MPQ6526, MPQ6523

Hex/Triple Half-Bridge Motor Driver with Serial Input Control

AEC-Q100

October 2017
MPQ6526_MPQ6523 Target Applications

- Automotive HVAC Controls  
  (Heating, Ventilation, A/C)
- Solenoid Drivers
These door drivers go into three primary product segments:

- **Climate control head (CCH) modules**: Modular centerstack module with integrated controls and human machine interface (HMI).
- **Integrated control/center panels (ICP)**: Full centerstack modules with integrated controls and HMI.
- **Remote climate control module (RCCM)**: a black box containing the climate controls, but no HMI.
Why Use These Parts?

They’re Simple and Easy!

• All half-bridges of the MPQ6523 and MPQ6526 can be controlled separately from a standard serial data interface.

• Various diagnostic functions: shorted output, open-load, over-temperature, and under-voltage, and fault output flag.
MPQ6526 – Hex Half-Bridge Driver

FEATURES

• 7V - 28V Supply Voltage Range
• 0.9A Output Current
• Serial Interface
• Individual 1/2-H-Bridge Control
• MOSFET On-Resistance: HS + LS = 1.1Ω
• Diagnostic Feedback
• AEC-Q100 Available

Available in QFN-24 (4mmx4mm) and (5mmx5mm) Packages
MPQ6523 – Triple Half-Bridge Driver

**FEATURES**

- 7V - 28V Supply Voltage Range
- 0.9A Output Current
- Serial Interface
- Individual 1/2-H-Bridge Control
- MOSFET On-Resistance: \( HS + LS = 1.1 \Omega \)
- Diagnostic Feedback
- AEC-Q100 Available

Available in a QFN-24 (4mmx4mm) Package
Open-Load Detection

Open-load monitoring of the MPQ6526 and MPQ6523 is controlled by the OLD (open-load detection) bit (bit[13]) of the input data register.

**Single-Ended High-Side Open Load**

A high-side load below can be directly monitored for an open-load condition.

\[ \text{LS}_x = 1 \rightarrow \text{high-side load open} \]
\[ \text{LS}_x = 0 \rightarrow \text{high-side load connected} \]

**Single-Ended Low-Side Open Load**

A low-side load below cannot be monitored for an open-load condition.

\[ \text{HS}_x = 1 \text{ for open/connected both instances.} \]
Open-load monitoring of the MPQ6526 and MPQ6523 is controlled by the OLD (open-load detection) bit (bit[13]) of the input data register.

**H-Bridge Configuration**

An H-bridge configuration can be directly monitored for an open-load condition. Testing for the open-load is a two step process:

**Step 1: Program All Drivers Off**
- Input register: OLD = 0, HSx / LSx / HSy / LSy = 0
- Output register result: LSx = 1, LSy = 1 → “Open-load” at LSx/LSy, which is expected

**Step 2: Program HSy On**
- Input register: OLD = 0, HSx = 0, LSx = 0, HSy = 1, LSy = 0
- Output register result:
  - LSy=0, LSx=0 (or HSy = 1, HSx = 1) → “Motor connected”
  - LSy=0, LSx=1 (or HSy = 1, HSx = 0) → “Motor disconnected”

External_Global_Product_Release
The MPQ6526 is able to deliver **900mA** of output current.

Test condition: Vcc = 5V, Vs = 13V, Io = 900mA
MPQ6526_MPQ6523 Short-Circuit Protection

- SCP test pass (OUT short to GND/VS, and OUTx short to OUTy).
- Overload protection delay time has two options by setting SCT.

<table>
<thead>
<tr>
<th>Over-current limit</th>
<th>IOCP</th>
<th>1</th>
<th>1.3</th>
<th>1.8</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over-current shutdown delay time</td>
<td>Bit[14] (SCT) = low, $V_{VS} = 13V$</td>
<td>0.1</td>
<td>0.21</td>
<td>0.3</td>
<td>ms</td>
</tr>
<tr>
<td></td>
<td>Bit[14] (SCT) = high, $V_{VS} = 13V$</td>
<td>0.28</td>
<td>0.53</td>
<td>0.72</td>
<td></td>
</tr>
<tr>
<td>Open-load detection current</td>
<td>Bit[13] (OLD) = low, output off</td>
<td>1.4</td>
<td>1.9</td>
<td>2.2</td>
<td>mA</td>
</tr>
</tbody>
</table>

SCT = 1

SCT = 0