

Application Note

TPS92630EVM ESD Test Report



ABSTRACT

This application note presents ESD contact discharge test results for the TPS92630EVM, 3-channel LED driver, and demonstrates how ISO 10605 standards can be met for this device.

Automotive industry in-vehicle use cases:

- Illuminate driver for driver monitoring systems (DMS)
- Power supply for indicator LED in side mirror in blind spot detection applications

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1 Introduction

A fully-compliant ESD chamber and equipment is used for this testing to conduct the following testing conditions.

The TPS92639EVM was protected with the ESD2CAN24-Q1, an automotive dual-ESD protection diode, soldered on the LED driver signal output and the LED loads of the evaluation module.

1.1 Test Conditions

The following:

- Disconnected from power supply
- Contact discharge:
 - ± 8 kV, 150 pF at 0.33 k Ω
 - ± 15 kV, 330 pF at 2 k Ω
 - ± 25 kV, 330 pF at 2 k Ω
- Three discharges with a 3-second interval
- Loaded and open configuration

1.2 Test Setup Diagrams

Figure 1-1 and Figure 1-2 show the loaded test and open test configurations, respectively. Figure 1-3 shows the EVM schematic with protection and testing modifications.

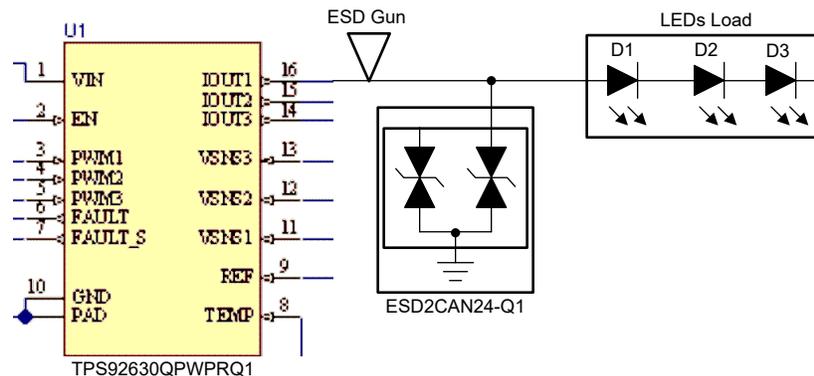


Figure 1-1. Loaded Test Configuration

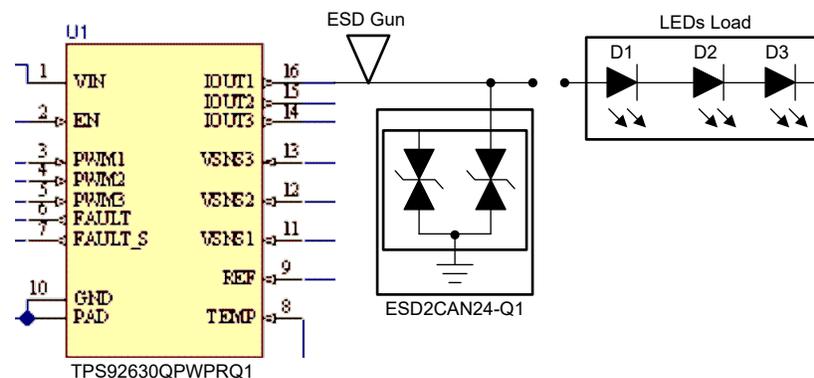


Figure 1-2. Open Test Configuration

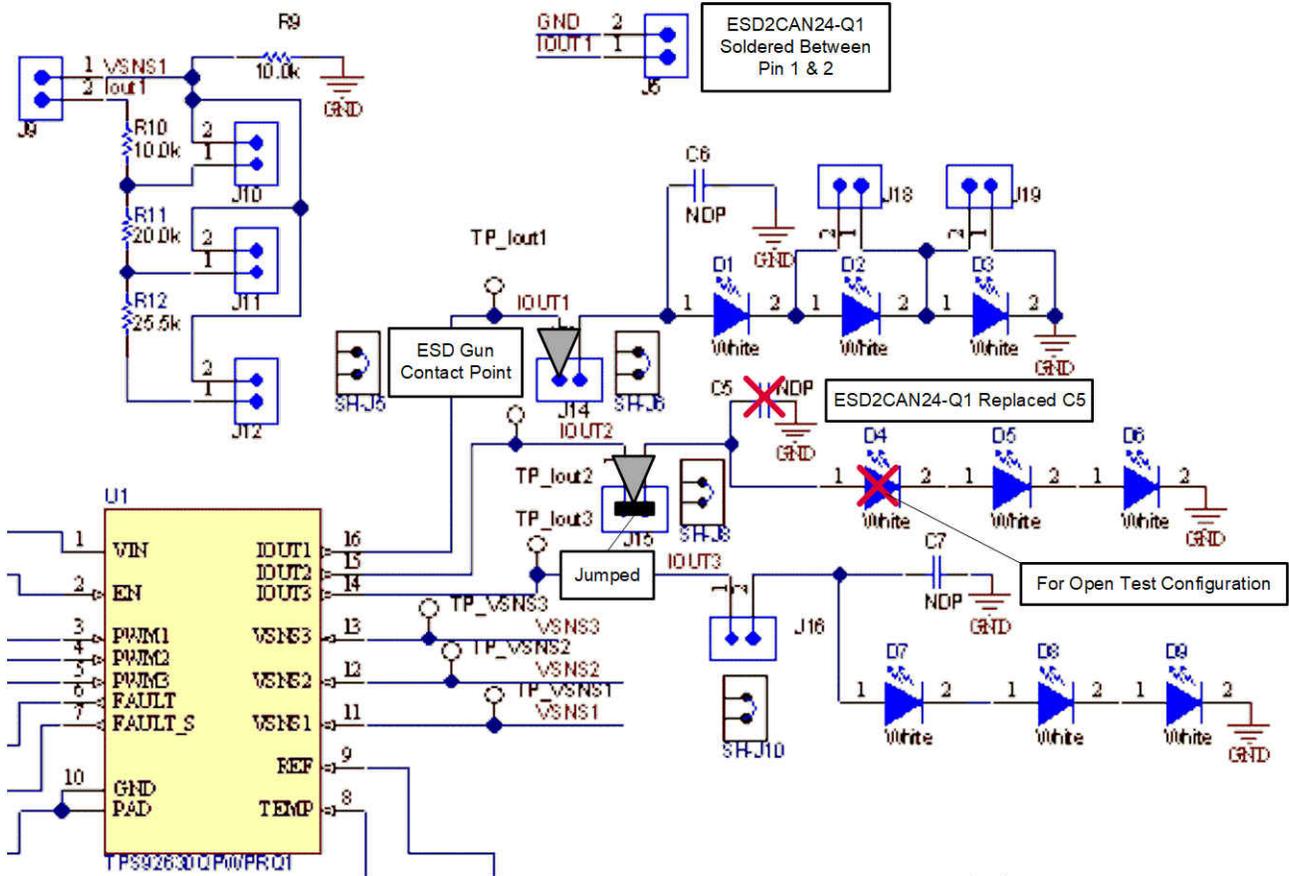


Figure 1-3. TPS92630EVM Schematic With Protection and Testing Modifications

2 Test Results

After each ESD test (3 discharges), the LED driver is powered and the load is connected (if necessary) to test LED operation.

Table 2-1. Loaded Test Configuration Results

Test Number	Contact Discharge	Result
1, 2	±8 kV, 150 pF at 0.33 kΩ	Channel 3 Operating Normally
3, 4	±15 kV 330 pF at 2 kΩ	Channel 3 Operating Normally
5, 6	±25 kV, 330 pF at 2 kΩ	Channel 3 Operating Normally

Table 2-2. Open Test Configuration Results

Test Number	Contact Discharge	Result
7, 8	±8 kV, 150 pF at 0.33 kΩ	Channel 1 Operating Normally
9, 10	±15 kV 330 pF at 2 kΩ	Channel 1 Operating Normally
11, 12	±25 kV 330 pF at 2 kΩ	Channel 1 Operating Normally
13, 14	±8 kV 150 pF at 0.33 kΩ	Channel 3 Operating Normally
15, 16	±15 kV 330 pF at 2 kΩ	Channel 3 Operating Normally
17, 18	±25 kV 330 pF at 2 kΩ	Channel 3 Operating Normally

Note

Channel 2 was used for initial testing with both channels of the protection diode (ESD2CAN24-Q1) shorted together.

3 Conclusion

The TPS92630-Q1EVM with an ESD2CAN24-Q1 protection device on each channel is adequately protected from ESD according to ISO 10605 standards.

4 References

1. Texas Instruments, [TPS92630-Q1 Evaluation Module \(EVM\) user's guide](#)
2. Texas Instruments, [ESD2CAN24-Q1 Automotive 24-V, 2-Channel ESD Protection Diode for In-Vehicle Networks](#) data sheet

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