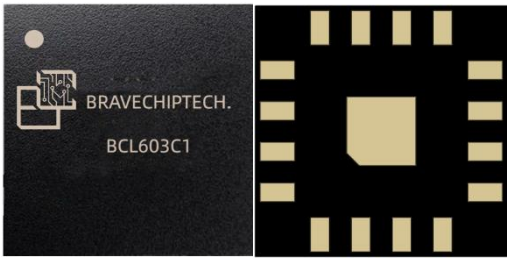
BCL603C1 Smart Ring Chiplet Datasheet



Features

- It integrates 27 devices such as load switches, NTC, TVS, overvoltage protection chips, MOSFET resistors and capacitors
- Operating voltage: 3.6V to 5.5V
- Adjustment of input voltage direction (non-polar input)
- The TVS protection voltage is 5.6V and the clamping voltage is 9.8V
- Overvoltage protection: 6V, output short circuit and overcurrent protection
- ESD: Air discharge ±15kV, contact discharge: 8kV
- Low-power and high-speed load switch
- Low-level reset circuit upon power-on (200ms)
- Temperature monitoring NTC
- Operating temperature range: -40℃ to 80℃

Application

- Smart Health ring
- XR space interactive controller
- Wearable devices
- Anti-loss device
- Data transparent module
- Miniaturized Bluetooth device

Number	Package Type	Type
BCL603C1	（4×4mm）	Tape

Description

BCL603C1 is a highly integrated and ultra-low power consumption Chiplet dedicated charging front-end protection chip for smart rings. It adopts a 4mm wide LGA package form. The smart ring can be designed with a two-layer board FPC, reducing the BOM number by 85% and ensuring a yield of over 95% when bending the PCBA.

Revision record：

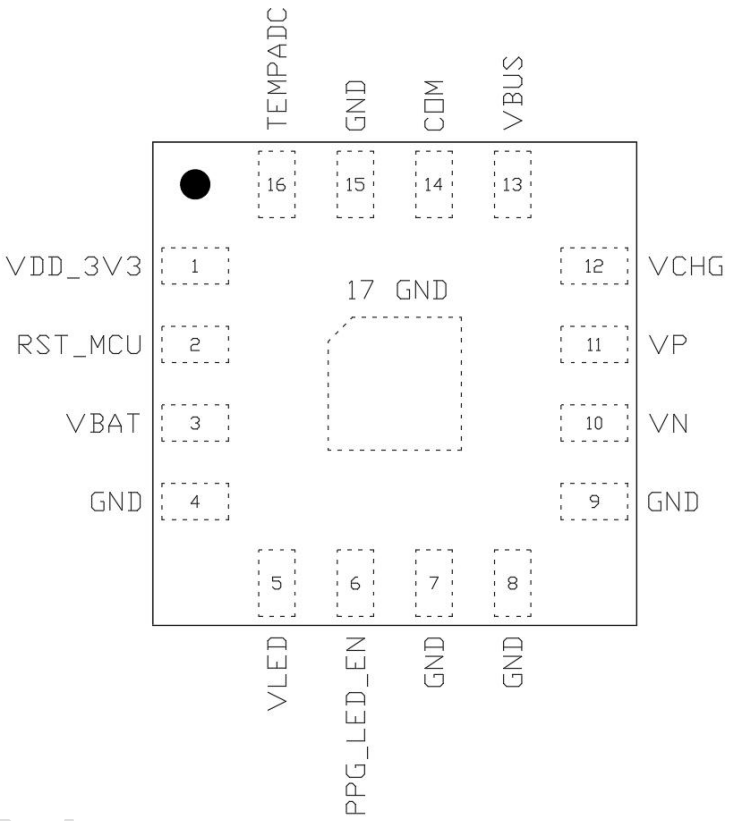
Version	Name	Date	Description
V1.0	Danlei Wang	2025.05.12	Original version
V1.1	Danlei Wang	2025.05.28	Modify the pin definitions and update the typical circuit diagrams

Catalogue

1、 Introduction

BCL603C1 adopts Chiplet technology to integrate 27 components including load switches, NTC, TVS, overvoltage protection chips, MOSFET resistors and capacitors, etc. It is specially designed for smart ring applications, significantly reducing product size, improving production yield, and simplifying clock and RF design.

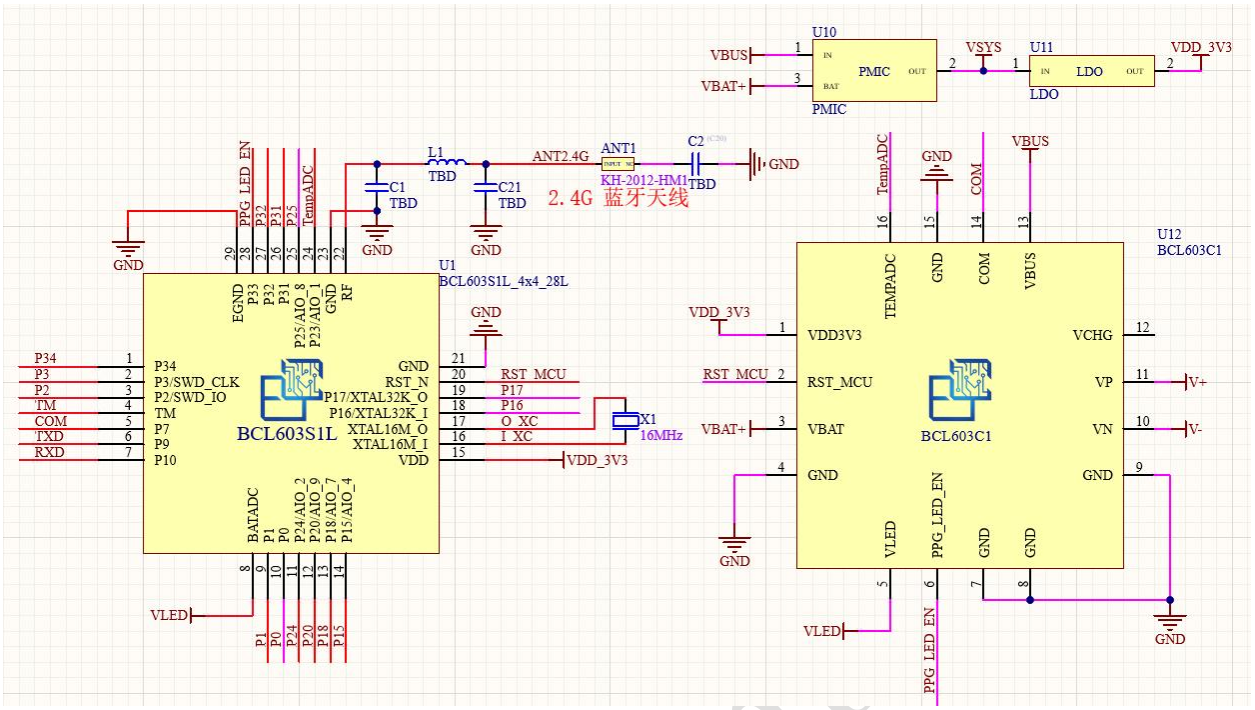
2、 Pin description



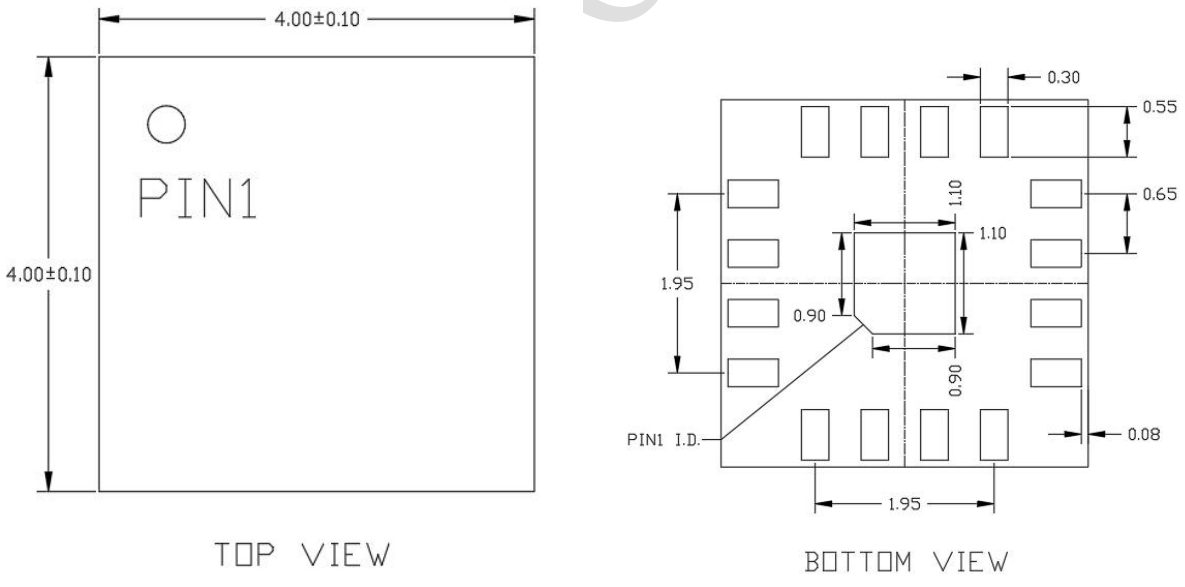
引脚编号	引脚名称	类型	说明
1	VDD3V3	Power	The charging reset circuit RST is pulled up for power supply and connected to the power supply voltage of the MCU
2	RST_MCU	Debugging	Charge and reset for 200ms low-level output, connect to the MCU reset pin
3	VBAT	Power	The internal load switch input is usually connected to the positive terminal of the battery

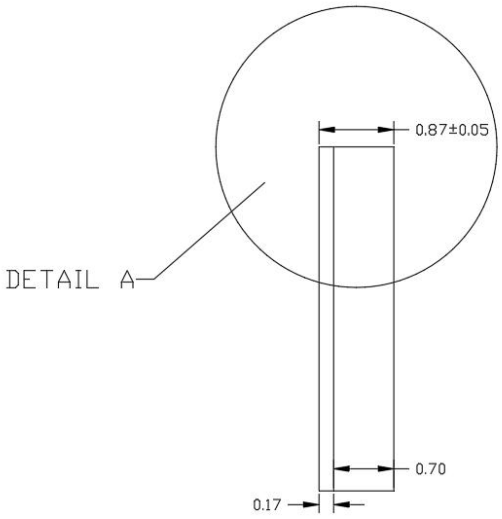
4	GND	Power	Ground
5	VLED	Power	Internal load switch output
6	PPG_LED_EN	Control input	Internal load switch enables control, high-level output, dangling or ground off
7	GND	Power	Ground
8	GND	Power	Ground
9	GND	Power	Ground
10	VN	Power	VP and VN are the internal rectifier bridge inputs, connected to 5V charging, non-polar, and usually charged by dual-electrode magnetic attraction
11	VP	Power	
12	VCHG	Power	Internal rectifier bridge output
13	VBUS	Power	The internal charging protection chip output is connected to the PMIC for power supply
14	COM	I/O	Data communication: When the charging port is multiplexed as a serial port, the communication pin is connected to the MCU IO
15	GND	Power	Ground
16	TEMPADC	Analog output	Temperature acquisition pin, internal NTC output, connected to the MCU ADC pin
17	GND	Power	The bottom pad of the chip and the power supply are grounded

3、Typical circuit



4、 Package Dimensions





SIDE VIEW