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SO14 IC Serial Output IC For 14 Bits of Output

General Description

The SO14 IC is designed to provide 14 bits of output data to connect to RS-232, RS-485, USB, Ethernet or directly to your UART. Outputs can be used to drive relay contacts, logic, optocouplers or a transistors. The SO14 also provides a pulse output when the OB data bits are received. The serial input to the SO14 is standard asynchronous format, using 8 bits, 1 stop and no parity at 9600 BPS. Other formats and encoding are available, contact the factory. A .1 uF bypass capacitor is suggested across the VDD and VSS pins. The part uses the standard 20 pin .3 inch width SOIC package. This part may be paired with the SI14 chip to achieve 14 bits of input and output, except on RS -485 interfaces.

Features

- Asynchronous serial control for up to 14 bits of data.
- Output control using RS-232, RS-485, USB or Ethernet or UART.
- Can drive be used to drive relays, optocouplers, and logic.
- No external parts required.
- Low power consumption 5 mA typical.
- Supply voltage 2.4 to 5.25 volts.
- All timing internally generated.
- TTL and CMOS compatible outputs.
- Part is in full production.
- SOIC and DIP 20 Pin Package.
- ROHS Compliant
- Low EMI

Applications

- Output Expansion
- Remote control
- Process control
- Building Automation
- Off site monitoring
- Security systems
- Internet of things
- Machine control

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Example Circuits 14 BITS OUTPUT ETHERNET OUTPUT B1 OUTPUT B3 OUTPUT B5 OUTPUT A0 +3. OUTPUT A2 **OUTPUT A4** ℅ OUTPUT A6 LANTRONIX XPORT vgc GND SO14 +3.3 ETHERNET VDD -POR SIN-19 2 4 OUTPUT A5 Ś OA5 OA6 ÓŬŤ 3 18 5 OUTPUT A3 OA3 OA4 IN 4 17 6 OUTPUT A1 OA1 OA2 CP1 5 16 7 NC OA0 NC CP2 15 8 OUTPUT B6 OB6 CP3 14 OUTPUT B4 OB5 OB4 8 13 OUTPUT B2 OB2 OB3 9 12 OUTPUT B0 OB0 OB1 10 11 VSS RXP = 14 BITS OUTPUT USB vgc .01 BEAD .1 4.7 OUTPUT B1 24 FT232-SSOP OUTPUT B5 OUTPUT A0 OUTPUT A2 OUTPUT A4 \checkmark USB TXD RXD 5 16 USBM X 1 DTR CTS 211 -CTS 76 9 DTR RTS 69 DTR 100 CBUS0 2113 CBUS0 112 CBUS1 12 CBUS3 12 CBUS3 12 CBUS4 12 CBUS4 OUTPUT A6 2 3 DTR -CTS 15 USBP 4 5 VÇC 19 -RST 27 SO14 CASE OSCI OSCO NC 28_____ 8_____ 24____ SIN-OA5 VDD OA6 19 OUTPUT A5 OUTPUT A3 OUTPUT A1 18 3 OA6 OA4 OA2 OA0 NC OB5 OA3 NC 17 OA1 NC OB6 OB4 GND GND AGND TEST REFER TO FT232 DATASHEET 16 5 6 7 15 FOR MORE DETAILS OUTPUT B6 OUTPUT B4 OUTPUT B2 OUTPUT B0 14 13 8 OB2 OB3 25 12 9 OB0 VSS OB1 RXP 10 11 ŧ 14 BITS OUTPUT RS-485 OUTPUT B1 OUTPUT B3 OUTPUT B5 OUTPUT A0 OUTPUT A2 OUTPUT A4 vçc OUTPUT A6 vçc RO VCC SO14 SIN-OA5 20 VDD -DO/-RI RF 19 OUTPUT A5 OA6 RS485 18 OA3 OA1 NC OA4 OA2 OA0 OUTPUT A3 OUTPUT A1 DE DO / RI 17 16 15 GND DI OUTPUT B6 OB6 OB4 NC OB5 14 13 OUTPUT B4

Part Number SO14 Copyright © 2014 ABCircuits. Revised September 2014 Page 2 of 6

U2 75176 FOR 5V U2 MAX3485 FOR 3.3V

8

9

10

OB2 OB0

VSS

OB3 OB1

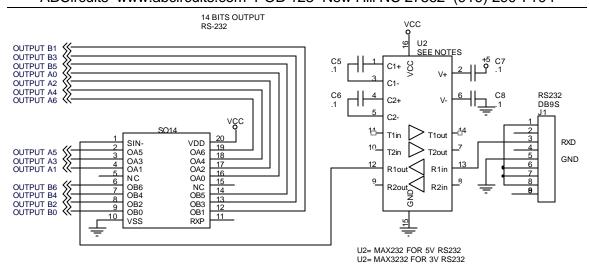
RXP

12

11

OUTPUT B2 OUTPUT B0

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Connection Diagram

		SO14		
1 2 3 4 5 6 7 8 9 9 10	SIN- OA5 OA3 OA1 NC OB6 OB4 OB2 OB0 VSS		VDD OA6 OA4 OA2 OA0 NC OB5 OB3 OB1 RXP	20 19 18 17 16 15 14 13 12 11

Pin Description

Pin #	Description	Pin #	Description	
1	SIN-	20	VDD	
2	OA5	19	OA6	
3	OA3	18	OA4	
4	OA1	17	OA2	
5	NC	16	OA0	
6	OB6	15	NC	
7	OB4	14	OB5	
8	OB2	13	OB3	
9	OB0	12	OB1	
10	VSS	21	RXP	

OA0-6 and OB0-6

These bits are set when a byte is received. If bit 8 is zero, the OA0-6 pins will be set. If bit 8 is a one, the OB0-6 pins will be set. Output drivers may be required for high power loads.

RXP

This pin outputs a positive pulse after a byte is received with bit 8 set to a one and the bits are placed on the OB pins. If bit 8 is zero, no pulse is generated on the RXP pin.



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SIN-

This is the serial input pin. It may be tied directly to the UART transmitter output of your UART or microprocessor; to a RS-232 receiver such as the MAX232; a RS485 receiver such as the 75176; an Ethernet interface such as the Lantronix Xport; or a USB IC such as the FT232. This pin is high in the idle state, the input format is 8 bits, 1 stop, no parity at 9600 BPS. Other formats and baud rates are available, please contact the factory for information. When the bits for OA0-6 are received, bit 8 of the received byte is a zero. When the bits for OB0-6 are received, bit 8 of the received byte is a one.

You can drive this input with any hexadecimal terminal program like REALTERM for testing and development.

vss

Connect to system ground.

VDD

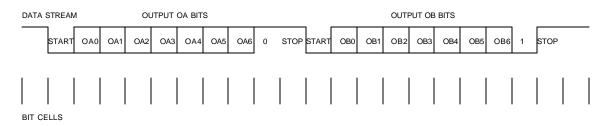
Connect to supply voltage of 2.4 to 5 volts. A .1 uF decoupling capacitor to ground is recommended.

NOTES:

Make no connection to the NC pins. Pins 5 and 15 must be left unconnected.

Serial Input Stream

When a byte is received on the SIN pin, bit 8 is tested. If the bit is a zero, the byte is placed on the OA pins. If bit 8 is a one, the byte is placed on the OB pins. The SI14 automatically removes start and stop bits from the data stream. The data is format is 9600 BPS, 8 bits, 1 stop, no parity.



Absolute Maximum Ratings

Symbol	Description	Min	Typical	Max	Units	Notes
T _{stg}	Storage Temperature	-55	25	+100	٥C	
Ta	Operating Temperature	-40		+85	٥C	
V _{dd}	V _{dd} - V _{ss} Voltage	-0.5		+6.0	V	
Vio	Input Voltage	V _{ss} - 0.5		V _{dd} +0.5	V	
I _{mio}	Maximum current into any pin	-25		+50	mA	
ESD	Electrostatic Discharge Voltage	2000			V	Human Body Model ESD
LU	Latch up current			200	mA	

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DC Electrical Characteristics						
Symbol	Description	Min	Typical	Max	Units	Notes
V _{dd}	Supply Voltage	2.4		5.25	V	
l _{dd}	Supply Current		5	8	mA	Note 1
V _{oh}	High Output Level	V _{dd} - 1.0			V	l _{oh} =10 mA
Vol	Low Output Voltage			0.75	V	l _{ol} =25 mA
V _{ih}	Input High Level	2.1			V	
V _{il}	Input Low Level			0.8	V	
l _{oh}	High Level Source Current			10	mA	
loi	Low Level Sink Current			25	mA	
C _{io}	Capacitive load		3.5	10	pF	
li li	Input leakage		1		nA	
R _{pu}	Pull Up Resistors On Inputs IA, IB, and SPD	4	5.6	8	k?	

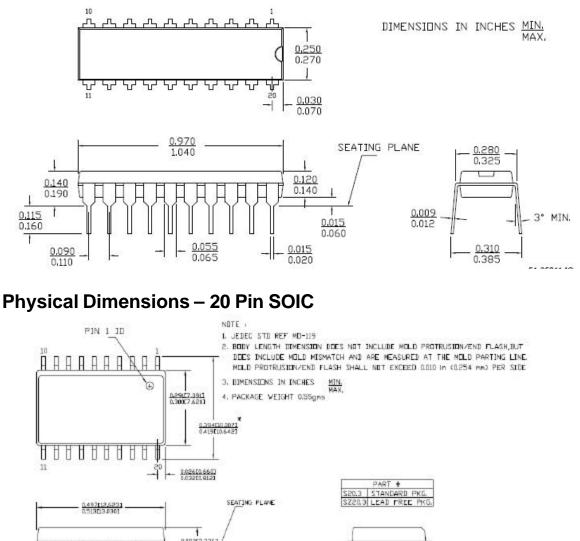
Note 1: Vdd=5VDC, all inputs and outputs open

Theory Of Operation

The SO14 IC is a custom programmed microprocessor designed to monitor a serial input stream and control outputs. When a byte is received, bit 8 is tested. If bit 8 is zero, the byte is placed on the OA pins. If bit 8 is one, the byte is placed on the OB pins and positive pulse is generated on the RXP pin. The data is standard asynchronous format 8 data bits, 1 stop bit and no parity. Baud rate is 9600 BPS. The OB and OA bytes may be sent in any order. It is recommended that the OA and OB bytes be sent periodically even if there is no change, to recover from power failure or serial data errors.

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Physical Dimensions – 20 Pin DIP (-DIP Suffix)





Close but not quite?

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