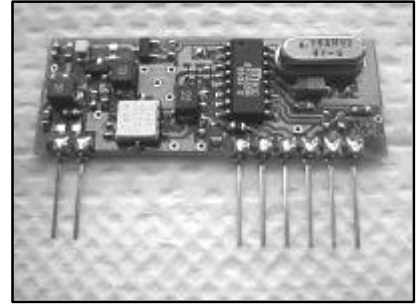


This AM superhet receiver provides greatly improved sensitivity and rejection of out of band signals over super regenerative receivers. It is ideal for upgrading car alarm, domestic alarm or other low cost applications that require improved range and more consistent operation. Low radiated emissions ensure compliance with EMC requirements. The receiver operates from a single 5V supply and is pin compatible with many industry standard devices. It is available for operation on 418MHz, 433MHz and 868MHz. A version will be available for operation on the US 916MHz band.

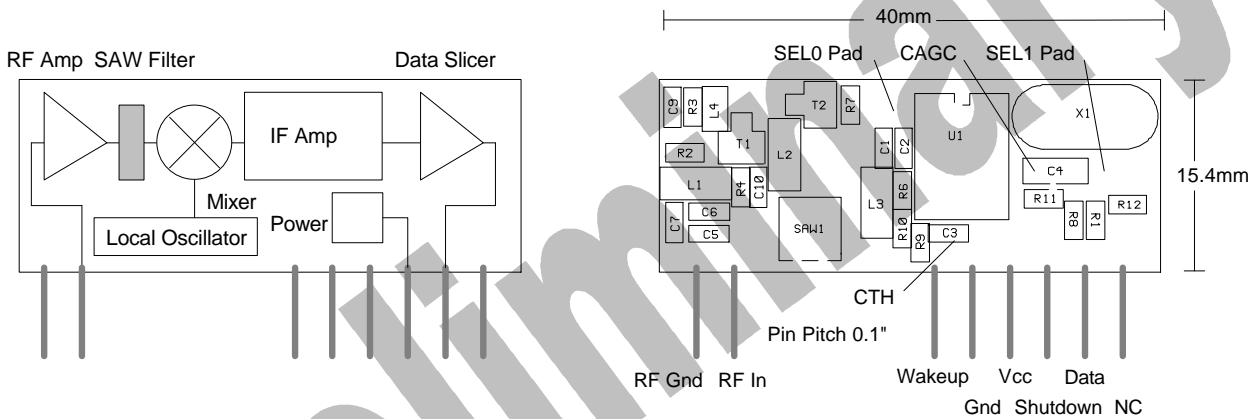


Features

- SAW based Front End Filter for selectivity
- Crystal controlled synthesiser
- Shutdown Input and wakeup output
- Duty cycle power saving possible
- Small size PCB Mounting, Single-in-Line (SIL) style

Applications

- Car alarm receivers
- Domestic alarm receivers
- Garage door openers
- Pager receivers



Block Diagram

Mechanical Detail

Notes

- Gnd and RF Gnd must be connected to 0V earth plane on the mother board.
- NC Pins are No electrical Connection
- The shutdown pin must be pulled down to Gnd to enable the module.

Pin	Function
1	RF Gnd
2	RF In
9	Wakeup
10	Gnd
11	Vcc
12	Shutdown
13	Data Out
14	NC

Application

The AM2000 series receiver is simple to apply, requiring only a “clean” DC supply of 5 Volts, an antenna and a suitable device for decoding the incoming digital data. The ground pins should be connected to a substantial copper area that will act as a “ground plane”. The receiver and its antenna **must** be kept well away from any circuitry that may generate harmonics that could extend into the UHF region. Even a simple crystal oscillator on a microprocessor clock can do this ! Particularly troublesome are externally bussed microprocessors and switched mode power supplies that can radiate significant energy into the ether. Good EMC practice (and testing) will reduce this likelihood which will generally manifest itself as reduced range or lack of sensitivity.

Antenna

All transmitters and receivers require antennas in order to work efficiently, the AM2000 receiver is no exception to this law of physics ! A ¼ wave whip antenna (approximately 16cm) will provide the best performance. It should be mounted in “free space” and well away from any conductive objects or surfaces.

Absolute Maximum Ratings

Supply Voltage Vcc, Pin 11	0.3 to +5.25 Volts
Operating Temperature	0° C to +70° C (Commercial)
Storage temperature	-10° C to +85° C

Performance Data Supply +5.0 Volt \pm 5%, Temperature 20° C

Parameter	Min	Typical	Max	Units	Notes
Supply Voltage	4.75	5.0	5.25	Volts	
Receive frequency (fo)		418.00		MHz	UK only
Receive frequency (fo)		433.92		MHz	UK & Europe
Receive frequency (fo)		868.350		MHz	UK & Europe
Sensitivity for 6dB S/N		-103		dBm	418/433 MHz version
Sensitivity for 6dB S/N		-90		dBm	868 MHz version
RF Pass Band		TBA		kHz	Note 1
LF Pass Band	50 Hz	1.25		kHz	Note 2
Supply Current		8		mA	Note 3
Shutdown Current		25		uA	To be characterised
Data output (logic 0)	0		0.5	Volts	50k load
(logic 1)	4.5			Volts	50k load
Size	40 x 15.4			mm	

Notes

1. A low noise amplifier (LNA) and SAW filter provide additional RF selectivity.
2. The bandwidth selectors are by default set to SEL0 low and SEL1 Low.
3. The shutdown pin must be pulled down to Gnd to enable the module.

NB: The module is fitted with an internal 10K pull down resistor to ensure that if the Shutdown pin is left 'floating' the module will be enabled. This has the undesirable effect of increasing the shutdown current by 500uA when it is pulled up to the positive supply ! This resistor should therefore be removed from the board if the shutdown facility is being utilised. Modules can be supplied without this resistor fitted by special request.

Bandwidth Selection

The bandwidth of the demodulator can be configured by 'solder blob' PCB pads on the track side of the PCB. (See Mechanical drawing for location) .During manufacture these jumpers are set to SEL0 Low (0) and SEL1 Low (0).

SEL0	SEL1	Bandwidth kHz
0	0	1.25
1	0	2.5
0	1	5
1	1	10

Users should configure these jumpers to reflect the data rate being used for encoding/decoding.

Shutdown Input & Wake Up Output

The 'shutdown' input can be used to reduce system power consumption by 'duty cycling' the receiver for power critical applications such as battery powered pager receivers.. An internal pull-up resistor is provided on the module and this pin should normally be pulled down to ground to enable the module.

The 'wake up' output goes low when the receiver detects a constant carrier within the pass band of the receiver for a period greater than approximately 6mS. This output can be used to 'flag' a microprocessor that an RF signal is present.

An application note detailing these modes of operation is in preparation.

AM2000 Receiver Module Pin Out Compatibility

Pin No	AM2000	AM Super Regen	AM Superhet
		Vcc	Vcc
1	RF Gnd	RF Gnd	RF Gnd
2	RF In	RF In	RF In
3			
4			
5			
6		Gnd	Gnd
7			
8			
9	Wake Up	Vcc	Vcc
10	Gnd	Gnd	Gnd
11	Vcc	Vcc	Vcc
12	Shut Down	Audio	Data
13	Data	Data	Data
14	NC	Vcc	Vcc

In general the AM2000 will plug directly into "industry standard" receiver sockets. Pin numbering schemes vary with manufacturer. Pin positions shown blank have no pin fitted. NC indicates No electrical connection.

Product Order Codes

Two versions of the receiver are currently available :

Name	Description	Order Code
AM2418	UK Receiver module on 418 MHz	LM-RXAM2418
AM2433	European Receiver module on 433 MHz	LM-RXAM2433
AM2868	<i>European Receiver module on 868 MHz</i>	<i>Future Product</i>
AM2916	<i>US Receiver module on 916 MHz</i>	<i>Future Product</i>

Please contact the sales office for availability and other variants of the standard product.

Document History

Issue	Date	Revision
1.0	Aug 99	Preliminary
1.1	Oct 99	Part Names Updated
1.2	Jan-00	Shutdown notes added

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