

### FEATURES

- 0.1  $\mu$ F to 10  $\mu$ F capacitors
- 120 kB/s data rate
- Two receivers active in shutdown (ADM213)
- On-board dc-to-dc converters
- $\pm 9$  V output swing with 5 V supply
- Low power (15 mW)
- Low power shutdown  $\leq 5$   $\mu$ W
- $\pm 30$  V receiver input levels
- Latch-up free
- Plug-in upgrade for MAX205-211/213

### APPLICATIONS

Computers  
Peripherals  
Modems  
Printers  
Instruments

### GENERAL DESCRIPTION

The ADM2xx family of line drivers/receivers is intended for all EIA-232-E and V.28 communications interfaces, especially in applications where  $\pm 12$  V is not available. The ADM206, ADM211, and ADM213 feature a low power shutdown mode that reduces power dissipation to less than 5  $\mu$ W, making them ideally suited for battery-powered equipment. The ADM213 has an active low shutdown and an active high receiver-enable control. Two receivers of the ADM213 remain active during shutdown. This feature is useful for ring indicator monitoring.

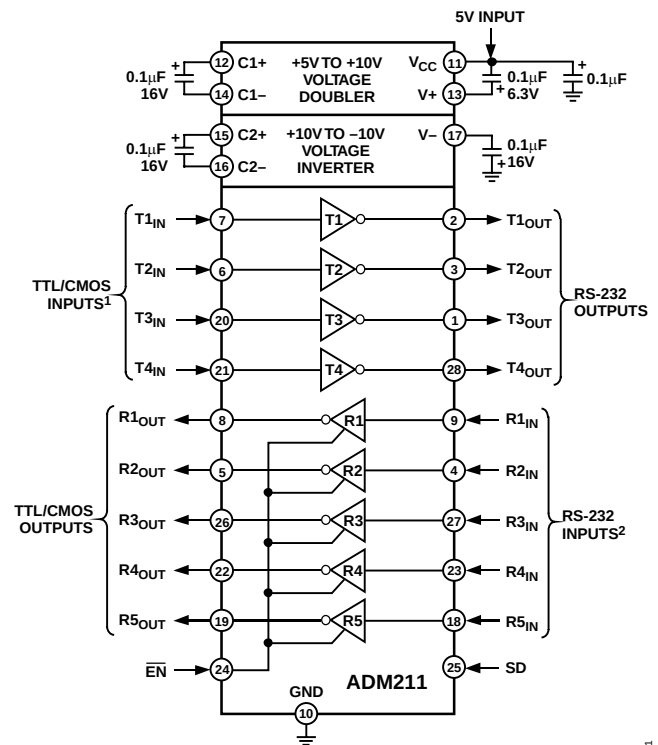
Table 1. Selection Table

| Part Number | Power Supply Voltage  | Number of RS-232 Drivers | Number of RS-232 Receivers | External Capacitors | Low Power Shutdown (SD) | TTL Three-State EN | Number of Receivers Active in Shutdown |
|-------------|-----------------------|--------------------------|----------------------------|---------------------|-------------------------|--------------------|----------------------------------------|
| ADM206      | 5 V                   | 4                        | 3                          | 4                   | Yes                     | Yes                | 0                                      |
| ADM207      | 5 V                   | 5                        | 3                          | 4                   | No                      | No                 | 0                                      |
| ADM208      | 5 V                   | 4                        | 4                          | 4                   | No                      | No                 | 0                                      |
| ADM209      | 5 V and 9 V to 13.2 V | 3                        | 5                          | 2                   | No                      | Yes                | 0                                      |
| ADM211      | 5 V                   | 4                        | 5                          | 4                   | Yes                     | Yes                | 0                                      |
| ADM213      | 5 V                   | 4                        | 5                          | 4                   | Yes (SD)                | Yes (EN)           | 2                                      |

#### Rev. C

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### TYPICAL OPERATING CIRCUIT



#### NOTES

- INTERNAL 400k $\Omega$  PULL-UP RESISTOR ON EACH TTL/CMOS INPUT.
- INTERNAL 5k $\Omega$  PULL-DOWN RESISTOR ON EACH RS-232 INPUT.

Figure 1.

All members of the ADM2xx family, except the ADM209, include two internal charge pump voltage converters that allow operation from a single 5 V supply. These parts convert the 5 V input power to the  $\pm 10$  V required for RS-232 output levels. The ADM209 is designed to operate from 5 V and 12 V supplies. An internal +12 V to -12 V charge pump voltage converter generates the -12 V supply.

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REVISION HISTORY

|                                                      |    |
|------------------------------------------------------|----|
| <b>1/05—Data Sheet Changed from Rev. B to Rev. C</b> |    |
| Changes to Specifications.....                       | 3  |
| Change to Receivers section.....                     | 11 |
| Change to Driving Long Cables section.....           | 12 |
| Updated Outline Dimensions.....                      | 13 |
| Changes to Ordering Guide.....                       | 15 |

|                                                      |           |
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| <b>6/02—Data Sheet Changed from Rev. A to Rev. B</b> |           |
| Removed all references to ADM205 .....               | Universal |

|                                                      |      |
|------------------------------------------------------|------|
| <b>3/02—Data Sheet Changed from Rev. 0 to Rev. A</b> |      |
| Changes to numbers in Min/Typ/Max column of          |      |
| Specifications page .....                            | 2    |
| Updated Figures.....                                 | 8, 9 |

Revision 0: Initial Version

## SPECIFICATIONS

$V_{CC} = 5\text{ V} \pm 10\%$  (ADM206, ADM207, ADM208, ADM209, ADM211, ADM213);  $V_+ = 9\text{ V}$  to  $13.2\text{ V}$  (ADM209);  $C1\text{--}C4 = 0.1\text{ }\mu\text{F}$  ceramic. All specifications  $T_{MIN}$  to  $T_{MAX}$ , unless otherwise noted.

**Table 2.**

| Parameter                               | Min     | Typ      | Max      | Unit             | Test Conditions/Comments                                                                                                        |
|-----------------------------------------|---------|----------|----------|------------------|---------------------------------------------------------------------------------------------------------------------------------|
| Output Voltage Swing                    | $\pm 5$ | $\pm 9$  |          | V                | All transmitter outputs loaded with $3\text{ k}\Omega$ to ground                                                                |
| $V_{CC}$ Power Supply Current           |         | 5        | 13       | mA               | No load                                                                                                                         |
|                                         |         | 0.4      | 1        | mA               | No load, ADM209                                                                                                                 |
| $V_+$ Power Supply Current              |         | 3.5      | 5        | mA               | No load, $V_+ = 12\text{ V}$ , ADM209 only                                                                                      |
| Shutdown Supply Current                 |         | 1        | 10       | $\mu\text{A}$    |                                                                                                                                 |
| Input Logic Threshold Low, $V_{INL}$    |         |          | 0.8      | V                | $T_{IN}, \overline{EN}, SD, EN, \overline{SD}$                                                                                  |
| Input Logic Threshold High, $V_{INH}$   | 2.0     |          |          | V                | $T_{IN}, \overline{EN}, SD, EN, \overline{SD}$                                                                                  |
| Logic Pull-Up Current                   |         | 10       | 25       | $\mu\text{A}$    | $T_{IN} = 0\text{ V}$                                                                                                           |
| RS-232 Input Voltage Range <sup>1</sup> | $-30$   |          | $+30$    | V                |                                                                                                                                 |
| RS-232 Input Threshold Low              | 0.8     | 1.25     |          | V                |                                                                                                                                 |
| RS-232 Input Threshold High             |         | 1.9      | 2.4      | V                |                                                                                                                                 |
| RS-232 Input Hysteresis                 |         | 0.65     |          | V                |                                                                                                                                 |
| RS-232 Input Resistance                 | 3       | 5        | 7        | $\text{k}\Omega$ | $T_A = 0^\circ\text{C}$ to $85^\circ\text{C}$                                                                                   |
| TTL/CMOS Output Voltage Low, $V_{OL}$   |         |          | 0.4      | V                | $I_{OUT} = 1.6\text{ mA}$                                                                                                       |
| TTL/CMOS Output Voltage High, $V_{OH}$  | 3.5     |          |          | V                | $I_{OUT} = -1.0\text{ mA}$                                                                                                      |
| TTL/CMOS Output Leakage Current         |         | 0.05     | $\pm 10$ | $\mu\text{A}$    | $\overline{EN} = V_{CC}, EN = 0\text{ V}, 0\text{ V} \leq R_{OUT} \leq V_{CC}$                                                  |
| Output Enable Time ( $T_{EN}$ )         |         | 115      |          | ns               | ADM206, ADM209, ADM211 (Figure 24. $C_L = 150\text{ pF}$ )                                                                      |
| Output Disable Time ( $T_{DIS}$ )       |         | 165      |          | ns               | ADM206, ADM209, ADM211 (Figure 24. $R_L = 1\text{ k}\Omega$ )                                                                   |
| Propagation Delay                       |         | 0.5      | 5        | $\mu\text{s}$    | RS-232 to TTL                                                                                                                   |
| Transition Region Slew Rate             |         | 8        |          | V/ $\mu\text{s}$ | $R_L = 3\text{ k}\Omega, C_L = 2500\text{ pF}$ ; measured from $+3\text{ V}$ to $-3\text{ V}$ or $-3\text{ V}$ to $+3\text{ V}$ |
| Output Resistance                       | 300     |          |          | $\Omega$         | $V_{CC} = V_+ = V_- = 0\text{ V}, V_{OUT} = \pm 2\text{ V}$                                                                     |
| RS-232 Output Short Circuit Current     |         | $\pm 12$ | $\pm 60$ | mA               |                                                                                                                                 |

<sup>1</sup> Guaranteed by design.

## ABSOLUTE MAXIMUM RATINGS

$T_A = 25^\circ\text{C}$ , unless otherwise noted.

**Table 3.**

| Parameter                                                               | Min                                           |
|-------------------------------------------------------------------------|-----------------------------------------------|
| $V_{CC}$                                                                | –0.3 V to +6 V                                |
| $V_+$                                                                   | ( $V_{CC} - 0.3$ V) to +14 V                  |
| $V_-$                                                                   | +0.3 V to –14 V                               |
| Input Voltages                                                          |                                               |
| $T_{IN}$                                                                | –0.3 V to ( $V_{CC} + 0.3$ V)                 |
| $R_{IN}$                                                                | $\pm 30$ V                                    |
| Output Voltages                                                         |                                               |
| $T_{OUT}$                                                               | ( $V_+$ , +0.3 V) to ( $V_-$ , –0.3 V)        |
| $R_{OUT}$                                                               | –0.3 V to ( $V_{CC} + 0.3$ V)                 |
| Short-Circuit Duration                                                  |                                               |
| $T_{OUT}$                                                               | Continuous                                    |
| Power Dissipation                                                       |                                               |
| N-24 PDIP (Derate 13.5 mW/ $^\circ\text{C}$ above 70 $^\circ\text{C}$ ) | 1000 mW                                       |
| R-24 SOIC (Derate 12 mW/ $^\circ\text{C}$ above 70 $^\circ\text{C}$ )   | 850 mW                                        |
| R-28 SOIC (Derate 12.5 mW/ $^\circ\text{C}$ above 70 $^\circ\text{C}$ ) | 900 mW                                        |
| RS-24 SSOP (Derate 12 mW/ $^\circ\text{C}$ above 70 $^\circ\text{C}$ )  | 850 mW                                        |
| RS-28 SSOP (Derate 10 mW/ $^\circ\text{C}$ above 70 $^\circ\text{C}$ )  | 900 mW                                        |
| Thermal Impedance, $\theta_{JA}$                                        |                                               |
| N-24 PDIP                                                               | 120 $^\circ\text{C}/\text{W}$                 |
| R-24 SOIC                                                               | 85 $^\circ\text{C}/\text{W}$                  |
| R-28 SOIC                                                               | 80 $^\circ\text{C}/\text{W}$                  |
| RS-24 SSOP                                                              | 115 $^\circ\text{C}/\text{W}$                 |
| RS-28 SSOP                                                              | 100 $^\circ\text{C}/\text{W}$                 |
| Operating Temperature Range                                             |                                               |
| Industrial (A Version)                                                  | –40 $^\circ\text{C}$ to +85 $^\circ\text{C}$  |
| Storage Temperature Range                                               | –65 $^\circ\text{C}$ to +150 $^\circ\text{C}$ |
| Lead Temperature, Soldering                                             | 300 $^\circ\text{C}$                          |
| Vapor Phase (60 s)                                                      | 215 $^\circ\text{C}$                          |
| Infrared (15 s)                                                         | 220 $^\circ$                                  |

Stresses above those listed under Absolute Maximum Ratings may cause permanent damage to the device. This is a stress rating only; functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods of time may affect device reliability.

## ESD CAUTION

ESD (electrostatic discharge) sensitive device. Electrostatic charges as high as 4000 V readily accumulate on the human body and test equipment and can discharge without detection. Although this product features proprietary ESD protection circuitry, permanent damage may occur on devices subjected to high energy electrostatic discharges. Therefore, proper ESD precautions are recommended to avoid performance degradation or loss of functionality.



## PIN CONFIGURATIONS AND FUNCTIONAL DESCRIPTIONS

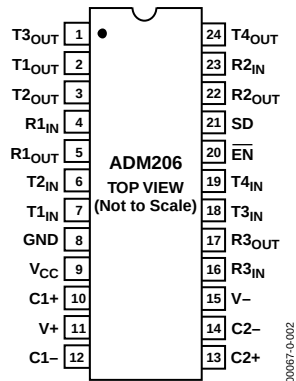


Figure 2. ADM206 PDIP/SOIC/SSOP Pin Configuration

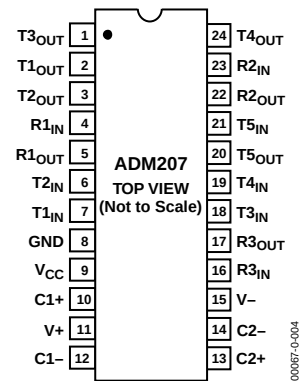
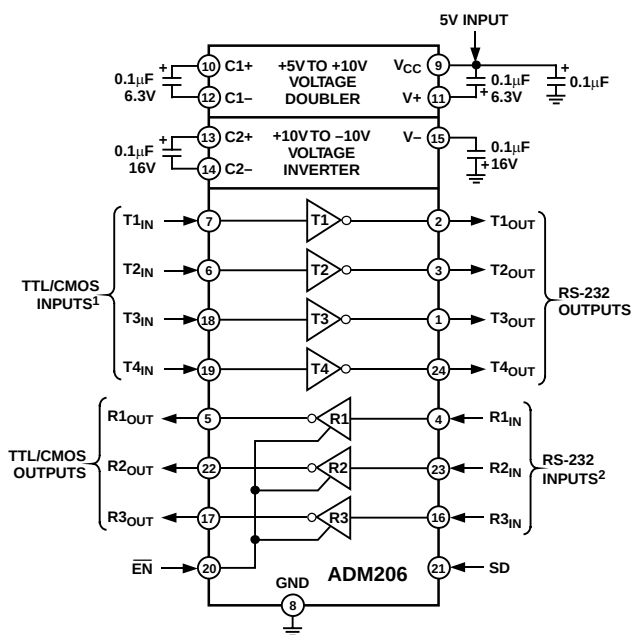
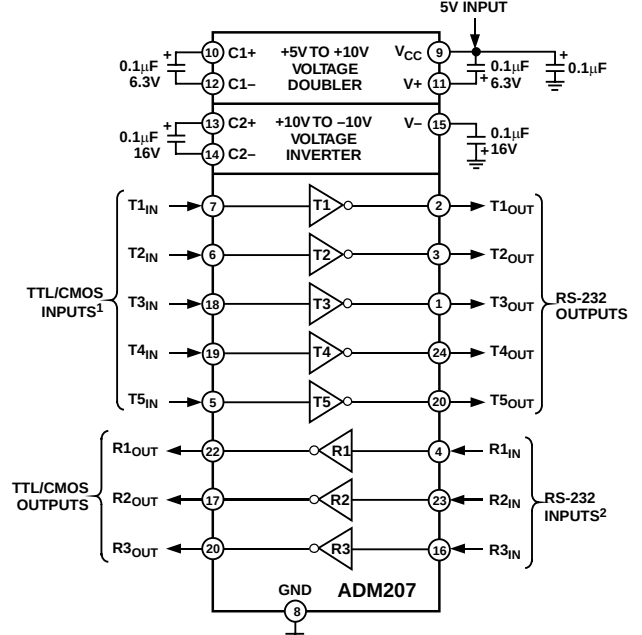


Figure 4. ADM207 PDIP/SOIC/SSOP Pin Configuration



NOTES  
<sup>1</sup>INTERNAL 400kΩ PULL-UP RESISTOR ON EACH TTL/CMOS INPUT.  
<sup>2</sup>INTERNAL 5kΩ PULL-DOWN RESISTOR ON EACH RS-232 INPUT.

Figure 3. ADM206 Typical Operating Circuit



NOTES  
<sup>1</sup>INTERNAL 400kΩ PULL-UP RESISTOR ON EACH TTL/CMOS INPUT.  
<sup>2</sup>INTERNAL 5kΩ PULL-DOWN RESISTOR ON EACH RS-232 INPUT.

Figure 5. ADM207 Typical Operating Circuit

# ADM206–ADM211/ADM213

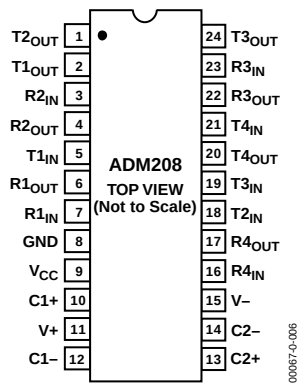


Figure 6. ADM208 PDIP/SOIC/SSOP Pin Configuration

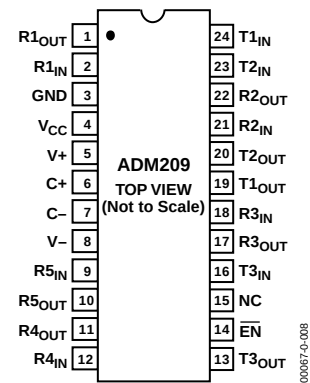
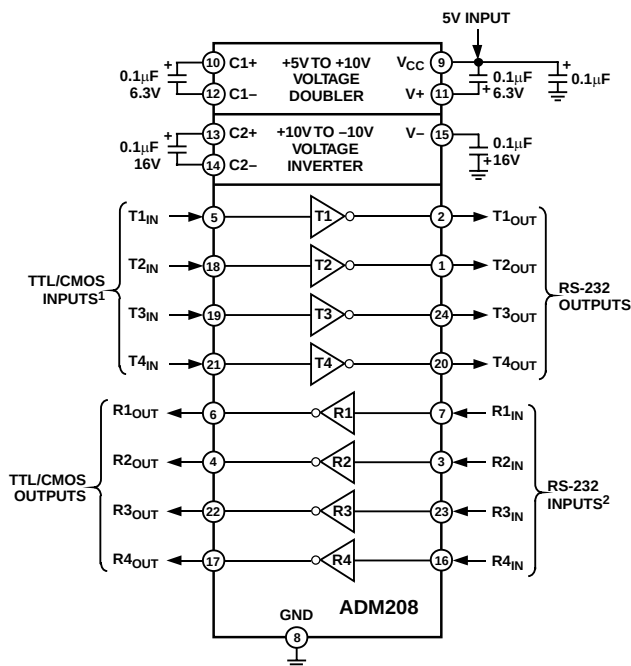


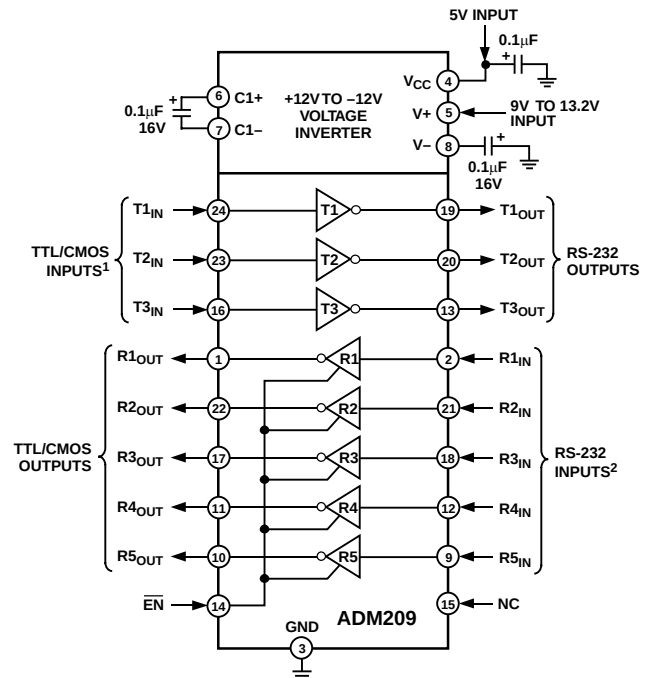
Figure 8. ADM209 PDIP/SOIC/SSOP Pin Configuration



## NOTES

- <sup>1</sup>INTERNAL 400k $\Omega$  PULL-UP RESISTOR ON EACH TTL/CMOS INPUT.
- <sup>2</sup>INTERNAL 5k $\Omega$  PULL-DOWN RESISTOR ON EACH RS-232 INPUT.

Figure 7. ADM208 Typical Operating Circuit



## NOTES

- <sup>1</sup>INTERNAL 400k $\Omega$  PULL-UP RESISTOR ON EACH TTL/CMOS INPUT.
- <sup>2</sup>INTERNAL 5k $\Omega$  PULL-DOWN RESISTOR ON EACH RS-232 INPUT.

Figure 9. ADM209 Typical Operating Circuit

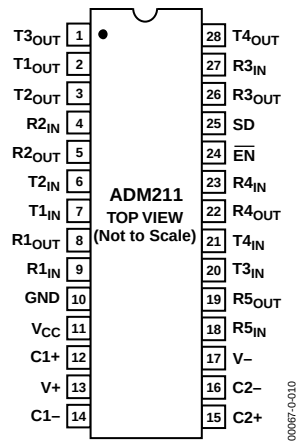


Figure 10. ADM211 SOIC/SSOP Pin Configuration

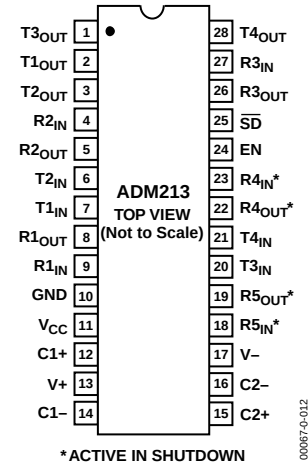
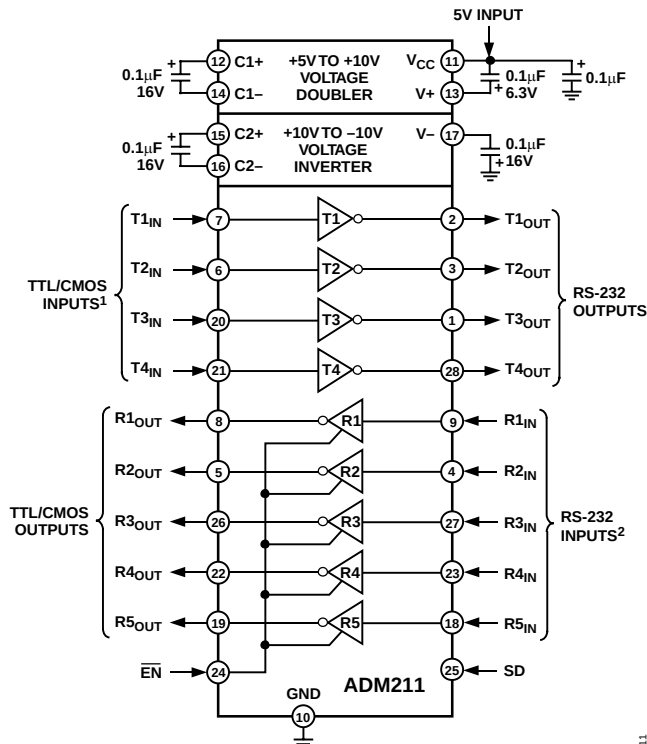
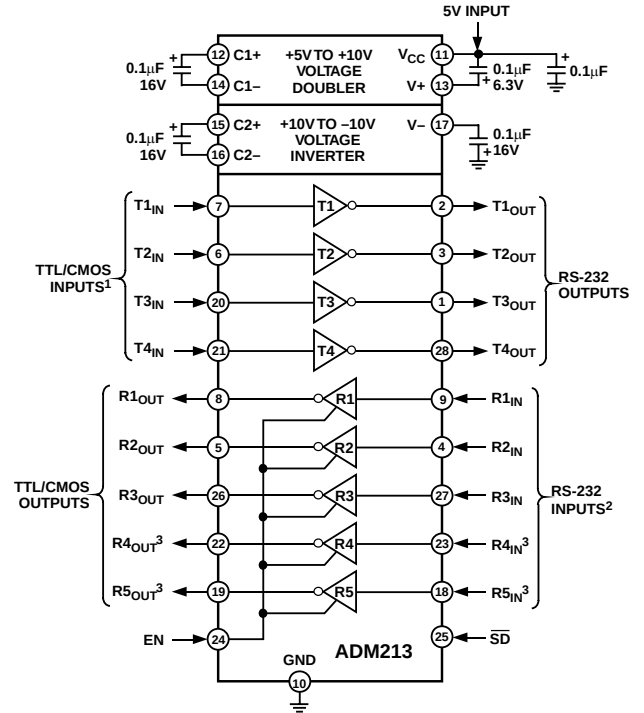


Figure 12. ADM213 SOIC/SSOP Pin Configuration



NOTES  
<sup>1</sup>INTERNAL 400kΩ PULL-UP RESISTOR ON EACH TTL/CMOS INPUT.  
<sup>2</sup>INTERNAL 5kΩ PULL-DOWN RESISTOR ON EACH RS-232 INPUT.

Figure 11. ADM211 Typical Operating Circuit



NOTES  
<sup>1</sup>INTERNAL 400kΩ PULL-UP RESISTOR ON EACH TTL/CMOS INPUT.  
<sup>2</sup>INTERNAL 5kΩ PULL-DOWN RESISTOR ON EACH RS-232 INPUT.  
<sup>3</sup>ACTIVE IN SHUTDOWN.

Figure 13. ADM213 Typical Operating Circuit

# ADM206–ADM211/ADM213

**Table 4. Pin Function Descriptions**

| Mnemonic                   | Function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| V <sub>CC</sub>            | Power Supply Input. 5 V ± 10%.                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| V+                         | Internally Generated Positive Supply (10 V nominal) on all parts, except ADM209. The ADM209 requires an external 9 V to 13.2 V supply.                                                                                                                                                                                                                                                                                                                                                          |
| V–                         | Internally Generated Negative Supply (–10 V Nominal).                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| GND                        | Ground Pin. Must be connected to 0 V.                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| C+                         | (ADM209 only) External capacitor (+ terminal) is connected to this pin.                                                                                                                                                                                                                                                                                                                                                                                                                         |
| C–                         | (ADM209 only) External capacitor (– terminal) is connected to this pin.                                                                                                                                                                                                                                                                                                                                                                                                                         |
| C1+                        | (ADM206, ADM207, ADM208, ADM211, and ADM213) External Capacitor (+ terminal) is connected to this pin.                                                                                                                                                                                                                                                                                                                                                                                          |
| C1–                        | (ADM206, ADM207, ADM208, ADM211, and ADM213) External Capacitor (– terminal) is connected to this pin.                                                                                                                                                                                                                                                                                                                                                                                          |
| C2+                        | (ADM206, ADM207, ADM208, ADM211, and ADM213) External Capacitor (+ terminal) is connected to this pin.                                                                                                                                                                                                                                                                                                                                                                                          |
| C2–                        | (ADM206, ADM207, ADM208, ADM211, and ADM213) External Capacitor (– terminal) is connected to this pin.                                                                                                                                                                                                                                                                                                                                                                                          |
| T <sub>IN</sub>            | Transmitter (Driver) Inputs. These inputs accept TTL/CMOS levels. An internal 400 kΩ pull-up resistor to V <sub>CC</sub> is connected to each input.                                                                                                                                                                                                                                                                                                                                            |
| T <sub>OUT</sub>           | Transmitter (Driver) Outputs. These are RS-232 levels (typically ± 10 V).                                                                                                                                                                                                                                                                                                                                                                                                                       |
| R <sub>IN</sub>            | Receiver Inputs. These inputs accept RS-232 signal levels. An internal 5 kΩ pull-down resistor to GND is connected to each input.                                                                                                                                                                                                                                                                                                                                                               |
| R <sub>OUT</sub>           | Receiver Outputs. These are TTL/CMOS levels.                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| EN/ $\overline{\text{EN}}$ | Enable Input. Active low on ADM206, ADM209, and ADM211. Active high on ADM213. This input is used to enable/disable the receiver outputs. With $\overline{\text{EN}}$ = low (EN = high ADM213), the receiver outputs are enabled. With $\overline{\text{EN}}$ = high (EN = low ADM213), the outputs are placed in a high impedance state. This is useful for connecting to microprocessor systems.                                                                                              |
| SD/ $\overline{\text{SD}}$ | Shutdown Input. Active high on ADM206 and ADM211. Active low on ADM213. With SD = high on the ADM206 and ADM211, the charge pump is disabled, the receiver outputs are placed in a high impedance state, and the driver outputs are turned off. With $\overline{\text{SD}}$ = low on the ADM213, the charge pump is disabled, the driver outputs are turned off, and all receivers, except R4 and R5, are placed in a high impedance state. In shutdown, the power consumption reduces to 5 μW. |
| NC                         | No Connect. No connections are required to this pin.                                                                                                                                                                                                                                                                                                                                                                                                                                            |

**Table 5. ADM206 and ADM211 Truth Table**

| SD | EN | Status           | Transmitters T1–T5 | Receivers R1–R5 |
|----|----|------------------|--------------------|-----------------|
| 0  | 0  | Normal Operation | Enabled            | Enabled         |
| 0  | 1  | Normal Operation | Enabled            | Disabled        |
| 1  | 0  | Shutdown         | Disabled           | Disabled        |

**Table 6. ADM213 Truth Table**

| SD | EN | Status           | Transmitters T1–T4 | Receivers R1–R3 | Receivers R4, R5 |
|----|----|------------------|--------------------|-----------------|------------------|
| 0  | 0  | Shutdown         | Disabled           | Disabled        | Disabled         |
| 0  | 1  | Shutdown         | Disabled           | Disabled        | Enabled          |
| 1  | 0  | Normal Operation | Enabled            | Disabled        | Disabled         |
| 1  | 1  | Normal Operation | Enabled            | Enabled         | Enabled          |



## TYPICAL PERFORMANCE CHARACTERISTICS

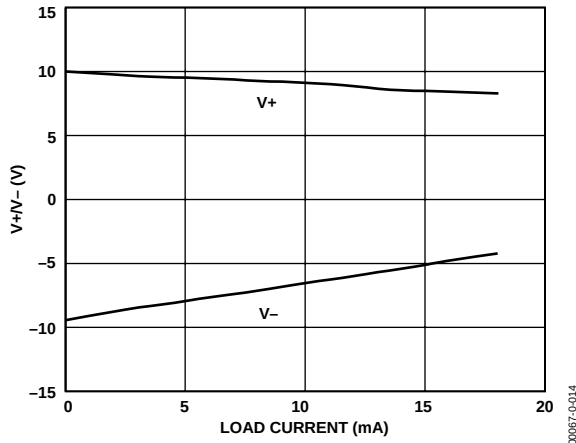


Figure 14. Charge Pump  $V_+$ ,  $V_-$  vs. Load Current

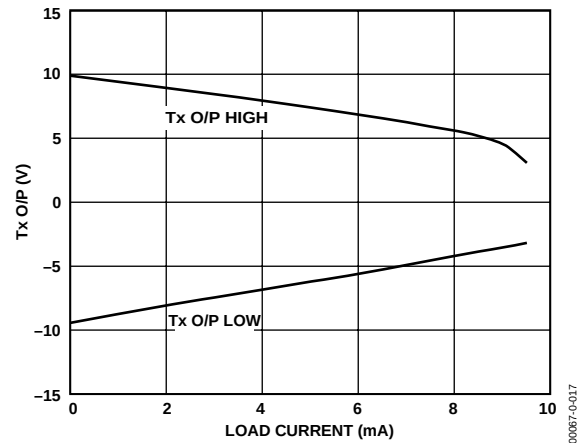


Figure 17. Transmitter Output Voltage vs. Load Current

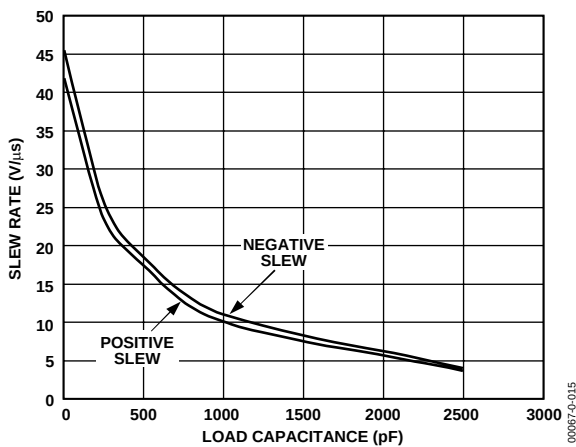


Figure 15. Transmitter Slew Rate vs. Load Capacitance

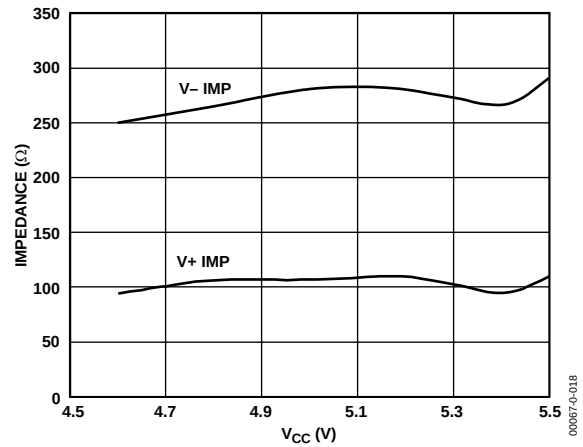


Figure 18. Charge Pump Impedance vs.  $V_{CC}$

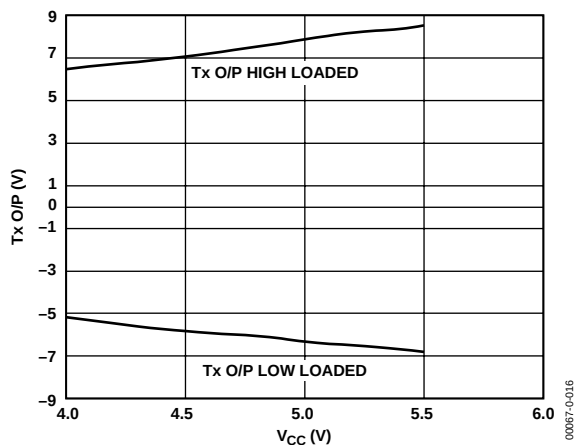


Figure 16. Transmitter Output Voltage vs.  $V_{CC}$

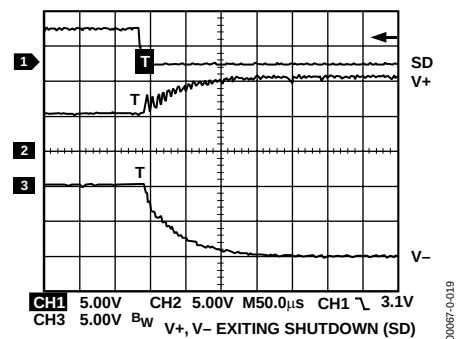


Figure 19. Charge Pump,  $V_+$ ,  $V_-$  Exiting Shutdown

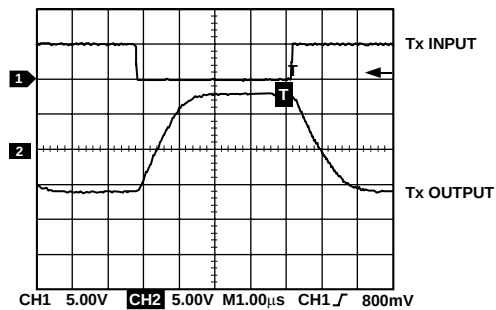


Figure 20. Transmitter Output Loaded Slew Rate

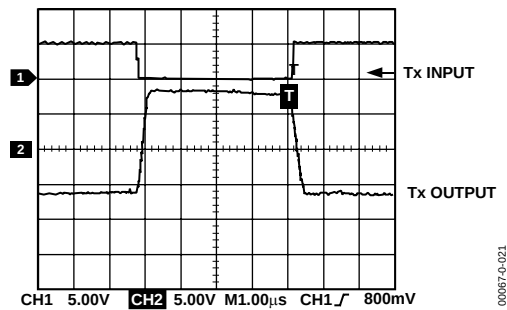


Figure 21. Transmitter Output Unloaded Slew Rate



## ADM206–ADM211/ADM213

Receivers R4 and R5 on the ADM213 remain enabled during shutdown. This feature allows monitoring external activity while the device is in a low power shutdown mode. The shutdown control input is active high on all parts except the ADM213, where it is active low. See Table 5 and Table 6.

### Enable Input

The ADM209, ADM211, and ADM213 feature an enable input used to enable or disable the receiver outputs. The enable input is active low on the ADM209 and ADM211 and active high on the ADM213. See Table 5 and Table 6. When the receivers are disabled, their outputs are placed in a high impedance state. This function allows the outputs to be connected directly to a microprocessor data bus. It can also be used to allow receivers from different devices to share a common data line. The timing diagram for the enable function is shown in Figure 24.

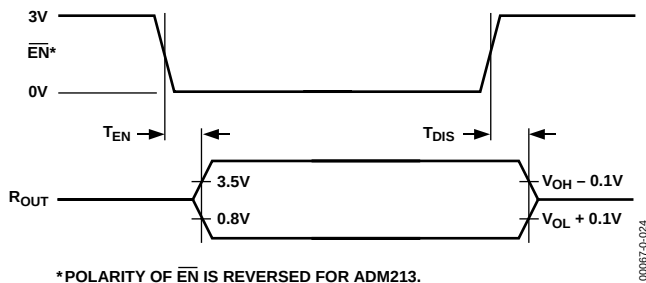


Figure 24. Enable Timing

## APPLICATION HINTS

### Driving Long Cables

In accordance with the EIA-232-E standard, long cables are permissible provided the total load capacitance does not exceed 2500 pF. For longer cables that do exceed this, it is possible to trade off baud rate for cable length. Large load capacitances cause a reduction in slew rate, and therefore the maximum transmission baud rate is decreased. The ADM206–ADM211/ADM213 are designed to minimize the slew rate reduction that occurs as load capacitance increases.

For the receivers, it is important that a high level of noise immunity be inbuilt so that slow rise and fall times do not cause multiple output transitions as the signal passes slowly through the transition region. The ADM206–ADM211/ADM213 have 0.65 V of hysteresis to guard against this. This ensures that even in noisy environments error-free reception can be achieved.

### High Baud Rate Operation

The ADM206–ADM211/ADM213 feature high slew rates, permitting data transmission at rates well in excess of the EIA-232-E specification. The drivers maintain  $\pm 5$  V signal levels at data rates up to 120 kB/s under worst-case loading conditions.

# OUTLINE DIMENSIONS

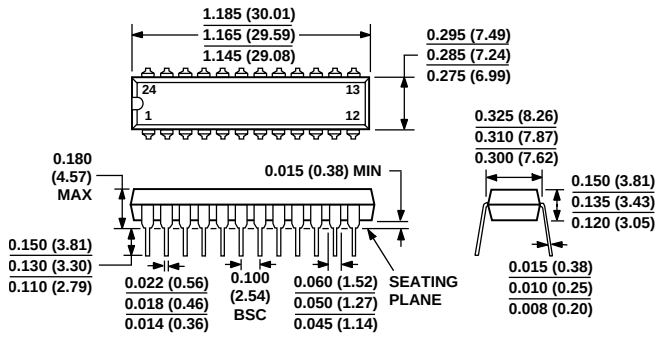


Figure 25. 24-Lead Plastic Dual In-Line Package [PDIP]  
(N-24)

Dimensions shown in inches and (millimeters)

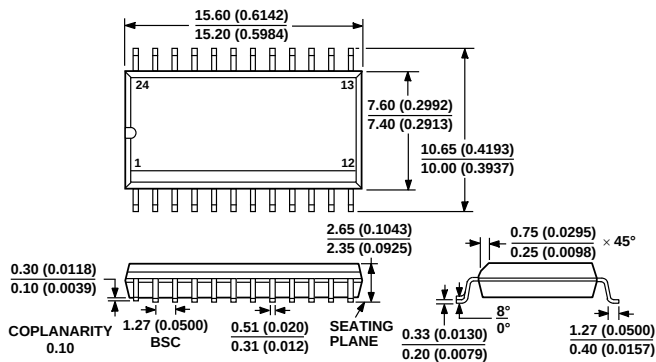


Figure 26. 24-Lead Standard Small Outline Package [SOIC]  
Wide Body  
(R-24)

Dimensions shown in millimeters and (inches)

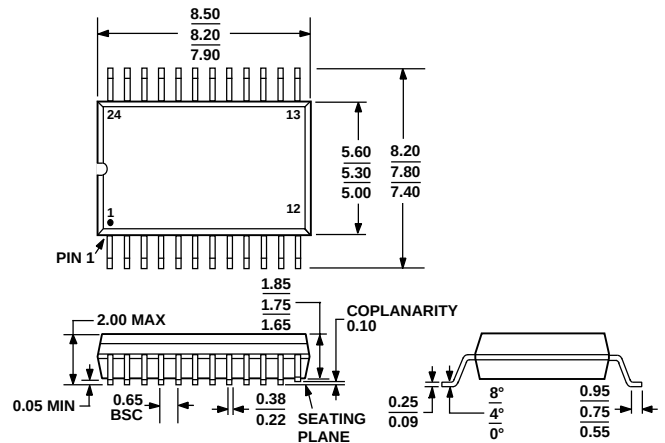


Figure 27. 24-Lead Shrink Small Outline Package [SSOP]  
(RS-24)

Dimensions shown in millimeters

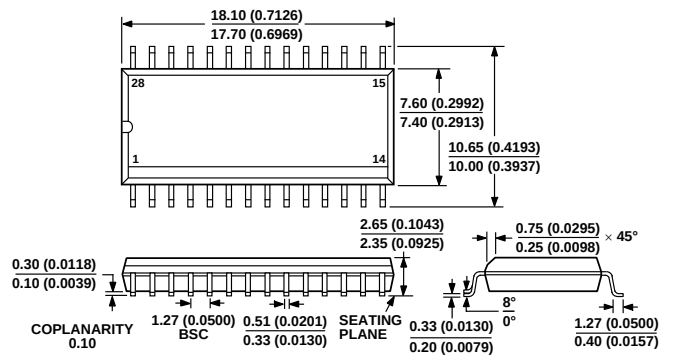
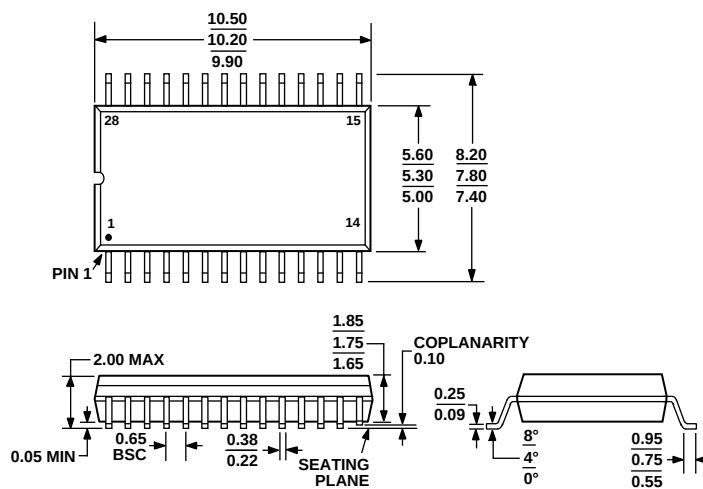


Figure 28. 28-Lead Standard Small Outline Package [SOIC]  
Wide Body  
(R-28)

Dimensions shown in millimeters and (inches)



COMPLIANT TO JEDEC STANDARDS MO-150AH

Figure 29. 28-Lead Shrink Small Outline Package [SSOP]  
(RS-28)  
Dimensions shown in millimeters

## ORDERING GUIDE

| Model                        | Temperature Range | Package Description | Package Option |
|------------------------------|-------------------|---------------------|----------------|
| ADM206AN                     | –40°C to +85°C    | 24-lead DIP         | N-24           |
| ADM206AR                     | –40°C to +85°C    | 24-lead SOIC        | R-24           |
| ADM206AR-REEL                | –40°C to +85°C    | 24-lead SOIC        | R-24           |
| ADM206ARS                    | –40°C to +85°C    | 24-lead SSOP        | RS-24          |
| ADM206ARS-REEL               | –40°C to +85°C    | 24-lead SSOP        | RS-24          |
| ADM206ARZ <sup>1</sup>       | –40°C to +85°C    | 24-lead SOIC        | R-24           |
| ADM206ARZ-REEL <sup>1</sup>  | –40°C to +85°C    | 24-lead SOIC        | R-24           |
| ADM207AN                     | –40°C to +85°C    | 24-lead DIP         | N-24           |
| ADM207AR                     | –40°C to +85°C    | 24-lead SOIC        | R-24           |
| ADM207AR-REEL                | –40°C to +85°C    | 24-lead SOIC        | R-24           |
| ADM207ARS                    | –40°C to +85°C    | 24-lead SSOP        | RS-24          |
| ADM207ARS-REEL               | –40°C to +85°C    | 24-lead SSOP        | RS-24          |
| ADM208AN                     | –40°C to +85°C    | 24-lead DIP         | N-24           |
| ADM208AR                     | –40°C to +85°C    | 24-lead SOIC        | R-24           |
| ADM208AR-REEL                | –40°C to +85°C    | 24-lead SOIC        | R-24           |
| ADM208ARS                    | –40°C to +85°C    | 24-lead SSOP        | RS-24          |
| ADM208ARS-REEL               | –40°C to +85°C    | 24-lead SSOP        | RS-24          |
| ADM209AN                     | –40°C to +85°C    | 24-lead DIP         | N-24           |
| ADM209AR                     | –40°C to +85°C    | 24-lead SOIC        | R-24           |
| ADM209AR-REEL                | –40°C to +85°C    | 24-lead SOIC        | R-24           |
| ADM209ARS                    | –40°C to +85°C    | 24-lead SSOP        | RS-24          |
| ADM209ARS-REEL               | –40°C to +85°C    | 24-lead SSOP        | RS-24          |
| ADM211AR                     | –40°C to +85°C    | 28-lead SOIC        | R-28           |
| ADM211AR-REEL                | –40°C to +85°C    | 28-lead SOIC        | R-28           |
| ADM211ARS                    | –40°C to +85°C    | 28-lead SSOP        | RS-28          |
| ADM211ARS-REEL               | –40°C to +85°C    | 28-lead SSOP        | RS-28          |
| ADM211ARSZ <sup>1</sup>      | –40°C to +85°C    | 28-lead SSOP        | RS-28          |
| ADM211ARSZ-REEL <sup>1</sup> | –40°C to +85°C    | 28-lead SSOP        | RS-28          |
| ADM213AR                     | –40°C to +85°C    | 28-lead SOIC        | R-28           |
| ADM213AR-REEL                | –40°C to +85°C    | 28-lead SOIC        | R-28           |
| ADM213ARS                    | –40°C to +85°C    | 28-lead SSOP        | RS-28          |
| ADM213ARS-REEL               | –40°C to +85°C    | 28-lead SSOP        | RS-28          |
| ADM213ARSZ <sup>1</sup>      | –40°C to +85°C    | 28-lead SSOP        | RS-28          |
| ADM213ARSZ-REEL <sup>1</sup> | –40°C to +85°C    | 28-lead SSOP        | RS-28          |

<sup>1</sup> Z = Pb-free part.

**NOTES**





Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

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