EVCS1826-Q-00A

Ultra-Small Package, 3V to 5.5V Single Supply, Linear Hall-Effect Current Sensor with OCD Evaluation Board

DESCRIPTION

The EVCS1826-Q-00A is an evaluation board designed to demonstrate the capabilities of the MCS1826. The MCS1826 is a series of linear Hall-effect current sensors for AC or DC current-sensing with integrated over-current detection (OCD). The Hall array is differential, which cancels out stray magnetic fields. The MCS1826 series supports a 3V to 5.5V power supply and current ranges between 5A and 50A to optimize for accuracy in different applications.

The output voltage (V_{OUT}) is proportional to the applied current flowing through the primary conductor. The galvanic isolation between the primary conductive path pins and the sensor leads allow the MCS1826 to replace optoisolators or other expensive isolation devices.

The MCS1826 is available in an ultra-small TQFN-12 (3mmx3mm) package.

PERFORMANCE SUMMARY

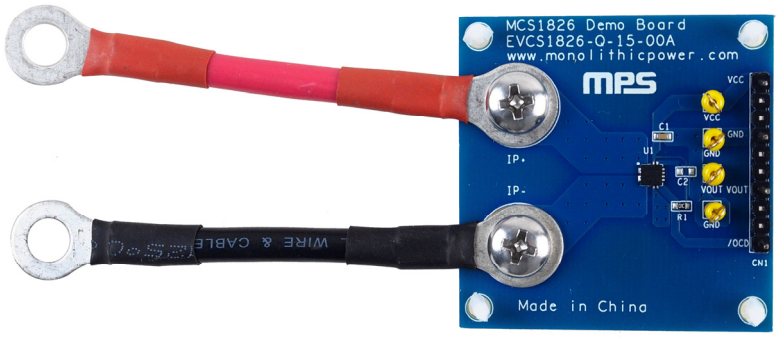
Specifications are at T_A = 25°C, unless otherwise noted.

Parameters	Conditions	Value
Supply voltage (V_{CC})		3V to 5.5V
Maximum primary applied current (I_{P_MAX})		±5A to ±50A
Output voltage (V_{OUT})		0.5 x V_{CC} + $Sens_{(TYP)}$ x I_P (1)
Total accuracy	I_P = I_{P_MAX}	±5%
/OCD error		<15%

Note:

1) $Sens_{(TYP)}$ is the symbol for “typical sensitivity.”

EVCS1826-Q-00A EVALUATION BOARD



LxWxH (45mmx115mmx17mm)

2 Layers

Board Number	MPS IC Number
EVCS1826-Q-AA-00A	MCS1826GQTE-AA

EVALUATION BOARD BASIC INFORMATION (2)

Evaluation Board PN	IC Part Number	Rated Primary Current (A)	Typical Sensitivity (mV/A)	/OCD Trigger Point (A)
EVCS1826-Q-05-00A	MCS1826GQTE-05	±5	80 x V_{CC}	±5
EVCS1826-Q-10-00A	MCS1826GQTE-10	±10	40 x V_{CC}	±10
EVCS1826-Q-15-00A	MCS1826GQTE-15	±15.5	27.3 x V_{CC}	±15.5
EVCS1826-Q-20-00A	MCS1826GQTE-20	±20	20 x V_{CC}	±20
EVCS1826-Q-31-00A	MCS1826GQTE-31	±31	13.6 x V_{CC}	±31
EVCS1826-Q-40-00A	MCS1826GQTE-40	±40	10 x V_{CC}	±40
EVCS1826-Q-50-00A	MCS1826GQTE-50	±50	8 x V_{CC}	±50

Note:

2) Contact an MPS FAE for additional variants.

QUICK START GUIDE

1. Preset the DC power supply to be between 3V and 5.5V, then turn off the power supply.
2. Connect the DC power supply terminals to:
   a. Positive (+): VCC
   b. Negative (-): GND
3. Connect the current source load terminals to:
   a. Positive (+): IP+
   b. Negative (-): IP-
4. Turn on the DC power supply and current source, then measure the output voltage (V_{OUT}) via the VOUT pin.
5. If over-current detection (OCD) is required, measure the /OCD signal via the /OCD pin.

EVALUATION BOARD SCHEMATIC

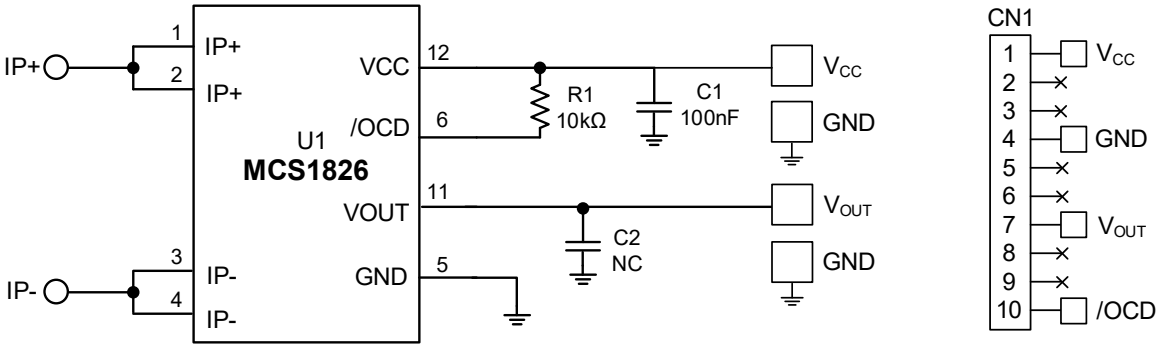


Figure 1: Evaluation Board Schematic

EVCS1826-Q-00A BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer PN
1	C1	0.1μF	VCC ceramic decoupling capacitor, 16V, X7R	0603	Murata	GRM188R71C104KA01D
1	C2	NC				
1	R1	10kΩ	/OCD pull-up resistor	0603	Yageo	RC0603FR-0710KL
1	CN1	2.54mm	Male pin header, 10-pin	DIP	Custom (3)	
1	U1	MCS1826	Ultra-small, 3V to 5.5V, linear Hall-effect current sensor with OCD	TQFN-12 (3mmx 3mm)	MPS	MCS1826GQTE-AA

Note:

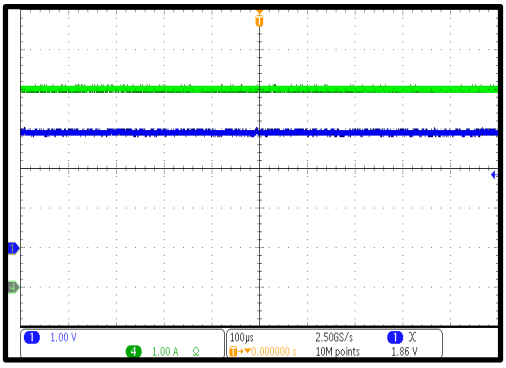
3) MPS custom-produces these pins. Contact an MPS FAE for more information.

EVB TEST RESULTS

Performance waveforms are tested on the EVCS1826-Q-05-00A evaluation board (see the Evaluation Board Basic Information section on page 2). V_{CC} = 3.3V, C2 = open, T_A = 25°C, unless otherwise noted.

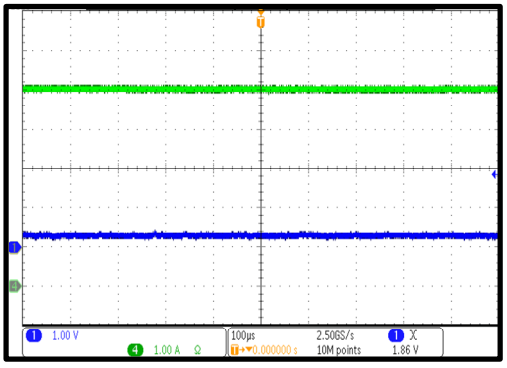
DC Current Status

I_P = 5A



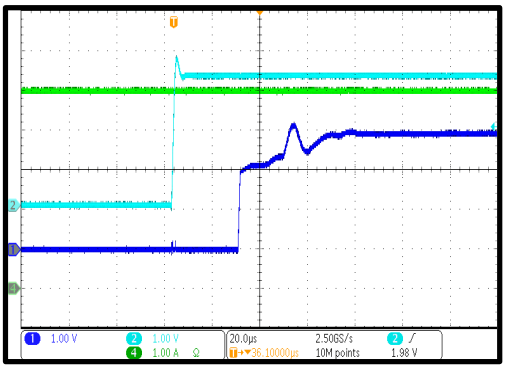
DC Current Status

I_P = -5A



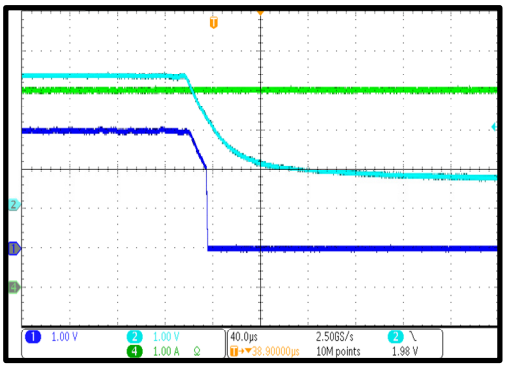
Start-Up through VCC

I_P = 5A



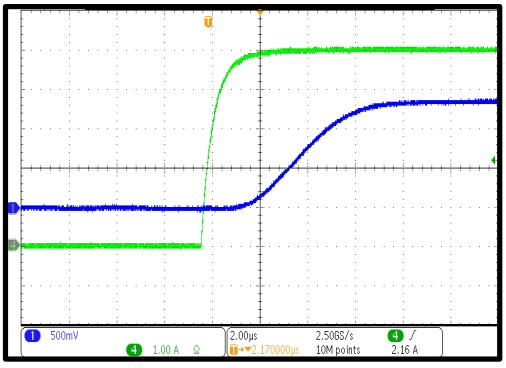
Shutdown through VCC

I_P = 5A



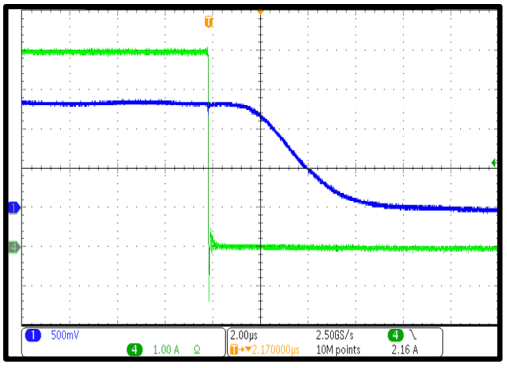
Step-Up Current

I_P = 5A



Step-Down Current

I_P = 5A



PCB LAYOUT

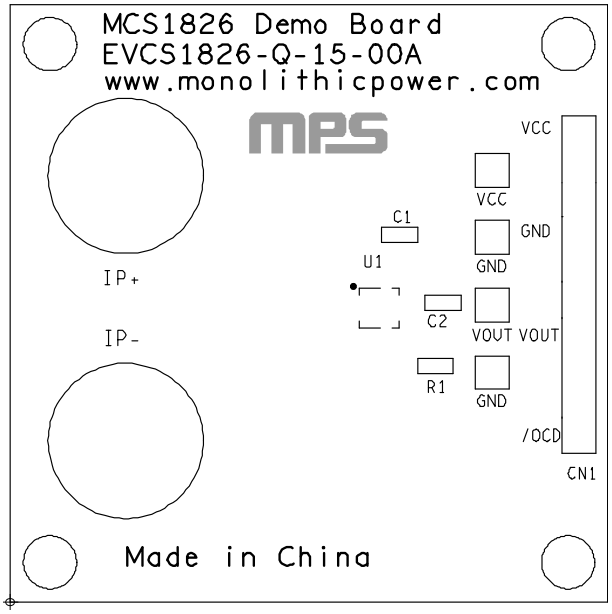


Figure 2: Top Silk

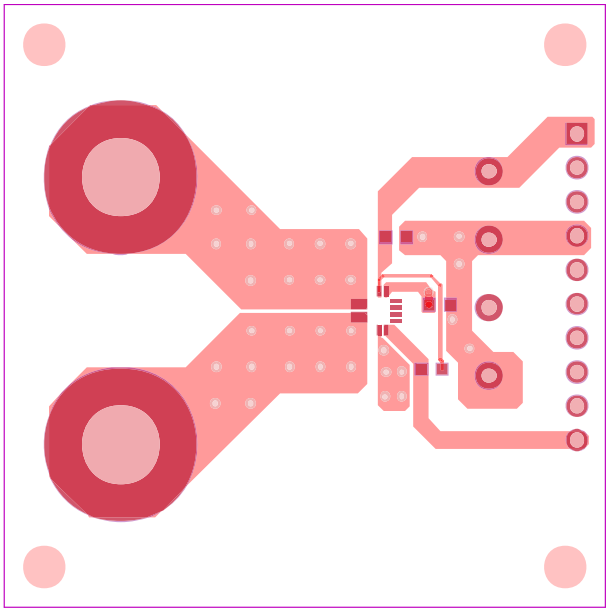


Figure 3: Top Layer

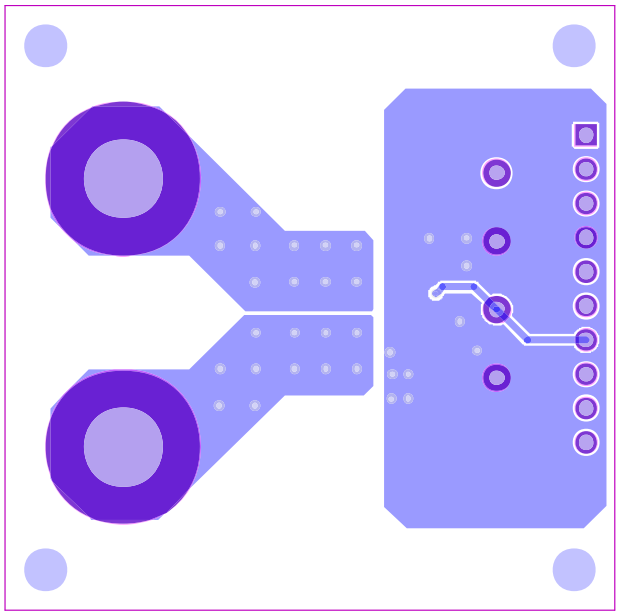


Figure 4: Bottom Layer

REVISION HISTORY

Revision #	Revision Date	Description	Pages Updated
1.0	8/2/2024	Initial Release	-