



VOMA618A Evaluation Board User's Guide

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INTRODUCTION

The “VOMA618A - Automotive Isolated MOSFET Switch” evaluation board provides a readily available platform for performance and design evaluation of Vishay’s automotive optocoupler VOMA618A in combination with MOSFET SQJA64EP, as an automotive isolated low-side switch. It also contains provisions for an additional MOSFET at the input, two LEDs as status feedback for input and output.

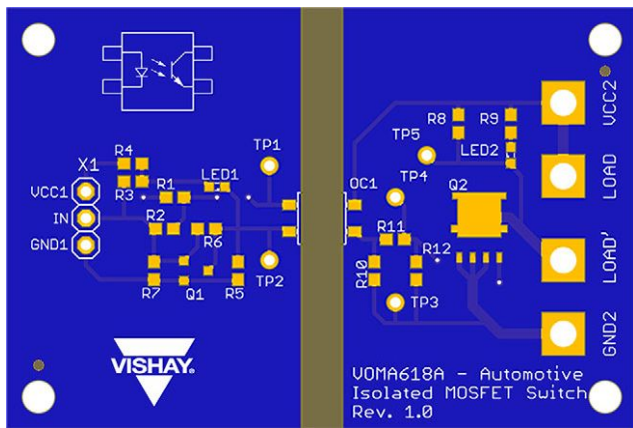


Fig. 1 - VOMA618A - Automotive Isolated MOSFET Switch Evaluation Board Picture

TEST CONFIGURATION

The default configuration requires the connection of a 5 V pulse generator GEN to drive the IR LED at the input side or a supply voltage of 5 V and an additional supply voltage V_{CC2} of 12 V to turn on the MOSFET at the output. The feedback LED₂ (not assembled) will show however the MOSFET is on or off. Please note, that for higher frequencies the LED will look like always on. The output voltage can be measured with a voltage meter or an oscilloscope at the test point TP₅.

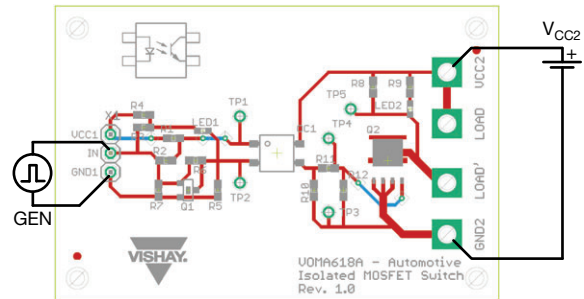


Fig. 2 - Default Connection

DESCRIPTION

The IRLED on the input side can be driven directly with a 5 V signal at the connector X₁ (V_{IN} , GND₁), resulting in a forward current I_F of 1.0 mA. On the output side, the VOMA618A provides a phototransistor output, which is connected to supply voltage of 12 V and a voltage divider R₁₀ and R₁₁. The voltage divider is connected to the gate of the MOSFET to provide the required voltage level and turn on the MOSFET. This voltage can be measured at the test point TP₃. The output signal (switched load voltage) is provided at the test point TP₅. The 12 V power supply must be connected at the vias V_{CC2} and GND₂.

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MOSFET CONFIGURATION

The MOSFET configuration also requires the connection of a 5 V pulse generator GEN to drive the IRED at the input side or a supply voltage of 5 V and an additional supply voltage V_{CC2} of 12 V to turn on the MOSFET at the output. The resistive load should be connected between vias LOAD and LOAD', in this case the resistor R_8 should be removed. The LED₂ (not assembled) will show however the MOSFET is on or off. The output voltage can be measured at the via LOAD' or at the test point TP₅ with a voltage meter or an oscilloscope.

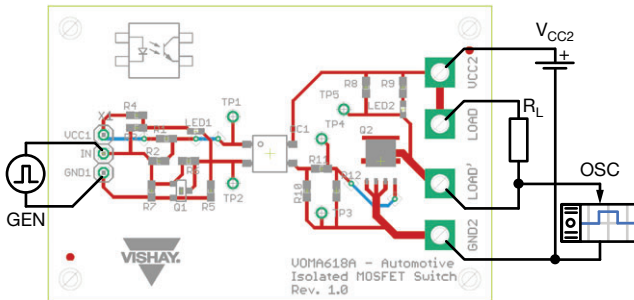


Fig. 3 - MOSFET Configuration

ALTERNATIVE CONFIGURATION

If a high impedance input is needed, an auxiliary driver MOSFET Q₁ can be used with R_1 instead of R_2 and R_5 , and R_7 as gate protection. Finally, a voltage source at the connector X₁ (V_{CC1} , GND₁) must be connected, as shown in Fig. 4.

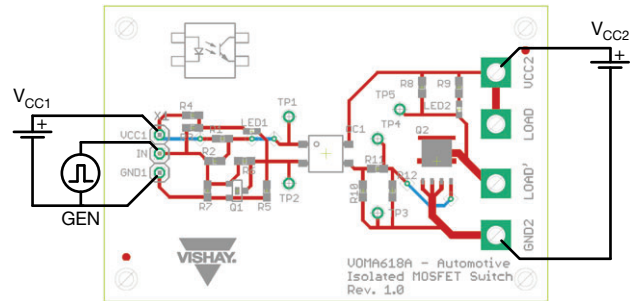


Fig. 4 - Alternative Configuration

SCHEMATIC

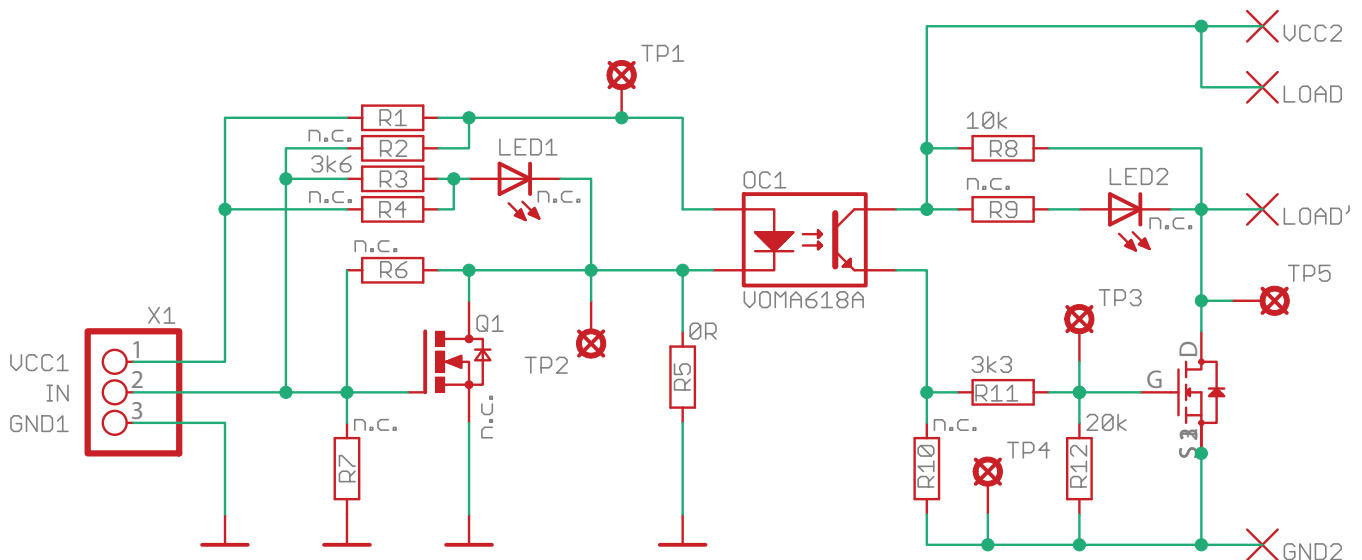


Fig. 5 - Schematic

APPLICATION NOTE



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TABLE 1 - BILL OF MATERIALS			
IDENTIFIER	PART NUMBER	COMMENT	MANUFACTURER
OC1	VOMA618A-3	Automotive 1 mA optocoupler	VISHAY
X1	90120-0763	Pin header, 3 circuits	MOLEX
R1	-	0603, not assembled	-
R2	CRCW06033K60FKTA	3.6 kΩ resistance	VISHAY
R3	-	0603, not assembled	-
R4	-	0603, not assembled	-
R5	CRCW06030000ZSTA	0 Ω jumper	VISHAY
R6	-	0603, not assembled	-
R7	-	0603, not assembled	-
R8	CRCW060310K0FKTA	10 kΩ resistance	VISHAY
R9	-	0603, not assembled	-
R10	-	0603, not assembled	-
R11	CRCW06033K30FKTA	3.3 kΩ resistance	VISHAY
R12	CRCW060320K0FKTA	20 kΩ resistance	VISHAY
Q1	-	MOSFET, SOT23, not assembled	-
Q2	SQJA64EP	Automotive n-channel MOSFET, 60 V	VISHAY
LED1	-	0603 SMD LED, not assembled	-
LED2	-	-	-
TP1	151-203-RC	Test point	KOBICONN
TP2	151-203-RC	Test point	KOBICONN
TP3	151-203-RC	Test point	KOBICONN
TP3	151-203-RC	Test point	KOBICONN