

DALLAS

SEMICONDUCTOR

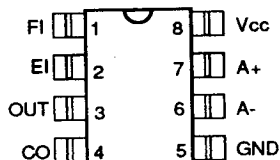
DS1203S-B1

MicroPower Receiver Chip

FEATURES

- Input channel continuously listens for input signals up to 250 KHz
- Ultra low-power listening gives longevity to the 3-volt supply
- 25 mV P-P input signal drives output to supply levels
- Electronic freshness seal eliminates power consumption during storage
- Applications include RF, IR, or magnetic front end for wireless devices
- Space-saving; small outline surface mount package

PIN CONNECTIONS



8-PIN SOIC
(150 MIL)

See Mechanical Drawing
Section 16, pg. 5

PIN NAMES

Vcc	- 3-volt Supply
GND	- Ground
FI	- Freshness Input
EI	- Enable Input
OUT	- Signal Output
CO	- Cycle Output
A+	- Non-inverting Input
A-	- Inverting Input

DESCRIPTION

The DS1203S-B1 MicroPower Receiver Chip is an ultra low-power comparator circuit designed to listen for signals of up to 250 KHz. Input signals as small as 25 mV peak-to-peak are presented at the output as full power supply level signals. The DS1203S-B1 makes an ideal front end for wireless communication links via RF, IR, ultrasound or magnetic field. The ultra low power feature

allows remote applications to be permanently powered by a single three-volt lithium energy source capable of lasting over ten years. A freshness seal can disconnect the power supply so that energy loss is avoided during periods of storage. The freshness seal is activated or deactivated through the use of a pulse packet protocol and the Freshness Input pin.

OPERATION

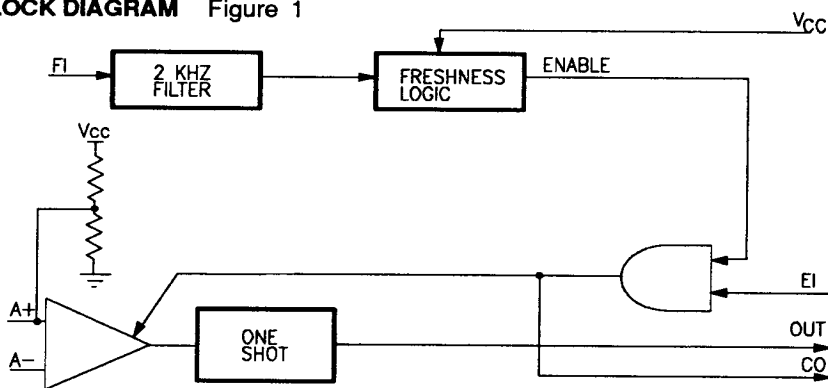
A block diagram of the DS1203S-B1 MicroPower Receiver Chip is shown in Figure 1. The device consists of a comparator which can be enabled by two sources. The enable input (EI) can be used to turn on the comparator directly, provided the freshness seal has been enabled. When the comparator is enabled, signals present at inputs A+ and A- of a magnitude greater than 25 mV peak-to-peak produce voltage swings between power supply input and ground at the output. In addition, the A+ input has a bias resistor of R_b approximately equal to 10M ohms to place the A+ pin at approximately $V_{DD}/2$. This facilitates differential reception.

FRESHNESS SEAL

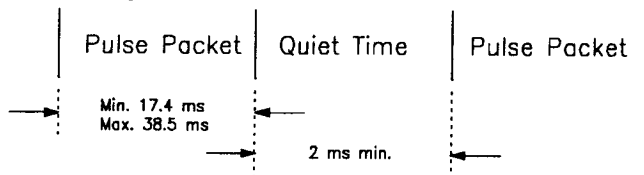
The freshness seal input pin (FI) is used to either stop or start DS1203S-B1 power consumption. This input accepts a pulse packet which is comprised of a series of pulses, representing either a logic 0 or a logic 1, separated by a 2-millisecond quiet time. Each pulse packet has a minimum aperture time of 17.4 milliseconds and a maximum aperture time of 38.5 milliseconds (see Figure 2). When the seal is intact, the comparator continuously listens for activity at the inputs. When the seal is broken, the DS1203S-B1 enters a no-power consumption mode.

Within this aperture time, a logic 0 is represented as 32 to 47 pulses. A logic 1 is represented as 48 to 63 pulses. The type of pulse packet command, either a seal or a break, is illustrated in Figure 3.

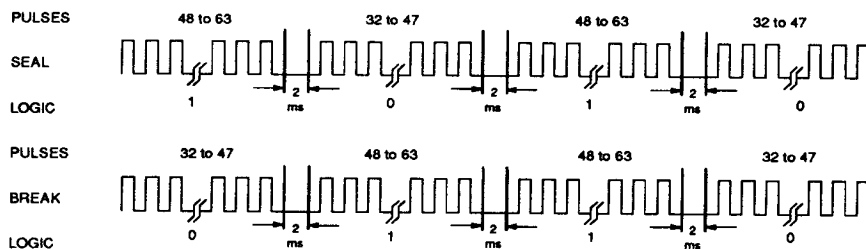
DS1203 BLOCK DIAGRAM Figure 1



FRESHNESS SEAL Figure 2



SEAL AND BREAK COMMAND Figure 3



ABSOLUTE MAXIMUM RATINGS*

Voltage on any Pin Relative to Ground

0.5V to +7V

Operating Temperature

0°C to 70°C

Storage Temperature

-55°C to +125°C

Soldering Temperature

260°C for 10 sec.

*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.

RECOMMENDED DC OPERATING CONDITIONS

(0°C to 70°C)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	NOTES
Power Supply Voltage	V_{CC}	2.5	3.0	5.5	Volts	1
Input Logic 1	V_{IH}	2.0		$V_{CC} + 0.3$	Volts	1, 2
Input Logic 0	V_{IL}	-0.3		0.8	Volts	1, 2
Input Sensitivity	V_{SIN}	25	20		mVolts	
FI Input Logic 1	V_{IHF}	2.0		$V_{CC} + 0.3$	Volts	1
FI Input Logic 0	V_{ILF}	-0.3		0.4	Volts	1

DC ELECTRICAL CHARACTERISTICS(0°C to 70°C, $V_{CC}=2.5$ to 3.5V)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	NOTES
Input Leakage	I_{IL}	-1.0		1.0	μA	
Output Logic 1	V_{OH}	$V_{CC} - 0.3$			Volts	1
Output Logic 0	V_{OL}			0.4	Volts	1
Operating Current	I_{CC}			3	μA	5
Power Down Current	I_{CC1}			50	μA	3
Output Current Logic 1	I_{OH}			250	μA	
Output Current Logic 0	I_{OL}			500	μA	
Propagation Delay	t_{PD}			30	μS	4
Comparator Sensitivity	V_{SINE}	25	20		mVpk-pk	6
Comparator Frequency	C_{FREQ}	0		250	KHz	
Comparator Input Resistance	R_{IMP}	1			M ohm	
Input Capacitance	C_{IMP}			5	pF	

NOTES:

1. All voltages are referenced to ground.
2. Applies to the EI pin only.
3. Power drain from V_{CC} input when freshness seal is enabled; 2 μA when freshness seal is broken.
4. Propagation delay from comparator inputs to output.
5. Only for $V_{CC} < 3.5$ volts.
6. Input signal is a sine wave, measured in peak-to-peak millivolts at a frequency of 133.3 KHz.