



EV5491-C-00A

Quad-Channel Laser Diode Current Source for Optical Modules Evaluation Board

DESCRIPTION

The EV5491-C-00A evaluation board is designed to demonstrate the capabilities of the MP5491, a quad-channel laser diode (LD) current source for optical modules. The device integrates four high-accuracy current sources for the LD. The MP5491 is well-suited for the transmitter optical subassembly (TOSA) of quad, small form factor, pluggable (QSFP) optical modules.

The MP5491 also integrates 6 channel general-purpose outputs (GPOs) These output statuses can be configured via the I²C interface.

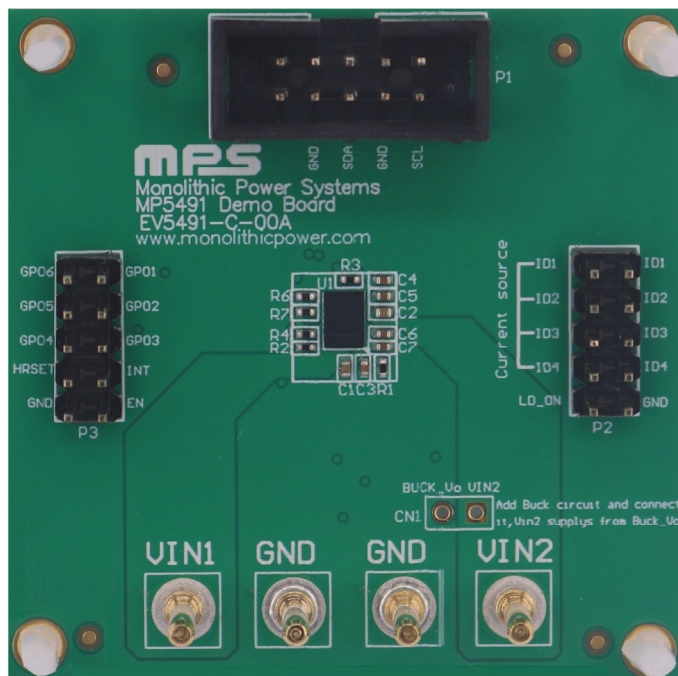
It is recommended to read the MP5491 datasheet prior to making any changes to the EV5491-C-00A.

PERFORMANCE SUMMARY

Specifications are at T_A = 25°C, unless otherwise noted.

Parameters	Conditions	Value
Input voltage for circuitry (V _{IN1}) range		2.7V to 5.5V
Input voltage for current sources (V _{IN2}) range		1.2V to V _{IN1}
Maximum ID current	R _{IMON} = 60.4kΩ	250mA

EV5491-C-00A EVALUATION BOARD



LxWxH (5.1cmx5.1cmx0.3cm)

Board Number	MPS IC Number
EV5491-C-00A	MP5491GC

QUICK START GUIDE

1. Preset the VIN1 power supply (V_{IN1}) between 2.7V and 5.5V.
2. Preset the VIN2 power supply (V_{IN2}) between 1.2V and V_{IN1} .
3. Turn off the power supply.
4. Connect the power supply terminals to:
 - a. Positive (+): VIN1 and VIN2
 - b. Negative (-): GND
5. Connect the load terminals to:
 - a. Positive (+): ID1, ID2, ID3, and ID4
 - b. Negative (-): GND
6. After making the connections, turn on the power supply.
7. Configure the MP5491's ID output using the microcontroller unit's (MCU) I²C interface or the MPS I²C communication interface, then follow the steps below:
 - a. Enable SYSEN by setting CTL0, bit D[7] to 1.
 - b. Set the ID output current(s) via ID (0x07), bits D[7:0] and ID (0x08), bits D[1:0] (e.g. set ID1 = 100mA by setting command 0x07, bits D[7:0] to 0110 0100 and setting command 0x08, bits D[1:0] to 00).
 - c. Enable ID_EN by setting CTL1, bit D[7] to 1. ID should start to work.
8. To use the enable function, apply a digital input to the EN pin. Drive EN above 0.8V to turn on the evaluation board; drive EN below 0.4V to turn off the evaluation board. Note that turning off the ID output via EN does not reset the register information, which is configured via the I²C interface.

Figure 1 shows the measurement equipment set-up.

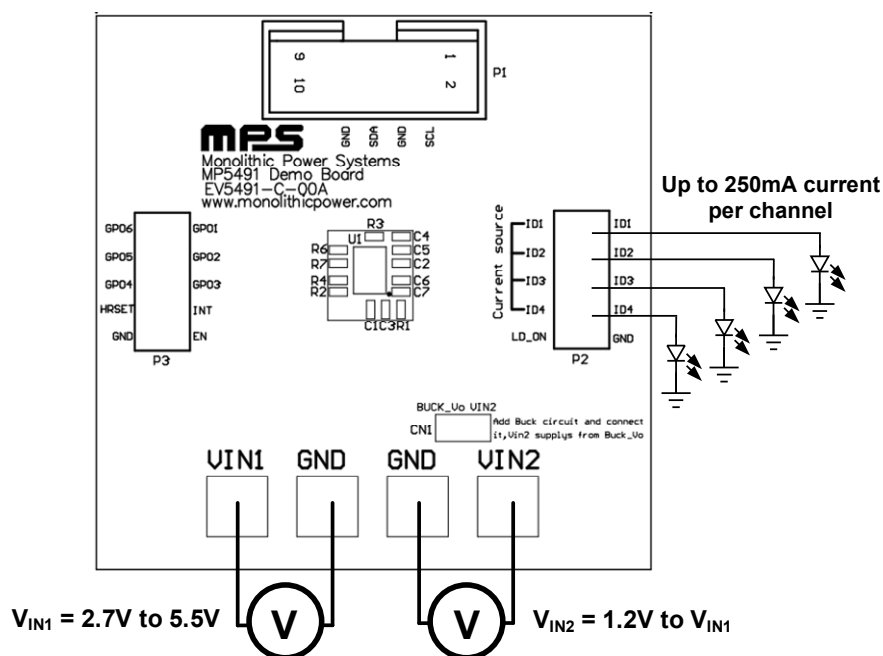


Figure 1: Measurement Equipment Set-Up

EVALUATION BOARD SCHEMATIC

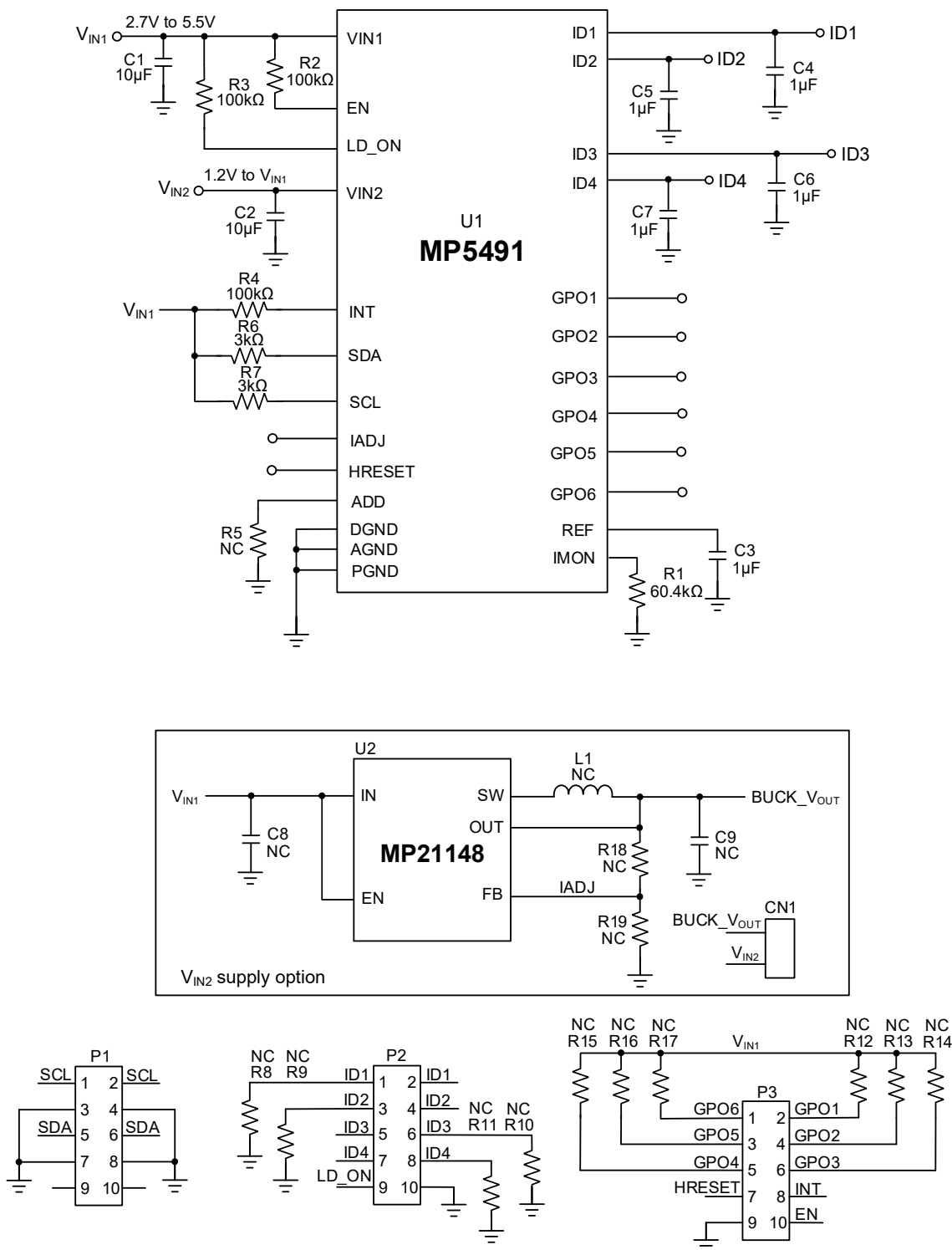


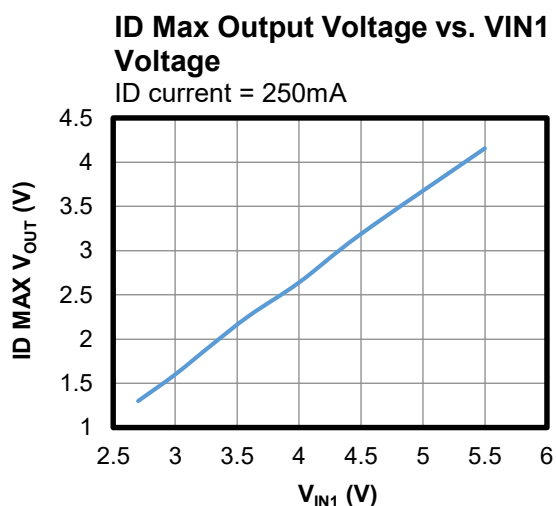
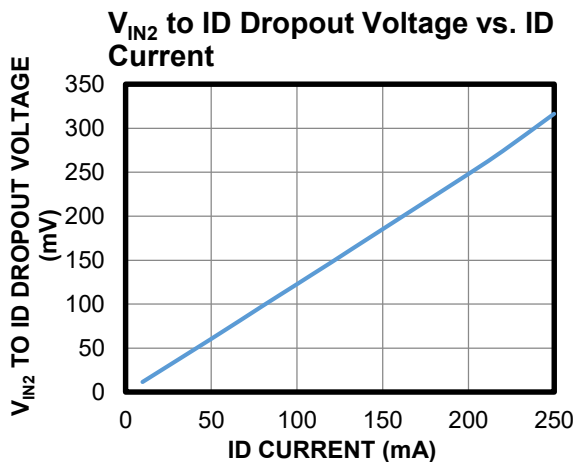
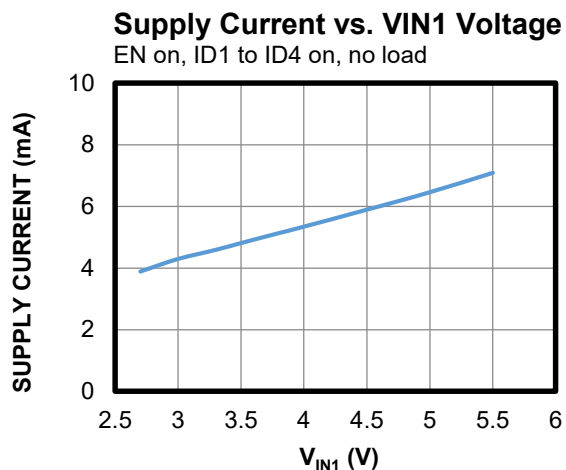
Figure 2: Evaluation Board Schematic

EV5491-C-00A BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer PN
2	C1, C2	10 μ F	Ceramic capacitor, 6.3V, X5R	0402	Murata	GRM155R60J106ME44D
5	C3, C4, C5, C6, C7	1 μ F	Ceramic capacitor, 25V, X5R	0402	Murata	GRM155R61E105KA12D
0	C8, C9	NC				
1	R1	60.4k Ω	Film resistor, 0.1%	0402	Panasonic	ERA-2AEB6042X
3	R2, R3, R4	100k Ω	Film resistor, 1%	0402	Yageo	RC0402FR-07100KL
0	R5, R8, R9, R10, R11, R12, R13, R14, R15, R16, R17, R18, R19	NC				
2	R6, R7	3k Ω	Film resistor, 1%	0402	Yageo	RC0402FR-073KL
1	P1	2.54mm	Connector header through-hole, 2-row, 10-pin	DIP	Würth	612010235121
2	P2, P3	2.54mm	Connector header through-hole, 2-row, 10-pin	DIP	Würth	61301021121
0	L1, U2, CN1	NC				
1	U1	MP5491	Quad-channel LD current source for optical modules	WLCSP-36 (3mmx 4.25mm)	MPS	MP5491GC

EVB TEST RESULTS

Performance curves and waveforms are tested on the evaluation board. $V_{IN1} = 3.3V$, $V_{IN2} = 1.8V$, $T_A = 25^{\circ}C$, unless otherwise noted.

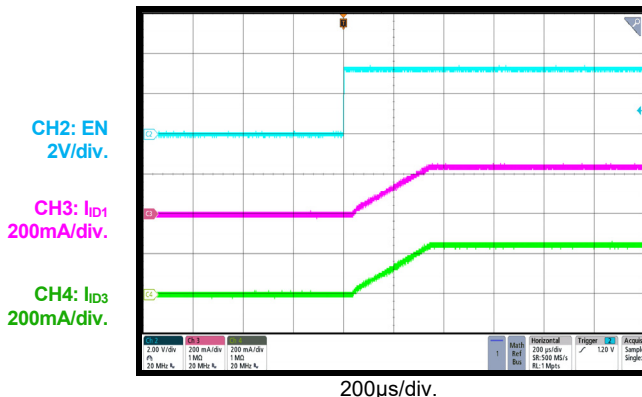


EVB TEST RESULTS (continued)

Performance curves and waveforms are tested on the evaluation board. $V_{IN1} = 3.3V$, $V_{IN2} = 1.8V$, $T_A = 25^{\circ}C$, unless otherwise noted.

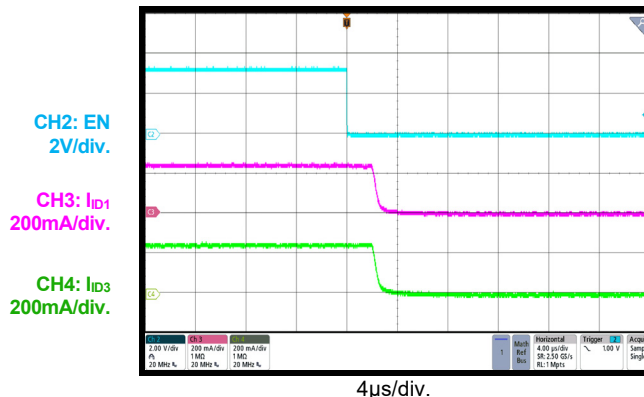
EN On

ID1 = ID3 = 250mA, SR bit = 01



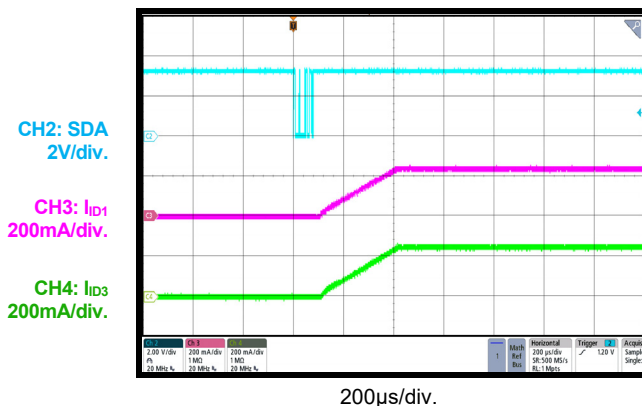
EN Off

ID1 = ID3 = 250mA, SR bit = 01



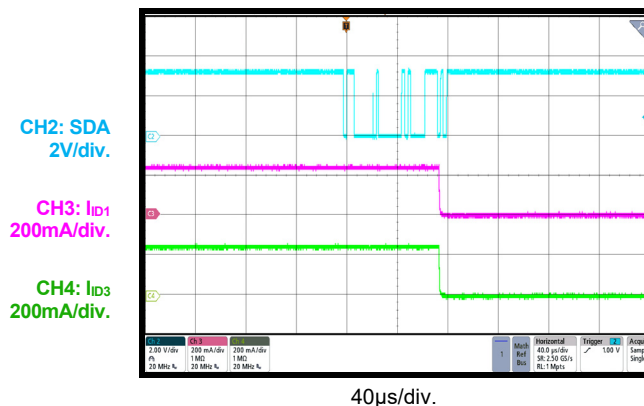
ID_EN Bit On

ID1 = ID3 = 250mA, SR bit = 01



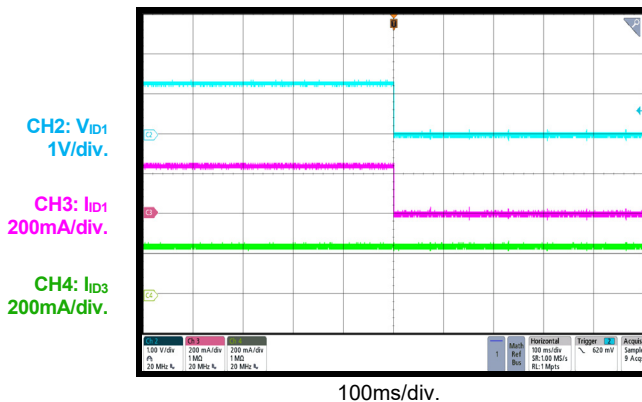
ID_EN Bit Off

ID1 = ID3 = 250mA, SR bit = 01



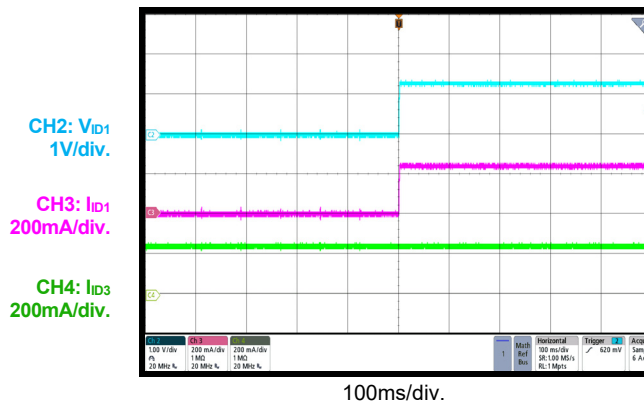
SCP Entry

ID1 = ID3 = 250mA, auto-recovery mode



SCP Recovery

ID1 = ID3 = 250mA, auto-recovery mode



PCB LAYOUT

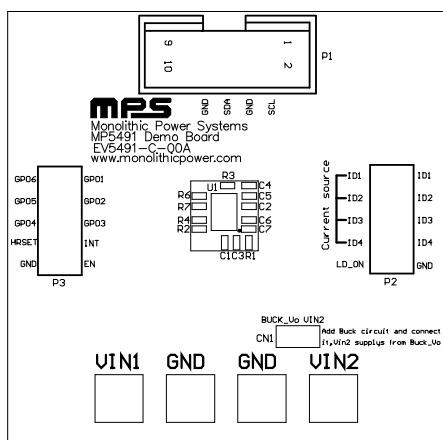


Figure 3: Top Silk

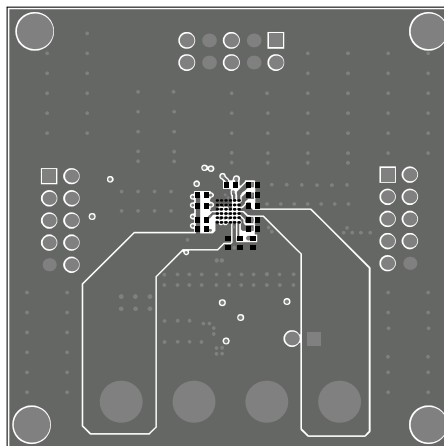


Figure 4: Top Layer

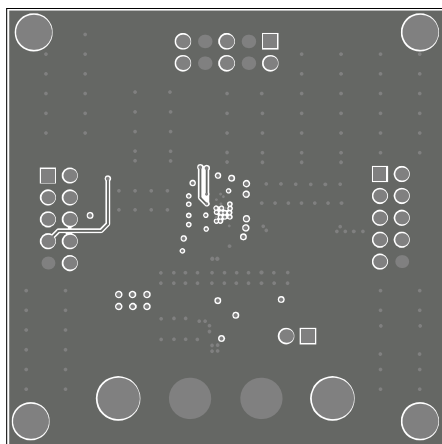


Figure 5: Mid-Layer 1

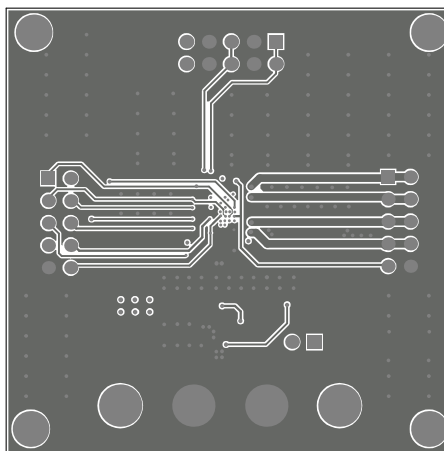


Figure 6: Mid-Layer 2

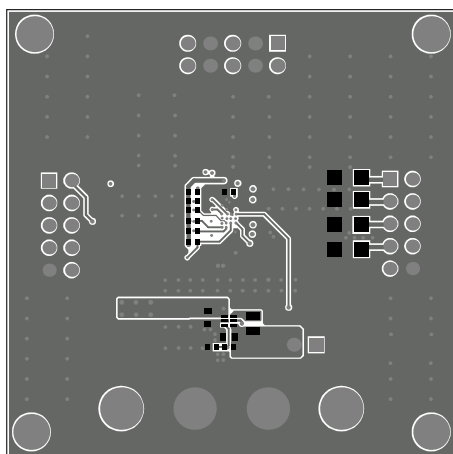


Figure 7: Bottom Layer

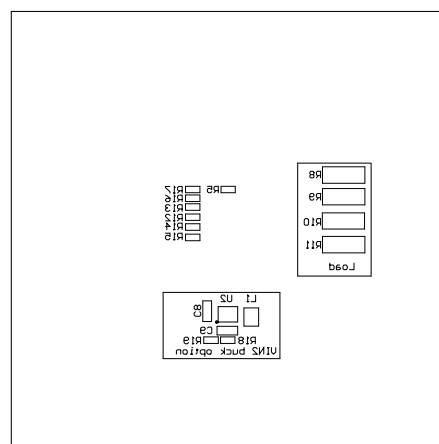


Figure 8: Bottom Silk

REVISION HISTORY

Revision #	Revision Date	Description	Pages Updated
1.0	5/26/2022	Initial Release	-

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