ARF27 SYSTEM USER GUIDE

TXARF27 transmitter

RXARF27 ASK receiver

RXARF27 FSK receiver

Regulation compliance

PSn / 01/03

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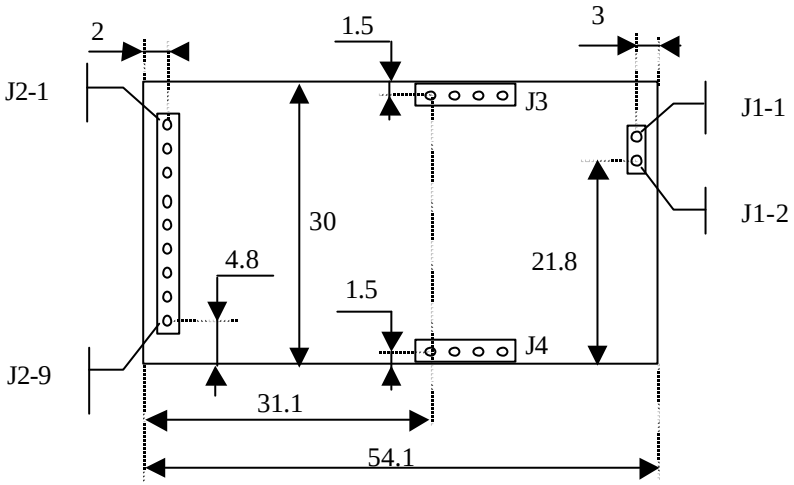
TX ARF27 TRANSMITTER

General use:

The TXARF27 transmitter is a frequency synthesis transmitter developing a power of 500 mW on 50R. It is available in 2 versions: ASK and FSK.
The ASK transmitter is compatible with any ASK receiver able to process 100% modulations.
The FSK transmitter is compatible with any FSK receiver able to process swings of +/-15kHz to +/-40kHz.

Dimensions / pin assignment:



J1-1: **GND RF**
J1-2 : **ANTENNA**

J3 **: 4xGND**

J4 : **4xGND**

J2-1 : **FSK_IN** (input of data to be transmitted in FSK)
J2-2 : **NC** (Not Connected)
J2-3 : **NC** (Not Connected)
J2-4 : **FSK_IN** (input of data to be transmitted in FSK)
J2-5 : **ASK_IN** (input of data to be transmitted in OOK)
J2-6 : **TX_ENABLE** : Product power-up.
J2-7 : **GND**
J2-8 : **VDC2**
J2-9 : **VDC1**

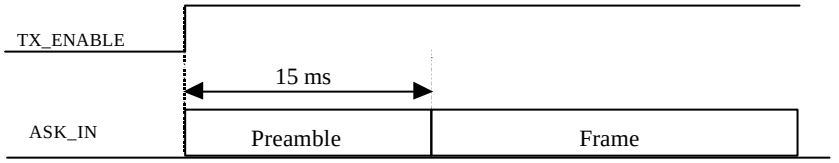
- The dimensions are given in mm.
- The pitch of the connectors J1, J2, J3 and J4 is 2.54 mm.

Notes:

- The transmitter power supply is provided by an external source between VDC1 (or VDC2) and GND. For VDC1 the supply voltage should be chosen in the 3.5–5V range and for VDC2 in the 3–4.5V range.
The maximum power is obtained for a power supply of 4.5V on VDC2 (or 5V on VDC1).
- Power -up/standby of the product is performed via the TX_ENABLE pin:
  - TX_ENABLE = 1 : Transmitter powered-up.
  - TX_ENABLE = 0 : Transmitter on standby.

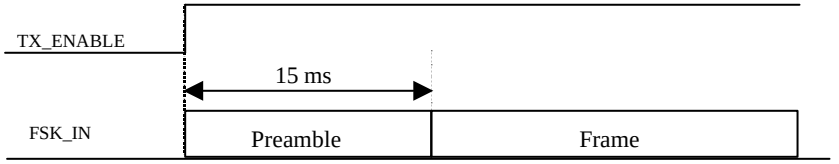
In standby mode:
  - the FSK_IN input must be set to 0 (for the FSK version).
  - the ASK_IN input must be set to 0 (for the ASK version).

- ASK transmitter (used with the ARF27 ASK receiver)



The FSK_IN inputs are not connected and must in no case be forced to a potential. It is therefore possible to limit the connector J2:
  - to the points J2-5 to J2-8 for a power supply on VDC2.
  - to the points J2-5 to J2-9 for a power supply on VDC1.

- FSK transmitter (used with the ARF27 FSK receiver)



- The ASK_IN input is not connected and must in no case be forced to a potential. As the FSK_IN inputs (J2-1 and J2-4) are identical, the data to be transmitted must be sent on one of the two pins only (either one), and the other pin must remain not connected (no potential applied on this pin).

- If the pin J2-4 is used to send the data, it is then possible to limit the connector J2:
  - to the points J2-4 to J2-8 for a power supply on VDC2.
  - to the points J2-5 to J2-9 for a power supply on VDC1.

- As the ARF27 is an “rough” link, the equivalent binary transmission rate must be comprised between 500 and 2400Hz for the ASK version and between 300 and 4800Hz for the FSK version.

- *For more information on the radio protocol: http://www.adeunis-rf.com/oem/appli_notes/an_radio-low-level-protocol.pdf*

- A transmitter by definition generates a large electrical field. Any high-impedance circuits in the surroundings will have to be either moved away or protected.

Parameter	Value	Conditions / Comments
Frequency	869.525 MHz	-
Power developed	500 mW (+27 dBm)	on 50R and @4.5V on VDC2
Modulation	ASK or FSK ± 25 kHz	-
Operating voltage	from 3V to 5V (+/- 5%).	from 3V to 4.5V on VDC2 from 3.5V to 5 V on VDC1
Digital input	0 / VDC1 or VDC2	depending on power supply pin used
Current consumed	250 mA 450 mA	@ 4.5V, ASK version (50% of duty cycle) @ 4.5V, FSK version
Standby current	250 uA max	@ 4.5V
Start-up time	10 ms	-
Interface with mother board	4 HE14 connectors to be fitted on the mother board	-
Dimensions (in mm)	54.1 x 30 x 11 excluding antenna.	-

Versions:

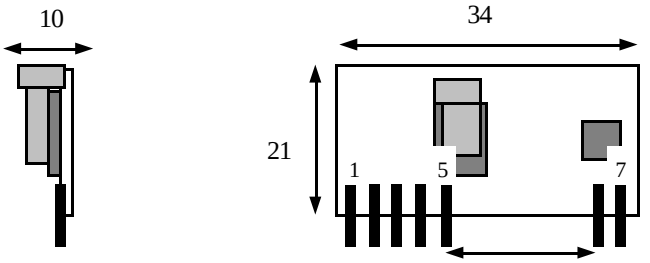
- ARF27 **ASK** transmitter: ARF6711A
- ARF27 **FSK** transmitter: ARF6711B

RX ARF27 ASK RECEIVER

General use:

The RXARF27 ASK receiver is a superheterodyne receiver with a sensitivity better than 0.7µV. The use of a whip antenna is compulsory for acceptable characteristics to be obtained on receipt.
This receiver is compatible with any 100% ASK transmitter using a quartz or surface wave pilot and is therefore compatible with the TX ARF27 ASK presented above.

Dimensions / pin assignment:



pins with 2.54mm pitch

1 - RXData
2 - Audio (For Test Only)
3 - VDC
4 - GND
5 - PWRUP
6 - ANTENNA Input
7 - GND RF

Notes:

- Receiver sampling is performed by commanding the PWRUP pin **(PWRUP = 1 : Receiver active)**. *For more information: http://www.adeunis-rf.com/oem/appli_notes/an_low-power-mgt.pdf*
- The AUDIO output cannot be used for analog transmission - the demodulator in fact supplies the modulation logarithm!
- A receiver is by definition sensitive to very low electrical levels. It should therefore be kept well away from any known radioelectric source (fast time base, logic clock, switching power supply, address / data bus, etc...). Likewise particular care should be taken over disconnection of its VDC (10R / 100 nF RC circuit recommended). *For more information: http://www.adeunis-rf.com/oem/appli_notes/an_emc-radio-integration.pdf*

Specifications:

Parameter	Value
Frequency	869.525 MHz / ARF6182C
Sensitivity	0.7µV(-110 dBm)
Demodulation	ASK > 75 %
Bandwith	400 kHz
Digital output / RXData	0/VDC (Output impedance: 100kR)
Start-up time	< 4 ms from PWRUP = 1
Operating voltage / VDC	5V +/- 10%
Consumption	10 mA
Current at rest	< 50 µA when PWRUP = 0
Dimensions (in mm)	34 x 21 x 10

Complete channel:

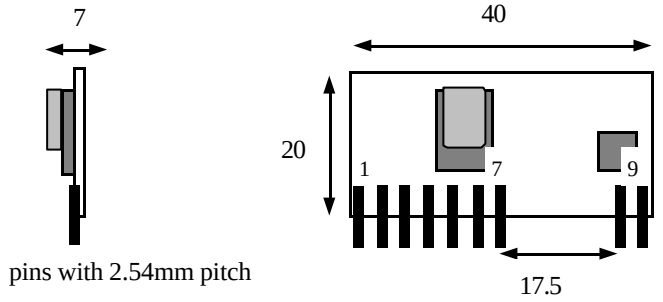
Channel settling time	15 ms maximum
Free field range	2000 m with the TX & RX ARF27 ASK couple
Data transmission rate	500/2400 Bps Manchester
Temperature	- 20 to + 70 °C
Regulations	Radio: EN 300220 EMC: EN 301489

RX ARF27 FSK receiver

General use:

The RXARF22 receiver is a superheterodyne receiver with a sensitivity better than 1.5 µV. The use of a whip antenna is compulsory for acceptable characteristics to be obtained on receipt.
This receiver is compatible with +/-15 to +/-40 kHz FSK transmitter using a synthesized or surface wave pilot. It is consequently designed to operate with the TX ARF27 FSK presented above.

Dimensions / Pin assignment:



1 - RSSI	4 - Unused	7 - PWRDN
2 - VDC	5 - VDC	8 - ANTENNA Input
3 - RXData	6 - GND	9 - GND RF

Notes:

- Receiver sampling must be performed via the PWRDN pin (Receipt valid if PWRDN = 0 / Standby if PWRDN = 1).

- *For more information: http://www.adeunis-rf.com/oem/appli_notes/an_low-power-mgt.pdf*

- The RSSI output enables the RF input level to be displayed. But the level of the DC image only varies between 1.15 to 1.55 V!

- A receiver is by definition sensitive to very low electrical levels. It should therefore be kept well away from any known radioelectric source (fast time base, logic clock, switching power supply, address bus etc.). Likewise particular care should be taken over disconnection of its VDC (10R / 100 nF RC circuit recommended).

- *For more information: http://www.adeunis-rf.com/oem/appli_notes/an_emc-radio-integration.pdf*

Specifications:

Parameter	Value
Frequency	869.525 MHz / ARF6440E
Sensitivity	1.5 µV (-103 dBm) / 5V
Demodulation	FSK from +/-15kHz to +/-40 KHz (+/- 25 kHz typ.)
Bandwith	400 kHz
Digital output / RXData	0/VDC (Output impedance:10kR)
Start-up time	10 ms from PWRDN = 0
Operating voltage / VDC	from 3 to 5 V +/-5%
Consumption	10 mA / 5V
Current at rest	10 µA when PWRDN = 1
Dimensions (in mm)	40 x 20 x 7

Complete channel:

Channel settling time	15 ms maximum
Free field range	2000 m with the TX & RX ARF27 FSK couple
Data transmission rate	300-4800 Bps Manchester
Temperature	- 20 to + 70 °C
Regulations	Radio: EN 300220 EMC: EN 301489

REGULATION COMPLIANCE

When using radio transmitters / receivers in the form of integrated daughter boards, conformity with regulation compliance relates to the finished product.
In Europe, finished products must comply with the RTTE directive. For this type of radio application, conformity with the RTTE directive will be established by compliance with the following requirements:

- EN300220 standard (Efficient use of Radio/spectrum).
- EN301489 standard (EMC).
- EN60950 standard (Electrical safety if necessary)

Important:

Although the ARF27 daughter boards comply with the criteria and dimensions of the EN300220 radio standard, their integration in a "mother" electronic system may modify some electrical characteristics (harmonic levels, spurious RF, etc.) Before it is sent for laboratory tests, the product therefore has to be examined on our premises to check that it complies with regulations. After presentation, the product and the test reports must be kept as proof of conformity.