Specification Approval Sheet

Name: Nickel Metal Hydride Battery Pack

Model: 11401-01

SPEC: AA 8S1P 9.6V 2000mAh

Approved By	Checkup	Make

Customer Confirmation	Signature	Date
	Company Name：	
	Stamp：	

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1.SCOPE

MODEL: 11401-01

The data involving nominal voltage and the approximate weight of stack-up batteries shall be equal to the value of the unit cell multiplied by the number unit cells in the battery. For example, a stack-up battery consists of three unit cells;

Nominal voltage of unit cell=1.2V

Thus, nominal voltage of stack-up battery=1.2V×3=3.6V

2.NOMINAL SPECIFICATION

2-1.Nominal voltage	9.6V
2-2.Nominal capacity*	2000mAh
2-3.Minimum capacity*	2000mAh
2-4.Charging**	
Standard charging	200mA for 16 hours
Quick charging	400mA for 7 hours
Rapid charging	1000mA for 2.4hours, –ΔV=5mV/cell
2-5.End voltage of discharge	1.0V/cell
2-6.Temperature (recommended)	
Standard charge	0~40℃
Quick charge	10~40℃
Rapid charge	10~30℃
Discharge:	0~50℃
Storage: Less than 30 days	-20~50℃
Less than 90 days	-20~40℃
Less than 1 year	-20~30℃
2-7.Relative humidity	45~85%
2-8.Weight	Approx. 220g

2-9.Dimensions shown in the page 8

Note *:Discharge capacity when the battery pack is discharged at 400mA after being standard charged.

Five cycles are permitted for this test .The test shall be terminated at the end of the first cycle which meets the requirement.

**: Unless otherwise stated in these specifications, the battery pack should be discharged to 1.0V/cell end voltage with 400mA before charging.

3. APPEARANCE

There shall be no practical damage such as conspicuous liquid electrolyte leakage, flow and dirt under conditions of storage or operation as specified herein.

4.ELECTRICAL CHARACTERISTICS

4-1.Testing conditions

The battery shall be evaluated within 1 month from the arrival date.

Unless otherwise stated in these specifications, the following test shall be carried out in an ambient temperature of 20±5℃, relative humidity of 65±20%.

4-2.Terminal voltage (O.C.V)

Open circuit voltage shall be a minimum voltage of 10.0V within 14 days after being standard charged.

4-3. Internal resistance **(**IEC61951-2（2003）7.10.1**)**

Within 1 hour after being standard charged, the internal resistance is not greater than 370mΩ, as tested by 1000Hz AC source.

4-4.Capacity **(**IEC61951-2 **(**2003）7.2.1**)**

4-4-1.The battery pack shall be capable of supplying 400mA (0.2C) continuous discharge current for a minimum of 300 minutes to the 1.0V/cell end voltage within 1 hour after being standard charged.

4-4-2.The battery pack shall be capable of supplying 1000mA (0.5C) continuous discharge current for a minimum of 105 minutes to the 1.0V/cell end voltage within 1 hour after being standard charged.

4-4-3.The battery pack shall be capable of supplying 2000mA (1.0C) continuous discharge current for a minimum of 48 minutes to the 0.9V/cell end voltage within 1 hour after being standard

charged.

4-5.Temperature characteristics

4-5-1.Within 1 hour after standard charged at 40℃, the battery pack shall be discharged at 20℃, at a current of 400mA to 1.0V/cell end voltage, discharge time shall be a minimum of 210 minutes.

4-5-2. Within 1 hour after standard charged at 20℃, the battery pack shall be discharged at 0℃, at a current of 400mA to 1.0V/cell end voltage, discharge time shall be a minimum of 210 minutes.

4-6.Charge (capacity) retention **(**IEC61951-2（2003）7.3**)**

After being standard charged battery pack is stored for 28 days at 20±2℃, the battery pack shall be discharged at 20℃, at a current of 400mA to 1.0V/cell end voltage, discharge time shall be a minimum of 180 minutes.

4-7.Overcharge **(**IEC61951-2（2003）7.6.1**)**

Within 1 hour after being charged at a current of 200mA for 48 hours, the battery pack shall be discharged at 20℃, at a current of 400mA to 1.0V/cell end voltage, discharge time shall be a minimum of 300 minutes.

4-8.Endurance in cycles **(**IEC61951-2（2003）7.4.1.1**)**

Prior to the endurance in cycles test, the battery pack shall be discharged at 400mA to 1.0V/cell end voltage. A battery pack shall be capable of 500 minimum cycles under the conditions as follows.

Cycle	Charge	Rest	Discharge
1	200mA for 16hours	None	500mA×140minutes
2~48	500mA for 190minutes	None	500mA×140minutes
49	500mA for 190minutes	None	500mA to 1.0V/cell
50	200mA for 16hours	1h to 4h	400mA to 1.0V/cell
Cycles 1 to 50 shall be repeated until the discharge time on any 50th cycle becomes less than 3 hours. At this stage, repeat 50th cycle, if the discharge time is less than 3 hours again the test is terminated. Note: If battery pack voltage drops below 1.0V/cell, discharge shall be discontinued.			

4-9.Safety

4-9-1.Continuous low-rate charging **(**IEC62133（2002）4.2.1**)**

After standard charged battery unit is charged at 60mA~100mA for 28 days, no fire or no explosion.

4-9-2.Forced discharge **(**IEC62133（2002）4.3.10**)**

The discharged battery unit is subjected to a reverse charge at 2000mA for 90 minutes, no fire or no explosion.

4-10.Vibration **(**IEC62133（2002）4.2.2**)**

The battery unit shall be no fire, no leakage or no explosion, when it is tested under the following conditions after being standard charged.

Frequency	10~55Hz
Amplitude	0.76mm
Rate of frequency variety	1 Hz/minute
Duration	90 minutes /axis (axis: X、Y、Z) 270 minutes in all

5. ENVIRONMENTAL PROTECTION REQUIREMENT

5-1.The requirement on Hazardous Substances in the materials should comply with Tenergy's criterion on HSF.

5-2.The requirement on Hazardous Substances in the Products should comply with 2006/66/EC and Tenergy's criterion on HSF.

6. TRANSPORT

6-1.To ensure battery safety during delivery, SOC(state of charge) must be below 35% , inside temperature of container could not be over 35℃. Product holder should be responsible for any possible loss during delivery if above conditions cannot be met completely.

6-2.Inside temperature of container must be below 20℃ if any client requires SOC(state of charge)above 35%, the distance between battery master cartons should be not less than 10cm in container, and coercive air cross ventilation system is required in container to ensure even temperature for each master carton. Product holder should be responsible for any possibly accidental loss if above conditions cannot be met completely.

7.PRECAUTION:

Please keep in mind the following points when designing and manufacturing equipment. Please insert in your instruction manual. To prevent equipment malfunctions from affecting the batteries, be sure to use protection devices for electrical circuits and batteries.

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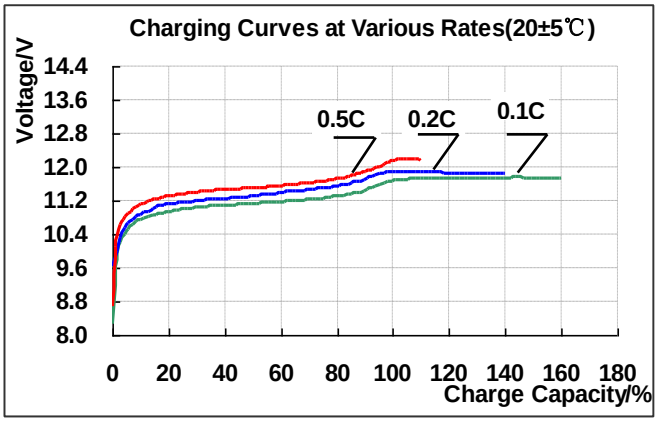
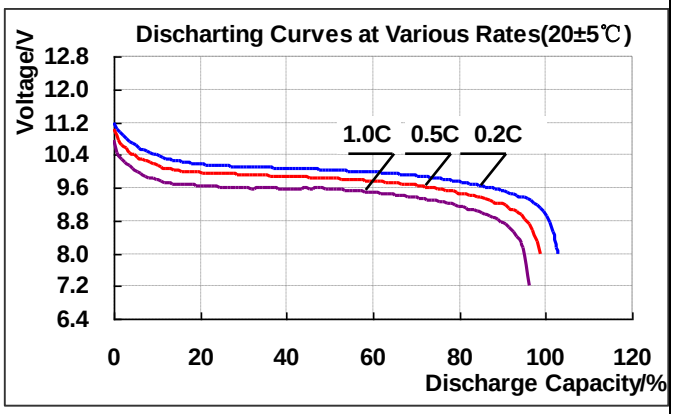
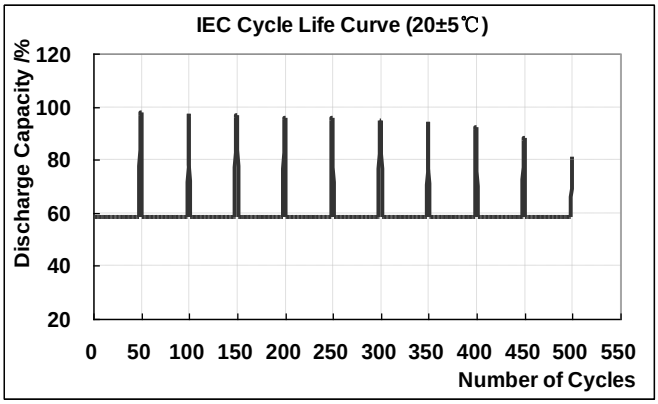
Data Sheet

Battery Model：11401-01		
Nominal Voltage（V）		9.6
Capacity*（mAh）	Nominal	2000
	Minimum	2000
Charge**	Standard	200mA×16hours
	Quick	400mA×7hours
	Rapid	1000mA×2.4hours -ΔV=5mV/cell
Weight		Approx.220g
Cycle Life		≥500cycles (IEC61951-2)
Open Circuit Voltage		≥10.0V
End Voltage		1.0V/cell
Charge(Capacity)retention		≥60%
Internal Resistance		≤370mΩ
Temperature recommended（℃）	Standard charge	0~40
	Quick Charge	10~40
	Rapid Charge	10~30
	Discharge	0~50
	storage	-20~30







Note： *:The Cycle Life Curve describes battery unit. Please discharge to the 1.0V/cell end voltage with 400mA before charging the battery unit.

The data sheet is for reference only and should not be used as a basis for product described guarantee or warranty.

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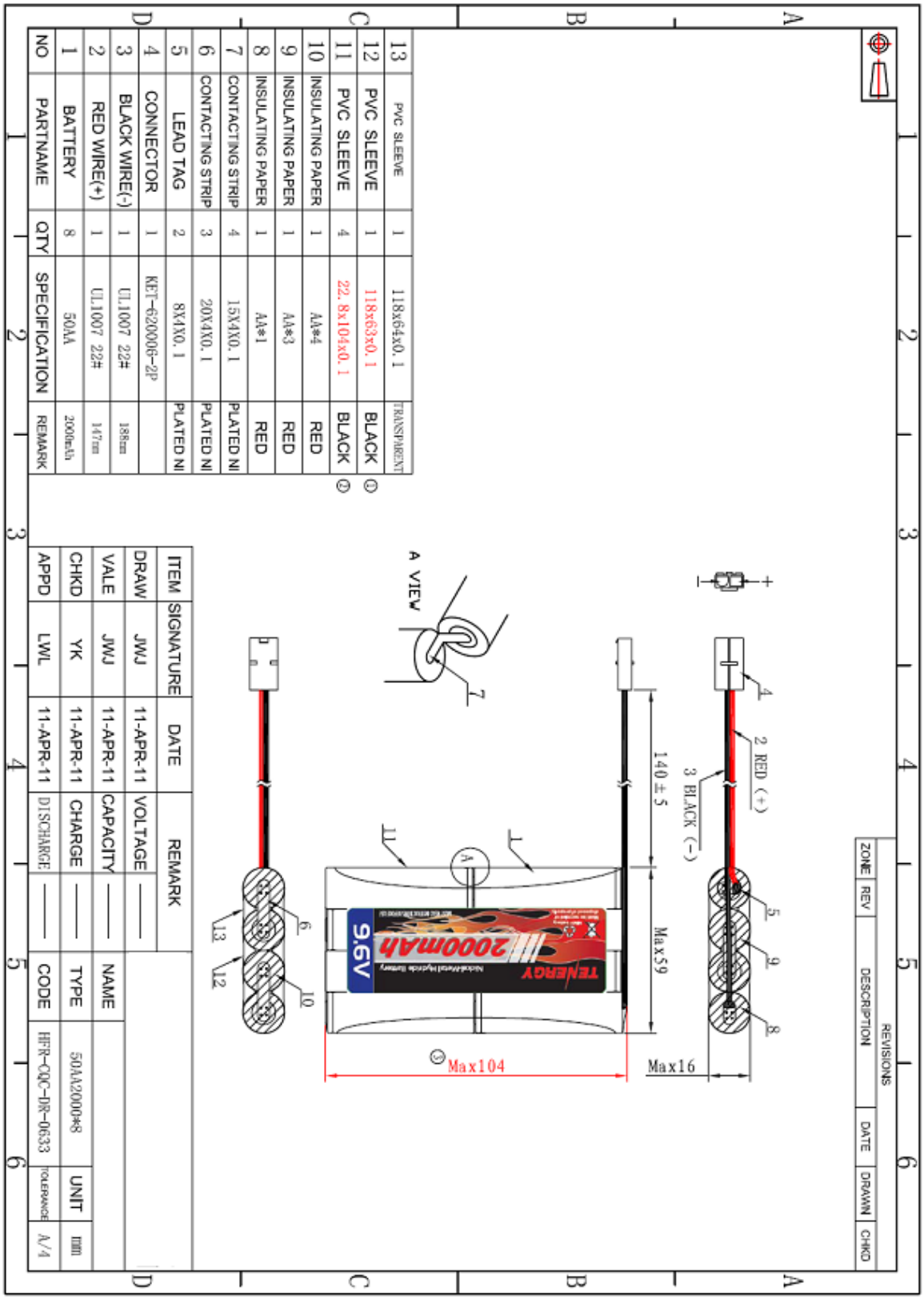

NO	PARTNAME	QTY	SPECIFICATION	REMARK
13	PVC SLEEVE	1	118x64x0.1	TRANSPARENT
12	PVC SLEEVE	1	118x63x0.1	BLACK ①
11	PVC SLEEVE	4	22.8x104x0.1	BLACK ②
10	INSULATING PAPER	1	AA*4	RED
9	INSULATING PAPER	1	AA*3	RED
8	INSULATING PAPER	1	AA*1	RED
7	CONTACTING STRIP	4	15X4X0.1	PLATED NI
6	CONTACTING STRIP	3	20X4X0.1	PLATED NI
5	LEAD TAG	2	8X4X0.1	PLATED NI
4	CONNECTOR	1	KET-620006-2P	
3	BLACK WIRE(-)	1	UL1007 22#	188mm
2	RED WIRE(+)	1	UL1007 22#	147mm
1	BATTERY	8	50AA	2000mAh

ITEM	SIGNATURE	DATE	REMARK
DRAW	JWJ	11-APR-11	VOLTAGE ——
VALE	JWJ	11-APR-11	CAPACITY ——
CHKD	YK	11-APR-11	CHARGE ——
APPD	LWL	11-APR-11	DISCHARGE ——

NAME			
TYPE	50AA2000#8	UNIT	mm
CODE	HFR-CQC-DR-0633	TOLERANCE	A/4

ZONE	REV	DESCRIPTION	DATE	DRAWN	CHKD
REVISIONS					