

INTERFACE

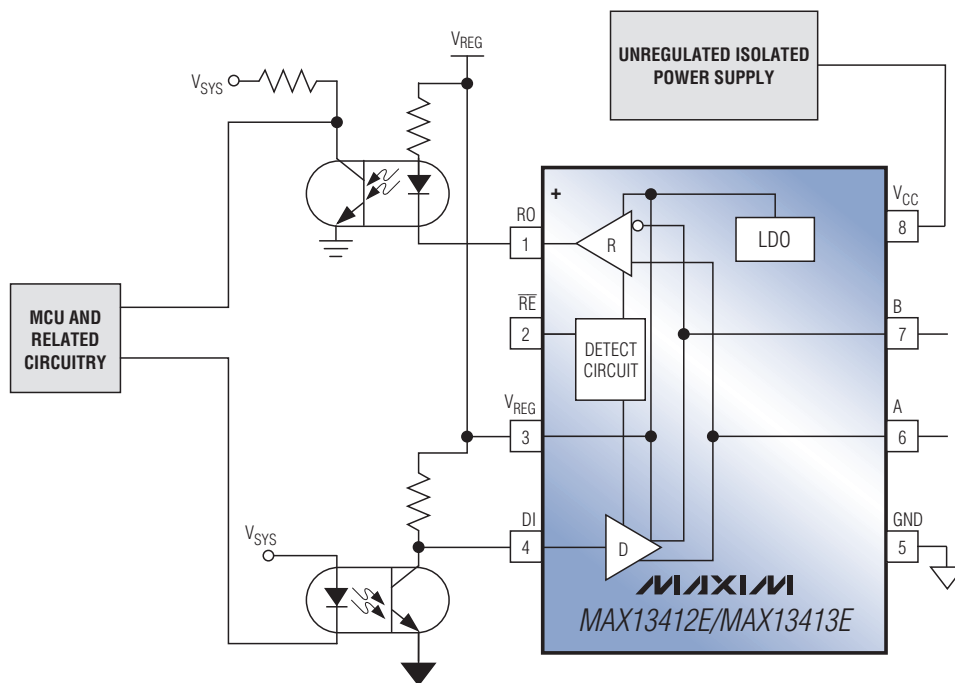
Design Guide

29th Edition

April 2008

Industry's first RS-485 transceivers with an LDO and AutoDirection

LDO provides isolated power for optocouplers, AutoDirection eliminates third optocoupler



- Integrated LDO allows wide, 6V to 28V supply range
- AutoDirection control eliminates the need for an isolated control channel
- 5V output V_{REG} supplies up to 20mA to external circuitry

Ideal for

- Isolated RS-485 interfaces
- Utility meters
- Industrial equipment

| Part | V_{CC} Supply (V) | Data Rate (bps) | $\pm 15\text{kV}$ ESD Protection* | AutoDirection | Price† (\$) |
|-----------|---------------------|-----------------|-----------------------------------|---------------|-------------|
| MAX13412E | 6 to 28 | 500k | ✓ | ✓ | 1.49 |
| MAX13413E | | 16M | | | |

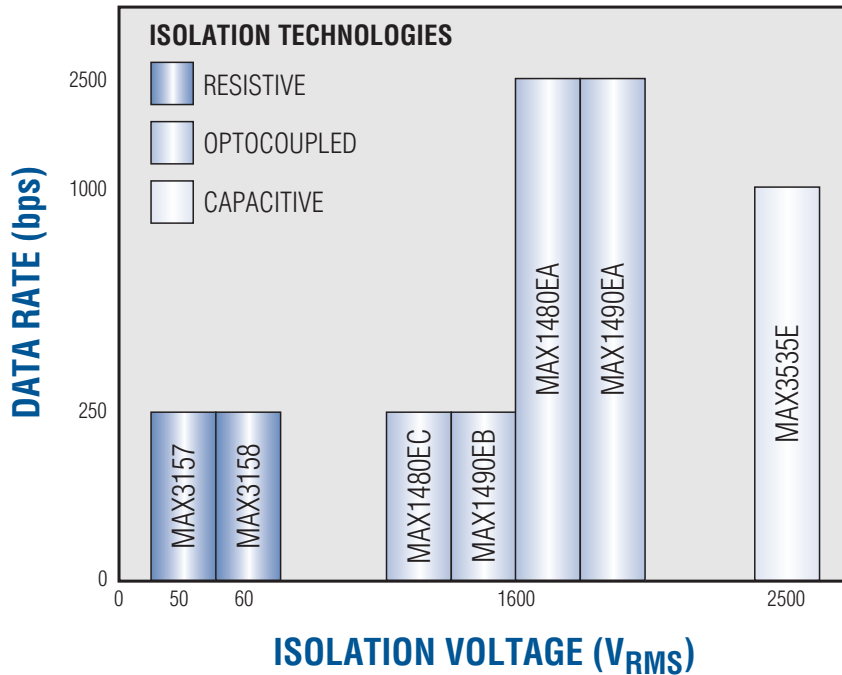
*Human Body Model.

†1000-up recommended resale. Prices provided are for design guidance and are FOB USA. International prices will differ due to local duties, taxes, and exchange rates. Not all packages are offered in 1k increments, and some may require minimum order quantities.

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Maxim offers three isolation technologies

Isolated RS-485/RS-422 transceivers integrate isolation barrier and PHY



MAX3157/MAX3158

- Lower cost solution
- 28-pin SSOP package enables compact designs
- Wide, $\pm 60V$ common-mode range compensates for GND shifts

MAX1480EA/EC, MAX1490EA/EB

- Highest integration
- $\pm 1600V_{RMS}$
- $\pm 15kV$ ESD protection*

MAX3535E

- Robust isolation: $\pm 2500V_{RMS}$ to $\pm 4000V_{RMS}$
- Best EMI immunity
- $\pm 15kV$ ESD protection*

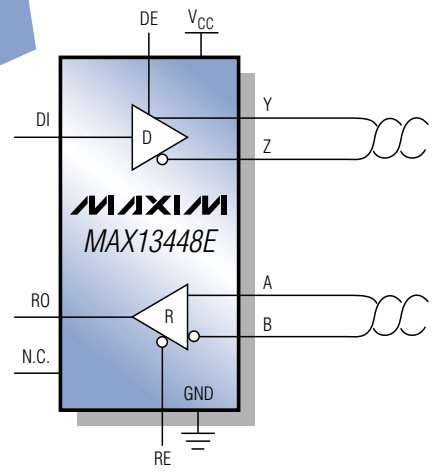
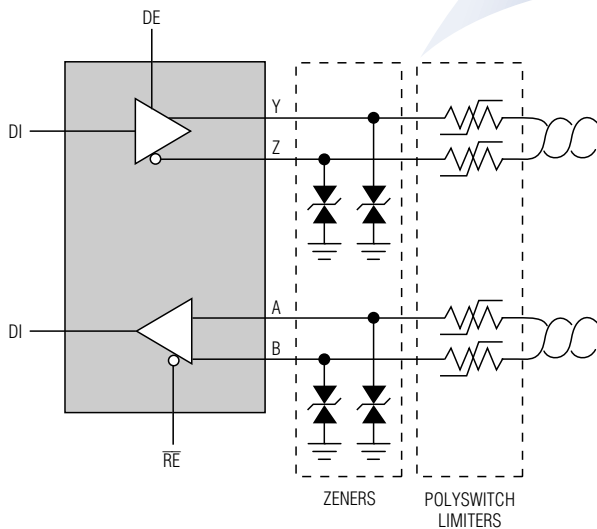
| Part | Isolation (V _{RMS}) | Data Rate (Mbps, max) | Configuration | Integrated Features | Isolation Barrier | Applications |
|--------------|-------------------------------|-----------------------|------------------------------|---|-------------------|--|
| MAX3157/58 | $\pm 50/\pm 60$ | 0.25 | Full/half duplex, selectable | Power isolation, phase reversal | Resistive | Servers, POS, telecom, gaming |
| MAX1480EA/EC | ± 1600 | 2.5/0.25 | Half duplex | Transformer, rectifying diodes, H-bridge driver, optocouplers | Optocoupled | Isolated metering, HVAC, industrial controls |
| MAX1490EA/EB | ± 1600 | 2.5/0.25 | Full duplex | | | |
| MAX3535E | $\pm 2500/\pm 4000$ | 1 | Full/half duplex | H-bridge driver, voltage regulator, capacitive isolation | Capacitive | |

*Human Body Model.

±80V fault-protected, full-duplex RS-485 transceiver operates from 3.3V to 5V

Adds fault protection, reduces design complexity, saves board space

Reduces external components, saves up to 25% board space



Features

- 3.3V to 5V supply-voltage range
- ±80V fault protection on RS-485 I/O ports
- ±12kV ESD protection* on RS-485 I/O ports
- Slew-rate limiting ensures error-free data transmission
- Hot-swappable DE pin
- True fail-safe receiver

Ideal for applications where power and data are on the same bus

Applications

- Industrial control systems
- HVAC control systems
- Utility meters

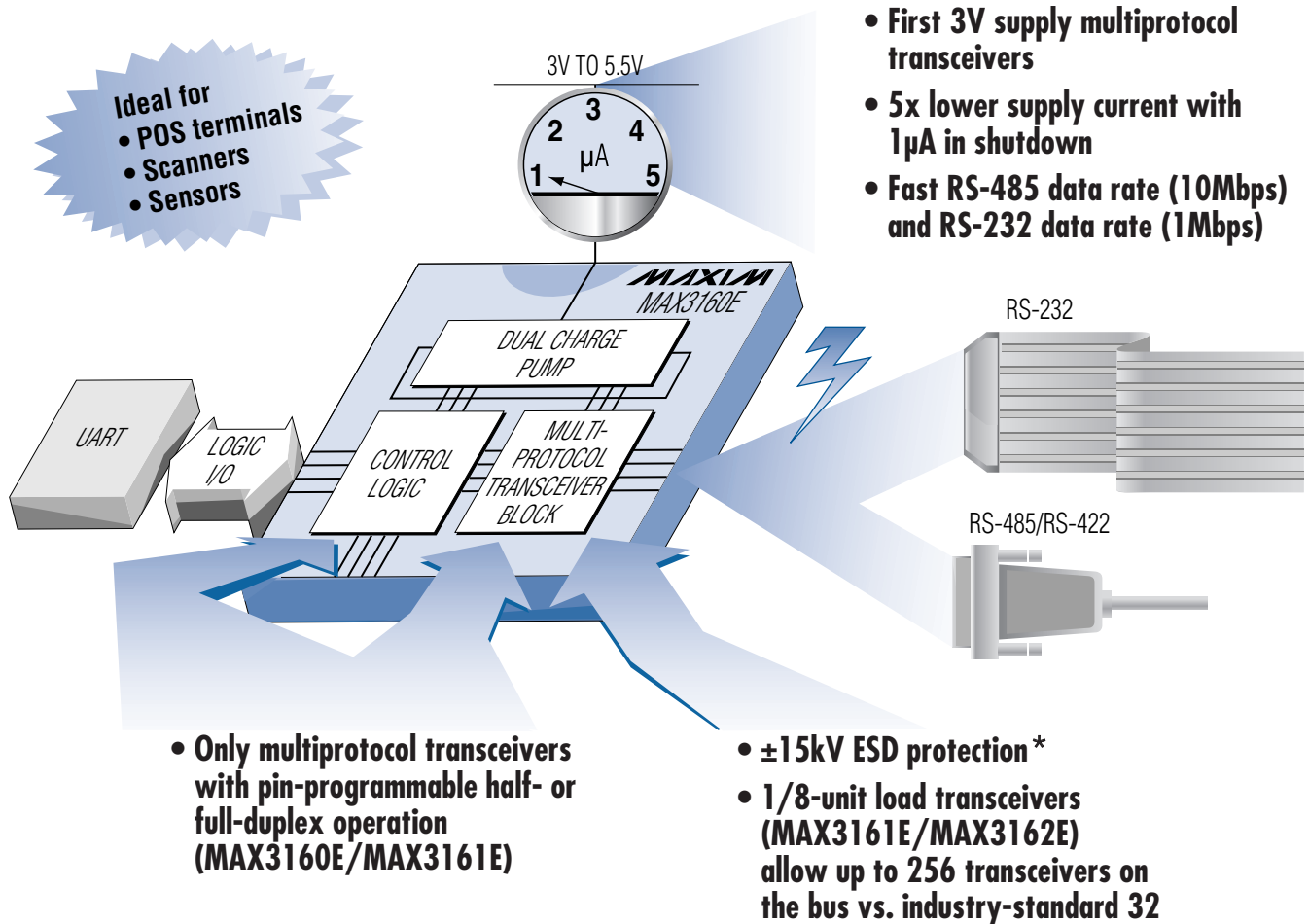
| Part | V _{CC} Supply (V) | Configuration | Fault Protection (V) | Data Rate (Mbps) | True Fail-Safe | Price† (\$) |
|---------------|----------------------------|---------------|----------------------|------------------|----------------|-------------|
| MAX13448E | 3.3 to 5 | Full | ±80 | 0.25 | ✓ | 2.20 |
| MAX3440E-44E | 5 | Half | ±60 | 0.25 to 10 | ✓ | |
| MAX13442E-44E | 5 | | ±80 | 0.25 to 10 | | |
| MAX3430 | 3.3 | | ±80 | 0.25 | | 2.25 |

*Human Body Model.

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First 3V, $\pm 15\text{kV}$ ESD, $1\mu\text{A}$, RS-232/RS-485 multiprotocol interface solutions

MAX3160E family beats the competition

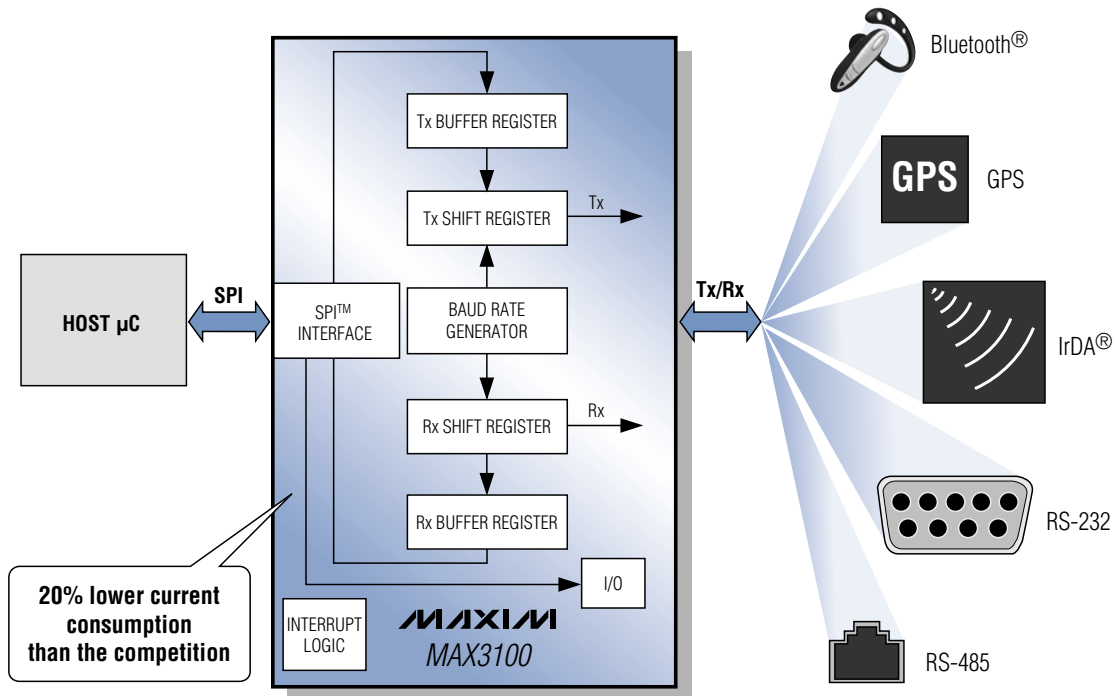


| Part | Interface Protocol | No. of Transceivers on Bus | Package |
|----------|--|----------------------------|---------|
| MAX3160E | Programmable 2 Tx/2 Rx RS-232 or 1 Tx/1 Rx RS-485/RS-422 | 128 | 20-SSOP |
| MAX3161E | Programmable 2 Tx/2 Rx RS-232 or 1 Tx/1 Rx RS-485/RS-422 | 256 | 24-SSOP |
| MAX3162E | Dedicated 2 Tx/2 Rx RS-232 and 1 Tx RS-485/RS-422 | 256 | 28-SSOP |

*Human Body Model.

UARTs simplify communication interface between host μ C and transceiver

Add an interface protocol to a design through the SPI port



Features

- **Lowest power: 150 μ A at 3.3V, 10 μ A in shutdown**
- **Easy to use**
 - Simple instruction set
 - Evaluation kit available
- **Integrated RS-232 PHY (MAX3110E/MAX3111E)**
- **Integrated RS-485 PHY (MAX3140)**

Ideal for

- **Battery-powered equipment**
- **Automotive infotainment**
- **Point-of-sale (POS) devices**
- **Industrial control LANs**

| Part | Integrated PHY | Supply Current (mA, typ) | Supply Voltage (V) | FIFO (Words) | Baud Rate Generator | Temp Range (°C) | Package |
|--------------|----------------|--------------------------|--------------------|--------------|---------------------|----------------------|------------------|
| MAX3100 | — | 0.27 | 2.7 to 5.5 | 8 | ✓ | -40 to +85 | 14-PDIP, 16-QSOP |
| MAX3110E/11E | RS-232 | 0.6 | 5/3.3 | | | 0 to +70 | 28-SO, 28-PDIP |
| MAX3140 | RS-485 | 0.7 | 5 | | | -40 to +85, 0 to +70 | 28-QSOP |

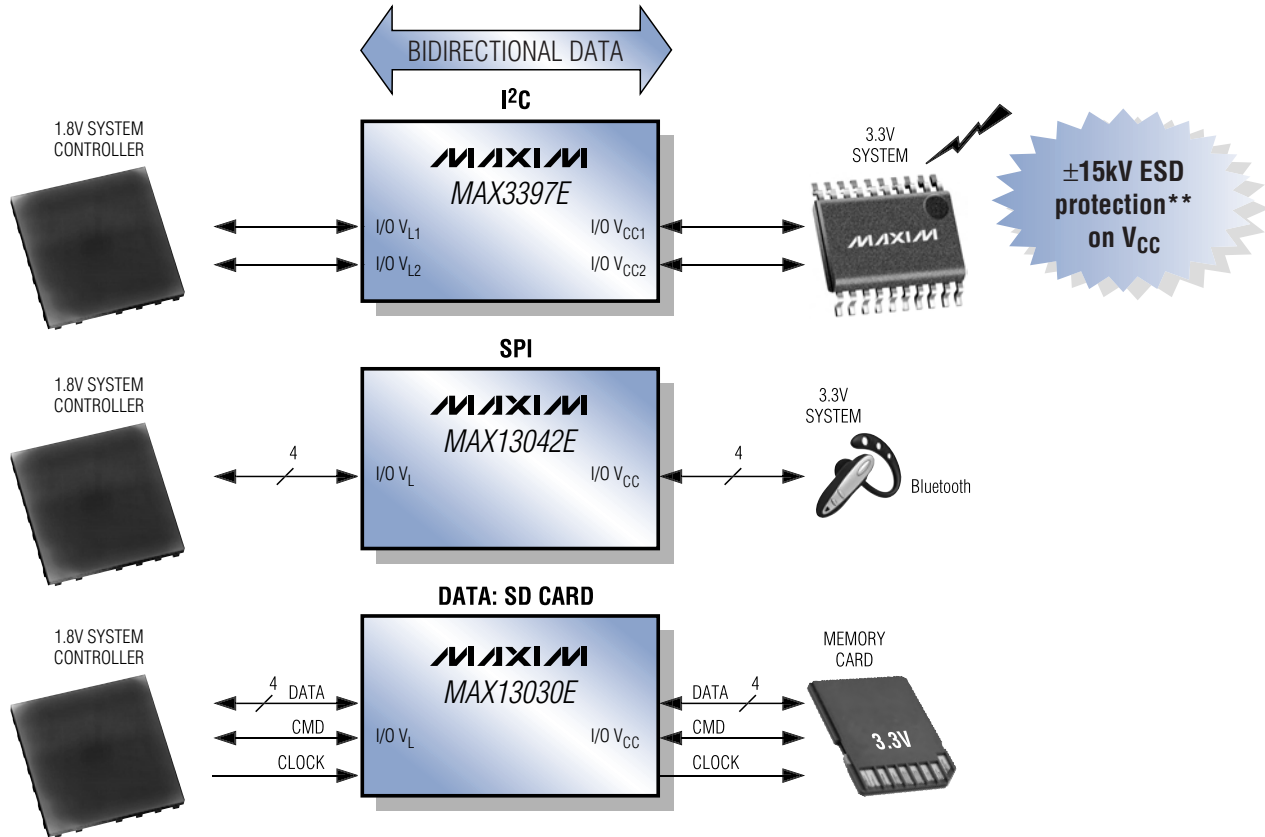
SPI is a trademark of Motorola, Inc.

Bluetooth is a registered trademark of Bluetooth Sig, Inc.

IrDA is a registered trademark of Infrared Data Association Corp.

Low-voltage, bidirectional level translators enable seamless interfacing

Translate data without a direction pin and save board space



Low-voltage operation

- $V_L = 1.2V$ to $5.5V$, $V_{CC} = 1.65V$ to $5.5V$

Save board space compared to discretes

- Small UCSP™ and μ DFN packages

Bidirectional operation with no direction pin

- Saves processor overhead

Robust protection

- $\pm 15kV$ ESD protection* (V_{CC} pins) on most devices

Save power

- Ultra-low, $1\mu A$ supply current in shutdown mode

| Part | No. of I/O Channels | V_L Supply (V) | V_{CC} Supply (V) | Data Rate (Mbps, max) | I/O V_L Shutdown State | I/O V_{CC} Shutdown State | Package (mm x mm) | |
|--------------------|---------------------|---------------------------|----------------------------|-----------------------|--------------------------|-----------------------------|---|-------------------|
| MAX3370/MAX13046E | 1 | 1.6 to 5.5/ 1.1 to 3.6 | 2.5 to 5.5/ 1.65 to 5.5 | 2/8 | High-Z | High-Z | 6- μ DFN (1 x 1.5) | |
| MAX3397E/MAX13047E | 2 | 1.2 to 5.5/ 1.1 to 3.6 | 1.65 to 5.5 | 8 | | | 8- μ DFN (2 x 2)/ 10-UTQFN (1.4 x 1.8) | |
| MAX13042E | 4 | 1.62 to 3.2 | 2.2 to 3.6 | 100 | | | 12-UCSP (1.5 x 2.1) | |
| MAX13030E | 6 | 1.62 to 3.2 | 2.2 to 3.6 | 100 | | | 16-UCSP (2 x 2) | |
| MAX3002E | 8 | 1.2 to 5.5 | 1.65 to 5.5 | 20 | | | 6k Ω to GND | 20-UCSP (2 x 2.5) |
| MAX13103E | 16 | 1.2 to 5.5 | 1.65 to 5.5 | 20 | | | High-Z | 36-UCSP (3 x 3) |

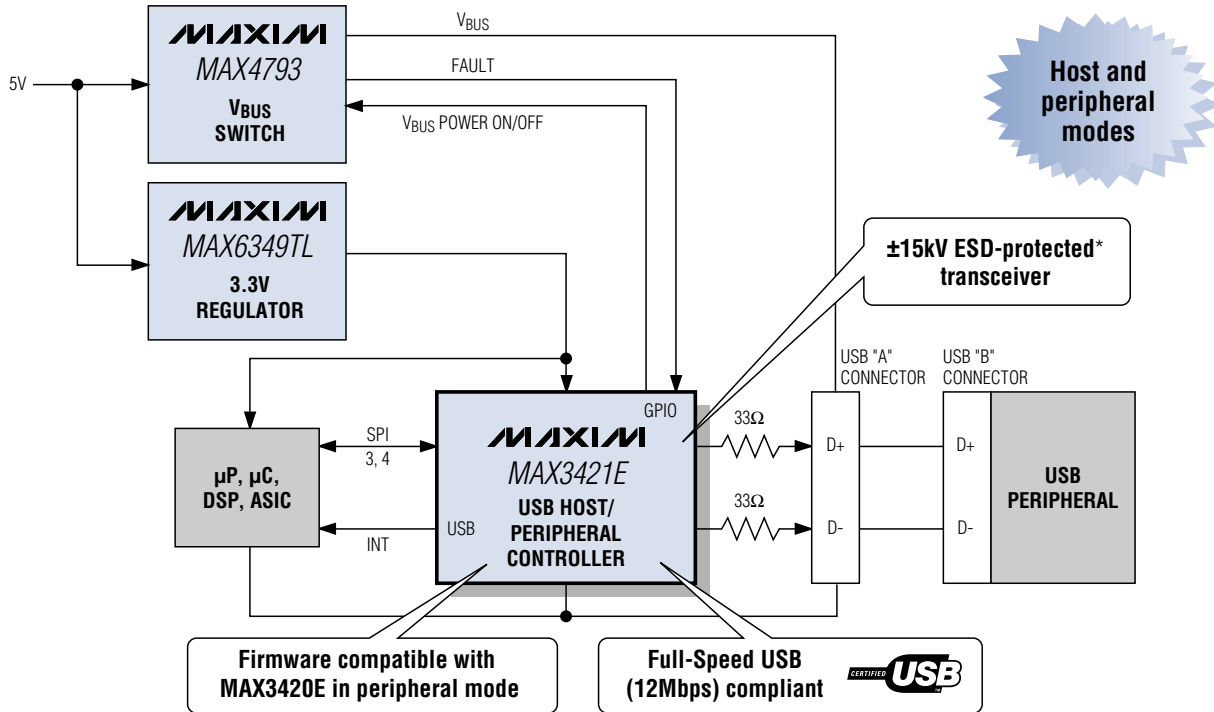
UCSP is a trademark of Maxim Integrated Products, Inc.

*Human Body Model. All devices have $\pm 15kV$ ESD protection, except the MAX3370.

Add USB to *any* system with a single IC

Make your μP , μC , DSP, or ASIC a Full-Speed USB host/peripheral

MAX3421E controller acting as an embedded host

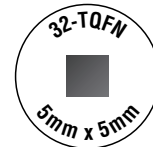


MAX3421E features

- Host capability in addition to peripheral operation
- $\pm 15\text{kV}$ ESD-protected, integrated Full-Speed USB transceiver (12Mbps)
- SPI interface to the register set (up to 26MHz)
- Extra I/Os: 8 general-purpose inputs and 8 general-purpose outputs
- Low-speed host operates directly or through USB hub
- 5mm x 5mm, 32-pin TQFN/TQFP
- Host stack (runs on ARM7™) with mass storage class support

MAX3421E ideal applications

- Host—connecting to USB mice, keyboards, memory sticks, hub support
- Peripherals—industrial, meter reading, automotive, medical



| Part | Operation Mode | No. of General-Purpose Inputs | No. of General-Purpose Outputs | Full-Speed USB (12Mbps) Compliant | Package (mm x mm) | Price† (\$) |
|----------|--------------------|-------------------------------|--------------------------------|-----------------------------------|----------------------------------|-------------|
| MAX3420E | Peripheral | 4 | 4 | ✓ | 24-TQFN (4 x 4), 32-TQFP (7 x 7) | 2.65 |
| MAX3421E | Host or peripheral | 8 | 8 | ✓ | 32-TQFN (5 x 5), 32-TQFP (5 x 5) | 3.47 |

ARM7 is a trademark of ARM Ltd.

*Human Body Model.

†1000-up recommended resale. Prices provided are for design guidance and are FOB USA. International prices will differ due to local duties, taxes, and exchange rates. Not all packages are offered in 1k increments, and some may require minimum order quantities.

| Part | VCC Supply Voltage (V) | Fault Protection (V) | AutoShutdown™ | Data Rate (kbps) | Shutdown Supply Current (µA) | Fault Tolerant | Features |
|---|-------------------------|--------------------------------|------------------------------------|-----------------------------------|------------------------------|----------------------------|---|
| CONTROLLER AREA NETWORK (CAN) TRANSCEIVERS | | | | | | | |
| MAX3050/53 | 4.5 to 5.5 | ±80 | ✓ | 2000 | 15 | | Slope control, autowakeup |
| MAX3051 | 3 to 3.6 | — | | 1000 | 5 | ✓ | 3V supply, standby mode |
| MAX3054/55/56 | 4.5 to 5.5 | ±80/—/— | | 250/125/40 | 3 | | Full wakeup, bus-failure detection |
| MAX3057/58 | 4.5 to 5.5 | ±80 | | 2000/1000 | 3/5 | | Slope control (MAX3057), standby mode |
| MAX3059 | 4.5 to 5.5 | — | | 1000 | 10 | | Switched termination resistor |
| MAX13051/52 | 4.5 to 5.5 | ±80 | ✓ | 1000 | 15 | | Autobaud (MAX13051), ±12V common-mode range |
| Part | Power Supply (V) | VCC Supply Current (mA) | VI Supply Current (mA) | USB Speed Supported | Features | | |
| USB CONTROLLERS | | | | | | | |
| MAX3420E | 3 to 3.6 | 15 | 6 | Full | | | ±15kV ESD-protected, peripheral controller |
| MAX3421E | 3 to 3.6 | 45 | 10 | Full | | | ±15kV ESD-protected, host and peripheral controller |
| Part | Power Supply (V) | Supply Current (mA) | Suspend Supply Current (µA) | USB Level Detect | Enumerate | USB Speed Supported | Features |
| USB TRANSCEIVERS | | | | | | | |
| MAX3344E*/45E* | 4 to 5.5 | 10 | 40 | ✓ | ✓ | Full | ±15kV ESD protection, internal 1.5kΩ pullup resistor, UCSP |
| MAX3346E* | 4 to 5.5 | 8 | 40 | ✓ | ✓ | Low/full | ±15kV ESD protection, internal 1.5kΩ pullup resistor, UCSP |
| MAX3453E | 4 to 5.5 | 10 | 40 | ✓ | ✓ | Full | ±15kV ESD protection, internal 1.5kΩ pullup resistor |
| MAX3454E | 3 to 5.5 | 10 | 35 | ✓ | ✓ | Low/full | ±15kV ESD protection, internal 1.5kΩ pullup resistor |
| MAX3455E | 4 to 5.5 | 10 | 35 | ✓ | ✓ | Low/full | ±15kV ESD protection |
| MAX3456E | 3 to 5.5 | 10 | 40 | —/✓ | ✓ | Low/full | ±15kV ESD protection, pin compatible with MIC2550A |
| MAX13481E/82E | 4 to 5.5 | 10 | 35 | ✓ | ✓ | Full | ±15kV ESD protection, internal 1.5kΩ pullup resistor (MAX13482E) |
| MAX13483E | 4 to 5.5 | 10 | 35 | ✓ | ✓ | Full | ±15kV ESD protection, Vbus detection |
| MAX3349E | 4 to 5.5 | 10 | 65 | ✓ | ✓ | Full | Multiplexed USB and UART lines, ±15kV ESD protection, internal 1.5kΩ pullup resistor and series resistors |
| MAX3301E/02E | 3 to 4.5 | 10 | 500 | ✓ | | Full | ±15kV ESD-protected, USB on-the-go (OTG) transceivers |
| Part | Power Supply (V) | Supply Current (mA) | Low-Power Shutdown (µA) | Receive FIFO Width (words) | Timing Compatible | Data Rate (kbps) | Features |
| SPI/MICROWIRE™ UART | | | | | | | |
| MAX3100 | 2.7 to 5.5 | 150 | 10 | 8 | ✓ | 230 | 16-QSOP 9-bit address-recognition interrupt, receive-activity interrupt shutdown |
| INTEGRATED UART AND RS-232 TRANSCEIVERS | | | | | | | |
| MAX3110E | 3 to 3.6 | 270 | 20 | 8 | ✓ | 230 | Combination UART and ±15kV ESD, RS-232 with internal capacitors |
| MAX3111E | 4.5 to 5.5 | 150 | 20 | 8 | ✓ | 230 | Combination UART and ±15kV ESD, RS-232 with internal capacitors |
| Part | Power Supply (V) | No. of Tx/Rx | ±15kV ESD Protection | Supply Current (1µA) | AutoShutdown Plus™ | AutoShutdown | External Capacitors (µF) |
| RS-232 INTERFACE PRODUCTS | | | | | | | |
| MAX3180E/81E | 3 to 5.5 | 0/1 | ✓ | ✓ | | | — (MAX3180E) |
| MAX3182E/83E | 3 to 5.5 | 0/1 | ✓ | ✓ | | | — (MAX3182E) |
| MAX3188E/89E | ±4.5 to ±6 | 1/0 | ✓ | | ✓ | | ✓ (MAX3181E) 1.5M |
| MAX3190E | ±7 to ±12 | 1/0 | ✓ | | ✓ | | ✓ (MAX3183E) 1.5M |
| MAX3209E | 3 to 5.5, 12 | 6/10 | ✓ | | ✓ | | ✓ 460k |
| MAX3212 | 2.7 to 3.6 | 3/5 | ✓ | | ✓ | | ✓ 460k |
| MAX3218 | 1.8 to 4.25 | 2/2 | ✓ | | ✓ | | ✓ 235k |
| MAX3221E | 3 to 5.5 | 1/1 | ✓ | | ✓ | | ✓ 120k |
| MAX3222E/23E | 3 to 5.5 | 2/2 | —/✓ | | ✓ | | ✓ 250k |
| MAX3224E/25E | 3 to 5.5 | 2/2 | ✓ | | ✓ | | ✓ 250k |
| MAX3226E/27E | 3 to 5.5 | 1/1 | ✓ | | ✓ | | ✓ 250k/1M |
| MAX3228E*/30E* | 2.35 to 5.5 | 2/2 | ✓ | | ✓ | | ✓ 250k |
| MAX3229E*/31E* | 2.35 to 5.5 | 1/1 | ✓ | | ✓ | | ✓ 250k |
| MAX3232E/33E | 3 to 5.5/3.6 | 2/2 | ✓ | —/✓ | ✓ | | —/✓ 1M/250k |
| MAX3237E/38E | 3 to 5.5 | 5/3 | ✓ | —/✓ | ✓ | | ✓ 250k |
| MAX3241E/43E | 3 to 5.5 | 3/5 | ✓ | —/✓ | ✓ | | ✓ 250k |
| MAX3244E/45E | 3 to 5.5 | 3/5 | ✓ | ✓ | ✓ | | ✓ 250k/1M |
| MAX3246E* | 3 to 5.5 | 3/5 | ✓ | ✓ | ✓ | | ✓ 250k |

AutoShutdown and AutoShutdown Plus are trademarks of Maxim Integrated Products, Inc.
MICROWIRE is a trademark of National Semiconductor Corp.
*UCSP offered.

| Part | Power Supply (V) | No. of Tx/Rx | ±15kV ESD Protection | Supply Current (1µA) | AutoShutdown Plus | AutoShutdown | External Capacitors (µF) | Shutdown and Three-State | Rx Active in Shutdown | Data Rate (bps) |
|--|------------------|--------------|----------------------|----------------------|-------------------|--------------|--------------------------|--------------------------|-----------------------|-----------------|
| RS-232 INTERFACE PRODUCTS (continued) | | | | | | | | | | |
| MAX3248E | 3 to 5.5 | 5/3 | ✓ | ✓ | ✓ | ✓ | 4 x 0.1 3 x 0.1 | ✓ | ✓ | 250k 460k |
| MAX3311E/13E | 5 | 1/1 | ✓ | ✓ | ✓ | ✓ | — | ✓ | ✓ | 460k |
| MAX3314E | ±5 | 1/1 | ✓ | ✓ | ✓ | ✓ | — | ✓ | ✓ | 460k |
| MAX3322E | 3 to 5.5 | 2/2 | ✓ | ✓ | ✓ | ✓ | 4 x 0.1 | ✓ | ✓ | 250k |
| MAX3323E | 3 to 5.5 | 1/1 | ✓ | ✓ | ✓ | ✓ | 4 x 0.1 | ✓ | ✓ | 250k |
| MAX3325 | 3 to 3.6 | 2/2 | ✓ | ✓ | ✓ | ✓ | 4 x 0.22 | ✓ | ✓ | 250k |
| MAX3380E/81E | 2.5 to 5.5 | 2/2 | ✓ | ✓ | ✓ | ✓ | 4 x 0.1 | ✓ | ✓ | 250k |
| MAX3384E/85E | 3 to 5.5 | 2/2 | ✓ | ✓ | ✓ | ✓ | 4 x 0.1 | ✓ | ✓ | 250k |
| MAX3386E | 3 to 5.5 | 3/2 | ✓ | ✓ | ✓ | ✓ | 4 x 0.1 | ✓ | ✓ | 230k |
| MAX3387E | 3 to 5.5 | 3/3 | ✓ | ✓ | ✓ | ✓ | 4 x 0.1 | ✓ | ✓ | 250k |
| MAX3388E | 2.35 to 3 | 3/2 | ✓ | ✓ | ✓ | ✓ | 4 x 0.1 | ✓ | ✓ | 460k |

| Part | Power Supply (V) | No. of RS-232 Tx/Rx | Nom Reset Threshold (V) | Reset Pulse Width (ms, min) | Supply Current (µA) | No. of External Capacitors | Nom Capacitor Value (µF) | Shutdown and Three-State | Rx Active in Shutdown | AutoShutdown Plus | Data Rate (kbps) |
|--|------------------|---------------------|-------------------------|-----------------------------|---------------------|----------------------------|---|--------------------------|-----------------------|-------------------|------------------|
| INTEGRATED µP SUPERVISORS AND RS-232 TRANSCEIVERS | | | | | | | | | | | |
| MAX3320A/B/L/T | 3 to 5.5 | 2/2 | 4.25/2.85/4.63/3.08 | 100 | ✓ | 4 | 0.1 | ✓ | ✓ | ✓ | 250 |
| ISOLATION PRODUCT (RS-232) | | | | | | | | | | | |
| MAX3250 | 3 to 5.5 | 250 | 2/2 | 15 | ±50 | 20 | Surface-mount isolation, no external transformer needed | ✓ | ✓ | ✓ | 250 |

RS-485/RS-422 Products

| Part | Power Supply (V) | No. of RS-485 Tx/Rx | Duplex | Data Rate (Mbps) | No. of Tx/Rx on Bus | Features |
|---|------------------|---------------------|--------|----------------------|---------------------|--|
| PREEMPHASIS FOR LONG DISTANCE AND HIGH SPEED | | | | | | |
| MAX3291 | 5 | 1/1 | Full | 5 to 10 Programmable | 128 | Pin compatible with industry standards |
| MAX3292 | 5 | 1/1 | Full | 5 to 10 Programmable | 128 | Pin compatible with industry standards |
| BATTERY POWERED (2.5V, 1.6µA) | | | | | | |
| MAX3471 | 2.5 to 5.5 | 1.6 | 1/1 | Half | 64 | Ideal for lithium battery-powered applications |
| 3V SUPPLY (3.0V TO 3.6V) | | | | | | |
| MAX3030E | 20 | 4/0 | ✓ | 0.1 | — | Pin compatible with 26LS31 |
| MAX3031E | 2 | 4/0 | ✓ | 0.1 | — | Pin compatible with 26LS31 |
| MAX3032E | 20 | 4/0 | ✓ | 0.1 | — | Pin compatible with 75174, 34C87 |
| MAX3033E | 2 | 4/0 | ✓ | 0.1 | — | Pin compatible with 75174, 34C87 |
| MAX3077E | 16 | 1/1 | ✓ | 0.8 | Full | True fail-safe receiver, hot-swap capable |
| MAX3094E/96 | 10 | 0/4 | ✓ | 2.4 | 256 | Rugged RS-422/RS-485 receiver |
| MAX3097E/98EA | 32 | 0/3 | ✓ | 3.1 | 128 | 32Mbps, four fault outputs |
| MAX3098EB | 32 | 0/3 | ✓ | 3.1 | 256 | 32Mbps, four fault outputs |
| MAX3280E-84E | 52 | 0/1 | ✓ | 9 | 128 | True fail-safe RS-485 in SOT23 |
| MAX3362 | 20 | 1/1 | ✓ | 1.7 | 256 | High-speed RS-485 transceiver in SOT23 |
| MAX3483E | 0.25 | 1/1 | ✓ | 1 | 32 | Slow-rate limiting reduces EMI and reflections |
| MAX3485E | 12 | 1/1 | ✓ | 1 | 32 | Guaranteed 12Mbps data rate |
| MAX3486E | 2.5 | 1/1 | ✓ | 1 | 32 | Slow-rate limiting reduces EMI and reflections |
| MAX3293 | 0.25 | 1/0 | ✓ | 5 | 1 | 6-SOT23, slow-rate limited, hot-swap inputs |
| MAX3294 | 2.5 | 1/0 | ✓ | 5 | 1 | 6-SOT23, slow-rate limited, hot-swap inputs |
| MAX3295 | 20 | 1/0 | ✓ | 5 | 1 | 6-SOT23, hot-swap inputs |

| Part | Data Rate (Mbps) | No. of RS-485 Tx/Rx | ±15kV ESD Protection | Supply Current (mA) | Shutdown Supply Current (nA) | Duplex | No. of Tx/Rx on Bus | Features |
|---|------------------|---------------------|----------------------|---------------------|------------------------------|--------|---------------------|---|
| 3V SUPPLY (3.0V TO 3.6V) (continued) | | | | | | | | |
| MAX3488E | 0.25 | 1/1 | ✓ | 1 | — | Full | 32 | Slew-rate limiting reduces EMI and reflections |
| MAX3490E | 12 | 1/1 | ✓ | 1 | — | Full | 32 | Guaranteed 12Mbps data rate |
| MAX3491E | 12 | 1/1 | ✓ | 1 | 2 | Full | 32 | MAX3490 plus driver/receiver enable |
| 5V SUPPLY | | | | | | | | |
| MAX13485E | 0.5 | 1/1 | 4 | 10 | | Half | ✓ | 8- μ DFN (2mm x 2mm) |
| MAX13486E | 16 | 1/1 | 4 | 10 | | Half | ✓ | 8- μ DFN (2mm x 2mm) |
| MAX13487E | 0.5 | 1/1 | 4 | 10 | ✓ | Half | ✓ | AutoDirection, 8-SO |
| MAX13488E | 16 | 1/1 | 4 | 10 | ✓ | Half | ✓ | AutoDirection, 8-SO |
| PROFIBUS | | | | | | | | |
| MAX3465/66 | 40 | 1/1 | 2.5 | ✓ (MAX3465) | 1 | Full | 128 | Complies with PROFIBUS specifications |
| MAX3467 | 40 | 1/1 | 2.5 | — | — | Full | 128 | Complies with PROFIBUS specifications |
| MAX3468/69 | 40 | 1/1 | 2.5 | ✓ (MAX3468) | 1 | Half | 128 | Complies with PROFIBUS specifications |
| QUAD Tx/Rx | | | | | | | | |
| MAX3040/43 | 5 | 0.25 | 4/0 | ±10 | 1.0 | 2 | — | ±10kV ESD protection, hot-swap for live insertion |
| MAX3041/44 | 5 | 2.5 | 4/0 | ±10 | 1.0 | 2 | — | ±10kV ESD protection, hot-swap for live insertion |
| MAX3042/45 | 5 | 20 | 4/0 | ±10 | 1.0 | 2 | — | ±10kV ESD protection, hot-swap for live insertion |
| MAX3093E/95 | 5 | 10 | 0/4 | ±15 | 2.4 | < 1 | 128 | 5V, rugged RS-422/RS-485 receiver |
| FAULT-PROTECTED RS-485/J1708 | | | | | | | | |
| MAX3430/13442E/13443E | RS-485 | 5 | ±80 | | 0.25 | 1/1 | 1/1 | 30 |
| MAX3440E/41E | RS-485 | 5 | ±60 | | 10 | 1/1 | 1/1 | 10 |
| MAX13444E | J1708 | 5 | ±80 | | 0.25 | 1/1 | 1/1 | 30 |
| TRUE FAIL-SAFE DEVICES | | | | | | | | |
| MAX3070E/73E/76E | 3 to 3.6 | 0.25/0.5/16 | 1/1 | ✓ | 0.8 | 0.05 | Full | 256 |
| MAX3071E/74E/77E | 3 to 3.6 | 0.25/0.5/16 | 1/1 | ✓ | 0.8 | — | Full | 256 |
| MAX3072E/75E/78E | 3 to 3.6 | 0.25/0.5/16 | 1/1 | ✓ | 0.8 | 0.05 | Half | 256 |
| MAX3079E | 3 to 3.6 | Selectable | 1/1 | ✓ | 0.8 | 0.05 | Selectable | 256 |
| MAX13080E/81E | 5 | 0.250 | 1/1 | ✓ | 1.2 | 2.8/— | Full | 256 |
| MAX13082E | 5 | 0.250 | 1/1 | ✓ | 1.2 | 2.8 | Half | 256 |
| MAX13083E/84E | 5 | 0.5 | 1/1 | ✓ | 1.2 | 2.8/— | Full | 256 |
| MAX13085E | 5 | 0.5 | 1/1 | ✓ | 1.2 | 2.8 | Half | 256 |
| MAX13086E/87E | 5 | 16 | 1/1 | ✓ | 1.2 | 2.8/— | Full | 256 |
| MAX13088E | 5 | 16 | 1/1 | ✓ | 1.2 | 2.8 | Half | 256 |
| MAX13089E | 5 | Selectable | 1/1 | ✓ | 1.2 | 2.8 | Half | 256 |
| MAX3093E/95 | 5 | 10 | 0/4 | ✓ | 2.4 | < 1nA | Selectable | 128 |
| ISOLATION PRODUCTS (RS-485/RS-422) | | | | | | | | |
| MAX3535E | 3 to 5.5 | 1 | 1/1 | 100 | ±2500 | — | ✓ | 3V to 5V supply operation, ±15kV ESD protection |
| MXL1535 | 5 | 0.25 | 1/1 | 100 | ±2500 | — | ✓ | ±15kV ESD protection |
| MAX1480A | 5 | 2.5 | 1/1 | 60 | ±1600 | 0.2 | ✓ | Complete, isolated RS-485/RS-422 in one package |
| MAX1480B | 5 | 0.25 | 1/1 | 35 | ±1600 | 0.2 | ✓ | Complete, isolated RS-485/RS-422 in one package |
| MAX1480C | 5 | 0.25 | 1/1 | 35 | ±1600 | 0.2 | ✓ | MAX1480B with 1.5 μ s enable |
| MAX1490A | 5 | 2.5 | 1/1 | 100 | ±1600 | 0.2 | ✓ | Complete, isolated RS-485/RS-422 in one package |
| MAX1490B | 5 | 0.25 | 1/1 | 65 | ±1600 | 0.2 | ✓ | Complete, isolated RS-485/RS-422 in one package |
| MAX3480A | 3.3 | 2.5 | 1/1 | 180 | ±1600 | 0.2 | ✓ | Complete, isolated RS-485/RS-422 in one package |

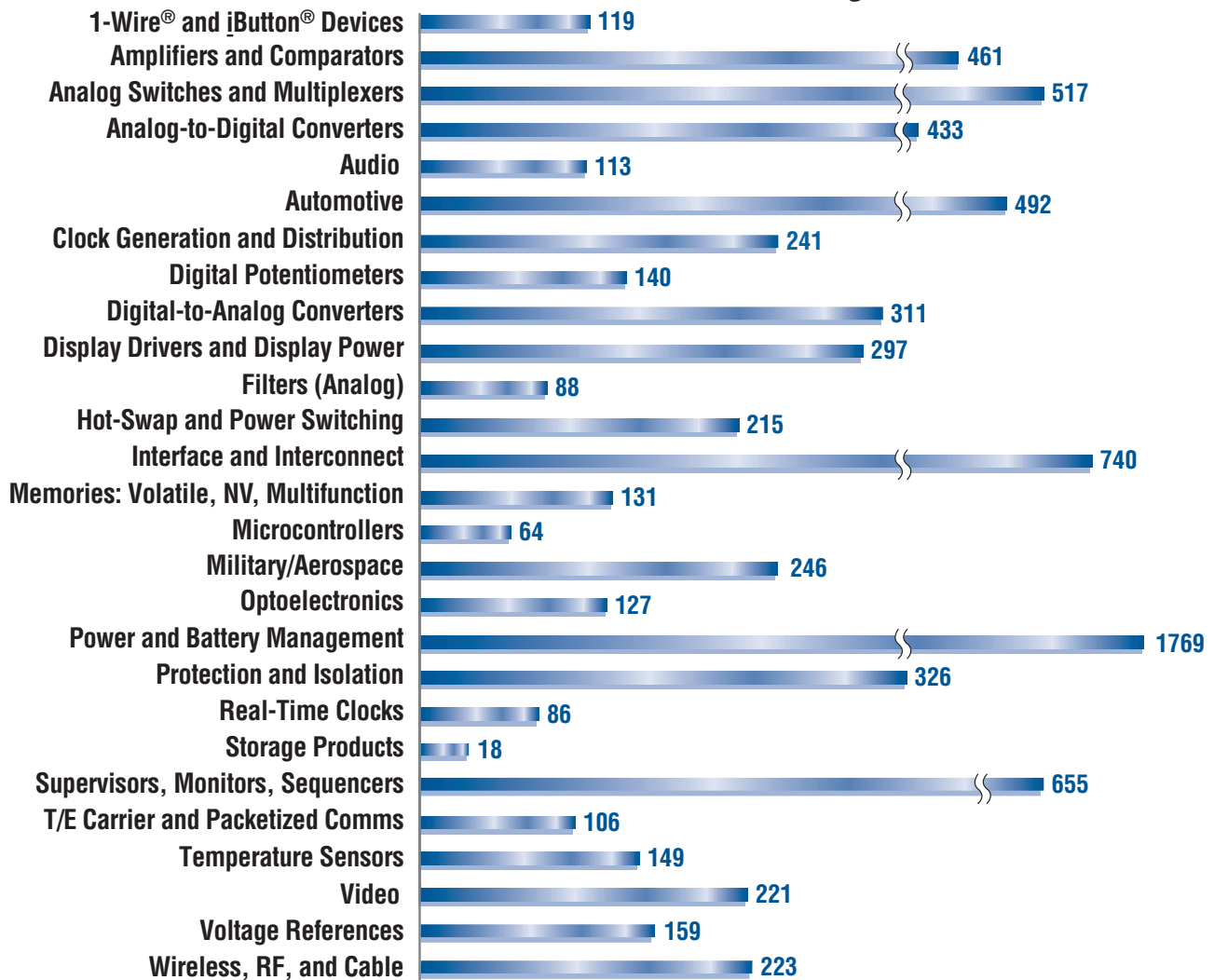
| Part | Power Supply (V) | Data Rate (Mbps) | No. of Tx/Rx | Supply Current (mA) | Isolation Voltage (V _{RMS}) | Shutdown Supply Current (µA) | Full Duplex | Features | |
|--|-----------------------------------|-----------------------------------|--------------------------------|---|---------------------------------------|------------------------------|-------------------------------|---|----------------------|
| ISOLATION PRODUCTS (RS-485/RS-422) (continued) | | | | | | | | | |
| MAX3480B | 3.3 | 0.25 | 1/1 | 120 | ±1500 | 0.2 | — | Complete, isolated RS-485/RS-422 in one package | |
| MAX3157 | 5 | 0.25 | 1/1 | 25 | ±50 | 25 | Selectable | Surface mount, no transformers required | |
| Part | Supply Voltage (V) | No. of RS-232 Tx/Rx | No. of RS-485 Tx/Rx | RS-232/RS-485 Functionality | Half or Full Duplex | Fail Safe | Data Rate | Supply Current (µA) | ±15kV ESD Protection |
| RS-232/RS-485 MULTIPROTOCOL TRANSCEIVERS | | | | | | | | | |
| MAX3160/61 | 3 to 5.5 | 2/2 | 1/1 | Pin programmable Simultaneous | Pin selectable Full duplex | ✓ | Pin selectable Pin selectable | 1 | ✓ |
| MAX3162 | 3 to 5.5 | 2/2 | 1/1 | | | ✓ | | 1 | ✓ |
| Part | Supply Voltage (V) | No. of Transceivers | No. of Termination Networks | Protocols Supported | | | | | |
| MULTIPROTOCOL TRANSCEIVERS AND TERMINATION NETWORKS | | | | | | | | | |
| MAX3170 | 3.3 | 3/3 | — | V.28 (RS-232), V.11 (RS-449V.36, EIA530, EIA530-A, X.21), V.35 | | | | ✓ | 28-SSOP |
| MAX3171/73 | 3.3 | 3/3 | — | V.28 (RS-232), V.10V.11 (RS-449, V.36, EIA530, EIA530-A, X.21, RS-423) | | | | ✓ | 28-SSOP |
| MAX3172 | 3.3 | 1/1 | 5 | V.28 (RS-232), V.11 (EIA530, EIA530-A, RS-449V.36; X.21), V.35 | | | | ✓ | 28-SSOP |
| MXL1543 | 5 | 3/3 | — | V.28 (RS-232), V.11 (RS-449V.36, EIA530, EIA530-A, X.21), V.35 | | | | ✓ | 28-SSOP |
| MXL1544 | 5 | 4/4 | — | V.28 (RS-232), V.10V.11 (RS-449V.36, EIA530, EIA530-A, X.21, RS-423) | | | | ✓ | 28-SSOP |
| MXL1344A | 5 | — | 6 | V.28 (RS-232), V.11 (EIA530, EIA530-A, RS-449V.36; X.21), V.35 | | | | ✓ | 24-SSOP |
| MAX3174 | 3.3 | 1/1 | 5 | V.11 (RS-422), RS-530, RS-530A, V.36/RS-449, V.35, V28/RS-232, V.10/RS-423, X.21) | | | | ✓ | 28-SSOP |
| MAX3175 | 5 | 4/4 | — | V.28 (RS-232), V.10V.11 (RS-449V.36, EIA530, EIA530-A, X.21, RS-423) | | | | ✓ | 28-SSOP |
| Part | No. of I/O Channels | V _L Supply (V) | V _C Supply (V) | Data Rate (Mbps, max) | I/O VL Shutdown State | I/O Vcc Shutdown State | Package (mm x mm) | | |
| LOGIC-LEVEL TRANSLATORS | | | | | | | | | |
| MAX3370 | 1 | 1.6 to 5.5 | 2.5 to 5.5 | 2 | High-Z | High-Z | 6-µDFN (1 x 1.5) | | |
| MAX13046E | 1 | 1.1 to 3.6 | 1.65 to 5.5 | 8 | High-Z | High-Z | 6-µDFN (1 x 1.5) | | |
| MAX3397E | 2 | 1.2 to 5.5 | 1.65 to 5.5 | 8 | High-Z | High-Z | 8-µDFN (2 x 2) | | |
| MAX13047E | 2 | 1.1 to 3.6 | 1.65 to 5.5 | 8 | High-Z | High-Z | 10-UTQFN (1.4 x 1.8) | | |
| MAX13042E | 4 | 1.62 to 3.2 | 2.2 to 3.6 | 100 | High-Z | High-Z | 12-UCSP (1.5 x 2.1) | | |
| MAX13030E | 6 | 1.62 to 3.2 | 2.2 to 3.6 | 100 | High-Z | High-Z | 16-UCSP (2 x 2) | | |
| MAX13032E | 6 | 1.62 to 3.2 | 2.2 to 3.6 | 100 | High-Z | High-Z | 16-UCSP (2 x 2) | | |
| MAX13035E | 6 | 1.62 to 3.2 | 2.2 to 3.6 | 100 | High-Z | High-Z | 16-UCSP (2 x 2) | | |
| MAX3000E | 8 | 1.2 to 5.5 | 1.65 to 5.5 | 0.23 | 75kΩ to GND | 6kΩ to GND | 20-UCSP (2 x 2.5) | | |
| MAX3001E/02E/03E | 8 | 1.2 to 5.5 | 1.65 to 5.5 | 4/20/20 | High-Z | High-Z | 20-UCSP (2 x 2.5) | | |
| MAX13000E/03E | 16 | 1.2 to 5.5 | 1.65 to 5.5 | 0.23/20 | High-Z | High-Z | 36-UCSP (3 x 3) | | |
| Part | Power Supply (V) | No. of Tx/Rx | LCD Contrast Voltage Range (V) | Shutdown Supply Current (µA) | External Capacitors (µF) | Shutdown and Three-State | Rx Active in Shutdown | Data Rate (kbps) | |
| RS-232 TRANSCEIVER WITH SEPARATE LCD POWER AND BIAS | | | | | | | | | |
| MAX3325 | 3 to 3.6 | 2/2 | -5 to +2 | 1 | 4 x 0.22 | ✓ | ✓ | 250 | |
| Part | Supply Voltage Range (V) | Signal Range (V) | Termination Values (Ω) | Resistance Accuracy (%) | | | | | |
| TERMINATION ICs | | | | | | | | | |
| MAX3406 | 4.5 to 5.5 | ±3.6 | 100/75 | ±2.5 | | | | | |
| MAX3407 | 4.5 to 5.5 | ±3.6 | 120/75 | ±2.5 | | | | | |
| MAX3408 | 4.5 to 5.5 | ±3.6 | 100/120 | ±2.5 | | | | | |
| Part | Power Supply (V) | No. of ESD-Protection Channels | Input Capacitance (pF) | ESD Protection: ±15kV Human Body Model, ±8kV IEC 61000-4-2 Contact, ±15kV IEC 61000-4-2 Air-Gap | Supply Current (nA) | | | | |
| ESD-PROTECTION DEVICES | | | | | | | | | |
| MAX3202E/03E | 0.9 to 5.5 | 2/3 | 5 | ✓ | 1 | | | | |
| MAX3204E/06E | 0.9 to 5.5 | 4/6 | 5 | ✓ | 1 | | | | |
| MAX3205E/07E | 0.9 to 5.5 | 6/2 | 2.5 | ✓ | 1 | | | | |
| MAX3208E | 0.9 to 5.5 | 4 | 2.6 | ✓ | 1 | | | | |
| MAX13202E | 0.9 to 16 | 2 | 6 | ±15kV (HBM), ±12kV (Contact), ±30kV (Air Gap) | 1 | | | | |
| MAX13204E/6E/8E | 0.9 to 16 | 4/6/8 | 6 | ±15kV (HBM), ±14kV (Contact), ±30kV (Air Gap) | 1 | | | | |
| Part | V _C Supply Voltage (V) | V _L Supply Voltage (V) | ±15kV ESD Protection | USB OTG Transceiver | VBUS Supply and Signaling | Switchable D+/D- Resistors | Shutdown Supply Current (µA) | | |
| USB ON-THE-GO | | | | | | | | | |
| MAX3301E | 3 to 4.5 | 1.65 to 3.6 | ✓ | ✓ | ✓ | ✓ | 3.5 | | |
| MAX3353E*/55E* | 2.6 to 5.5/1.65 to 5.5 | 1.65 to V _{CC} | ✓ | ✓ | ✓ | ✓/— | 0.4/1 | | |

*UCSP offered.

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