# EV3021DQ-00A

## 1x, 1.5x, 2x Auto-Adjust Charge Pump White LED Backlight Evaluation Board

**NOT RECOMMENDED FOR NEW DESIGNS, REFER TO EV3320A-Q-00A**

## DESCRIPTION

The EV3021DQ-00A is the Evaluation Board for the MP3021, a WLED driver that can drive up to 4 backlight WLEDs at up to 30mA each. Backlight brightness can be adjusted with a 5-bit register plus one bit for precise low brightness control.

The MP3021 employs an efficient inductorless charge pump with 1x, 1.5x and 2x automatic mode control to achieve high efficiency power conversions.

Monolithic Power System's single wire MPC™ serial data link provides a simple and fast interface used to enable, disable and set current levels for each LED. In addition, soft-start limits the inrush current during startup and mode switching.

## FEATURES

- Backlight: up to 4 WLEDs at 30mA Each
- Single Wire Serial Bus (MPC™ Serial Data Link)
  - Simple, Low Overhead Solution
  - Fast Data Transfer Rate
- Thermal Shutdown Protection
- Under-Voltage Protection
- Available in a 3mm x 3mm 16-Pin QFN Package

## APPLICATIONS

- Cellular Phones
- PDA Phones
- PDAs

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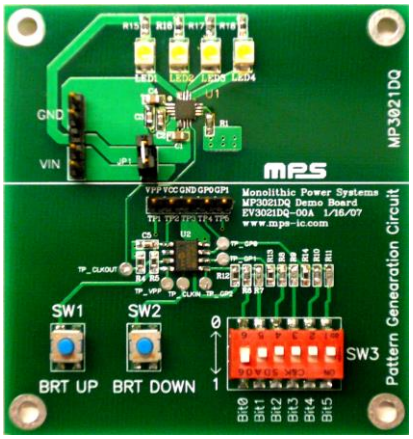
## ELECTRICAL SPECIFICATIONS

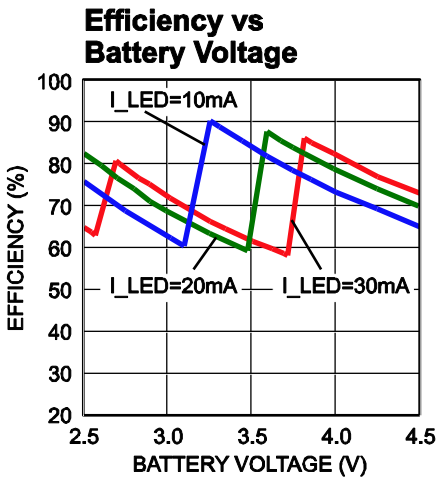
| Parameter | Symbol | Value | Units |
|---|---|---|---|
| Input Voltage | $V_{IN}$ | 2.5 – 5.5 | V |
| # of WLEDs | | 4 | |
| LED Current | $I_{LED}$ | 30 | mA |

## EV3021DQ-00A EVALUATION BOARD




**(L x W x H) 2.6" x 2.5" x 0.4"**
**(6.6cm x 6.4cm x 1.0cm)**

| Board Number | MPS IC Number |
|---|---|
| EV3021DQ-00A | MP3021DQ |





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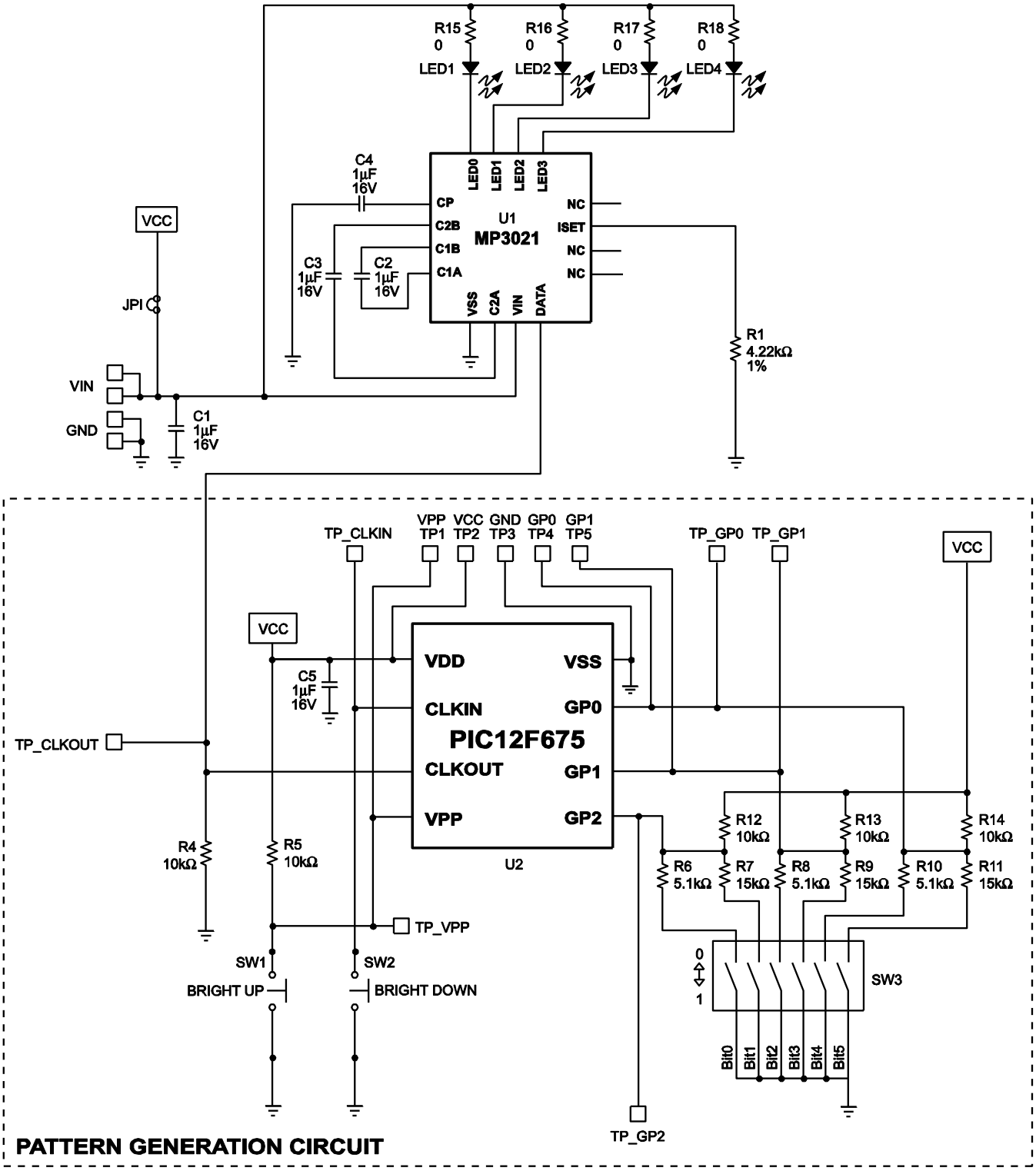
## EVALUATION BOARD SCHEMATIC





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## EV3021DQ-00A BILL OF MATERIALS

| Qty | Ref | Value | Description | Package | Manufacturer | Manufacturer P/N |
|---|---|---|---|---|---|---|
| 4 | C1,C2,C3,C4 | 1µF | 16V/X7R Ceramic Cap. | SM0603 | muRata | GRM188R71C105KA |
| 4 | LED1~LED4 | NS | No Stuff | | | |
| 1 | R1 | 4.22kΩ | Film Res, 1% | 603 | Panasonic | ERJ-3EKF4221V |
| 4 | R15~R18 | 0Ω | Film Res, 5% | 603 | Panasonic | ERJ-3GEY0R00V |
| 1 | U1 | | White LED Driver | 3x3 QFN16 | MPS | MP3021DQ |

## EV3021DQ-00A PATTERN GENERATION CIRCUIT BILL OF MATERIALS

| Qty | Ref | Value | Description | Package | Manufacturer | Manufacturer P/N |
|---|---|---|---|---|---|---|
| 1 | C5 | 1µF | 16V/X7R Ceramic Cap. | SM0603 | muRata | GRM188R71C105KA |
| 1 | SW3 | 6 POS | Top slide DIP switch | DIP 12 | Digi-Key | CKN1290-ND |
| 1 | JP1 | | DIP Jumper | | Digi-Key | WM18533-ND |
| 3 | R6,R8,R10 | 5.1kΩ | Film Res, 1% | 603 | Panasonic | ERJ-3EKF5111V |
| 5 | R4,R5,R12, R13,R14 | 10kΩ | Film Res, 1% | 603 | Panasonic | ERJ-3EKF1002V |
| 3 | R7,R9,R11 | 15kΩ | Film Res, 1% | 603 | Panasonic | ERJ-3EKF1502V |
| 2 | SW1,SW2 | Switch | Push Switch | 5mmx5mm | Digi-Key | CKN9020-ND |
| 1 | U2 | | Microcontroller | SO-8 | Microchip | PIC12F675 |


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## PRINTED CIRCUIT BOARD LAYOUT

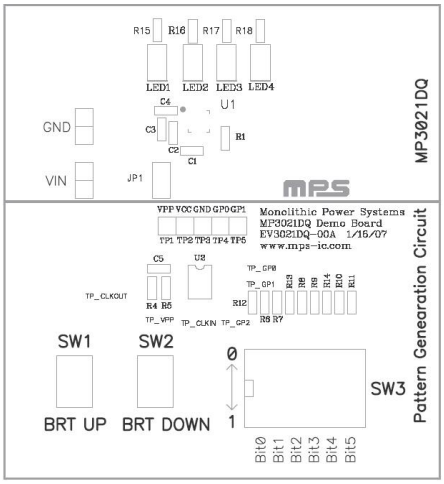


**Figure 1—Top Silk Layer**

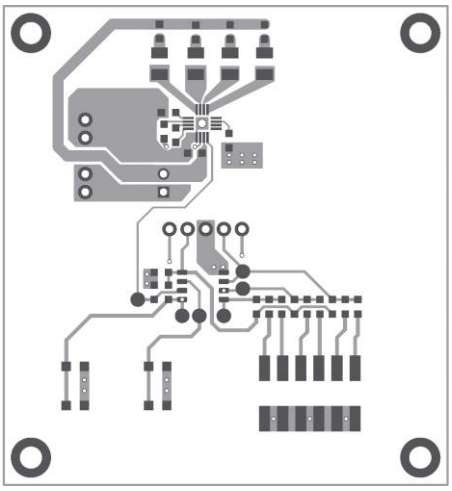

**Figure 2—Top Layer**

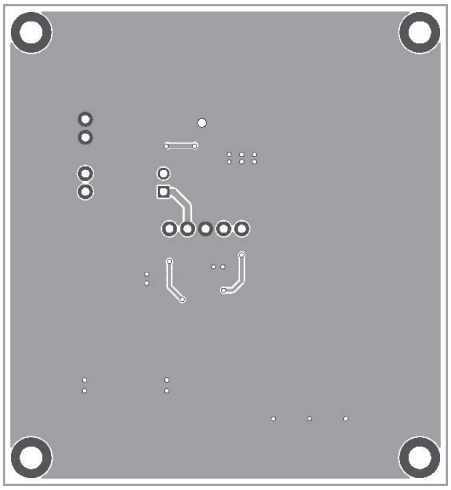

**Figure 3—Bottom Layer**


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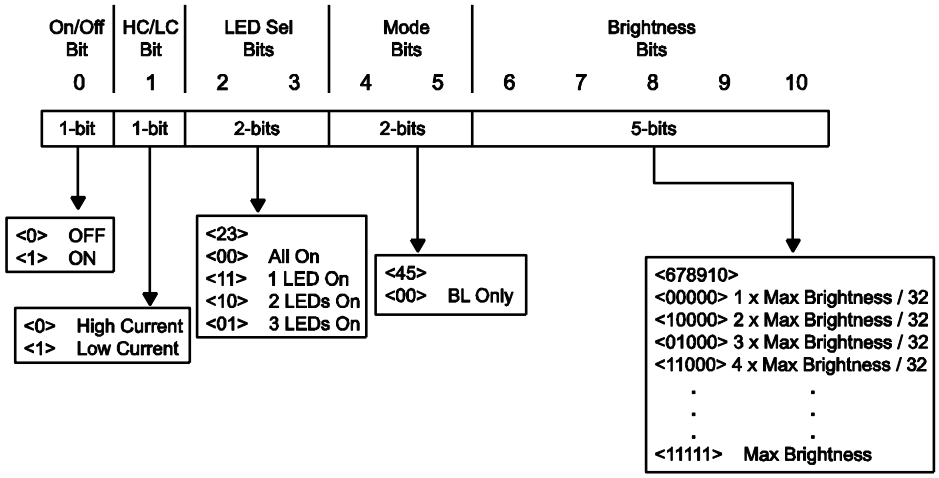
## QUICK START GUIDE

1. Solder LED1 – LED4, and Flash LED to the board if they are not populated.
2. Turn off the power supply.
3. Attach the positive terminal of the power supply (2.5V - 5.5V) to the VIN.
4. Attach the negative terminal of the power supply to GND pin.
5. Set the number of LEDs by SW3. See Table below and make sure it is in position. **Always set Mode bits to "00"**.




6. Turn on the power supply.
7. Push the "BRT UP" or "BRT DOWN" button to control the brightness of the LEDs. One push represents one level brightness change. Push and hold the button will continuously increase or decrease the brightness.

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