TeKNiKio

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BLUE STAR LEDBOARD - TECHNICAL DATASHEET

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PRODUCT DESCRIPTION

Starry starry LEDs! These blue star-shaped sewable boards with gold tips have a blue LED in the middle that lights up when you connect 3V across the + and - pads. Use with a CR2032 battery and the Teknikio battery holder or another 3V power source. Can be used with a higher voltage with a resistor.

KEY FEATURES

- Star-shaped PCB design
- Integrated blue SMD LED
- Gold-plated connection tips/pads
- Simple 2-wire connection (+ and -)
- Perfect for e-textiles and paper circuits
- Educational electronics projects
- Wearable technology applications
- Compatible with CR2032 battery

ELECTRICAL SPECIFICATIONS

Operating Voltage: 3.0V (recommended)
Forward Current: 30mA (continuous operation)
Pulse Forward Current: 150mA (peak current rating)
LED Color: Blue
Supply Current: 30mA at 3V operation
Forward Voltage: ~3.0V (typical for blue LED)

PHYSICAL SPECIFICATIONS

Shape: Star (5-pointed)
PCB Color: Blue
LED Type: SMD (Surface Mount Device)
LED Position: Center of star shape
Connection Type: Gold-plated pads/tips for sewing
Tip Finish: Gold plating for corrosion resistance

PINOUT & CONNECTIONS

Pin Functions:
[+] Positive Pad: Connect to positive terminal of 3V power source
[-] Negative Pad: Connect to negative terminal (ground) of power source
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POWER SUPPLY REQUIREMENTS

Recommended Power Sources:
- CR2032 Coin Cell Battery (3V) with Teknikio battery holder
- Teknikio Battery Board (3V)
- 2x AA Batteries (3V total)
- 3V Power Supply

Higher Voltage Sources (add resistor):
Supply Voltage | Required Resistor | Notes
5V | 68 ohm | Standard USB/Arduino voltage
9V | 200 ohm | 9V battery
12V | 300 ohm | Wall adapter voltage

Resistor Calculation: R = (Vsupply - 3V) / 0.03A

INSTALLATION GUIDELINES

Sewable Connection:
1. Use conductive thread for e-textile projects
2. Recommended thread: Stainless steel conductive thread
3. Make secure knots at gold-plated connection pads
4. Test continuity before final installation
5. Gold plating provides excellent corrosion resistance

Soldering Connection:

1. Use standard electronics solder (60/40 or lead-free)
2. Keep soldering time minimal to prevent heat damage
3. Use flux for clean connections on gold-plated pads
4. Test LED immediately after soldering

DESIGN CONSIDERATIONS

Current Requirements:
- Single LED: 30mA @ 3V
- Multiple LEDs: Calculate total current (N × 30mA)
- CR2032 battery life: ~225mAh ÷ Total Current(mA) = Hours
- Example: Single star = 225mAh ÷ 30mA = 7.5 hours continuous

Thermal Management:
- Continuous operation at 30mA generates minimal heat
- Pulse operation up to 150mA acceptable for short durations
- Star shape provides good heat dissipation
- Ensure adequate ventilation in enclosed projects

Mechanical Considerations:
- PCB thickness suitable for flexible textile applications
- Star shape provides decorative celestial element
- Gold-plated pads resist corrosion and provide reliable connections
- Multiple points for creative sewing patterns

APPLICATIONS

Educational Projects:
- Introduction to circuits
- Basic electronics learning
- STEM education activities
- Paper circuit projects
- Constellation models

Wearable Technology:
- Light-up clothing and accessories
- Interactive costumes
- Fashion technology
- Soft circuits
- Night safety gear

Art & Craft Projects:
- Illuminated artwork
- Greeting cards

- Holiday decorations
- Interactive installations
- Space-themed projects

TROUBLESHOOTING

LED Not Lighting:
1. Check power supply voltage (should be ~3V)
2. Verify correct polarity (+ to +, - to -)
3. Test with multimeter for continuity
4. Check CR2032 battery charge level (should be >2.8V)

Dim LED Output:
1. Check connection resistance
2. Verify power supply current capability
3. Clean gold-plated connection points
4. Replace battery if voltage drops below 2.5V

Intermittent Operation:
1. Check for loose connections at gold pads
2. Verify solder joints if applicable
3. Test conductive thread continuity
4. Ensure stable power supply connection

Blue LED Specific Issues:
- Blue LEDs typically have higher forward voltage (~3V)
- May appear dimmer than red/green LEDs at same current
- Ensure adequate voltage supply for proper operation

SAFETY INFORMATION

Electrical Safety:
- Do not exceed maximum ratings
- Use appropriate current limiting resistors
- Avoid short circuits
- Disconnect power when not in use

Mechanical Safety:
- Handle PCB carefully to avoid damage
- Avoid bending of star points
- Keep small parts away from children under 3
- Sharp star points - handle with care

STORAGE & HANDLING

Storage Conditions:
- Temperature: -20°C to +70°C
- Humidity: < 85% RH
- Avoid direct sunlight
- Store in anti-static packaging
- Keep gold pads clean and dry

Handling Guidelines:
- Handle by edges to avoid LED damage
- Use anti-static precautions
- Avoid applying pressure to LED surface
- Keep gold-plated connection pads clean
- Avoid contaminating gold surfaces