

Spec. No.	INR18650-3500-2S1P	Version No.	0.0
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SPECIFICATION

OF

Battery Type: INR18650-3500-2S1P

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1. Scope.

The specification shall be applied to Li-ion rechargeable battery pack of INR18650-3500-2S1P. The product is ROHS compliant.

2. Battery Pack Datasheet:

NO	Items	Criteria	Remarks
2.1	Typical Capacity	3450mAh	Discharge:1700mA Cut-off voltage: 5.0V
	Rated Capacity	3350mAh	
2.2	Energy	24.84Wh	
2.3	Nominal Voltage	7.2V	
2.4	Open Circuit Voltage	7.0~7.5V	
2.5	Internal Impedance	Cell: $\leq 35\text{m}\Omega$	AC 1KHz after standard charge
		Battery pack: $\leq 150\text{m}\Omega$	
2.6	Charge voltage	8.4V	
2.7	Charge Time (Std.)	4 hours	
2.8	Standard charge current	1700mA	Ambient temperature 25°C
2.9	Standard discharge current	680mA	Ambient temperature 25°C
2.10	Max. discharge current	5200mA	Ambient temperature 25°C
2.11	Discharge cut-off voltage	5.0V	
2.12	Operating Temperature	Charge: 0°C ~ +45°C	
		Discharge: -10°C ~ +60°C	
2.13	Storage Temperature	-20°C ~ +60°C	Less than 1 month
		-20°C ~ +45°C	Less than 3 months
2.14	Weight	Max.145g	
2.15	Size(mm) Max.	(L)67.5*(W)37.0*(T)19.5	

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3. Battery pack configuration

NO	Item	Criteria	Remarks
3.1	Cell	INR18650-35E /3450mAh	Samsung cell
3.2	PCM		
	PCB	UL VM-1	
3.3	Wire	UL 1007 AWG22	
	Connector	NONE	
3.4	PVC	Black	

4. Battery Performance Criteria**4.1 Appearance**

There shall be no such defect as scratch, bur and other mechanical scratch, and the connector should be no rust dirt. The structure and dimensions see attached drawing of the battery.

4.2 Measurement Apparatus**(1) Dimension Measuring Instrument**

The dimension measurement shall be implemented by instruments with equal or more precision scale of 0.01mm.

(2) Voltmeter

Standard class specified in the national standard or more sensitive class having inner impedance not less than 10 K Ω /V.

(3) Ammeter

Standard class specified in the national standard or more sensitive class. Total external resistance including ammeter and wire is less than 0.01 Ω .

(4) Impedance Meter

Impedance shall be measured by a sinusoidal alternating current method (AC 1kHz LCR meter).

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4.3 Standard Test Condition

Test should be conducted with new batteries within one month after shipment from our factory and the cells shall not be cycled more than five times before the test. Unless otherwise defined, test and measurement shall be done under temperature of $20\pm 5^{\circ}\text{C}$ and relative humidity of 45~85%.

4.4 Rest Period

Unless otherwise defined 30min, rest period after charge 30min, rest period after discharge.

4. Handling precaution and prohibitions of lithium Ion rechargeable batteries

Inaccurate handling of lithium ion and lithium ion polymer rechargeable battery may cause leakage, heat, smoke, an explosion, or fire.

This could cause deterioration of performance or failure. Please be sure to follow instructions carefully.

1.1 Storage

Store the battery at low temperature (below 25°C is recommended), low humidity, no dust and no corrosive gas atmosphere.

1.2 Safety precaution and prohibitions

To assure product safety, describe the following precautions in the instruction manual of the application.

[Danger!]

■ Electrical misuseage

Use stipulated charger.

Use or charge the battery only in the stipulated application.

Don't charge the battery by an electric outlet directly or a cigarette lighter charger.

Don't charge the battery reversely.

■ Environmental misuseage

Don't leave the battery near the fire or a heated source.

Don't throw the battery into the fire.

Don't leave, charge or use the battery in a car or similar place where inside of temperature may be over 60°C .

Don't immerse, throw, wet the battery in water / sea water.

■ Others

Don't fold the battery cased with laminated film such as pouch and polymer.

Don't store the battery in a pocket or a bag together with metallic objects such as keys,

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necklaces,

hairpins, coins, or screws.

Don't short circuit (+) and (-) terminals with metallic object intentionally.

Don't pierce the battery with a sharp object such as a needle, screw drivers.

Don't heat partial area of the battery with heated objects such as soldering iron.

Don't hit with heavy objects such as a hammer, weight.

Don't step on the battery and throw or drop the battery on the hard floor to avoid mechanical shock.

Don't disassemble the battery or modify the battery design including electric circuit.

Don't solder on the battery directly.

Don't use seriously scared or deformed battery.

Don't put the battery into a microwave oven, dryer or high-pressure container.

Don't use or assemble the battery with other makers' batteries, different types and/or models of batteries such as dry batteries, nickel-metal hydride batteries, or nickel-cadmium batteries.

Don't use or assemble old and new batteries together.

[Warning!]

Stop charging the battery if charging isn't completed within the specified time.

Stop using the battery if the battery becomes abnormally hot, order, discoloration, deformation, or abnormal conditions is detected during use, charge, or storage.

Keep away from fire immediately when leakage or foul odors are detected. If liquid leaks onto your skin or cloths, wash well with fresh water immediately.

If liquid leaking from the battery gets into your eyes, don't rub your eyes and wash them with clean water and go to see a doctor immediately.

If the terminals of the battery become dirty, wipe with a dry cloth before using the battery.

The battery can be used within the following temperature ranges. Don't exceed these ranges.

The operating temperature is based on the cell surface temperature in hottest position in pack.

Charge temperature ranges : 0°C ~ 50°C.

Discharge Temperature ranges : -20°C ~ 60°C.

Store the battery at temperature below 60°C.

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6. Protection Circuit**6.1 Electrical characteristics**

Item	Symbol	Content	Criterion
Over charge protection	VDET1	Over charge detection voltage	4.30±0.025V
	tVDET1	Over charge detection delay time	1.0±0.2s
Over discharge protection	VDET2	Over discharge detection voltage	2.4±0.05V
	tVDET2	Over discharge detection delay time	102~153ms
Over current protection	VDET3	Over current detection voltage	0.2±0.01V
	IDP	Over current detection current	8-15 A
	t DIOV1	Detection delay time1	8±2ms
	t DIOV2	Detection delay time2	2ms
		Release condition	Cut load
Short protection		Detection condition	Exterior short circuit
	tSHORT	Detection delay time	224-336us
		Release condition	Remove the Load
Current consumption		Normal mode	8.0uA

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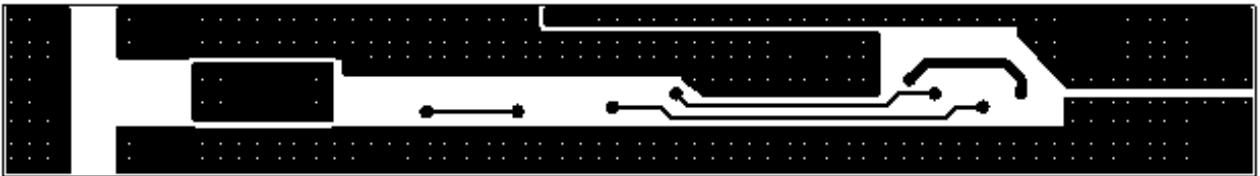
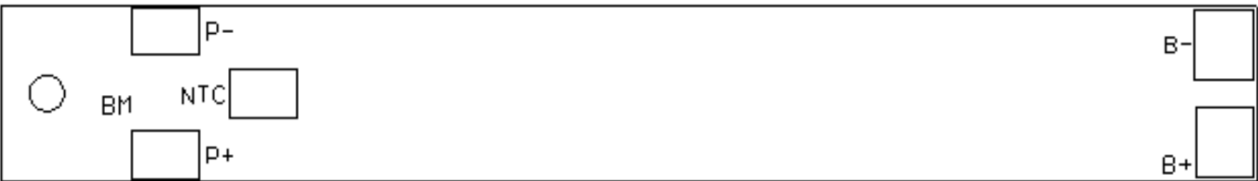
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6.2 PCM BOM

Name	Brand	Quantity	Reference	Part
Capacity	Samsung	2	C1, C2	0603/0.1uF/±10%/50V
Resistor	Yageo	2	R1, R2	0603/470Ω±5%/1/10W
Resistor	Yageo	1	R3	0603/2KΩ±5%/1/10W
IC	Seiko	1	U1	S-8252AACFT
MOSFET	AOS	2	U2,U3	AO8810
PCB	ASSOON	1		

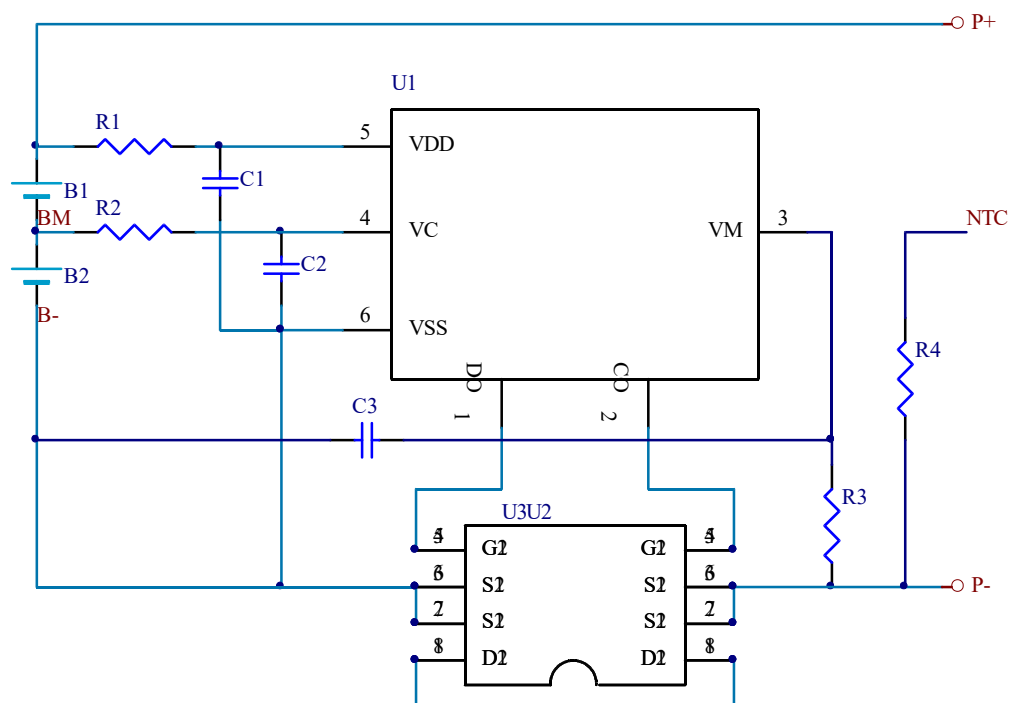
6.3 PCB Layout



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6.4 Circuit Diagram



7.Assembly Drawing.

