



# IT900 PIM9A Product Brief Datasheet

June 2019

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**PRELIMINARY** information concerns products in the formative or design phase of development. Characteristic data and other specifications are design goals.

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**Proprietary Information**

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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)

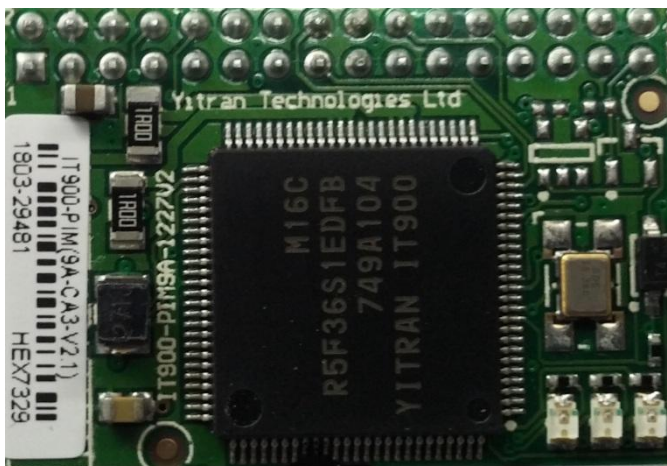


Figure 1: IT900 PIM9A

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:

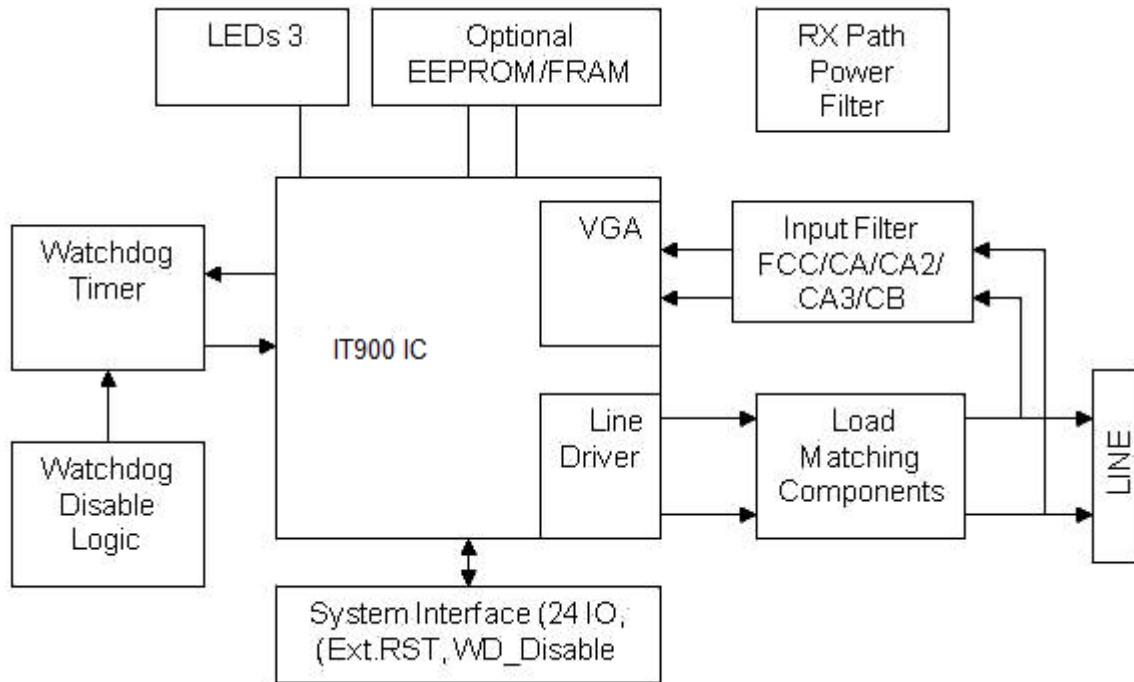


Figure 2: IT900 Block Diagram

## 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-Chip (SoC).
- Compliant to HomePlug® Command and Control 1.0 (HPCC) standard.
- FCC, CENELEC & ARIB frequency bands & EMC compliance.
- Operation voltage:  $+3.3V \pm 5\%$ , 0.5A max.
- Dimensions: 23 x 33 mm
  - Height:
    - PCB: 1.6mm
    - Max. bottom: 4.5mm
    - Max. top: 2.42 mm
- Weight: 5.2gr ( $\pm 1\%$ ).
- 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:

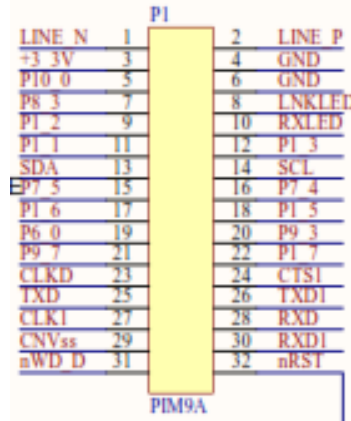


Figure 3: IT900 PIM9A Connector pin-out

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)

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<b>Pin #</b>	<b>Signal or Function</b>	<b>Comment</b>
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.

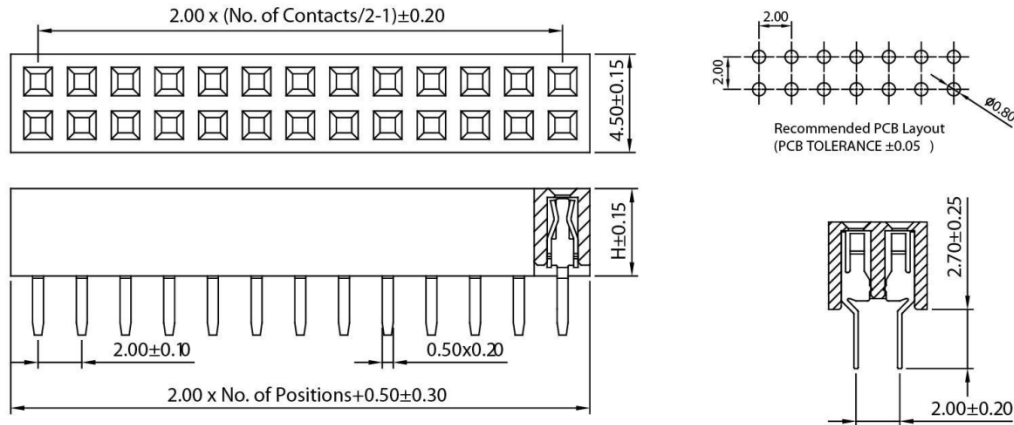
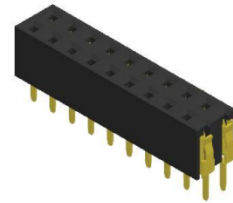
### Female Header 2.0mm 2 Row H=4.0/4.3/4.6mm Straight Type

**SPECIFICATION**

Current Rate:1.5 AMP  
 Insulation Resistance:1000MΩ Min.  
 Contact Resistance:20mΩ Max.  
 Dielectric Voltage:500V AC for one minute  
 Operation Temperature:-40°C to +105°C

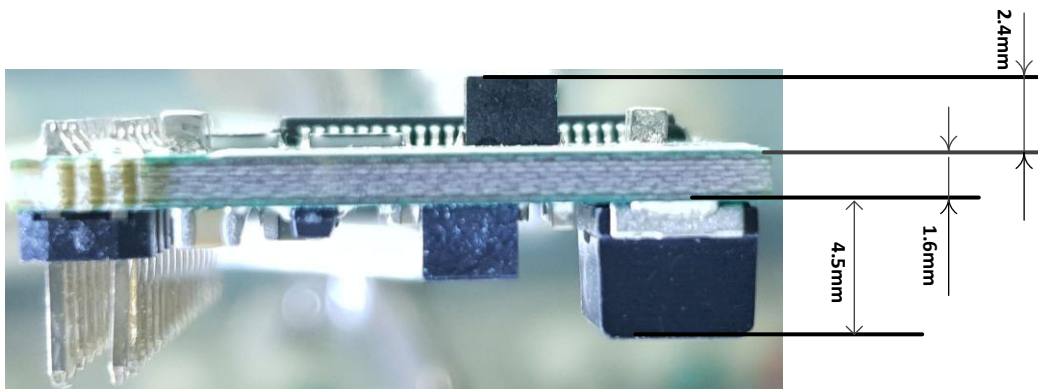
**MATERIAL**

Insulator:Polyester,UL 94V-0  
 Standard:PBT or Nylon 6T  
 Contact Pin:Copper Alloy  
 Contact Plating:Gold Flash all over



**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**

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**Document Control**

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

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