Content

文件修訂記錄表(HISTORY RECORD)

修訂日期 (Date)	版次 (Rev.)	修訂原因及說明(Revision Reason and Statement)	
		舊版內容 (Old)	新版內容 (New)
103.01.10	1.0		NEW
103.03.12	1.1		
103.08.21	1.2		Add Label
103.09.11	1.3		因應業務要求,新增 Item 10 Warranty
	1.4		變更 Label（新增 China RoHs 符號）
		EME33-ME202EK	變更產品文件名稱(EME33-E028)以符合 AE0002 Battery Pack 產品型號編碼管理作業程序書
		6.4.Available specification	6.4.Available specification 新增 (Note: TCA flag in BatteryStatus is cleared if RelativeStateOfCharge is below TCA Clear %)

1. General

1.1 Scope

This product specification covers the requirement for the rechargeable lithium ion battery pack with protection circuit for detecting function of overcharge, over-discharge and over current. Pack Supports the Smart/Battery Specification SBS V1.1 The rechargeable Li-ion battery packs manufactured and used for Notebook PC or others.

1.2 Name and Model

1.2.1 E-One Moli Energy Model Name: ME202EK

1.2.2 Cell Configuration: ICR18650K (3P-3S)

1.3 Safety Regulation

E-One Moli Energy applies the safety regulation: UL

2. Product Specification

2.1 Rated Specifications

	Item	Specification	Remarks
2.1.1	Nominal Capacity	7800mAh	0.2C discharge, until cut off
2.1.2	Nominal Voltage	11.1V	3.7V/cell, OCV
2.1.3	Charge method	Constant voltage with current limited charge method	CC/CV mode
2.1.4	Rated Charge Voltage	12.6V	
2.1.5	Maximum Charge Voltage	12.6V	
2.1.6	Discharge Cutoff Voltage	9.0V	
2.1.7	Rated Charge Current	3A	
2.1.8	Maximum Charge Current	4A	
2.1.9	Maximum Discharge Current	6A	Discharge from Full to Empty 9.0V
2.1.10	Allowable Temperature Range	1~50 ℃ 1~45 ℃	Rated Discharging Rated Charging
2.1.11	Storage Temperature	<35℃	Recommended temperature less than 23 degree C for long term storage.

Rated Discharge: Constant current discharge(0.2CA) till the discharge end V (9.0V) at 25 ±2℃.

Rated Charge :12.6 constant voltage and 0.5CA current limited charge, for 3.0 hours at 25 ±2℃.

2.2 Dimension and Appearance

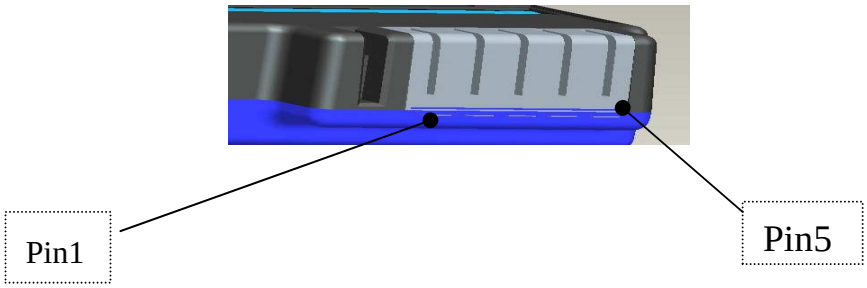
2.2.1 Weight: 520 g or less

2.2.2 Appearance

Any critical damage such as scratches, tears, cracks, discoloration, leakage and distortion must not be found from the appearance of the product, and the surface of product shall have uniformity.

2.2.3 Pin define and Description Socket:

Part No : TSD0-02105-10T3 5PIN



Pin No.	Name	Description
1	Pack+	Battery pack Positive terminal(P+ pin)
2	SMBC	SMBUS Clock signal
3	SMBD	SMBUS Data signal
4	ID	Connect a resistor(300ohm) to Ground
5	Pack-	Battery Pack Positive terminal(P- pin)

3. Current Consumption

Normal Run:600uA or less

No_communcation:200uA or less

Shut down:20uA or less

4. Safety Control

4.1 Primary Protection Function

Control Charge/discharge FET.(Set Protection Parameter for BQ20Z95)

Parameter	Typical	Unit
Over Charge Detect Voltage	4275	mV
Over Charge Delay time	2~4	Sec
Over charge release voltage	4150	mV
Over discharge Detect Voltage	2750	mV
Over discharge delay time	2~4	Sec
Over discharge Release Voltage	2800	mV
Over Current detect	7	A
Over Current Delay time	2~4	sec

4.2 Secondary Protection Function

Blow up the SCP Fuse. The Protection driver have the S8244AAF and Software BQ20Z95

Parameter	Minimum	Typical	Maximum	Unit
Over charge Detect Voltage (S8244)	4.40	4.45V	4.50	V
Over charge Delay Time	1	1.5	2	sec
Over charge detect voltage(Software)	13.00	13.05	13.10	V
Over charge Delay time(software)	2	3	4	sec
Charge Over temp Detect(software)	73	75	77	℃
Discharge Over temp Detect(software)	78	80	82	℃

5. Performance and test condition

No	Item	Standards	Test conditions (Note 1)
1	Outside Appearance	No Prominent stain, deformation or damage.	Visual check
2	Outside dimension	According to the Attached drawing	Use a caliper(0.5mm a division)
3	Initial internal resistance	Below 200mΩ	Measured by the alternate current method (1khz) Within one hour after the rate charge (25±2℃)
4	Open circuit voltage	Above 12.0V	Measured Within twenty-four hours after the rated charge(25±2℃)
5	Cycle life	Above 65%	Carry out 300cyles at 0.5CA Cycling charges and rated discharges (25±2℃) Then measured rated discharge time after the rated charge (at301st cycle)
		Above 65%	Carry out 300 cycles at 0.5CA charges and rated discharges(45±2℃) Then measured rated discharge time after the rated charge.(at 301st cycle)
6	Temperature shock cycle	No outside abnormality Above 200minutes	5 times of cycles test under the following environment are made to the cell after the rated charge. Then measure the rated discharge time and check outside appearance immediately after the rated charge 60℃,2hours⟺-10℃.8hours

7	Long time storage performance	Above 210 minutes	Storage the cell at 50% capacity condition. Cell shall be rate discharge and rate charge .Then measure the rated discharge time. This test can be carried out up to three times if discharge time is below specified time Storage temperatures: Storage periods 60℃: 1 month 45℃: 3 months
8	Charge retention performance	Above 180 minutes	Leave 30 days at 25±2℃ after rated charge. Then measure elapsed time at rated discharge.
9	Overcharge performance	No leakage or prominent breakage	Charge the sample after discharge till end voltage at constant current and constant voltage (0.5CA/13.5±0.05V) for 24hours at 25±2℃.Then measure the rated discharge time and check outside appearance immediately after the rated charge.
10	Over discharge performance	No leakage or prominent breakage	Discharge the sample for 24hours by connecting to 15Ω resister at 25±2℃ after rated charge. Then measure the rated discharge time and check outside appearance immediately after the rated charge.
11	Short between terminal(safety test)	No rupture, fire, smoke or leakage	Leave a pack shorted between terminals for 8hours after the rated charge at 25±2℃
12	Reverse charge(Safety test)	No rupture ,fire, smoke or leakage	Connect to power supply at a reverse polarity condition(0.5CA/12.6V±0.05V) at 25±2℃ and leave it for 8 hours
13	Heat test	No outside abnormality normal function	Leave rated charged at 50% Capacity test sample at 70±2℃ for 10hours ,then leave for more than 5 hours at 25±2℃.Then measure the rated discharge time and check the outside appearance immediately after rated charge

6. Control circuit

6.1 Performance

No.	Item	Rated performance	Remarks
1	Circuit Current consumption (During storage)	Below 200uA (Average current)	Measure the current consumption When the cell voltage is 3.5V,

6.2 Protection function

No.	Functional Item	Control function and Operation	Condition for reset
1	Overcharge first Protection function	Shut down the circuitry and stop the charging process if the cell Voltage became above 4.275±0.050V lasting for a few seconds (Possible to discharge)	Discharge the cell voltage below 4.150±0.050V.
2	Overcharge Second Protection Function	Shut down the circuitry and stop the charging/discharge process if the cell voltage becomes above 4.450±0.050V.lasting for a few seconds.	Not recoverable.(Impossible to charge or discharge)
3	Over discharge Protection Function	Shut down the circuitry and stop the discharge if the cell voltage becomes under 2.750±0.050V. (Possible to charge)	Recover the cell voltage above 2.80±0.050V.by pre-charging.
4	Over Current Discharge Protection Function	Stop the discharge if the discharge current is over 6.5~7.5A lasting for few seconds.	Remove discharge load for few minute
5	Over current Charge Protection Function	Stop the charge if the charge current is over 4.5~5.5A lasting for few seconds.	Remove charge for few minutes
6	Over temperature Protection function	Stop the discharge if the Temperature inside the Battery packs raises over 75±3℃ Stop the charge if the Temperature inside the Battery packs raises over 60±3℃	Recover when the Temperature inside the battery pack falls to 25℃ from active temperature.
7	Protection for High Temperature	Thermal Fuse melts if the temperature inside the battery packs raises over 94±3℃	Not recoverable. (impossible charge or discharge).

6.3 Calibration data specification

Item	Specification	remark
Accuracy of Voltage(No Load)	±10mV	Cell voltage 3.00~4.20V
Accuracy of Voltage(Max discharge)	±30mV	Discharge cell Voltage:3.00~4.20mV
Accuracy of Voltage(charge)	±30mV	2A charge Cell Voltage:3.00~4.20V

Accuracy of Current(Max discharge)	±20mA	1% 2A discharge
Accuracy of Current(Max charge)	±20mA	1% 2A charge
Accuracy of temperature	±3℃	Operation temperature range:1~50℃

6.4 Available Specifications

Smart Battery Data Specification Rev:1.1

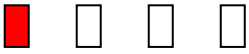
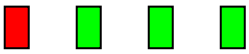
(Note: TCA flag in BatteryStatus is cleared if RelativeStateOfCharge is below TCA Clear %)

Smart Management Bus Specification Rev1.1

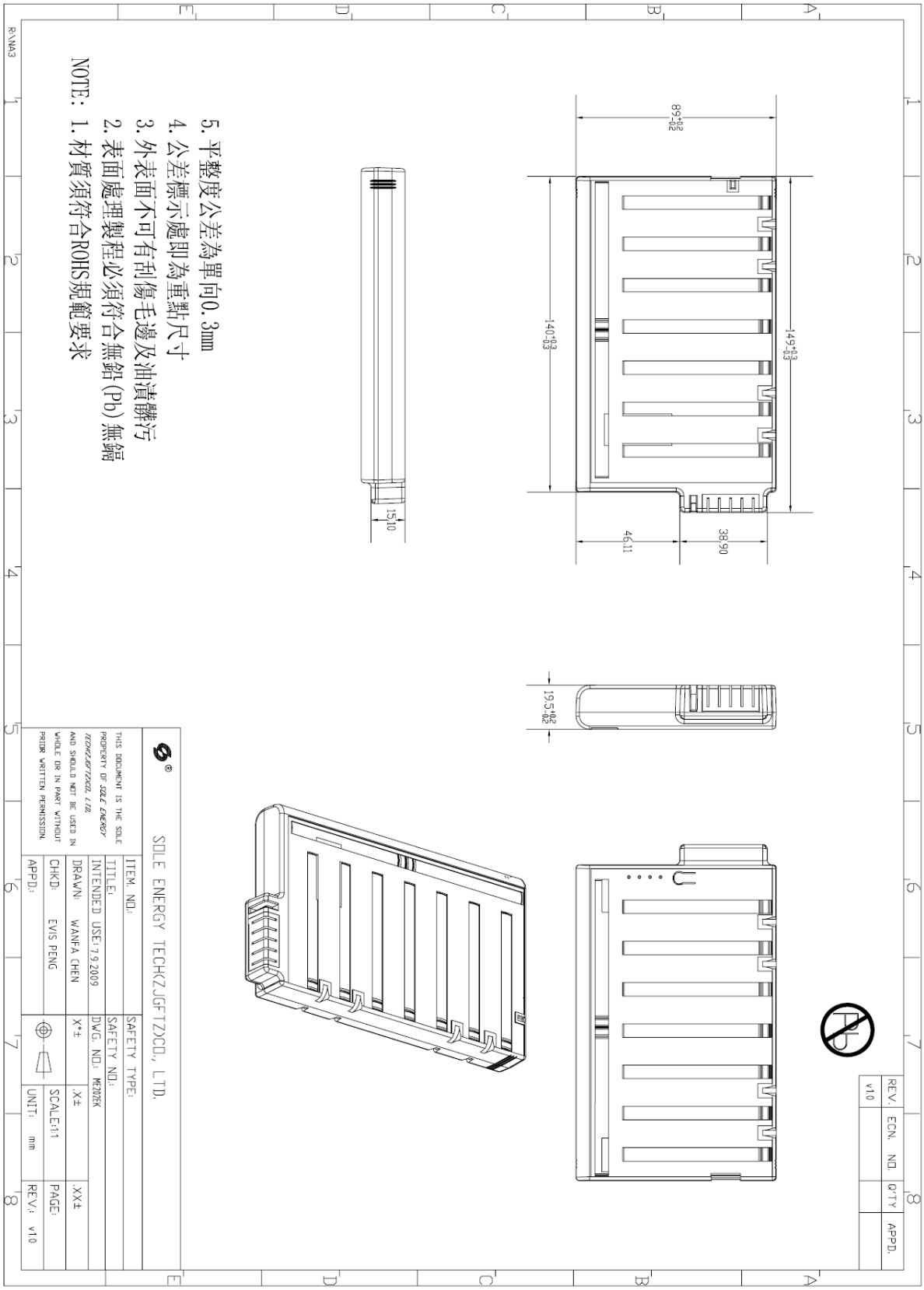
Supports SHA-1 Authentication

7. LED Light

When The Switch is Pushed, LED lamp is lighted as follows According to relative state of charge.

RSOC	LED LAMPS	Label Showing
0~24%		25
25~49%		50
50~74%		75
75%~100%		100

8. Mechanics drawing



9. Label

10. Warranty

Warranty period is one year after shipment under normal conditions. Within this period, E-One Moli Energy will replace the pack for free against defects as long as it is confirmed such defects are the failure of the pack manufacturing process. Any other defects caused by system malfunction or abnormal usage of the pack are not covered by this warranty.

11. Handling Precaution

- Use specified charge/discharge conditions
- Capacity at shipping point : > 40%
- Specified product use only
- Do not short terminals
- Do not immerse in water
- Do not heat or throw in fire
- Do not leave in conditions of over than 60℃or in a heated car.
- Do not attempt to crush or drop
- Do not attempt to modify
- Do not solder to terminals
- Leave in cool and dry places
- Do not put it in a microwave oven or pressurized container
- If charging time exceeds specification, stop charge
- If the battery voltage is less than the specified discharge voltage, pre-charge the pack at a very low current less than 0.03C. Do not use the battery if it does not recover during the conditioning noted above
- During assembly, charging, normal use or storage of battery pack, if something unusual occurs such as smell, change in color or mechanical changes are detected, discontinue use immediately.
- In case of leakage or odors resulting from thermal conditions, rinse off the liquid with clean water .
- In case of contact with eyes, wash off with water and consult your doctor
- Any discrepancies should be resolved by mutual discussion.