

User Manual

BMP561 EVM

Version: V1.0

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1. Introduction

The BMP561EVM is an evaluation module (EVM) designed to test the BMP561 lithium battery fuel gauge IC. It includes the BMP561 IC and all necessary components to accurately measure and estimate the capacity of lithium-ion or lithium-polymer batteries.

1.1 Key Features

- Complete fuel gauge evaluation solution
- Pre-installed circuit modules for fast setup
- Supports data logging and system parameter configuration via PC

2. BMP561-Based Circuit Evaluation Module

The BMP561 EVM integrates the BMP561 fuel gauge IC and an external sense resistor for precise lithium-ion battery capacity measurement.

It requires a battery (or power supply) and an I2C communication link (via the communication box). The module also supports connection to loads or chargers for charge/discharge testing.

2.1 Evaluation Module Interface Connections

- Battery/Power: Connect battery positive (B+) and negative (B-) terminals via connector P1.
- System Load/Charger: Connect through P2 terminals (P/C+ and P/C-) for charging and discharging.
- I2C Communication: Connect to PC using USB interface through P5 pins (SDA, SCL, GND).
- Signal Output: GPIO0 and GPIO1 pins serve as general-purpose IO and programming interface (SWDIO, SWCLK).



2.2 Pin Description

Pin Name	Description					
B+	Battery positive terminal					
В-	Battery negative terminal					
P+	System positive terminal					
P-	System negative terminal					
SDA	I2C data line					
SCL	I2C clock line					
GND	System ground					
GPIO0,GPIO1,GPIO4~GPIO7,GPIO9	GPIO ports					

3. Evaluation Module Details

This section includes the PCB layout, bill of materials (BOM), and schematic of the BMP561 circuit module.

3.1 PCB Layout

Includes top and bottom layers and assembly details (Figures 3-1, 3-2).





Figures 3-1



Figures 3-2

3.2 Schematic

Partial circuit diagram provided. (Figure 3-3).



Figure 3-3



3.3	Bill of	Materials	(BOM)
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Designator	Comment	Quantity	Description	Footprint
C1	1uF/±10%/50V /X7R	1	Surface-Mount Capacitors	C0201
C2, C3	10nF/±10%/50V /X7R	2	Surface-Mount Capacitors	C0201
		4		DFN1006-2L
D1, D2, D3, D4	IPDIEIUDUODPIK	4	ESD	-BI
J4	1x 3-Pin Header (Pins 2-1)	1	3PIN	SP3-2.54
JP4, JP5, JP6, JP7	2x Jumper Caps	4	2PIN	SP2-2.54
P1, P2	KF301/5.08/2P	2	Header, 2-Pin	sp2-5.08
P3, P5	Header 4	2	1x 4-Pin Header	
P4	Header 6	1	1x 6-Pin Header	
P6	XH-2A	1	Wire-To-Board Connectors	
P7	Header 3	1	1x 6-Pin Header	
P8	Header 2	1	NC	
R1	1K/±1% /50mW	1	Surface-Mount Resistors	0402
R2	1mΩ/±1% /3W	1	Surface-Mount Resistors	1206
R6, R7	0Ω/±1% /50mW	2	Surface-Mount Resistors	0201
R9, R10, R18,	1000/±1% /50mW	1	Surface Mount Posisters	0402
R19	10022/±1 % /301100	4	Sullace-would Resistors	0402
R13, R14	10K/±1% /50mW	2	Surface-Mount Resistors	0402
R15	10Ω/±1% /50mW	1	Surface-Mount Resistors	0402
R16, R17	100Ω/±1% /50mW	2	Surface-Mount Resistors	0201
U1	BMP561_QFN16	1		QFN16

4. EVM Hardware and Software Setup

This section explains how to connect the BMP561EVM to a PC and how to set up its components.

4.1 System Requirements

The BMP-TOOL software supports Windows XP or later. Earlier versions may not support the USB driver.

4.2 **Software Installation**

Follow the BMP-TOOL installation guide to install the host software.



4.3 Hardware Connections

The BMP561 evaluation system needs two main connections: a battery cell and an I2C communication box. To test charging and discharging, you can also connect a system load or charger.

The diagram below shows how to connect the BMP561 module to the battery and load/charger.



- Jumper Settings:
- **P3:** Chip Enable (CE).
- **JP6:** Connects chip BAT to B+.
- **JP4/JP5:** I2C clock and data pull-up.
- **J4:** Select external VCC or P/C+ for I2C pull-up.
- **JP7:** TS chip, enabling the external NTC sensor by connecting this jumper.



5. Startup

- When powering the board via a power supply or a battery connected to P1, make sure P3 (CE and BSNS pins shorted) and the JP6 jumper are connected.
- 2) After powering on, connect the communication box and open the BMP_Tool software.

B Panel:	Channel:	电量计	奇存器 参数 台	命令栏	校准	通	刊调试 认证说	周试	固件文件提	附作	数据监控表格	数据监控折线图
查询 停止扫描	Config	Registe O Scar	n All Standard Instructions	Scan A	AII.							
	CHIP	Scan	Name	Value	Unit	Scan	Name	Value	Unit	Scan	Name	
	Chann	el_Confg								×	Cell 1 Curre	
	Gauge	I Moo	ibus PID/SN				Enable				Cell 1 Powe	
	Device Channe FW_ID	1.1 352	UCB\VID_314B&	PID_110	3\A0000	000000	1 0				Power	一键查询
	addres Channe	2	2								Int Tempera	间隔时间(ms):
h	Channe	13	4				0				TS1 Temper	1000
	Voltag Channe	4					0				Cell Temper	周期查询
0%	Soc: Clo	ie 🛛									Cell 1 Raw \	
											Wake Comp	开始保存
			Relative State of Charge		%		Temp Lo Set		degC		Flt Rem Q	
1			Remaining Capacity		mAh		Temp Lo Clear		degC		Flt Rem E	
1000 1000 Current			Full charge Capacity		mAh		SOC Delta Set		%	~	Flt Full Chg	
2000	Current	\checkmark	Average Time to Empty		min	\checkmark	BTP Dsg Set		mAh/%	\checkmark	Flt Full Chg	
··· 👂 💷		\checkmark	Average Time to Full		min	\checkmark	BTP Chg Set		mAh/%	\checkmark	True Rem Q	
4000 1000		172	Max Load Current		mA	122	Charoino Current		m4h/%		True Rem F	

3) In the software, click Config, select I2C for Modbus communication. Once connected, the communication box LED turns green, and the software will display battery capacity, current, voltage, and other data.

文件 ~ 语言设置	~ 帮助 ~	-						2	022			
SB Panel:	Channel:	电量计	寄存器参数 含	命令栏	校准	通讯	调试 认证调试	C (2	计文件操作	F ŝ	数据监控表格	数据监控折线图
查询 停止扫描	Config	Register	n All Standard Instructions	Scan Al	i.							
	CHIP	Scan	Name	Value	Unit	Scan	Name	Value	Unit	Scan	Name	
		\checkmark	Manufacturer Access	0x0077	hex	\checkmark	Turbo Rhf	1	mOhm	\checkmark	Cell 1 Curi	
	Gauge	\checkmark	At Rate	-489	mA	\checkmark	Turbo Vx	39	mV	\checkmark	Cell 1 Pow	. 23
	FW_ID	\checkmark	At Rate Time To Empty	769	min	\checkmark	Volt Hi Set	4500	mV	\checkmark	Power	一键查询
	address	\checkmark	Temperature	-40.0	degC	\checkmark	Volt Hi Clear	4400	mV	\checkmark	Int Tempe	间隔时间(ms):
4	Voltage:		Voltage	3299	mV	\checkmark	Volt Lo Set	2500	mV		TS1 Temp	1000
	vonage.	\checkmark	Current	-5	mA	\checkmark	Volt Lo Clear	2600	mV 🕑		Cell Temp	周期查询
0%	Soc:	\checkmark	Average Current	-7	mA	\checkmark	Temp Hi Set	60	degC	\checkmark	Cell 1 Raw	
		\checkmark	Average Power	-23	cW		Temp Hi Clear	55	degC		Wake Con	开始保存
		\checkmark	Relative State of Charge	0	96	\checkmark	Temp Lo Set	0	degC	\checkmark	Flt Rem Q	
22			Remaining Capacity	0	mAh		Temp Lo Clear	5	degC		Flt Rem E	
1000 1000	Current:	\checkmark	Full charge Capacity	4632	mAh	\checkmark	SOC Delta Set	1	%	\checkmark	Flt Full Ch	
2000			Average Time to Empty	65535	min	\checkmark	BTP Dsg Set	-10	mAh/%	\checkmark	Flt Full Ch	
3000 300	00	\checkmark	Average Time to Full	43690	min	\checkmark	BTP Chg Set	1	mAh/%	\checkmark	True Rem	
4000 Current 3000		\checkmark	Max Load Current	16140	mA	\checkmark	Charging Current	0	mAh/%	\checkmark	True Rem	

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