Proprietary Information

IT900
PIM9A Product Brief
Datasheet

June 2019

IT900-DS-002-R1.1

PRELIMINARY information concerns products in the formative or design phase of development. Characteristic data and other specifications are design goals.
Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of YITRAN Technologies semiconductor products and disclaimers thereto appears at the end of this document.

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1. Introduction

The IT900-9A Plug-in Module (PIM9A) is a high-performance, cost-effective Powerline Communication (PLC) modem for a variety of applications, such as Smart Grid (AMR, AMM & AMI), Home Energy Management, M2M and additional industrial and commercial applications. The PIM9A is a ready to use module that allows straight forward integration (without a real need for manufacture's support), enables short time to market and quick field deployment with minimal efforts and resources.

2. PIM9A Variations

There are 7 variations of PIM-9A modules for 4 different frequency bands defined by the following regulations:

1. US (FCC: 120-400 kHz)
2. Japan (ARIB, MPT: 120-400 kHz)
3. Europe Outdoor:
    a. CA: (CENELEC Band A: 20-80 kHz)
    b. CA2: (CENELEC Band A: 72-92 kHz)
    c. CA3: (CENELEC Band A: 65-95 kHz)
    d. CA4: (CENELEC Band A: 45-95 kHz)
4. Europe Indoor: (CENELEC Band B: 95-125 kHz)

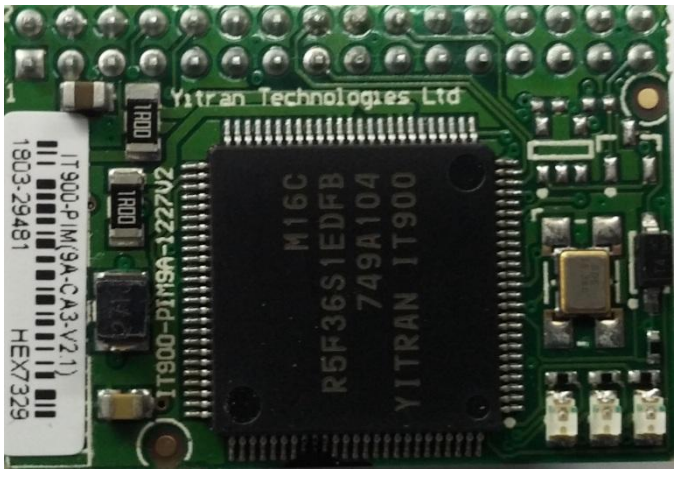

Figure 1: IT900 PIM9A

To facilitate the evaluation and development process, this PIM can be operated with Yitran's Starter Kit platform.

3. IT900 Block Diagram

The following diagram shows the IT900 PIM9A blocks:

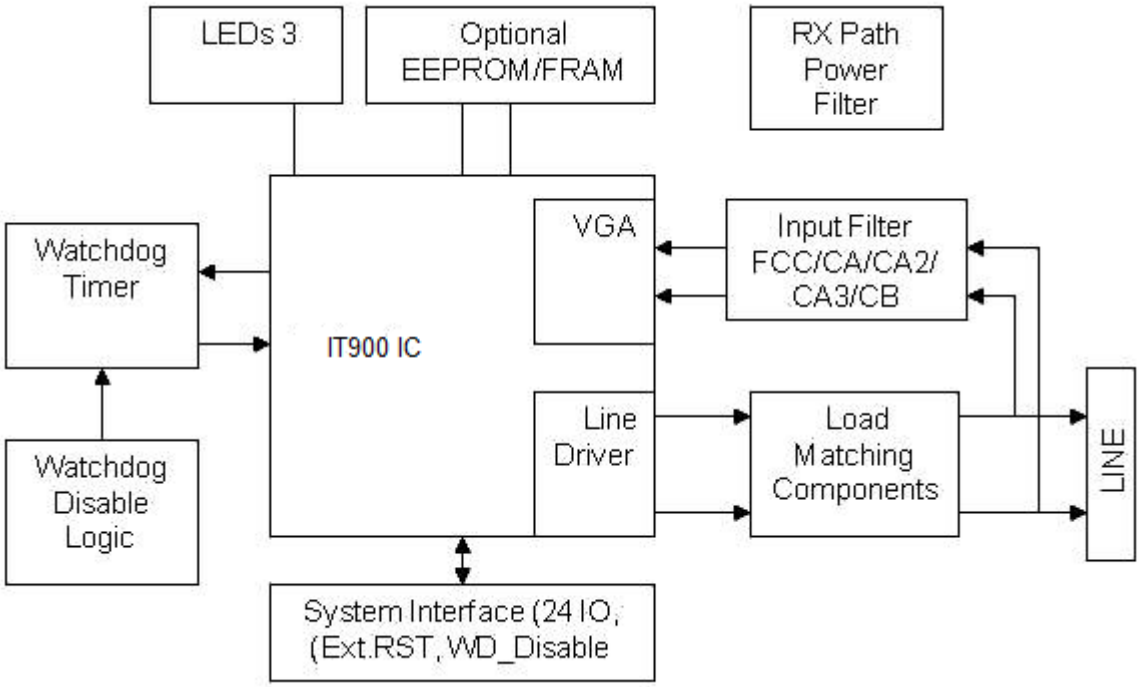

Figure 2: IT900 Block Diagram

4. IT900 PIM9A Main Features

- High-performance, cost-effective Powerline Communication (PLC) plug-in module.
- Incorporates Yitran's IT900 low-cost and robust PLC System-on-a-Cip (SoC).
- Compliant to HomePlug® Command and Control 1.0 (HPCC) standard.
- FCC, CENELEC & ARIB frequency bands & EMC compliance.
- Operation voltage: +3.3V±5%, 0.5A max.
- Dimensions: 23 x 33 mm
  - Height:
    - PCB: 1.6mm
    - Max. bottom: 4.5mm
    - Max. top: 2.42 mm
- Weight: 5.2gr (±1%).
- Temperature range:
  - Operation: -40 to +85 degC
  - Max. storage temperature: 105 degC
- Humidity range:
  - Operation: 20% - 100% (no condensation)
- Halogen Free, Lead Free, RoHS complaint
- CE IEC/EN 60950-1 compliant

5. IT900 PIM9A Main Applications

- Smart Grid Applications:
  - Automated Meter Reading (AMR)
  - Advanced Metering Infrastructure (AMI)
  - Demand Response & Real-Time pricing
- Smart Home & Energy Management:
  - Home & Building Automation
  - Home Appliance Control & Diagnostics
  - Security, Access and Environmental Control
- Industrial and Commercial Applications:
  - M2M
  - Street Light, Vending Machine, Signage Control

6. IT900 PIM9A Connector Pin out

The IT900 PIM9A incorporates a 32 pin gold-plated connector with the following signals:

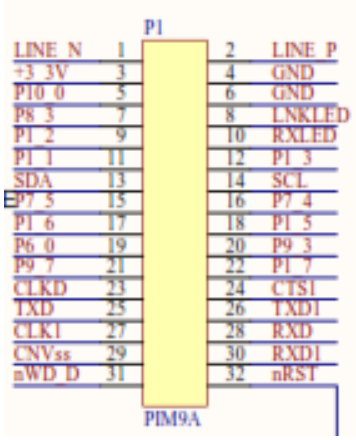

Figure 3: IT900 PIM9A Connector pin-out

The following table describes the interface signals:

Pin #	Signal or Function	Comment
1	LINE_N	Powerline Signal
2	LINEP	Powerline Signal
3	+3.3V	Power Supply +3.3V
4	GND	GND
5	P10_0	GIO
6	GND	GND
7	TX LED	TX LED / Active Low
8	LINK LED	Link LED / Active Low
9	P1_2	GIO
10	RX LED	RX LED / Active Low
11	P1_1	GIO
12	P1_3	GIO
13	SDA	I2C (SDA)
14	SCL	I2C (SCL)

Pin #	Signal or Function	Comment
15	P7_5	Safe Mode
16	P7_4	GIO
17	P1_6	GIO / System Monitor
18	P1_5	GIO
19	P6_0	UART SlowRate
20	P9_3	GIO
21	P9_7	GIO
22	P1_7	GIO
23	CLKD	GIO / JTAG (CLKD)
24	CTS1	GIO / JTAG (CTS1)
25	TXD	UART (TXD)
26	TXD1	GIO / JTAG (TXD1)
27	CLK1	GIO / JTAG (CLK1)
28	RXD	UART (RXD)
29	CNVss	GIO / JTAG (CNVss)
30	RXD1	GIO / JTAG (RXD1)
31	nWD_De	H/W Watchdog Disable
32	nRST	IT900 IC External Reset (Active Low)

Table 1: PIM9A Connector Pinout

7. PIM9A Connector Dimensions and Height Limitations

The IT900 PIM 9A connector consists of a single header with 2 rows of 16 pins. The picture below details the dimensions of the Female Connector for the IT900 PIM 9A.

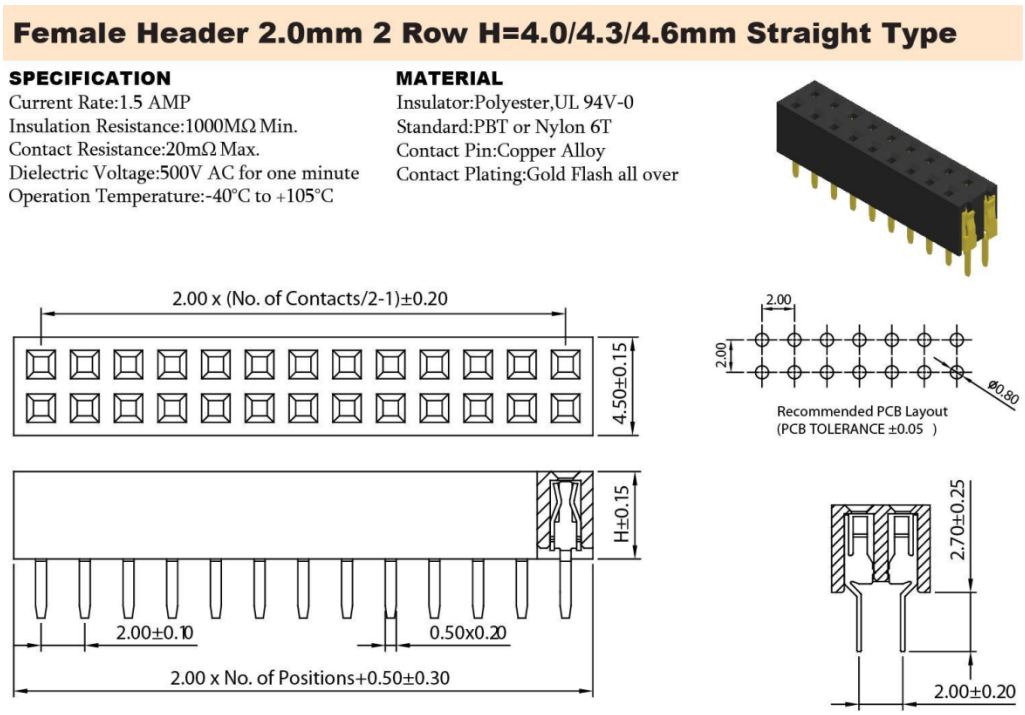

Figure 4: Female header specifications

Height limitations:

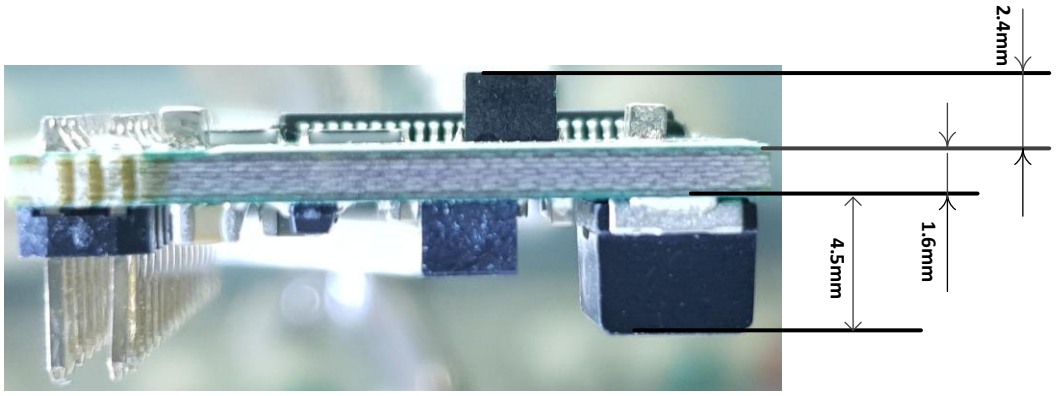

Figure 5: PIM9A Height Limitations

8. Led Indications

The IT900 PIM9A has the following LEDs with the following indications:

- RX mode – Green (dedicated line)
- TX mode – Red (configurable GPIO)
- LINK – Green (configurable GPIO)

9. Encryption

Symmetric Block Cipher Algorithm – 128-bit AES in CTR mode is available. The encryption algorithms are fixed and can't be modified by the user

10. Application Recommendations

It is recommended to use two bypass capacitors (100 uF Tantalum and 0.1 uF ceramic) connected to the power rail (+3.3V and GND). These capacitors must be located close to the power pin of the PIM.

11. Ordering Information

Part No.	Manufacture Code	Remarks
IT900-PIM9A-CA	1227V2.1-CA	Operation band 20-80 kHz
IT900-PIM9A-CA-NEA	1227V2.1-CA-NEA	Operation band 20-80 kHz. No Encryption
IT900-PIM9A-CA2	1227V2.1-CA2	Operation band 72-90 kHz
IT900-PIM9A-CA3	1227V2.1-CA3	Operation band 65-95 kHz
IT900-PIM9A-CA3-NEA	1227V2.1-CA3	Operation band 65-95 kHz. No Encryption
IT900-PIM9A-CA4	1227V2.1-CA4	Operation band 45-95 kHz
IT900-PIM9A-CB	1227V2.1-CB	Operation band 95-120 kHz
IT900-PIM9A-CB-NEA	1227V2.1-CB-NEA	Operation band 95-120 kHz. No Encryption
IT900-PIM9A-FC	1227V2.1-FC	Operation band 120-400 kHz
IT900-PIM9A-FC-NEA	1227V2.1-FC	Operation band 120-400 kHz. No Encryption

Table 2: PIM9A Ordering Information

Document Control

Revision	Date	Description
1.0	June 2019	Creation
1.1	December 2020	"Important Notice" updated
1.2	December 2020	Ordering information updated

Important Notice

YITRAN Technologies (YITRAN) reserve the right to make changes to their products (with exception of encryption algorithms) or to discontinue any product or service without notice, and advise customers to obtain the latest version of relevant information to verify, before placing orders, that information being relied on is current and complete. All products are sold subject to the terms and conditions of sale supplied at the time of order acknowledgement, including those pertaining to warranty, patent infringement, and limitation of liability.

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