

**Evaluates: MAX17526A/B/C – 5.5V to 60V, 6A Current Limiter with OV, UV, Reverse Protection, and Power Limit** **MAX17526A Evaluation Kit****General Description**

The MAX17526A evaluation kit (EV kit) is a fully assembled and tested circuit board that demonstrates the MAX17526A high accuracy adjustable power limiter in a 20-pin TQFN-EP package. The EV kit can be configured to demonstrate adjustable overvoltage, undervoltage, overcurrent, different current-limit types, and power limit features.

**Features**

- 5.5V to 60V Wide Input Voltage Range
- Features a TVS Diode across the Input and Schottky Diode across the Output Terminals
- External NMOSFET Installed
- Evaluates UVLO, OVLO, Three Current-Limit Types, and Current-Limit Threshold
- Programmable Input Overvoltage Setting up to 40V
- Demonstrates Internal UVLO programmed to 12.8V
- Demonstrates Internal OVLO programmed to 36.2V
- Active Power Limit to Protect Supply or Load
- Proven PCB Layout
- Fully Assembled and Tested

***Ordering Information*** appears at end of data sheet.

**Quick Start****Recommended Equipment**

- MAX17526A EV kit
- 60V DC power supply
- Multimeters
- Adjustable load (0A to 10A)
- 5V DC power supply

**Equipment Setup and Test Procedure**

The EV kit is fully assembled and tested. Follow the steps below to verify board operation. **Caution: Do not turn on the power supply until all connections are completed.**

- 1) Verify that all jumpers are in their default positions.
- 2) Connect a 5V DC power supply to  $V_{IO}$  (TP21).
- 3) Set the 40V DC power supply to 10V and connect it between  $V_{SN}$  (TP1/TP2) and GND (TP3/TP4). Verify that LED1 is on and  $\overline{FLAG}$  (TP15) is 0V.
- 4) Increase the DC power-supply voltage and verify that LED2 turns on when voltage reaches approximately 12.8V. Also check that voltage on  $V_{OUT}$  (TP5/TP6) is 12.8V and  $\overline{FLAG}$  is 5V.
- 5) Gradually increase the DC power-supply voltage and verify that LED2 turns off when voltage reaches approximately 36.2V. Also check that voltage on  $V_{OUT}$  goes down and  $\overline{FLAG}$  is 0V.
- 6) Gradually decrease the DC power-supply voltage and verify that LED2 turns on when voltage reaches approximately 34.1V. Also check that voltage on  $V_{OUT}$  is 34.1V and  $\overline{FLAG}$  is 5V.
- 7) Set the DC power-supply voltage to 24V and connect the adjustable load between  $V_{OUT}$  and GND terminals and a multimeter in series to measure the current. Gradually increase the load current and verify that the  $V_{OUT}$  goes down and  $\overline{FLAG}$  goes low when the load current increases above 6A.
- 8) The jumpers JU7-JU10 can be configured to change the current-limit as in [Table 7](#). Verify various current-limit operations by repeating step 7.

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### Detailed Description

The EV kit circuit can be configured to evaluate user-defined UVLO and OVLO thresholds using resistor-dividers. The overcurrent threshold is determined by external resistors connected to the SETI pin and is jumper-configurable through jumpers JU7-JU10. Using jumper JU2, the EV kit circuit can be configured to evaluate different current-limit types (Autoretry, Continuous, and Latch-off). The EV kit also features LEDs to indicate the presence of input and output voltages (see [Table 1](#)).

### Input Power Supply

The EV kit is powered by a user-supplied 5.5V to 60V power supply connected between TP1/TP2 (V<sub>SN</sub>) and GND.

### Enable Inputs

Use jumpers JU1 and JU12 to enable the device (see [Table 2](#) for jumper settings and [Table 3](#) for enable switch status).

### UVLO/OVLO Threshold

Use jumpers JU3 and JU5 to select internal or external OVLO threshold. Install a shunt on either JU3 or JU5. See [Table 4](#) for jumper settings.

**Table 1. LED Indicator (LED1, LED2)**

| LED  | DESCRIPTION                    |
|------|--------------------------------|
| LED1 | LED1 is on when SN is powered  |
| LED2 | LED2 is on when OUT is powered |

**Table 2. Enable Inputs Jumper Setting (JU1, JU12)**

| JUMPER | SHUNT POSITION | DESCRIPTION                           |
|--------|----------------|---------------------------------------|
| JU1    | 1-2            | HVEN pin connected to V <sub>SN</sub> |
|        | 2-3*           | HVEN pin connected to GND             |
| JU12   | Installed      | EN is high                            |
|        | Not Installed* | EN is low                             |

\*Default Position

The external OVLO threshold for input voltage is set through either R2/R3 or R6 resistive divider. Use the following equation to calculate the value of R2 for a required OVLO threshold level:

$$R3 = \frac{R2}{\left( \frac{V_{OVLO}}{V_{SET\_OVLO}} - 1 \right)}$$

where:

R2 can be chosen as 2.2MΩ

V<sub>SET\_OVLO</sub> = 1.22V

V<sub>OVLO</sub> = Required overvoltage protection threshold

Use jumpers JU4 and JU6 to select internal or external UVLO threshold. Install a shunt on either JU4 or JU6. See [Table 5](#) for jumper settings.

The external UVLO threshold for input voltage is set through either R4/R5 or R7 resistive divider. Use the following equation to calculate the value of R4 for a required UVLO threshold level:

$$R4 = \frac{R5}{\left( \frac{V_{UVLO}}{V_{SET\_UVLO}} - 1 \right)}$$

where:

R5 can be chosen as 2.2MΩ

V<sub>SET\_UVLO</sub> = 1.26V

V<sub>UVLO</sub> = Required undervoltage protection threshold

**Table 3. Enable Inputs Switch Status**

| HVEN | EN | MAX17526A STATUS |
|------|----|------------------|
| 0    | 0  | ON               |
| 0    | 1  | ON               |
| 1    | 0  | OFF              |
| 1    | 1  | ON               |

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### Power Limit Threshold

The EV kit features jumpers (JU13-JU14) to use different power limit thresholds. Install jumpers as shown in [Table 6](#) to change the power-limit threshold. Refer to the MAX17526A data sheet to program PLIM using R21 and R22 (or R16 resistive divider).

### Current-Limit Threshold

The EV kit features jumpers (JU7-JU10) to use different resistors to program the current-limit threshold. Install a jumper as shown in [Table 7](#) to change the current-limit threshold.

### Current-Limit Type Select

The EV kit features jumper JU2 to select different current-limit responses. See [Table 8](#) for jumper settings.

**Table 4. OVLO Threshold Jumper Setting (JU3, JU5)**

| JUMPER | SHUNT POSITION | DESCRIPTION   |
|--------|----------------|---|
| JU3    | Installed*     | OVLO is connected to ground; internal OVLO threshold is used (do not install JU5).  |
|        | Not Installed  | OVLO is programmable  |
| JU5    | 1-2            | OVLO is connected to $V_{SN}$ with external voltage-divider; use either R2/R3 or R6 to set overvoltage threshold (do not install JU3).    |
|        | 2-3            | OVLO is connected to $V_{IN}$ with an external voltage-divider; use either R2/R3 or R6 to set overvoltage threshold (do not install JU3). |
|        | Not Installed* | Internal OVLO is selected through JU3   |

\*Default Position

**Table 5. UVLO Threshold Jumper Setting (JU4, JU6)**

| JUMPER | SHUNT POSITION | DESCRIPTION  |
|--------|----------------|--|
| JU4    | Installed*     | UVLO is connected to ground; internal UVLO threshold is used (do not install JU6).   |
|        | Not Installed  | UVLO is programmable   |
| JU6    | 1-2            | UVLO is connected to $V_{SN}$ with external voltage-divider; use either R4/R5 or R7 to set overvoltage threshold (do not install JU4). |
|        | 2-3            | UVLO is connected to $V_{IN}$ with external voltage-divider; use either R4/R5 or R7 to set overvoltage threshold (do not install JU4). |
|        | Not Installed* | Internal UVLO is selected through JU4  |

\*Default Position

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**Table 6. PLIM Threshold Jumper Setting (JU13, JU14)**

| JUMPER | SHUNT POSITION | DESCRIPTION  |
|--------|----------------|--|
| JU13   | Installed*     | PLIM is connected to ground; PLIM is disabled (do not install JU14).   |
|        | Not Installed  | PLIM is programmable   |
| JU14   | 1-2            | PLIM is connected to $V_{OUT}$ with external voltage-divider; Use either R21/R22 or R16 to set PLIM threshold (do not install JU13). |
|        | 2-3            | PLIM is connected to $V_{IN}$ with external voltage-divider; Use either R21/R22 or R16 to set PLIM threshold (do not install JU13).  |
|        | Not Installed* | PLIM is disabled   |

\*Default Position

**Table 7. Current-Limit Threshold (JU7-JU10)**

| JUMPER | SHUNT POSITION | DESCRIPTION                  |
|--------|----------------|------------------------------|
| JU7    | Installed*     | Current-limit 0.6A           |
|        | Not Installed  | SETI open. Part is disabled. |
| JU8    | Installed      | Current-limit 2.9A           |
|        | Not Installed* | SETI open. Part is disabled. |
| JU9    | Installed      | Current-limit 6.0A           |
|        | Not Installed* | SETI open. Part is disabled. |
| JU10   | Installed      | Current-limit adjustable     |
|        | Not Installed* | SETI open. Part is disabled  |

\*Default Position

**Table 8. Current-Limit Type Select (JU2)**

| JUMPER | SHUNT POSITION | DESCRIPTION |
|--------|----------------|-------------|
| JU2    | 1-2*           | Autoretry   |
|        | 2-3            | Latch-off   |
|        | Open           | Continuous  |

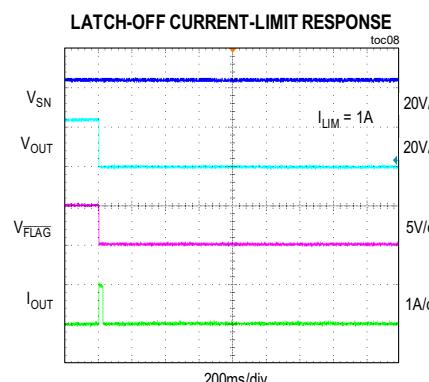
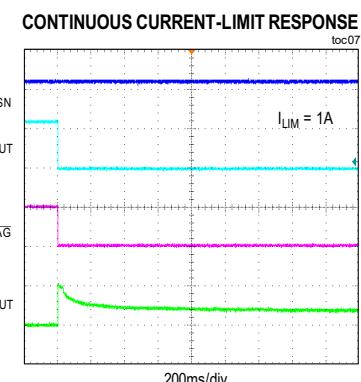
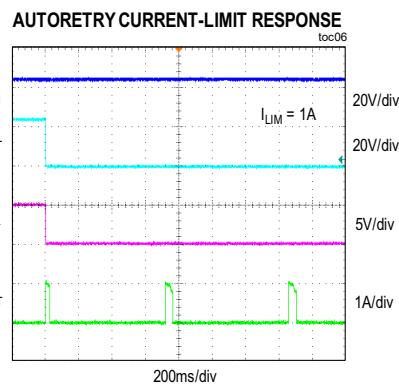
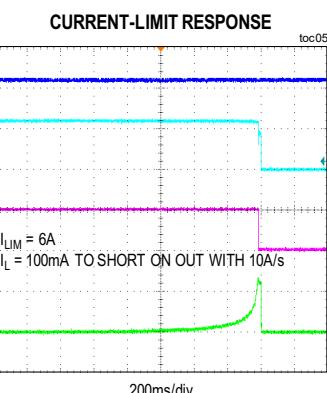
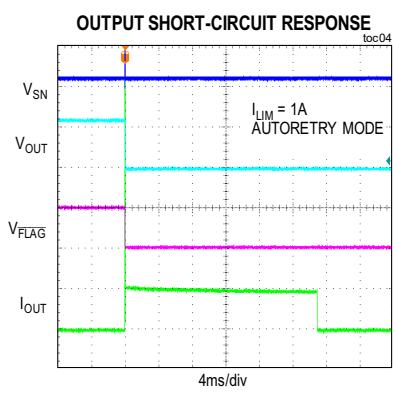
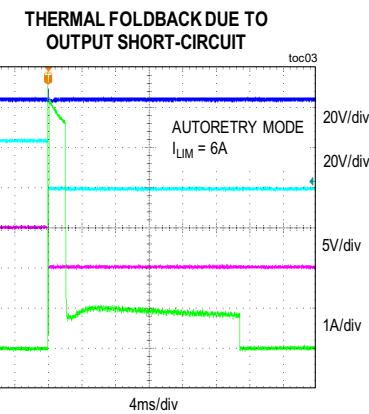
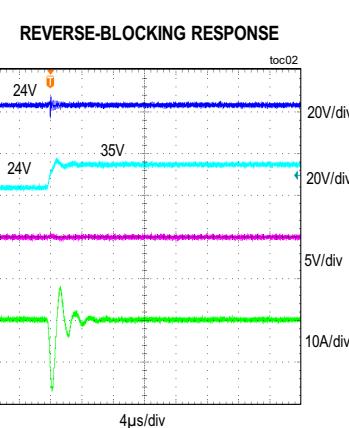
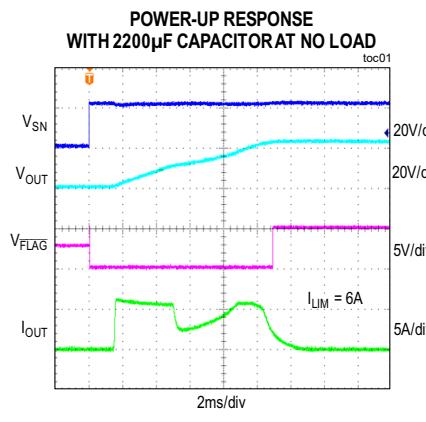
\*Default Position

## MAX17526A Evaluation Kit

Evaluates: MAX17526A/B/C – 5.5V to 60V, 6A Current Limiter with OV, UV, Reverse Protection, and Power Limit

### MAX17526A EV Kit Performance Report

( $V_{IN}$  = 24V, unless otherwise noted.)

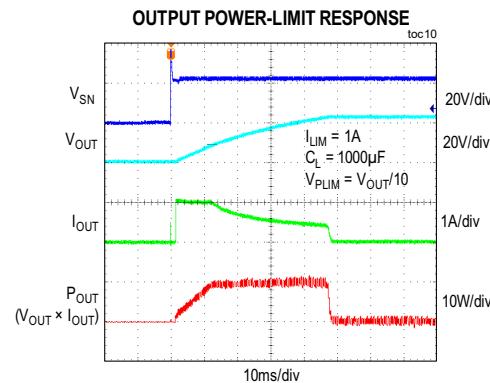
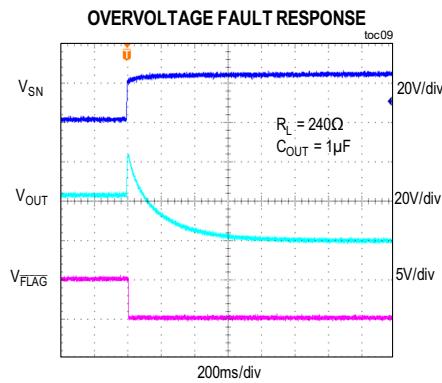


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Evaluates: MAX17526A/B/C – 5.5V to 60V, 6A  
Current Limiter with OV, UV, Reverse  
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### MAX17526A EV Kit Performance Report (continued)

( $V_{IN}$  = 24V, unless otherwise noted.)



### Component Suppliers

| SUPPLIER                        | WEBSITE  |
|---------------------------------|--|
| Bourns, Inc.                    | <a href="http://www.bourns.com">www.bourns.com</a>               |
| Infineon                        | <a href="http://www.infineon.com">www.infineon.com</a>           |
| Lite-On, Inc.                   | <a href="http://www.us.liteon.com">www.us.liteon.com</a>         |
| Lumex Inc.                      | <a href="http://www.lumex.com">www.lumex.com</a>                 |
| Murata Americas                 | <a href="http://www.murata.com">www.murata.com</a>               |
| Panasonic Corp.                 | <a href="http://www.panasonic.com">www.panasonic.com</a>         |
| TDK Corp.                       | <a href="http://www.component.tdk.com">www.component.tdk.com</a> |
| ON Semiconductor                | <a href="http://www.onsemi.com">www.onsemi.com</a>               |
| SullinsCorp Connector Solutions | <a href="http://www.sullinscorp.com">www.sullinscorp.com</a>     |
| Keystone Electronics Corp       | <a href="http://www.keyelco.com">www.keyelco.com</a>             |

**Note:** Indicate that you are using the MAX17526A when contacting these component suppliers.

### Ordering Information

| PART            | TYPE   |
|-----------------|--------|
| MAX17526AEVKIT# | EV Kit |

## MAX17526A Evaluation Kit

Evaluates: MAX17526A/B/C – 5.5V to 60V, 6A Current Limiter with OV, UV, Reverse Protection, and Power Limit

### MAX17526A EV System Bill of Materials

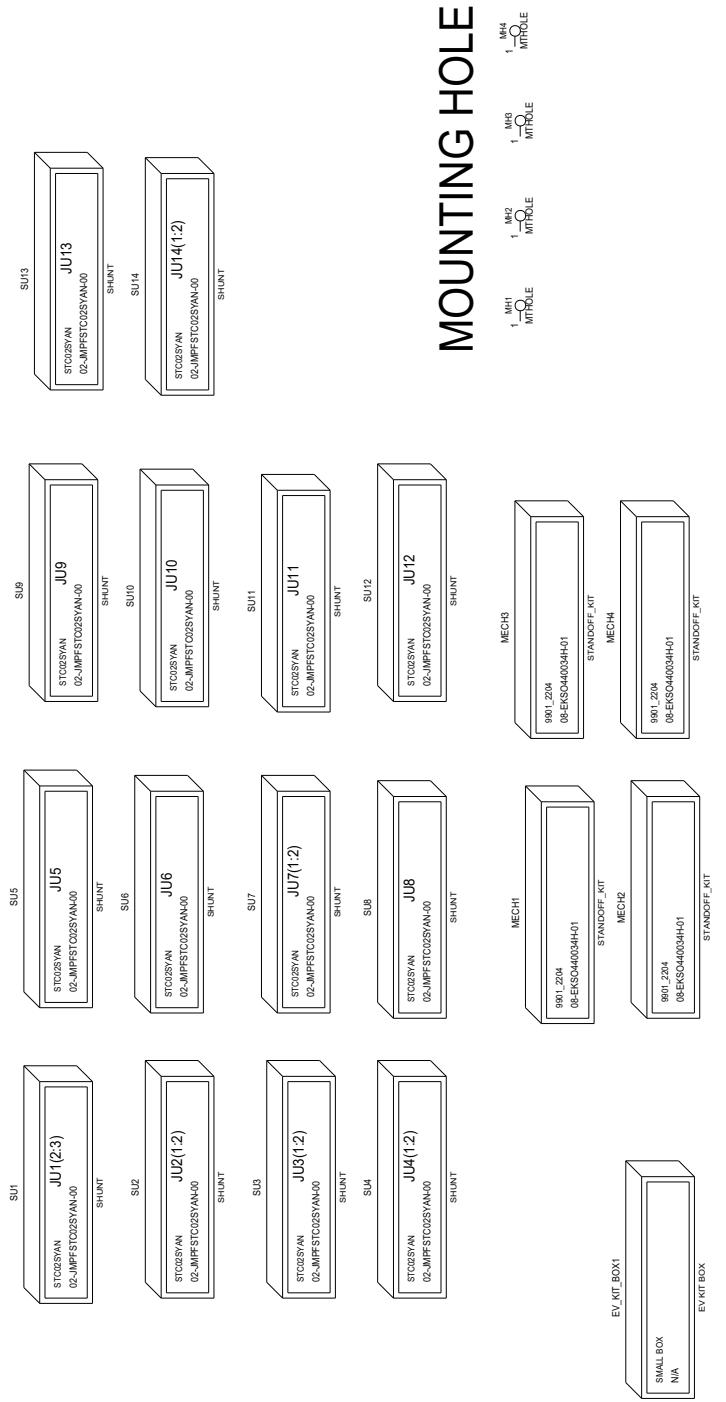
| PART REFERENCE                 | QTY | DESCRIPTION   | MANUFACTURER PART NUMBER                         |
|--------------------------------|-----|---|--|
| C1, C5                         | 2   | 1µF 10%, 100V X7R ceramic capacitors (1206)   | Murata GRM31CR72A105KA01L; TDK C3216X7R2A105K160 |
| C2, C4                         | 2   | 10µF 20%, 63V aluminium electrolytic (5mm)  | Panasonic ECA-1JHG100                            |
| C3                             | 1   | 1µF 10%, 6.3V X7R ceramic capacitors (0603)   | Murata GRM188R60J105KA01                         |
| D1                             | 1   | Power Schottky Diode, 50V, 1A (SMA)   | ON Semiconductor MURA105T3G                      |
| D2                             | 1   | TVS Diode, 1500W (SMC)  | Generic Part SMCJ36CA                            |
| JU1, JU2, JU5, JU6, JU14       | 5   | 3-Pin Single-Row Header, 0.1in centers, cut to fit  | Sullins Connector PEC03SAAN                      |
| JU3, JU4, JU7-JU10, JU12, JU13 | 8   | 2-Pin Single-Row Header, 0.1in centers, cut to fit  | Sullins Connector PEC02SAAN                      |
| LED1                           | 1   | Green LED (1206)  | Lumex Optocomponents SML-LX1206GW-TR             |
| LED2                           | 1   | Yellow LED (1206)   | Lite-On Electronics LTST-C150KSKT                |
| Q1                             | 1   | N-CH MOSFET 100V 40A  | Infineon BSZ150N10LS3 G                          |
| R1, R15                        | 2   | 220k ohm 1% resistors (0603)  | -  |
| R6, R7, R16                    | 3   | 1M ohm Trimmer Potentiometers   | Bourns Inc. PV36W105C01B00                       |
| R8                             | 1   | 62k ohm 1% resistor (0603)  | -  |
| R9                             | 1   | 13k ohm 1% resistors (0603)   | -  |
| R10                            | 1   | 6.2k ohm 1% resistors (0603)  | -  |
| R11                            | 1   | 100k ohm Trimmer Potentiometers   | Bourns Inc. 3296W-1-104LF                        |
| R12, R13                       | 2   | 10k ohm 1% resistors (0603)   | -  |
| R14                            | 1   | 100k ohm 1% resistors (0603)  | -  |
| R17, R18                       | 2   | 2.7k ohm 1% resistors (0805)  | -  |
| R19, R20                       | 2   | 0 ohm 5% resistors (0805)   | -  |
| TP1, TP5, TP17                 | 3   | Red Banana Connector  | Keystone Electronics Corp 7006                   |
| TP2, TP6, TP12, TP18           | 4   | Red Test Point  | Keystone Electronics Corp 5000                   |
| TP3, TP7                       | 2   | Black Banana Connector  | Keystone Electronics Corp 7007                   |
| TP4, TP8, TP22-TP27            | 8   | Black Test Point  | Keystone Electronics Corp 5001                   |
| TP9-TP11, TP14, TP16, TP20     | 6   | Yellow Test Point   | Keystone Electronics Corp 5004                   |
| TP15                           | 1   | White Test Point  | Keystone Electronics Corp 5002                   |
| TP21                           | 1   | Orange Test Point   | Keystone Electronics Corp 5003                   |
| U1                             | 1   | 5.5V to 60V, 6A Current-Limiter with OV, UV, Reverse Protection, and Power Limit (20-Pin TQFN-EP 5mm x 5mm) | MAX17526AATP+                                    |
| C6                             | 0   | 10µF 20%, 63V aluminium electrolytic (5mm)  | Panasonic ECA-1JHG100                            |
| JU11                           | 0   | 2-Pin Single-Row Header, 0.1in centers, cut to fit  | Sullins Connector PEC02SAAN                      |
| R2-R5, R21, R22                | 0   | 0603 Resistors (Open)   | -  |
| PCB                            | 1   | PCB: MAX17626A Evaluation Kit   | -  |

MAX17526A Evaluation Kit

Evaluates: MAX17526A/B/C – 5.5V to 60V, 6A  
Current Limiter with OV, UV, Reverse  
Protection, and Power Limit

## MAX17526A EV System Schematic

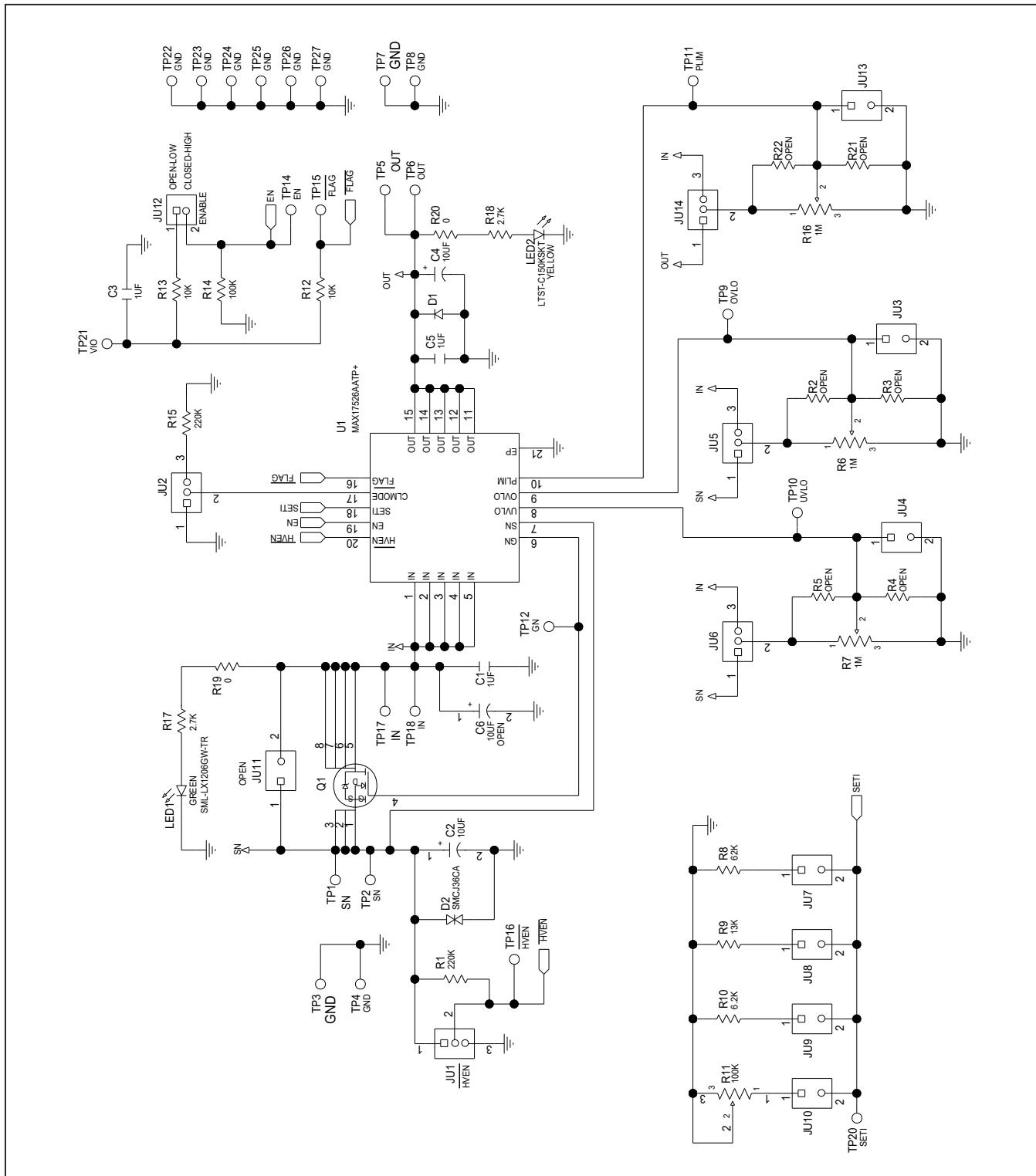
# MECHANICAL



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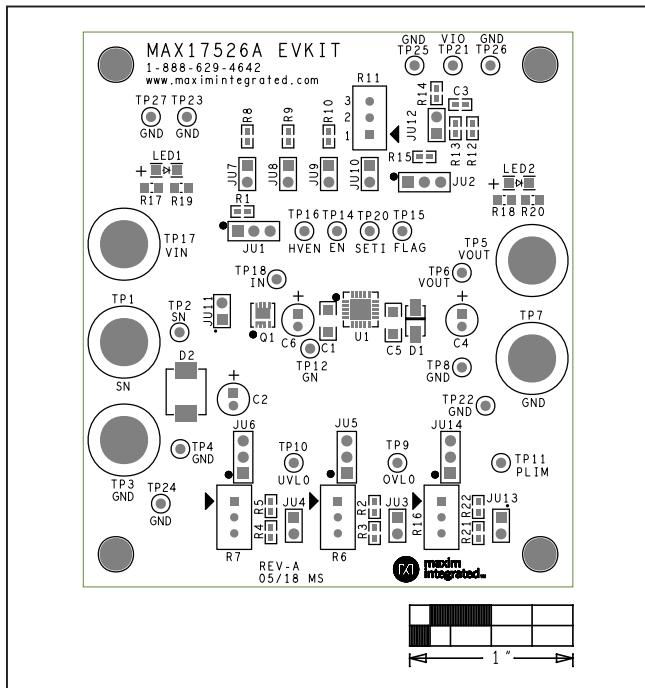
## MAX17526A EV System Schematic (continued)



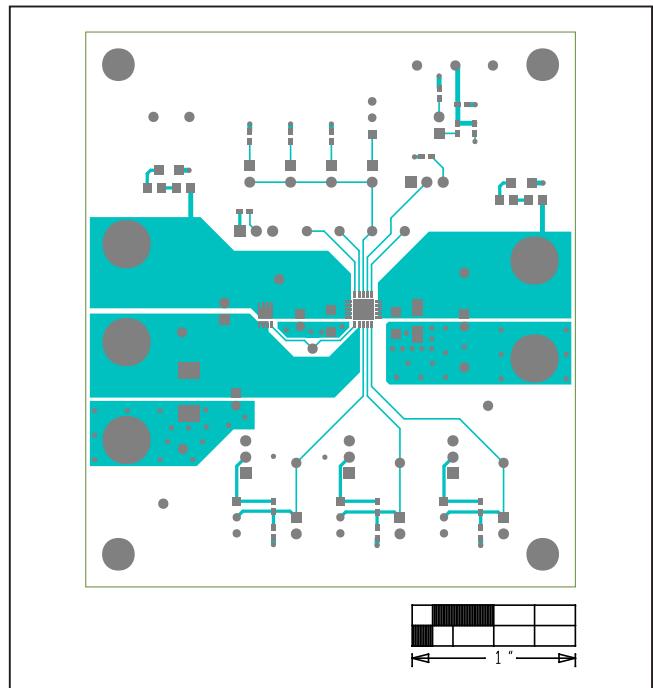
## MAX17526A Evaluation Kit

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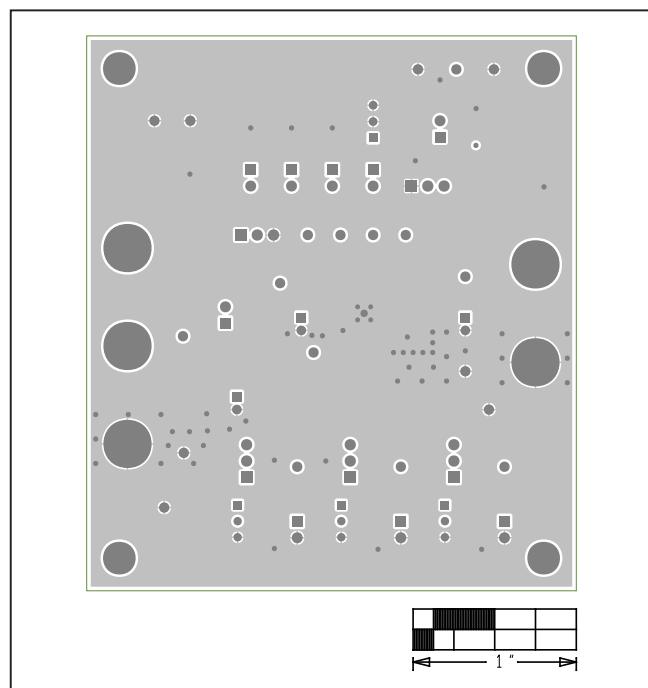
## MAX17526A EV System PCB Layouts



## Silk Top



Top

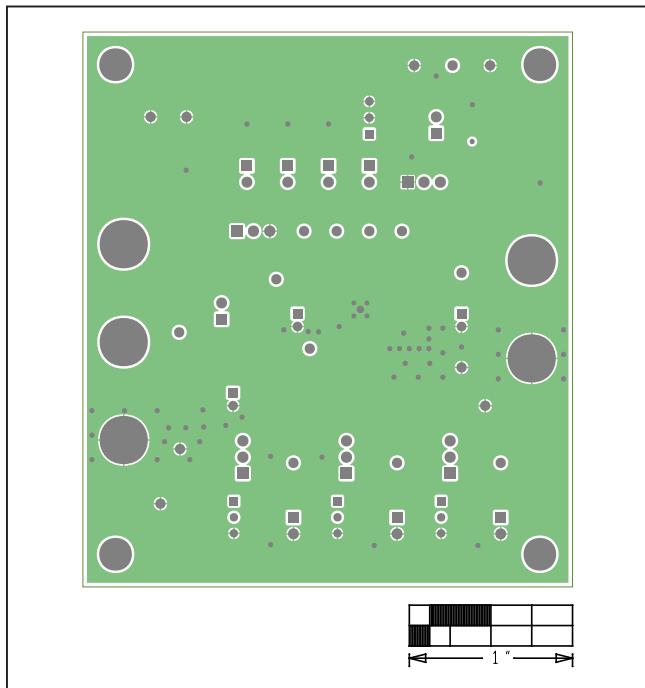


INTERNAL2

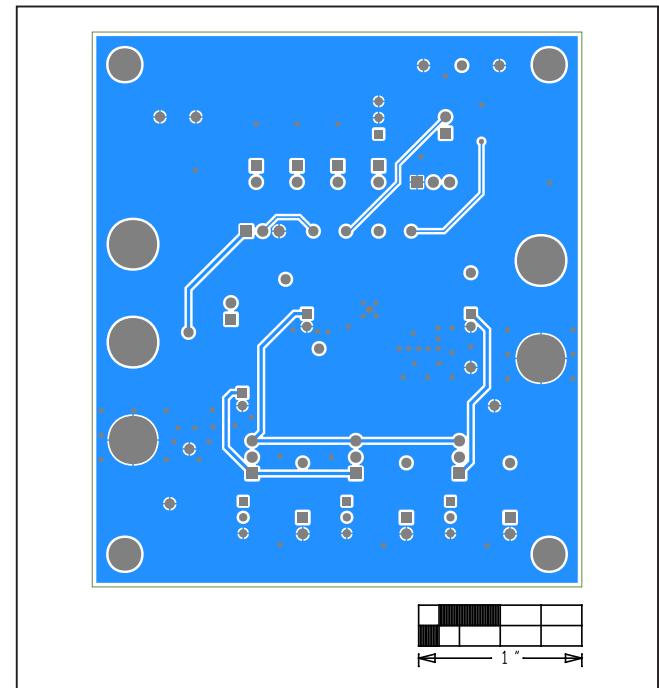
## MAX17526A Evaluation Kit

Evaluates: MAX17526A/B/C – 5.5V to 60V, 6A  
Current Limiter with OV, UV, Reverse  
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### MAX17526A EV System PCB Layouts (continued)



INTERNAL3



Bottom

## MAX17526A Evaluation Kit

Evaluates: MAX17526A/B/C – 5.5V to 60V, 6A  
Current Limiter with OV, UV, Reverse  
Protection, and Power Limit

### Revision History

| REVISION NUMBER | REVISION DATE | DESCRIPTION                    | PAGES CHANGED |
|-----------------|---------------|--------------------------------|---------------|
| 0               | 6/18          | Initial release                | —             |
| 1               | 10/24         | Added MAX17526B and C to title | 1–12          |

