POWERBUS

EV620 Core Circuit Board

Description:	connect/reference devices	
EV620 The core circuit board of PB620。	EV721/HP	The master evaluation board
EV620 contains the core circuit part of the PB620 manual and can be used as a module in batch ,it can also be plugged into EV721/HP for networking test .	PB620	The master chip adopting powerbus
	PB331	The slave chip adopting powerbus

## Core Circuit Part in Main Station

Characteristics

◇　　Anti-interference ability and long -line performance
◇　　Are significantly enhanced
◇　　Low cost solution

Circuit function and advantage

The module is the core circuit part of evaluation board with master chip PB620

The board is designed with master chip PB620 and can be plugged into EV721/HP board for networking test .

You can design the device layout of POWERBUS master station.the design with stamp hole can be directly used as powerbus control sub-board for production.
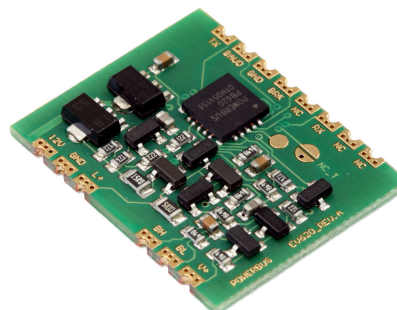
ABSOLUTE MAXIMUM RATINGS [†]

table 1.

Parameter	rating
V+ to GND	54 V
L+ to GND	54 V
V_{cc} to GND	20 V
TX to GND	-0.3 V to 4V
RX to GND	-0.3 V to 4V
BAUD to GND	-0.3 V to 4V
Storage Temperature Range	−55℃ to +125℃
Operating Temperature Range	−40℃ to +85℃
Storage humidity	95%
BRK to GND	20 mA
Lead Temperature Range	300℃
（ Soldering 10 sec)	
ESD rating（HBM）	4KV
ESD rating（CDM）	2KV
ESD rating（MM）	400V

† Stresses above those listed under Absolute Maximum Ratings may cause permanent damage to the device ,Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

ESD CAUTION

ESD(Electrostatic discharge) sensitive device . charged device and circuit board can discharge without detection ,although this product feature patented or proprietary protection circuitry ,damage may occur on devices subject to high energy ESD. therefor ,proper ESD precautions should be taken to avoid performance degradation or loss of functionality.
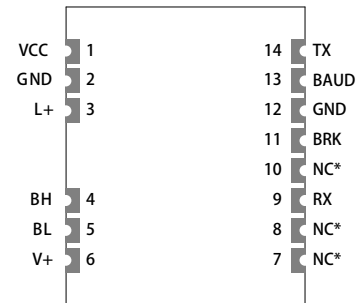
PIN CONFIGURATIONS

Figure 1
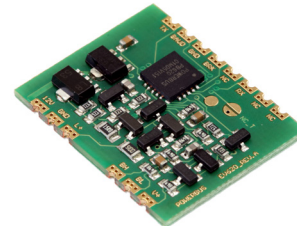
PIN CONNECTIONS
Top View

*NC = NO CONNECT. DO NOT CONNECT TO THIS PIN.

TABLE. 2 .TERMINAL FUNCTIONS .

PIN NUMBER	PIN NAME	FUNCTION
1	VCC	Power supply input
2	GND	Ground
3	L+	POWERBUS line output
4	BH	MOSFET driver
5	BL	Powerbus line driver
6	V+	DC source detection
7	NC	No connect
8	NC	No connect
9	RX	Data receiver, connecting to MCU TX
10	NC	No connect
11	BRK	Powerbus fault indicator, Low level output when fault happens
12	GND	Ground
13 [1]	BAUD	Baud rate setting, Connecting to GND for 2400bps ,Floating for 9600bps
14	TX	Data transmitter, Connecting to MCU RX

(1) Connecting to GND for 2400bps , supply maximum current 20A.

1 Start quickly

Required equipments

◆ EV620 **centre controller board**
◆ EV721/HP **master board**
◆ **Slave board with Powerbus interface**

Steps

Note：make sure that the power is not turned on until the connections are completed

Figure 2

1）Place the needles into socket of EV721/HP as shown in figure 2 , both 2.54mm spacing round and squre needles are allowed .

2) Press EV620 over needles as shown in figure 3 .

3）Weld the board and needle properly ,and pay attention to the full solder to ensure strength .

4）Referring to EV721/HP manual ,start testing

Figure 3

【attention】Be sure to insert the needles into the holes before welding to ensure that the space and angle of the needles are perpendicular to the 2.54mm space grid .
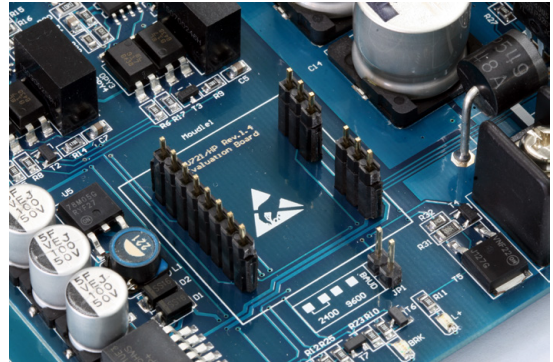
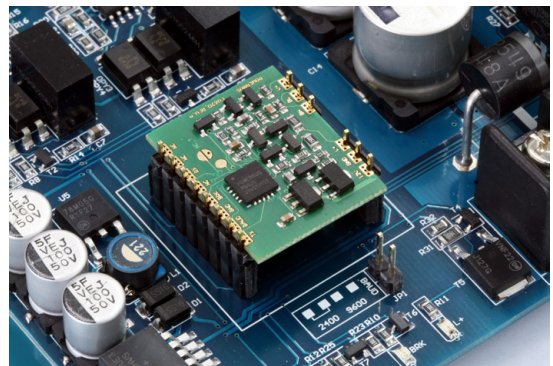# 2 EV620 Application information

2.1 Vcc input

Vcc input of EV620 board uses LM317L in samll package , Because the device generates heat when it works , the input voltage range of the port is recommended 12V-18V ,or LM317L may heat up a lot using high voltage . The method of this parts selection is detailed in PB620 manual .

2.2 LDO on board and 3.3V TTL

EV620 board contains 3.3V LDO,attention,the input voltage of PB620 and TTL power of UART interface are 3.3V ,if MCU can not use 3.3V, TTL level conversion should be carried out , detailed in PB620 manual .

1.BAUD rate setting

Pin13 can switch 9600bps and 2400bps，connect this pin to ground means 2400bps UART rate at 20A current.

table 3. BAUD pin setting

| pin	I/0 direction	Status	Function
BAUD（Pin13)	input	High/Floating	9600bps @ 5A Max
		Low	2400bps @ 20A Max

2 .

The board is the centre controller of PB620 ,there are no devices on bottom ,single-sided layout , can be used as sub-board and welded directly to the master board . recommended layout size as follows :
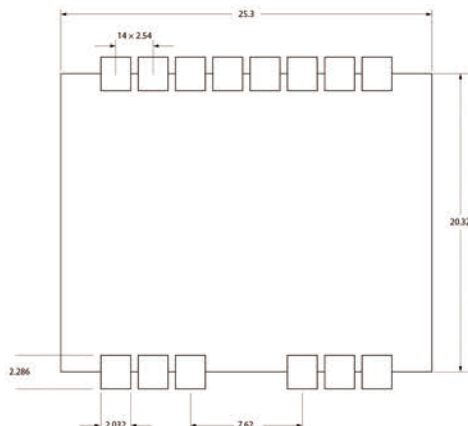
NOTES: A. All linear dimensios are in millimeters

3. EV620 application circuit

EV620 application needs other parts except centre controller circuit , detailed in PB620 manual
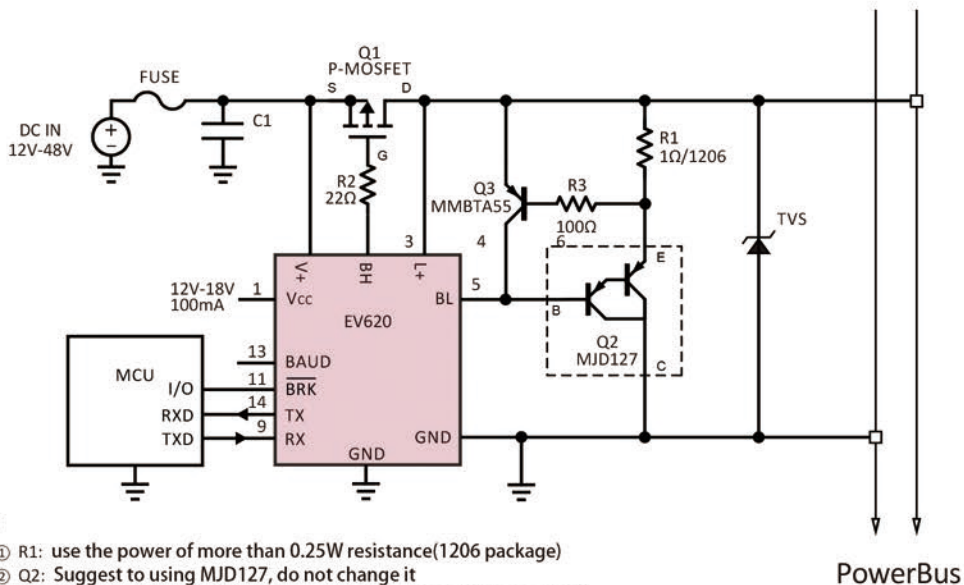
NOTE:
① R1: use the power of more than 0.25W resistance(1206 package)
② Q2: Suggest to using MJD127, do not change it
③ Other resistances permit to use package as small as 0603 except R1

Figure 4 . Basic application circuit

3 EV620 Schematic diagram

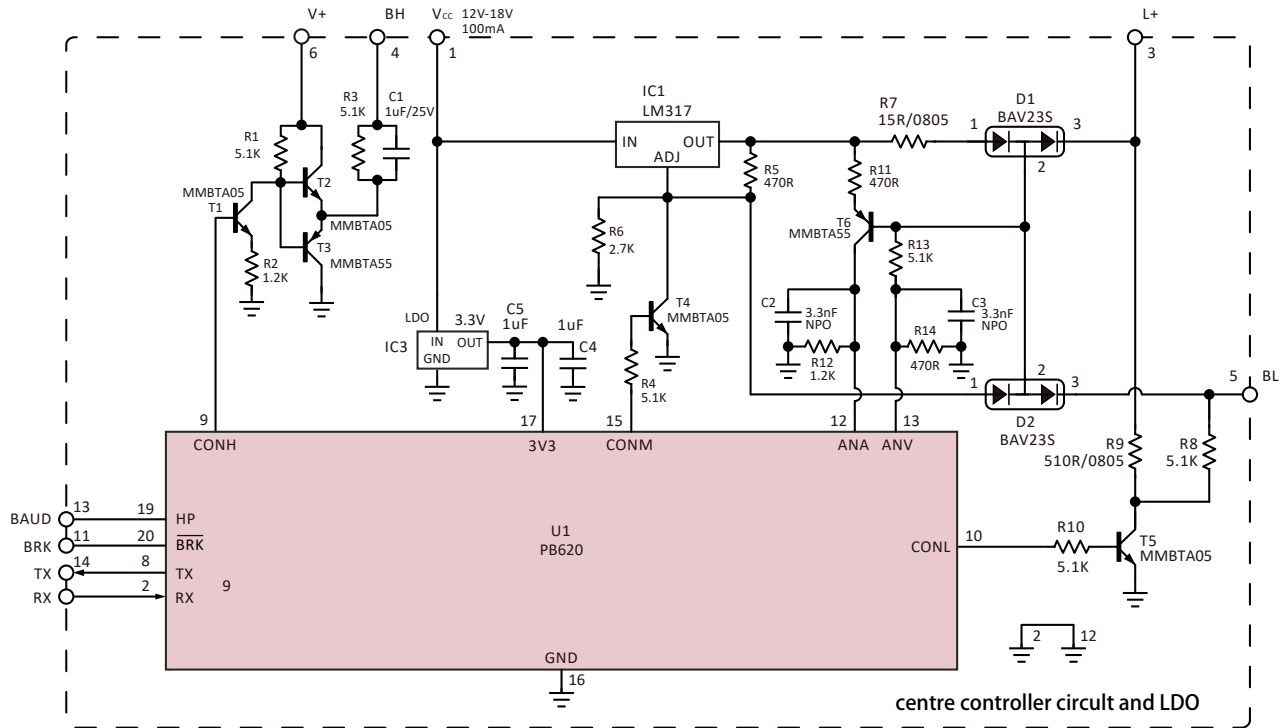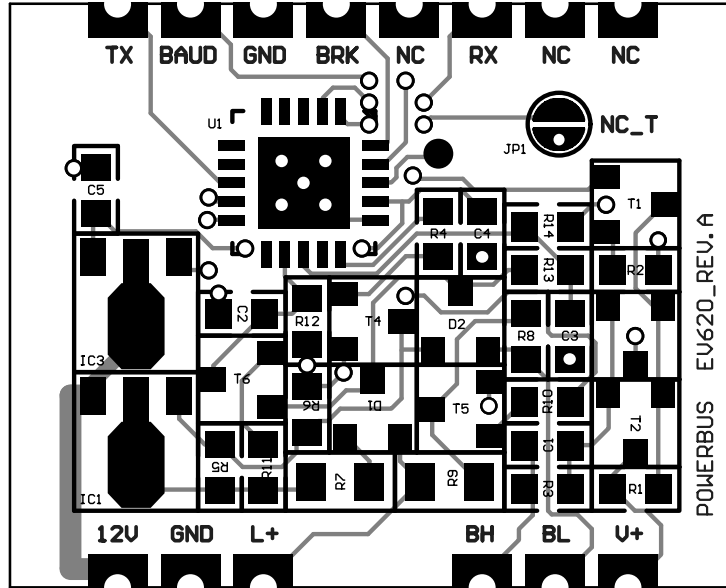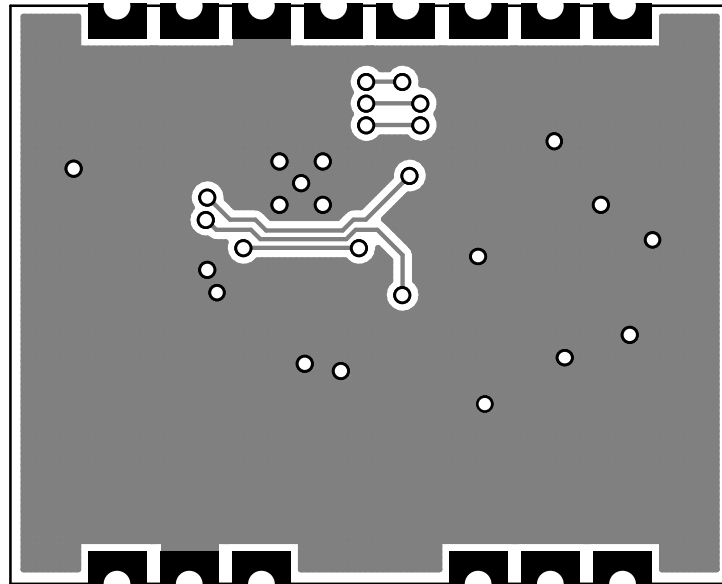The circuit is the centre controller diagram of PB620 with a 3.3V LDO on it .

Figure 4 *EV620 Schematic diagram*

4   Board Layout

Top Layer

Bottom Layer

5 Bill of Materials

Bill of Materials - EV620

Marks	Partsnu	Pkg	Description
R1 R3 R4 R8 R10 R13	5.1K 1%	0603	YAGEO RC0603FR-075K11L
R2 R12	1.2K 1%	0603	YAGEO RC0603FR-071K2L
R14 R11 R15	470R 1%	0603	YAGEO RC0603FR-07470RL
R6	2.7K 1%	0603	YAGEO RC0603FR-072K7L
R9	510R 1%	0805	YAGEO RC0805FR-07510RL
R7	15R 1%	0805	YAGEO RC0805FR-0715RL
C1 C4 C5	105/35V(X7R)	0603	TDK C1608X7R1V105K080
C2 C3	3.3nF(npo)	0603	TDK C1608C0G1H332J080
T1 T2 T4 T5	MMBTA05	SOT-23	DIODES MMBTA05-7-F
T3 T6	MMBTA55	SOT-23	DIODES MMBTA55-7-F
D1 D2	BAV23S	SOT-23	DIODES BAV23S-7-F
IC3	HT7533	SOT-89	HOLTEK HT7533 100mA 3.3V LDO
IC1	LM317L	SOT-89	Texas Instruments LM317LIPK
U1	PB620	QFN-20	PowerBus PB620