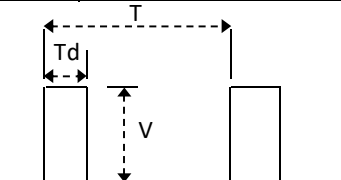
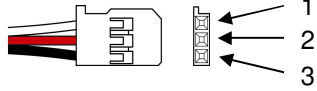
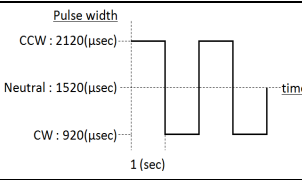


# BLA1HD21 Technical Specification

| Item  |                             | Specification                                     |       |                                                              |        | Remark                                                                                                                                                                                                                               |                                                           |             |
|-------|-----------------------------|---------------------------------------------------|-------|--------------------------------------------------------------|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|-------------|
| 1     | Communication Interface     | PWM                                               |       |                                                              |        | Signal Voltage:V                                                                                                                                                                                                                     | HIGH : min. 2.0V<br>max. Vcc                              |             |
|       |                             |                                                   |       |                                                              |        |                                                                                                                                                                                                                                      | LOW : min. 0.0V<br>max. 0.45V                             |             |
|       |                             |                                                   |       |                                                              |        | Frame Rate:T                                                                                                                                                                                                                         | 3.0~30ms (Default 14.25ms)                                |             |
|       |                             |                                                   |       |                                                              |        | Left/Center/Right:Td                                                                                                                                                                                                                 | 2120/1520/920μs<br>(Resolution recommends less than 1μs.) |             |
|       |                             |                                                   |       |                                                              |        |                                                                                                                                                   |                                                           |             |
| S.BUS |                             |                                                   |       | Futaba Serial Protocol (Please ask us for more information.) |        |                                                                                                                                                                                                                                      |                                                           |             |
| 2     | Rated Voltage               | 6.0~7.4V DC                                       |       |                                                              |        | —                                                                                                                                                                                                                                    |                                                           |             |
| 3     | Operating Voltage           | 4.0~8.4V DC                                       |       |                                                              |        | —                                                                                                                                                                                                                                    |                                                           |             |
| 4     | Standby Current             | ≤ 45mA                                            |       |                                                              |        | at 6.0~7.4V                                                                                                                                                                                                                          |                                                           |             |
| 5     | Consumption Current*        | LL                                                | Me    | UL                                                           | unit   | at 7.4V , No-Load                                                                                                                                                                                                                    |                                                           |             |
|       |                             | 180                                               | 270   | 360                                                          | mA     | LL : Low Limit Me : Medium Value UL : Upper Limit                                                                                                                                                                                    |                                                           |             |
| 6     | Max. Torque*                | LL                                                | Me    | UL                                                           | unit   | at 7.4V                                                                                                                                                                                                                              |                                                           |             |
|       |                             | 4.6                                               | 7.6   | 10.6                                                         | kgf·cm |                                                                                                                                                                                                                                      |                                                           |             |
|       |                             | 0.45                                              | 0.75  | 1.04                                                         | N·m    |                                                                                                                                                                                                                                      |                                                           |             |
|       |                             | 63.9                                              | 105.5 | 147.2                                                        | ozf·in |                                                                                                                                                                                                                                      |                                                           |             |
| 7     | Rated Torque*               | LL                                                | Me    | UL                                                           | unit   | at 7.4V<br>10% of Max. Torque                                                                                                                                                                                                        |                                                           |             |
|       |                             | 0.5                                               | 0.8   | 1.1                                                          | kgf·cm |                                                                                                                                                                                                                                      |                                                           |             |
|       |                             | 0.05                                              | 0.07  | 0.10                                                         | N·m    |                                                                                                                                                                                                                                      |                                                           |             |
|       |                             | 6.4                                               | 10.6  | 14.7                                                         | ozf·in |                                                                                                                                                                                                                                      |                                                           |             |
| 8     | No Load Speed*              | LL                                                | Me    | UL                                                           | unit   | at 7.4V                                                                                                                                                                                                                              |                                                           |             |
|       |                             | 0.07                                              | 0.10  | 0.13                                                         | s/60°  |                                                                                                                                                                                                                                      |                                                           |             |
|       |                             | 461.5                                             | 600.0 | 857.1                                                        | °/s    |                                                                                                                                                                                                                                      |                                                           |             |
|       |                             | 76.9                                              | 100.0 | 142.9                                                        | rpm    |                                                                                                                                                                                                                                      |                                                           |             |
| 9     | Default Travel Angle        | CW 60° (920us)<br>CCW 60° (2120us)                |       |                                                              |        | —                                                                                                                                                                                                                                    |                                                           |             |
| 10    | Max Travel Angle            | CW 90° (920us)<br>CCW 90° (2120us)                |       |                                                              |        | Programing tool (CIU-2/-3, S-Link) required.                                                                                                                                                                                         |                                                           |             |
| 11    | BackLash*                   | ≤ 0.5°                                            |       |                                                              |        | —                                                                                                                                                                                                                                    |                                                           |             |
| 12    | Operating Temperature Range | -10~+45°C (14~113°F)                              |       |                                                              |        | —                                                                                                                                                                                                                                    |                                                           |             |
| 13    | Storage Temperature Range   | -20~+60°C (-4~140°F)                              |       |                                                              |        | —                                                                                                                                                                                                                                    |                                                           |             |
| 14    | Outer Dimension             | 1.30 x 0.59 x 1.07 inch<br>(33.0 x 15.0 x 27.1mm) |       |                                                              |        | —                                                                                                                                                                                                                                    |                                                           |             |
| 15    | Weight                      | 0.99oz (28g)                                      |       |                                                              |        | —                                                                                                                                                                                                                                    |                                                           |             |
| 16    | Case Material               | Upper : Resin / Middle : Resin / Bottom : Resin   |       |                                                              |        | —                                                                                                                                                                                                                                    |                                                           |             |
| 17    | Gear Set Material           | 1st ,2nd,3rd,4th,5th(Final) : Metal               |       |                                                              |        | —                                                                                                                                                                                                                                    |                                                           |             |
| 18    | Cable                       | Non-Shielded Cable                                |       |                                                              |        | Please refer to Outer Dimension.                                                                                                                                                                                                     |                                                           |             |
| 19    | Connector                   | Manufacture                                       |       | J.A.M Co., LTD.                                              |        |                                                                                                                                                 |                                                           |             |
|       |                             | Type                                              |       | FC25-03HG                                                    |        |                                                                                                                                                                                                                                      |                                                           |             |
|       |                             | Mating                                            |       | FC25-03M etc.                                                |        |                                                                                                                                                                                                                                      |                                                           |             |
|       |                             | Pin Assignment                                    |       | 1                                                            | White  |                                                                                                                                                                                                                                      |                                                           | S.BUS / PWM |
|       |                             |                                                   |       | 2                                                            | Red    |                                                                                                                                                                                                                                      |                                                           | Vcc         |
| 20    | MTTF                        | 500h                                              |       |                                                              |        | Test Condition<br>• Test voltage : 7.4V<br>• Load : 10% of Max. Torque<br>• Operating Condition : 0.5Hz sweep (±60°)<br>• Input Pluse : PWM<br> |                                                           |             |
|       |                             |                                                   |       |                                                              |        |                                                                                                                                                                                                                                      |                                                           |             |
|       |                             |                                                   |       |                                                              |        |                                                                                                                                                                                                                                      |                                                           |             |
|       |                             |                                                   |       |                                                              |        |                                                                                                                                                                                                                                      |                                                           |             |
|       |                             |                                                   |       |                                                              |        |                                                                                                                                                                                                                                      |                                                           |             |
| 21    | Vibration Resistance *      | Operating time ≥ 50h<br>(at 7.4V)                 |       |                                                              |        | Test Condition                                                                                                                                                                                                                       |                                                           |             |
|       |                             |                                                   |       |                                                              |        | Frequency range                                                                                                                                                                                                                      | 80 to 400Hz                                               |             |
|       |                             |                                                   |       |                                                              |        | Acceleration                                                                                                                                                                                                                         | 30G (294m/s <sup>2</sup> )                                |             |
|       |                             |                                                   |       |                                                              |        | Sweep rate                                                                                                                                                                                                                           | 1.2 min / single-sweep                                    |             |
|       |                             |                                                   |       |                                                              |        | Vibration axis                                                                                                                                                                                                                       | X, Y, Z                                                   |             |

\* Initial Performance Data at 23±5°C

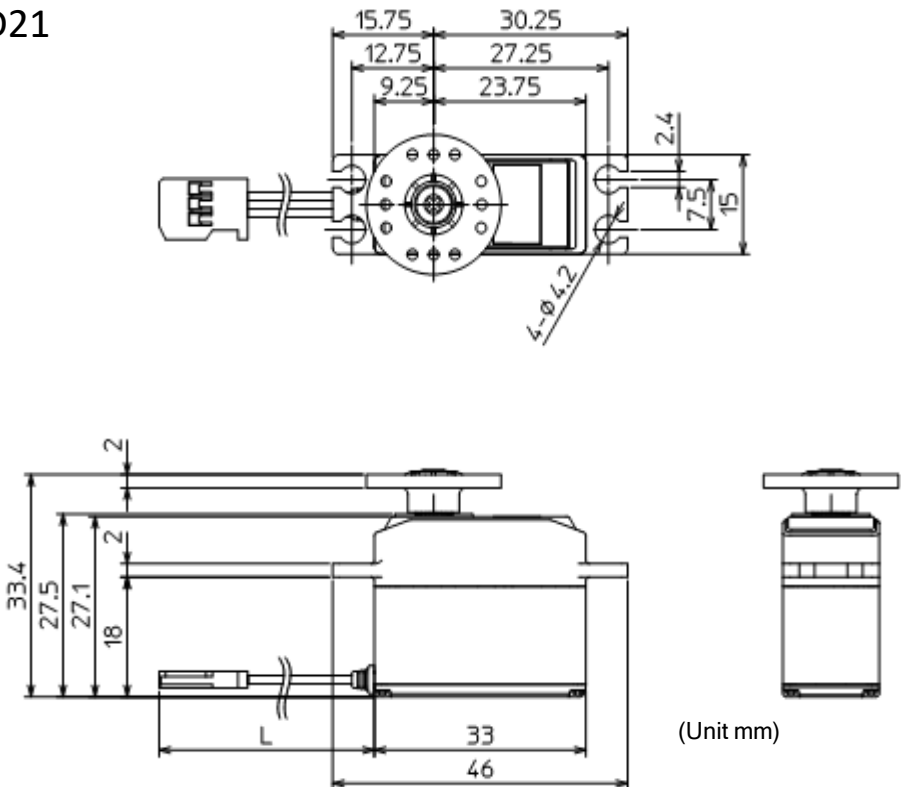
**All Specifications are subject to change without prior notice.**

## Caution

• This product SHOULD NOT be used for the devices that is directly related to human life.

**Outer Dimension**

**BLA1HD21**



Cable Length

BLA1HD21 11.81 inch (300mm)