# EVAL-ADM3056EEBZ Evaluation Board User Guide
UG-1437

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## Evaluating the ADM3056E 5.7 kV RMS, Signal Isolated, CAN FD Transceiver

### FEATURES

- ADM3056E 12 Mbps isolated CAN FD transceiver
- On-board LDOs for 6 V to 9 V supply, providing 5 V to the ADM3056E $V_{DD1}$ pin and $V_{DD2}$ pin
- Screw terminal connectors for the following
  - 6 V to 9 V LDO, 5 V power supply to the $V_{DD1}$ pin
  - 1.7 V to 5.5 V direct power supply to $V_{DD1}$ pin
  - 6 V to 9 V LDO, 5 V power supply to the $V_{DD2}$ pin
  - 4.5 V to 5.5V direct power supply to $V_{DD2}$ pin
  - TXD pin, RXD pin, STBY pin, SILENT pin, $AUX_{IN}$ pin, $AUX_{OUT}$ pin, RS pin, CANH pin, and CANL pin signals
  - Divided PCB power and return planes
- SMA connectors for TXD pin and RXD pin signals

### EVALUATION KIT CONTENTS

- EVAL-ADM3056EEBZ evaluation board
- ADM3056EBRIZ
- ADP7104
- LTC6900

### DOCUMENTS NEEDED

- ADM3056E data sheet

### GENERAL DESCRIPTION

The EVAL-ADM3056EEBZ evaluation board allows the user to evaluate the ADM3056E signal isolated transceiver for controller area network (CAN) or CAN with flexible data rate (CAN FD) networks. The EVAL-ADM3056EEBZ allows all of the input and output functions to work without the need for external components.

Based on the Analog Devices, Inc., *i*Coupler® technology, the ADM3056E integrates logic side on-off keying (OOK) signal isolation channels and a 12 Mbps CAN FD transceiver.

The EVAL-ADM3056EEBZ comes populated with the ADM3056E.

Full specifications of the ADM3056E can be found in the ADM3056E data sheet, and must be consulted in conjunction with this user guide when using the EVAL-ADM3056EEBZ.

Refer to the AN-1123 Application Note for more information on CAN protocol implementation.

### EVALUATION BOARD PHOTOGRAPH

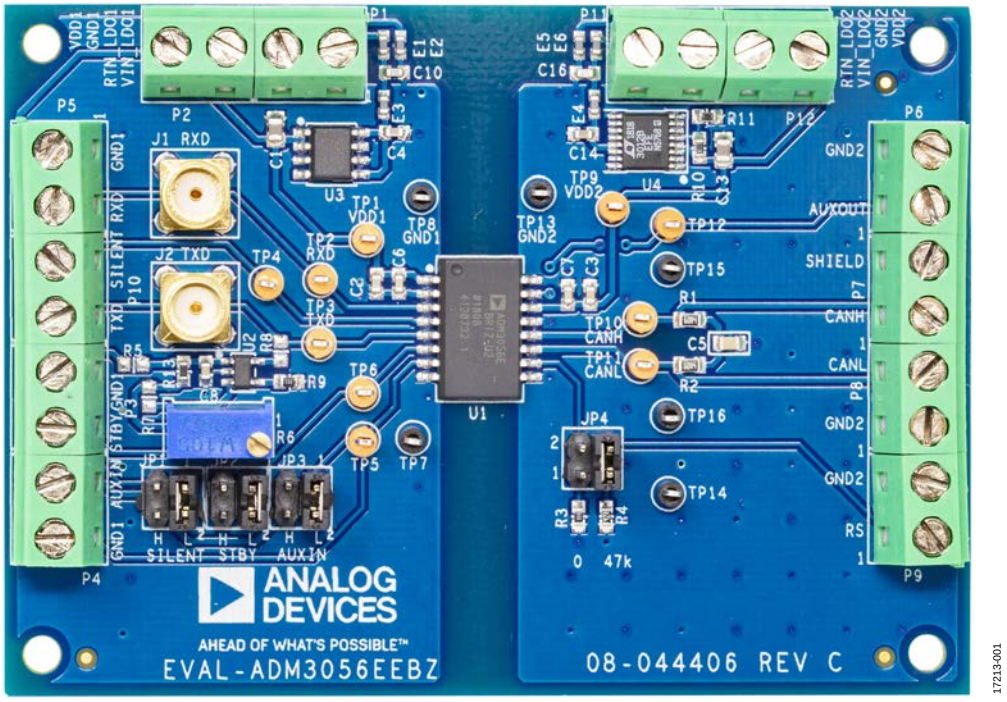


*Figure 1.*

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## REVISION HISTORY

**12/2018—Revision 0: Initial Version**

# EVALUATION BOARD HARDWARE

## USING THE EVALUATION BOARD

Figure 1 shows the EVAL-ADM3056EEBZ. The $V_{DD1}$ and $V_{DD2}$ supply pins of the ADM3056E device must be supplied with input power. The $V_{DD1}$ pin and the $V_{DD2}$ pin can be powered directly or through the fixed output 5 V on-board low dropout (LDO) regulators. The $V_{DD1}$ side LDO input supply requires a power supply voltage of 6 V to 9 V and connects to Pin 1 of Screw Terminal P1 (marked VIN_LDO1 on the schematic) and Pin 2 of Screw Terminal P1 (marked RTN_LDO1 on the schematic). The $V_{DD2}$ side LDO input supply also requires a power supply voltage of 6 V to 9 V but connects to Pin 1 of Screw Terminal P11 (marked VIN_LDO2 on the schematic) and Pin 2 of Screw Terminal P11 (marked RTN_LDO2 on the schematic).

Using the LDO regulator, the complete board can be powered by a 9 V battery (when testing for electromagnetic compatibility (EMC), for example). The ADP7104 LDO regulator and LT3012 LDO regulator both feature reverse current protection and can be left unpowered but connected to the EVAL-ADM3050EEBZ evaluation board when supplying power directly to the ADM3050E $V_{DD1}$ and $V_{DD2}$ pins. Additionally, the LT3012 is protected against reverse voltages to the input power pin. This LT3012 feature can be used in conjunction with the ADM3056E device bus fault tolerance to protect against miswire damage in applications where the supply power and CAN bus pins are manually wired.

## PRINTED CIRCUIT BOARD (PCB) LAYOUT RECOMENDATIONS

Place a 0.1 µF capacitor as close as possible to VDD1 and GND1 and another 0.1 µF capacitor as close as possible to VDD2 and GND2 as shown in the layout example for the EVAL-ADM3056EEBZ (see Figure 2).

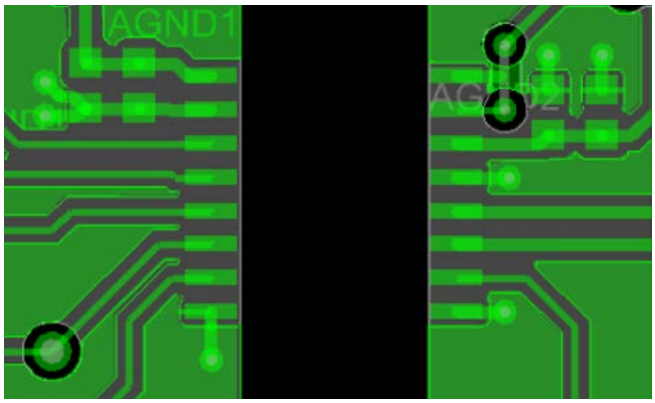


*Figure 2. Layout Example for the EVAL-ADM3056EEBZ*

# EVALUATION BOARD SCHEMATIC AND ARTWORK

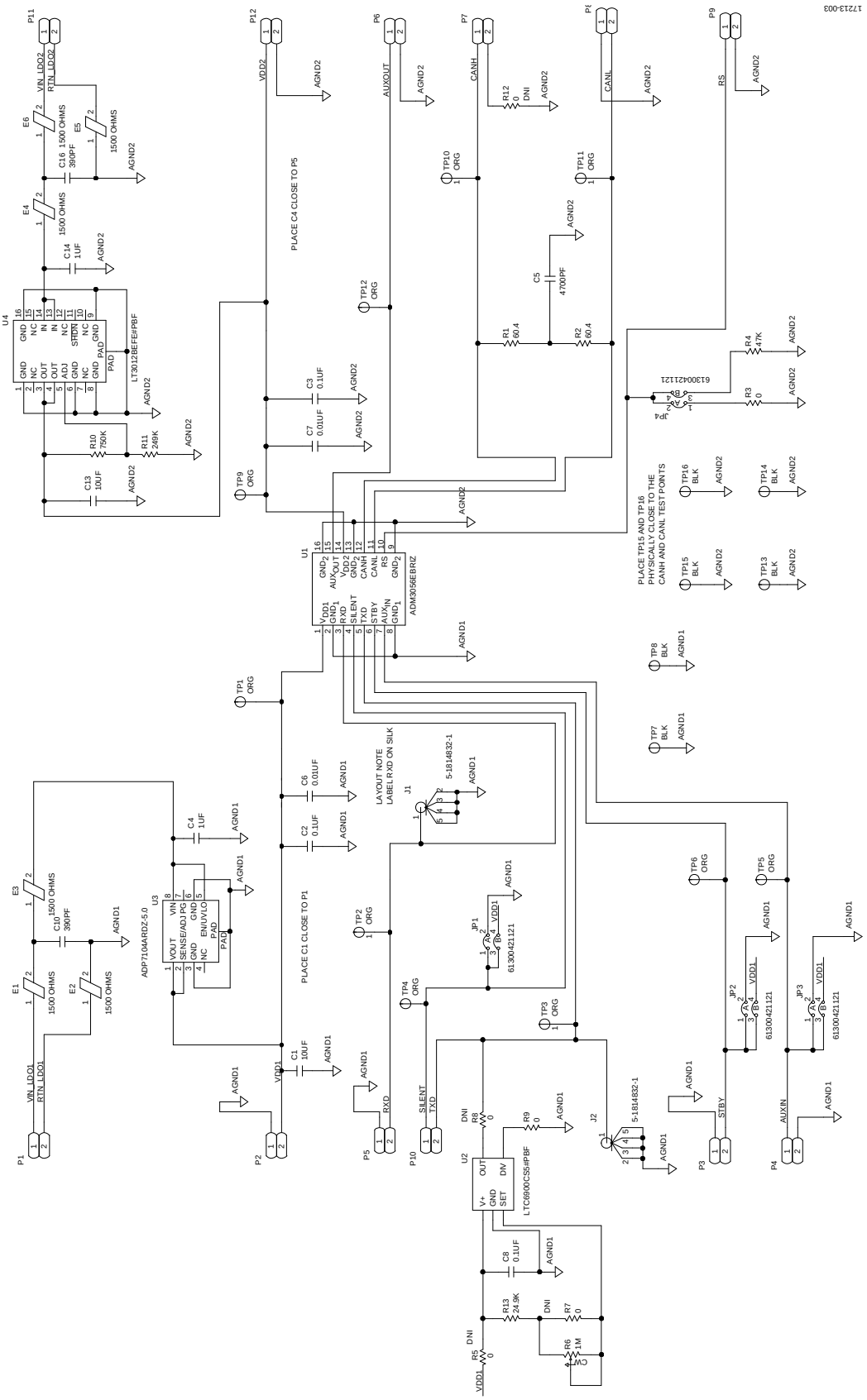

*Figure 3. EVAL-ADM3056EEBZ Schematic*

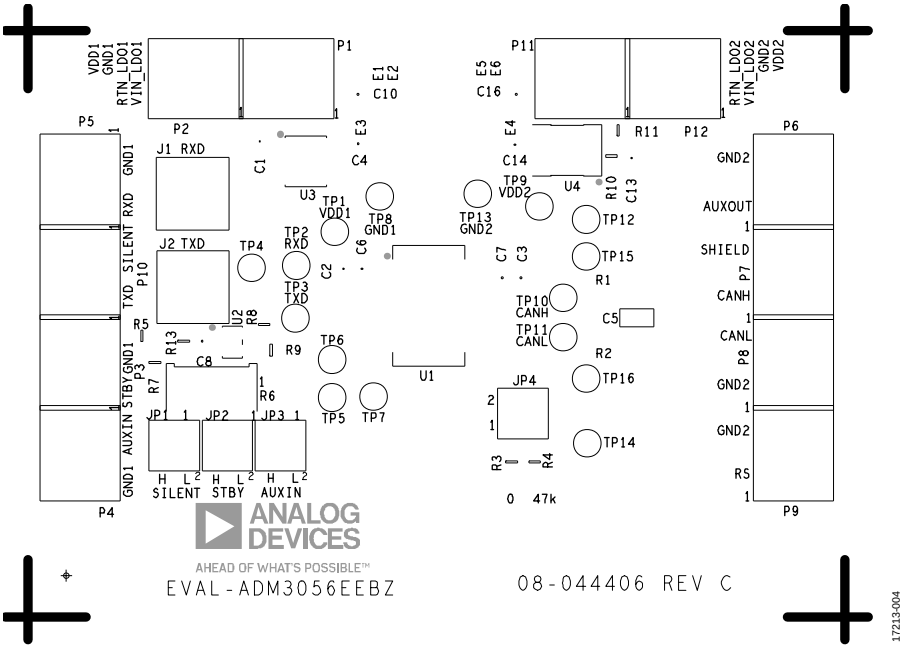


*Figure 4. EVAL-ADM3056EEBZ Primary Silkscreen*

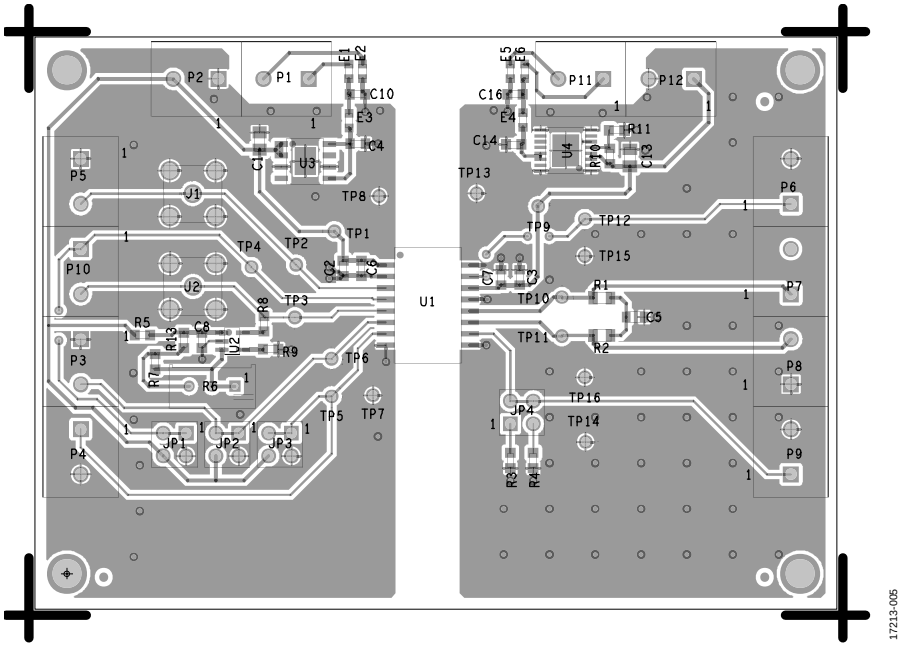


*Figure 5. EVAL-ADM3056EEBZ Top Layer*

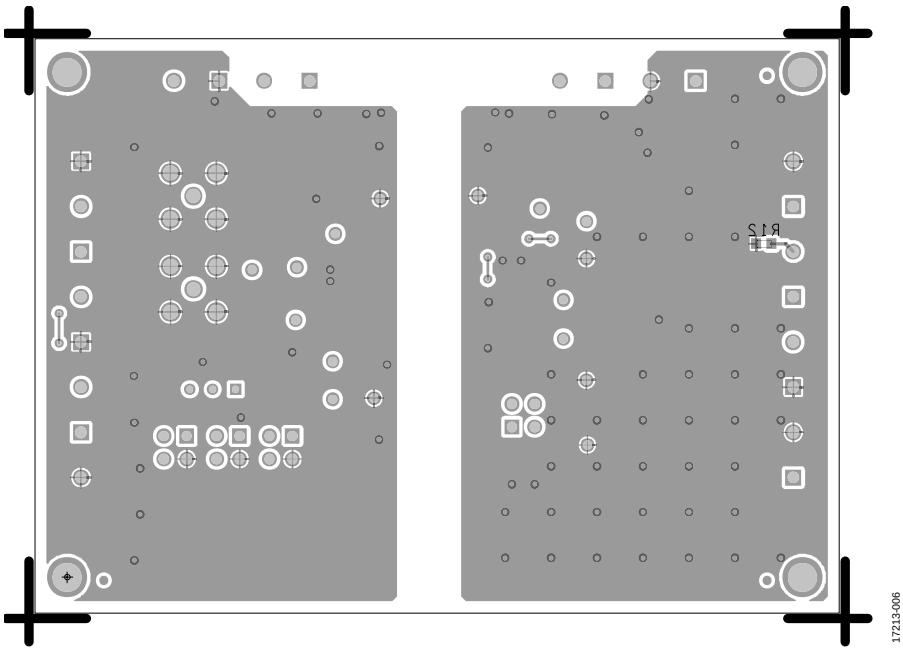


*Figure 6. EVAL-ADM3056EEBZ Bottom Layer*

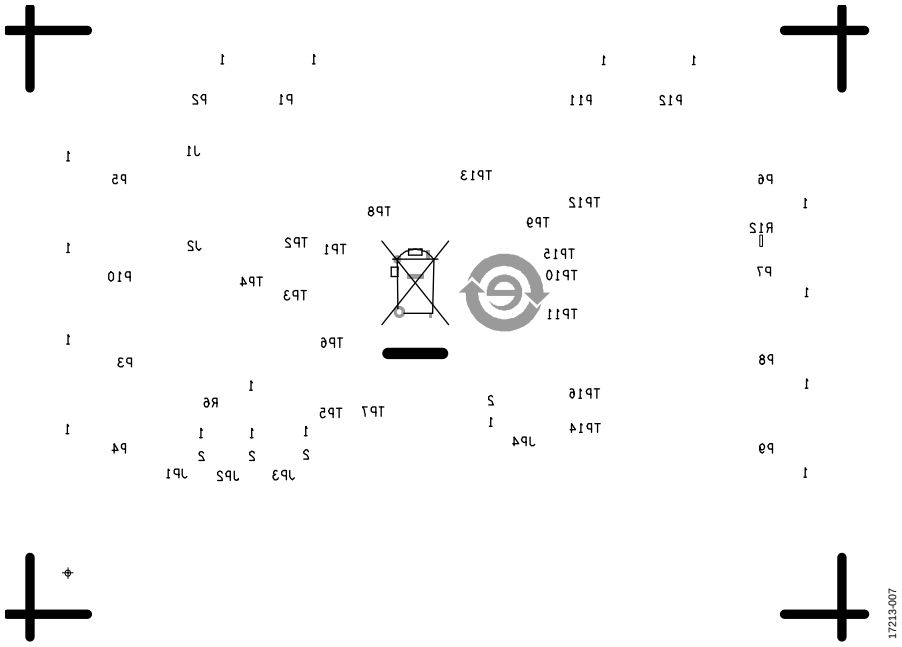


*Figure 7. EVAL-ADM3056EEBZ Bottom Silkscreen*

# ORDERING INFORMATION

## BILL OF MATERIALS

**Table 1.**

| Component | Description | Supplier | Part No. |
|---|---|---|---|
| U1 | 5.7 kV rms, signal isolated, CAN FD transceiver | Analog Devices | ADM3056EBRIZ |
| U2 | Low power, resistor set oscillator, 1 kHz to 20 MHz | Analog Devices | LTC6900CS5#PBF |
| U3 | Low noise, complementary metal-oxide semiconductor (CMOS), LDO, 5.0 V output voltage | Analog Devices | ADP7104ARDZ-5.0-R7 |
| U4 | LDO, micropower linear regulator | Analog Devices | LT3012EFE#PBF |
| C1, C13 | Capacitors, 10 µF, X7R, 0805 | Wurth Elektonik | 885012207026 |
| C10, C16 | Capacitors, 390 pF, X7R, 0603 | AVX | 0603YC391KAT2A |
| C4, C14 | Capacitors, 1 µF, X7R, 0603 | Wurth Elektonik | 885012206076 |
| C2, C3, C8 | Capacitors, 0.1 µF, X7R, 0603 | Wurth Elektonik | 885012206046 |
| C5 | Capacitors, 4700 pF, X7R, 0805 | Wurth Elektonik | 885012207090 |
| C6, C7 | Capacitors, 0.01 µF, X7R, 0603 | Wurth Elektonik | 885012206014 |
| E1, E2, E3, E4, E5, E6 | Ferrite beads, 1500 Ω, 0603 | Murata | BLM18HE152SN1D |
| J1, J2 | Connectors, subminiature, Version A (SMA) | TE Connectivity | 5-1814832-1 |
| JP1, JP2, JP3, JP4 | 4-position headers | Wurth Elektonik | 61300421121 |
| Not Applicable | Mechanical jumper | FCI | 65474-001LF |
| P1, P2, P3, P4, P5, P6, P7, P8, P9, P10, P11, P12 | Connectors, 2-position screw terminal block | Wurth Elektonik | 691 213 710 002 |
| R1, R2 | Resistors, 60.4 Ω, 1/8 W, 0805 | Panasonic | ERJ-6ENF60R4V |
| R10 | Resistor, 750 kΩ, 1/10 W, 0603 | Panasonic | ERJ-3EKF7503V |
| R11 | Resistor, 249 kΩ, 1/10 W, 0603 | Panasonic | ERJ-3EKF2493V |
| R13 | Resistor, 24.9 kΩ, 1/10 W, 0603 | Panasonic | ERJ-3EKF2492V |
| R3, R9 | Resistors, 0 Ω, 1/10 W, 0603 | Panasonic | ERJ-3GEY0R00V |
| R4 | Resistor, 47 kΩ, 1/10 W, 0603 | Panasonic | ERJ-3EKF4702V |
| R6 | Potentiometer, 1 MΩ | Bourns | 3296W-1-105LF |
| TP1, TP2, TP3, TP4, TP5, TP6, TP9, TP10, TP11, TP12 | Orange test points | Keystone | 5003 |
| TP7, TP8, TP13, TP14, TP15, TP16 | Black test points | Keystone | 5001 |
| R5, R7, R8, R12 | Resistors, 0 Ω, 1/10 W, 0603, do not install (DNI) | Panasonic | ERJ-3GEY0R00V |

# 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.



**UG17213-0-12/18(0)**


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