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EV1906-S-00A

80V, High Frequency Half-Bridge Gate Driver EV Board

DESCRIPTION

This is EV board documentation for MP1906. The MP1906 is a high-performance, 80V, gate driver that can drive two external N-MOSFETs in a half-bridge configuration with 12V gate supply. It accepts independent gate input signals and provides shoot-through prevention. During voltage lockout, the output of the high- and low-side driver goes low to prevent erratic operation under low supply conditions. The high-current driving capability and short dead time make it suitable for high-power and high-efficiency power applications.

This demo board is configured to a Half-Bridge.. For simplicity, HPWM and LPWM are connected together and drove by a same PWM signal generated by NE555. The user can evaluate MP1906 performance expediently..

ELECTRICAL SPECIFICATION

Parameter	Symbol	Value	Units
Driver Voltage	V _{DD}	10 – 16	V
Input Power Voltage	V _{POWER}	0-80	V
Duty	D	50	%
Frequency	F _{SW}	200	kHz

FEATURES

- Drives Two Low Cost and High-Efficiency N-MOSFETs
- 10V-16V Gate Drive Supply
- 3.3V, 5V Logic Compatibility
- 80ns Propagation Delay Time
- Less than 90µA Quiescent Current
- Undervoltage Lockout for Both Channels
- Input Signal Overlap Protection
- Internal 150ns Dead Time
- Available in a Compact 8-pin SOIC Package

APPLICATIONS

- Motor Drivers
- Half-Bridge Power Supplies
- Avionics DC-DC converters
- Active-clamp Forward Converters

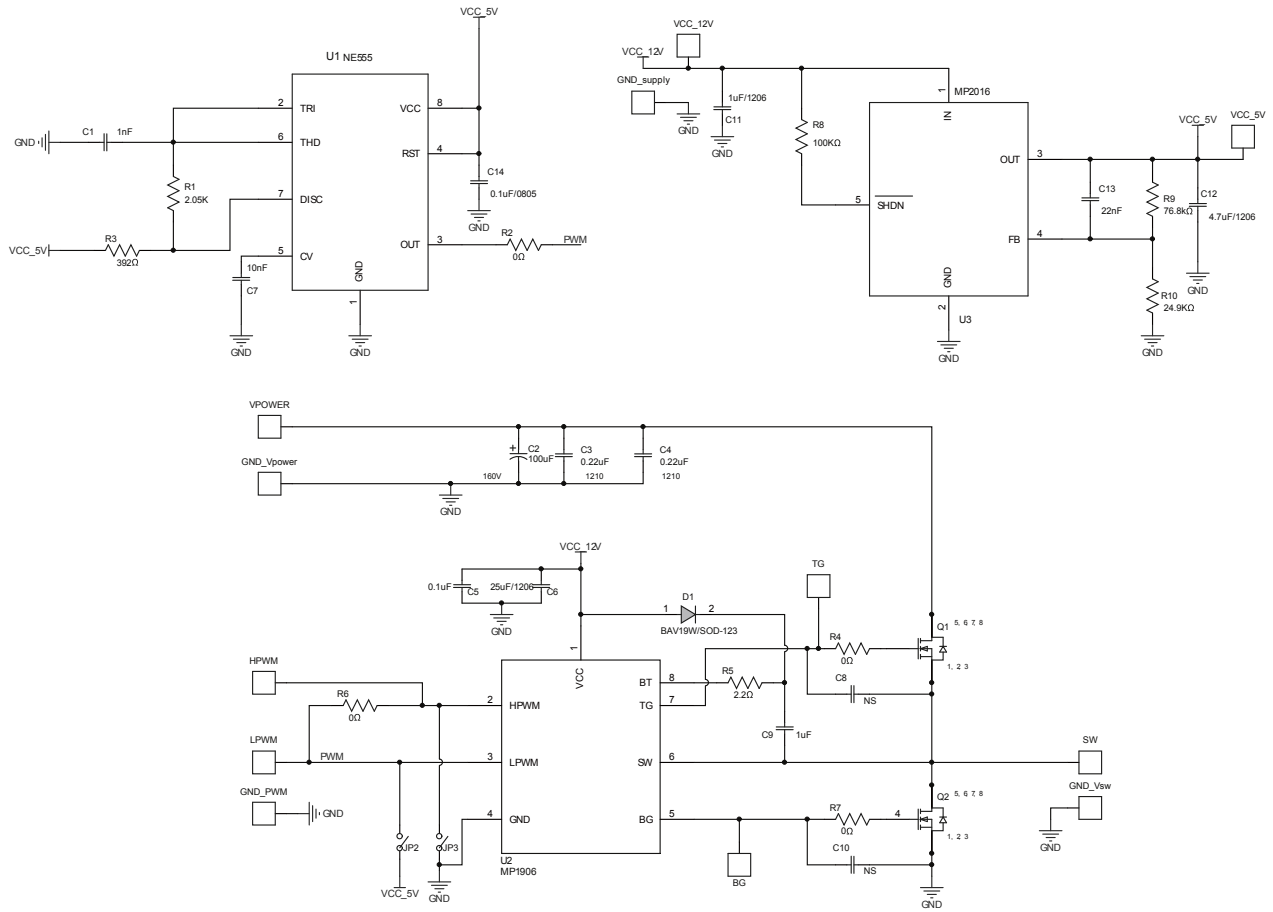
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EV1906-S-00A EVALUATION BOARD



(L x W x H) 6.4cm x 6.4cm x 2.5cm

Board Number	MPS IC Number
EV1906-S-00A	MP1906DS

EVALUATION BOARD SCHEMATIC


EV1906-S-00A BILL OF MATERIALS

Qty	RefDes	Value	Description	Package	Manufacturer	Manufacturer P/N
1	C1	1nF	Ceramic Cap,16V,X7R	0603	muRata	GRM188R71C102KA01D
1	C2	100µF	100V, Aluminium Cap	10X22X5 mm	红宝石	CD11-100V-100µF
2	C3,C4	0.22µF	Ceramic Cap., 250V, X7R	1210	muRata	GRM32DR72E224KW01D
2	C5,C14	0.1µF	Ceramic Cap., 16V, X7R	0805	muRata	GRM219R71C104KA01D
1	C6	22µF	Ceramic Cap,25V,X7R	1206	muRata	GRM31ER71E226KE15L
1	C7	10nF	Ceramic Cap,16V,X7R	0603	muRata	GRM188R71C103KA01D
2	C8,C10	NS		0603		
1	C9	1µF	Ceramic Cap, 25V, X5R	0805	muRata	GRM216R61E105KA12D
1	C11	1µF	Ceramic Cap, 25V, X7R	1206	muRata	GRM31MR71E105KC01L
1	C12	4.7µF	Ceramic Cap, 25V, X7R	1206	muRata	GRM31CR71E475KA88L
1	C13	22nF	Ceramic Cap,16V,X7R	0603	muRata	GRM188R71C223KA01D
1	R1	2.05k	Thick Film Res, 1%	0603	ROYAL	RL0603FR-072K05L
2	R3	392Ω	Thick Film Res, 1%	0603	ROYAL	RL0603FR-07392RL
4	R2,R4, R6,R7	0Ω	Thick Film Res., 1%	0603	Yageo	RC0603FR-070RL
1	R5	2.2Ω	Thick Film Res., 1%	0603	ROYAL	RL0603FR-072R2L
1	R8	100k	Thick Film Res., 1%	0603	ROYAL	RL0603FR-07100KL
1	R9	76.8k	Thick Film Res., 1%	0603	ROYAL	RC0603FR-0776K8L
1	R10	24.9k	Thick Film Res., 1%	0603	ROYAL	RL0603FR-0724K9L
1	D1	BAV19W	Switching diodes	SOD-123	DIODES	BAV19W-7-F
2	Q1,Q2	Si4100DY	N-channel MOSFET	SO8	VISHAY	Si4100DY
1	U1	NE555	General Purpose Single Bipolar Timers	SOIC8	STMicroelectronics	NE555D
1	U2	MP1906	80V Half Bridge Driver	SOIC8	MPS	MP1906R2
1	U3	MP2016	LDO, 5V, 30mA	TSOT23-5	MPS	MP2016D

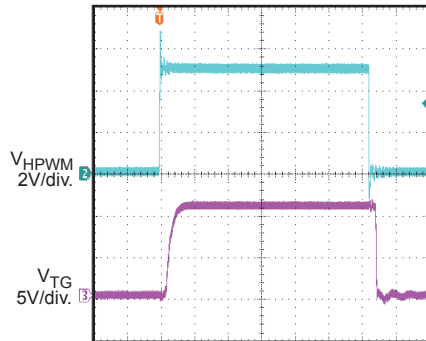
EVB TEST RESULTS

Performance waveforms are tested on the evaluation board.

$V_{POWER} = 80V$, $V_{DD} = 12V$, Duty=50%, Frequency=200kHz, $T_A = 25^\circ C$, unless otherwise noted.

HPWM to TG Delay with MOSFET

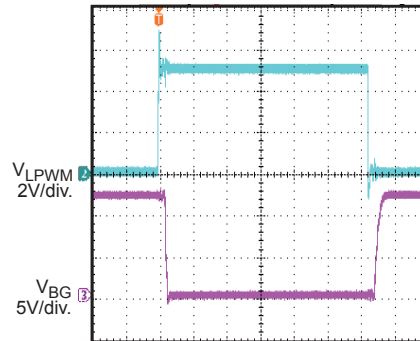
V_{POWER} is not applied



400ns/div.

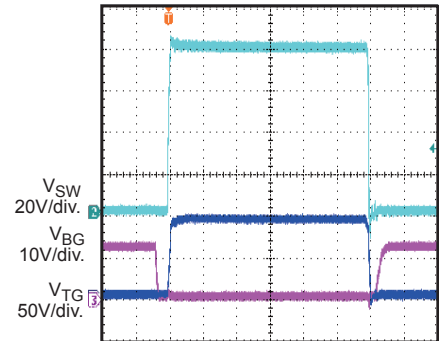
LPWM to BG Delay with MOSFET

V_{POWER} is not applied



400ns/div.

Generated TG and BG from SW



400ns/div.

PRINTED CIRCUIT BOARD LAYOUT

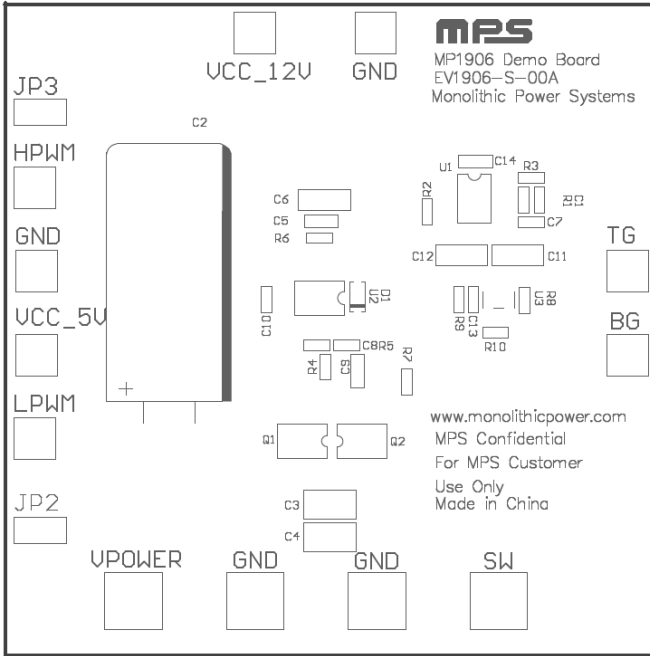


Figure 1—Top Silk Layer

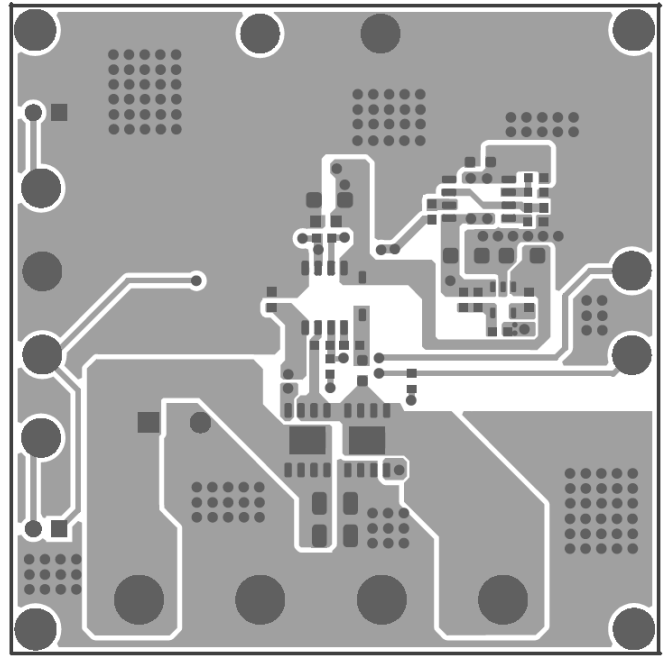


Figure 2—Top Layer

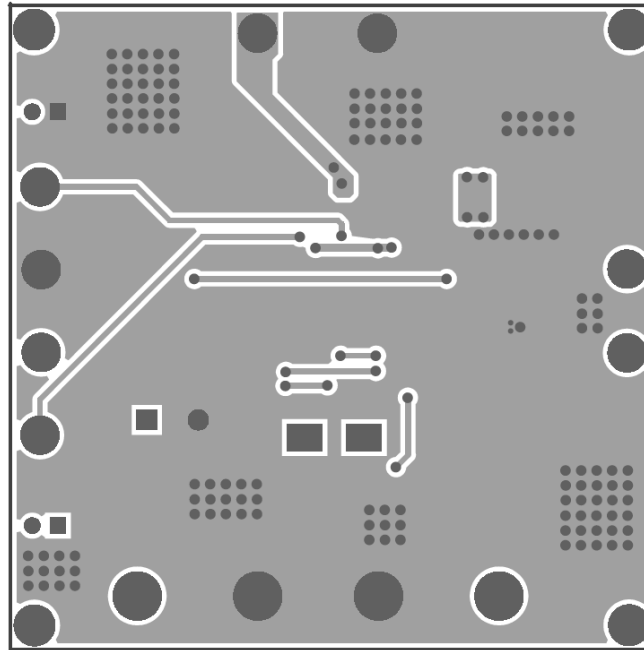


Figure 3—Bottom Layer

QUICK START GUIDE

EV1906-S-00A is configured in a half-bridge. Below is the recommended setting for users to evaluate the EV board.

1. Preset Driver Power Supply between 10V-16V.
2. Preset Input Power Supply between 0V-80V.
3. Connect Driver Power Supply terminals to:
 - a. Positive (+): VCC_12V
 - b. Negative (-): GND
4. Connect Input Power Supply terminals to:
 - a. Positive (+): VPOWER
 - b. Negative (-): GND
5. Connect Load to:
 - a. Positive (+): SW
 - b. Negative (-): GND
6. Turn on Driver Power Supply.
7. To turn off the board, please follow these steps:
 - a. Turn off load.
 - b. Turn off Input Power Supply.
 - c. Turn off Driver Power Supply.

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