旭星電子股份有限公司
Top Best Energy Storage Corp.

客 戶 承 認 書

SPECIFICATION FOR APPROVAL

CUSTOMER/客戶名稱：	**Merits Health Products**
MODEL No./客戶型號：	**ME0704B**
Part No./客戶料號：	**33700687**
TBSC MODEL No./型號：	**ME0704B**
TBSC PART NO./料號：	**EAME0704AA12**
TBSC DISCRIPTION/品名規格：	**24.0V 11.5Ah 7S4P Li-ion Battery Pack (Cell: DMEGC INR18650-29E 2900mAh)**
Version/版本：	**0.6**
DATE/日期：	**2021.12.29**

CUSTOMER SIGNATURE	TBSC SIGNATURE		
	APPROVAL	CHECK	DESIGN
	彭國光 2021.12.29	研發部 2021.12.29 偕洵豪	Jeff 2021/12/29

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旭星電子股份有限公司
Top Best Energy Storage Corp.

承 認 書 履 歷

料號：**EAME0704AA12**

Rev.	Description	Date	Author
0.1	新承認	2021.11.09	Jeff
0.2	Modify Power Rated (<300Wh)	2021.11.16	Jeff
0.3	Modify Nominal and Minimum Capacity	2021.11.18	Jeff
0.4	Modify Protection Specification	2021.12.10	Jeff
0.5	Add Customer Part Number and Model Name Add Finished Appearance and Labeling Add Charger and Discharge Curve	2021.12.23	Jeff
0.6	Add TBSC Part Number Modify Nominal Voltage (24.0V) Modify Label Drawing (Model Name) Modify Pack Dimension and Appearance Picture Modify Cell Specification Datasheet	2021.12.29	Jeff

旭星電子股份有限公司
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1. Scope

This product specification has been prepared to specify the Rechargeable Lithium Ion Battery pack to be supplied to the customer by Merits Health Products.

2. Description and Model

2.1 Description	Rechargeable 7S4P Lithium-ion battery pack
2.2 Customer Description	24.0V 11.5Ah Rechargeable Battery Pack
2.3 Part Number	EAME0704AA12
2.4 Customer Part Number	33700687
2.5 Cell Vendor / Model	DMEGC INR18650-29E 2900mAh
2.6 Product Model Name	ME0704B

3. Characteristics and performance

ITEM	CONDITION	STANDARD
3.1 Pack Type	7S4P Li-ion battery pack	276Wh
3.2 Nominal Voltage	Pack nominal voltage	24.0V
3.3 Nominal and Minimum Capacity	When 0.2C Charge / 0.2C discharged at 25 ºC (Charging voltage 29.4V (Imin≦ 300mA) and end voltage 18.2V)	Nominal 11.5Ah
		Minimum 10.8Ah
3.4 Charge Voltage	Stop while charge reaches	29.4V
3.5 Cycle life @ 25℃	Carry out 1000 cycles Charge: 0.2C/29.4V (Imin≦300mA) Discharge:0.2C (EDV=18.2V)	≧7560mAh (70% of the minimum capacity)
3.6 Maximum Charge Current	Constant current. (0ºC ~ 45 ºC)	5A
3.7 Maximum Discharge Current	Constant current. (-20ºC ~ 60 ºC). End of discharge voltage 18.2V	20A for continuous 35A for 15sec
3.8 Discharge Cut-Off Voltage	Discharge end voltage	18.2V
3.9 Charge Method	CC-CV (Standard charge constant current with constant voltage)	5A charge current and 29.4V charge voltage
3.10 Pack Weight		Less than 2.0kg
3.11 Pack Dimension	without power cable	185*160*46mm (max)
3.12 Cell Internal Impedance	Measured between “ P+ “ and “ P- “ with 1KHz.	Less than 85mΩ.
3.13 Operating Temperature	CHARGE Humidity Max 85% RH	0 ~ +45°C

	DISCHARGE Humidity Max 85% RH	-20 ~ +60 °C
3.14 Storage Temperature	within 30 days (Shipped conditions)	-20 ~ +50 °C
	within 90 days (Shipped conditions)	-20 ~ +45 °C
	within 1 year (Shipped conditions)	-20 ~ +20 °C

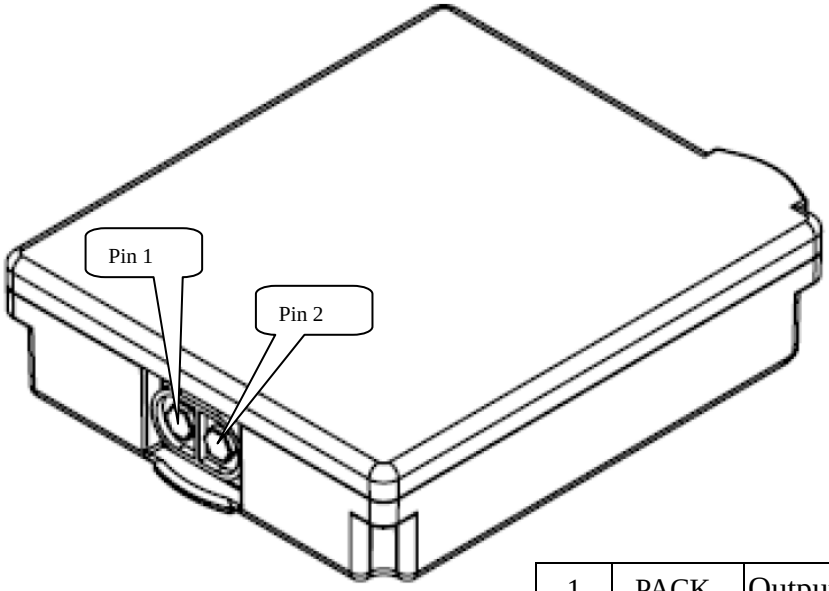
4. PCM Electrical Specification

Item	Parameter		Unit	Specification
4.1	Operating Temperature		℃	@25℃
4.2	Over Charge Voltage Protection (cell)	Detect voltage	V	4.30 ± 0.05
		Delay time	sec	2 ±1
		Release voltage	V	4.15 ± 0.05
4.3	Over Discharge Voltage Protection (cell)	Detect voltage	V	2.60 ± 0.1
		Delay time	sec	2 ±1
		Release voltage	V	3.30 ± 0.1
4.4	Over charge Current Protection	Detect current	A	8 ± 2
		Delay time	sec	3 ±1
		Release condition	sec	16 ±1
4.5	Over Discharge Current Protection	Detect current	A	40 ± 4
		Delay time	sec	3 ±1
		Release condition	sec	16 ±1
4.6	Short Circuit Protection	Detect current	A	>80A
		Delay time	us	<600
		Release condition		Load release or Charger plug in
4.6	Over Charge Temperature Protection	Detect temperature	℃	50 ± 3
		Delay time	sec	2 ±1
		Release temperature	℃	40 ± 3
4.7	Under Charge Temperature Protection	Detect temperature	℃	-10 ± 3
		Delay time	sec	2 ±1
		Release temperature	℃	0 ± 3

4.8	Over Discharge Temperature Protection	Detect temperature	℃	60 ± 3
		Delay time	sec	2 ±1
		Release temperature	℃	50 ± 3
4.6	Current Loop Impedance of PCM	Measured between "B-"and"P-" with 1KHz.	mΩ	20(Max)
4.7	Total impedance of whole battery pack	Measured between "P+"and"P-" with 1KHz.	mΩ	105(Max)
4.8	PCM Power Consumption: Operating mode	Current	uA	<500
4.8	PCM Power Consumption: Sleep mode	Current	uA	<100

5. Package PIN Define

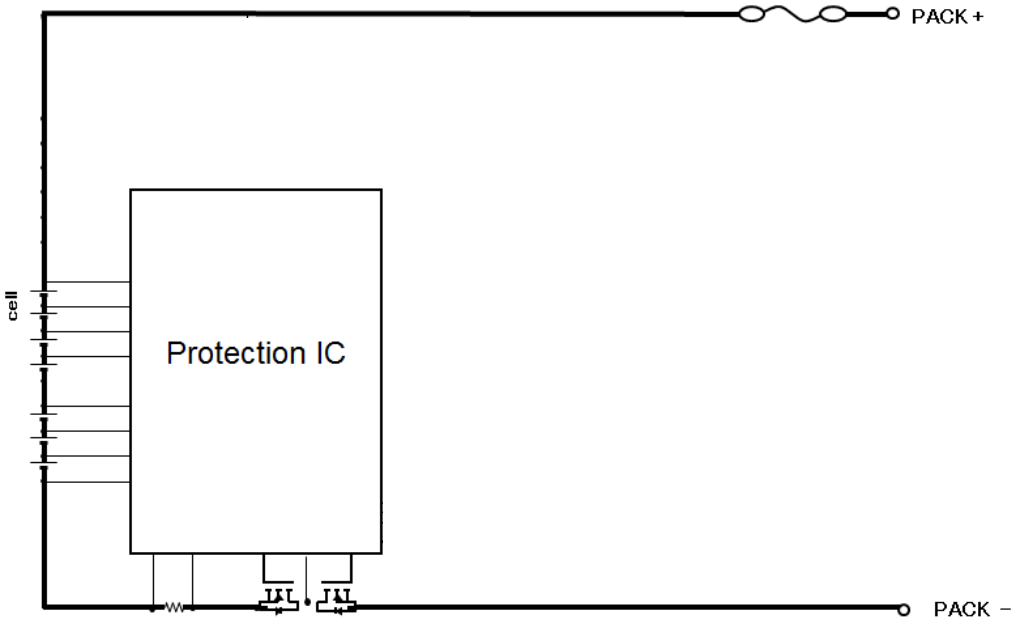
5.1 Power Output Port Pins Assignment



1	PACK-	Output positive terminal	UL1015 Black 14AWG
2	PACK+	Output negative terminal	UL1015 Red 14AWG

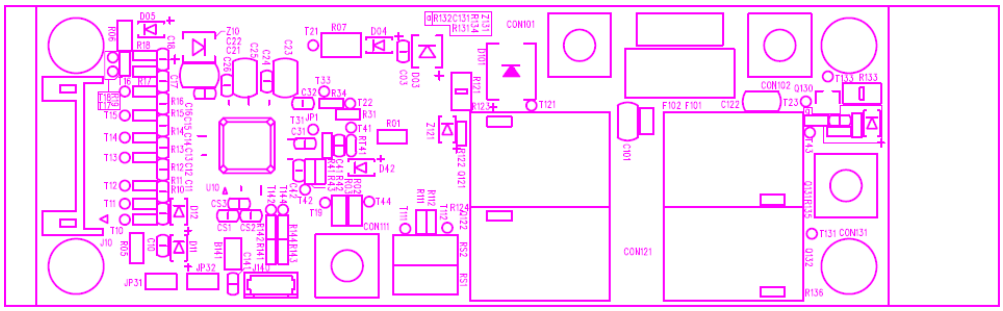
6. PCM Circuit and Layout Drawing:

6.1 Circuit Diagram

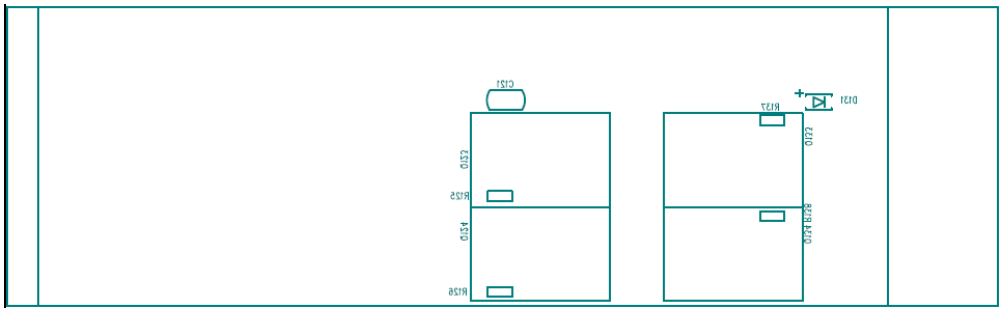


6.2 PCB Layout

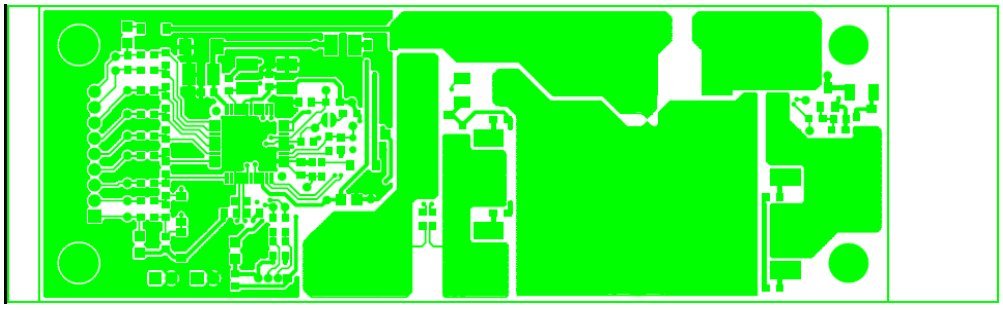
TOP-SILK



BOT-SILK



TOP SIDE

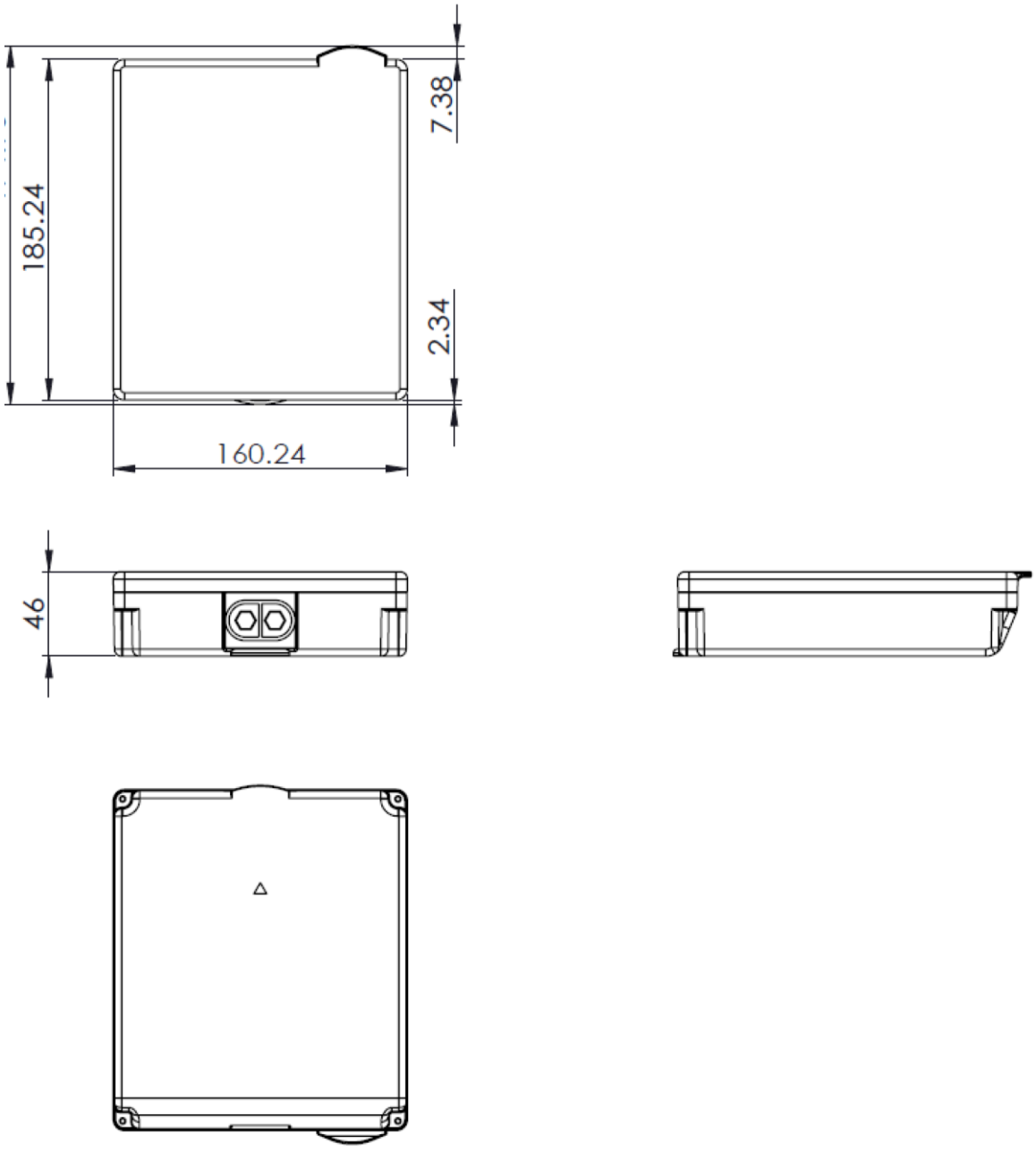


7. Bill of Materials

TBD

8. Dimension Specification

8.1 Pack Dimension Specification



8.2 Finished appearance and labeling

內部示意圖

外觀示意圖

8.3 Explosion Drawing

TBD

** 8.3 Label Dimension Specification

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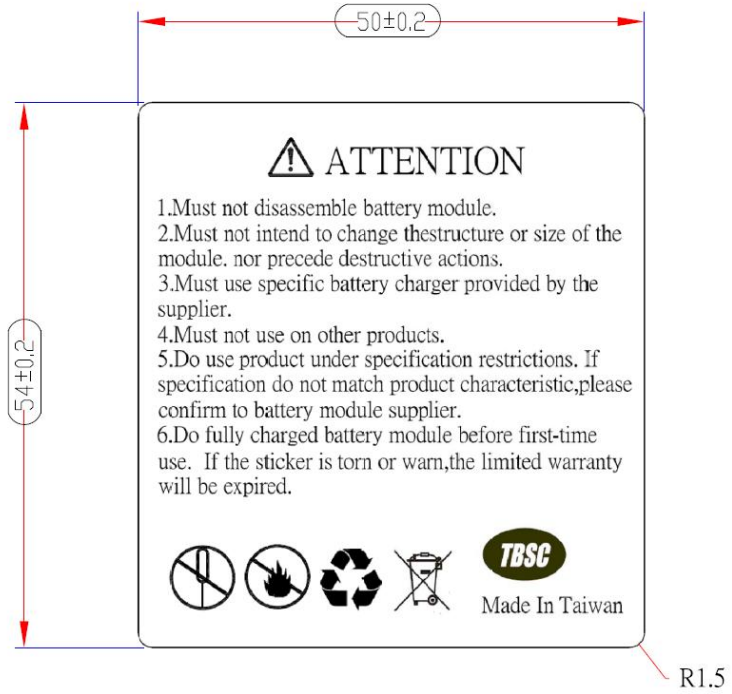
** Attention label :

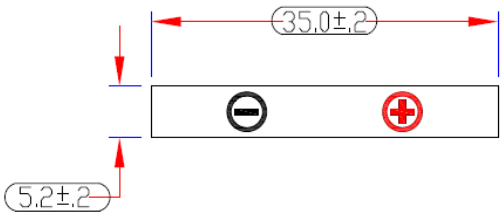


NOTE:
1. 材質: 霧面PC
2. 膠質: 3M467
3. 厚度:0.3±0.04mm含膠
4. 底色印刷白色, 圖形&字形黑色.
5. 貼紙勿刮傷表面及破損髒污
6.標示 ( ) 為重點尺寸

Specification label :

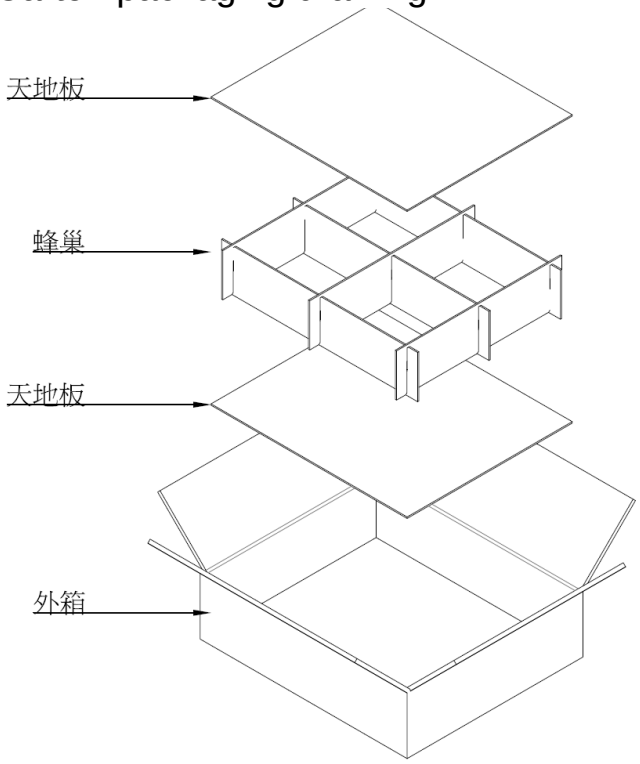
NOTE:
1. 材質: 霧面PC
2. 膠質: 3M467
3. 厚度:0.3±0.04mm含膠
4. 底色印刷白色, 圖形&字形黑色.
5. 貼紙勿刮傷表面及破損髒污
6.標示 ( ) 為重點尺寸

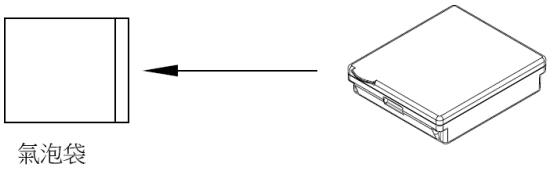
Polarity label :



NOTE:
1. 材質: 霧面PC
2. 膠質: 3M467
3. 厚度:0.3±0.04mm含膠
4. 底色印刷白色, 圖形&字形黑色.
5. 貼紙勿刮傷表面及破損髒污
6.標示 ( ) 為重點尺寸

8.4 Carton packaging drawing

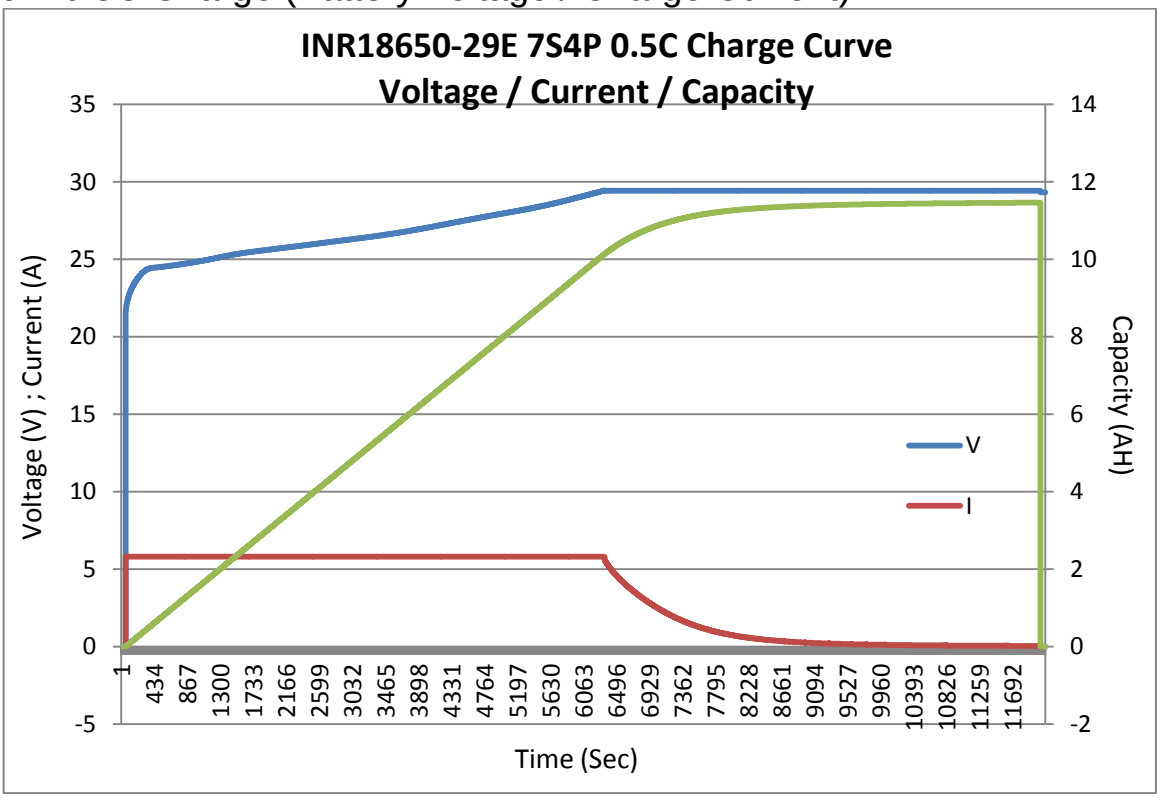




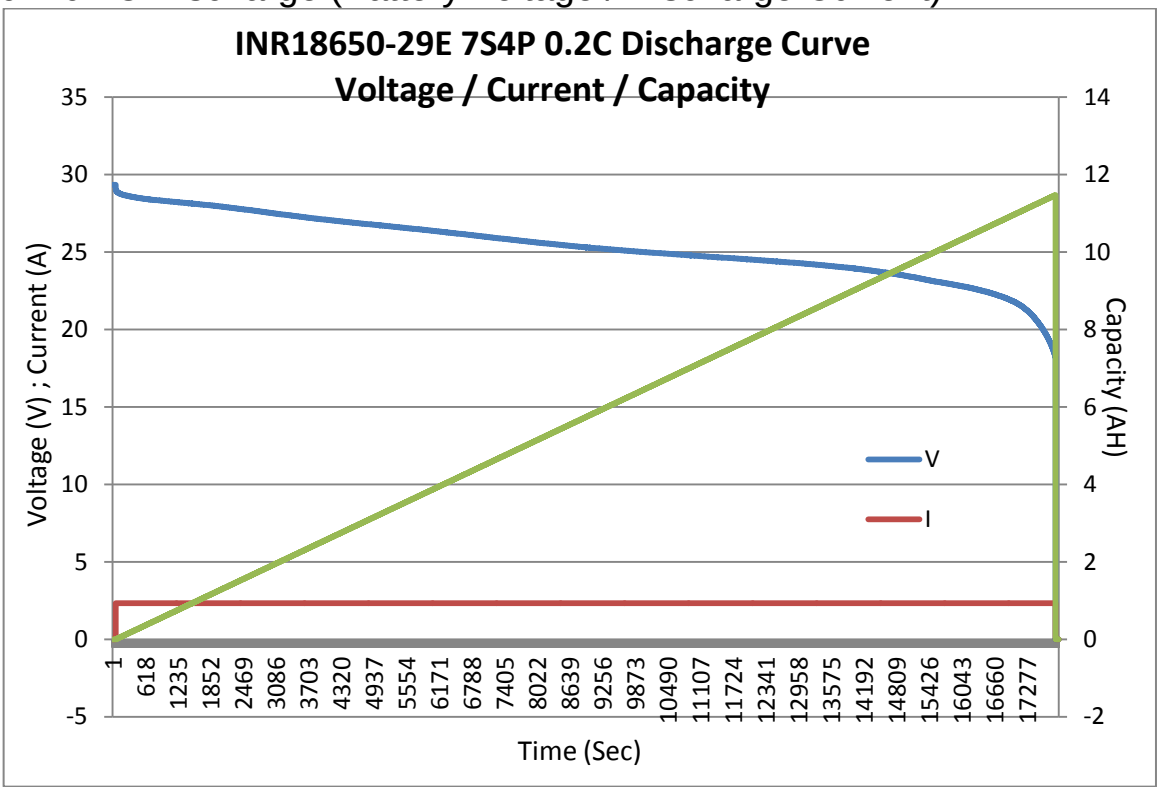
品名	規格	用量
外箱	內部尺寸 L=479.3*W=405.3*H=132mm	1
天地板	469.3*395.3*3 mm B楞	2
長隔板	469.3*106*3mm B楞	3
短隔板	395.3*106*3mm B楞	3

9. Performance Curve

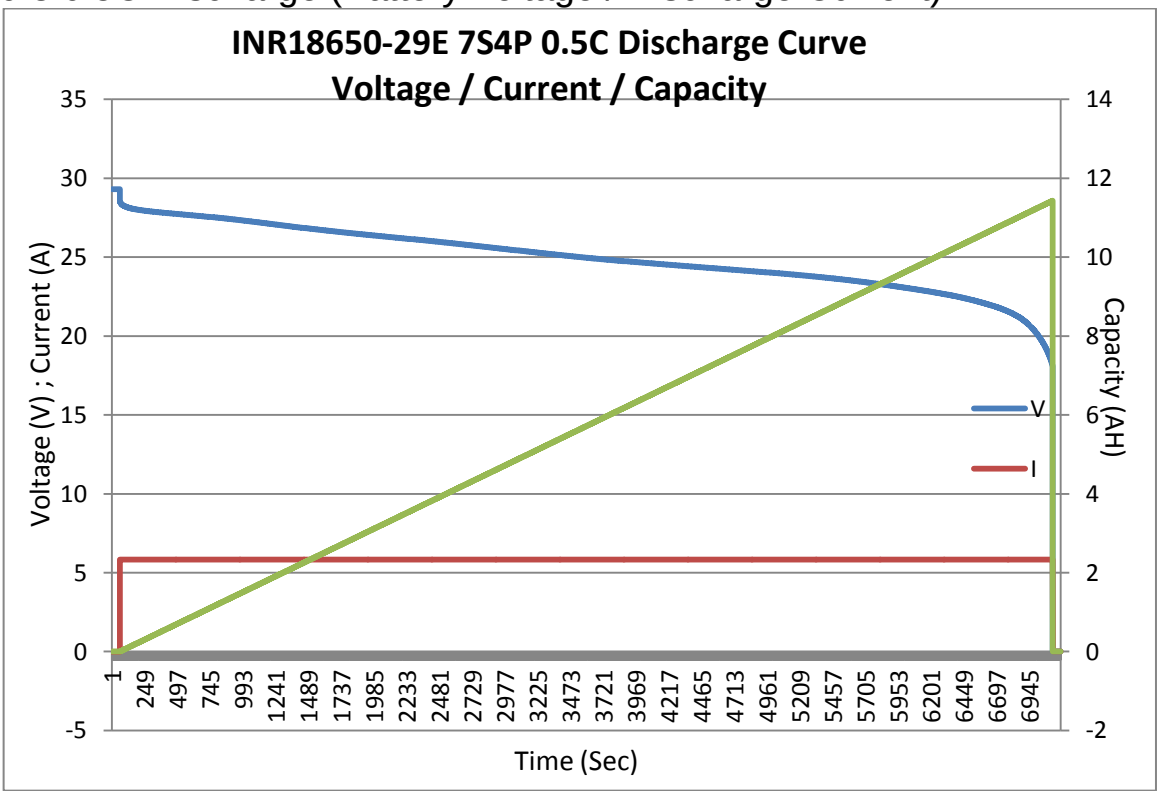
9.1 0.5C Charge (Battery Voltage / Charge Current)



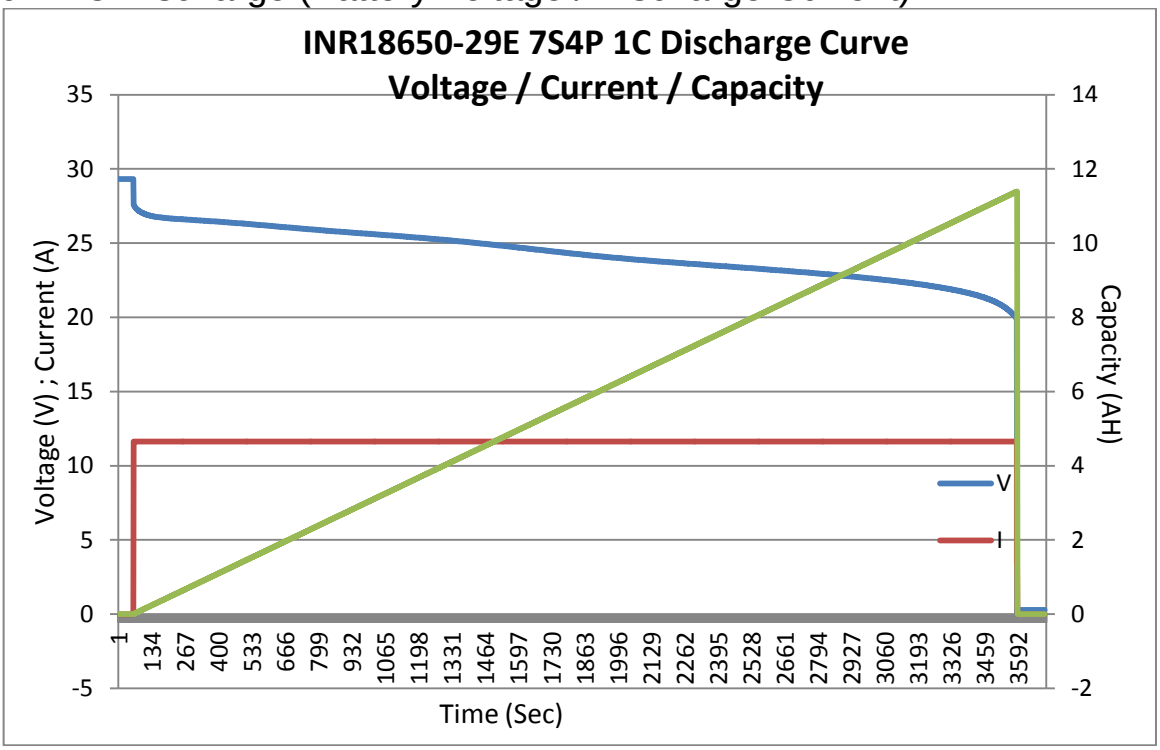
9.2 0.2C Discharge (Battery Voltage / Discharge Current)



9.3 0.5C Discharge (Battery Voltage / Discharge Current)



9.4 1C Discharge (Battery Voltage / Discharge Current)



10. Main Components Specification 主件規格資料

Protection IC: O2Micro OZ890
附件一
MOSFET: HY G050N08
附件二
Cell: DMEGC INR18650-29E
附件三