x USB2.0 Device
- 3 x UART interface
- Audio CODEC
- 2 x I2C
- 1 x USIM
- SPI LCD
- SPI camera
- 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/B8	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

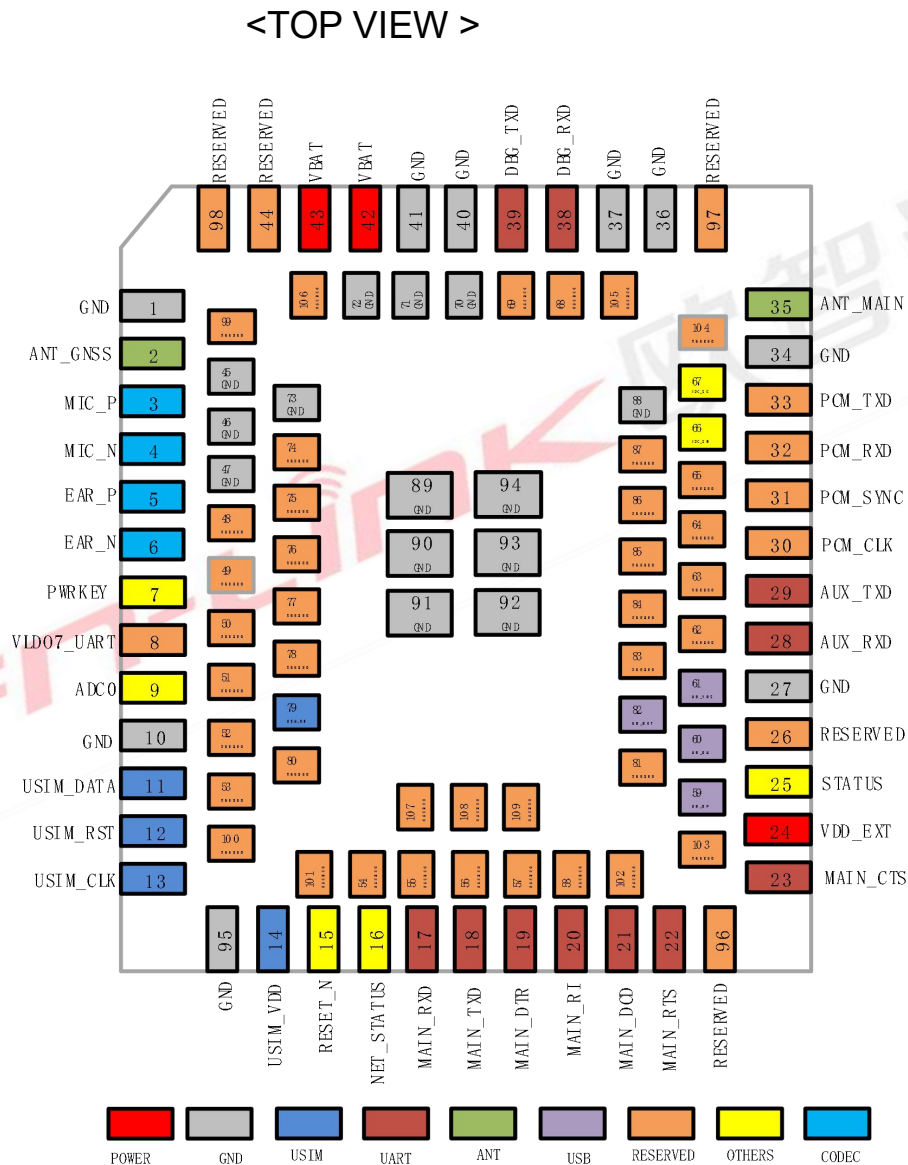
Frequency band	RX Sensitivity			3GPP Standard
	PRX	DRX	PRX+DRX	3GPP (PRX+DRX)
LTE-FDD B1 (10 MHz)	-99	N/A	N/A	-96.3 dBm
LTE-FDD B3 (10 MHz)	-97.5	N/A	N/A	-93.3 dBm
LTE-FDD B5 (10 MHz)	-98.5	N/A	N/A	-94.3 dBm
LTE-FDD B8 (10 MHz)	-98.5	N/A	N/A	-93.3 dBm

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	MIC_P	AI		Micphone analog input
4	MIC_N	AI		
5	EAR_P	AO		Audio output for earphone
6	EAR_N	AO		
7	PWRKEY	DI	3V	Module turn on/off
8	VLDO7_UART	DO	1.8V/3.3V	Power domain for MAIN UART
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	PCM_CLK	IO	1.8V	PCM interface
31	PCM_SYNC	IO	1.8V	
32	PCM_RXD	IO	1.8V	
33	PCM_TXD	IO	1.8V	
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	Debug UART for module
39	DBG_TXD	DO	1.8V	Debug 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 resistor
67	I2C_SCL	DI	1.8V	I2C serial clock, for external device, require external pull-up 4.7k resistor
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 power	TBD	-	TBD	A
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

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

7.2 Marking Description

< TOP VIEW >



7.3 Physical Dimensions

<BOTTOM View>

TBD

7.4 Layout Recommendation

TBD

8. The Key Material List

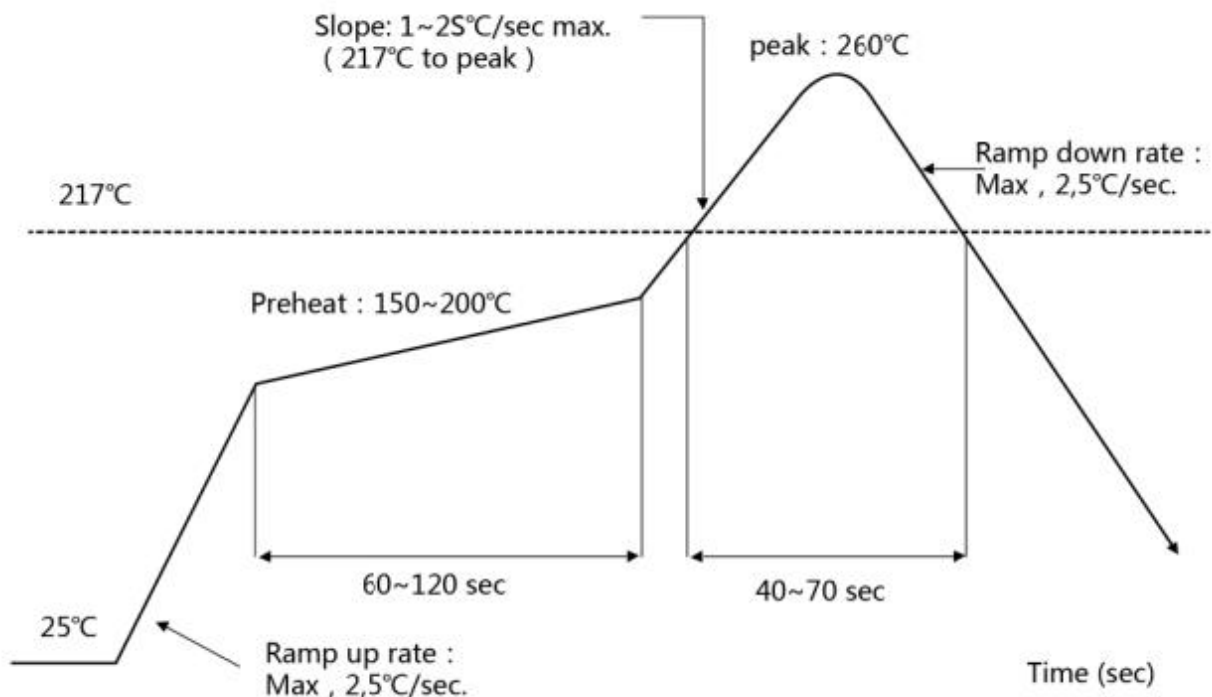
Item	Part Name	Description	Manufacturer
1	PCB	P106W-U,HDI 6L,FR4,17.7X15.8X0.8mm	XY-PCB, GDKX, Sunlord, SLPCB
2	Crystal	2016 26MHz ±8ppm 9pF	ECEC, Hosonic, TKD, JWT
3	Chipset	ASR1606, SoC, BGA238	ASR
4	Shielding	P106W-U Shielding	Suntech, JLT

9. Recommended Reflow Profile

Referred to IPC/JEDEC standard.

Peak Temperature : <260°C

Number of Times : ≤2 times

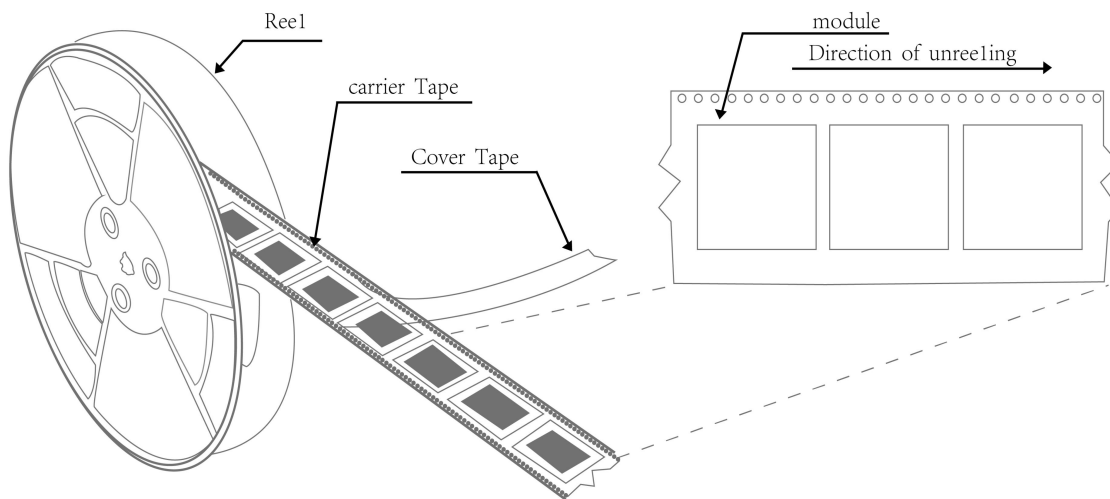


10. RoHS compliance

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:

- Calculated shelf life in sealed bag: 12 months at <math><40^{\circ}\text{C}</math> and <math><90\%</math> relative humidity (RH)
- Environmental condition during the production: - The maximum time between the opening of the sealed bag and the reflow process must be 168 hours if condition
- "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

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