

2015 Q1



# UNION SEMICONDUCTOR

[www.union-ic.com](http://www.union-ic.com)

Interface and System Interconnect Selection Guide

# Company Profile

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## Who We Are

Founded in 2001, Union Semiconductor is a fabless integrated circuit design company, engaged in inventing, designing and marketing high performance linear and mixed-signal integrated circuits (ICs) for use in a variety of electronic equipment.

Union Semiconductor's products bridge the analog real world and digital world by detecting, measuring, amplifying, converting power supply and providing protection for electronic circuits.

## Corporate Mission

Union Semiconductor's mission is to continuously develop high quality and innovative mixed signal IC solutions that add value to customers' electronics equipment worldwide.

## Products and Applications

Our products include power supplies, power management circuits, analog switches, interface circuits, ESD protection ICs and EMI filters.

Union Semiconductor markets over 180 analog ICs for uses in a wide variety of electronic equipment. These include PCs and their peripherals, portable devices, instrumentation, test equipments and digital consumer electronics.

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# Product Selection Guide

## Interface and System Interconnect

### RS485 Interface

Part Number	Description	Data Rate (Mbps) (Min)	Fail Safe	Transceivers on Bus	ESD (kV)		Package
					Contact	Air	
UM3085EE	5V Supply, 1TX/1RX RS485 Interface	0.5	Yes	256	±8	±15	SOP8 DIP8
UM3088EE	5V Supply, 1TX/1RX RS485 Interface	2.5	Yes	256	±8	±15	SOP8 DIP8
UM3483EE	3.3V to 5.0V Supply, 1TX/1RX RS485 Interface	0.5	Yes	256	±8	±15	SOP8 DIP8
UM3486EE	3.3V to 5.0V Supply, 1TX/1RX RS485 Interface	2.5	Yes	256	±8	±15	SOP8 DIP8
UM3352EE	5V Supply, 1TX/1RX RS485 Interface	0.5	Yes	256	±8	±15	SOP8 DIP8
*UM3087EE	5V Supply, 1TX/1RX RS485 Interface Auto Polarity Reversal	0.5	Yes	256	±8	±15	SOP8
*UM3487EE	3.3V to 5.0V Supply, 1TX/1RX RS485 Interface Auto Polarity Reversal	0.5	Yes	256	±8	±15	SOP8

### RS422 Interface

Part Number	Description	Data Rate (Mbps) (Min)	Fail Safe	Transceivers on Bus	ESD (kV)		Package
					Contact	Air	
UM491EE	5V Supply, 1TX/1RX RS422 Interface	2.5	Yes	256	±8	±15	SOP14 DIP14
UM3491EE	3.3V to 5.0V Supply, 1TX/1RX RS422 Interface	10	Yes	256	±8	±15	SOP14 DIP14
*UM488EE	5V Supply, 1TX/1RX RS422 Interface	2.5	Yes	256	±8	±15	SOP8 DIP8
*UM3488EE	3.3V to 5.0V Supply, 1TX/1RX RS422 Interface	10	Yes	256	±8	±15	SOP8 DIP8

### RS232 Interface

Part Number	Description	Data Rate (kbps)	Operating Temperature (°C)	Fail Safe	ESD (kV)		Package
					Contact	Air	
UM202EESE	Single 5V Powered 2TX/2RX	120	-40~+85	Yes	±8	±15	SOP16
UM202EEPE	Single 5V Powered 2TX/2RX	120	-40~+85	Yes	±8	±15	DIP16
UM202EEUE	Single 5V Powered 2TX/2RX	120	-40~+85	Yes	±8	±15	TSSOP16
UM232ECSE	Single 5V Powered 2TX/2RX	120	0~+70	Yes	±8	±15	SOP16
UM232ECPE	Single 5V Powered 2TX/2RX	120	0~+70	Yes	±8	±15	DIP16
UM232ECUE	Single 5V Powered 2TX/2RX	120	0~+70	Yes	±8	±15	TSSOP16
UM232EESE	Single 5V Powered 2TX/2RX	120	-40~+85	Yes	±8	±15	SOP16
UM232EEPE	Single 5V Powered 2TX/2RX	120	-40~+85	Yes	±8	±15	DIP16
UM232EEUE	Single 5V Powered 2TX/2RX	120	-40~+85	Yes	±8	±15	TSSOP16
UM3232EEUE	3V~5.5V Powered 2TX/2RX	250	-40~+85	Yes	±8	±15	TSSOP16
UM3232EESE	3V~5.5V Powered 2TX/2RX	250	-40~+85	Yes	±8	±15	SOP16
UM3232EEAE	3V~5.5V Powered 2TX/2RX	250	-40~+85	Yes	±8	±15	SSOP16
UM3232EEPE	3V~5.5V Powered 2TX/2RX	250	-40~+85	Yes	±8	±15	DIP16
UM3222EEUE	3V~5.5V Powered 2TX/2RX with Enable and Shutdown Control	250	-40~+85	Yes	±8	±15	TSSOP20
UM3221EEExx	3V~5.5V Powered 1TX/1RX with Enable and Shutdown Control	250	-40~+85	Yes	±8	±15	TSSOP16 SSOP16
*UM3243EEExx	3V~5.5V Powered 3TX/5RX	250	-40~+85	Yes	±8	±15	TSSOP28 SSOP28 SOP28 QFN32 5.0×5.0

# Product Selection Guide

## Interface and System Interconnect

### Level Shifters

Part Number	Description	V <sub>CCA</sub> (V)	V <sub>CCB</sub> (V)	Max Data Rate (Mbps) V <sub>CCA</sub> =3.3V	ESD (kV) (B Port)	Package
UM3301	1-Bit Auto Direction Detect, CMOS Output	1.2~3.6	1.65~5.5	100	±15	SOT23-6 SOT363 DFN6 1.4×1.0
UM3302H	2-Bit Auto Direction Detect, CMOS Output	1.2~3.6	1.65~5.5	100	±15	CSP8
UM3304	4-Bit Auto Direction Detect, CMOS Output	1.2~3.6	1.65~5.5	100	±4	CSP12
UM3304Q	4-Bit Auto Direction Detect, CMOS Output	1.2~3.6	1.65~5.5	100	±4	QFN14 3.5×3.5
UM3304QT	4-Bit Auto Direction Detect, CMOS Output	1.2~3.6	1.65~5.5	100	±4	QFN16 2.8×1.6
UM3308	8-Bit Auto Direction Detect, CMOS Output	1.2~3.6	1.65~5.5	100	±15	CSP20
UM3202H	2-Bit Auto Direction Detect, for Push-Pull or Open-Drain Applications	1.65~3.6	2.3~5.5	24Mbps (Push-Pull) 2Mbps (Open-Drain)	±15	CSP8
UM3202Q	2-Bit Auto Direction Detect, for Push-Pull or Open-Drain Applications	1.65~3.6	2.3~5.5	24Mbps (Push-Pull) 2Mbps (Open-Drain)	±15	DFN8 1.7×1.3
UM3202A	2-Bit Auto Direction Detect, for Push-Pull or Open-Drain Applications	1.65~3.6	2.3~5.5	24Mbps (Push-Pull) 2Mbps (Open-Drain)	±15	QFN10 1.8×1.4
UM3204H	4-Bit Auto Direction Detect, for Push-Pull or Open-Drain Applications	1.65~3.6	2.3~5.5	24Mbps (Push-Pull) 2Mbps (Open-Drain)	±5	CSP12
UM3204Q	4-Bit Auto Direction Detect, for Push-Pull or Open-Drain Applications	1.65~3.6	2.3~5.5	24Mbps (Push-Pull) 2Mbps (Open-Drain)	±5	QFN14 3.5×3.5
UM3204UE	4-Bit Auto Direction Detect, for Push-Pull or Open-Drain Applications	1.65~3.6	2.3~5.5	24Mbps (Push-Pull) 2Mbps (Open-Drain)	±5	TSSOP14
UM3212M8	2-Bit Auto Direction Detect, for Push-Pull or Open-Drain Applications	1.0~3.3	1.8~5.0	3.4Mbps (Max)	±4	MSOP8
UM3212DA	2-Bit Auto Direction Detect, for Push-Pull or Open-Drain Applications	1.0~3.3	1.8~5.0	3.4Mbps (Max)	±4	DFN8 2.1×1.6
UM2002U8	2-Bit Auto Direction Detect, for Push-Pull or Open-Drain Applications	1.0~3.3	1.8~5.0	3.4Mbps (Max)	±4	TSSOP8
UM2002S8	2-Bit Auto Direction Detect, for Push-Pull or Open-Drain Applications	1.0~3.3	1.8~5.0	3.4Mbps (Max)	±4	SOP8
UM2001P	1-Bit Auto Direction Detect, for Push-Pull or Open-Drain Applications	1.0~3.3	1.8~5.0	3.4Mbps (Max)	±4	SOT363

\*: Future product, contact factory.

## Interface and System Interconnect

### ±15kV ESD-Protected, Slew-Rate-Limited, High-Speed and Fail-Safe RS485 Transceiver

#### UM3085E/UM3483E

##### Key Features

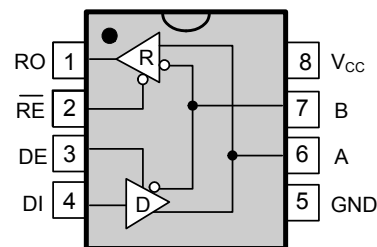
- ESD Protection for RS-485 I/O Pins  
±15kV—Human Body Model  
±15kV—IEC 61000-4-2, Air Discharge
- True Fail-Safe Protection
- Low Current Shutdown Mode
- -7V to +12V Common-Mode Input Voltage Range
- Allows up to 256 Transceivers on the Bus
- Current Limiting for Driver Overload Protection
- UM3085: +5.0V Powered  
UM3483: +3.0V to +5.5V Powered

##### Applications

- RS-485 Transceivers
- Level Translators
- Transceivers for EMI-Sensitive Applications
- Industrial-Control Local Area Networks

The UM3085E, UM3483E are ±15kV electrostatic discharge (ESD)-protected, high-speed transceivers for RS-485 communication that contain one driver and one receiver. These devices feature fail-safe circuitry, which guarantees a logic-high receiver output when the receiver inputs are open, shorted or idle. This means that the receiver output will be logic high if all transmitters on a terminated bus are disabled (high impedance).

UM3085/3483 Pin Configurations



### Fail-Safe, Single Supply RS-232 Transceiver

#### UM3232E/UM3222E

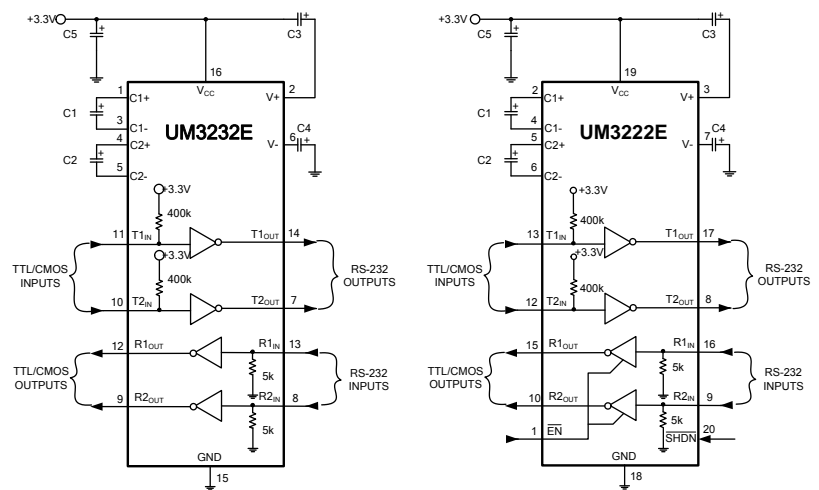
##### Key Features

- Meets True EIA/TIA-232-F Standards from a +3.0V to +5.5V Power Supply
- Enhanced ESD Specifications:  
±15kV Human Body Mode  
±15kV IEC61000-4-2 Air Discharge  
±8kV IEC61000-4-2 Contact Discharge
- 1µA Low Power Shutdown (UM3222E)
- 250 kbps Minimum Transmission Rate
- Guaranteed 30V/µs Max Slew Rate
- Compatible with 1.8V Logic @ V<sub>CC</sub>=3.3V

##### Applications

- Notebooks and Palmtop Computers
- Battery-Powered Equipments
- Hand-Held Equipments
- POS Terminals

The UM3222E/UM3232E is dual driver, dual receiver RS-232 transceiver solutions intended for portable or hand-held applications. The UM3222E features a 1µA shutdown mode that reduces power consumption in battery-powered portable systems. The UM3222E and UM3232E are pin, package, and functionally compatible with the industry standard products pin out, respectively.



UM3232E/UM3222E Typical Operating Circuits

## Interface and System Interconnect

### +3V to +5.5V, 3-Driver/5-Receiver RS-232 Transceiver with Auto Shutdown

#### UM3243

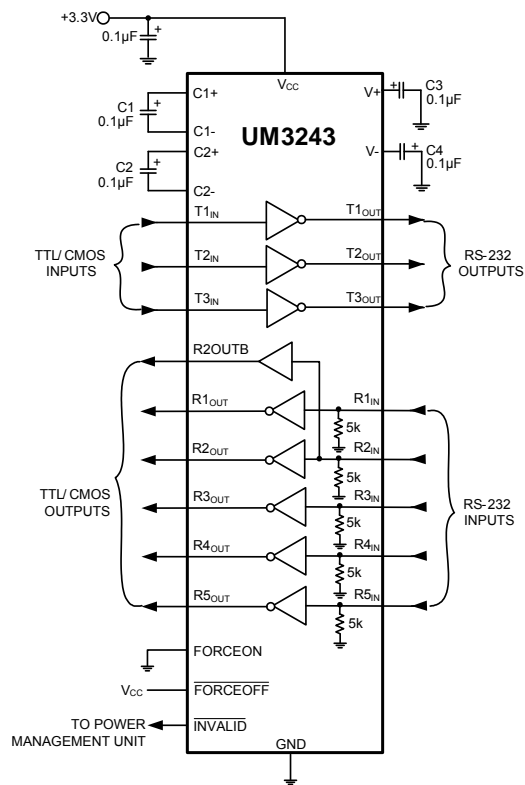
##### Key Features

- Meets True EIA/TIA-232-F Standards from a +3.0V to +5.5V Power Supply
- Enhanced ESD Specifications:  
±15kV Human Body Mode  
±15kV IEC61000-4-2 Air Discharge  
±8kV IEC61000-4-2 Contact Discharge
- 1µA Low Power Shutdown
- 250kbps Minimum Transmission Rate
- Guaranteed 30V/µs Max Slew Rate
- Latch-Up Performance Exceeds 200mA
- Hot Swap and Fail-Safe
- I/O Logic Compatible with 1.8V Logic @  $V_{CC}=3.3V$
- SOP28, SSOP28, TSSOP28 and QFN32 5.0×5.0 Packages

##### Applications

- Battery-Powered Systems
- PDAs
- Notebooks
- Laptops
- Palmtop PCs
- Hand-Held Equipments

The UM3243 is a 3-driver/5-receiver RS-232 transceiver with auto shutdown and low supply current. When the UM3243 does not sense a valid signal level on their receiver inputs, the on-board power supply and drivers shut down. The UM3243 requires only 4×0.1µF capacitors in 3.3V operation, and can operate from input voltages ranging from +3.0V to +5.5V. It is ideal for 3.3V-only systems, mixed 3.3V and 5.0V systems, or 5.0V-only systems that require true RS-232 performance.



UM3243 Typical Operating Circuit

## Interface and System Interconnect

### 2/4-Bit Bidirectional Voltage-Level Translator for Open-Drain and Push-Pull Applications

#### UM3202/UM3204

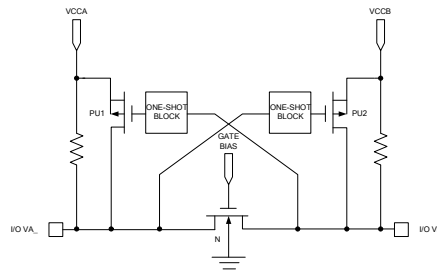
##### Key Features

- Max Data Rates: 24Mbps (Push-Pull), 2Mbps (Open-Drain)
- 2-Bit for UM3202  
4-Bit for UM3204
- Bidirectional, No Direction Control Required
- 1.65V to 3.6V on A Port and 2.3V to 5.5V on B Port ( $V_{CCA} \leq V_{CCB}$ )
- $\pm 5kV$  ESD Protection on B Port
- No Power-Supply Sequencing Required  
 $V_{CCA}$  or  $V_{CCB}$  Can be Ramped First

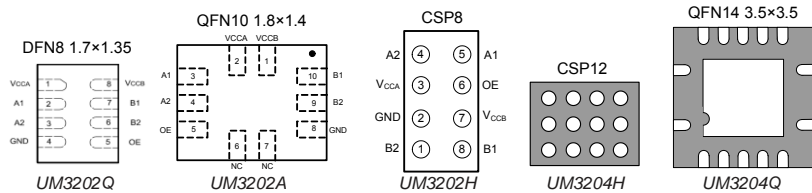
##### Applications

- SPI, MICROWIRE and I<sup>2</sup>C Level Translation
- Low-Voltage ASIC Level Translation
- Portable POS Systems
- Portable Communication Devices
- Low-Cost Serial Interfaces
- Cell-Phones
- GPS
- Telecommunications Equipments

The UM3202/3204 is 2/4 channel ESD-protected level translator provide the level shifting necessary to allow data transfer in a multi-voltage system. Externally applied voltages,  $V_{CCB}$  and  $V_{CCA}$ , set the logic levels on either side of the device. A low-voltage logic signal present on the  $V_{CCA}$  side of the device appears as a high-voltage logic signal on the  $V_{CCB}$  side of the device, and vice-versa.



Block Diagram of UM3202/UM3204 I/O Cell



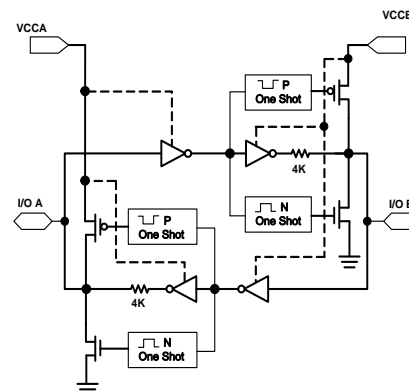
### 1/2/4/8-Bit Bidirectional Voltage-Level Translator with Auto Direction Sensing

#### UM3301/UM3302/UM3304/UM3308

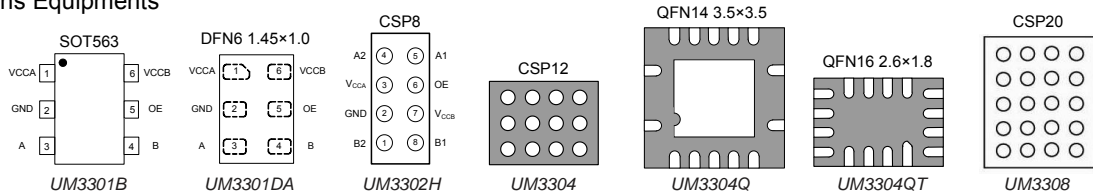
##### Key Features

- Max Data Rates: 100Mbps
- 1-Bit for UM3301, 2-Bit for UM3302  
4-Bit for UM3304, 8-Bit for UM3308
- Bidirectional, No Direction Control Required
- 1.2V to 3.6V on A Port and 1.65V to 5.5V on B Port ( $V_{CCA} \leq V_{CCB}$ )
- Enhanced ESD Protection on B Ports
- V<sub>CC</sub> Isolation Feature: If Either V<sub>CC</sub> Input is at GND, All Outputs are in the High-Impedance State
- OE Input Circuit Referenced to  $V_{CCA}$
- Low Power Consumption

UM3301/UM3302/UM3304/UM3308 is level translator with auto direction sensing and enhanced ESD protection. This non-inverting translator uses two separate configurable power-supply rails. The A port is designed to track  $V_{CCA}$ .  $V_{CCA}$  accepts any supply voltage from 1.2V to 3.6V. The B port is designed to track  $V_{CCB}$ .  $V_{CCB}$  accepts any supply voltage from 1.65V to 5.5V.



Block Diagram of UM3304 I/O Cell





## Sales Contact

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