EV05W0505B-YE-00A

5V, 0.5W, Regulated, 3kV$_{RMS}$ Isolated DC/DC Module Evaluation Board

DESCRIPTION

The EV05W0505B-YE-00A is an evaluation board designed to demonstrate the capabilities of the MIE05W0505BGYE, an isolated, regulated DC/DC module. It can support 3V to 5.5V input voltage (V_{IN}) applications. The MIE05W0505BGYE has excellent load regulation, line regulation, and supports up to 0.5W of output power (P_{OUT}).

The MIE05W0505BGYE uses capacitive isolation technology for the feedback block, which can regulate the output voltage (V_{OUT}) without a traditional optocoupler and precision-configurable reference IC. This module is a small solution that provides highly reliable operation when compared to traditional isolation power modules.

The MIE05W0505BGYE features continuous short-circuit protection (SCP) and over-temperature protection (OTP). It is available in a small SOIC-8 wide body (WB) package.

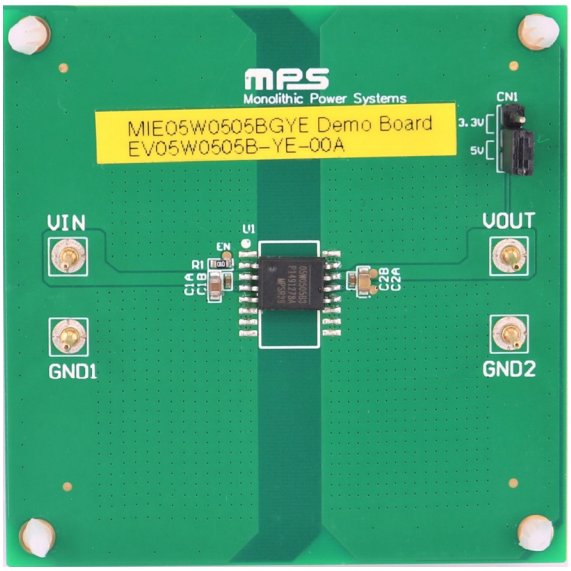
It is recommended to read the datasheet for the MIE05W0505BGYE prior to making any changes to the EV05W0505B-YE-00A.

PERFORMANCE SUMMARY

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

Parameters	Conditions	Value
Input voltage (V_{IN}) range	V_{OUT} = 5V	4.5V to 5.5V
	V_{OUT} = 3.3V	3V to 5.5V
Output voltage (V_{OUT})	I_{OUT} = 0A to 0.1A	5V
Maximum output current (I_{OUT})	V_{IN} = 4.5V to 5.5V	0.1A
Typical efficiency	V_{IN} = 5V, V_{OUT} = 5V, I_{OUT} = 0.1A	46%

EVALUATION BOARD



LxWxH (6.4cmx6.4cmx0.2cm)

Board Number	MPS IC Number
EV05W0505B-YE-00A	MIE05W0505BGYE-3R

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QUICK START GUIDE

The board's output voltage is set to 5V by default. To quick start the EV05W0505B-YE-00A, refer to Figure 1 and follow the steps below:

1. Preset the power supply (V_{IN}) to be 4.5V ≤ V_{IN} ≤ 5.5V.
2. Turn off the power supply.
3. Connect the power supply terminals to:
   a. Positive (+): VIN
   b. Negative (-): GND1
4. Connect the load terminals to:
   a. Positive (+): VOUT
   b. Negative (-): GND2
5. After making the connections, turn on the power supply. The board should automatically start up.
6. To use the enable function, apply a digital input to the EN pin. Drive EN above 2V to turn on the EV05W0505B-YE-00A; drive EN below 0.4V to turn it off.
7. Set the output voltage (V_{OUT}) to 3.3V by moving the jumper from the 5V selection to the 3.3V selection on CN1. VIN should start up.

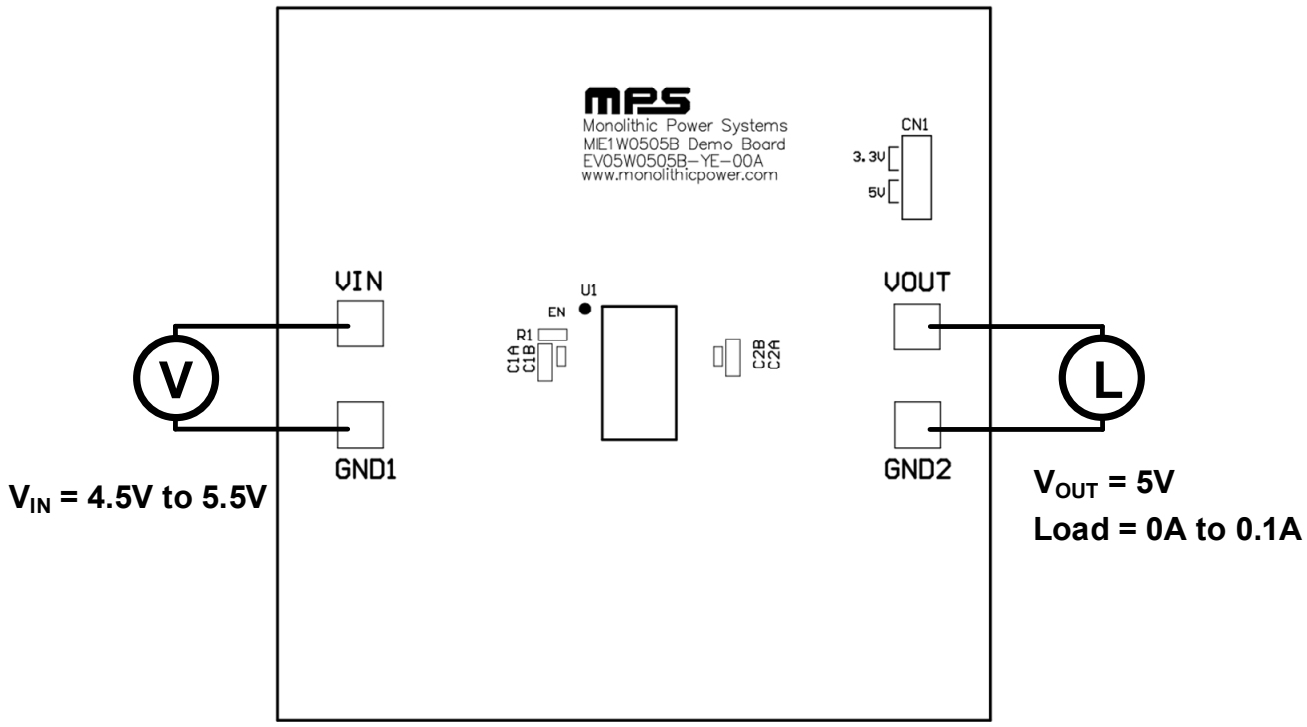

Figure 1: Measurement Equipment Set-Up

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EVALUATION BOARD SCHEMATIC

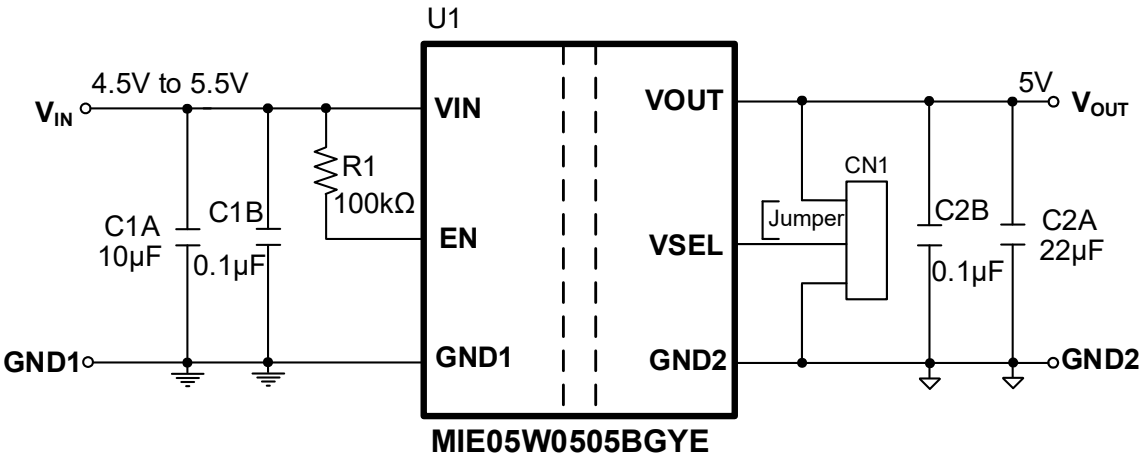

Figure 2: Evaluation Board Schematic

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EV05W0505B-YE-00A BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer PN
1	C1A	10µF	Ceramic capacitor, 10V	0805	Murata	GRM21BR71A106KA73L
1	C2A	22µF	Ceramic capacitor, 10V	0805	Wurth	885012107011
2	C1B, C2B	0.1µF	Ceramic capacitor, 16V	0402	Murata	GRM155R71C104KA88D
1	R1	100kΩ	Film resistor, ±1%	0603	Yageo	RC0603FR-07100KL
1	CN1	3-pin	Header, 3-pin	SIP	Wurth	61300311121
1	U1	MIE05W0505BGYE	5V, 3kVRMS isolated DC/DC module	SOIC-8 WB	MPS	MIE05W0505BGYE-3R-Z

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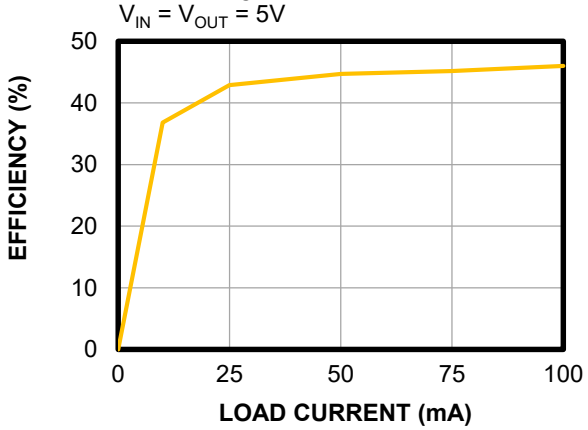
EVB TEST RESULTS

Performance curves and waveforms are tested on the evaluation board. V_{IN} = 5V/3.3V, V_{OUT} = 5V/3.3V, C_{IN} = 0.1µF + 10µF, C_{OUT} = 0.1µF + 22µF, T_A = 25°C, unless otherwise noted.

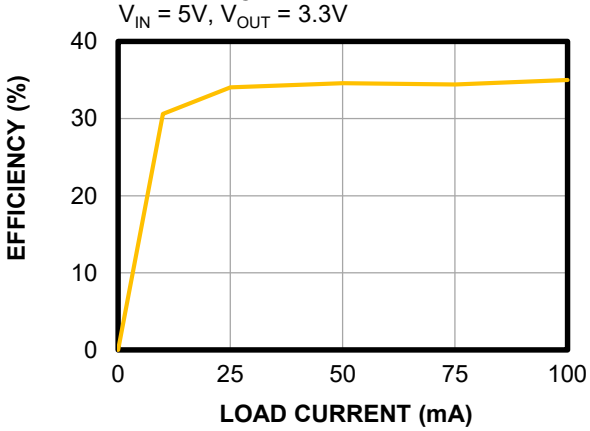
Efficiency vs. Load Current

V_{IN} = V_{OUT} = 5V



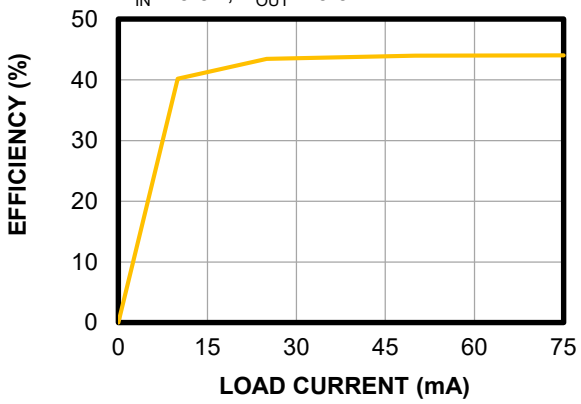
Efficiency vs. Load Current

V_{IN} = 5V, V_{OUT} = 3.3V



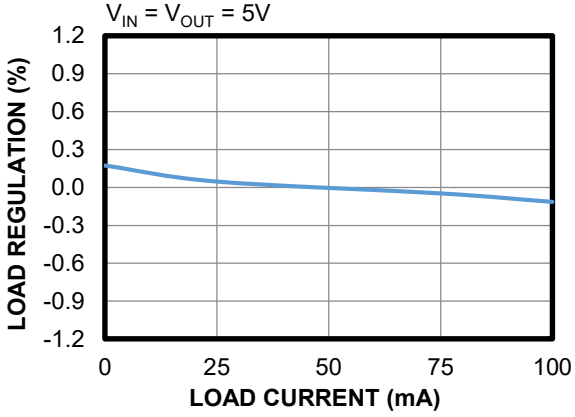
Efficiency vs. Load Current

V_{IN} = 3.3V, V_{OUT} = 3.3V



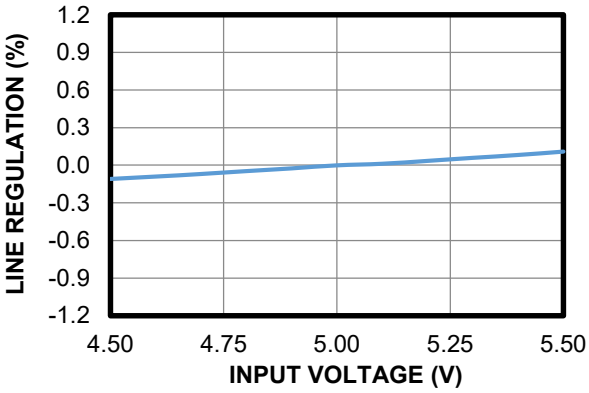
Load Regulation

V_{IN} = V_{OUT} = 5V



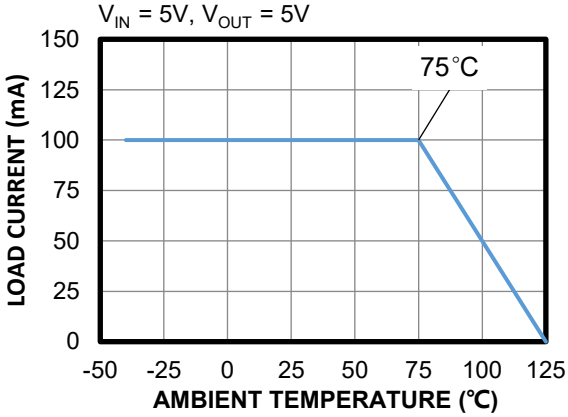
Line Regulation

V_{OUT} = 5V, I_{OUT} = 0.1A



Load Derating vs. Temperature

V_{IN} = 5V, V_{OUT} = 5V



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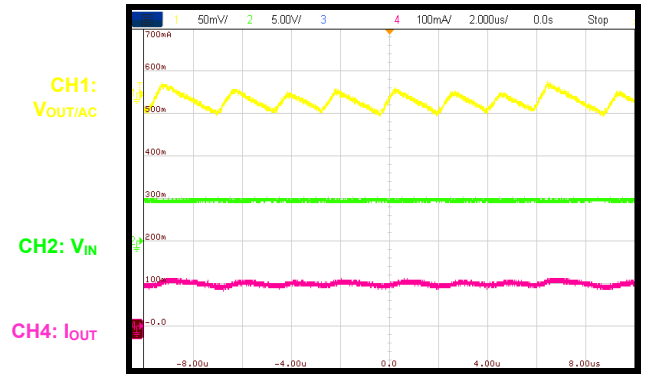
EVB TEST RESULTS *(continued)*

Performance curves and waveforms are tested on the evaluation board. V_{IN} = 5V, V_{OUT} = 5V, C_{IN} = 0.1µF + 10µF, C_{OUT} = 0.1µF + 22µF, T_A = 25°C, unless otherwise noted.

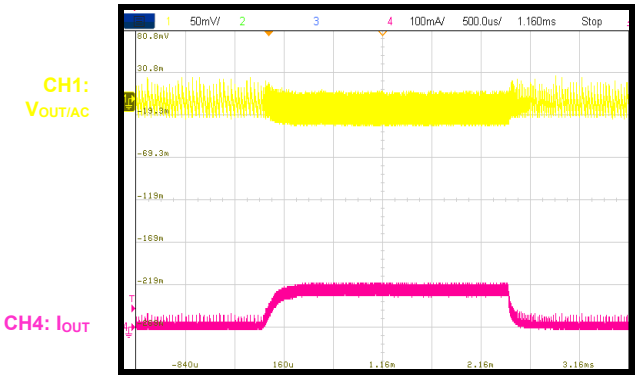
Output Voltage Ripple

I_{OUT} = 0.1A



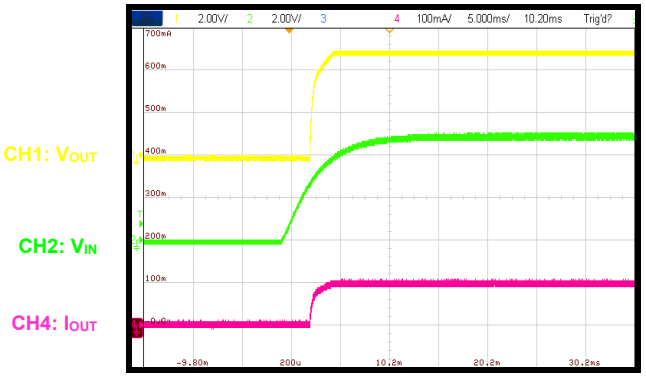
Load Transient Response

I_{OUT} = 0A to 0.1A



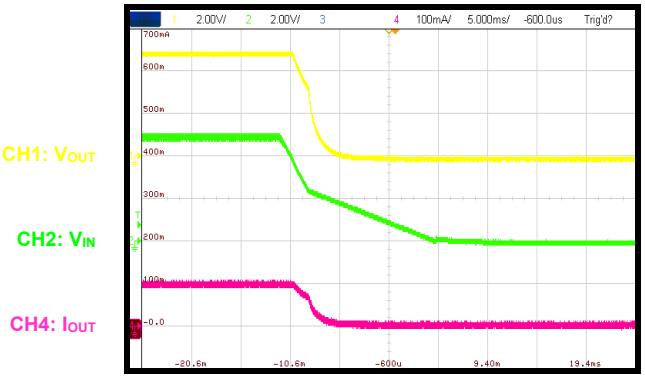
Start-Up through VIN

I_{OUT} = 0.1A



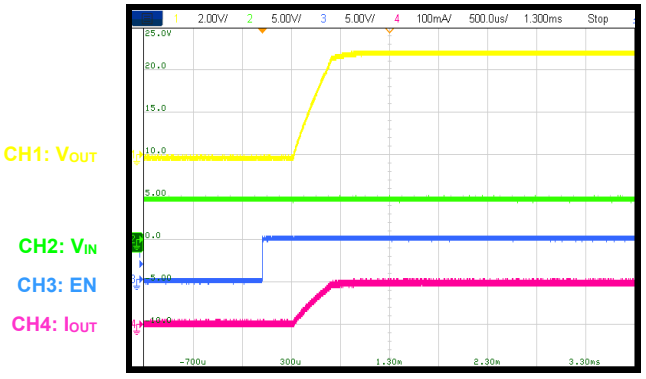
Shutdown through VIN

I_{OUT} = 0.1A



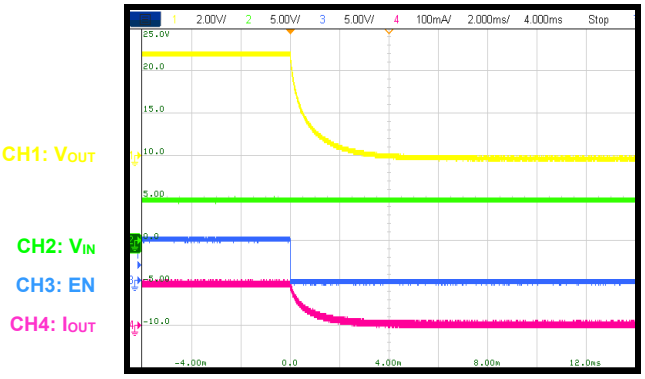
Start-Up through EN

I_{OUT} = 0.1A



Shutdown through EN

I_{OUT} = 0.1A



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PCB LAYOUT

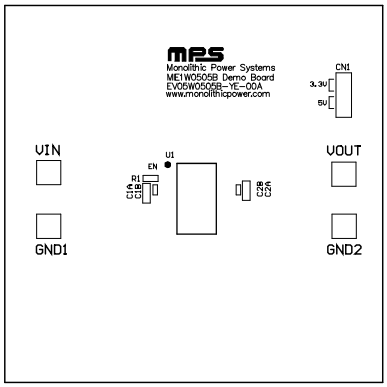

Figure 3: Top Silk

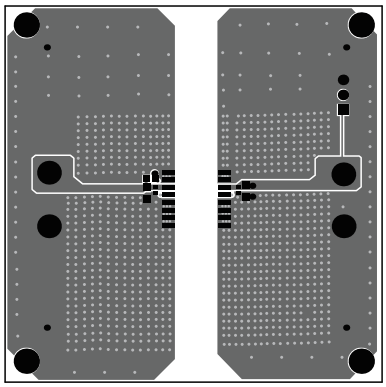

Figure 4: Top Layer

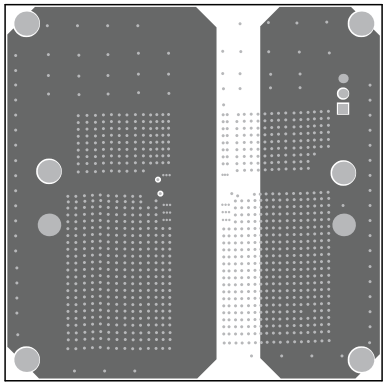

Figure 5: Mid-Layer 1

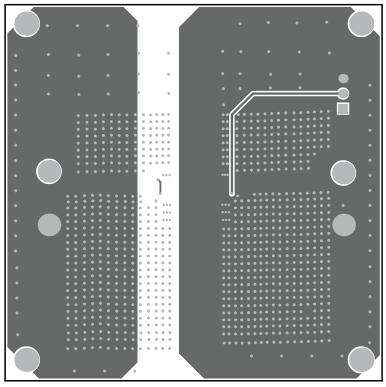

Figure 6: Mid-Layer 2

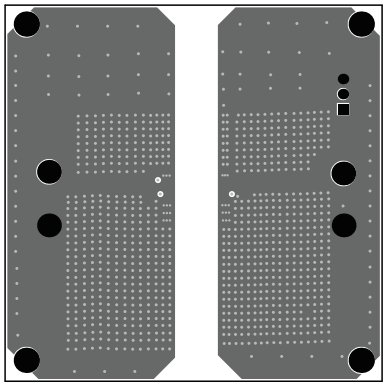

Figure 7: Bottom Layer

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REVISION HISTORY

Revision #	Revision Date	Description	Pages Updated
1.0	5/21/2024	Initial Release	-

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