CB 350M6918 A Series, Automotive, 0.5% Tolerance
Operation Temperature -40℃~+105℃
Shunt Based Current Sensor

1、Characteristics

- Current Measurement Range： -8000A~+8000A
  - Continuous Operating Range： -350A~+350A
  - Measurement Accuracy： ±0.5%
- Temperature Measurement Range -50℃~+150℃
- Communication Protocol： CAN2.0 A/B
  - Selectable Data Format
  - Configurable CAN ID
  - Configurable CAN Speed： 250Kbps/500Kbps/1Mbps
  - CB350M6918A0/1XS： Configured 120Ω Terminal Resistor
  - CB350M6918A0/1XN： No Terminal Resistor

- Supply Voltage： 6V~18V
- Operation Temperature Range： -40℃~+105℃
- Power Consumption： ≤216mW @12VDC
- Galvanic Isolation： 3000VAC

3、Applications

- Automotive Cu rrent Monitor
- Grid Energy Storage
- UPS
- Charging Station

2、Introduction

CB350M6918A current sensor is an automotive current sensing module, which can be used to measure bidirectional DC current. Featuring high accuracy, low power consumption, wide operating temperature range, excellent response speed, temperature stability and anti-interference ability.

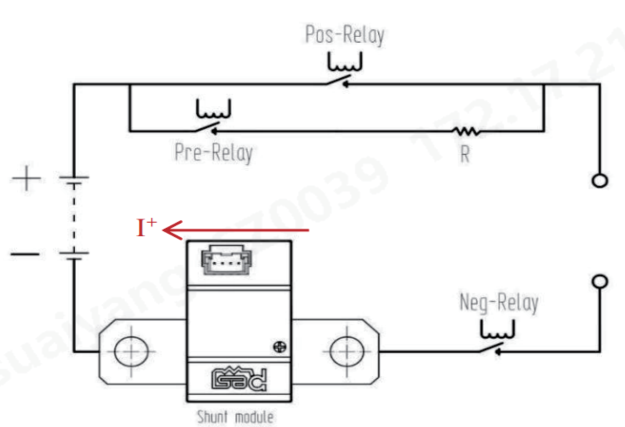
The sensor is designed based on low-TCR shunt, adopts 16-bit ADC, M0-architecture MCU core, communicates through CAN2.0 A/B protocol, and has static discharge protection, temperature compensation, current calibration and other functions.

The sensor meets the operating temperature range of -40℃~+105℃, can apply to the continuous operating current of -350A~+350A and the temperature measurement of -50℃~+150℃, and the current measurement accuracy is ± 0.5% in the range of +20A~+350A or -350A~-20A, and the maximum temperature measurement offset error in the temperature operating range is ± 3℃.

CB350M6918A current sensor operates from 6V to 18V. Its power consumption is controlled below 216mW (12VDC), and it can realize complete high-low voltage isolation, which can be applied to the main positive electrode or the main negative electrode of the battery system.

Sensor Information

Part #	Shunt Size	Connector
CB350M6918A	69mm×18mm	5600200420



Typical Application

Content

4、Revision

Date	Revised Content	Note
2023.02	-	Initial Issue

5、Specifications

5.1 Limit Parameters

Note: Product will affect its reliability and cause unexpected permanent damage if operating under limit parameters for long time.

Parameter	Condition	Min.	Typical	Max.	Unit
Supply Voltage				30	V
Current Measurement Range	±1400A			10	s
	±8000A			50	ms
CAN Interface	Configured 120Ω Terminal Resistor (Continuous Power Supply)			6	V
	ESD			25	KV
Operating Temperature		-40		105	℃
Storage Temperature		-40		125	℃
Humidity				95	%RH

5.2 General Parameters

Test Conditions: Ambient Temperature 25 ℃ (Unless Otherwise Noted)

Parameter	Condition	Min.	Typical	Max.	Unit
Power Supply					
Supply Voltage		6	12	18	V
Operating Current	6V	10	14	18	mA
	12V	10	14	18	mA
	18V	10	14	18	mA
Power Consumption	6V	60	80	108	mW
	12V	120	170	216	mW
	18V	180	250	324	mW
Start-Up Time	Required time from power-on to sending the first frame valid message	100	130	150	ms
Current Measurement (-40℃~+105℃)					
Accuracy	-20A~+20A		±50	±100	mA
	+20A~+350A or -350A~-50A			±0.5	%[1]
	+350A~+1000A or -1000A~-350A		±0.5	±1	%[1]
	+1000A~+8000A or -8000A~-1000A		±1	±5	%[1]
Duration	-350A~+350A		Continuous		
	±600A			5	min
	±1400A			5	s
	±8000A			40	ms
Resolution	-350A~+350A		10		mA
	> 350A or < -350A		60		mA
Linearity	-350A~+350A		±0.02		%
	> 350A or < -350A		±0.2		%

Test Conditions: Ambient Temperature 25 ℃ (Unless Otherwise Noted)

Parameter	Condition	Min.	Typical	Max.	Unit
Temperature Measurement					
Measurement Range		-50		+150	℃
Measurement Error	-50℃~+150℃	-3		+3	℃
Resolution			0.1		℃
Power & Temperature Rise					
DC Impedance		45	50	55	μΩ
Inductance				3	nH
Temperature Rise	±350A@25℃ Copper Bus Bar 20 mm*3mm, 15Nm			60	℃
	±350A@85℃ Copper Bus Bar 20 mm*3mm, 15Nm			60	℃
Communication					
Protocol	CAN2.0 A/B				
Communication Speed		250	500	1000	Kbps
Terminal Resistor	With Terminal Resistor	108	120	132	Ω
	Without Terminal Resistor				
Output Rate of Current Message		10	10	1000	ms
Output Rate of Temperature Message		10	100	1000	ms
Isolation					
Galvanic Isolation			3000		VAC
Creepage Distance			5.5		mm
Clearance			4.1		mm

[1] Accuracy is the error accuracy of current.

5.3 Typical Characteristic Curve

5.3.1 Start-Up Time Test Curve

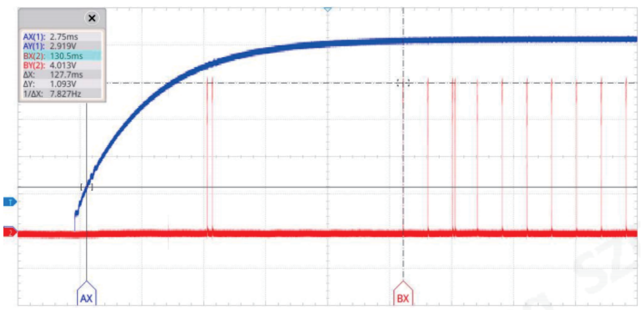


Figure 5-1 Sample1 Start-Up Time Test Curve

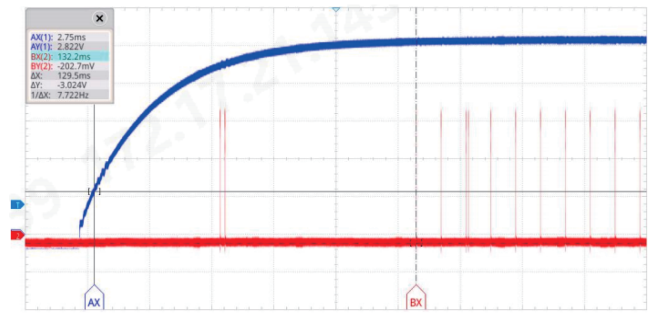


Figure 5-2 Sample2 Start-Up Time Test Curve

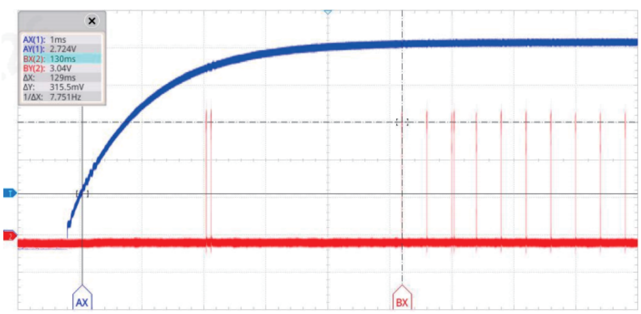


Figure 5-3 Sample3 Start-Up Time Test Curve

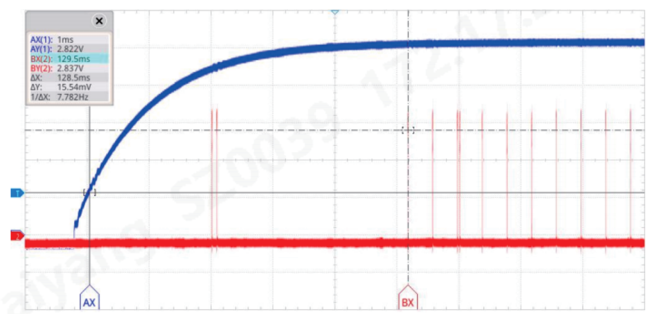


Figure 5-4 Sample4 Start-Up Time Test Curve

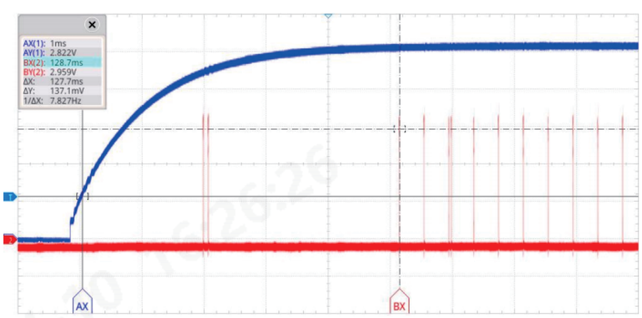


Figure 5-5 Sample5 Start-Up Time Test Curve

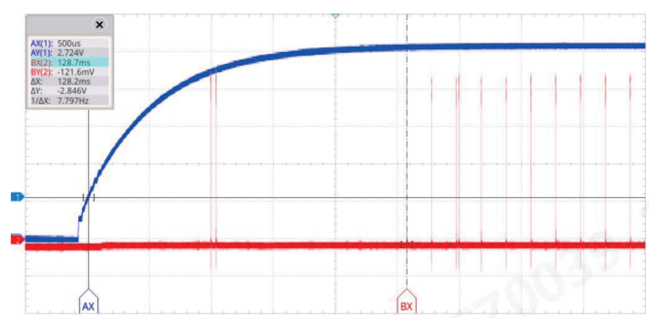


Figure 5-6 Sample6 Start-Up Time Test Curve

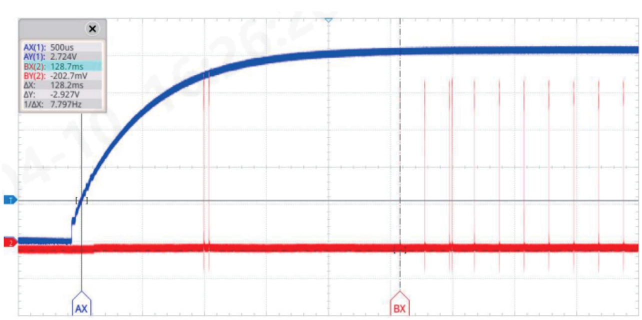


Figure 5-7 Sample7 Start-Up Time Test Curve

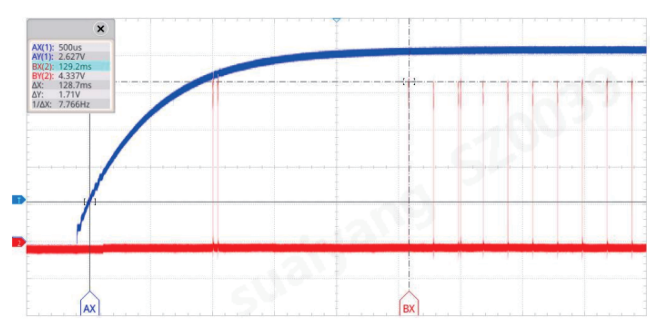


Figure 5-8 Sample8 Start-Up Time Test Curve

5.3.2 Current Consumption Test Curve

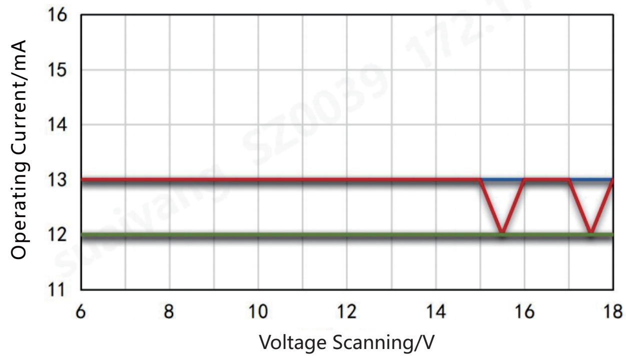


Figure 5-9 -40℃ Current Consumption Test Curve

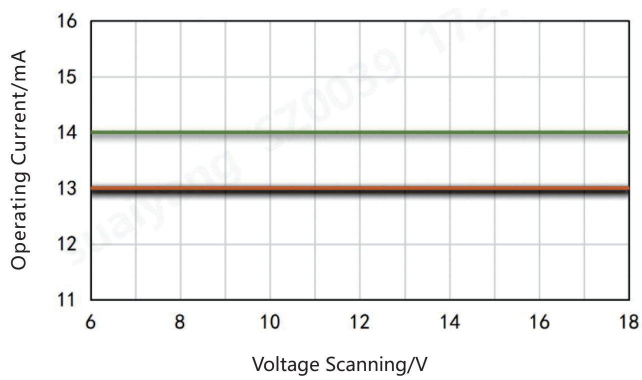


Figure 5-10 +25℃ Current Consumption Curve

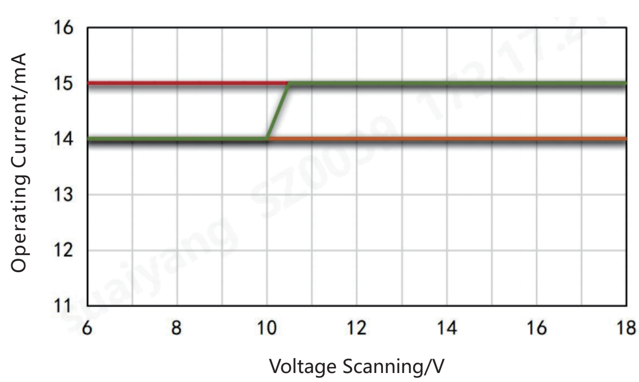


Figure 5-11 +105℃ Current Consumption Curve

5.3.3 Low-Current Accuracy Test Curve

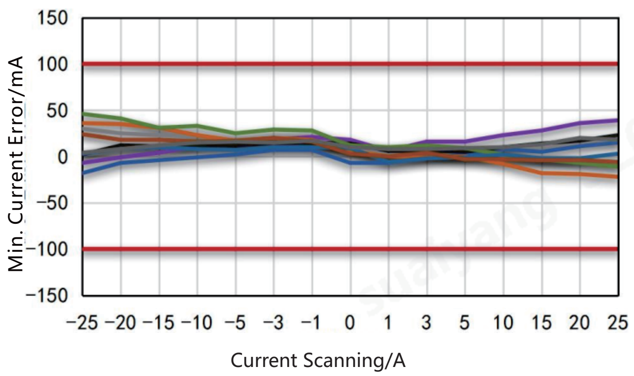


Figure 5-12 -40℃ Low-Current Test Accuracy@Min. Current Error

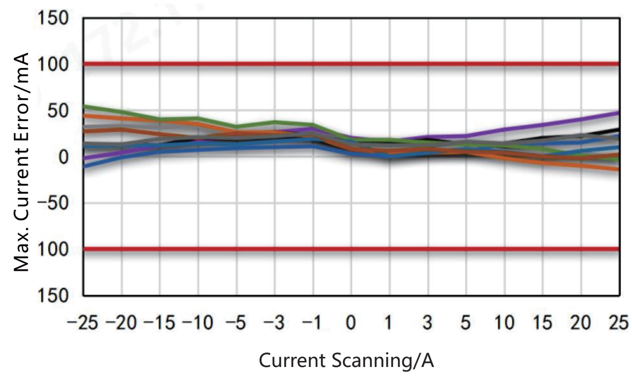


Figure 5-13 -40℃ Low-Current Test Accuracy@Max. Current Error

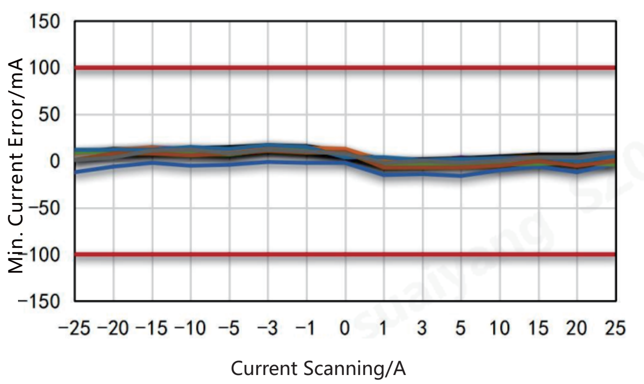


Figure 5-14 +25℃ Low-Current Test Accuracy@Min. Current Error

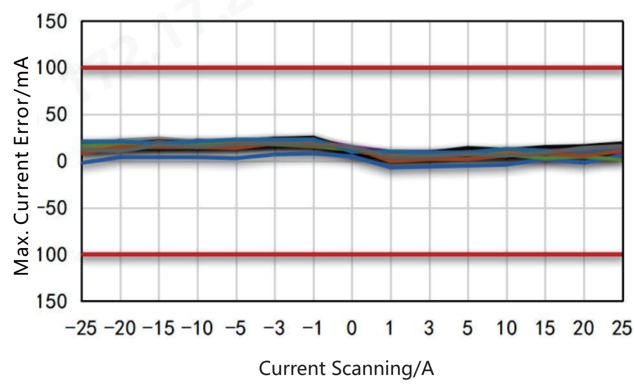


Figure 5-15 +25℃ Low-Current Test Accuracy@Max. Current Error

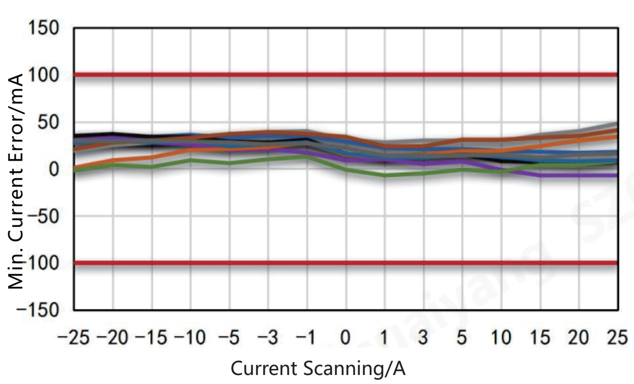


Figure 5-16 +105℃ Low-Current Test Accuracy@Min. Current Error

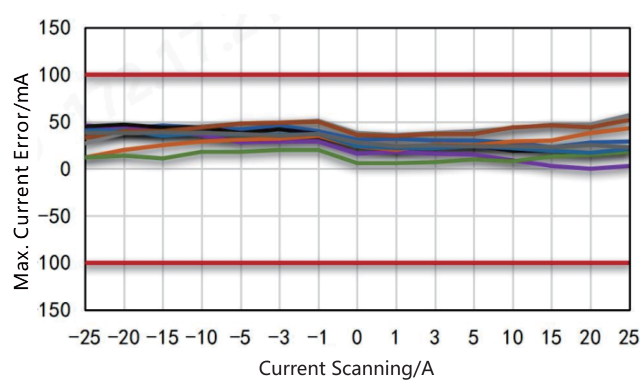


Figure 5-17 +105℃ Low-Current Test Accuracy@Max. Current Error

5.3.4 High-Current Accuracy Test Curve

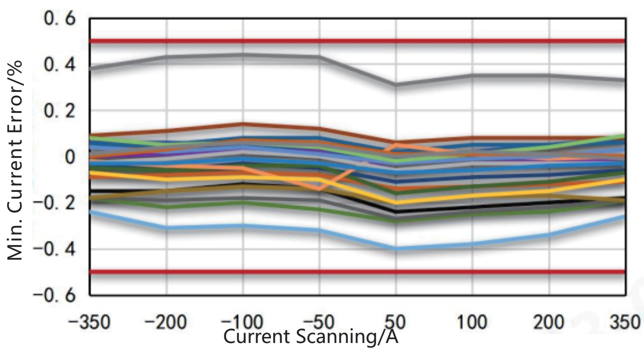


Figure 5-18 -40℃ High-Current Test Accuracy@Min. Current Error

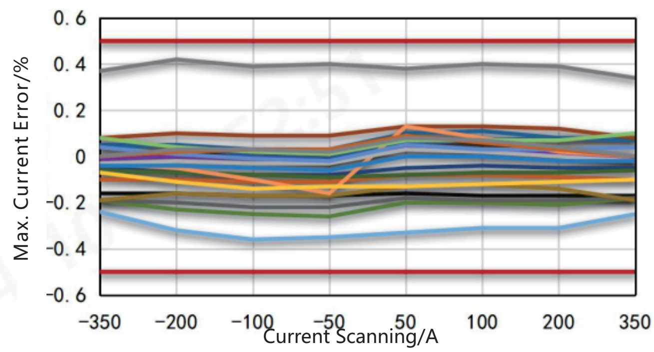


Figure 5-19 -40℃ High-Current Test Accuracy@Max. Current Error

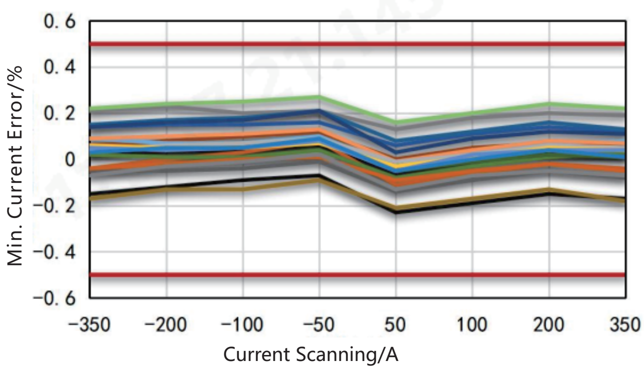


Figure 5-20 +25℃ High-Current Test Accuracy@Min. Current Error

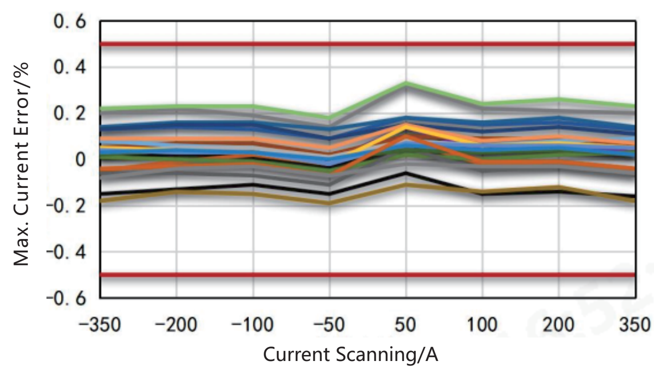


Figure 5-21 +25℃ High-Current Test Accuracy@Max. Current Error

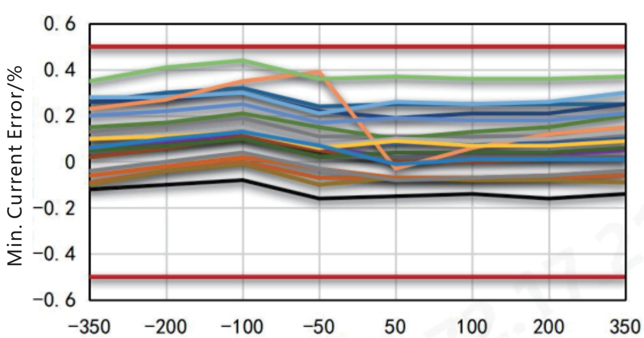


Figure 5-22 +85℃ High-Current Test Accuracy@Min. Current Error

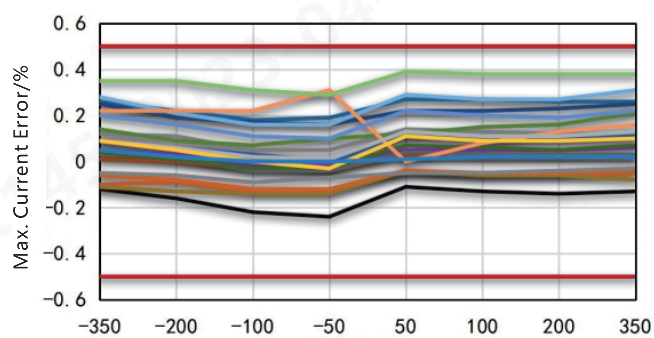


Figure 5-23+85℃ High-Current Test Accuracy@Max. Current Error

6、Test Standards

Test No.	Test Standards	Test Items
General inspection		
1	/	Appearance
2	/	Dimension
3	/	Weight
4	/	Function Check
Electrical loads		
5	VW 80000	E-01 Long-term overvoltage
6	VW 80000	E-02 Transient overvoltage
7	VW 80000	E-03 Transient undervoltage
8	VW 80000	E-04 Jump start
9	VW 80000	E-05 Load dump
10	VW 80000	E-06 Ripple voltage
11	VW 80000	E-07 Slow decrease and increase of the supply voltage
12	VW 80000	E-08 Slow decrease, quick increase of the supply voltage
13	VW 80000	E-09 Reset behavior
14	VW 80000	E-10 Brief interruptions
15	VW 80000	E-11 Start pulses
16	VW 80000	E-12 Voltage curve with vehicle electrical system control
17	VW 80000	E-13 Pin interruption
18	VW 80000	E-14 Connector interruption
19	VW 80000	E-15 Reverse polarity
20	VW 80000	E-16 Ground potential difference
21	VW 80000	E-17 Short circuit in signal cable and load circuits ..
22	VW 80000	E-18 Insulation resistance
23	VW 80000	E-19 Quiescent current
24	VW 80000	E-20 Dielectric strength
25	/	Continuous power test
26	ISO 7637-2:2011	CI pulse 1
27	ISO 7637-2:2011	CI pulse 2a / 2b
28	ISO 7637-2:2011	CI pulse 3a / 3b
29	ISO 7637-2:2011	CI pulse 4
30	ISO 7637-2:2011	CI pulse 5b
31	ISO 10605:2008	ESD
32	CISRP 25	Radiated emissions
33	CISRP 25	Conducted emissions
34	ISO 11452-2	Radiated immunity
35	ISO 11452-4	Bulk current injection

Test No.	Test Standards	Test Items
Climatic loads		
36	VW 80000	K-01 High-/low-temperature aging
37	VW 80000	K-02 Incremental temperature test
38	VW 80000	K-03 Low-temperature operation
39	VW 80000	K-05 Thermal shock (component).
40	VW 80000	K-14 Damp heat, constant
41	VW 80000	L-02 Service life test - high-temperature durability testing
42	VW 80000	L-03 Service life test – Temperature cycle durability testing
43	IEC 60068-2-30	Dew test
44	GB/T 2423.34	Composite temeperature & humidity cyclic test
Mechanical loads		
45	VW 80000	M-01 Free fall
46	VW 80000	M-04 Vibration test
47	VW 80000	M-05 Mechanical shock
48	VW 80000	M-08 Protection against foreign bodies - IP0x to IP4x, A, B, C, D
Regulation Validation		
49	GB/T 30512-2014	Requirements for prohibited substances on automobiles
50	UL-94:2016	Vertical Burning Test

7、Communication

7.1 CAN Protocol

CB350M6918A applies CAN2.0 A/B communication protocol and communicates through data frame. The data length of message frame is between 1-8 bytes. The default CAN speed is 500Kbps. 1Mbps/250Kbps are also available. There are two kinds of data frame, standard frame and extended frame, as shown in Figure 7-1 and Figure 7-2. Standard frame has an ID of 11 bytes, and the extended frame has an ID of 29 bytes. The defaulted data frame is standard frame, which can be adjusted to the extended frame. The defaulted data format is Motorola, which can be adjusted to Intel.

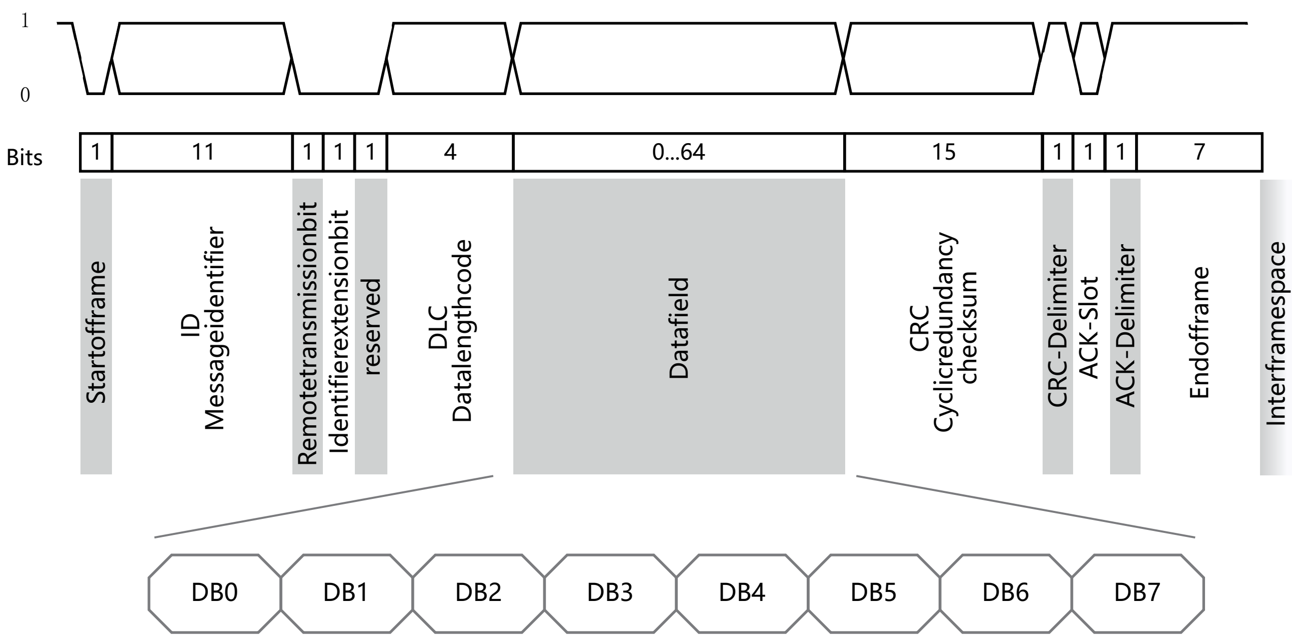


Figure 7-1 Standard Frame

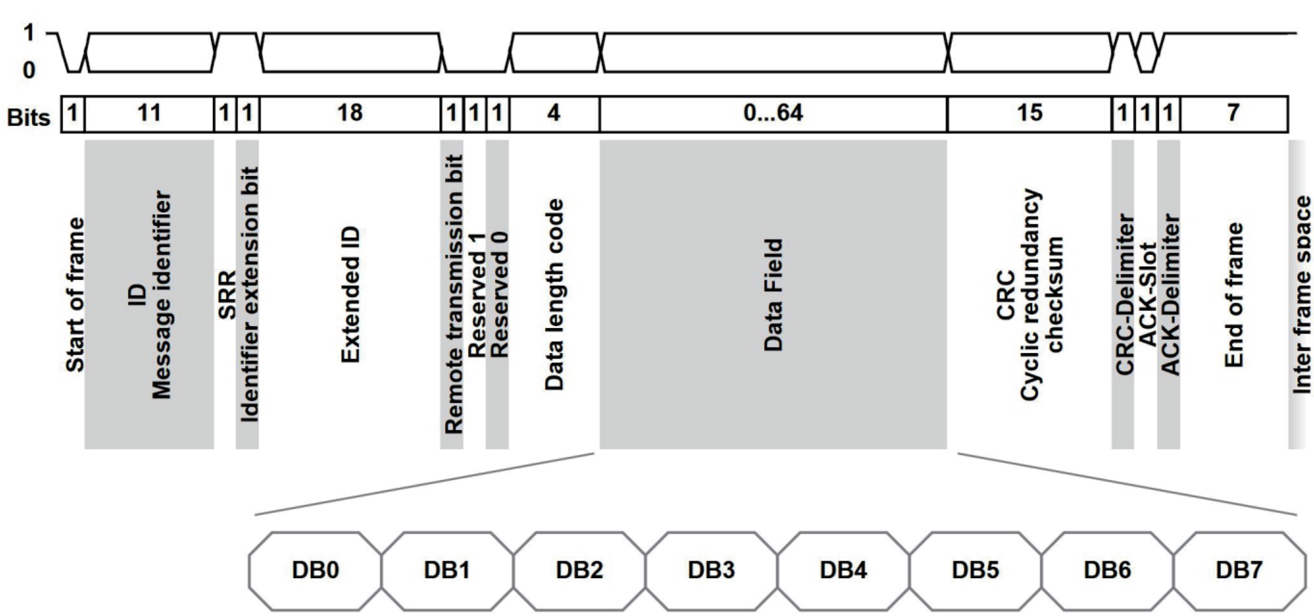


Figure 7-2 Extended Frame

7.2 Data Frame

The data frame of CB350M6918A can apply multiple data formats, as shown in Table 7-1. Among them, both formats A and B are composed of two frames of messages, which transmit real-time current and real-time temperature. Both formats C and D are composed of one frame of message. Format C transmits real-time current and real-time temperature in one frame of message. Format D only transmits real-time current. The data frame format defaults to format A.

Table 7-1. Message Frame Data Format

Data Format Type	Data Frame Content	CANID[1]	Data Length	Characteristics
Format A	Real-Time Current	0x0301	6	32-bit current value is a signed integer. Available Unit: mA/μA
	Real-Time Temperature	0x0325	6	32-bit temperature value is a signed integer, in 0.1℃
Format B	Real-Time Current	0x03C2	8	24-bit current value is an unsigned integer with offset 0x800000, in mA
	Real-Time Temperature	0x06C2	8	8-bit NTC temperature value is a signed short integer, in ℃ 8-bit MCU temperature value is a signed short integer, in ℃
Format C	Real-Time Current & Temperature	0x03C2	8	24-bit current value is an unsigned integer with offset 0x800000, in mA 16-bit temperature value is a signed short integer. Unit: 0.1 ℃
Format D	Real-Time Current	0x03C0	8	32-bit current value is an unsigned integer with offset 0x80000000, in mA

[1] The CANID in the above table are default and can be modified by commands (refer to the relevant application documents for details)

7.2.1 Format A

Format A consists of current data frame and temperature data frame, each with a 4-bit cyclic counter and a 2-bit module exception flag. In addition, the current data frame has an 8-bit current channel flag, a 32-bit current value, a 1-bit unit selection and a 1-bit reserved bit. The temperature data frame has an 8-bit temperature channel flag, a 32-bit temperature value and a 2-bit reserved bit. The details of the message are shown in Table 7-2, Examples of message and decoding information are shown in Table 7-3 and Table 7-4.

Table 7-2. Format A Message

Frame Type	CANID	Length	byte0	byte1	byte2	byte3	byte4	byte5
Current (mA/μA)	0x0301	6	0x00[1]	B[7]: Reserved Bit[2] B[6]: Current Unit[3] B[5]: Measurement Error Flag[4] B[4]: Overcurrent Flag[5] B[3:0]: Cyclic Counter[6]	32-bit Signed Current Value[7]			
Temperature (0.1℃)	0x0325	6	0x04[8]	B[7:6]: Reserved Bit[2] B[5]: Overtemperature Flag of Shunt[9] B[4]: Overtemperature Flag of PCBA[10] B[3:0]: Cyclic Counter[6]	32-bit Signed Temperature Value[11]			

[1] Current Channel Flag.
[2] Reserved bit, default is 0.
[3] Current Unit, 0: mA; 1: μA
[4] Measurement error flag, active when the ADC fault is detected, indicates that the current value is invalid. When alarming, the current sensor still sends and receives data messages, but the current value in the message is invalid. The measurement deviation may exceed the range specified in the technical specification.
[5] Overcurrent error flag. Default is inactive. It can be defined by the user.
[6] Cyclic Counter, 0x0-0xF cycle count value.
[7] 32-bit current data uses big-endian by default. The high bit is followed by the low bit. It is a signed integer.
[8] Temperature Channel Flag.
[9] Overtemperature Flag of Shunt, active when the shunt temperature is detected to be more than 150 ℃, indicates that the sensor may have no message output or low accuracy. When alarming, the current sensor can still send and receive data messages in a short time, and the current value in the message is valid. If overtemperature for a long time, the performance of current sensor can be damaged. At this time, it is recommended to limit the output power of BMS.
[10] Overtemperature Flag of PCBA, active when the board temperature is detected to be more than 125 ℃, indicates that the sensor may have no message output or low accuracy. When alarming, the current sensor can still send and receive data messages in a short time, and the current value in the message is valid. If overtemperature lasts for a long time, the performance of current sensor can be damaged. Then, it is recommended to limit the output power of BMS.
[11] 32-bit temperature data uses big-endian by default. The high bit is followed by the low bit. It is a signed integer. Unit: 0.1 ℃

Table 7-3. Examples of Format A Message Frame

Example	DB0	DB1	DB2	DB3	DB4	DB5
1	0x00	0x00	0x00	0x00	0x03	0xE8
2	0x00	0x00	0xFF	0xFF	0xFC	0x18
3	0x04	0x00	0x00	0x00	0x01	0x0A
4	0x04	0x00	0xFF	0xFF	0xFE	0xF6

Table 7-4. Decoding Information of Table 7-3 Examples

Example	Byte	Value	Message
1	DB0	0x00	Current Channel Flag.
	DB1	0x00	Reserved bit 0, unit: mA, no measurement error, cycle sequence 0
	DB2-DB5	0x000003E8	Current: 1000mA, i.e. 1A
2	DB0	0x00	Current Channel Flag.
	DB1	0x00	Reserved bit 0, unit: mA, no measurement error, cycle sequence 0
	DB2-DB5	0xFFFFFC18	Current: -1000mA, i.e. -1A
3	DB0	0x04	Temperature Channel Flag.
	DB1	0x00	Reserved bit 0, Shunt temperature < 150 ℃, PCBA temperature < 125 ℃, cycle sequence 0
	DB2-DB5	0x0000010A	The Temperature is +26.6 ℃
4	DB0	0x04	Temperature Channel Flag.
	DB1	0x00	Reserved bit 0, Shunt temperature < 150 ℃, PCBA temperature < 125 ℃, cycle sequence 0
	DB2-DB5	0xFFFFFEF6	The Temperature is -26.6 ℃

7.2.2 Format B

Format B consists of current data frame and temperature data frame, each with a 4-bit cyclic counter. In addition, the current data frame has a 24-bit current value, a 1-bit flag bit, an 8-bit software version, an 8-bit check bit and a 19-bit reserved bit. The temperature data frame has an 8-bit temperature value, a 2-bit status bit, an 8-bit check bit and a 34-bit reserved bit. The details of the message are shown in Table 7-5, Examples of message and decoding information are shown in Table 7-6 and Table 7-7.

Table 7-5. Format B Message

Frame Type	CANID	Length	byte0	byte1	byte2	byte3	byte4	byte5	byte6	byte7
Current (mA)	0x03C2	8	B[7:4]: Cyclic Counter[1] B[3:2]: Reserved Bit[2] B[1]: Hardware Fault Flag[3] B[0]: Reserved Bit[2]	24-bit Unsigned Current Value Offset 0x800000[4]			Reserved Bit[2]		Software Version	CRC-8 Check SAE J1850[5]
Temperature (℃)	0x06C2	8	B[7:4]: Cyclic Counter[1] B[3:2]: Internal Temperature Status[6] B[1:0]: Reserved Bit[2]	NTC (℃)[7]	MCU (℃)[8]	Reserved Bit[2]				CRC-8 Check SAE J1850[5]

[1] Cyclic Counter, 0x0-0xF cycle count value.
[2] Reserved bit, default is 0.
[3] Hardware Fault Flag, active when a hardware fault is detected, indicates that the ADC may have a fault.
[4] 24-bit current data uses big-endian by default. The high bit is followed by the low bit. It is an unsigned integer. Unit: mA
The actual value is expressed as V=D-0x800000. D is the value in the message.
[5] CRC-8 Check generates a check code for the first 7 bytes of data.
[6] Internal Temperature Status, '0': Normal; '1': Overtemperature; '2': Inactive; '3': Invalid.
[7] NTC Temperature, 8-bit temperature data uses big-endian by default. The high bit is followed by the low bit. It is a signed integer. Unit: ℃
[8] MCU Temperature, 8-bit temperature data uses big-endian by default. The high bit is followed by the low bit. It is a signed integer. Unit: ℃

Table 7-6. Examples of Format B Message Frame

Example	DB0	DB1	DB2	DB3	DB4	DB5	DB6	DB7
1	0x00	0x80	0x03	0xE8	0x00	0x00	0x64	0x83
2	0x00	0x7F	0xFC	0x18	0x00	0x00	0x64	0xAB
3	0x00	0x1A	0x1A	0x00	0x00	0x00	0x00	0xD5
4	0x00	0xE6	0xE6	0x00	0x00	0x00	0x00	0x47

Table 7-7. Decoding Information of Table 7-6 Examples

Example	Byte	Value	Message
1	DB0	0x00	Cycle sequence 0, reserved bit 0, no hardware fault, reserved bit 0
	DB1-DB3	0x8003E8	Current: 1000mA, i.e. +1A
	DB4-DB5	0x0000	Reserved bit 0
	DB6	0x64	Software version is V1.00
	DB7	0x83	CRC-8 Check Value
2	DB0	0x00	Cycle sequence 0, reserved bit 0, no hardware fault, reserved bit 0
	DB1-DB3	0x7FFC18	Current: -1000mA, i.e. -1A
	DB4-DB5	0x0000	Reserved bit 0
	DB6	0x64	Software version is V1.00
	DB7	0xAB	CRC-8 Check Value
3	DB0	0x00	Cycle sequence 0, normal temperature, reserved bit 0
	DB1	0x1A	NTC: +26℃
	DB2	0x1A	MCU: +26℃
	DB3-DB6	0x00000000	Reserved bit 0
	DB7	0xD5	CRC-8 Check Value
4	DB0	0x00	Cycle sequence 0, normal temperature, reserved bit 0
	DB1	0xE6	NTC: -26℃
	DB2	0xE6	MCU: -26℃
	DB3-DB6	0x00000000	Reserved bit 0
	DB7	0x47	CRC-8 Check Value

7.2.3 Format C

Format C consists of one frame of message, including a 24-bit current value, an 16-bit temperature value, a 4-bit cyclic counter, a 2-bit status bit, a 1-bit flag bit, an 8-bit check bit and a 9-bit reserved bit. The details of the message are shown in Table 7-8, Examples of message and decoding information are shown in Table 7-9 and Table 7-10.

Table 7-8. Format C Message

Frame Type	CANID	Length	byte0	byte1	byte2	byte3	byte4	byte5	byte6	byte7
Current (mA) Temperature (0.1℃)	0x03C2	8	B[7:4]: Cyclic Counter[1] B[3:2]: Malfunction Status[2] B[1]: Hardware Fault Flag[3] B[0]: Reserved Bit[4]	24-bit Unsigned Current Value Offset 0x800000[5]			16-bit Signed Temperature Value[6]		Reserved Bit[4]	CRC-8 Check SAE J1850[7]

[1] Cyclic Counter, 0x0-0xF cycle count value.
[2] Malfunction Status, '0': Normal; '1': ADC Conversion Error; '2': Current exceeds 1550A; '3': Shunt temperature exceeds 150 ℃ or PCBA temperature exceeds 125 ℃.
[3] Hardware Fault Flag, active when a hardware fault is detected, indicates that the ADC may have a fault.
Reserved bit, default is 0.
[4] 24-bit current data uses big-endian by default. The high bit is followed by the low bit. It is an unsigned integer. Unit: mA
[5] The actual value is expressed as V=D-0x800000. D is the value in the message.
[6] 16-bit temperature data uses big-endian by default. The high bit is followed by the low bit. It is a signed integer. Unit: ℃.
[7] CRC-8 Check generates a check code for the first 7 bytes of data.

Table 7-9. Examples of Format C Message Frame

Example	DB0	DB1	DB2	DB3	DB4	DB5	DB6	DB7
1	0x00	0x80	0x03	0xE8	0x01	0x0A	0x00	0x2E
2	0x00	0x7F	0xFC	0x18	0xFE	0xF6	0x00	0x9D

Table 7-10. Decoding Information of Table 7-9 Examples

Example	Byte	Value	Message
1	DB0	0x00	Cycle sequence 0, normal function, no hardware fault, reserved bit 0
	DB1-DB3	0x8003E8	Current: 1000mA, i.e. +1A
	DB4-DB5	0x010A	The Temperature is +26.6 ℃
	DB6	0x00	Reserved bit 0
	DB7	0x2E	CRC-8 Check Value
2	DB0	0x00	Cycle sequence 0, normal function, no hardware fault, reserved bit 0
	DB1-DB3	0x7FFC18	Current: -1000mA, i.e. -1A
	DB4-DB5	0xFEF6	The Temperature is -26.6 ℃
	DB6	0x00	Reserved bit 0
	DB7	0x9D	CRC-8 Check Value

7.2.4 Format D

Format D consists of one frame of message, including a 32-bit current value, a 1-bit flag bit, a 7-bit status bit, an 8-bit software version, a 16-bit reserved byte and no temperature value. The details of the message are shown in Table 7-11, Examples of message and decoding information are shown in Table 7-12 and Table 7-13.

Table 7-11. Format D Message

Frame Type	CANID	Length	byte0	byte1	byte2	byte3	byte4	byte5	byte6	byte7
Current (mA)	0x03C0	8	32-bit Unsigned Current Value Offset 0x80000000[1]				B[0]: Error Flag[2] B[7:1]: Error Status[3]	Reserved Bit[4]		Software Version

[1] 32-bit current data uses big-endian by default. The high bit is followed by the low bit. It is an unsigned integer. Unit: mA. The actual value is expressed as V=D-0x80000000. D is the value in the message.
[2] Error Flag, '0': Normal; '1': Error;
[3] Error Status, 0x64: no error; 0x50: ADC hardware error; 0x51: ADC conversion error; 0x60: Temperature exceeds the limit (current value remains measured).
[4] Reserved bit, default is 0.

Table 7-12. Examples of Format D Message Frame

Example	DB0	DB1	DB2	DB3	DB4	DB5	DB6	DB7
1	0x080	0x00	0x03	0xE8	0xC8	0x00	0x00	0x64
2	0x7F	0xFF	0xFC	0x18	0xC8	0x00	0x00	0x64

Table 7-13. Decoding Information of Table 7-12 Examples

Example	Byte	Value	Message
1	DB0-DB3	0x800003E8	Current: 1000mA, i.e. 1A
	DB4	0xC8	Normal, no error
	DB5-DB6	0x0000	Reserved bit 0
	DB7	0x64	Software version is V1.00
2	DB0-DB3	0x7FFFFC18	Current: -1000mA, i.e. -1A
	DB4	0xC8	Normal, no error
	DB5-DB6	0x0000	Reserved byte 0
	DB7	0x64	Software version is V1.00

7.3 Bus Topology

CB350M6918A can be applied to a bus-type topology and transmits network information to each node through the bus, as shown in Figure 7-3.

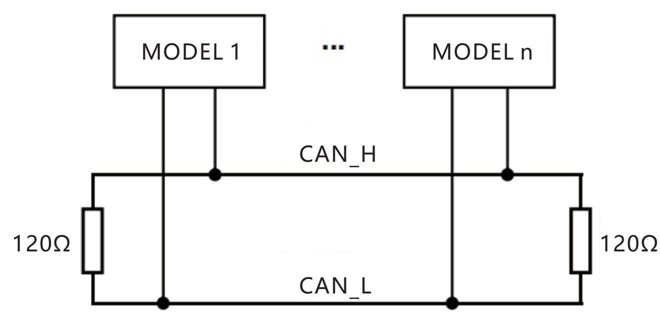


Figure 7-3 CAN Bus Topology

7.4 Measuring Mode

7.4.1 Time Interval + Command Trigger Mode

The sensor samples data at a fixed time interval set by the system and sends message to the CAN bus. At the same time, It can also respond to the trigger command. In the sampling period, the measurement will be active immediately when the trigger command is received and sends message to CAN bus. No need to wait for next sampling interval. As shown in Figure 7-4.

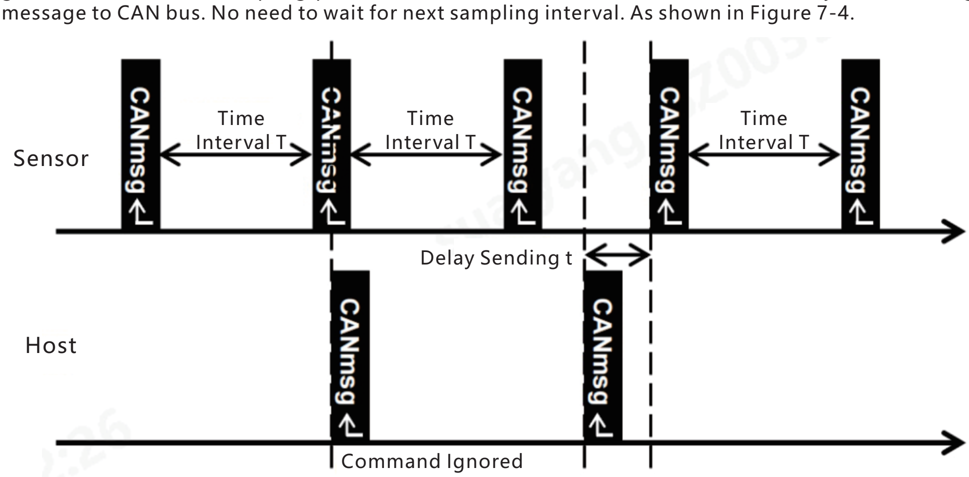


Figure 7-4. Time Interval + Command Trigger Mode

After the sensor receives the trigger command, if it is sampling or sending CAN message, the present trigger command will be ignored. When the command is valid, a sampling and sending process will be started, and the time interval T for the next sending will be automatically calculated from the moment of this trigger. As Figure 7-4 shown, there is a delay between the sensor receiving a valid trigger command and sending the CAN message, which is less than 1ms.

7.4.2 Command Triggered Mode

Under this mode, the sensor will not automatically send message, but keep sampling, calculating and filtering data at a fixed time interval. The sensor will send the recent sampling data to CAN bus and reset the start of time interval when a valid command is received from the host, as Figure 7-5 shown.

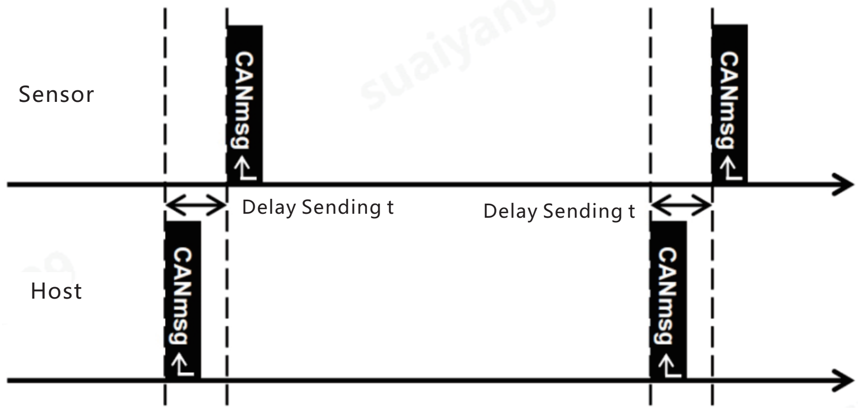


Figure 7-5. Command Trigger Mode

As Figure 7-5 shown, the sensor sends data to the CAN bus after receiving a trigger command from the host, with a delay of less that 1ms between receiving the command and sending the data.

8、Mechanical Structure

8.1 Dimensions

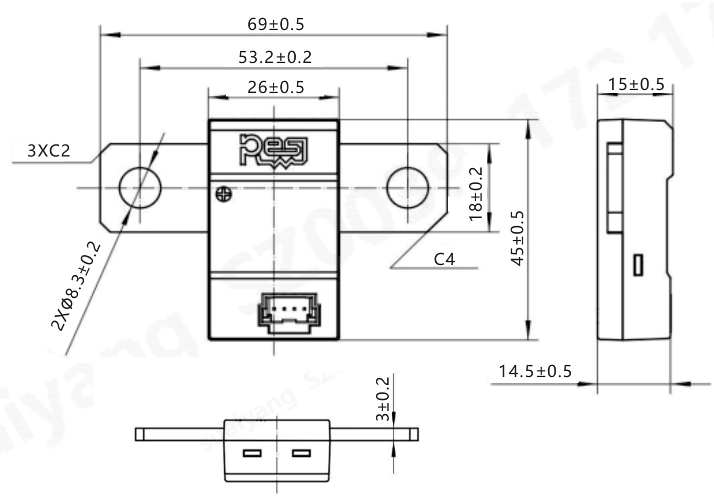


Figure 8. 1 Structure Diagram

8.2 Copper Bar Connection

- Recommended Bolts:M8
- Recommended Torque:15-20Nm
- Recommended Width * Thickness of Copper Bar:24mm*3mm
- Recommended Length of Overlap between Shunt and Copper Bar:20mm
- Do not use a flat washer between the copper bar and the shunt
- Keep the surface of shunt and copper bar clean and free of scratches

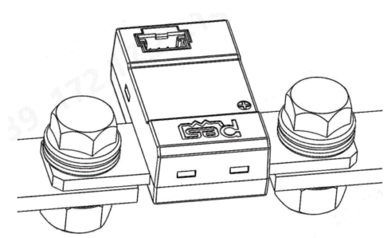


Figure 8-2. CB350M6918A Copper Bar Connection Diagram

8.3 Connector

Connector	Manufacturer	Pin Count	Part #
Male Connector[1]	Molex	4	5600200420
Female Connector[2]	Molex	4	5601230400

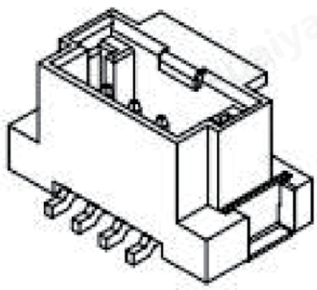


Figure 8-3. Male Connector

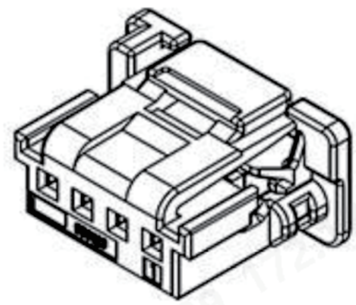


Figure 8-4. Female Connector

[1] For more information about male connector, please refer to Molex datasheet:https://www.molex.com/pdm_docs/sd/5600200420_sd.pdf
[2]For more information about female connector, please refer to Molex datasheet :https://www.molex.com/pdm_docs/sd/5601230400_sd.pdf

8.4 Connector Definition

NO.	Pin No.	Description
1	Pin1	VCC
2	Pin2	CAN_L
3	Pin3	CAN_H
4	Pin4	GND

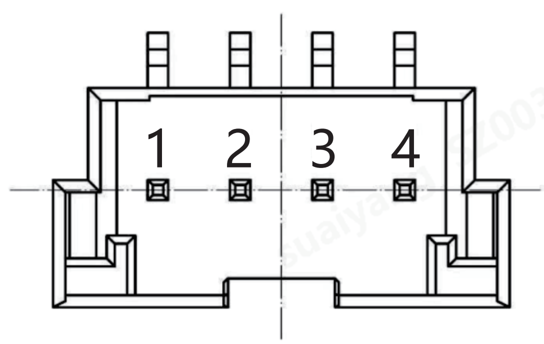


Figure 8-5. Male Connector Molex5600200420

9、Typical Applications

CB350M6918A [1] is used for accurate current measurement in key system. It is recommended that the current sensor connects to the circuit of positive or negative electrode of high-voltage end [2], as shown in Figure 9-1 and Figure 9-2, to sample the current in the main circuit. The high and low voltage ends are galvanic isolated inside the sensor. It is recommended that the low voltage end connects to the battery management system, as shown in Figure 9-3, for real-time and accurate reporting of current data in key system.

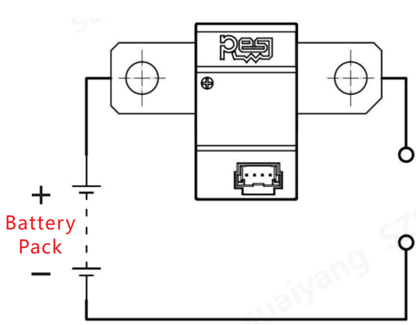


Figure 9-1. Recommended Use of Positive Electrode of High-Voltage End

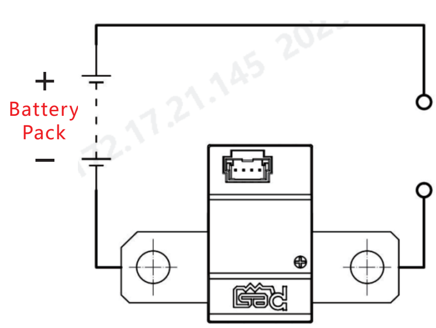


Figure 9-2. Recommended Use of Negative Electrode of High-Voltage End

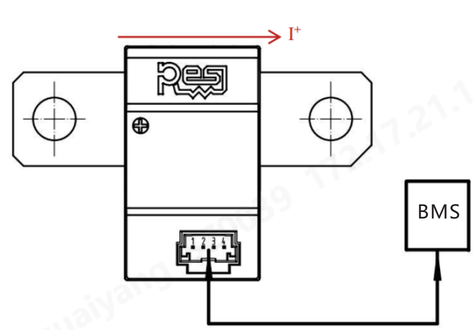


Figure 9-3. Recommended Use of Low-Voltage End

[1] The "+" on the CB350M8536A current sensor housing is the direction of current entry, that is, the positive current direction.
[2]The high voltage electrode is installed as shown in the figure. The operating condition indicated by the sensor output value is:
When the sensor outputs positive value, the battery pack is discharging;
When the sensor outputs negative value, the battery pack is charging.

10、Storage & Packaging

10.1 Storage

- Storage temperature: 15℃~35℃. Storage humidity: 40% RH~60% RH. Storage height: H < 2m.
- The storage environment shall be clean, tidy, dry and free of harmful gases, and the packaging case shall be protected from direct sunlight.
- It is recommended that the storage time of finished products T≤12 months.
- Anti-static bracelet or anti-static gloves shall be worn during installation, storage and handling.

10.2 Packaging

10.2.1 General Information

Packaging Element	Specifications	
SNP[1]	80	
Container Name	Carton	
Container Size	545*521*323	mm
Unit Weight of Finished Product	42±5	g

[1] SNP，Standard Number of Package

10.2.2 Auxiliary Materials Information

No.	Materials	Size L*W*H(mm)	Quantity
1	40-Grid EPE Tray	525*500*130	2
2	EPE Tray Cover	525*500*35	1
3	Anti-Static PE bag	200*150	80

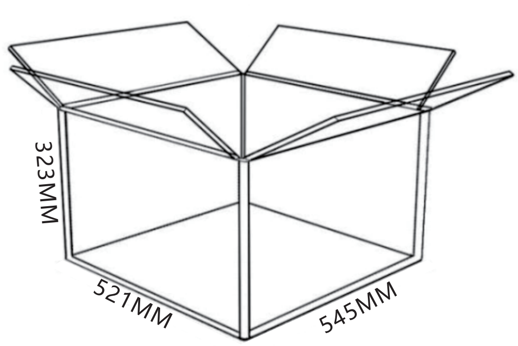


Figure 10-1. Carton Diagram

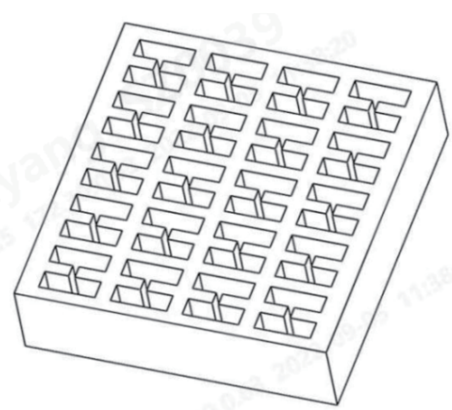


Figure 10-2. Structure Diagram of EPE

11、Part Number Information

CB 350 M 6918 A 1 S S NN

Series

CB: C&B Current Sensor

Rated Current

350: 350A
600: 600A
1000: 1000A

Tolerance

B: 0.05%
F: 0.1%
L: 0.2%
M: 0.5%
K: 1%

Shunt Size

6918: 69mm×18mm
8518: 85mm×18mm
8436: 84mm×36mm
8536: 85mm×36mm

Application Grade

A:Automotive
I:Industrial

Type

0: Standard, Thickness 4mm
1: Standard, Thickness 3mm
2: Customized

Special Byte

Standard
- K:25μΩ
- S:50μΩ
- P:100μΩ
- J:150μΩ

Customized
- Custom Byte, 0~9, A~Z

Special Byte

Standard
- S:CAN Terminal Resistor 120Ω
- N:No CAN Terminal Resistor

Customized
- Custom Byte, 0~9, A~Z

Code

NN : 00 ~ 99 or Blank

For more performance options and other relevant information, please refer to the official website: https://en.resistor.today/

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