EV6605D-R-00A

4-Channel Low-Side Driver with Parallel Interface Evaluation Board

DESCRIPTION

The EV6605D-R-00A evaluation board is designed to demonstrate the capabilities of the MP6605D, a 4-channel low-side (LS) driver with a parallel interface. It integrates low-side MOSFETs (LS-FETs) and high-side (HS) clamp diodes to drive inductive loads.

The MP6605D operates from a supply voltage up to 60V, and can deliver output currents (I_{OUT}) up to 1.5A. The MP6605D has a simple logic interface and supports a 3.3V and 5V logic supply. Internal safety features include over-current protection (OCP), under-voltage lockout (UVLO), and over-temperature (OT) shutdown.

The MP6605D is typically used for unipolar stepper motors and solenoid drivers. The MP6605D is available in a QFN-24 (4mmx4mm) package.

PERFORMANCE SUMMARY

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

Parameters	Conditions	Value
Supply voltage range (V_{IN})	24V TVS diode connected between VIN and VCLAMP	4.5V to 30V
	VCLAMP connected to VIN	4.5V to 60V
High-side (HS) clamp voltage (V_{CLAMP})		≤60V
Maximum low-side (LS) output current (I_{LS})	For low-side MOSFETs (LS-FETs)	1.5A
Maximum HS output current (I_{HS})	For HS diodes	1.5A at duty cycle < 20%

EV6605D-R-00A EVALUATION BOARD

LxWxH (6.35cmx6.35cmx2.5cm)

Board Number	MPS IC Number
EV6605D-R-00A	MP6605DGR

QUICK START GUIDE

1. Preset the logic power supply voltage (typically 3.3V or 5V).
2. To preset the input power supply voltage, follow the steps below:
   a. Connect the 24V TVS diode between the VIN and VCLAMP pins (where V_{IN} is between 4.5V and 30V).
   b. Connect VCLAMP to VIN (where V_{IN} is between 4.5V and 60V).
3. Connect the loads to the OUTx terminals.
4. Connect the logic power supply terminals to:
   a. Positive (+): VCC
   b. Negative (-): GND
5. Connect the input power supply terminals to:
   a. Positive (+): VIN
   b. Negative (-): GND
6. Input INx via P2. INx can also be controlled via S1's dial switch.
7. LED1 indicates fault events including over-current protection (OCP), under-voltage lockout (UVLO) and over-temperature (OT) shutdown.

   Figure 1 shows the measurement equipment set-up.

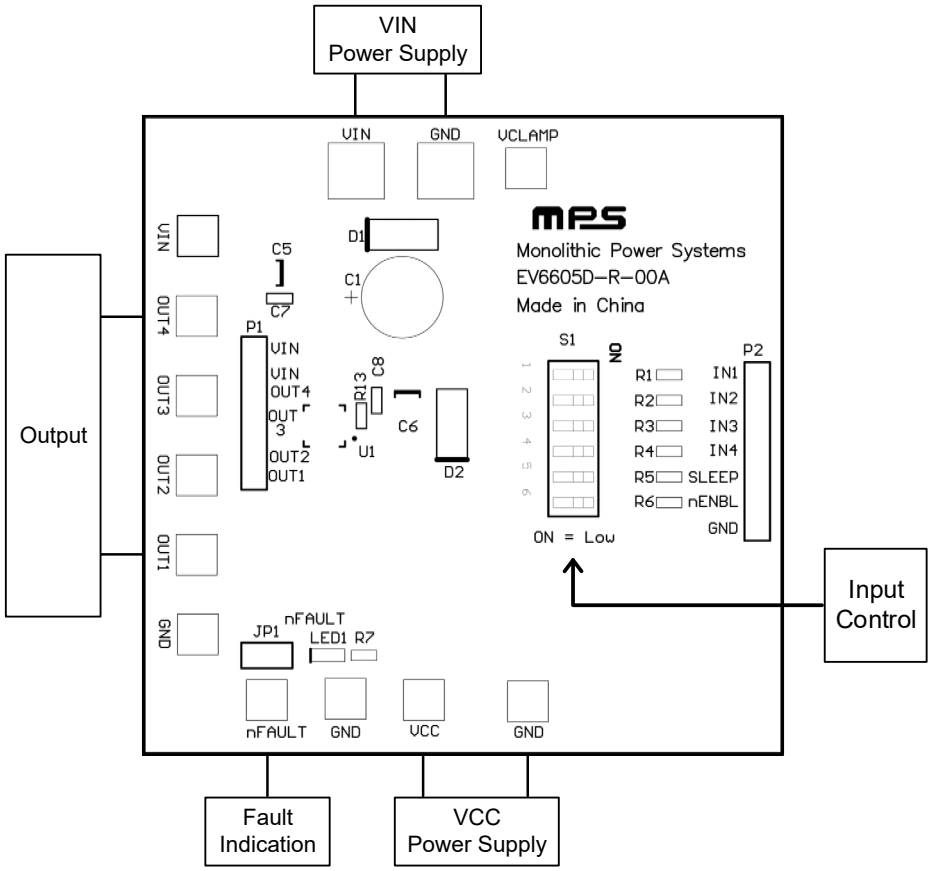


Figure 1: Measurement Equipment Set-Up

EVALUATION BOARD SCHEMATIC

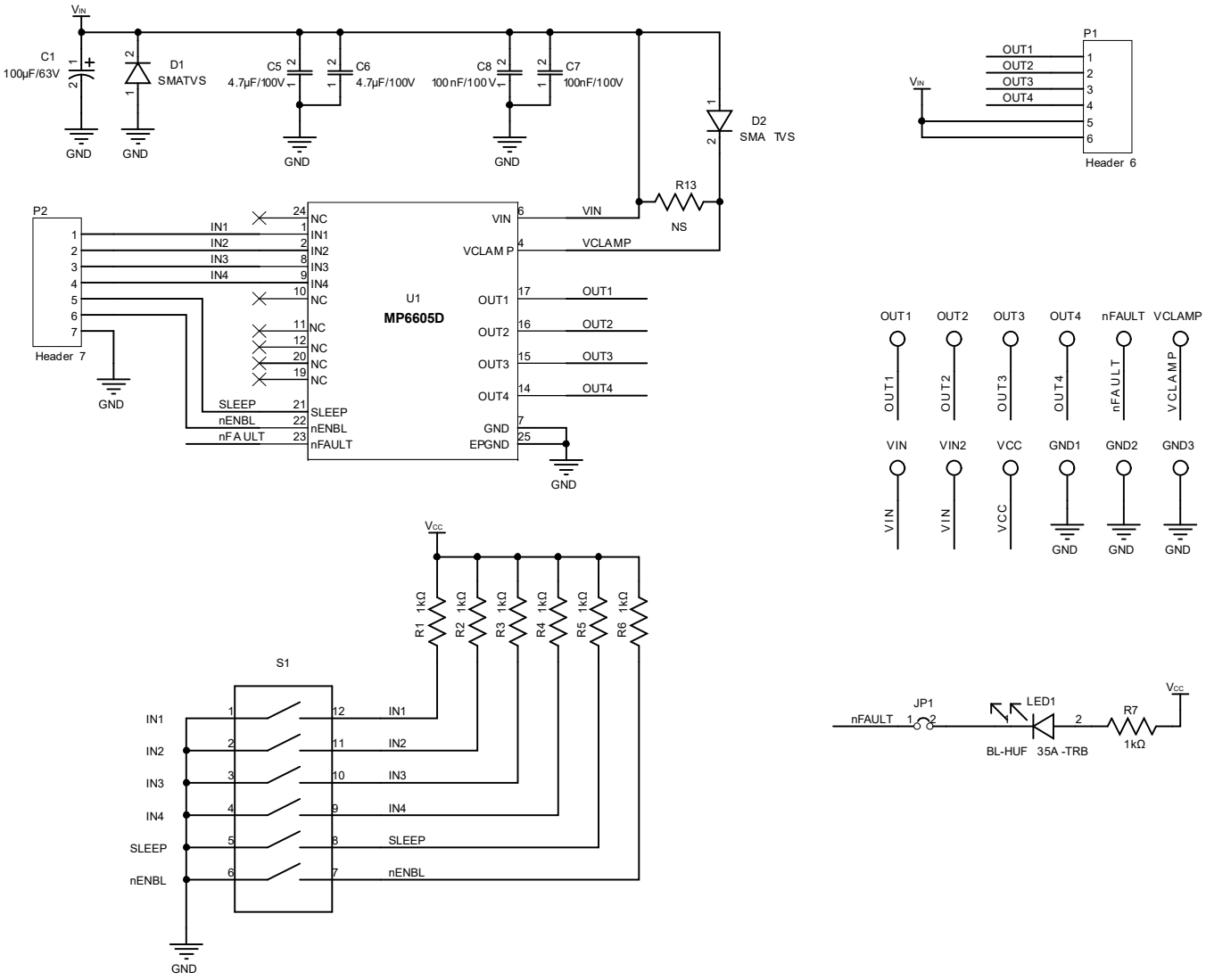


Figure 2: Evaluation Board Schematic

EV6605D-R-00A BILL OF MATERIALS

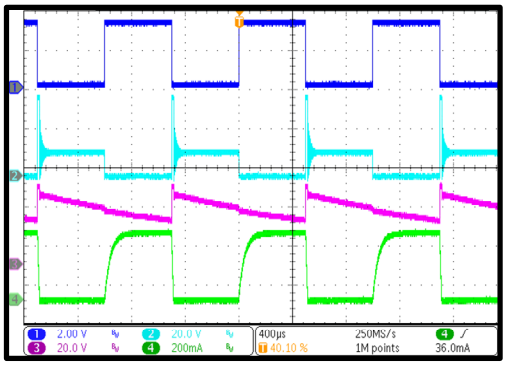
Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer PN
1	C1	100μF	Electrolytic capacitor, 100V	DIP	Jianghai	CD263-100V100
2	C5, C6	4.7μF	Ceramic capacitor, 100V, X8L	1210	Murata	GCM32DL8EL475KE07L
2	C7, C8	100nF	Ceramic capacitor, 100V, X7R	0603	Murata	GRM188R72A104KA35D
7	R1, R2, R3, R4, R5, R6, R7	1kΩ	Film resistor, 1%	0603	Yageo	RC0603FR-071KL
1	R13	NS				
1	D2	24V	TVS diode	DO-214C-2	Vishay	SMAJ24A
1	S1	6-bit	Dial switch	SMD	Wurth	418121270806
1	LED1	20mA	Red LED	0805	Baihong	BL-HUE35A-AV-TRB
1	JP1	2.54mm	Single-line needle with jumper	SIP	Custom	
2	P1, P2	2.54mm	Single-line needle	SIP	Custom	
2	VIN, GND	2mm	Needle	SIP	Custom	
11	VCLAMP, VIN, OUT1, OUT2, OUT3, OUT4, NFLT, GND, VCC	1mm	Needle	SIP	Custom	
1	U1	MP6605D	4-channel low-side driver with parallel interface	QFN-24 (4mmx 4mm)	MPS	MP6605DGR

EVB TEST RESULTS

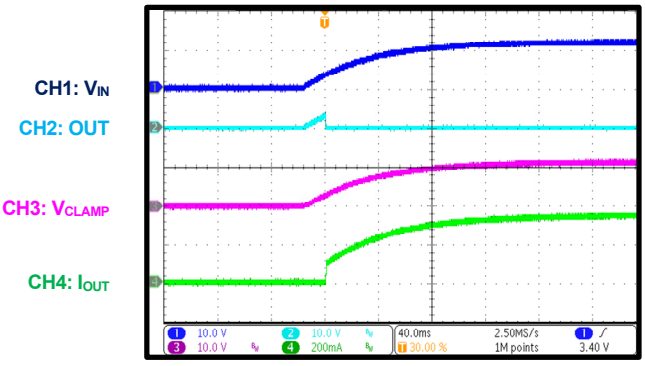
V_{IN} = 12V, V_{CLAMP} = 24V TVS to V_{IN}, T_A = 25°C, resistor + inductor load: R = 33Ω, L = 1.5mH per channel, unless otherwise noted.

Normal Operation

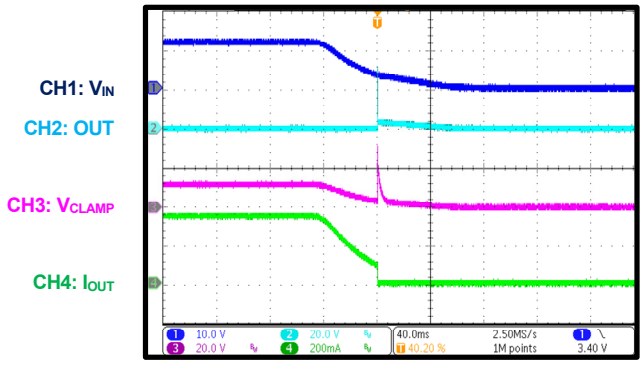
f_{SW} = 1kHz



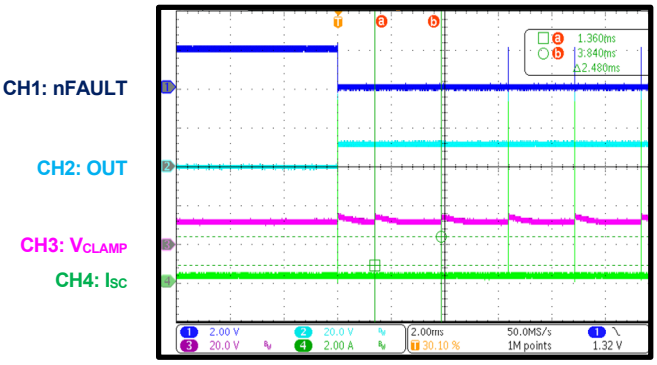
Start-Up through VIN



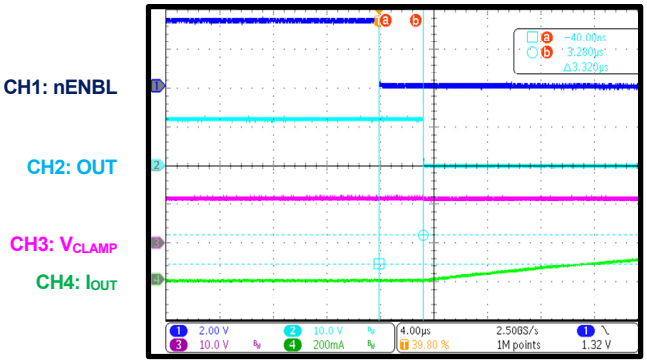
Shutdown through VIN



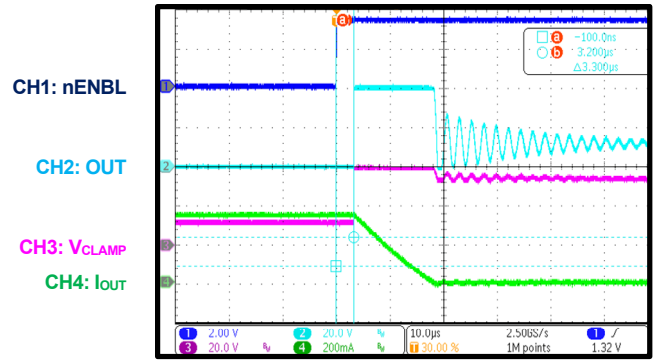
SCP



Chip Enabled



Chip Disabled



PCB LAYOUT

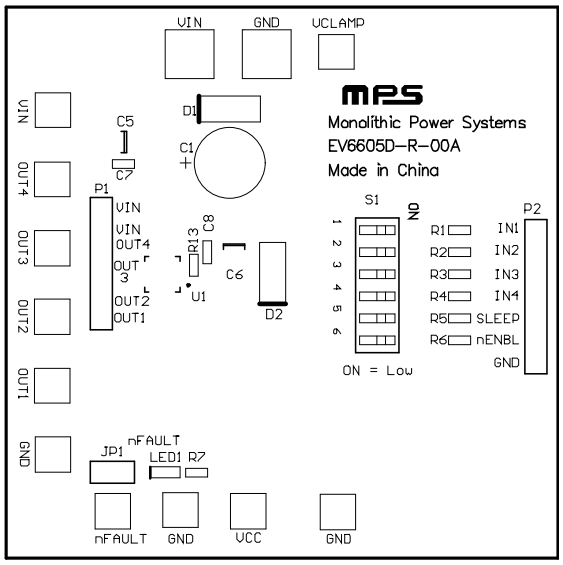


Figure 3: Top Silk

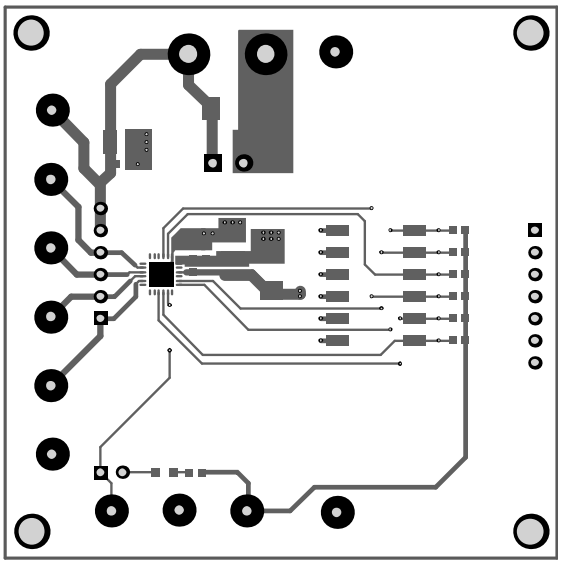


Figure 4: Top Layer

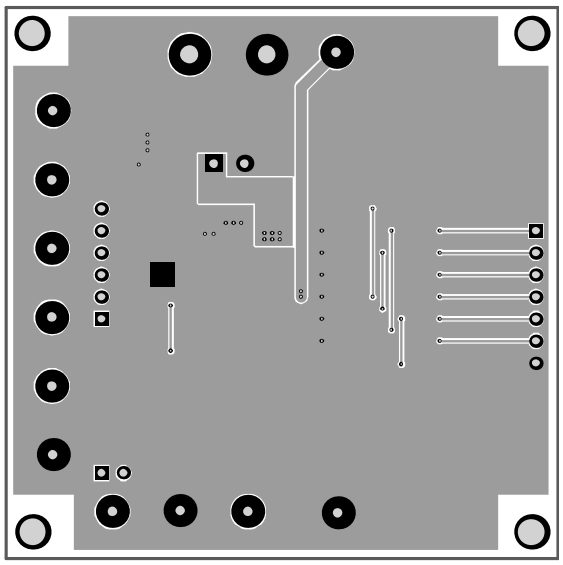


Figure 5: Bottom Layer

REVISION HISTORY

Revision #	Revision Date	Description	Pages Updated
1.0	6/14/2022	Initial Release	-

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EV6605D-R-00A