

## 4-Layer EN55022 Class B Radiated Emissions Compliant Evaluation Board for the **ADM2582E/ADM2587E** 2.5 kV rms Signal and Power Isolated RS-485/RS-422 Transceivers with $\pm 15$ kV ESD Protection

### FEATURES

- 2.5 kV rms power and signal isolated RS-485/RS-422 transceiver
- Printed circuit board (PCB) layout optimized for EN55022 radiated emissions according to the [AN-1349 Application Note](#)
- ADM2582E** passes EN55022 Class B (certification available)
- ADM2587E** passes EN55022 Class B (certification available)
- 4-layer PCB layout that minimizes PCB material cost
- Convenient connections for power and signal through screw terminal blocks
- Configurable as half duplex or full duplex
- 5 V or 3.3 V operation
- Easily configurable through jumper connections
- Test points for measuring all signals

### EVALUATION KIT CONTENTS

- EVAL-ADM2582EEBZ** or **EVAL-ADM2587EEBZ** evaluation board

### DOCUMENTS NEEDED

- [AN-1349 Application Note](#)
- [ADM2582E/ADM2587E](#) data sheet

### GENERAL DESCRIPTION

The [ADM2582E/ADM2587E](#) evaluation board can easily evaluate the [ADM2582E](#) and [ADM2587E](#) power and signal isolated RS-485/RS-422 transceivers. Screw terminal blocks provide convenient connections for the power and signal connections. The evaluation board is easily configured through jumper connections. The board can be used in half-duplex or full-duplex configurations and has a 120  $\Omega$  termination resistor fitted on the receiver input. The evaluation board can be used with either the [ADM2582E](#) 16 Mbps device or the [ADM2587E](#) 500 kbps device. The driver and receiver are enabled and disabled by jumper connections. Test points are included on the power and signal lines on both sides of the isolation barrier.

### EN55022 RADIATED EMISSIONS

The [ADM2582E/ADM2587E](#) evaluation board is designed to reduce emissions generated by the high frequency switching elements used by the *isoPower*<sup>®</sup> technology to transfer power through the [ADM2582E/ADM2587E](#) integrated transformer. The layout of the evaluation board is generated using the guidelines provided in the [AN-1349 Application Note, PCB Implementation Guidelines to Minimize Radiated Emissions on the ADM2582E/ADM2587E RS-485/RS-422 Transceivers](#). The [ADM2587E](#) and [ADM2582E](#) evaluation boards are tested and certified to pass EN55022 Class B.

### EVALUATION BOARD PHOTOGRAPH

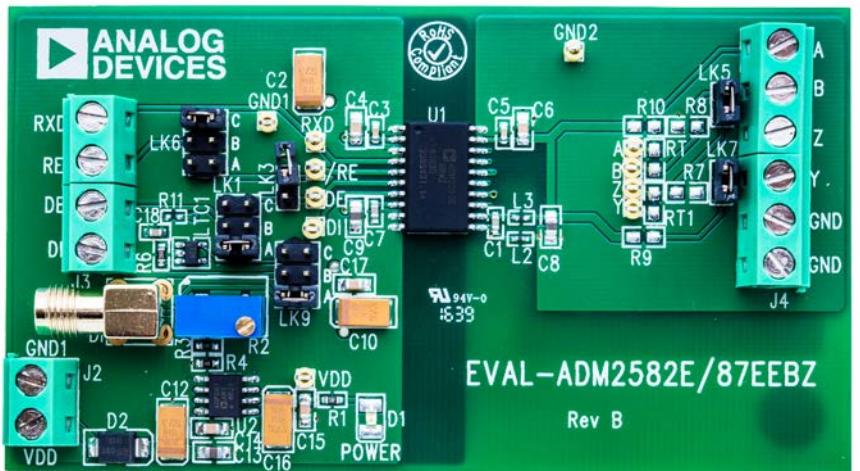


Figure 1.

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## REVISION HISTORY

### 5/2017—Rev. C to Rev. D

|  |            |
|--|------------|
| Changed EN55022 Class A (dB $\mu$ V/M) to EN55022 Class B (dB $\mu$ V/M) ..... | Throughout |
|--|------------|

### 2/2017—Rev. B to Rev. C

|  |           |
|--|-----------|
| Updated Layout .....   | Universal |
| Changes to User Guide Title, Features Section, General Description Section, and Figure 1 .....                       | 1         |
| Added Documents Needed Section and EN55022 Radiated Emissions Section .....  | 1         |
| Deleted Radiated Emissions Section and IEC 61000-4-5 Surge Test Section .....  | 1         |
| Deleted IEC 61000-4-5 Surge Test Circuits and Results Section, Figure 2, and Table 1; Renumbered Sequentially .....  | 3         |
| Added Evaluation Board Hardware Section .....  | 3         |
| Changed Evaluation Board Hardware Configuration Section to Evaluation Board Hardware Section .....                   | 3         |
| Added Test Setup Section and Figure 2; Renumbered Sequentially .....   | 3         |
| Changes to Jumper Settings Section and Table 1 .....   | 3         |
| Changes to Decoupling and Reservoir Capacitors Section and Board Internal Layer Thickness Section .....              | 4         |
| Added Overlapping Stitching Capacitor Section and PCB Layout Recommendation Section .....                            | 4         |
| Deleted Table 3 .....  | 5         |
| Added Figure 3, EN55022 Radiated Emissions Test Results Section, Table 2, and Table 3; Renumbered Sequentially ..... | 5         |
| Added Figure 4, Table 4, Figure 5, Table 5 .....   | 6         |
| Added Figure 6, Table 6, Figure 7, Table 7 .....   | 7         |
| Deleted Assembly Drawings and Board Layout Section and Figure 4 to Figure 6 .....                                    | 7         |
| Changed Evaluation Board Schematics Section to Evaluation Board Schematics and Artwork Section .....                 | 8         |
| Changes to Figure 8 .....  | 8         |

|   |    |
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| Added Figure 9 to Figure 11 .....    | 9  |
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### 5/2012—Rev. A to Rev. B

|   |    |
|---|----|
| Changes to User Guide Title, Features Section, and IEC 61000-4-5 Surge Test Section ..... | 1  |
| Changes to Table 1 .....  | 3  |
| Changes to Jumper Settings Section and Table 2 .....                                      | 4  |
| Changes to Decoupling and Reservoir Capacitors Section .....                              | 5  |
| Moved Evaluation Board Schematics Section .....   | 6  |
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### 10/2011—Rev. 0 to Rev. A

|   |    |
|---|----|
| Changes to User Guide Title, Features Section, and Figure 1 .....   | 1  |
| Added Evaluation Kit Contents Section and IEC61000-4-5 Surge Test Section .....                                 | 1  |
| Added IEC61000-4-5 Surge Test Circuit and Results Section, Figure 2, and Table 1; Renumbered Sequentially ..... | 3  |
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| Added Termination and Pull-Up/Pull-Down Resistors Section .....   | 9  |
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### 11/2009—Revision 0: Initial Version

## EVALUATION BOARD HARDWARE

### TEST SETUP

The EVAL-ADM2582E/EVAL-ADM2587E evaluation board is shown in Figure 2 with the default jumper settings on the LK1 through LK9 jumper blocks. In the default jumper connections, both the ADM2582E/ADM2587E driver and receiver are enabled. Figure 2 also shows the power connection on the J2 terminal block, input signal connection on the DI jack, and probes attached to the RXD, DI, Y, and Z test points for a loopback test (LK5 and LK7 are closed to connect the A pin to Y pin and B pin to Z pin, respectively).

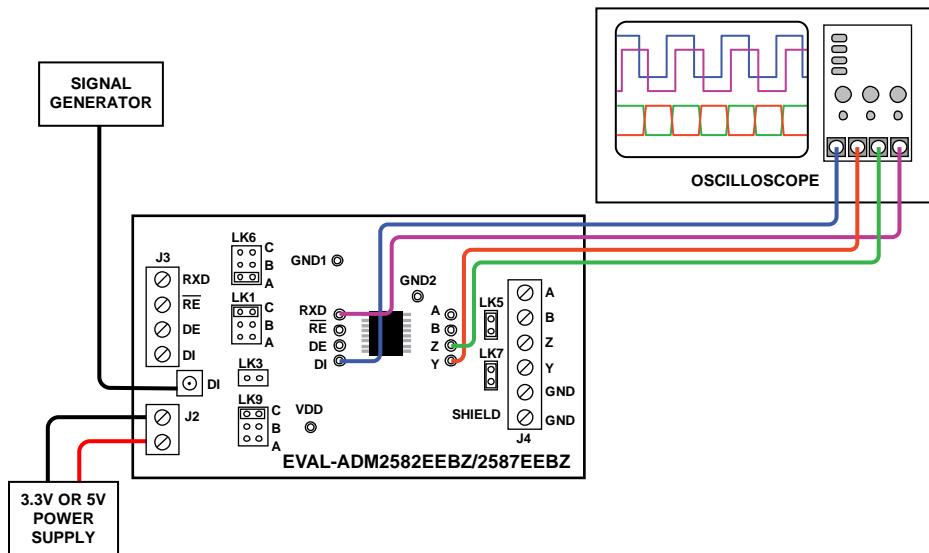


Figure 2. Basic Operation of the EN55022 Class B Compliant Evaluation Board for the ADM2582E/ADM2587E Isolated RS-485/RS-422 Transceivers

Table 1. Jumper Configurations

| Link | Connection | Description  |
|------|------------|--|
| LK1  | A          | Connects the driver enable input (DE) of the ADM2582E/ADM2587E to the $V_{CC}$ pin. This setting enables the driver.   |
|      | B          | Connects the driver enable input (DE) of the ADM2582E/ADM2587E to the DE J3 terminal block connector.  |
|      | C          | Connects the driver enable input (DE) of the ADM2582E/ADM2587E to the $GND_1$ pin. This setting disables the driver.   |
| LK6  | A          | Connects the receiver enable input ( $\bar{RE}$ ) of the ADM2582E/ADM2587E to the $V_{CC}$ pin. This setting disables the receiver.  |
|      | B          | Connects the receiver enable input ( $\bar{RE}$ ) of the ADM2582E/ADM2587E to the $\bar{RE}$ J3 terminal block connector.  |
|      | C          | Connects the receiver enable input ( $\bar{RE}$ ) of the ADM2582E/ADM2587E to the $GND_1$ pin. This setting enables the receiver.  |
| LK3  | Closed     | Connects the receiver enable input ( $\bar{RE}$ ) of the ADM2582E/ADM2587E to the driver enable input (DE). This setting ensures that when the driver is enabled, the receiver is disabled, or when the driver is disabled, the receiver is enabled. |
| LK9  | A          | Connects the TxD pin of the ADM2582E/ADM2587E to the DI connector.   |
|      | B          | Connects the TxD pin of the ADM2582E/ADM2587E to the DI J3 terminal block connector.   |
|      | C          | Connects the TxD pin of the ADM2582E/ADM2587E to the on-board oscillator circuit.  |
| LK5  | Closed     | Connects the ADM2582E/ADM2587E Receiver Input B to Driver Output Z. When LK5 and LK7 are both connected, the evaluation board is configured for half-duplex operation.   |
|      | Open       | When LK5 and LK7 are both open, the evaluation board is configured for full-duplex operation.  |
| LK7  | Closed     | Connects the ADM2582E/ADM2587E Receiver Input A to Driver Output Y. When LK5 and LK7 are both connected, the evaluation board is configured for half-duplex operation.   |
|      | Open       | When LK5 and LK7 are both open, the evaluation board is configured for full-duplex operation.  |

### JUMPER SETTINGS

The inputs to the ADM2582E/ADM2587E can be configured using the jumpers on the evaluation board (see Table 1). Do not place multiple jumpers on the LK1, LK6, and LK9 jumper blocks because doing so can short the input sources together. For each link, a single jumper block can move from one position to another, as specified in Table 1.

## TERMINATION AND PULL-UP/PULL-DOWN RESISTORS

The evaluation board includes the RT and RT1 footprints for fitting termination resistors between the A and B receiver inputs and the Y and Z driver outputs. By default, the board is not fitted with a  $120\ \Omega$  resistor, RT, between A and B. This resistor must not be fitted if the board is connected to a bus that is already terminated at both ends. For more information about proper termination, see the [AN-960 Application Note, RS-485/RS-422 Circuit Implementation Guide](#).

Although the [ADM2582E/ADM2587E](#) have a built in receiver fail-safe for the bus idle condition, there are footprints on the evaluation board for fitting the R9 and R10 pull-up resistors to the  $V_{ISOOUT}$  supply of the [ADM2582E/ADM2587E](#) on Receiver Input A and Driver Output Y, as well as the R7 and R8 pull-down resistors to  $GND_2$  on Receiver Input B and Driver Output Z. These resistors can be fitted if the user is connecting to other devices that require external biasing resistors on the bus. The exact value required for a 200 mV minimum differential voltage in the bus idle condition depends on the supply voltage (for example,  $960\ \Omega$  for 3.3 V and  $1440\ \Omega$  for 5 V).

For more information about the bus idle fail-safe, see the [AN-960 Application Note, RS-485/RS-422 Circuit Implementation Guide](#).

## DECOUPLING AND RESERVOIR CAPACITORS

The evaluation board uses the following decoupling and reservoir capacitors:

- On the logic side of the board, the C3 and C4 capacitors must be 10 nF and 100 nF ceramic capacitors, respectively, and the C2 capacitor must be a  $10\ \mu F$  tantalum capacitor.
- On the logic side of the board, the C7 capacitor must be a 100 nF ceramic capacitor, and the C9 capacitor must be a  $10\ \mu F$  tantalum capacitor.
- On the logic side of the board, additional capacitors are added for the power regulation circuits. C12, C13, and C16 must be  $10\ \mu F$  tantalum capacitors, and C14 and C15 must be 100 nF ceramic capacitors.
- On the bus side of the board, the C5 and C6 capacitors must be 10 nF and 100 nF, respectively, and the C1 and C8 capacitors must be 100 nF and  $10\ \mu F$ , respectively.

## BOARD INTERNAL LAYER THICKNESS

The [EVAL-ADM2582EEBZ/EVAL-ADM2587EEBZ](#) evaluation board consists of four layers. The spacing between the top and bottom layer is 1.6 mm.

The [EVAL-ADM2582EEBZ](#) and [EVAL-ADM2587EEBZ](#) PCB has a minimum distance of 0.4 mm of insulation along a bonded surface, meeting requirements for isolation standards IEC 61010, third edition, and IEC 60950 as described in the [AN-1109 Application Note, Recommendations for Control of Radiated Emissions with iCoupler® Devices](#).

## OVERLAPPING STITCHING CAPACITOR

The evaluation board implements an embedded stitching capacitor structure. An embedded PCB capacitor is created when two metal planes in a PCB overlap each other and are separated by dielectric material. This embedded stitching capacitor is formed by extending the internal reference planes from the primary and secondary layers across the area, which is used for creepage on the PCB surface. This capacitor provides a return path for high frequency common-mode noise currents across the isolation gap. The overlapping area is 53 mm  $\times$  7 mm and the distance between overlapping layers is 0.4064 mm, therefore, the plate capacitor is around 35 pF. The layout and implementation of embedded stitching capacitors is explained in detail in the [AN-0971 Application Note](#).

## PCB LAYOUT RECOMMENDATIONS

The [EVAL-ADM2582EEBZ/EVAL-ADM2587EEBZ](#) evaluation board is designed to reduce emissions generated by the high frequency switching elements used by the *isoPower* technology to transfer power through the [ADM2582E/ADM2587E](#) integrated transformer. The layout of the evaluation board is generated using the guidelines provided in the [AN-1349 Application Note](#).

The [AN-1349 Application Note](#) provides examples of 4-layer PCBs. The [EVAL-ADM2582EEBZ](#) and [EVAL-ADM2587EEBZ](#) PCB layouts are 4-layer PCBs. To pass EN55022 Class B on a 4-layer PCB, the following layout guidelines are recommended:

- Ensure that there is good decoupling on the PCB (see the Decoupling and Reservoir Capacitors section).
- Place a ferrite bead between the PCB trace connections and the following IC pins:  $V_{ISOOUT}$  (Pin 12) and  $GND_2$  (Pin 11 and Pin 14).
- Do not connect the  $V_{ISOOUT}$  pin to a power plane; connect between  $V_{ISOOUT}$  and  $V_{ISOIN}$  using a PCB trace. Ensure that  $V_{ISOIN}$  (Pin 19) is connected through the L3 ferrite to  $V_{ISOOUT}$  (Pin 12), as shown in Figure 3.
- Place an embedded stitching capacitor between  $GND_1$  and  $GND_2$  using internal layers of the PCB planes (see the Overlapping Stitching Capacitor section).

The following additional notes apply to the PCB layout; refer to the schematic and artwork in Figure 8 to Figure 13.

- Ensure that  $GND_2$  (Pin 14) is connected to  $GND_2$  (Pin 11) on the inside (device side) of the C1 100 nF capacitor.
- Ensure that the C1 capacitor is connected between  $V_{ISOOUT}$  (Pin 12) and  $GND_2$  (Pin 11) on the device side of the L2 and L3 ferrites.
- Ensure that  $GND_2$  (Pin 16) is connected to  $GND_2$  (Pin 11) on the outside (bus side) of the L2 ferrite, as shown in Figure 3.
- Ensure that there is a keep out area for the  $GND_2$  plane in the PCB layout around the L2 and L3 ferrites. The keep out area means there must not be a  $GND_2$  fill on any layer below the L2 and L3 ferrites.

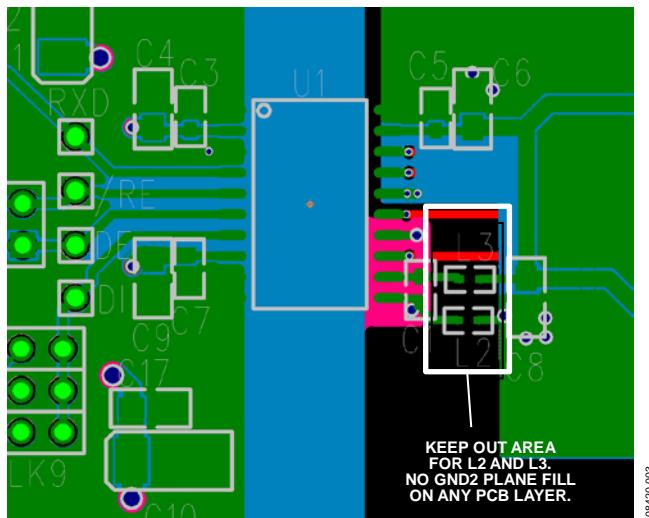


Figure 3. Layout Notes for EVAL-ADM2582EEBZ and EVAL-ADM2587EEBZ

- Locate the power delivery circuit in close proximity to the **ADM2582E/ADM2587E** device, so that the  $V_{CC}$  trace is as short as possible. The **EVAL-ADM2582EEBZ** and **EVAL-ADM2587EEBZ** PCB has a power delivery circuit located at the bottom of the PCB with a short trace from the **ADP667ARZ** regulator output to  $V_{CC}$  (Pin 8). This layout example minimizes the loop area in which high frequency current can flow. An increase in the loop area results in an increase in the emissions levels.

Table 2. PCB Stack Up

| Primary $V_{CC}$ Side   | Secondary $V_{ISO}$ Side                              |
|-------------------------|---|
| Layer 1: Ground 1 plane | Layer 1: Ground 2 plane                               |
| Layer 1: Ground 1 plane | Layer 2: Ground 2 plane                               |
| Layer 3: $V_{CC}$ plane | Layer 3: Ground 2 plane (overlap stitching capacitor) |
| Layer 4: Ground 1 plane | Layer 4: Ground 2 plane                               |

## EN55022 RADIATED EMISSIONS TEST RESULTS

The **EVAL-ADM2587EEBZ** evaluation board is tested and certified to pass EN55022 Class B with a  $>5$  dB  $\mu$ V/m margin. The **EVAL-ADM2582EEBZ** evaluation board is tested and certified to pass EN55022 Class B. EN55022 certification documents for the **EVAL-ADM2582EEBZ** and **EVAL-ADM2587EEBZ** evaluation boards are available to users upon request from Analog Devices, Inc.

Table 3 provides a summary of the capability of the **EVAL-ADM2582EEBZ** and **EVAL-ADM2587EEBZ** evaluation boards. All EN55022 radiated emissions tests are performed with the PCB schematic and layout, as described in Figure 8 to Figure 13.

Table 3. EN55022 Test Results Summary

| Device          | Configuration                               | EN55022 Class B Result              |
|-----------------|---|-------------------------------------|
| <b>ADM2582E</b> | 3.3 V $V_{CC}$ , 16 Mbps, 60 $\Omega$ load  | Pass (with 4.7 dB $\mu$ V/m margin) |
| <b>ADM2582E</b> | 5.0 V $V_{CC}$ , 16 Mbps, 60 $\Omega$ load  | Pass (with 6.5 dB $\mu$ V/m margin) |
| <b>ADM2587E</b> | 3.3 V $V_{CC}$ , 500 kbps, 60 $\Omega$ load | Pass (with 5.5 dB $\mu$ V/m margin) |
| <b>ADM2587E</b> | 5.0 V $V_{CC}$ , 500 kbps, 60 $\Omega$ load | Pass (with 8.5 dB $\mu$ V/m margin) |

The **EVAL-ADM2582EEBZ** and **EVAL-ADM2587EEBZ** evaluation boards are configured and tested with 3.3 V  $V_{CC}$  or 5.0 V  $V_{CC}$  power supplied to the **ADM2582E** and **ADM2587E** devices, with the power supplied from the **ADP667ARZ** regulator output to  $V_{CC}$  (Pin 8). The **ADP667ARZ** regulator input is supplied from a standard 9 V battery. All EN55022 radiated emissions testing is performed with 9 V batteries. Testing is performed at a 500 kbps clock (**ADM2587E**) or 16 Mbps clock (**ADM2582E**), with the clock supplied by the on-board oscillator. The **ADM2582E/ADM2587E** transceiver is connected in full-duplex mode and the bus pins are loaded with a 60  $\Omega$  termination resistor. Measurements are carried out in a semi anechoic chamber at 10 m from 30 MHz to 2 GHz. Figure 4 to Figure 7 show the results of the worst case horizontal scans, and Table 4 to Table 7 show the tabulated quasi-peak (QP) results.

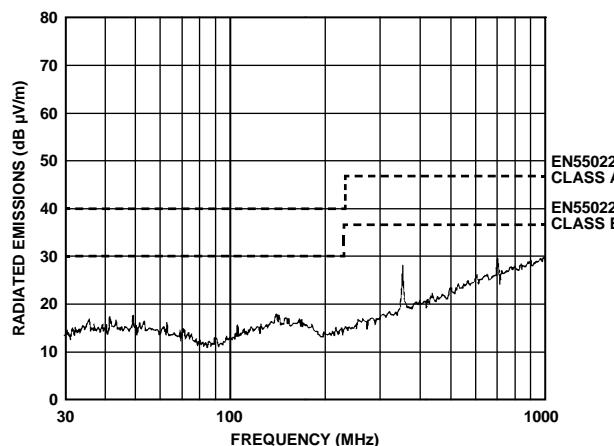


Figure 4. Horizontal Scan from 30 MHz to 1000 MHz (Corresponds to Worst Case for Table 4)

Table 4. ADM2587E 3.3 V V<sub>CC</sub> Test Results

| Frequency (MHz) | QP Level (dB μV/m) | EN55022 Class B (dB μV/m) | Antenna Position | Antenna Height (m) | Pass/Fail |
|-----------------|--------------------|---------------------------|------------------|--------------------|-----------|
| 353.0560        | 31.50              | 37                        | Horizontal       | 2.5                | Pass      |
| 705.1640        | 27.1               | 37                        | Horizontal       | 1.2                | Pass      |

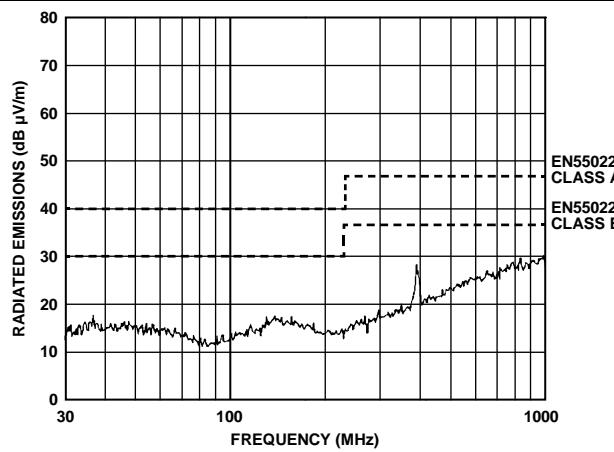


Figure 5. Horizontal Scan from 30 MHz to 1000 MHz (Corresponds to Worst Case for Table 5)

Table 5. ADM2587E 5.0 V V<sub>CC</sub> Test Results

| Frequency (MHz) | QP Level (dB μV/m) | EN55022 Class B (dB μV/m) | Antenna Position | Antenna Height (m) | Pass/Fail |
|-----------------|--------------------|---------------------------|------------------|--------------------|-----------|
| 391.7840        | 28.50              | 37                        | Horizontal       | 2.5                | Pass      |

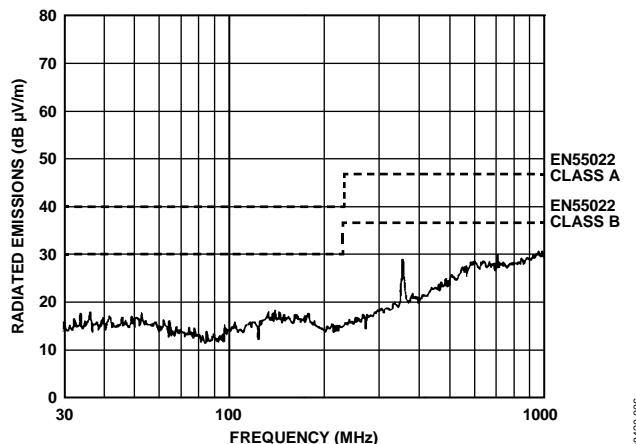


Figure 6. Horizontal Scan from 30 MHz to 1000 MHz (Corresponds to Worst Case for Table 6)

Table 6. ADM2582E 3.3 V V<sub>CC</sub> Test Results<sup>1</sup>

| Frequency (MHz) | QP Level (dB μV/m) | EN55022 Class B (dB μV/m) | Antenna Position | Antenna Height (m) | Pass/Fail |
|-----------------|--------------------|---------------------------|------------------|--------------------|-----------|
| 358.1160        | 17.10              | 37                        | Vertical         | 1                  | Pass      |
| 357.1520        | 32.30              | 37                        | Horizontal       | 2.5                | Pass      |

<sup>1</sup> Not using a high voltage discrete capacitor between GND<sub>1</sub> and GND<sub>2</sub>.

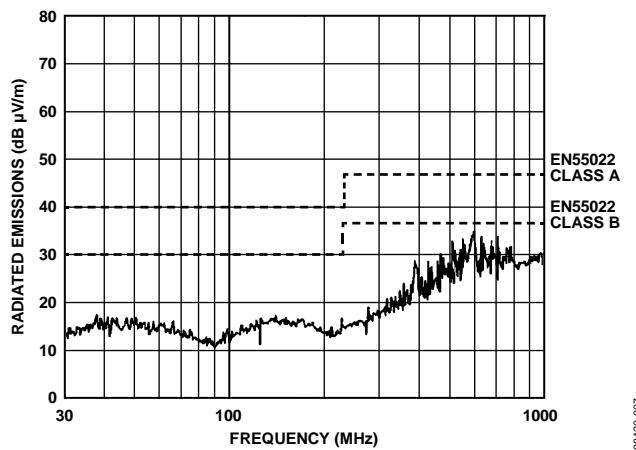
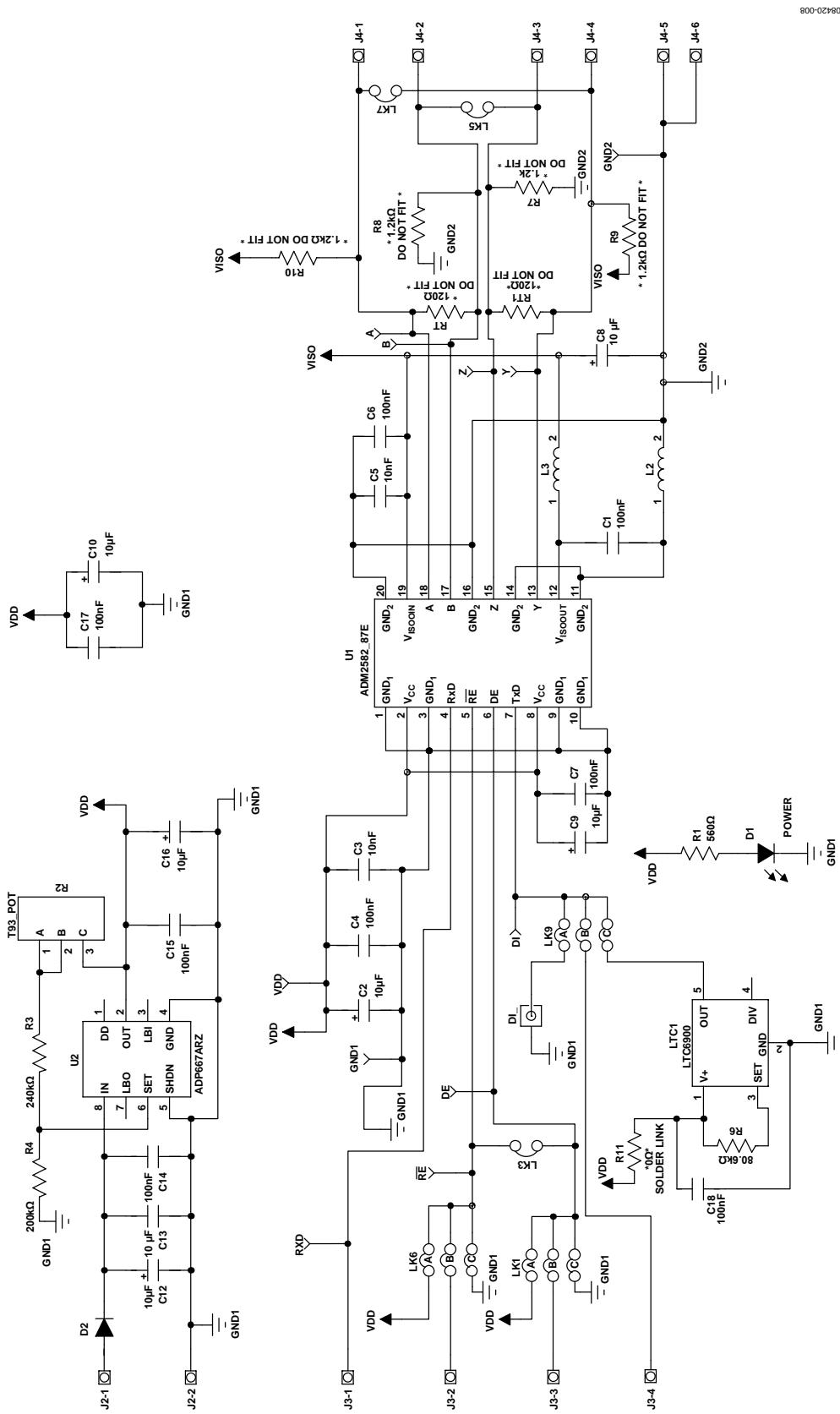


Figure 7. Horizontal Scan from 30 MHz to 1000 MHz (Corresponds to Worst Case for Table 7)

Table 7. ADM2582E 5.0 V V<sub>CC</sub> Test Results

| Frequency (MHz) | QP Level (dB μV/m) | EN55022 Class B (dB μV/m) | Antenna Position | Antenna Height (m) | Pass/Fail |
|-----------------|--------------------|---------------------------|------------------|--------------------|-----------|
| 360.0480        | 15.50              | 37                        | Horizontal       | 1                  | Pass      |
| 392.1560        | 30.50              | 37                        | Horizontal       | 2.5                | Pass      |
| 432.8720        | 22.20              | 37                        | Horizontal       | 2                  | Pass      |
| 473.0560        | 24.70              | 37                        | Horizontal       | 2                  | Pass      |
| 513.2880        | 26.60              | 37                        | Horizontal       | 1.8                | Pass      |
| 553.6760        | 26.30              | 37                        | Horizontal       | 1.5                | Pass      |
| 604.1840        | 29.50              | 37                        | Horizontal       | 1.2                | Pass      |
| 638.8040        | 25.10              | 37                        | Horizontal       | 1.5                | Pass      |
| 719.7120        | 26.10              | 37                        | Horizontal       | 1.5                | Pass      |
| 791.8040        | 30.00              | 37                        | Horizontal       | 1.2                | Pass      |

## EVALUATION BOARD SCHEMATICS AND ARTWORK



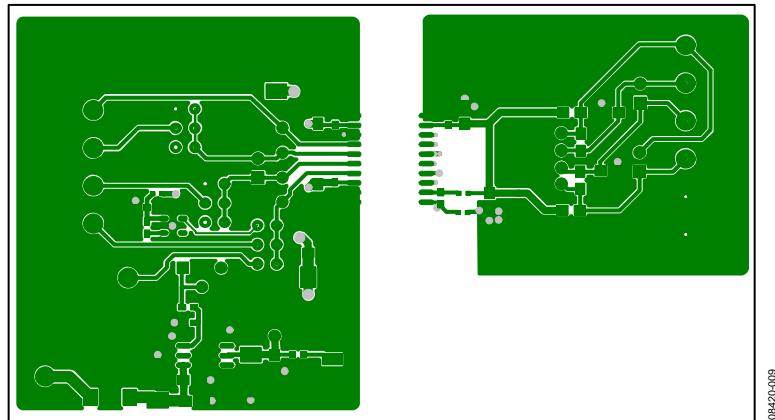
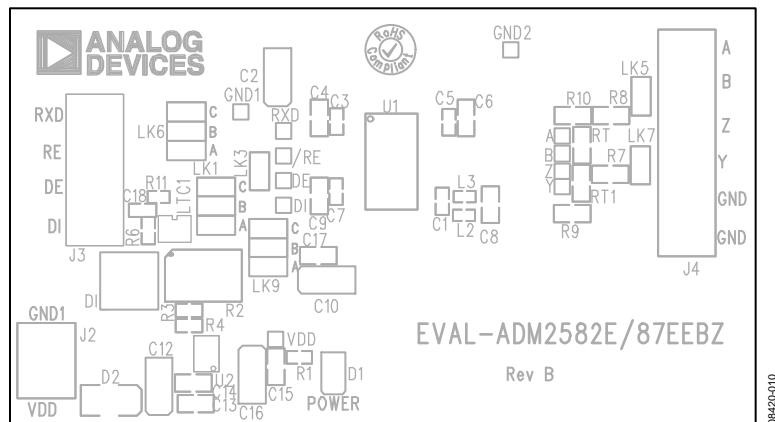
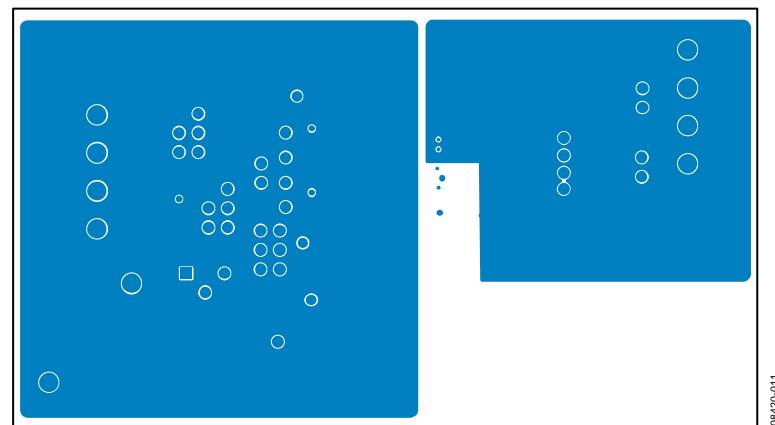


Figure 9. Top Layer



*Figure 10. Silkscreen*



*Figure 11. Second Layer*

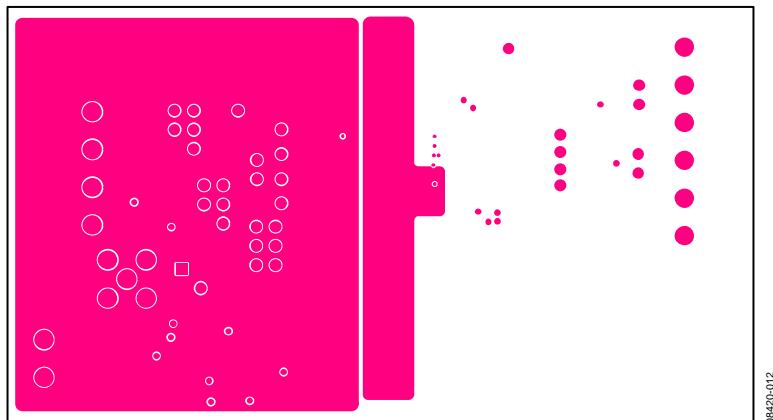


Figure 12. Third Layer

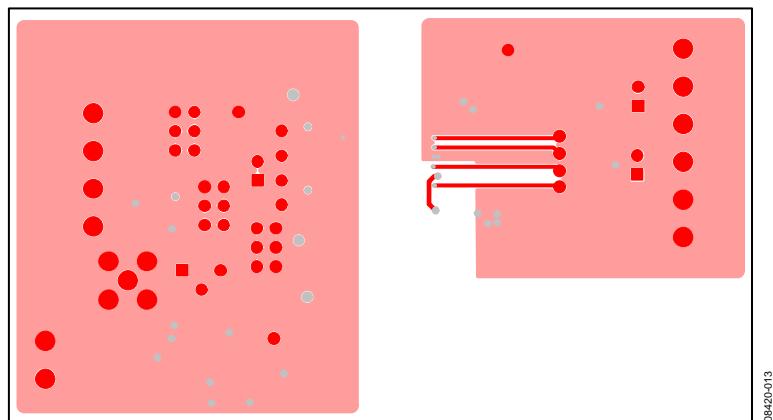


Figure 13. Bottom Layer

## ORDERING INFORMATION

### BILL OF MATERIALS

Table 8. EVAL-ADM2582EEBZ

| Qty | Reference Designator                         | Description                                       | Manufacturer     | Part Number              |
|-----|--|---|------------------|--------------------------|
| 4   | R7, R8, R9, R10                              | Resistors, size 0805 (not inserted)               | Panasonic        | ERA6AEB122V              |
| 1   | R11  | Resistor, 0 Ω, size 0402 (not inserted)           | Multicomp        | MCMR04X000 PTL           |
| 1   | RT   | Resistor, 120 Ω, size 0805 (not inserted)         | Yageo            | RC0805JR-07120RL         |
| 1   | RT1  | Resistor, 120 Ω, size 0805 (not inserted)         | Yageo            | RC0805JR-07120RL         |
| 3   | C8, C9, C13                                  | Capacitors, size 0805, 10 µF                      | AVX              | 08056C106KAT2A           |
| 5   | C4, C6, C14, C15, C17                        | Capacitors, size 0805, 100 nF                     | Multicomp        | MC0805F104Z160CT         |
| 4   | C2, C10, C12, C16                            | Capacitors, tantalum, 10 µF                       | Kemet            | B45196E3106K309          |
| 3   | C1, C7, C18                                  | Capacitors, size 0603, 100 nF                     | Yageo            | CC0603KRX7R7BB104        |
| 2   | C3, C5                                       | Capacitors, size 0603, 10 nF                      | AVX              | 0603YC103KAT2A           |
| 1   | J2   | Power connector, 2-pin terminal block             | Camdenboss       | CTB5000/2                |
| 1   | J3   | Connector, 4-pin terminal block                   | Camdenboss       | CTB5000/4                |
| 1   | J4   | Connector, 6-pin terminal block                   | Camdenboss       | CTB5000/6                |
| 1   | LTC1   | Oscillator  | LTC              | LTC6900CS5#TRMPBF        |
| 1   | R1   | Resistor, 0603, 1%, 560 Ω                         | Multicomp        | CRCW0603560RFKEAHP       |
| 1   | R2   | Trimmer, potentiometer, 500 kΩ, 23 turn           | Vishay           | T93YB504KT20             |
| 1   | R3   | Resistor, 0603, 240 kΩ, 5%                        | Vishay           | CRCW0603240KFKEA         |
| 1   | R4   | Resistor, 0603, 200 kΩ, 5%                        | Bourns           | CR0603-FX-2003ELF        |
| 1   | R6   | Resistor, 0603, 80.6 kΩ, 0.1%                     | Multicomp        | MC0063W060312K49         |
| 3   | LK1, LK6, LK9                                | 6-pin (3 x 2), 2.54 mm header and shorting blocks | Harwin           | M20-9983646 and M7566-05 |
| 3   | LK3, LK5, LK7                                | 2-pin (1 x 2), 2.54 mm header and shorting blocks | Harwin           | M20-9990246              |
| 1   | U1   | 20-lead, wide body SOIC                           | Analog Devices   | ADM2582EBRWZ             |
| 1   | U2   | Adjustable voltage regulator                      | Analog Devices   | ADP667ARZ                |
| 2   | LK2, LK3                                     | Ferrite beads, 0402                               | Taiyo Yuden      | BKH1005LM182-T           |
| 1   | DI   | SMA, right hand jack                              | TE Connectivity  | 5-1814400-1              |
| 1   | D1   | LED, SMD  | Avago            | HSMS-C191                |
| 1   | D2   | Schottky diode, 1 A, SMB                          | ON Semiconductor | MBRS130T3G               |
| 11  | RXD, RE, DE, DI, A, B, Z, Y, VDD, GND1, GND2 | Test points, yellow                               | Vero             | 20-313140                |

Table 9. EVAL-ADM2587EEBZ

| Qty | Reference Designator  | Description                               | Manufacturer    | Part Number        |
|-----|-----------------------|---|-----------------|--------------------|
| 4   | R7, R8, R9, R10       | Resistors, size 0805 (not inserted)       | Panasonic       | ERA6AEB122V        |
| 1   | R11                   | Resistor, 0 Ω, size 0402 (not inserted)   | Multicomp       | MCMR04X000 PTL     |
| 1   | RT                    | Resistor, 120 Ω, size 0805 (not inserted) | Yageo           | RC0805JR-07120RL   |
| 1   | RT1                   | Resistor, 120 Ω, size 0805 (not inserted) | Yageo           | RC0805JR-07120RL   |
| 3   | C8, C9, C13           | Capacitors, size 0805, 10 µF              | AVX             | 08056C106KAT2A     |
| 5   | C4, C6, C14, C15, C17 | Capacitors, size 0805, 100 nF             | Multicomp       | MC0805F104Z160CT   |
| 4   | C2, C10, C12, C16     | Capacitors, tantalum, 10 µF               | Kemet           | B45196E3106K309    |
| 3   | C1, C7, C18           | Capacitors, size 0603, 100 nF             | Yageo           | CC0603KRX7R7BB104  |
| 2   | C3, C5                | Capacitors, size 0603, 10 nF              | AVX             | 0603YC103KAT2A     |
| 1   | J2                    | Power connector, 2-pin terminal block     | Camdenboss      | CTB5000/2          |
| 1   | J3                    | Connector, 4-pin terminal block           | Camdenboss      | CTB5000/4          |
| 1   | J4                    | Connector, 6-pin terminal block           | Camdenboss      | CTB5000/6          |
| 1   | LTC1                  | Oscillator                                | LTC             | LTC6900CS5#TRMPBF  |
| 1   | R1                    | Resistor, 0603, 1%, 560 Ω                 | Multicomp       | CRCW0603560RFKEAHP |
| 1   | R2                    | Trimmer, potentiometer, 500 kΩ, 23 turn   | Vishay          | T93YB504KT20       |
| 1   | R3                    | Resistor, 0603, 240 kΩ, 5%                | Vishay          | CRCW0603240KFKEA   |
| 1   | R4                    | Resistor, 0603, 200 kΩ, 5%                | Bourns          | CR0603-FX-2003ELF  |
| 1   | R6                    | Resistor, 0603, 2.49 kΩ, 0.1%             | TE Connectivity | RP73D1J80K6BTDG    |

| Qty | Reference Designator                                 | Description                                       | Manufacturer     | Part Number                  |
|-----|--|---|------------------|------------------------------|
| 3   | LK1, LK6, LK9  | 6-pin (3 x 2), 2.54 mm header and shorting blocks | Harwin           | M20-9983646 and M7566-05     |
| 3   | LK3, LK5, LK7  | 2-pin (1 x 2), 2.54 mm header and shorting blocks | Harwin           | M20-9990246                  |
| 1   | U1   | 20-lead, wide body SOIC                           | Analog Devices   | <a href="#">ADM2587EBRWZ</a> |
| 1   | U2   | Adjustable voltage regulator                      | Analog Devices   | <a href="#">ADP667ARZ</a>    |
| 2   | LK2, LK3   | Ferrite beads, 0402                               | Taiyo Yuden      | BKH1005LM182-T               |
| 1   | DI   | SMA, right hand jack                              | TE Connectivity  | 5-1814400-1                  |
| 1   | D1   | LED, SMD  | Avago            | HSMS-C191                    |
| 1   | D2   | Schottky diode, 1 A, SMB                          | ON Semiconductor | MBRS130T3G                   |
| 11  | RXD, <u>RE</u> , DE, DI, A, B, Z, Y, VDD, GND1, GND2 | Test points, yellow                               | Vero             | 20-313140                    |

## RELATED LINKS

| Resource                 | Description   |
|--------------------------|---|
| <a href="#">ADM2587E</a> | 500 kbps, 2.5 kV rms signal and power isolated RS-485/RS-422 transceivers with $\pm 15$ kV ESD protection                                 |
| <a href="#">ADM2582E</a> | 16 Mbps, 2.5 kV rms signal and power isolated RS-485/RS-422 transceivers with $\pm 15$ kV ESD protection                                  |
| <a href="#">AN-1349</a>  | Application Note, <i>PCB Implementation Guidelines to Minimize Radiated Emissions on the ADM2582E/ADM2587E RS-485/RS-422 Transceivers</i> |
| <a href="#">AN-960</a>   | Application Note, <i>RS-485/RS-422 Circuit Implementation Guide</i>   |
| <a href="#">AN-1109</a>  | Application Note, <i>Recommendations for Control of Radiated Emissions with iCoupler Devices</i>  |
| <a href="#">AN-0971</a>  | Application Note, <i>Control of Radiated Emissions with isoPower Devices</i>  |

## NOTES



### ESD Caution

**ESD (electrostatic discharge) sensitive device.** Charged devices and circuit boards can discharge without detection. Although this product features patented or proprietary protection circuitry, damage may occur on devices subjected to high energy ESD. Therefore, proper ESD precautions should be taken to avoid performance degradation or loss of functionality.

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