

General Description

The ADT2510 is a miniaturized receiver IC for use in the infrared remote control system. It has a wide voltage operating such as 2.7~5.5V, a high sensitivity, and good noise immunity. It has high noise immunity from external light source disturbance which are general fluorescent lamp, incandescent lamp etc.

It has the frequency selecting pads for setting the center frequency of band-pass filter and also has 5 trimming Pads for the fined adjust of center frequency.

These ICs is capable of accepting a photodiode directly and include many excellent circuit such as a high gain initial amplifier, a gain control amplifier, a limiter, a band pass filter, a detection circuit, two comparator circuits, gain control circuits, integrator circuits, a waveform shaping circuit assembled on a single chip.

Features

- Wide Operating Supply Voltage 2.7V ~ 5.5 V
- Internal voltage reference circuit for wide operating built-in.
- Excellent interference safety against external light sources.
- No external components necessary.
- The Center Frequency can be varied with option PADs
(36.0kHz, 37.9kHz, 40.0kHz, 56.7kHz)
- Internal filter for a high frequency lighting fluorescent lamp.
- Built-in automatic bias control for sunlight.
- Output active low.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Supply Voltage	Vcc	0	6.0	V
Output Voltage	Vout	0	6.0	V
Output Current	Iout	0	2.5	mA
Operating Temperature	Topr	-20	80	°C
Storage Temperature	Tst	-40	125	°C

* Stress above those listed under Absolute Maximum Ratings may cause permanent damage of device.

This is stress rating only and 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 longer periods may affect device reliability.

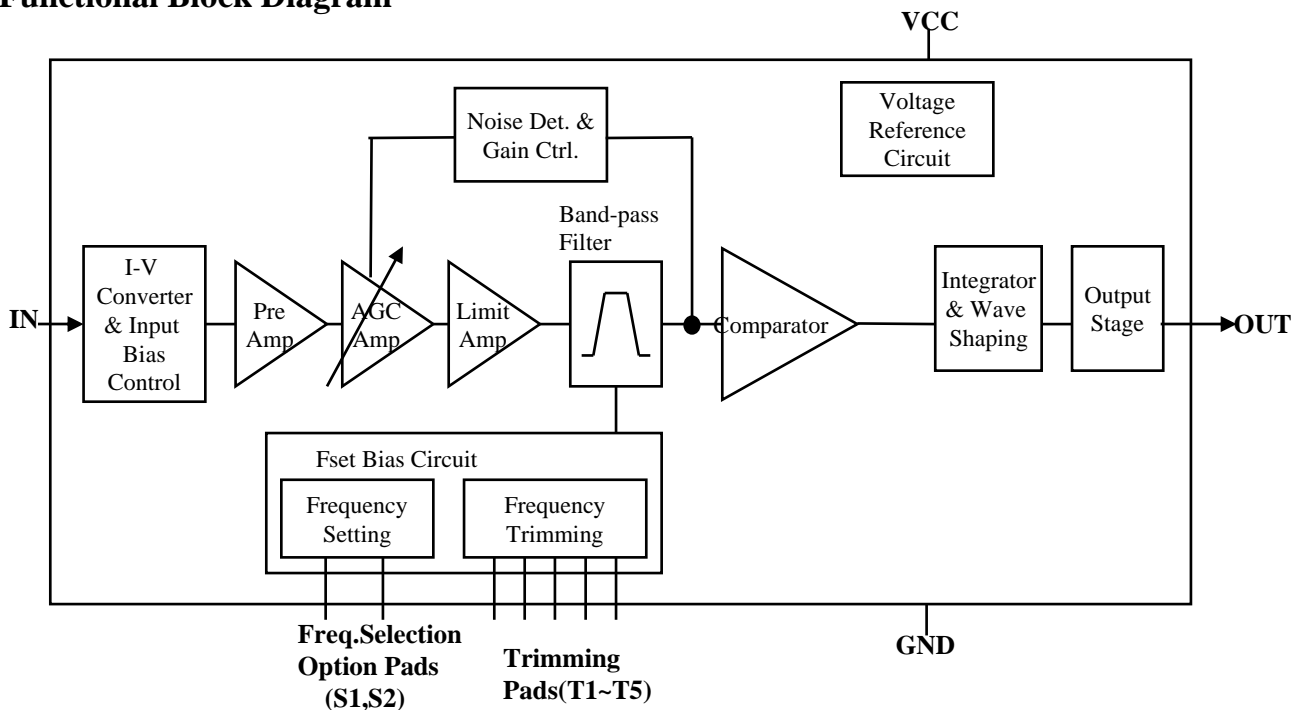
During overload conditions (VIN>Vcc or VIN<GND), those voltage on Vcc pins with respect to ground must not exceed the values defined by the absolute maximum ratings.

** This specifications are subject to be changed without notice*

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit
Operating Voltage	Vcc	2.7	5.0	5.5	V
Input Frequency	fin	30	37.9	60	kHz
Operating Temperature	Top	-20	25	80	°C

Functional Block Diagram



Fc (Center Frequency)	PAD Setting Method	
	S1	S2
36.0kHz	GND	GND
37.9kHz	Floating	Floating
40.0kHz	Floating	GND
56.7kHz	GND	Floating

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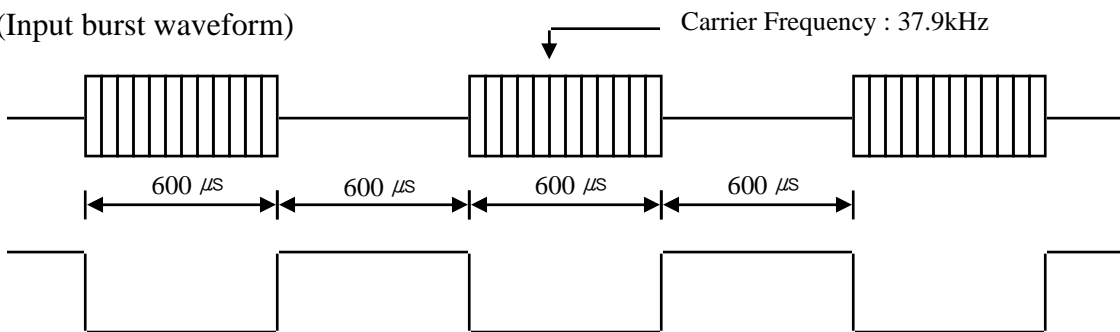
Electrical Specifications

Specifications hold over the Recommended Operating Conditions, unless otherwise noted herein.
All values are at **25°C** and **V_{CC}=3.0V/5.0V**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Supply Current	I _{CC}	-	0.9	1.5	mA	I _{in} =0 μA, V _{CC} =3V
		-	1.0	1.5	mA	I _{in} =0 μA, V _{CC} =5V
Max. Voltage gain	A _V	65	72	80	dB	f _{in} =37.9kHz, V _{in} =30μV p-p
BPF Bandwidth	f _{BW}	4	5.8	8	kHz	-3dB Bandwidth V _{in} =30μV p-p
Output pulse width	t _{PW1}	500	600	800	usec	f _{in} =37.9kHz, burst wave V _{in} =500 μV p-p note*1
	t _{PW1}	500	600	800	usec	f _{in} =37.9kHz, burst wave V _{in} =50 mV p-p note*1
Low level output voltage	V _{OL}	-	0.15	0.3	V	I _{sink} =2.5mA
High level output voltage	V _{OH}	2.7	3.0	-	V	V _{CC} =3V
		4.7	5.0	-	V	V _{CC} =5V

Note 1 :

(Input burst waveform)

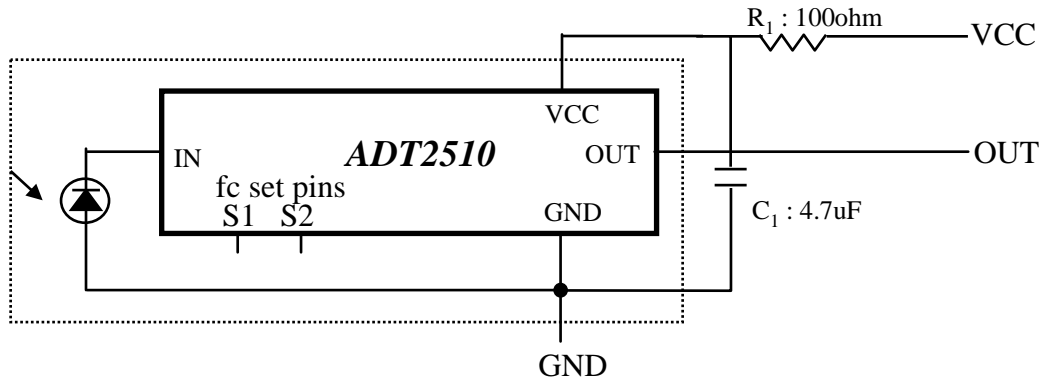


(Output pulse)

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Application Guide

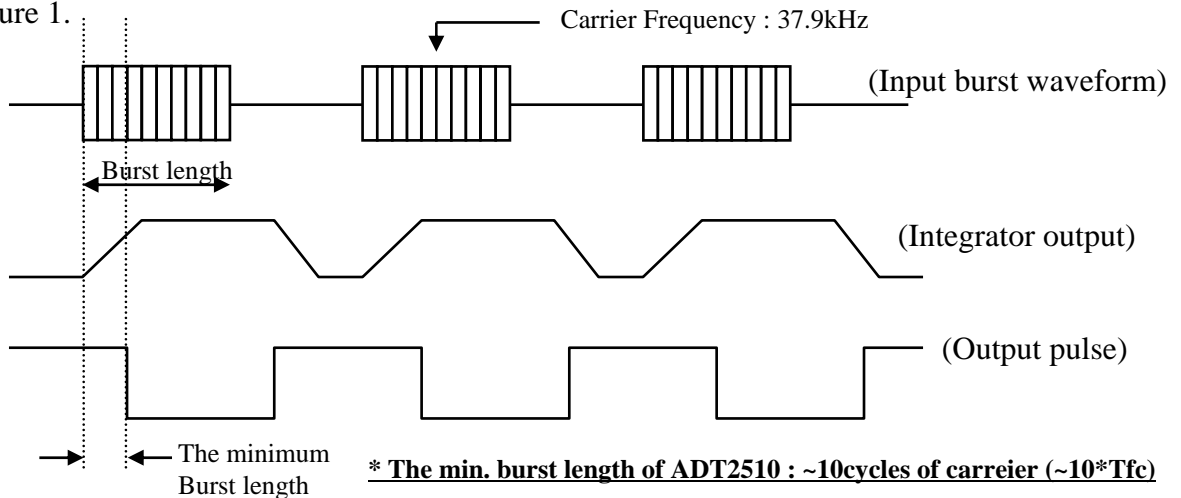
1. Example of Module(37.9kHz) Packaging Using ADT2510



2. Functional Guide of ADT2510

- ADT2510 is high gain amplifier for high sensitivity. So if you want better characteristic of receivable distance, you have much careful attention in bonding of GND pads and shielding to GND.
- For more better distance performance, it is important to suppress the supply noise. The supply filter R_1, C_1 have to be located close to IC if possible
- The photo diode are the important factor in IR receiver module and you select it considerately.
- In packaging of IR module, the photo lens is good for receiving of photo signal. But if the chip is included in the lens, the chip also receives the photo signal and the signal acts as a noise in the chip. So when you design the lens or module frame, the above point must be considered.
- In the detection or demodulation(wave shape) of incoming signal, ADT2510 need the minimum burst length of modulated signals. The incoming photo signal is modulated with proper carrier signal(e.g.37.9kHz) and if the '1' data bit is modulated with carrier signal, the period of data bit '1' is important. Because the carrier signals is in this period, in the integrator& wave shape block of ADT2510 the integration need minimum period to the reach of appropriately level. Hence the minimum burst length is important characteristic and specification of remote control systems. The minimum burst length of ADT2510 is about 10 cycles of carrier. ($\sim 10 * T_{fc}$) You can easily understand as see the figure 1.

Figure 1.



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