

**Data Sheet**  
**BP2548 - 12v 22Ah Lithium Polymer Battery Pack**

|                    |                                     |
|--------------------|-------------------------------------|
| Product Name       | Lithium Polymer (LiPo) Battery Pack |
| Battery Model Spec | LiPo - 7088120 3S2P 11.1V 22Ah      |
| File Revision      | A3                                  |

Amendment Records

| Revision | Description | Issued Date |
|----------|-------------|-------------|
| A3       | File Update | 2015-06-28  |

## 1 Scope

This document describes the performance characteristics and testing methods for LiPo batteries produced by Tracer Power, a division of Deben Group Industries Ltd.

## 2 Product type and model number

### 2.1 Product type

Lithium Polymer Battery Pack

### 2.2 Model number

LiPo - 7088120 3S2P 11.1V 22Ah (BP2548)

## 3 Rated performance

**Table 1: Rated Performance**

| #  | Item                                 | Rated performance                                                                                           | Remark                                                                                                                                                                                                      |
|----|--------------------------------------|-------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | Nominal capacity                     | 22Ah±5%                                                                                                     | Standard discharge after standard charge                                                                                                                                                                    |
| 2  | Nominal voltage                      | 11.1V                                                                                                       | Mean operation voltage during standard discharge after standard charge                                                                                                                                      |
| 3  | Equivalent Lithium Content (ELC)     | 19.8g                                                                                                       |                                                                                                                                                                                                             |
| 4  | Voltage at end of discharge          | 8.25V                                                                                                       | Discharge cut-off voltage                                                                                                                                                                                   |
| 5  | Charging voltage                     | 12.6V                                                                                                       |                                                                                                                                                                                                             |
| 6  | Impedance                            | < 125mΩ                                                                                                     |                                                                                                                                                                                                             |
| 7  | Standard charge                      | Constant current: 0.2C <sub>5</sub> A<br>Constant voltage: 12.6V<br>Cut-off current: ≤ 0.02C <sub>5</sub> A |                                                                                                                                                                                                             |
| 8  | Standard discharge                   | Constant current: 0.2C <sub>5</sub> A<br>End voltage: 8.25V                                                 |                                                                                                                                                                                                             |
| 9  | Maximum charge                       | Constant current: 0.5C <sub>5</sub> A<br>Constant voltage: 12.6V<br>Cut-off current: ≤ 0.02C <sub>5</sub> A |                                                                                                                                                                                                             |
| 10 | Maximum continuous discharge current | 10A                                                                                                         |                                                                                                                                                                                                             |
| 11 | Peak discharge current               | 30A                                                                                                         | For 10ms                                                                                                                                                                                                    |
| 12 | Operation temperature range          | Charge: 0~45°C<br>Discharge: -10~60°C                                                                       | 60±25% R.H                                                                                                                                                                                                  |
| 13 | Cycle life                           | > 300 cycles                                                                                                | Charging/discharging in the below condition:<br>Charge: standard charge<br>Discharge: 0.5C <sub>5</sub> A to 8.25V<br>Rest time between charge/discharge: 30min<br>Until the discharge capacity < 60% of NC |
| 14 | Storage temperature                  | ≤1 month: -10~45°C<br>≤3 months: -10~35°C<br>≤1 year: 0~25°C                                                | 60±25% R.H<br>Best: 10~25°C for long-time storage                                                                                                                                                           |
| 15 | Weight                               | Approx: 1250g                                                                                               |                                                                                                                                                                                                             |
| 16 | Case Dimensions                      | Thickness: 161mm<br>Width: 115mm<br>Length: 56mm                                                            |                                                                                                                                                                                                             |

## 4 Supplied items

- Tracer 12V 22Ah LiPo Battery Pack
- Mains 1.65A Fast Charger (inc: UK, US, EU, AUS Plugs) (TR8136)
- Neoprene Carry Case
- Bullet (right angle) to 12V Cigar Socket (TR8132)
- DC Vehicle Charger (TR8137)

## 5 Battery case features

- Tracer "Bullet" socket rated to 10A output/input.
- DC charge socket rated to 5A.
- Built-in Fuel Gauge - 5 colour LED fuel gauge mounted externally to show charge level.

## 6 Electrical performances

**Table 2: Battery Electrical Performances**

| # | Items                 | Test procedure                                                                                                                                                                                                                                                                               | Requirements                 |
|---|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| 1 | Nominal voltage       | The average value of the working voltage during the whole discharge process.                                                                                                                                                                                                                 | 11.1V                        |
| 2 | Discharge performance | The discharge capacity of the battery, measured with 0.2C <sub>5</sub> A down to 8.25V within 1 hour after a standard charge at 25±5°C                                                                                                                                                       | Discharge ≥ Minimum capacity |
| 3 | Capacity retention    | After 28 days storage at 25±5°C, after having been standard charged and discharged at 0.2C <sub>5</sub> A to 8.25V (the residual capacity is above 90% of nominal capacity)                                                                                                                  | Discharge time ≥ 4.5h        |
| 4 | Cycle life            | Charging/discharging in the below condition:<br>Charge: standard charge at 25±5°C<br>Discharge: 0.5C <sub>5</sub> A to 8.25V<br>Rest time between charge/discharge: 30min<br>Until the discharge capacity < 60% of nominal capacity                                                          | > 300 cycles                 |
| 5 | Storage               | (Within 3 months after manufactured) The battery is charged with 0.2C <sub>5</sub> A to 40-50% capacity and stored at ambient temperature 25±5°C, 65±20% RH for 12 months.<br>After the 12 months storage period, the cell is fully charged and discharged to 8.25V with 0.2C <sub>5</sub> A | Discharge time ≥ 4h          |

## 7 Fuel gauge specifications

Built-in Fuel Gauge - 5 colour LED fuel gauge mounted externally to show charge level.

LED Status:

|                  |                        |       |
|------------------|------------------------|-------|
| 3 green & 2 red: | Battery fully charged  | 11.7V |
| 2 green & 2 red: | Over 50% capacity      | 11.4V |
| 1 green & 2 red: | Over 20% capacity      | 11.1V |
| 2 red:           | Less than 20% capacity | 10.7V |
| 1 red:           | Less than 10% capacity | 10.3V |
| No lights:       | Battery empty          | 8.25V |

## 8 Standard test conditions

Any tests are to be conducted with new batteries that have not been cycled more than five times before the test. Unless otherwise defined, test and measurements done under a temperature of 20±5°C and relative humidity of 45~85%. If it is judged that the test results are not affected by such conditions, the tests may be conducted at temperature 15~30°C and humidity 25~85% RH.

## 9 Cautions in use

To ensure proper use of the battery please read the manual carefully before using it.

### 9.1 Handling

- Do not expose to, or dispose of the battery in fire.
- Do not put the battery in a charger or equipment with wrong terminals connected.
- Avoid short-circuiting the battery.
- Avoid excessive physical shock or vibration.
- Do not disassemble or deform the battery.
- Do not immerse in water.
- Do not use the battery mixed with other different make, type, or model batteries.
- Keep out of the reach of children.

**9.2 Charge and discharge**

Battery must be charged in appropriate charger only.  
Never use a modified or damaged charger.  
Do not leave the battery in a discharged state for over 24 hours.

**9.3 Storage**

Store the battery in a cool, dry area out of direct sunlight.

**9.4 Disposal**

Regulations vary for different countries, dispose of in accordance with local regulations.  
Dispose of responsibly by contacting your local refuse centre.

**10 Battery operation instruction****10.1 Charging**

Charging current: Must not surpass the highest charging current which is specified within Table 1.  
Charging voltage: Must be regulated to the charging voltage specified within Table 1.  
Charging temperature: The battery must be charged in the ambient temperature scope in Table 1.  
Use constant electric current and constant voltage to charge.  
Do not reverse charge.  
The battery electrode and the cathodes must not meet as this can damage the battery.

**10.2 Discharging current**

The discharge current must not surpass the highest discharge current specified in Table 1.  
An oversized discharge current can cause the battery's nominal capacity to reduce and the battery to overheat.

**10.3 Electric discharge temperature**

The battery must be discharged in the ambient temperature scope specified in Table 1.

**10.4 Over-discharge**

When excessively discharged the battery should always be charged immediately after use to ensure the battery maintains nominal capacity and does not deteriorate.

**10.5 Storing the batteries**

The battery should always be stored in conditions as specified in Table 1.  
If the battery is left unused for a period longer than 6 months it should be placed on charge.

**11 Period of warranty**

Tracer LiPo batteries are covered by a one year limited warranty. The warranty covers premature failure due to defects in materials and/or workmanship. Any breakage caused by accidental damage or as a result of abuse or misuse is not covered. The warranty is limited to the original purchaser and is not transferable.  
The warranty is void if the serial number is removed from the product or if the battery has been modified in any way. Please charge your battery directly after each use. Leaving your battery in discharged state will seriously and permanently damage its performance. Please note we cannot uphold warranty claims in these circumstances. Your battery will degrade over time and with use, such degradation is not covered by warranty.

**12 Other - Chemical reaction**

Because batteries utilise a chemical reaction, battery performance will deteriorate over time even if stored for a long period of time without being used. In addition, if the various usage conditions such as charge, discharge, ambient temperature, etc. are not maintained within the specified ranges, the life expectancy of the battery may be shortened or the device in which the battery is used may be damaged by electrolyte leakage. If the batteries cannot maintain a charge for long periods of time, even when they are charged correctly, this may indicate it is time to change the battery.

**13 Note**

Any other items which are not covered in this specification shall be agreed by both parties.