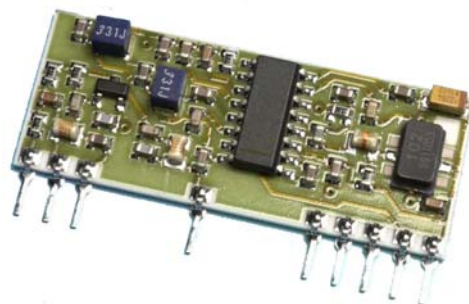




# THE DATASHEET OF AMRRQ3-433



- Compact Hybrid Module.
- Ceramic Substrate
- Very High Frequency Stability
- Receiving Range Up To 100 Metres.
- CMOS/TTL Compatible Output.
- Single Supply Voltage 5V.
- Compatible with R.F. Solutions AM Transmitters.
- Compliant to ETS300-220
- **RRQ3 Version**
  - Sleep Mode
  - Sensitivity Typically  $-107$  dBm
  - 315 / 433 / 868MHz Available
- **RRQ5 Version**
  - Front End SAW Filter
  - Sensitivity Typically  $-110$  dBm
  - 433MHz Available

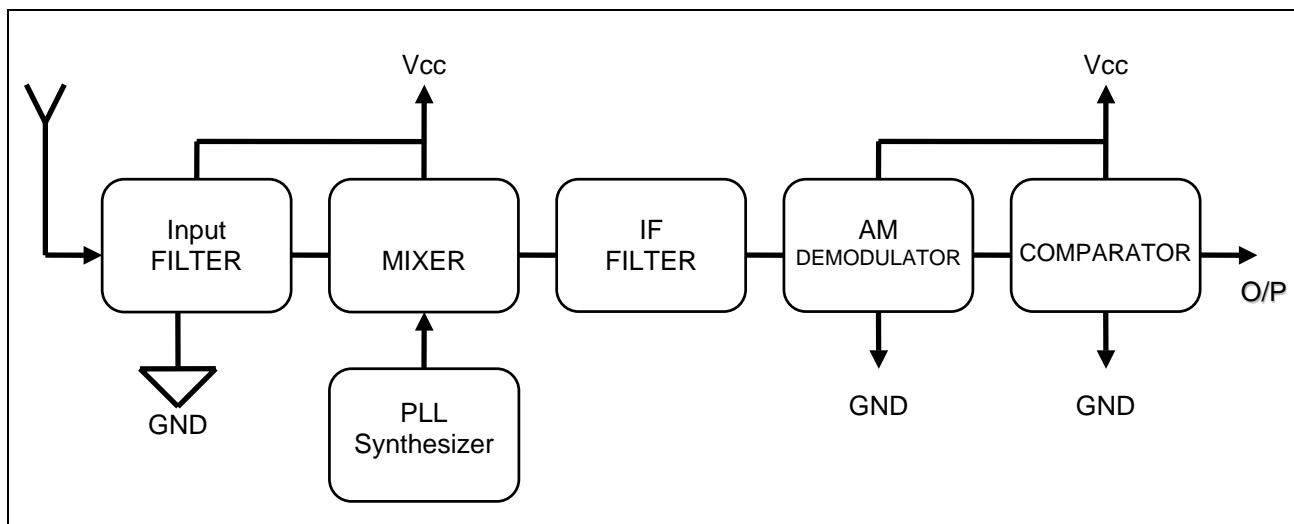


### Description

The RF Solutions AM Superheterodyne Receivers are compact modules, which can be used to capture undecoded data from any equivalent AM Transmitter, such as R.F. Solutions AM-RT4 range of transmitters. (See AM Transmitter datasheet).

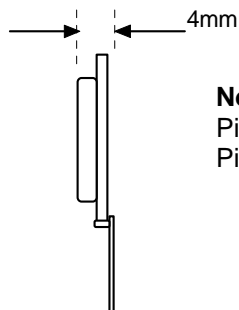
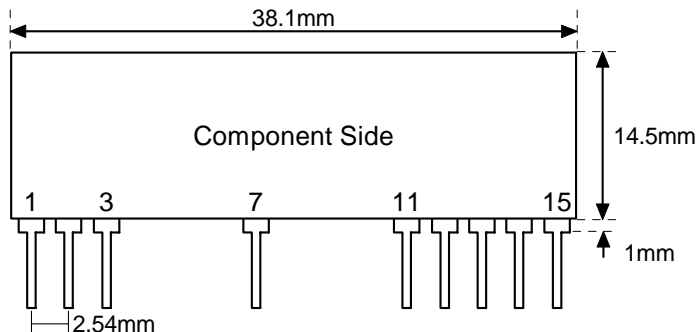
Receivers are manufactured on a ceramic substrate, the RRS3 incorporates an LC Filter, pre amplifier front end and PLL Synthesizer for high sensitivity and reduced EMC emissions. The RRQ5 incorporates a SAW Filter to provide a further increase in the module sensitivity. The modules show a very high frequency stability over a wide operating temperature even when subjected to mechanical vibrations or manual handling offering a very cost effective solution.

### Block diagram





### AM-RRQ3 Mechanical Dimensions



#### Notes

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

### Pin Descriptions

| RRQ3   |   |
|--------|---|
| Pin No | Pin Name  |
| 1      | +Vcc  |
| 2      | GND   |
| 3      | DATA IN (Antenna)   |
| 7      | GND   |
| 11     | GND   |
| 12     | +Vcc  |
| 13     | RSSI (output)   |
| 14     | DATA OUT  |
| 15     | PD (Power Down input)<br>0 = Standby Mode ( $I_{standby}$ 100nA max)<br>5V = Normal Operation |

### RSSI Output

| RF In (dBm) | RSSI (V) |
|-------------|----------|
| -120        | 1.20     |
| -110        | 1.32     |
| -100        | 1.50     |
| -90         | 1.78     |
| -80         | 2.06     |
| -70         | 2.35     |
| -60         | 2.62     |
| -50         | 2.72     |
| -40         | 2.75     |

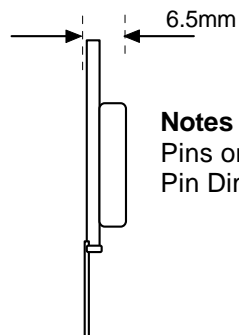
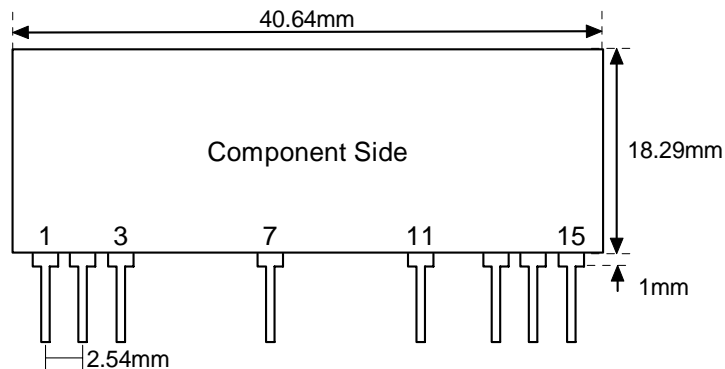
### Electrical Characteristics

Ambient temperature = 25°C.

| Electrical Characteristics                | Min   | Typical | Max | Dimension |
|---|-------|---------|-----|-----------|
| Supply Voltage (Vcc)                      | 4.5   | 5       | 5.5 | V         |
| Supply Current                            |       | 5       | 6   | mA        |
| Receiver Frequency 315MHz variants        |       | 315     |     | MHz       |
| Receiver Frequency 433MHz variants        |       | 433.92  |     | MHz       |
| Receiver Frequency 868MHz variants        |       | 868.35  |     | MHz       |
| Low Level Output Voltage (I=10uA)         |       |         | 0.8 | V         |
| High Level Output Voltage (I=200uA)       | Vcc-1 |         |     | V         |
| Operating Temperature Range               | -25   |         | +80 | °C        |
| R.F Sensitivity (100% AM) at 315 / 433MHz |       | -106    |     | dBm       |
| R.F Sensitivity (100% AM) at 868MHz       |       | -101    |     | dBm       |
| 3dB Bandwidth                             |       | +/-150  |     | KHz       |
| Max Data Rate                             |       |         | 4.8 | KHz       |
| Level of Emitted Spectrum                 |       |         | -70 | dBm       |



### AM-RRQ5 Mechanical Dimensions



#### Notes

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

### Pin Descriptions

| RRQ5   |                   |
|--------|-------------------|
| Pin No | Pin Name          |
| 1      | +Vcc              |
| 2      | GND               |
| 3      | DATA IN (Antenna) |
| 7      | GND               |
| 11     | GND               |
| 13     | RSSI (output)     |
| 14     | DATA OUT          |
| 15     | +Vcc              |

### RSSI Output

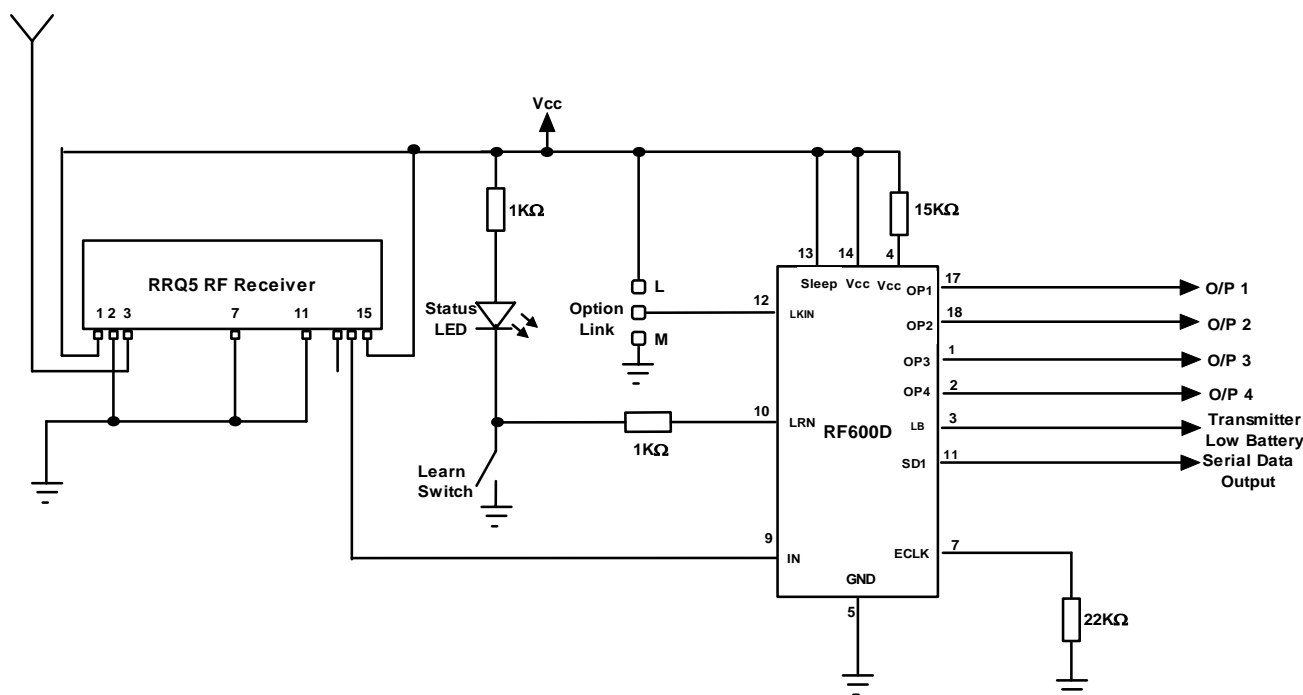
| RF In (dBm) | RSSI (V) |
|-------------|----------|
| -120        | 1.20     |
| -110        | 1.32     |
| -100        | 1.50     |
| -90         | 1.78     |
| -80         | 2.06     |
| -70         | 2.35     |
| -60         | 2.62     |
| -50         | 2.72     |
| -40         | 2.75     |

### Electrical Characteristics

Ambient temperature = 25°C.

| Electrical Characteristics          | Min   | Typical | Max | Dimension |
|-------------------------------------|-------|---------|-----|-----------|
| Supply Voltage (Vcc)                | 4.5   | 5       | 5.5 | V         |
| Supply Current                      |       | 6       | 7   | mA        |
| Receiver Frequency 433MHz variants  |       | 433.92  |     | MHz       |
| Low Level Output Voltage (I=10uA)   |       |         | 0.8 | V         |
| High Level Output Voltage (I=200uA) | Vcc-1 |         |     | V         |
| Operating Temperature Range         | -25   |         | +80 | °C        |
| R.F Sensitivity (100% AM)           | -108  | -110    |     | dBm       |
| 3dB Bandwidth                       |       | +/-150  |     | KHz       |
| Max Data Rate                       |       |         | 4.8 | KHz       |
| Level of Emitted Spectrum           |       |         | -70 | dBm       |

## Application Circuit



## Notes

- Do not use Veroboard or Stripboard to mount the module!
- Ensure the supply is stable (ideally <10mVpk ripple).
- Keep the module away from other EMF generating components.
- Mount the antenna as close to the module as possible.

## Part numbering

|                    |                                     |
|--------------------|-------------------------------------|
| <b>AM-RRQ3-315</b> | Receiver Module 315MHz              |
| <b>AM-RRQ3-433</b> | Receiver Module 433MHz              |
| <b>AM-RRQ3-868</b> | Receiver Module 868MHz              |
| <b>AM-RRQ5-433</b> | Receiver Module, SAW Filter, 433MHz |

Should you require further assistance, please call:

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E Sussex, BN8 6JL. England.**

**Tel +44 (0)1273 898 000. Fax +44 (0)1273 480 661.**



**Email [sales@rfsolutions.co.uk](mailto:sales@rfsolutions.co.uk)**

**<http://www.rfsolutions.co.uk>**

*RF Solutions is a member of the Low Power Radio Association.*

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