EVCS1806-S-X-Y-00A

3kV$_{RMS}$ Isolated Hall-Effect Current Sensor Evaluation Board

DESCRIPTION

The EVCS1806-S-X-Y-00A is an evaluation board designed to demonstrate the capabilities of the MCS1806GS-X-Y series, which are high-accuracy, linear Hall-effect current sensors for AC or DC current sensing. The Hall array is differential, which cancels out stray magnetic field. The MCS1806GS-X-Y series provides two power supply options (3.3V or 5V) and six full current ranges of 5A to 50A to optimize 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 allows the MCS1806GS-X-Y to replace optoisolators or other expensive isolation devices.

PERFORMANCE SUMMARY

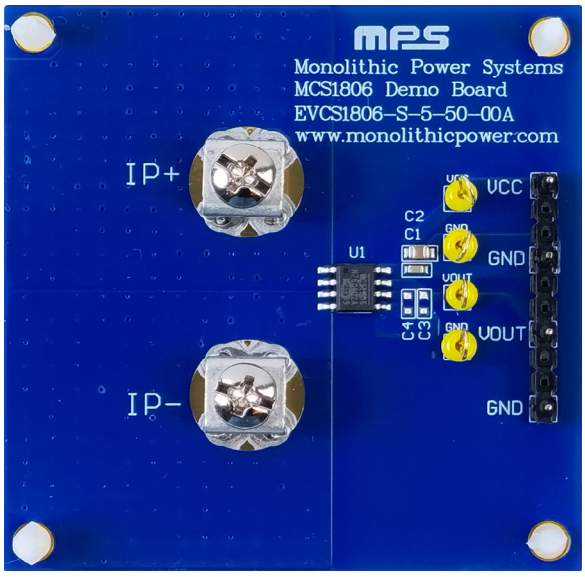
Specifications are at T_A = 25°C, unless otherwise noted.

Parameters	Conditions	Value
Supply voltage (V_{CC})		3.3V or 5V
Maximum primary applied current (I_{P_MAX})		Six options: ±5A to ±50A
Output voltage (V_{OUT})		0.5 x V_{CC} + $Sens_{(TYP)}$ x I_P (1)
Total accuracy	I_P from 10% x I_{P_MAX} to I_{P_MAX}	<2.5%

Note:

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

EVCS1806-S-X-Y-00A EVALUATION BOARD



LxWxH (58mmx58.5mmx12mm)
2 Layers

Board Number	MPS IC Number
EVCS1806-S-X-Y-00A	MCS1806GS-X-Y

EVALUATION BOARD BASIC INFORMATION

Evaluation Board PN	Typical VCC Supply Voltage (V)	Rated Primary Current Range (A)	Typical Sensitivity (mV/A)
EVCS1806-S-3-05-00A	3.3	±5	264
EVCS1806-S-3-10-00A		±10	132
EVCS1806-S-3-20-00A		±20	66
EVCS1806-S-3-30-00A		±30	44
EVCS1806-S-3-40-00A		±40	33
EVCS1806-S-3-50-00A		±50	26.4
EVCS1806-S-5-05-00A	5	±5	400
EVCS1806-S-5-10-00A		±10	200
EVCS1806-S-5-20-00A		±20	100
EVCS1806-S-5-30-00A		±30	66
EVCS1806-S-5-40-00A		±40	50
EVCS1806-S-5-50-00A		±50	40

QUICK START GUIDE

1. Preset DC power supply to 3.3V or 5V.
2. Turn off the power supply.
3. Connect the DC power supply terminals to:
   a. Positive (+): VCC
   b. Negative (-): GND
4. Connect the current source terminals to:
   a. Positive (+): IP+
   b. Negative (-): IP-
5. Turn on the DC power supply and current source, then measure the output result via the VOUT pin.
6. C4 determines the sensor's bandwidth. A lower bandwidth results in reduced output voltage ripple noise.

EVALUATION BOARD SCHEMATIC

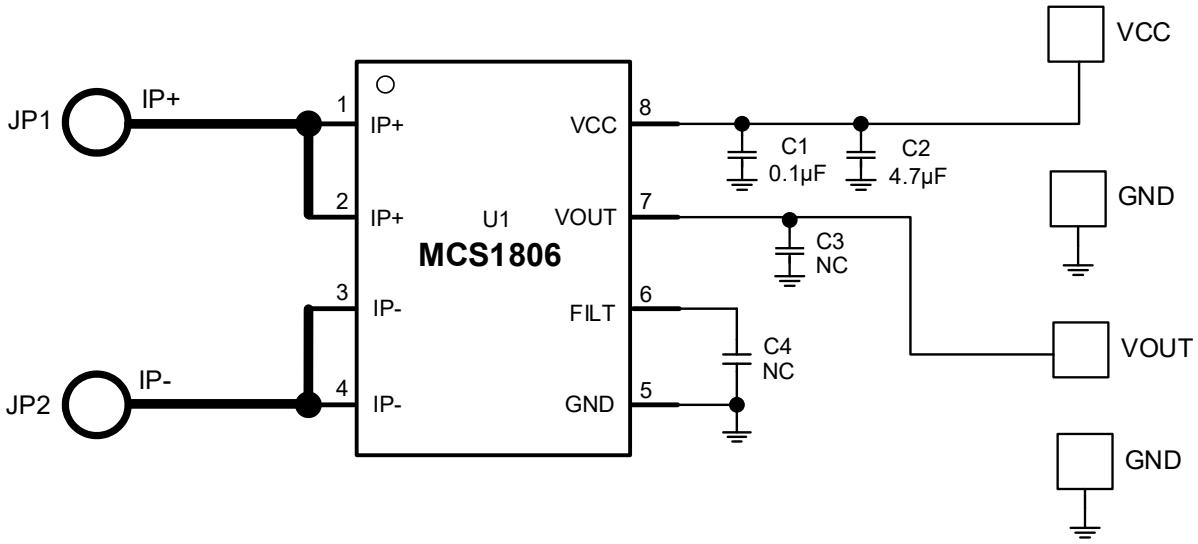


Figure 1: Evaluation Board Schematic

EVCS1806-S-X-Y-00A BILL OF MATERIALS

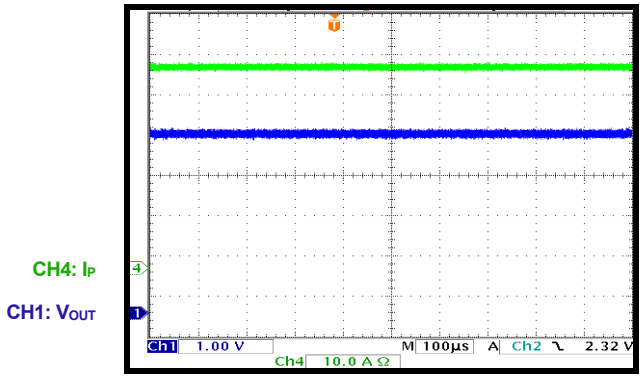
Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer PN
1	C1	0.1µF	Ceramic capacitor, 16V, X7R	0603	Murata	GRM188R71C104KA01D
1	C2	4.7µF	Ceramic capacitor, 16V, X7R	0805	Murata	GCM21BR71C475KA73L
1	C3	NC				
1	C4	NC				
2	IP+, IP-	4 pins	Screw terminal	DIP	Keystone Electronics	8191K-ND
1	U1	MCS1806GS-X-Y	Linear Hall-effect current sensor with ±2.5% accuracy	SOIC-8	MPS	MCS1806GS-X-Y

EVB TEST RESULTS

Performance waveforms are tested on the EVCS1806-S-5-50-00A evaluation board. V_{CC} = 5V, C3 open, C4 open, T_A = 25°C, unless otherwise noted.

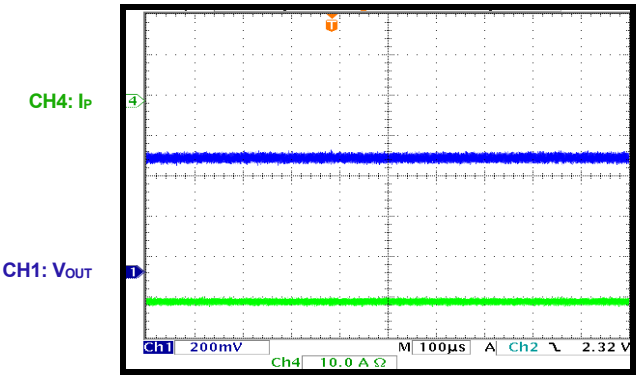
DC Current Status

I_P = 50A



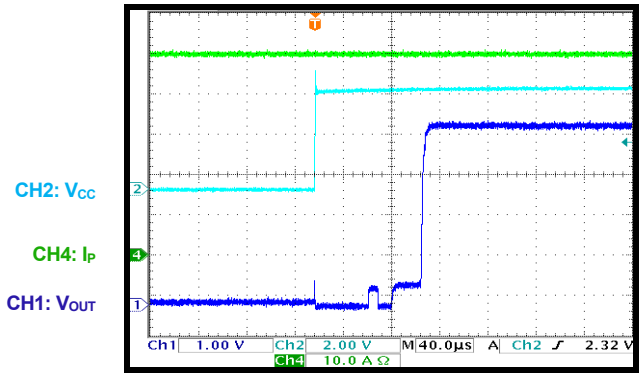
DC Current Status

I_P = -50A



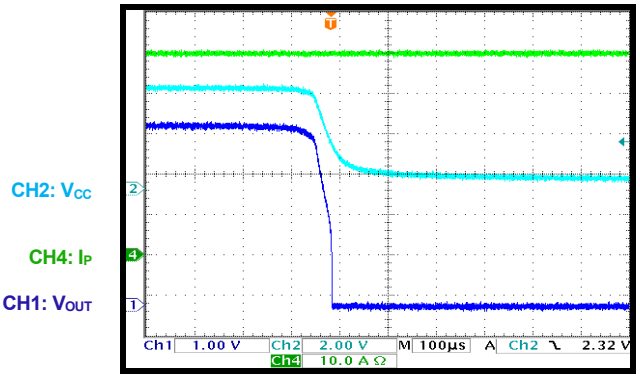
Start-Up through VCC

I_P = 50A

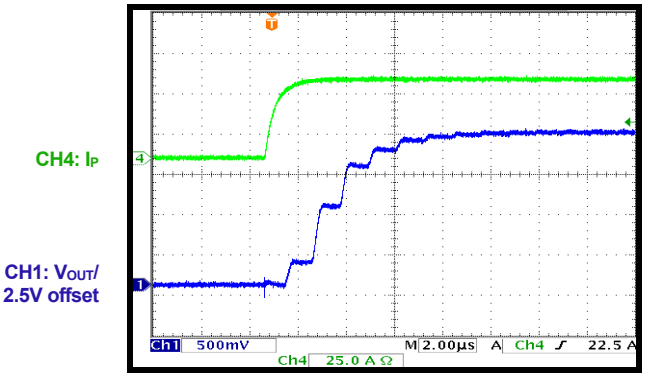


Shutdown through VCC

I_P = 50A

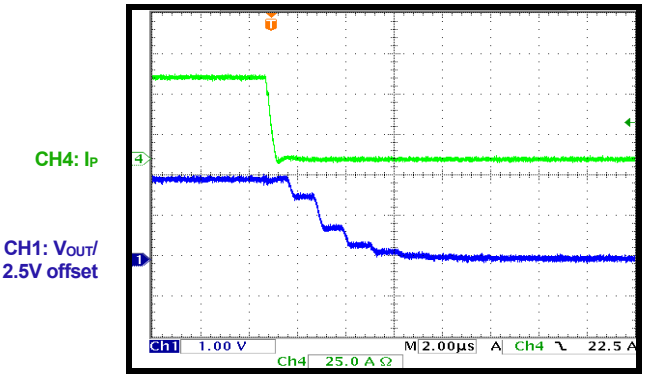


Step-Up Current



Step-Down Current

I_P = 50A



PCB LAYOUT

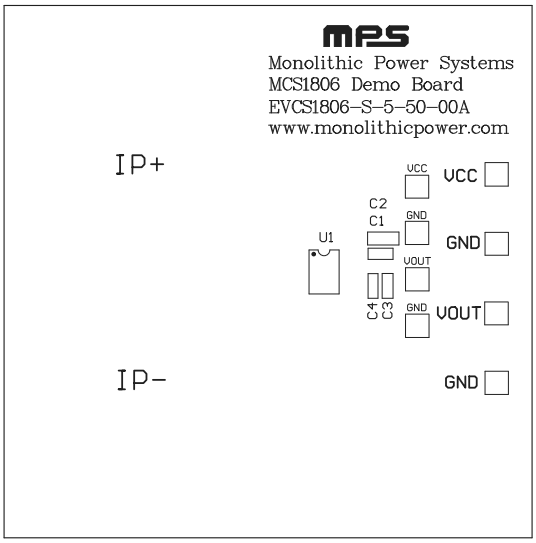


Figure 2: Top Silk

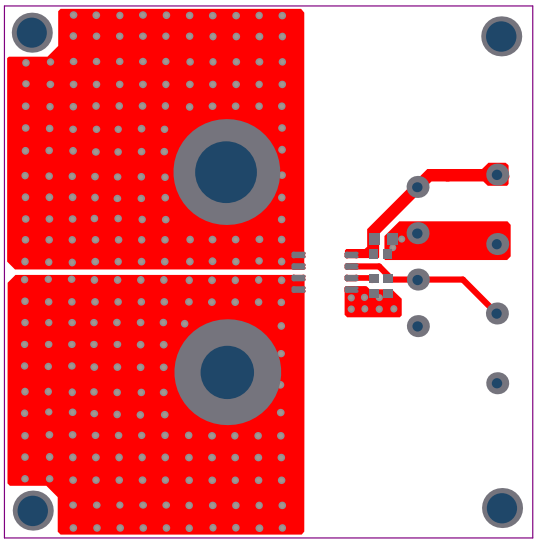


Figure 3: Top Layer

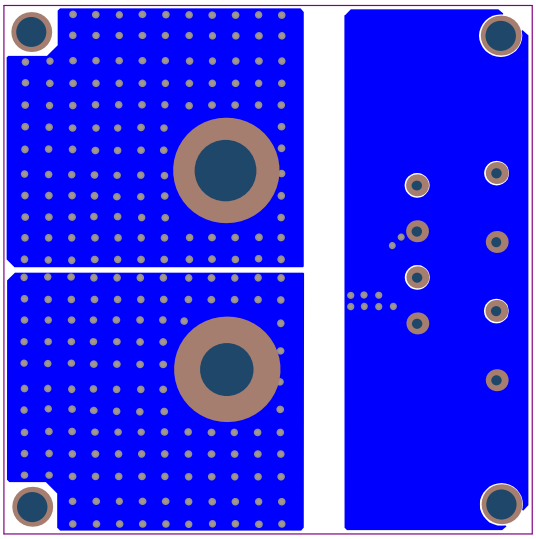


Figure 4: Bottom Layer

REVISION HISTORY

Revision #	Revision Date	Description	Pages Updated
1.0	12/8/2022	Initial Release	-