



DB2050

Wideband PLC DB2050 Module Specification 2.0.2

Issue No. 2.0.2: 2016.09

Detailed Revision History

Issue No.	Issue Date	Details of Change
1.0.0	2016.8.15	Init.
2.0.0	2016.9.14	Update chapter 1/2/3/4/5
2.0.1	2016.9.19	Add Mechanical Information
2.0.2	2016.9.26	Modify PIN Definition

Legal Information

Copyright

Copyright 2016 Dropbeats, Ltd. Co. All rights reserved.

The information in this document is proprietary and confidential to Dropbeats, Ltd. Co., and for its customers' internal use. In any event, no part of this document may be reproduced or redistributed in any form without the express written consent of Dropbeats, Ltd. Co.

[DB-xxxxxxx] ([Development Status][x]), ref [DB-yyyyyyy] ([Development Status][y])

Disclaimer

None of the information contained in this document constitutes an express or implied warranty by Dropbeats, Ltd. Co. as to the sufficiency, fitness or suitability for a particular purpose of any such information or the fitness, or suitability for a particular purpose, merchantability, performance, compatibility with other parts or systems, of any of the products of Dropbeats, Ltd. Co., or any portion thereof, referred to in this document. Dropbeats, Ltd. Co. expressly disclaims all representations and warranties of any kind regarding the contents or use of the information, including, but not limited to, express and implied warranties of accuracy, completeness, merchantability, fitness for a particular use, or non-infringement.

In no event will Dropbeats, Ltd. Co. be liable for any direct, indirect, special, incidental or consequential damages, including, but not limited to, lost profits, lost business or lost data resulting from any use of or reliance upon the information, whether or not Dropbeats, Ltd. Co. has been advised of the possibility of such damage.

Trademarks

For a complete list of Dropbeat's trademarks and registered trademarks, visit: <http://www.drop-beats.com/>

Patents

The technology discussed in this document is protected by one or more of the following patent grants:

U.S. Patent No. x,xxx,xxx, y,yyy,yyy. Canadian Patent No. xx,xxx,xxx, and so on. Other relevant patent grants may also exist.

Contacting Dropbeats

Dropbeats

123 Juli Road, Building 4, Shanghai, China

Tel: +86 (21) 5085-0752

Fax: +86 (21) 5085-0753

Document Information: document@drop-beats.com

Corporate Information: info@drop-beats.com

Technical Support: apps@drop-beats.com

Web Site: <http://www.drop-beats.com>

Table of Contents

Legal Information	3
Copyright	3
Disclaimer	3
Trademarks	3
Patents	3
Contacting Dropbeats	3
Table of Contents	4
Table of Figures	5
1 GENERAL DESCRIPTION	6
2 KEY FEATURES	7
3 BLOCK DIAGRAM	8
4 SPECIFICATIONS	9
5 PIN DEFINITION	10
5.1 Pin Assignment	10
5.2 Pin Definitions	10
6 ELECTRICAL CHARACTERISTICS	12
6.1 Recommended operating rating	12
6.2 Environment Storage Condition	12
6.3 DC Switching Thresholds	12
7 MECHANICAL INFORMATION	13



Table of Figures

Figure 1 Hybrid Interoperable Network..... 6
Figure 2 DB2050 Block Diagram 8
Figure 3 DB2050 Board Assembly 10
Figure 4 DB2050 Board Assembly 13
Figure 5 DB2050 Board Height 13
Figure 6 PIN Specifications 14
Figure 7 PCB Layout..... 14
Figure 8 DB2050 Module 3-Views 2..... 14

Dropbeats Technology

1 GENERAL DESCRIPTION

The Wideband DB2050 module offers a unique means of communication for a power-supply system, which takes full advantage of the wide coverage of power-line installations without having to lay dedicated cables. With mesh networking, HPAV devices can exchange data with HPAV gateway, which adapts the HPAV protocol with WIFI, within its network of control. The total 16 HPAV could be connected by HPAV /WIFI adapter.

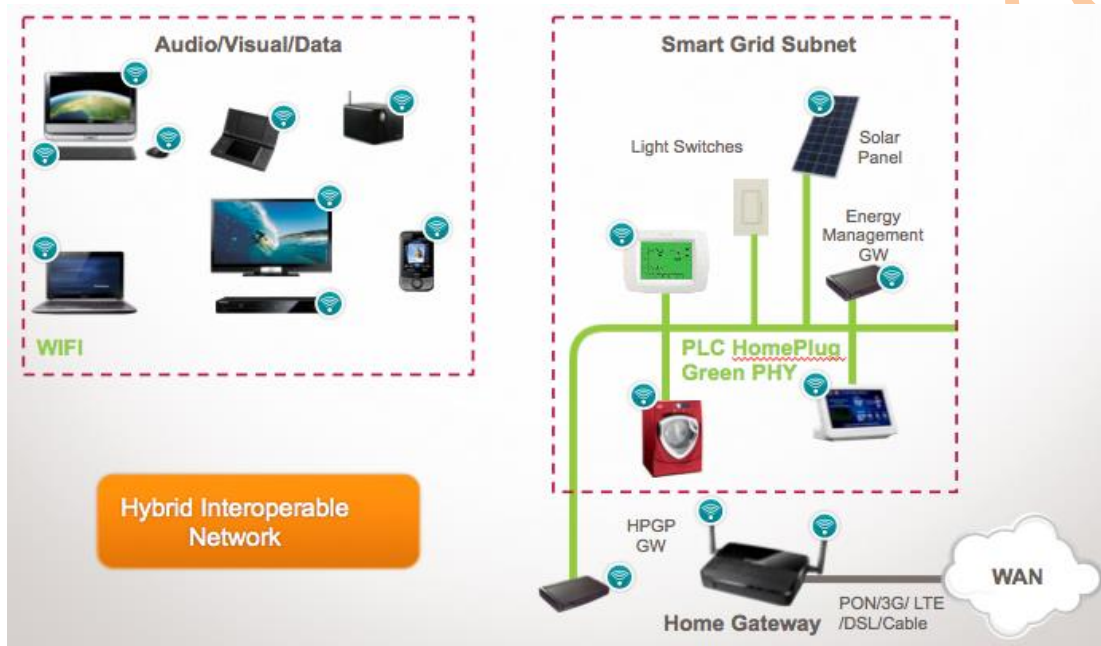


Figure 1 Hybrid Interoperable Network

The Wideband PLC DB2050 Module delivers a set of hardware module, software and service solution to device manufacturers who want their customers to connect domestic electrical appliances, sensors, switches to internet; connect outdoor industrial device to management and controlling center via power-line.

2 KEY FEATURES

- High performance 500 Mbps
- IEEE 1901 and HomePlug ® AV compliant
- Co-existence with HomePlug® 1.0 Nodes
- HomePlug AV chip: QCA7420
- Spectrum: 2-68MHz
- Modulation: Support OFDM 4096/1024/256/64/16/8-QAM,QPSK,BPSK and ROBO Modulation Schemes
- Subcarriers: 1334
- Subcarrier Space: 24.414KHz

3 BLOCK DIAGRAM

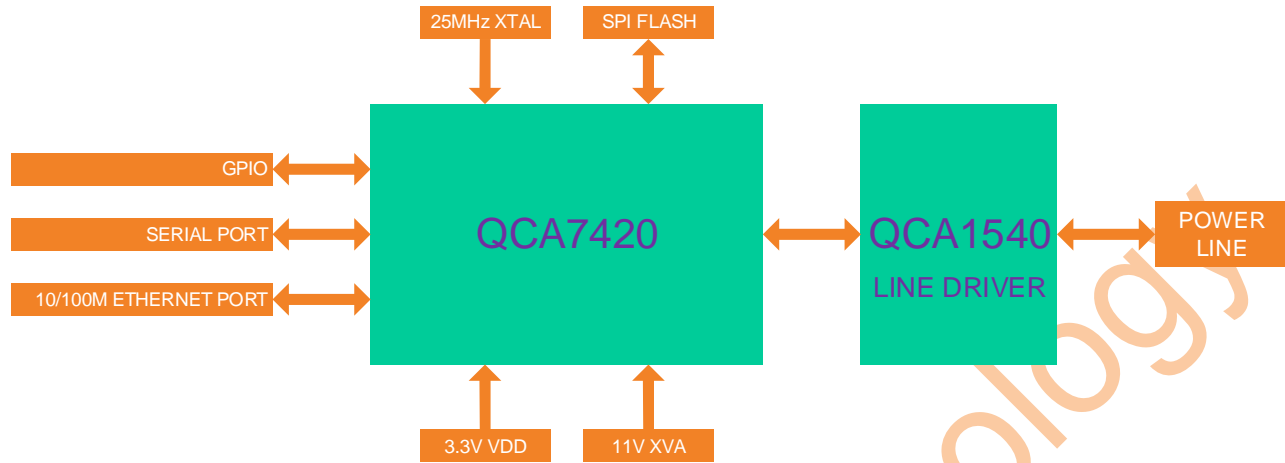


Figure 2 DB2050 Block Diagram

4 SPECIFICATIONS

- Ethernet PHY support
- GPIO and UART support
- Single 3.3 V power supply
- External PA Power supply
- 45mm*25mm, 4-layer design

Dropbeats Technology

5 PIN DEFINITION

5.1 Pin Assignment

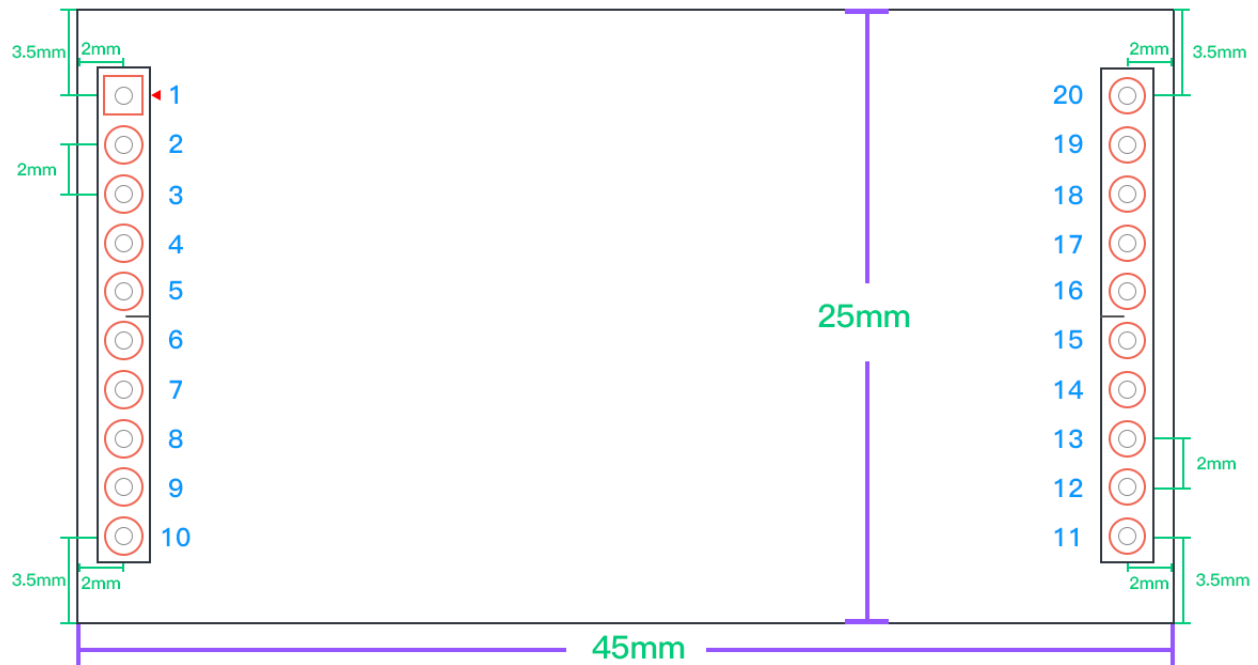


Figure 3 DB2050 Board Assembly

5.2 Pin Definitions

Pin	Name	I/O	Usage
1	2.0VD	P	Output ; 2.0V Power output for ETH Transformer.
2	2.0V PHY	P	Input; If capacitance coupling, this pin would be connected directly to PIN 1. If ETH PHY pins (3/4/5/6) connect to ETH transformer, this PIN would be floating.
3	EPHY_TXN0	OA	ETH PHY TX Differential Output Pair
4	EPHY_TXP0	OA	ETH PHY TX Differential Output Pair
5	EPHY_RXN0	IA	ETH PHY RX Differential Input Pair
6	ENET_RXP0	IA	ETH PHY RX Differential Input Pair
7	GPIO[3]	I/O	Input, Push button.
8	GND	P	Ground
9	3.3V	P	Input; 3.3V Power Supply.
10	XVA	P	Input; Power Supply for PA.



11	ZC_IN	IA	Power Line Zero Cross in. Note: The QCA7420 has an analog amplifier circuit that detects when the 50 Hz or 60 Hz AC power line voltage crosses through zero volts. This input pin is self-biased so it is AC coupled by a capacitor. This input only requires a small AC waveform of about 100mVpp.
12	TR1+	I/O	Power Line Coupling Transformer TR1+
13	TR1-	I/O	Power Line Coupling Transformer TR1-
14	GND	P	Ground
15	SERIAL_IO_3	I/O	Multiplexed pin used by UART Serial Out or SHARED_GPIO[7]
16	SERIAL_IO_0	I/O	SHARED_GPIO[4]
17	SERIAL_IO_4	I/O	Multiplexed pin used by UART Serial In or SHARED_GPIO[8]
18	SERIAL_IO_1	I/O	Multiplexed pin used by UART RTS or SHARED_GPIO[5]
19	SERIAL_IO_2	I/O	Multiplexed pin used by UART CTS or SHARED_GPIO[6]
20	RESET_L	IL	Power-On Reset; Active Low

The following nomenclature is used for signal types:

I/O A digital bidirectional signal

P A power or ground signal

IA Analog input signal

I Digital input signal

OA An analog output signal

OD An open-drain digital output signal

O A digital output signal

IH Input signals with weak internal pull-up, to prevent signals from floating when left open

IL Input signals with weak internal pull-down, to prevent signals from floating when left open

6 ELECTRICAL CHARACTERISTICS

6.1 Recommended operating rating

Symbol	Parameter	Min	Typ	Max	Units
3.3V	DB2050 Power Supply	3.13	3.3	3.46	V
XVA	DB2050 PA Power Supply	10	11.4	12.6	V

6.2 Environment Storage Condition

Environment condition	
Temperature	Operating Temperature: -0 deg.C ~70 deg.C
	Storage Temperature: -40 deg.C ~85 deg.C

6.3 DC Switching Thresholds

Symbol	Parameter	Test Conditions	Min	Max	Units
V_{IL}	Low-level input voltage		—	0.8	V
V_{IH}	High-level input voltage		2.0	—	V
V_{OL}	Low-level output voltage	$I_{OL} = 4 \text{ mA}, 12 \text{ mA}^1$	—	0.4	V
V_{OH}	High-level output voltage	$I_{OH} = -4 \text{ mA}, -12 \text{ mA}^2$	2.4	—	V
I_{IL}	Low-level input current	$V_I = \text{Gnd}$	-1	—	μA
I_{IH}	High-level input current	$V_I = \text{Vdd}$	—	1	μA
I_{OZ}	High-impedance output current	$\text{Gnd} \leq V_I \leq \text{Vdd}$	-1	+1	μA

1. $I_{OL} = 12 \text{ mA}$ for all GPIOs
 $I_{OL} = 4 \text{ mA}$ for all other interfaces
2. $I_{OH} = -12 \text{ mA}$ for all GPIOs,
 $I_{OH} = -4 \text{ mA}$ for all other interfaces



7 MECHANICAL INFORMATION

PCB Assembly Dimension as following:

- Dimension (W x L): 45mm x 25mm
- PCB: 4 layer design

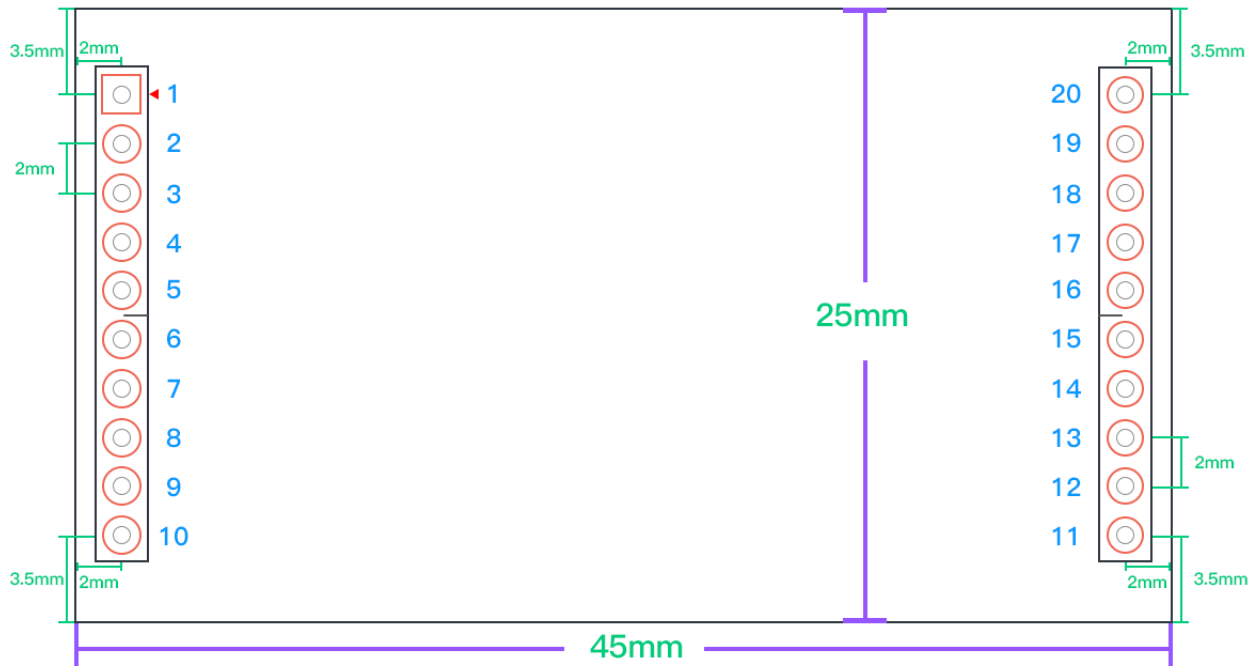


Figure 4 DB2050 Board Assembly

Module Height (Unit: mm):

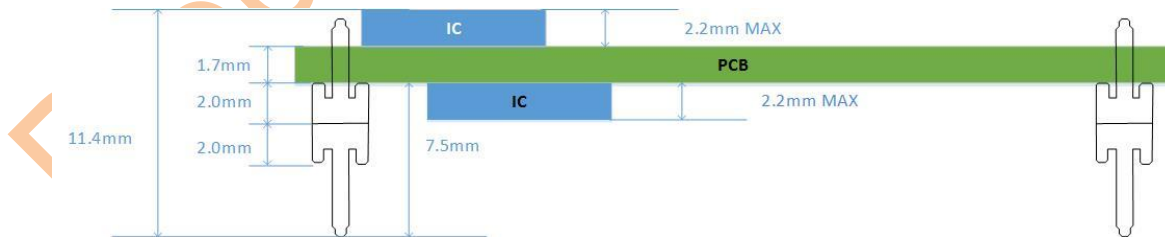


Figure 5 DB2050 Board Height

PIN Specifications (Unit: mm):

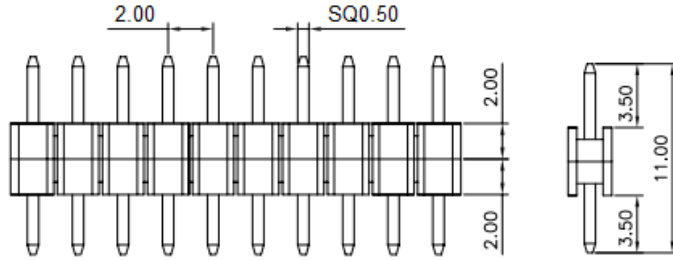


Figure 6 PIN Specifications

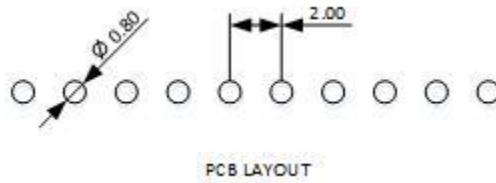


Figure 7 PCB Layout

DB2050 Module 3-Views:



Figure 8 DB2050 Module 3-Views 2