

### General Description

The EV0021 evaluation board uses the MP1521 to drive up to three strings of 5 White LEDs. This MP1521 uses a peak current, constant minimum off-time architecture and has three individual current-sensing feedbacks. The OLS pin is designed for detecting loose or open LED connections.

The feedback pins measure voltage across sense resistors in series with the LED strings. When supplying a bias current of 20mA, the voltage drop across the sense resistor is only 0.4V to minimize power loss. Either a DC voltage or a PWM signal at the BRT/PWM input can control the LED brightness. The MP1521 has an on board power MOSFET switch that is protected by current limit, open load shutdown, thermal shutdown, and under voltage lockout.

### Absolute Maximum Ratings

Supply Voltage ( $V_{IN}$ )	28V
Switch Voltage to GND	-0.5V to 28V
$V_{EN}, V_{REF}, V_{BRT}, V_{FB1}, V_{FB2}, V_{FB3}$	-0.3V to 6V
Storage Temperature	-55°C to +150°C

### Recommended Operating Conditions

Supply Voltage ( $V_{IN}$ )	2.7 V to 25V
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### Ordering Information

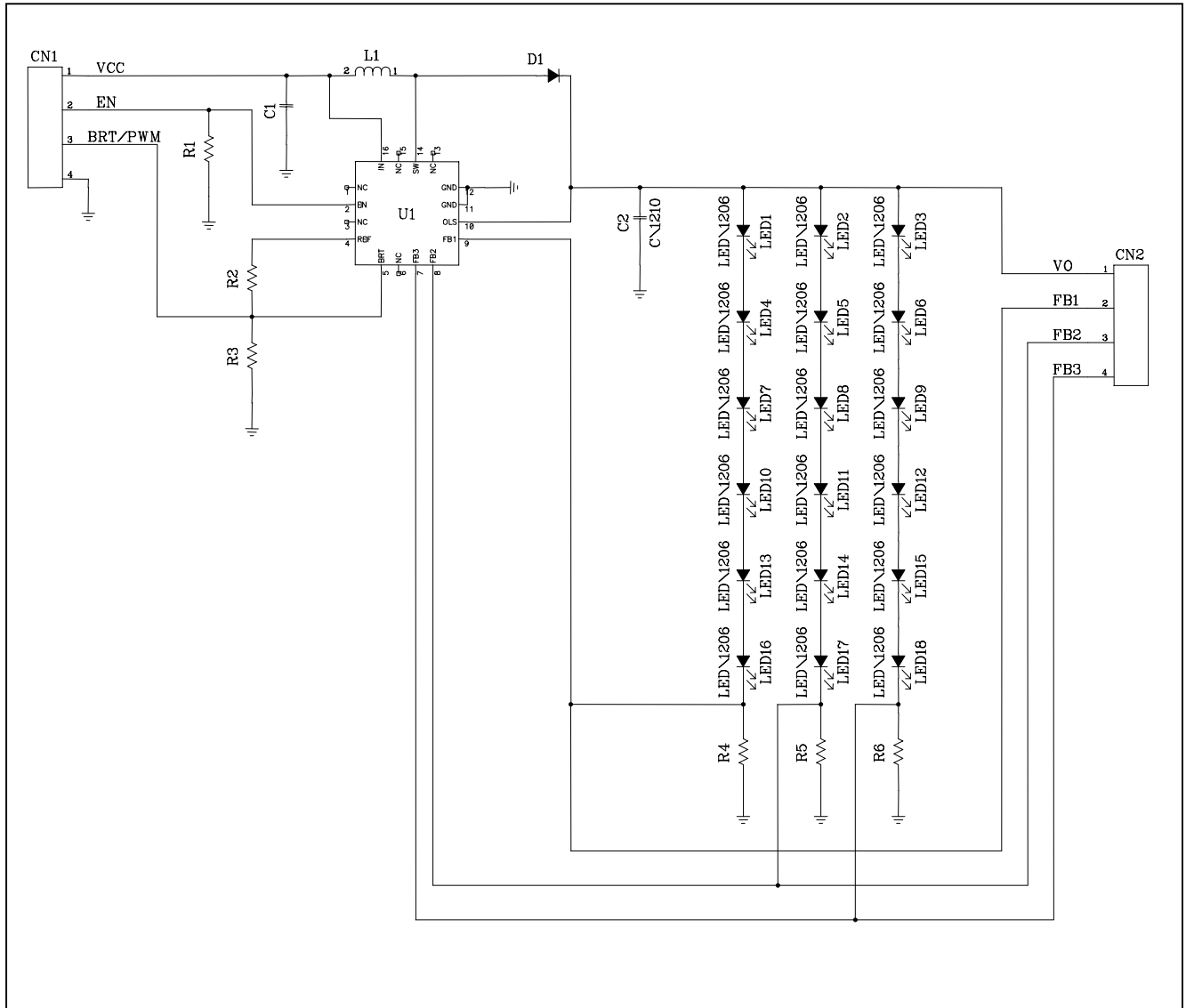
Board Number      MPS IC Number

EV0021	<a href="#">MP1521EQ</a>
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Figure 1: EV0021 Evaluation Board



Figure 2: EV0021 Schematic



**Table 1: EV0021 Bill of Materials**

Parts	Package	Vendor	QTY	Components
<b>ICs</b>				
MP1521EQ	QFN16	MPS	1	U1
<b>Capacitors</b>				
4.7 $\mu$ F	1206	Any	1	C1
1 $\mu$ F, 25V	1210	Any	1	C2
<b>Resistors</b>				
10K $\Omega$	0603	Any	3	R1, R2, R3
20 $\Omega$	0603	Any	3	R4, R5, R6
<b>Inductors</b>				
15 $\mu$ H	CDRH3D16	Sumida	1	L1
<b>Diodes</b>				
B130, 1A, 30V, Schottky	SMA	Any	1	D1
<b>LEDS (Not Provided)</b>				

## Operating Instructions

1. Connect VCC to the power source's positive output.
2. Connect GND to supply ground.
3. Applying a logic signal to EN pin will enable the MP1521. Logic high ( $V_{EN} > 1V$ ) turns on IC, logic low puts it into low current shutdown mode. Place a 100K $\Omega$  resistor in series with EN if the input is greater than 10V. For automatic start up connect EN to VCC.
4. Applying a PWM signal to the BRT will adjust the LED brightness. When used in analog mode, apply a DC voltage of 0.3 to 1.2V. This input voltage is attenuated by 1/3 to set the voltage across sense resistors at FB1, FB2, and FB3. Maximum brightness (20mA) occurs with 1.2V applied. To control brightness in PWM mode, apply a PWM square wave with a minimum voltage less the 0.18V and a maximum greater than 1.2V. When a voltage less than 0.18V is applied to this pin, the output switch is turned off. The regulator operates at maximum brightness when more than 1.2V is applied. The frequency of the PWM signal must be between 100 to 400 Hz.
5. The FB1, FB2 and FB3 pins can be used to measure the voltage across the current-sense resistor that is in series with the LED strings. Unused feedback pins must be connected to any used feedback pin.
6. OLS senses the regulator output voltage to protect IC during open load operation. When this pin's voltage exceeds 28V, the output switch is shut off. The output switch remains off until the IC is reset by cycling the enable pin (EN) or input supply (VIN)

Figure 3: EV0021 Top Silk Layer

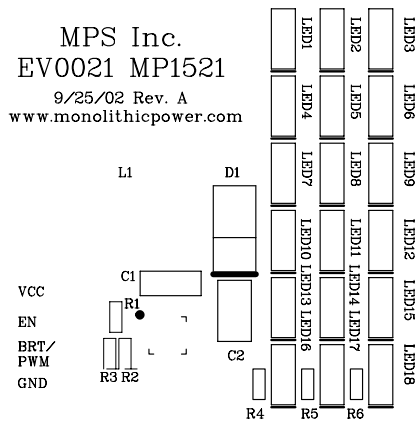


Figure 4: EV0021 Top Layer

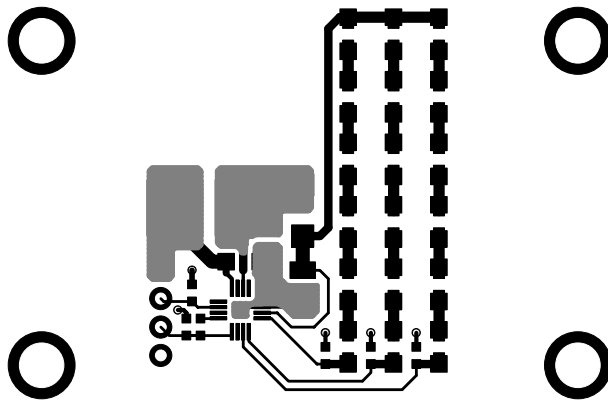
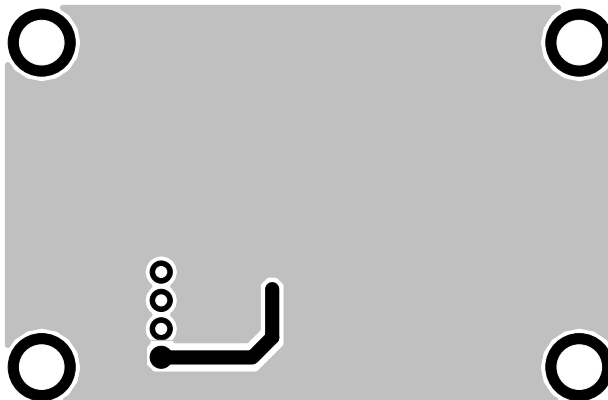


Figure 5: EV0021 Bottom Layer



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