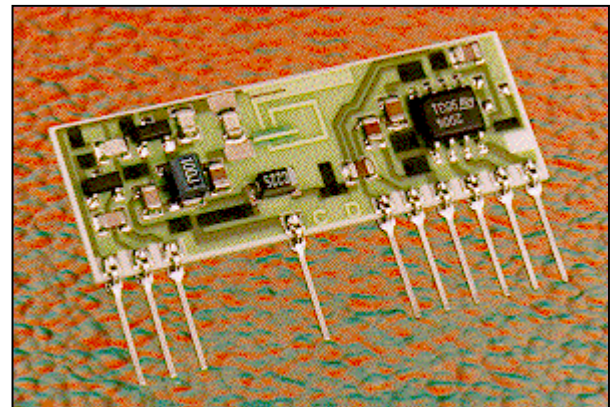


AM Super Regenerative Receiver

Features

- Compact Hybrid Modules.
- Standard Frequencies; 315, 433, 868MHz
- Very High Frequency Stability (With No Adjustable Components).
- Receiving Range Up To 50 Metres.
- CMOS/TTL Compatible Output.
- Low Current Consumption;
 - ⇒ HRR3 Typ 2.5mA.
 - ⇒ HRR18 Typ 70uA.
- Single Supply Voltage 3V or 5V.
- Compatible With R.F. Solutions AM Transmitters.
- Patented Laser Trimmed Inductor.
- Compliant To ETSI300-220.
- Requires No Radio Licence To Operate.



Description

The R.F. Solutions range of AM 'Super Regen' Receiver modules are compact hybrid RF receivers, which can be used to capture undecoded data from any AM Transmitter, such as R.F. Solutions AM-RT4 / 5 range of transmitters. (See AM Transmitter datasheet DS013).

These modules show a very high frequency stability over a wide operating temperature even when subjected to mechanical vibrations or manual handling. A unique laser trimming process which has been patented gives a very accurate on board inductor, removing the need for any adjustable components.

All receivers are compatible, producing a CMOS/TTL output, and require connections to power and antenna only. The HRR6 is a version with Very Low Current consumption which has a typical quiescent current drain of only 0.5mA. In addition the HRR8 operates from a 3Vdc supply.

RF Solutions also offer a range of Super Heterodyne Receivers, for data on these products (please see Datasheet DS017).

Block Diagram

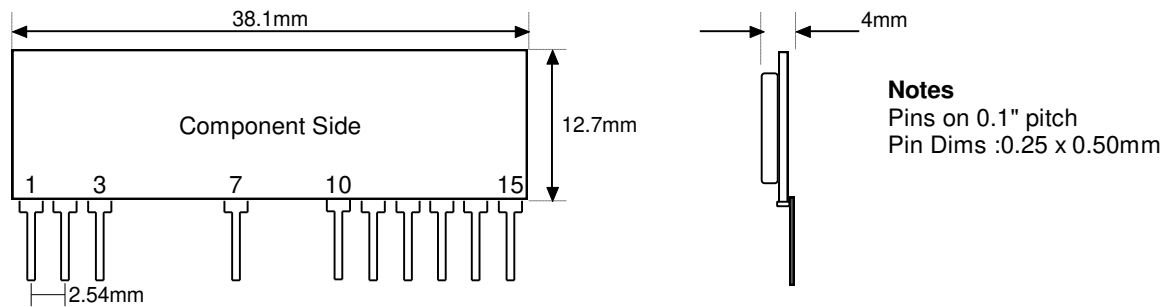
Products From 250-450MHz

The following modules are available from stock as 315, 418, 433MHz, although any frequency between 250-450MHz is available.

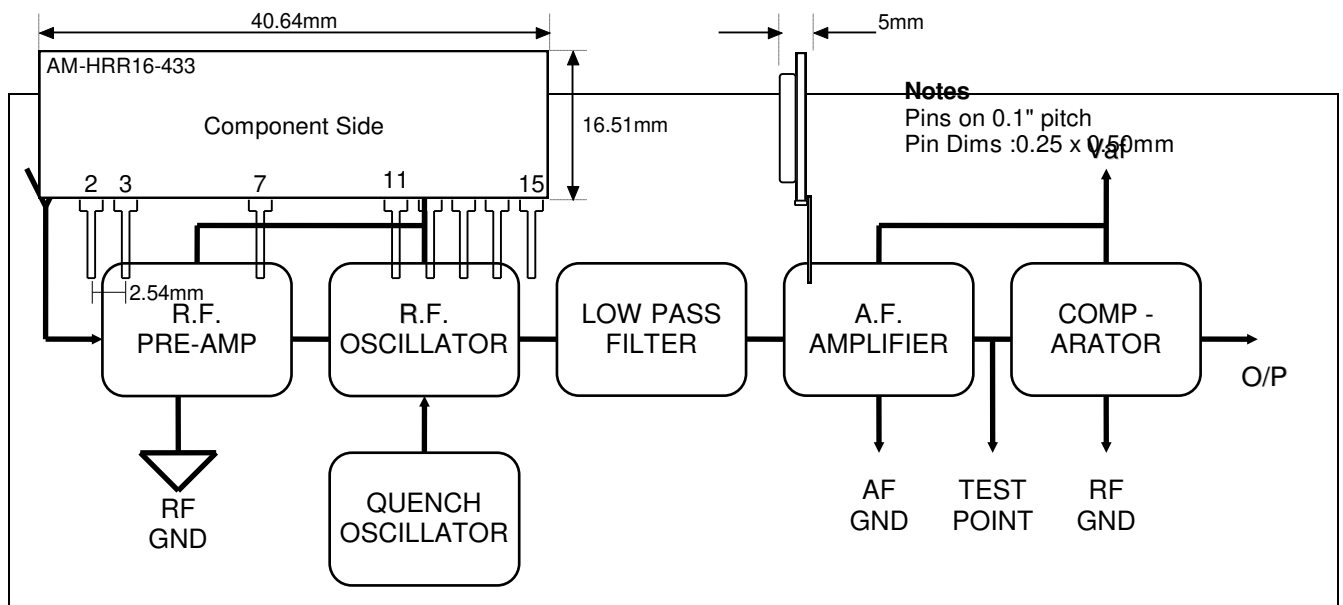
| Part Number | 315 | 433 | Description |
|----------------|-----|-----|---|
| AM-HRR3-XXX | √ | √ | Standard Receiver |
| AM-HRR6-XXX | √ | √ | Low Power version (0.5mA) |
| AM-HRR8-XXX | √ | √ | Low Voltage (3V), Low Power (0.5mA) |
| AM-HRR10-XXX | √ | √ | Rx with passive front end Filter |
| AM-HRR11-XXX | | √ | Low Power version (0.3mA) |
| AM-HRR16-XXX | √ | √ | SIL AM Receiver Module with SAW filter |
| AM-HRR16-XXX-S | √ | √ | SIL AM Receiver Module with Metal Shield & SAW filter |
| AM-HRR18-XXX | | √ | Low Voltage (3V), and Very Low Power (70uA) |

Mechanical Details

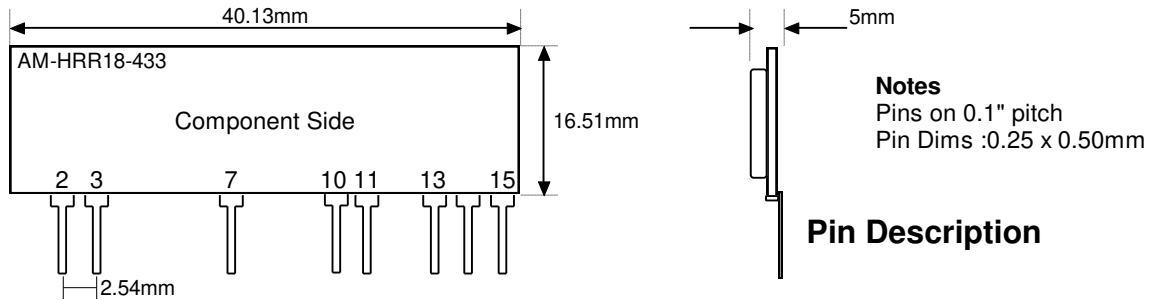
Dimensions for AM-HRR3, AM-HRR6, AM-HRR8 (No Pin 10), AM-HRR10, AM-HRR11:



Dimensions for AM-HRR16-XXX & AM-HRR16-XXX-S:



Dimensions for AM-HRR18-XXX:



| Pin No | Pin Name | Notes |
|------------|---------------|---|
| 1 | RF +Vcc | |
| 2, 7 | RF GND | |
| 3 | DATA IN (Ant) | |
| 10, 12, 15 | AF +VCC | Can be ignored on versions without pin 10 |
| 11 | AF GND | |
| 13 | TEST POINT | |
| 14 | DATA OUT | |

Electrical Characteristics (Applies to all variants below)

Ambient temperature = 25°Celsius.

| Electrical Characteristics | Min | Typ | Max | Dimension |
|---|-----|---------|---------|-----------|
| Storage Temperature Range | -30 | | +85 | °C |
| Operating Temperature Range | -25 | | +80 | °C |
| Tuning Tolerance | | +/- 0.2 | +/- 0.5 | MHz |
| Working Frequency Range | 200 | | 450 | MHz |
| Level of Emitted Spectrum | | -65 | -60 | dBm |
| Output Voltage @ 1mA sink | | 0.6 | | V |
| Data Output Current (AM-HRR3-XXX @3.6V) | | | 10 | mA |

Characteristics for AM-HRR3-xxx, AM-HRR6-xxx & AM-HRR8-xxx

| Electrical Characteristics | AM-HRR3-xxx | | | AM-HRR6-xxx | | | AM-HRR8-xxx | | | Units |
|---|-------------|-------|-------|-------------|-------|-------|-------------|-------|-------|-------|
| | Min | Typ | Max | Min | Typ | Max | Min | Typ | Max | |
| Supply Voltage | 4.5 | 5 | 5.5 | 4.5 | 5 | 5.5 | 2.7 | 3 | 3.3 | V |
| Supply Current | | 2.5 | 3 | | 0.5 | | | 0.5 | | mA |
| Time from Power on to Valid Output Signal | | 1200 | | | 150 | | | 150 | | mS |
| R.F Sensitivity 100% AM | -100 | -105 | | | -95 | | | -90 | | dBm |
| -3dB Bandwidth | | +/- 2 | +/- 3 | | +/- 2 | +/- 3 | | +/- 2 | +/- 3 | MHz |
| Data Rate | 50 | | 2000 | 50 | | 2000 | 50 | | 2000 | Hz |
| High Level Output Voltage | 4.5 | | | 4.5 | | | 4.5 | | | V |

Characteristics for AM-HRR10-xxx and AM-HRR11-xxx

| Electrical Characteristics | AM-HRR10-xxx | | | AM-HRR11-xxx | | | Units |
|---|--------------|---------|-------|--------------|-------|-------|-------|
| | Min | Typ | Max | Min | Typ | Max | |
| Supply Voltage | 4.5 | 5 | 5.5 | 4.5 | 5 | 5.5 | V |
| Supply Current | | 1.2 | 1.5 | | 0.3 | | mA |
| Time from Power on to Valid Output Signal | | 150 | | | 100 | 150 | mS |
| R.F Sensitivity 100% AM | -100 | -102 | | | -95 | | dBm |
| -3dB Bandwidth | | +/- 1.5 | +/- 2 | | +/- 2 | +/- 3 | MHz |
| Data Rate | 50 | | 2000 | | | 2000 | Hz |
| High Level Output Voltage | 3.6 | | | 3.6 | | | V |
| Low Level Output Voltage | | | 0.6 | | | 0.6 | V |

Characteristics for AM-HRR16-xxx/s and AM-HRR18-xxx

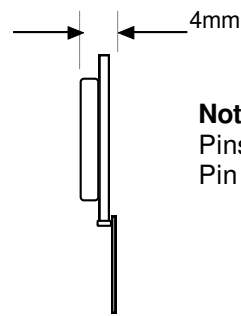
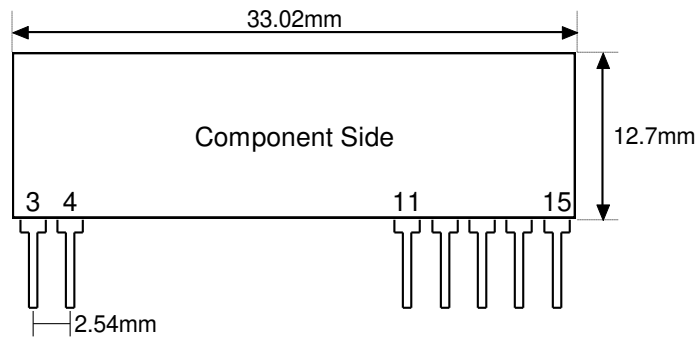
| Electrical Characteristics | AM-HRR16-xxx | | | AM-HRR18-xxx | | | Units |
|---|--------------|--------|--------|--------------|-------|-------|-------|
| | Min | Typ | Max | Min | Typ | Max | |
| Supply Voltage | 4.5 | 5 | 5.5 | 2.75 | 3 | 3.25 | V |
| Supply Current | | 4 | | | 0.07 | | mA |
| Time from Power on to Valid Output Signal | | | | | 2,000 | | mS |
| R.F Sensitivity 100% AM | -98 | +/-250 | +/-300 | | -94 | | dBm |
| -3dB Bandwidth | | -102 | | | 0.6 | | MHz |
| Data Rate | 3600 | 4800 | 9600 | | 2,000 | 3,000 | Hz |
| High Level Output Voltage | 4.5 | | | 4.5 | | | V |
| Low Level Output Voltage | | | 0.5 | | | 0.5 | V |

868MHz Products

The following modules are available from stock as 868MHz

| Part Number | 868 | Description |
|--------------|-----|----------------------------|
| AM-HRR13-868 | √ | Low Power Receiver (0.5mA) |

AM-HRR13-868



Notes

Pins on 0.1" pitch
Pin Dims :0.25 x 0.50mm

Pin Description

| Pin No | Pin Name |
|--------|---------------|
| 3 | DATA IN (Ant) |
| 4 | GND |
| 11 | AF GND |
| 12 | NC |
| 13 | TEST POINT |
| 14 | DATA OUT |
| 15 | AF +VCC |

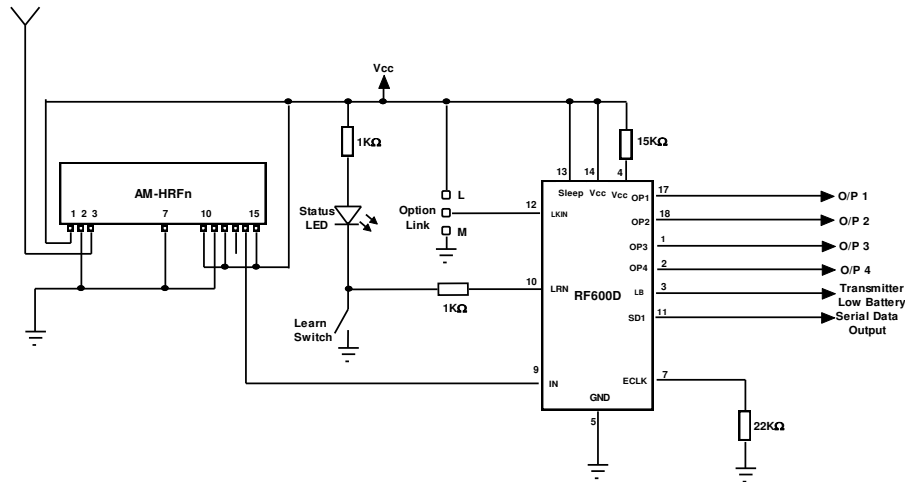
AM-HRR13-868 Electrical Characteristics

Ambient temperature = 25°Celsius.

| ELECTRICAL CHARACTERISTICS | MIN | TYPICAL | MAX | DIMENSION |
|---|-----|---------|------|-----------|
| Storage Temperature Range | -30 | | +85 | °C |
| Operating Temperature Range | -25 | | +85 | °C |
| Operating Frequency | | 868.350 | | MHz |
| Tuning Tolerance | | ±0.2 | ±0.5 | MHz |
| Supply Voltage | 4.5 | 5 | 5.5 | V |
| Supply Current | | 0.5 | | mA |
| Data Rate | 50 | | 4800 | bits/Sec |
| Time from Power on to Valid Output Signal | | 100 | | mSecs |
| R.F Sensitivity 100% AM | | -90 | | dBm |
| -3dB Bandwidth | | +/- 2 | | MHz |
| Conducted Spurious Emissions | | | -60 | dBm |
| High Level Output Voltage | 3.5 | | | V |
| Low Level Output Voltage | | | 0.25 | V |

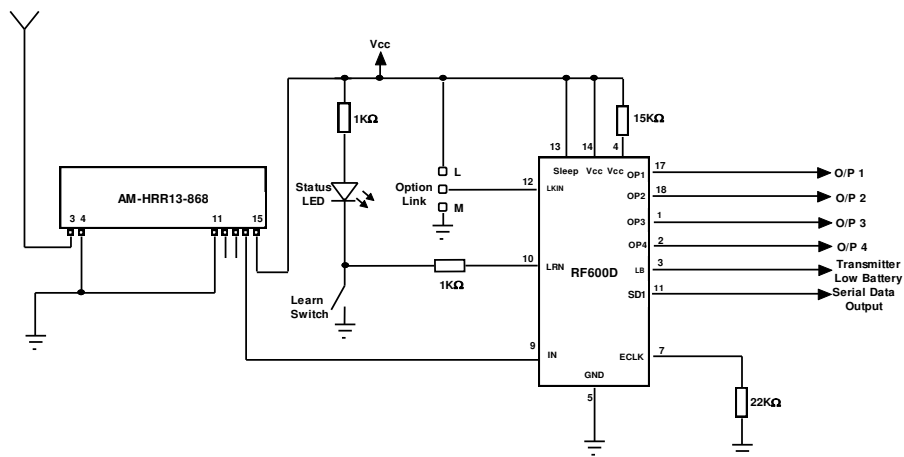
Application Circuits

Products From 250-450MHz



NOTE: For versions without PIN 10 all other connections are the same.

868MHz Products



RF Solutions Ltd. Recycling Notice

Meets the following EC Directives:

DO NOT

Discard with normal waste, please recycle.



ROHS Directive 2002/95/EC

Specifies certain limits for hazardous substances.



WEEE Directive 2002/96/EC

Waste electrical & electronic equipment. This product must be disposed of through a licensed WEEE collection point. RF Solutions Ltd., fulfills its WEEE obligations by membership of an approved compliance scheme.

Waste Batteries and Accumulators

Directive 2006/66/EC

Where batteries are fitted, before recycling the product, the batteries must be removed and disposed of at a licensed collection point.

Environment Agency producer registration number:

WEE/JB0104WV.

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