

High-speed CAN Transceiver

UMCAN1057NS8 SOP8

UMCAN1057ES8 SOP8

UMCAN1057VS8 SOP8

UMCAN1057VDA DFN8 3.0×3.0

1 Description

The UMCAN1057 is a high-speed CAN transceiver that provides an interface between a Controller Area Network (CAN) protocol controller and the physical two-wire CAN bus. The transceiver is designed for high-speed CAN applications in the automotive industry, providing differential transmit and receive capability to (a microcontroller with) a CAN protocol controller. The UMCAN1057 offers improved ElectroMagnetic Compatibility (EMC) and ElectroStatic Discharge (ESD) performance, and also features:

- Ideal passive behavior to the CAN bus when the supply voltage is off.
- UMCAN1057VS8 and UMCAN1057VDA can be interfaced directly to microcontrollers with 3.3V or 5V supply voltage.

The UMCAN1057 implements the CAN physical layer as defined in ISO 11898-2:2016 and SAE J2284-1 to SAE J2284-5. This implementation enables reliable communication in the CAN FD fast phase at data rates up to 5 Mbit/s. These features make the UMCAN1057 an excellent choice for all types of HS-CAN networks, in nodes that do not require a standby mode with wake-up capability via the bus.

2 Applications

- Automotive Industry
- Industrial Control
- Wireless Infrastructure

3 Features

- ISO 11898-2:2016 and SAE J2284-1 to SAE J2284-5 compliant
- Timing guaranteed for data rates up to 5 Mbit/s in the CAN FD fast phase
- Suitable for 12V system
- V_{IO} input on UMCAN1057VS8 and UMCAN1057VDA allows for direct interfacing with 3.3V or 5V microcontrollers (available in SOP8 and very small DFN8 packages respectively)
- EN input on UMCAN1057ES8 allows the microcontroller to switch the transceiver to a very low-current Off mode
- Transceiver disengages from the bus when not powered up (zero load)
- High ElectroStatic Discharge (ESD) handling capability on the bus pins
- Transmit Data (TXD) dominant time-out function
- Undervoltage detection on pins V_{CC} and V_{IO}
- Thermally protected

4 Ordering Information

| Part Number | Marking Code | Package Type | Shipping Qty |
|--------------|--------------|--------------|----------------------------|
| UMCAN1057NS8 | 1057NS8 | SOP8 | 3000pcs/13Inch Tape & Reel |
| UMCAN1057ES8 | 1057ES8 | SOP8 | 3000pcs/13Inch Tape & Reel |
| UMCAN1057VS8 | 1057VS8 | SOP8 | 3000pcs/13Inch Tape & Reel |
| UMCAN1057VDA | 1057V | DFN8 3.0×3.0 | 3000pcs/13Inch Tape & Reel |

5 Pin Configuration and Function

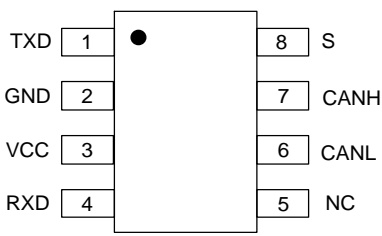
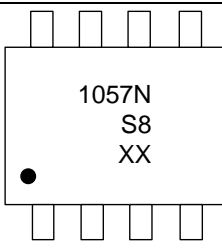
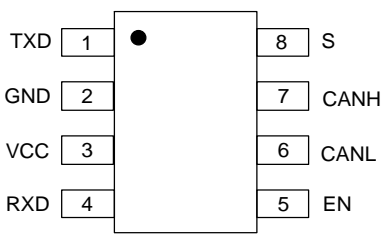
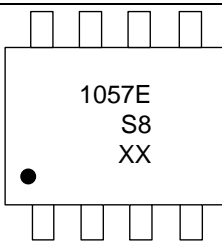
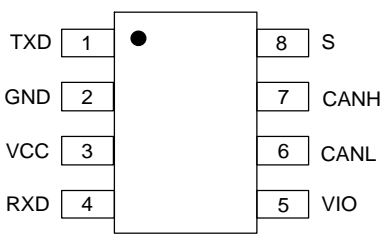
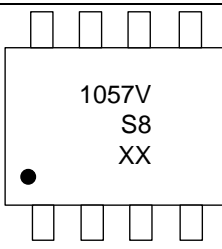
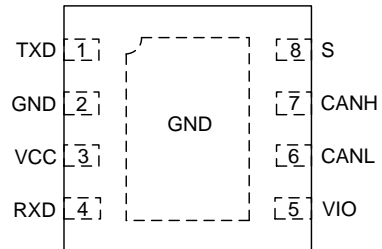
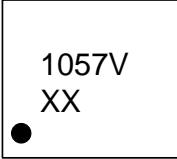
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|  |  <p>XX: Week Code UMCAN1057ES8 SOP8</p> |
|  |  <p>XX: Week Code UMCAN1057VS8 SOP8</p> |
|  |  <p>XX: Week Code UMCAN1057VDA DFN8 3.0×3.0</p> |

Table 5-1. Pin Functions

| Pin Number | Symbol | Description |
|------------|-----------------|--|
| 1 | TXD | Transmit data input |
| 2 | GND | Ground (Note1) |
| 3 | VCC | Supply voltage |
| 4 | RXD | Receive data output; reads out data from the bus lines |
| 5 | NC | Not connected; in UMCAN1057NS8 version |
| | EN | Enable control input; UMCAN1057ES8 only |
| | V _{IO} | Supply voltage for I/O level adapter; UMCAN1057VS8 and UMCAN1057VDA only |
| 6 | CANL | LOW-level CAN bus line |
| 7 | CANH | HIGH-level CAN bus line |
| 8 | S | Silent mode control input |

Note 1: DFN8 package die supply ground is connected to both the GND pin and the exposed center pad. The GND pin must be soldered to board ground. For enhanced thermal and electrical performance, it is recommended that the exposed center pad also be soldered to board ground.

6 Specifications

6.1 Recommended Operating Conditions

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|-----------------|----------------------------------|------------|-----|-----|-----|------|
| V _{CC} | Bus supply voltage | | 4.5 | | 5.5 | V |
| V _{IO} | Supply voltage I/O level shifter | | 2.9 | | 5.5 | V |
| T _A | Operating ambient temperature | | -40 | | 125 | °C |

6.2 Absolute Maximum Ratings (Note 1, 2, 3)

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|------------------|--|------------|------|-----|----------------------|------|
| V _I | Voltage range on CANH, CANL | | -40 | | +40 | V |
| | Voltage range on V _{CC} , V _{IO} | | -0.3 | | 6.5 | V |
| | Voltage range on any other pin | | -0.3 | | V _{IO} +0.3 | V |
| V _{DIF} | Voltage range between CANH and CANL | | -27 | | +27 | V |
| V _{ESD} | Contact discharge, per IEC 61000-4-2 | Bus pins | | ±9 | | kV |
| | Human body model (HBM), per ANSI/ESDA/JEDEC JS-001 | All pins | | ±4 | | kV |
| | | Bus pins | | | ±8 | |
| T _{VJ} | Virtual junction temperature | | -40 | | 150 | °C |
| T _{STG} | Storage temperature | | -55 | | 150 | °C |

Note 1: Operation outside the Absolute Maximum Ratings may cause permanent device damage. Absolute Maximum Ratings do not imply functional operation of the device at these or any other conditions beyond those listed under Recommended Operating Conditions. If used outside the Recommended Operating Conditions but within the Absolute Maximum Ratings, the device may not be fully functional, and this may affect device reliability, functionality, performance, and shorten the device lifetime.

Note 2: All voltage values, except differential I/O bus voltages, are with respect to ground terminal.

Note 3: V_{IO} = V_{CC} in non-VIO product variants.

6.3 Electrical Characteristics (Static) (Note 1)

$T_J = -40^{\circ}\text{C}$ to $+150^{\circ}\text{C}$; $V_{CC} = 4.5\text{V}$ to 5.5V ; $V_{IO} = 2.9\text{V}$ to 5.5V (Note1); $R_L = 60\Omega$; $C_L = 100\text{pF}$ unless otherwise specified; All voltages are defined with respect to ground; positive currents flow into the IC.

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|------|-----|--------------|---------------|
| Supply; pin VCC | | | | | | |
| V_{CC} | Supply voltage | | 4.5 | | 5.5 | V |
| V_{UVD} | Undervoltage detection voltage on pin VCC | | 3.5 | 4 | 4.3 | V |
| I_{CC} | Supply current | Normal mode; TXD = 0 V; short circuit on bus lines; $-3\text{V} < (\text{CANH}=\text{CANL}) < 18\text{V}$ | 2 | 80 | 110 | mA |
| | | Normal mode; TXD = V_{IO} | 2 | 5 | 10 | mA |
| | | Normal mode; TXD = 0 V | 20 | 45 | 70 | mA |
| | | Silent mode; TXD = V_{IO} | 0.1 | | 1.2 | mA |
| I/O level adapter supply; pin VIO | | | | | | |
| V_{IO} | Supply voltage on pin VIO | | 2.9 | | 5.5 | V |
| V_{UVD} | Undervoltage detection voltage on pin VIO | | 2.1 | | 2.8 | V |
| I_{IO} | Supply current on pin VIO | Normal mode; TXD = 0V | | 110 | 320 | μA |
| | | Normal mode; TXD = V_{IO} | | 7 | 30 | μA |
| | | Silent mode | | 3 | 16 | μA |
| Mode control inputs; pins S and EN (Note2) | | | | | | |
| V_{IH} | High-level input voltage | | 2 | | $V_{IO}+0.3$ | V |
| V_{IL} | Low-level input voltage | | -0.3 | | 0.8 | V |
| I_{IH} | High-level input current | $V_{IN} = V_{IO}$ | 1 | | 10 | μA |
| I_{IL} | Low-level input current | $V_{IN} = 0\text{V}$ | -1 | | -1 | μA |

6.3 Electrical Characteristics (Static)---continued (Note 1)

$T_J = -40^{\circ}\text{C}$ to $+150^{\circ}\text{C}$; $V_{CC} = 4.5\text{V}$ to 5.5V ; $V_{IO} = 2.9\text{V}$ to 5.5V (Note1); $R_L = 60\Omega$; $C_L = 100\text{pF}$ unless otherwise specified; All voltages are defined with respect to ground; positive currents flow into the IC.

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|--|---|------|-------------|--------------|---------------|
| CAN transmit data input; pin TXD | | | | | | |
| V_{IH} | High-level input voltage | | 2 | | $V_{IO}+0.3$ | V |
| V_{IL} | Low-level input voltage | | -0.3 | | 0.8 | V |
| I_{IH} | High-level input current | $V_{IN} = V_{IO}$ | -5 | | 5 | μA |
| I_{IL} | Low-level input current | $V_{IN} = 0\text{V}$ | -260 | | -30 | μA |
| C_I | Input capacitance | | | 5 | 10 | pF |
| CAN receive data output; pin RXD | | | | | | |
| I_{OH} | High-level output current | $\text{RXD} = V_{IO} - 0.4\text{V}$ | -9 | -3 | -1 | mA |
| I_{OL} | Low-level output current | $\text{RXD} = 0.4\text{V}$ | 1 | | 12 | mA |
| Driver | | | | | | |
| $V_{O(\text{DOM})}$ | Dominant output voltage | $\text{TXD} = 0\text{V}$; $t < t_{\text{TO}(\text{DOM})\text{TXD}}$; $50\Omega \leq R_L \leq 65\Omega$; pin CANH | 2.75 | 3.5 | 4.5 | V |
| | | $\text{TXD} = 0\text{V}$; $t < t_{\text{TO}(\text{DOM})\text{TXD}}$; $50\Omega \leq R_L \leq 65\Omega$; pin CANL | 0.5 | 1.5 | 2.25 | V |
| $V_{\text{OD}(\text{DOM})}$ | Dominant differential output voltage | $\text{TXD} = 0\text{V}$; $t < t_{\text{TO}(\text{DOM})\text{TXD}}$; $50\Omega \leq R_L \leq 65\Omega$; | 1.5 | | 3 | V |
| | | $\text{TXD} = 0\text{V}$; $t < t_{\text{TO}(\text{DOM})\text{TXD}}$; $45\Omega \leq R_L \leq 70\Omega$; | 1.4 | | 3.3 | V |
| | | $\text{TXD} = 0\text{V}$; $t < t_{\text{TO}(\text{DOM})\text{TXD}}$; $R_L = 2240\Omega$; | 1.5 | | 5 | V |
| $V_{\text{O}(\text{REC})}$ | Recessive output voltage | Normal or silent mode; $\text{TXD} = V_{IO}$; $R_L = \text{open}$ | 2 | $0.5V_{CC}$ | 3 | V |
| $V_{\text{OD}(\text{REC})}$ | Recessive differential output voltage | Normal or silent mode; $\text{TXD} = V_{IO}$; $R_L = \text{open}$ | -50 | | 50 | mV |
| $V_{\text{SYM}(\text{DOM})}$ | Dominant output voltage symmetry, $V_{CC}\text{-CANH-CANL}$ | $\text{TXD} = 0\text{V}$; $t < t_{\text{TO}(\text{DOM})\text{TXD}}$; $R_L = 60\Omega$ | -400 | | 400 | mV |

6.3 Electrical Characteristics (Static)---continued (Note 1)

$T_J = -40^{\circ}\text{C}$ to $+150^{\circ}\text{C}$; $V_{CC} = 4.5\text{V}$ to 5.5V ; $V_{IO} = 2.9\text{V}$ to 5.5V (Note1); $R_L = 60\Omega$; $C_L = 100\text{pF}$ unless otherwise specified; All voltages are defined with respect to ground; positive currents flow into the IC.

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|-----------------------|--|--|-------------|-----|-------------|------------------|
| $V_{\text{SYM(TX)}}$ | Transmitter output voltage symmetry, $(\text{CANH}+\text{CANL})/V_{CC}$ | $\text{TXD} = 250\text{ kHz}, 1\text{ MHz}, 2.5\text{MHz}$; $R_L = 60\ \Omega$; $C_{\text{SPLIT}} = 4.7\text{ nF}$ | $0.9V_{CC}$ | | $1.1V_{CC}$ | V |
| $I_{\text{OS(DOM)}}$ | Dominant short-circuit output current | $\text{TXD} = 0\text{ V}$; $t < t_{\text{TO(DOM)TXD}}$; $V_{CC} = 5\text{ V}$; $\text{CANH} = -15\text{ V}$ to 40 V ; pin CANH | -100 | -70 | | mA |
| | | $\text{TXD} = 0\text{ V}$; $t < t_{\text{TO(DOM)TXD}}$; $V_{CC} = 5\text{ V}$; $\text{CANL} = -15\text{ V}$ to 40 V ; pin CANL | | 70 | 100 | mA |
| $I_{\text{OS(REC)}}$ | Recessive short-circuit output current | Normal mode; $\text{TXD} = V_{IO}$; $-27\text{ V} \leq \text{CANH} = \text{CANL} \leq 32\text{ V}$ | -5 | | 5 | mA |
| Receiver | | | | | | |
| V_{TH} | Differential receiver threshold voltage | Normal or silent mode; $-12\text{ V} \leq \text{CANH}, \text{CANL} \leq 12\text{ V}$ | 0.5 | | 0.9 | V |
| $V_{\text{ID(REC)}}$ | Receiver recessive voltage | Normal or silent mode; $-12\text{ V} \leq \text{CANH}, \text{CANL} \leq 12\text{ V}$ (Note3) | -4 | | 0.5 | V |
| $V_{\text{ID(DOM)}}$ | Receiver recessive voltage | Normal or silent mode; $-12\text{ V} \leq \text{CANH}, \text{CANL} \leq 12\text{ V}$ (Note3) | 0.9 | | 9 | V |
| V_{HYS} | Differential receiver hysteresis voltage | Normal or silent mode; $-12\text{ V} \leq \text{CANH}, \text{CANL} \leq 12\text{ V}$ | 50 | | 300 | mV |
| $I_{\text{LKG(PD)}}$ | Unpowered Leakage current | $V_{CC} = V_{IO} = 0\text{ V}$ or shorted to GND via $47\text{ k}\Omega$; $\text{CANH} = \text{CANL} = 5\text{ V}$ | -5 | | 5 | μA |
| R_{I} | Input resistance | $-2\text{ V} \leq \text{CANH}, \text{CANL} \leq 7\text{ V}$ (Note3) | 9 | 15 | 35 | $\text{k}\Omega$ |
| ΔR_{I} | Input resistance deviation, $[1 - (R_{\text{IN(CANH)}}/R_{\text{IN(CANL)}})] \times 100\%$ | $0\text{ V} \leq \text{CANH}, \text{CANL} \leq 5\text{ V}$ (Note3) | -3 | | 3 | % |
| R_{ID} | Differential input resistance | $-2\text{ V} \leq \text{CANH}, \text{CANL} \leq 7\text{ V}$ (Note3) | 19 | 30 | 70 | $\text{k}\Omega$ |
| C_{IN} | Common-mode input capacitance to ground | Note3 | | | 20 | pF |

6.3 Electrical Characteristics (Static)---continued (Note 1)

$T_J = -40^{\circ}\text{C}$ to $+150^{\circ}\text{C}$; $V_{CC} = 4.5\text{V}$ to 5.5V ; $V_{IO} = 2.9\text{V}$ to 5.5V (Note1); $R_L = 60\Omega$; $C_L = 100\text{pF}$ unless otherwise specified; All voltages are defined with respect to ground; positive currents flow into the IC.

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---------------------------|--------------------------------|------------|-----|-----|-----|--------------------|
| C_{ID} | Differential input capacitance | Note3 | | | 10 | pF |
| Thermal Protection | | | | | | |
| $T_{J(SD)}$ | Shutdown junction temperature | Note3 | | 185 | | $^{\circ}\text{C}$ |

Note 1: $V_{IO} = V_{CC}$ in non-VIO product variants.

Note 2: Only UMCAN1057ES8 has an EN pin.

Note 3: Not tested in production; guaranteed by design.

6.4 Electrical Characteristics (Dynamic) (Note 1)

$T_J = -40^{\circ}\text{C}$ to $+150^{\circ}\text{C}$; $V_{CC} = 4.5\text{V}$ to 5.5V ; $V_{IO} = 2.9\text{V}$ to 5.5V (Note1); $R_L = 60\Omega$; $C_L = 100\text{pF}$ unless otherwise specified; all voltages are defined with respect to ground.

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|--|--------------------------------------|---|-----|-----|-----|------|
| CAN timing characteristics; $t_{\text{BIT(TXD)}} \geq 200 \text{ ns}$; see Figure 7-1, Figure 7-3 and Figure 7-4 | | | | | | |
| $t_{\text{D(TXD-BUSDOM)}}$ | Delay time from TXD to bus dominant | Normal mode; $R_L = 60 \Omega$, $C_L = 100 \text{ pF}$ | | 60 | 90 | ns |
| $t_{\text{D(TXD-BUSREC)}}$ | Delay time from TXD to bus recessive | Normal mode; $R_L = 60 \Omega$, $C_L = 100 \text{ pF}$ | | 75 | 90 | ns |
| $t_{\text{D(BUSDOM-RXD)}}$ | Delay time from bus dominant to RXD | Normal mode; $C_{\text{L(RXD)}} = 15 \text{ pF}$ | | 60 | 100 | ns |
| $t_{\text{D(BUSREC-RXD)}}$ | Delay time from bus recessive to RXD | Normal mode; $C_{\text{L(RXD)}} = 15 \text{ pF}$ | | 90 | 110 | ns |
| $t_{\text{D(TXDL-RXDL)}}$ | Delay time from TXD LOW to RXD LOW | Normal mode; $R_L = 60 \Omega$, $C_L = 100 \text{ pF}$, $C_{\text{L(RXD)}} = 15 \text{ pF}$ | 50 | | 195 | ns |
| $t_{\text{D(TXDH-RXDH)}}$ | Delay time from TXD HIGH to RXD HIGH | Normal mode; $R_L = 60 \Omega$, $C_L = 100 \text{ pF}$, $C_{\text{L(RXD)}} = 15 \text{ pF}$ | 50 | | 195 | ns |
| CAN FD timing characteristics according to ISO 11898-2:2016; see Figure 7-1 and Figure 7-4 | | | | | | |
| $t_{\text{BIT(BUS)}}$ | Transmitted recessive bit width | $t_{\text{BIT(TXD)}} = 500 \text{ ns}$ | 435 | | 530 | ns |
| | | $t_{\text{BIT(TXD)}} = 200 \text{ ns}$ | 155 | | 210 | ns |
| $t_{\text{BIT(RXD)}}$ | Bit time on pin RXD | $t_{\text{BIT(TXD)}} = 500 \text{ ns}$ | 400 | | 550 | ns |
| | | $t_{\text{BIT(TXD)}} = 200 \text{ ns}$ | 120 | | 220 | ns |
| Δt_{REC} | Receiver timing symmetry (Note 2) | $t_{\text{BIT(TXD)}} = 500 \text{ ns}$ | -65 | | 40 | ns |
| | | $t_{\text{BIT(TXD)}} = 200 \text{ ns}$ | -45 | | 15 | ns |
| $t_{\text{TO(DOM)TXD}}$ | TXD dominant time-out time | Normal mode; TXD = 0V | 0.8 | 3 | 6.5 | ms |

Note 1: $V_{IO} = V_{CC}$ in non-VIO product variants.

Note 2: $\Delta t_{\text{REC}} = t_{\text{BIT(RXD)}} - t_{\text{BIT(BUS)}}$.

7 Parameter Measurement Information

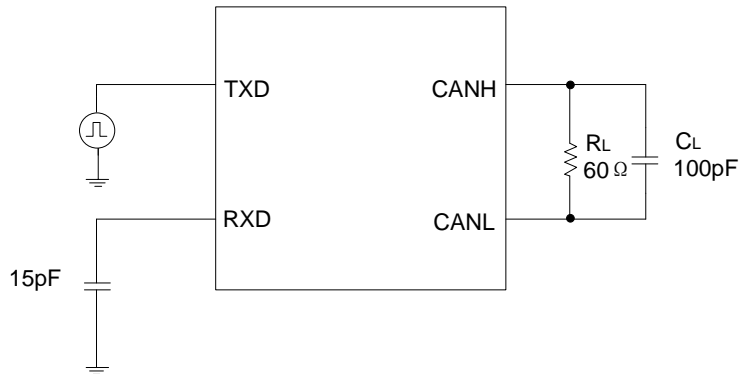


Figure 7-1. CAN transceiver timing test circuit

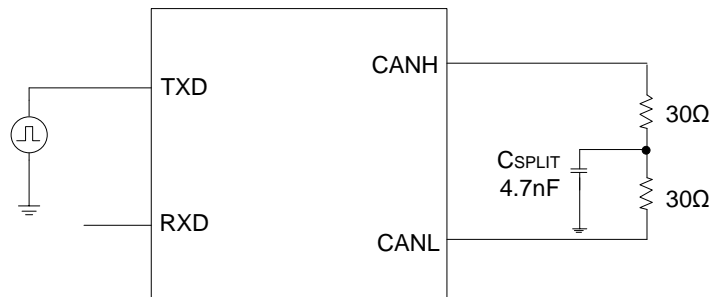


Figure 7-2. Test circuit for measuring transceiver transmitter driver symmetry

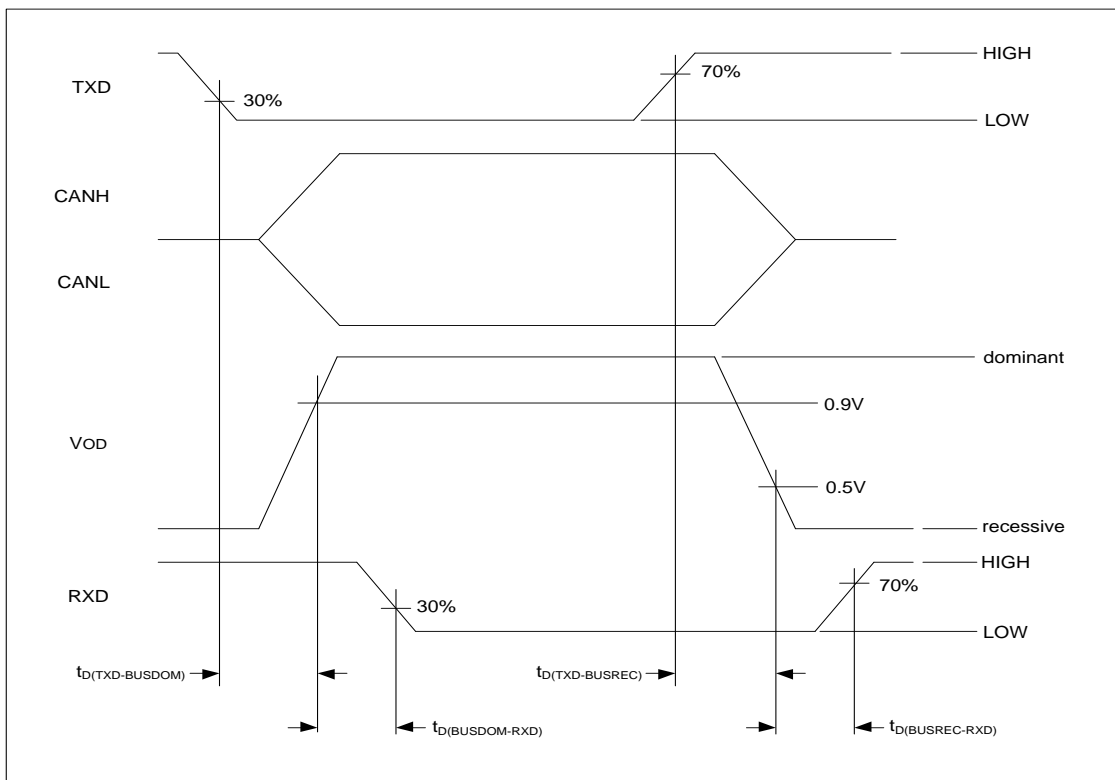


Figure 7-3. CAN transceiver timing diagram

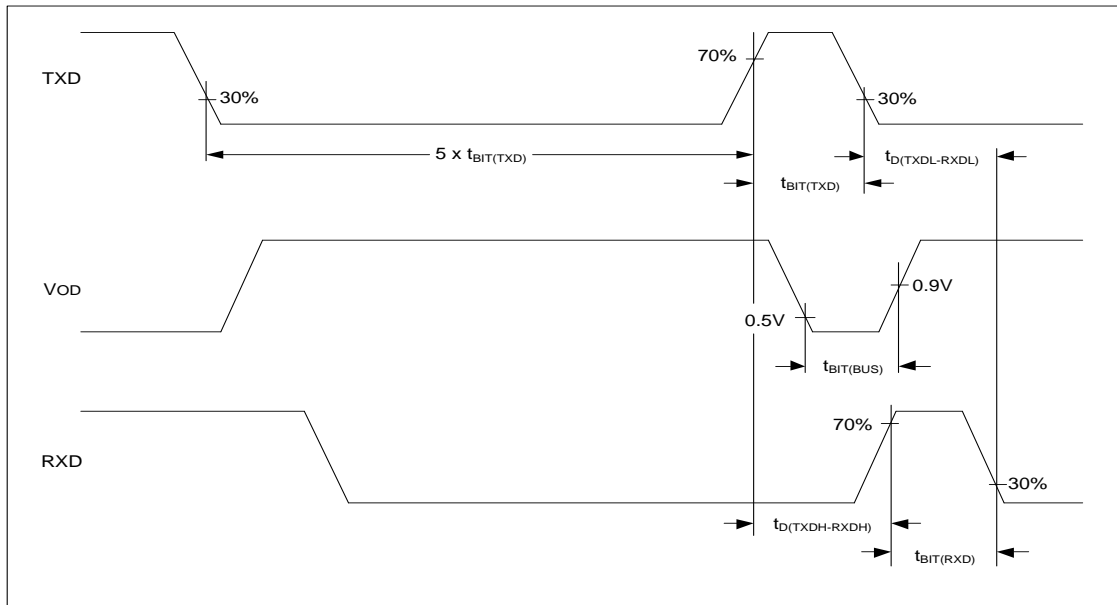


Figure 7-4. CAN FD timing definitions according to ISO 11898-2:2016

8 Block diagram

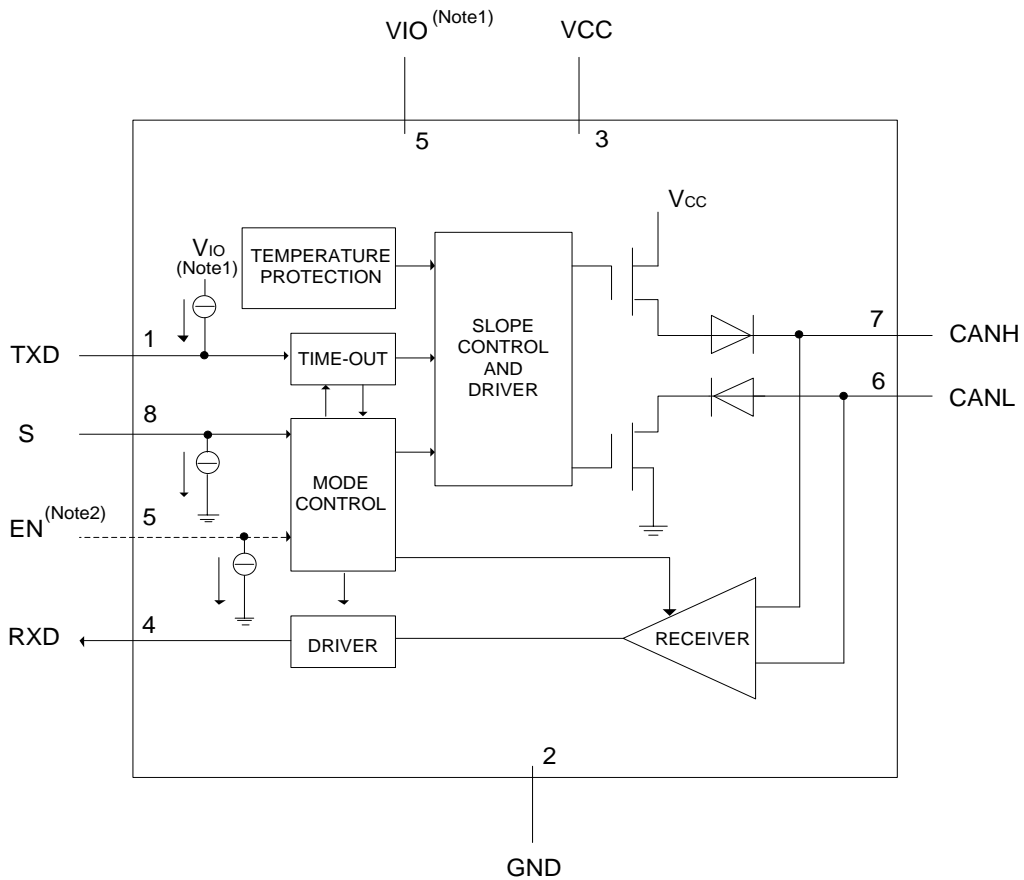


Figure 8-1. Block diagram

Note 1: $V_{IO} = V_{CC}$ in non-VIO product variants.

Note 2: Only present in the UMCAN1057ES8.

9 Detailed Description

9.1 Functional Description

The UMCAN1057 is a high-speed CAN stand-alone transceiver with Silent mode. It combines the functionality of transceiver with improved EMC and ESD handling capability. Improved slope control and high DC handling capability on the bus pins provides additional application flexibility. The UMCAN1057 is available in three versions, distinguished only by the function of pin 5:

- The UMCAN1057VS8 and UMCAN1057VDA allow for direct interfacing to microcontrollers with supply voltages down to 3.3 V.
- The UMCAN1057ES8 allows the transceiver to be switched to a very low-current Off mode.

9.2 Operating modes

The UMCAN1057 supports two operating modes, Normal and Silent, which are selected via pin S. An additional Off mode is supported in the UMCAN1057ES8 via pin EN. See Table 1 for a description of the operating modes under normal supply conditions.

Table 9-1. Operating modes

| Mode | Inputs | | | Outputs | |
|---------------|-------------------|-----------|-----------|------------|------------------|
| | Pin EN (Note1) | Pin S | Pin TXD | CAN driver | Pin RXD |
| Normal | HIGH | LOW | LOW | dominant | Active (Note2) |
| | HIGH | LOW | HIGH | recessive | Active (Note2) |
| Silent | HIGH | HIGH | X (Note3) | recessive | Active (Note2) |
| Off (Note1) | LOW | X (Note3) | X (Note3) | floating | floating |

Note1: Only available on the UMCAN1057ES8.

Note2: LOW if the CAN bus is dominant, HIGH if the CAN bus is recessive.

Note3: 'X' = Don't care.

9.2.1 Normal mode

A LOW level on pin S selects Normal mode. In this mode, the transceiver is able to transmit and receive data via the bus lines CANH and CANL (see Figure 8-1 for the block diagram). The differential receiver converts the analog data on the bus lines into digital data which is output to pin RXD. The slopes of the output signals on the bus lines are controlled internally and are optimized in a way that guarantees the lowest possible ElectroMagnetic Emission (EME).

9.2.2 Silent mode

A HIGH level on pin S selects Silent mode. In Silent mode the transmitter is disabled, releasing the bus pins to recessive state. All other IC functions, including the receiver, continue to operate as in Normal mode. Silent mode can be used to prevent a faulty CAN controller from disrupting all network communications.

9.2.3 Off mode

A LOW level on pin EN of UMCAN1057ES8 selects Off mode. In Off mode the entire transceiver is disabled, allowing the microcontroller to save power when CAN communication is not required. The bus pins are floating in Off mode, making the transceiver invisible to the rest of the network.

9.3 Fail-Safe Features

9.3.1 TXD dominant time-out function

A ‘TXD dominant time-out’ timer is started when pin TXD is set LOW. If the LOW state on pin TXD persists for longer than $t_{io(dom)TXD}$, the transmitter is disabled, releasing the bus lines to recessive state. This function prevents a hardware and/or software application failure from driving the bus lines to a permanent dominant state (blocking all network communications). The TXD dominant time-out timer is reset when pin TXD is set HIGH. The TXD dominant time-out time also defines the minimum possible bit rate of 20 kbit/s.

9.3.2 Internal biasing of TXD, S and EN input pins

Pin TXD has an internal pull-up to V_{IO} and pins S and EN (UMCAN1057ES8) have internal pull-downs to GND. This ensures a safe, defined state in case one or more of these pins is left floating.

9.3.3 Undervoltage detection on pins VCC and VIO

Should V_{CC} or V_{IO} drop below their respective undervoltage detection levels ($V_{uvd(VCC)}$ and $V_{uvd(VIO)}$), the transceiver will switch off and disengage from the bus (zero load) until V_{CC} and V_{IO} have recovered.

9.3.4 Overtemperature protection

The output drivers are protected against overtemperature conditions. If the operating junction temperature exceeds the shutdown junction temperature, $T_{J(SD)}$, the output drivers will be disabled until the operating junction temperature falls below $T_{J(SD)}$ and TXD becomes recessive again. Including the TXD condition ensures that output driver oscillations due to temperature drift are avoided.

9.3.5 VIO supply pin

There are three versions of the UMCAN1057 available, only differing in the function of a single pin. Pin 5 is either an enable control input (EN), a V_{IO} supply pin or is not connected. Pin V_{IO} on the UMCAN1057VS8 and UMCAN1057VDA should be connected to the microcontroller supply voltage (see Figure 10-2). This will adjust the signal levels of pins TXD, RXD and S to the I/O levels of the microcontroller. For versions of the UMCAN1057 without a V_{IO} pin, the V_{IO} input is internally connected to V_{CC} . This sets the signal levels of pins TXD, RXD and S to levels compatible with 5V microcontrollers.

10 Application Information

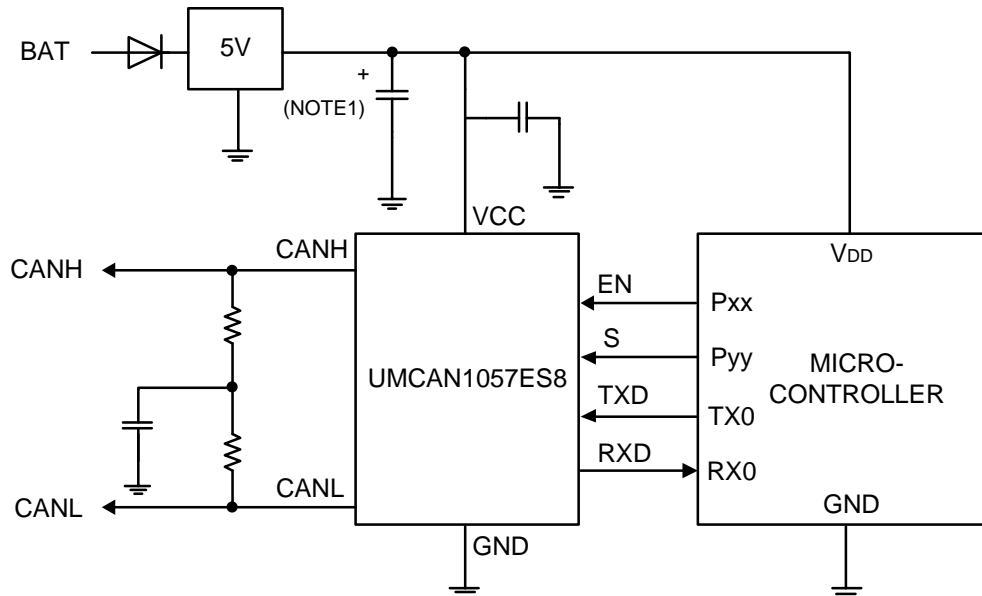


Figure 10-1. Typical application of the UMCAN1057ES8

Note1: Optional, depends on regulator

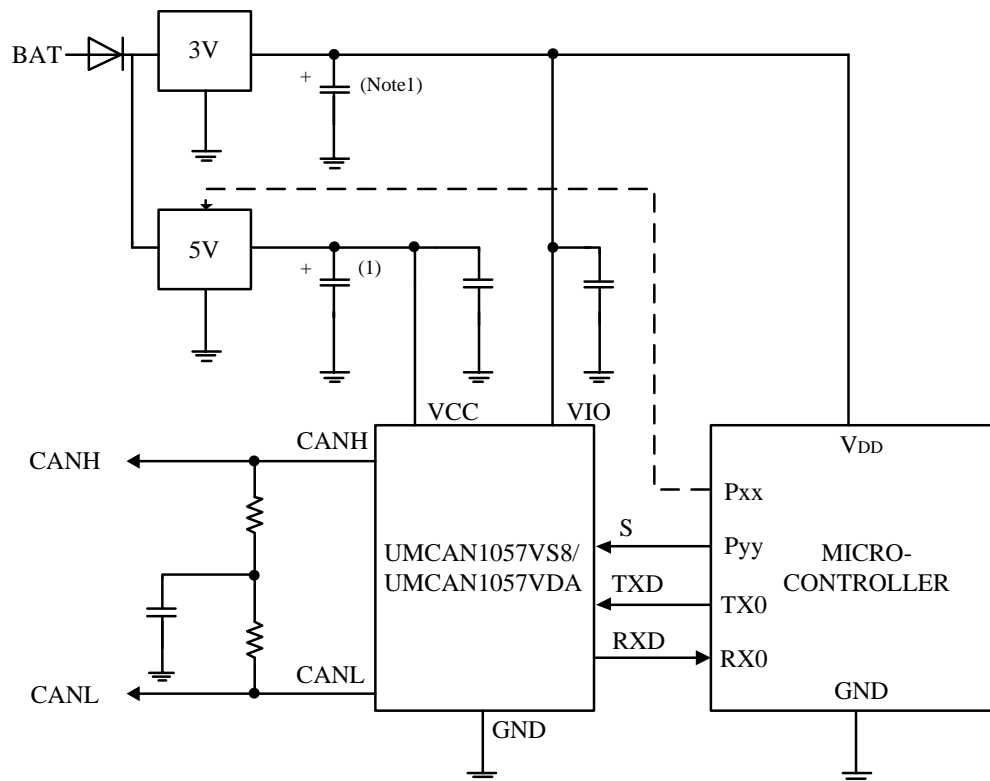


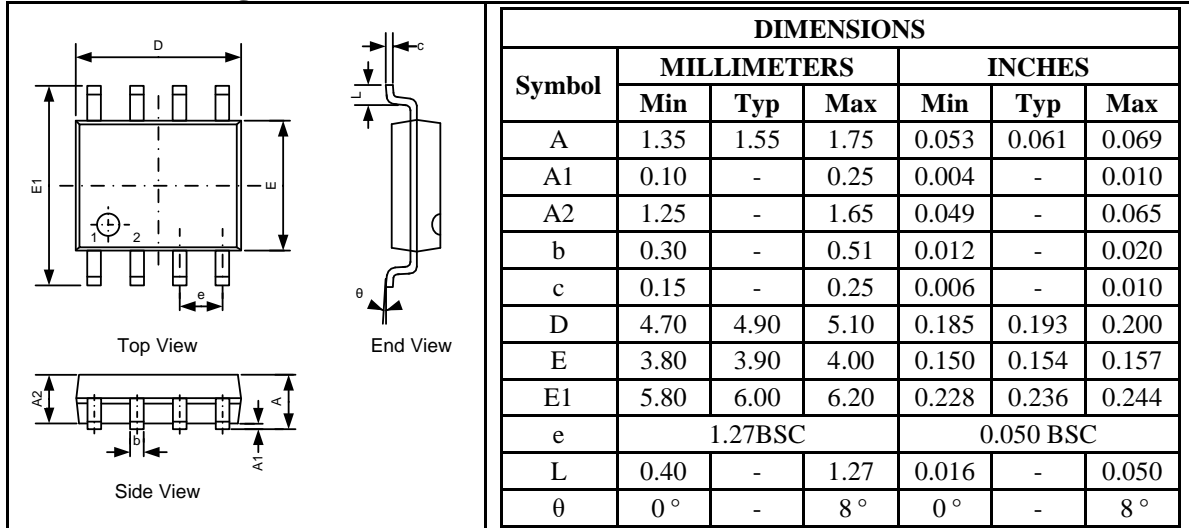
Figure 10-2. Typical application of the UMCAN1057VS8 or UMCAN1057VDA

Note1: Optional, depends on regulator

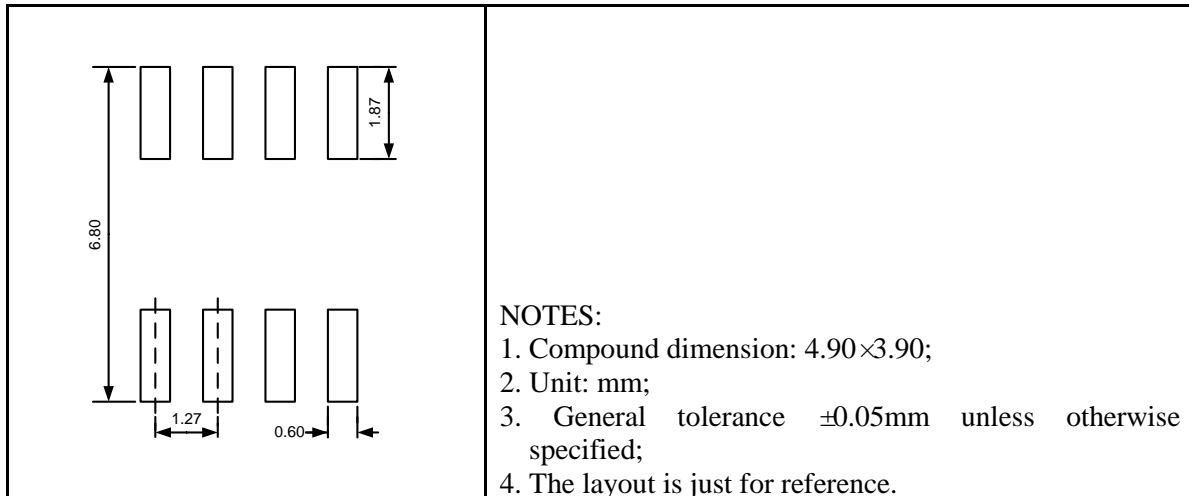
11 Package Information

SOP8

Outline Drawing

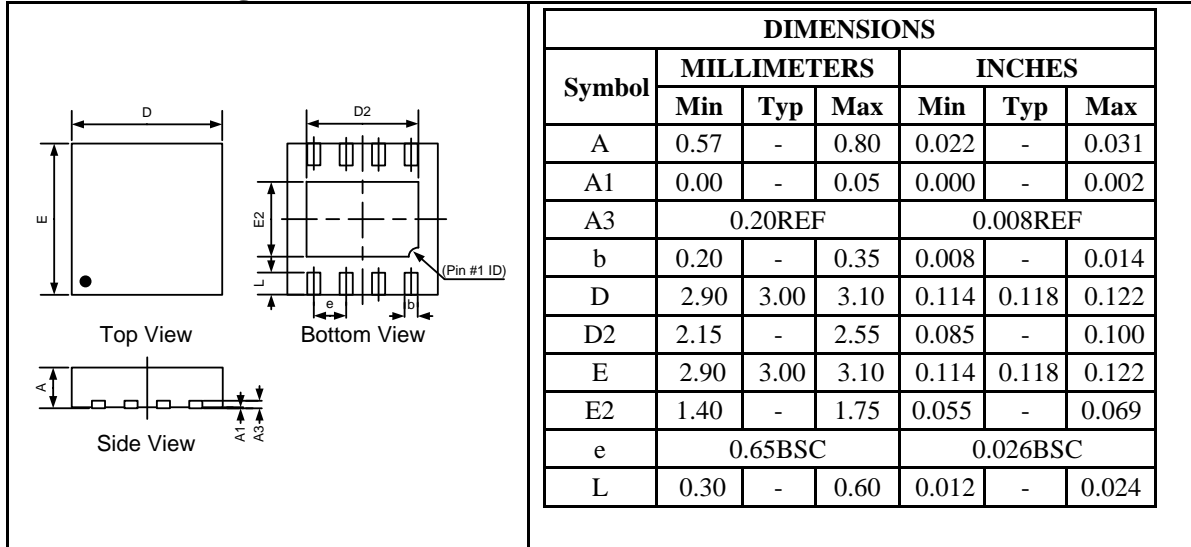


Land Pattern

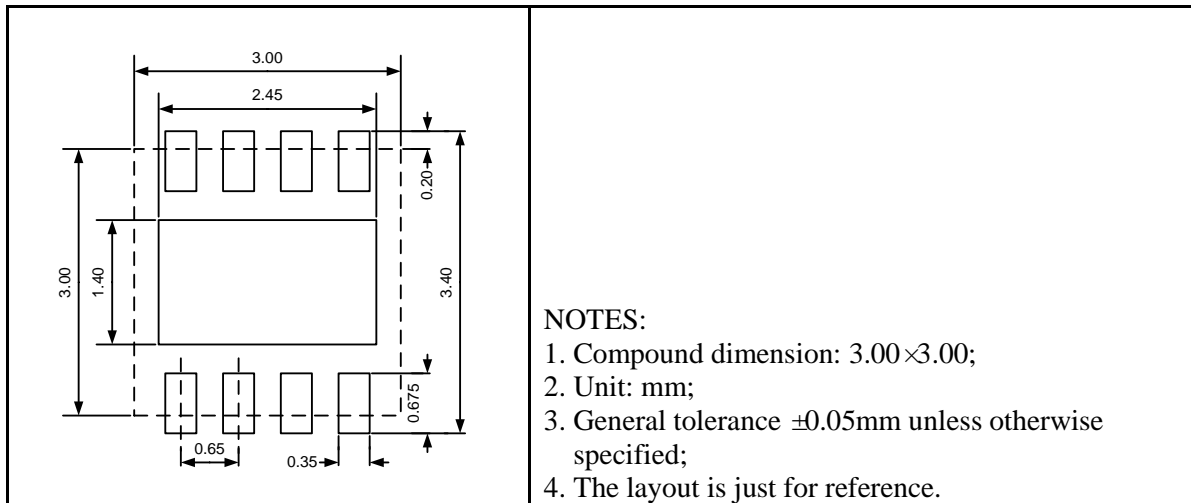


DFN8 3.0×3.0

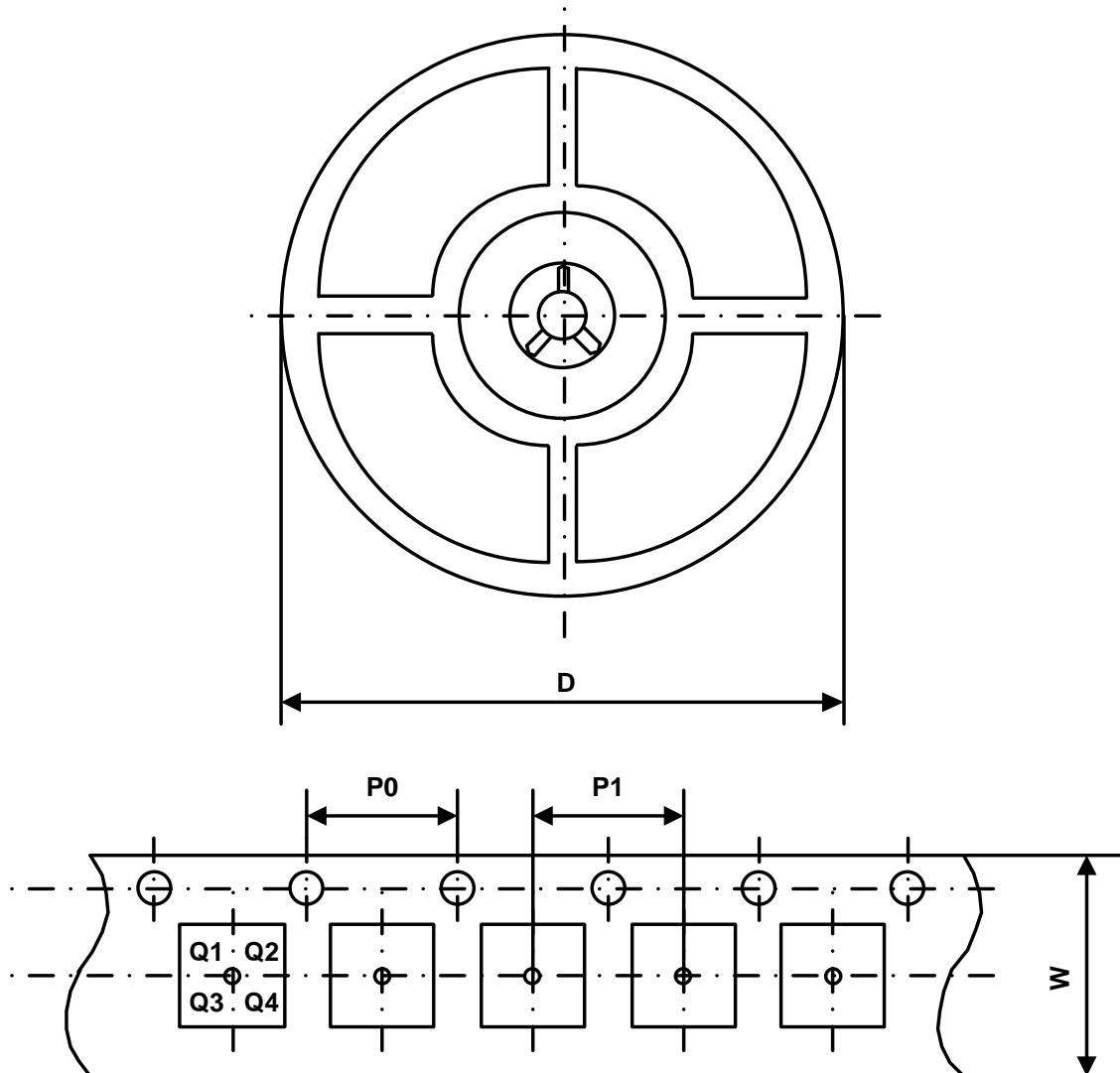
Outline Drawing



Land Pattern



Packing Information



| Part Number | Package Type | Carrier Width (W) | Pitch (P0) | Pitch (P1) | Reel Size (D) | PIN 1 Quadrant |
|--------------|--------------|-------------------|------------|------------|---------------|----------------|
| UMCAN1057NS8 | SOP8 | 12 mm | 4 mm | 8 mm | 330 mm | Q1 |
| UMCAN1057ES8 | SOP8 | 12 mm | 4 mm | 8 mm | 330 mm | Q1 |
| UMCAN1057VS8 | SOP8 | 12 mm | 4 mm | 8 mm | 330 mm | Q1 |
| UMCAN1057VDA | DFN8 3.0×3.0 | 12 mm | 4 mm | 8 mm | 330 mm | Q1 |

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Union Semiconductor, Inc

Add: Unit 606, No.570 Shengxia Road, Shanghai 201210

Tel: 021-51093966

Fax: 021-51026018

Website: www.union-ic.com