MM8118W02LFE Eval Board



MM8118W02 Eval Board is an evaluation board for the purpose of remaining capacity evaluation for Li-ion battery. A current sense resistor and a thermistor is mounted on this board. By using Interface Box and "EvaTool" software for MM8118W02 at the evaluation of Li-ion battery, the user can get Log such as voltage, current and remaining capacity etc., and write the battery parameter and set the other general settings.

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1. Feature

1. Feature

•Intelligent Gauge6 (=Remaining capacity estimation algorithm with low power-consumption) installed Eval Board

·Eval Board is able to check and record Remaining capacity easily by the software

1.1 Eval Board Information

Table 1. Supported Battery

Name	Configuration	Battery type	Battery Capacity
MM8118W02 Eval Board	1 Cell	Li-ion	16000mAh or less

1.2 Eval Board Specification

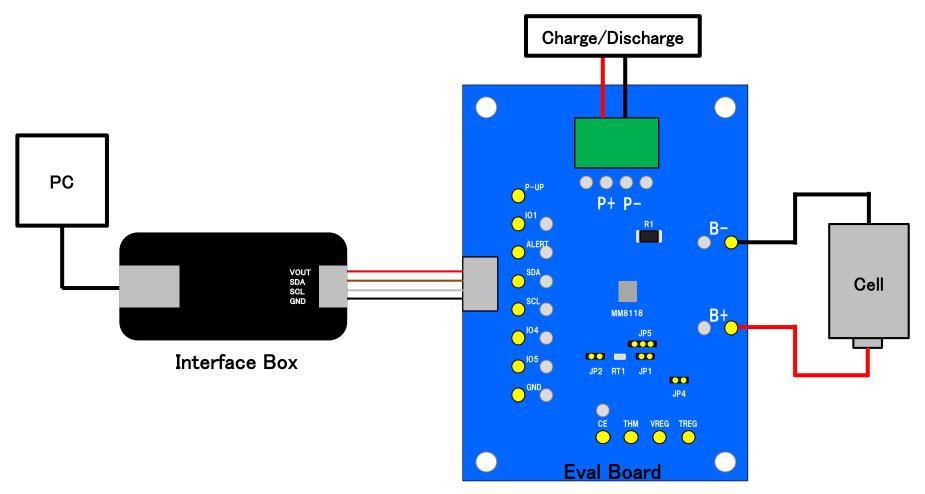
Table 2. Eval Board Specification

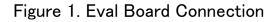
Parameter	MIN.	ТҮР.	MAX.
Input voltage B+ to B- and P+ to P-	2.5V	-	5.5V
Input voltage range of I/O pin (SDA/SCL/ALERT/IO1/IO4/IO5)	-0.3V	-	VDD+0.3V
Charge / Discharge current P+ to P-	0.0A	1.0A	3.0A
Current sense resistor	-	20mΩ	-



2. Eval Board Connections

2. Eval Board Connections2.1 Connection example to Eval Board







2. Eval Board Connections

2.2 Pin Descriptions

Name	Description
B+	Cell+ terminal
B-	Cell- terminal
P+	Pack+ terminal
P-	Pack- terminal
VREG	Regulator output terminal
TREG	Regulator output terminal for thermistor
THM	Thermistor input terminal
SDA	I2C data input/output terminal
SCL	I2C clock input/output terminal
101	General purpose output terminal
104	General purpose output terminal
105	General purpose output terminal
ALERT	General purpose output terminal
	Chip enable terminal
CE	%If you do not use this function, please set JP5
	to Pull-up side.
	External power input terminal for pull-up
	XIf you use External power for Pull−up to general
P-UP	purpose terminal, please mount $1K\Omega$ resistor
	on R13 (ALERT), R14 (IO1), R18 (IO4) and R19 (IO5)

Please refer to MM8118W02LFE specification for each terminal ratings.



3. Eval Board Layout

Eval Board Layout
 Layout and Bill of Materials

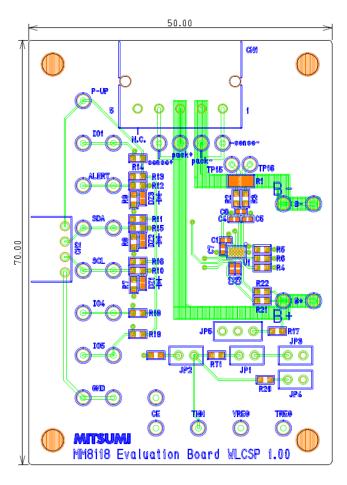


Figure 2. Eval Board Layout

Table 4. Bill of Materials

Symbol	Value
C1	0.47µF
C2	1.0µF
C3	0.1µF
R1	20mΩ
R2,R3	0Ω
R4,R5,R6 R10,R12,R15,R22	100Ω
R17	10kΩ
R20	100kΩ
R21	10Ω
RT1	10kΩ
RT2	100kΩ
DZ1,DZ2,DZ3	Breakdown voltage Min. 5.8V

MinebeaMitsumi Passion to Create Value through Difference

3. Eval Board Layout

3.2 Eval Board Schematic

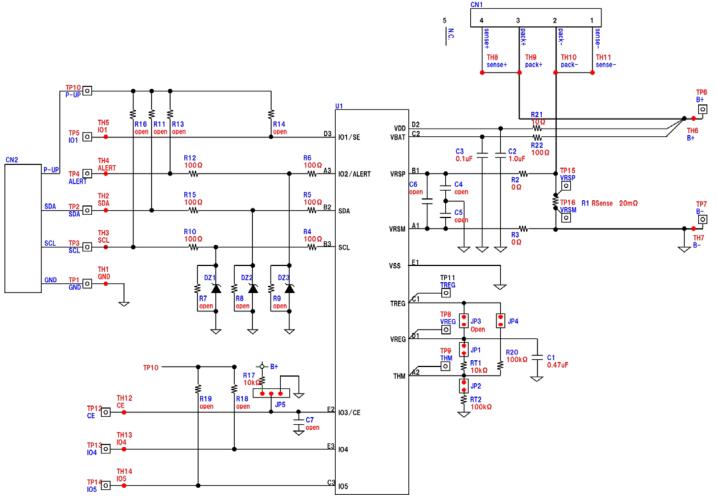


Figure 3. Eval Board Schematic

4. Software 4.1 EvaTool

The user can evaluate easily by using the software (EvaTool) which controls MM8118W02 to check the voltage/current/remaining capacity/etc. of MM8118W02 and to store Log data and to execute each sensor Calibration.

Please contact us to obtain EvaTool.

4.2 Ready to use EvaTool

- 1. Download VCP driver of FTDI Chip, and install it to the PC.
- 2. Connect the USB cable to the Interface Box and the PC.
- 3. Run EvaTool.

Passion to Create Value through Differen

- 4. Select [MM8118W02_EvaTool] in [Target Selection Wizard] window. (Figure 4)
- 5. The main screen of EvaTool appears. (Figure 5)

rget Selection Wizard		X		Refresh	Start Logging	Stop Logging (Value	Scanning unit Log	Scan	Name	Va	ilue unit	Log
			1	Control			NA 🗹		8TPSOC1Set		mAh	
se select a target			FG Data	AtRate Unfiltered	inc.		m∧ ⊠ % ⊠		8TPSOC1Clear InternalTemperat		mAh depC	N N
8G01 EvaTeel			a second s	Temperati			degC 🗹		CycleCount	ure	Counts	
8W02_EvaTool				Voltage			mV 🖂		StateOfCharge		55	2
			Paramete				NA 🗹		StateOfHealth		55	
				FullAvalabi	alableCapacity		mAh 🗹	2	ChargeVoltage		Vm	Ø
				Remaining			mAh 🗹		ChargeOurrent PassedCharge		mA mAb	NG
			12C Pro	FullCharger			mAh 🖂		DOD0		NA	Ø
				AverageCu	irrent		mA 🖾		SelfDischargeCurr	ent	mA	Ø
					meToEmpty		min 🗹		PackConfig		Hex	Ø
			mmEAS	Y FiberedFct UnfiberedF			mAh 🗹		DesignCapacity ProductInformatio	ad an other	mAh NA	SS
				Maxi.cadG			mA 🗹	N	Productinformatio		NA	20
				Unfiltered			mAh 🖂	Ø	FGCondition		NA	
				FilteredRM			mAh 🖂	8	Current		mA	
				Control	RSVD	FAS	55	CALMODE	RSVD	RSVD	QMAXUPDATE	RSVE
					SHUTDOWN	HIBERNATE	RULLSLEEP	SLEEP	LDMD	DNR	VOK	QEN
			100%	Flags	OTC	OTD	RATHI	BATLOW	CHG_DH	RSVD	FC	CHC
			100%	rings	OCVTAKEN	000	ODC	OT	UT	SOC1	SOOF	056
				Pack	RSVD	DITPO	INTSel	RSVD	RSVD	RSVD	RSVD	CRES
		Cancel		Config	RSVD	RSVD	SLEEP	RSVD	RSVD	RSVD	RSVD	TEMS
	an a	1L		FG			Normal	Sleep	Shutdown	Standby mode	ocv	Syster
			0%	Condition		·	mode	mode	mode	mode	correction	Rese

Figure 5. EvaTool main screen

4.3 Communication to Eval Board

- 1. Connect Interface Box and Eval Board. (refer to P.4)
- Click [I2C Pro] =>[Port Scan] in order and select the COM number, then click [Connect]. (Figure 6)
- 3. Click [FG Data] = > [Refresh] in order.

4. When the communication is successful, the current data is displayed in Value. (Figure 7)
※Refer to the document below for more detail.
「MM8118_AN030_StandardEvaluationKit_QuickStartGui de_rev1.●.pdf」

4.4 EvaTool Basic Operation

Refresh	: update data once
Start Logging	: start to save Log continuously with
	any interval
Stop Logging	: stop to save Log
Keep Scanning	: update data continuously with any
	interval
「Option」 => 「S	et Scan And Logging Interval]
	: set the interval of data update
	[0ms~600000ms]

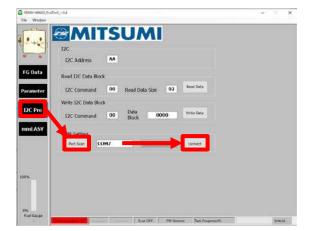


Figure 6. I2C Pro screen

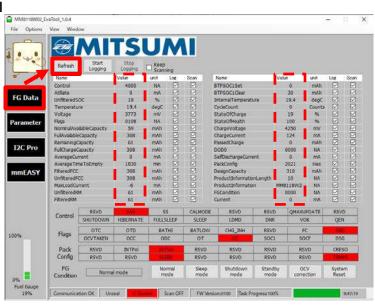


Figure 7. FG Data screen

Document No. FG-1444 AN-102 Ver.1.00

4.5 Check Battery Parameter Data

- 1. Click [Parameter] => [Read All] in order
- 2. Battery Parameter data which is written in MM8118W02 is displayed in Value column.

4.6 Make Battery Parameter

If the actual use battery and battery parameter condition is different in MM8118W02, the accuracy of remaining capacity gets worse.

The user can make battery parameter easily by using the software [ParameterEditor] from the basic data of the use battery.

The accuracy of remaining capacity improves by writing the made battery parameter to MM8118W02 using EvaTool.

Please contact us to obtain [ParameterEditor] and please refer the document below for [ParameterEditor] usage.

[MM8118_AN031_ParameterEditorToolGuide_rev 1.●.pdf].

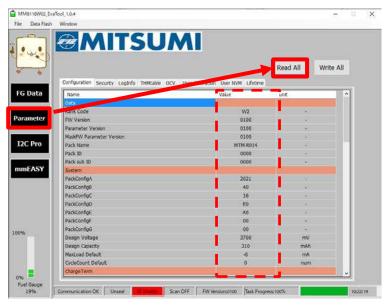


Figure 8. Battery Parameter data check

		NOTES	
		8118 Parameter Editor are based on typical battery characteristics, er from those of the battery actually used.	
the expected accuracy may not be	satisfied.	e man ander er og ander i ander i ander	
		Model	
MM8118W			-
		Setting Items	
Create Read			
Battery Capacity[mAh]	380 2	Input range=108-1000	
Charge Voltage[mV]	4200 🛊	Input range=+100-++00	
Cut-off Charge Current[mA]	19 🗘	Input range=3-100	
Low Limit Voltage(mV)	3300 ᅌ	Input range=3000-3500	
Sense Resistor(mΩ)	20.0 🛟	Input range=10.0-200.0	
Number of parallel cells	10	Input range=1-10	
Battery Pack Name		Half-width alphanumeric characters and symbols, 0-8 characters	
Parameter Version	0001	Hex charactors, 4 characters	
Current Resolution	2	Input range=1.0.1	
525230000256000			
MUNITA MAL CONTRACT BARAGES		Base File	12000
MM8118_W0x_Sample1_BatteryCa	раскузвител	×	Search

Figure 9. ParameterEditor screen

4.7 Write Battery Parameter

To write battery parameter, follow the steps below. (Figure 10)

- 1. Click [mmEASY]
- 2. Drag and drop the battery parameter file made by [ParameterEditor] in [Step 1] area, or click [Browse] and select it.
- 3. If you want to start the evaluation right after the battery parameter write finished, check [IG_Enable set].
- 4. Click [Write].
- 4.8 Each Sensors Calibration

MM8118W02 has voltage sensor, current sensor, IC temperature sensor and thermistor, and needs Calibration (adjustment) for these sensors.

Please refer the document below for the calibration procedure.

[MM8118_AN030_StandardEvaluationKit_Quick StartGuide_rev1.●.pdf]

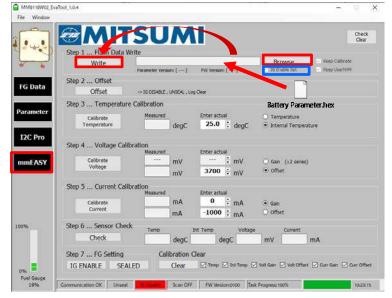


Figure 10. Battery Parameter Write

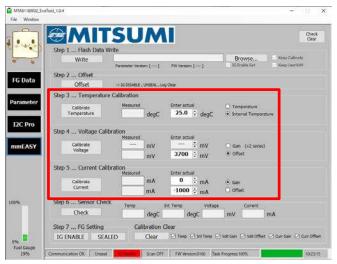


Figure 11. Calibration

5. NOTES

[Safety Precautions]

• Though Mitsumi Electric Co., Ltd. (hereinafter referred to as "Mitsumi") works continually to improve our product's quality and reliability, semiconductor products may generally malfunction or fail. Customers are responsible for complying with safety standards and for providing adequate designs and safeguards for their hardware, software and systems which minimize risk and avoid situations in which a malfunction or failure of this product could cause loss of human life, bodily injury, or damage to property, including data loss or corruption. Before customers use this product, create designs including this product, or incorporate this product into their own applications, customers must also refer to and comply with (a) the latest versions or all of our relevant information, including without limitation, product specifications, data sheets and application notes for this product and (b) the user's manual, handling instructions or all relevant information for any products which is to be used, or combined with this products. Customers are solely responsible for all aspects of their own product design or applications, including but not limited to (a) determining the appropriateness of the use of this product in such design or applications; (b) evaluating and determining the applicability of any information contained in this document, or in charts, diagrams, programs, algorithms, sample application circuits, or any other referenced documents; and (c) validating all operating parameters for such designs and applications.

• This product is intended for applying to computers, OA units, communication units, instrumentation units, machine tools, industrial robots, AV units, household electrical appliances, and other general electronic units.

[Precautions for Product Liability Act]

•No responsibility is assumed by us for any consequence resulting from any wrong or improper use or operation, etc. of this product.

[ATTENTION]

• This product is designed and manufactured with the intention of normal use in general electronics. No special circumstance as described below is considered for the use of it when it is designed. With this reason, any use and storage under the circumstances below may affect the performance of this product. Prior confirmation of performance and reliability is requested to customers.

Environment with strong static electricity or electromagnetic wave

Environment with high temperature or high humidity where dew condensation may occur

• This product is not designed to withstand radioactivity, and must avoid using in a radioactive environment.

• This specification is written in Japanese and English. The English text is faithfully translated into the Japanese. However, if any question arises, Japanese text shall prevail.

