



High-Speed, 5 V, 0.1 μ F CMOS RS-232 Driver/Receivers

ADM202/ADM203

FEATURES

120 kB Transmission Rate

ADM202: Small (0.1 μ F) Charge Pump Capacitors

ADM203: No External Capacitors Required

Single 5 V Power Supply

Meets EIA-232-E and V.28 Specifications

Two Drivers and Two Receivers

On-Board DC-DC Converters

± 9 V Output Swing with 5 V Supply

Low Power BiCMOS: 2.0 mA I_{CC}

± 30 V Receiver Input Levels

APPLICATIONS

Computers

Peripherals

Modems

Printers

Instruments

GENERAL DESCRIPTION

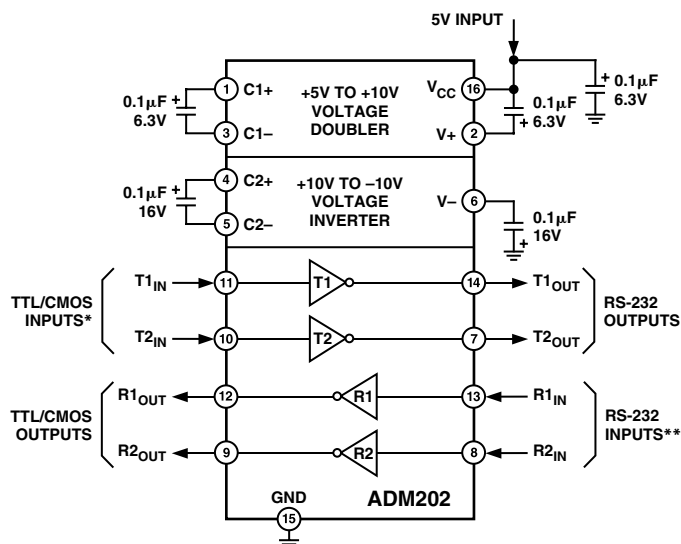
The ADM202/ADM203 is a two-channel RS-232 line driver/receiver pair designed to operate from a single 5 V power supply. A highly efficient on-chip charge pump design permits RS-232 levels to be developed using charge pump capacitors as small as 0.1 μ F. The capacitors are internal to the package on the ADM203 so no external capacitors are required. These converters generate ± 10 V RS-232 output levels.

The ADM202/ADM203 meets or exceeds the EIA-232-E and V.28 specifications. Fast driver slew rates permit operation up to 120 kB while high-drive currents allow for extended cable lengths.

An epitaxial BiCMOS construction minimizes power consumption to 10 mW and also guards against latch-up. Overvoltage protection is provided allowing the receiver inputs to withstand continuous voltages in excess of ± 30 V. In addition, all pins contain ESD protection to levels greater than 2 kV.

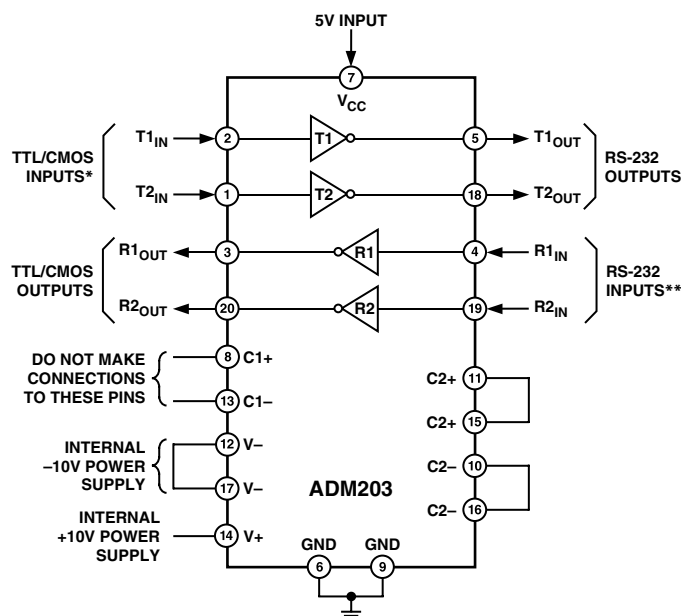
The ADM202 is available in 16-lead DIP and both narrow and wide SOIC packages. The ADM203 is available in a 20-lead DIP package.

FUNCTIONAL BLOCK DIAGRAMS



*INTERNAL 400k Ω PULL-UP RESISTOR ON EACH TTL/CMOS INPUT.

**INTERNAL 5k Ω PULL-DOWN RESISTOR ON EACH RS-232 INPUT.



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ADM202/ADM203—SPECIFICATIONS

($V_{CC} = 5\text{ V} \pm 10\%$, (ADM202 C1–C4 = 0.1 μF). All Specifications T_{MIN} to T_{MAX} , unless otherwise noted)

Parameter	Min	Typ	Max	Unit	Conditions/Comments
Output Voltage Swing	± 5	± 9		V	$V_{CC} = 5\text{ V} \pm 5\%$, $T1_{OUT}$, $T2_{OUT}$ Loaded with 3 k Ω to GND
Output Voltage Swing	± 5	± 9		V	$V_{CC} = 5\text{ V} \pm 10\%$, $T_A = 25^\circ\text{C}$, $T1_{OUT}$, $T2_{OUT}$ Loaded with 3 k Ω to GND
V_{CC} Power Supply Current		2.5	6.0	mA	No Load, $T1_{IN}$, $T2_{IN} = V_{CC}$ or $T1_{IN}$, $T2_{IN} = \text{GND}$
Input Logic Threshold Low, V_{INL}			0.8	V	T_{IN}
Input Logic Threshold High, V_{INH}	2.4			V	T_{IN}
Logic Pull-Up Current		12	25	μA	$T_{IN} = 0\text{ V}$
RS-232 Input Voltage Range	–30		+30	V	
RS-232 Input Threshold Low	0.8	1.2		V	
RS-232 Input Threshold High		1.6	2.4	V	
RS-232 Input Hysteresis	0.2	0.4	1.0	V	
RS-232 Input Resistance	3	5	7	k Ω	$T_A = 0^\circ\text{C}$ to 85°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	$I_{OUT} = -1.0\text{ mA}$
Propagation Delay		0.3	5	μs	RS-232 to TTL
Transition Region Slew Rate		8		V/ μs	$R_L = 3\text{ k}\Omega$, $C_L = 1000\text{ pF}$
Baud Rate	120			kB	Measured from +3 V to –3 V or –3 V to +3 V
Output Resistance	300			Ω	$R_L = 3\text{ k}\Omega$, $C_L = 1\text{ nF}$
RS-232 Output Short Circuit Current		± 10	± 60	mA	$V_{CC} = V_+ = V_- = 0\text{ V}$, $V_{OUT} = \pm 2\text{ V}$

Specifications subject to change without notice.

ABSOLUTE MAXIMUM RATINGS*

($T_A = 25^\circ\text{C}$ unless otherwise noted)

V_{CC}	6 V
V_+	($V_{CC} - 0.3\text{ V}$) to +14 V
V_-	+0.3 V to –14 V
Input Voltages	
T_{IN}	–0.3 V to ($V_{CC} + 0.3\text{ V}$)
R_{IN}	$\pm 30\text{ V}$
Output Voltages	
T_{OUT}	(V_+ , +0.3 V) to (V_- , –0.3 V)
R_{OUT}	–0.3 V to ($V_{CC} + 0.3\text{ V}$)
Short Circuit Duration	
T_{OUT}	Continuous
Power Dissipation	
N-16 DIP	470 mW
R-16N SOIC	600 mW
R-16W SOIC	500 mW
N-20 DIP	890 mW
Thermal Impedance	
N-16 DIP	135 $^\circ\text{C/W}$
R-16N SOIC	105 $^\circ\text{C/W}$

R-16W SOIC	105 $^\circ\text{C/W}$
N-20 DIP	125 $^\circ\text{C/W}$
Operating Temperature Range	
Commercial (J Version)	0 $^\circ\text{C}$ to 70 $^\circ\text{C}$
Storage Temperature Range	–65 $^\circ\text{C}$ to +150 $^\circ\text{C}$
Lead Temperature Soldering	
Vapor Phase (60 sec)	215 $^\circ\text{C}$
Infrared (15 sec)	220 $^\circ\text{C}$
ESD Rating	>2000 V

*This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operation sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods of time may affect reliability.

ORDERING GUIDE

Model	Temperature Range	Package Option
ADM202JN	0 $^\circ\text{C}$ to 70 $^\circ\text{C}$	N-16
ADM202JRN	0 $^\circ\text{C}$ to 70 $^\circ\text{C}$	R-16N
ADM202JRW	0 $^\circ\text{C}$ to 70 $^\circ\text{C}$	R-16W
ADM203JN	0 $^\circ\text{C}$ to 70 $^\circ\text{C}$	N-20

PIN CONFIGURATIONS



PIN FUNCTION DESCRIPTION

Mnemonic	Function
V _{CC}	Power Supply Input 5 V ± 10%.
V+	Internally Generated Positive Supply (+10 V nominal).
V-	Internally Generated Negative Supply (-10 V nominal).
GND	Ground Pin. Must be connected to 0 V.
C1+	ADM202 External Capacitor, (+ terminal) is connected to this pin. ADM203: The capacitor is connected internally and no external capacitor is required.
C1-	ADM202 External Capacitor, (- terminal) is connected to this pin. ADM203: The capacitor is connected internally and no external capacitor is required.
C2+	ADM202 External Capacitor, (+ terminal) is connected to this pin. ADM203: The capacitor is connected internally and no external capacitor is required.
C2-	ADM202 External Capacitor, (- terminal) is connected to this pin. ADM203: The capacitor is connected internally and no external capacitor is required.
T _{IN}	Transmitter (Driver) Inputs. These inputs accept TTL/CMOS levels. An internal 400 kΩ pull-up resistor to V _{CC} is connected on each input.
T _{OUT}	Transmitter (Driver) Outputs. These are RS-232 levels (typically ±10 V).
R _{IN}	Receiver Inputs. These inputs accept RS-232 signal levels. An internal 5 kΩ pull-down resistor to GND is connected on each of these inputs.
R _{OUT}	Receiver Outputs. These are TTL/CMOS levels.

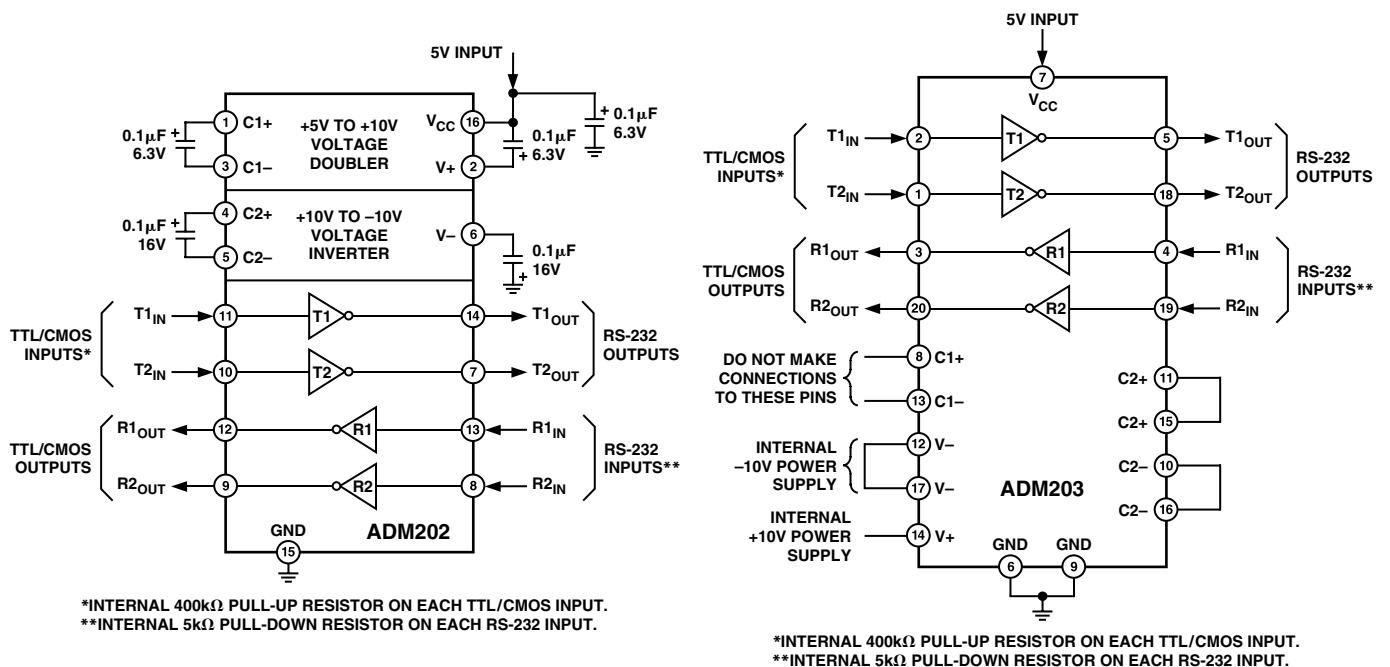
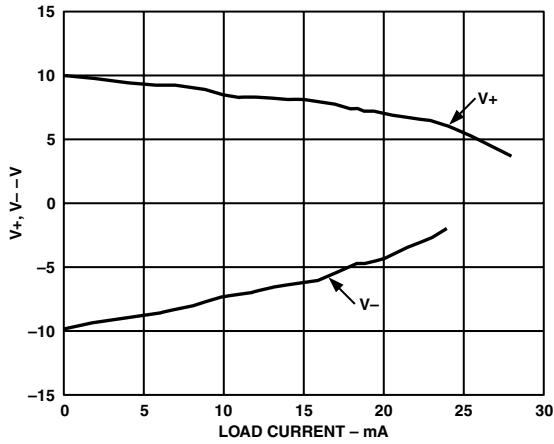
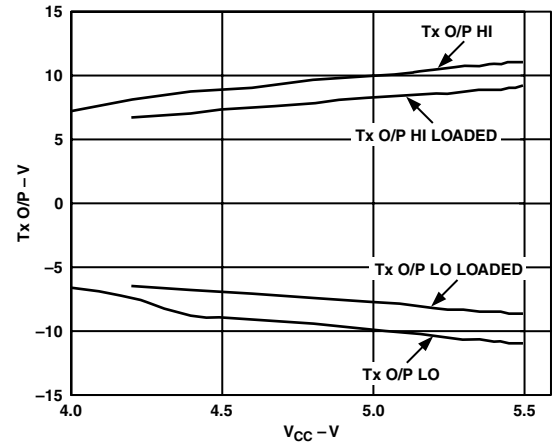


Figure 1. Typical Operating Circuits

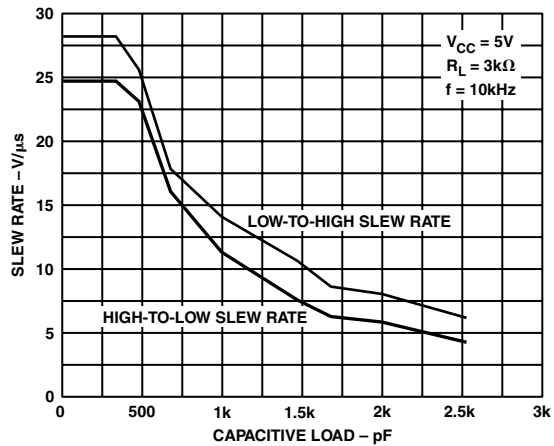
ADM202/ADM203—Typical Performance Characteristics



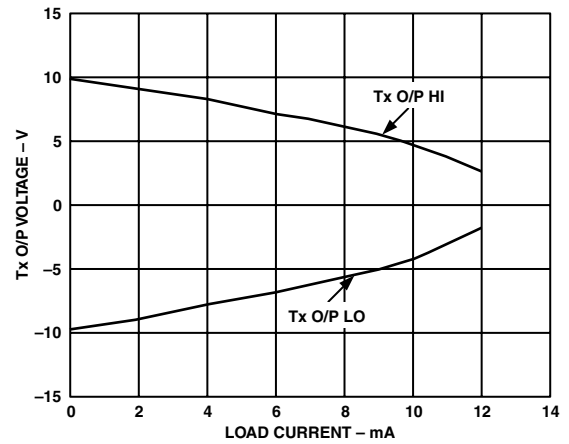
TPC 1. Charge Pump V_+ , V_- vs. Current



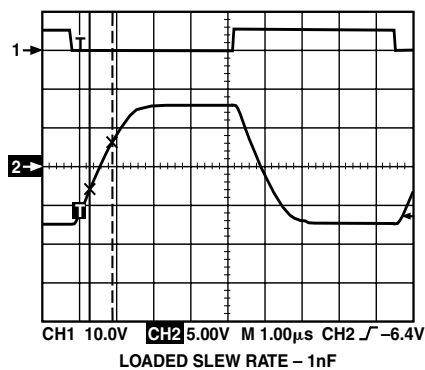
TPC 4. Transmitter Output Voltage vs. V_{CC}



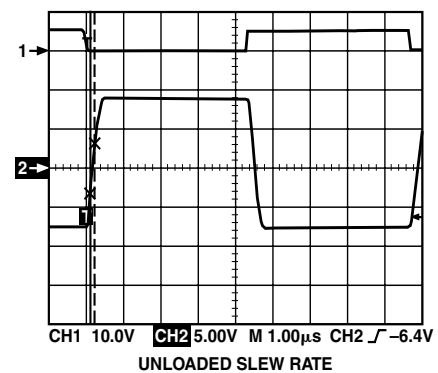
TPC 2. Transmitter Slew Rate vs. Load Capacitance



TPC 5. Transmitter Output Voltage vs. Current



TPC 3. Transmitter Fully Loaded Slew Rate

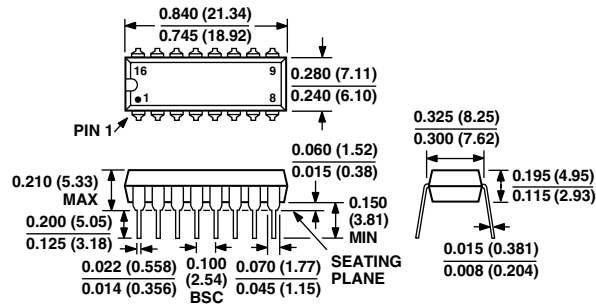


TPC 6. Transmitter Unloaded Slew Rate

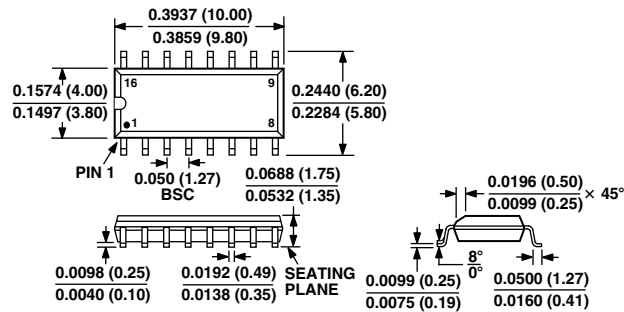
OUTLINE DIMENSIONS

Dimensions shown in inches and (mm).

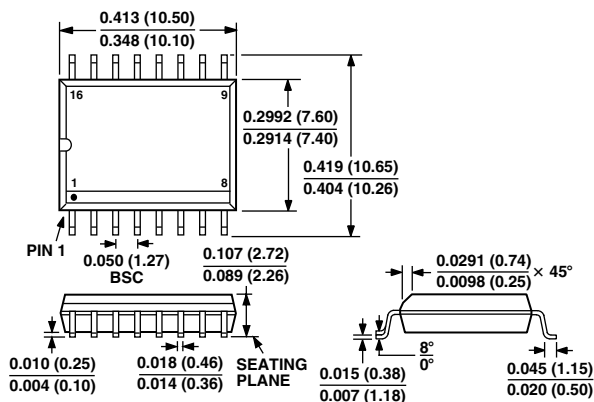
16-Lead Plastic DIP (N-16)



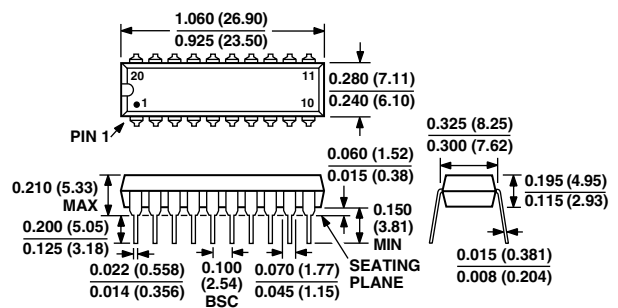
16-Lead Narrow SOIC (R-16N)



16-Lead Wide SOIC (R-16W)



20-Lead Plastic DIP (N-20)





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- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



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