

### Simple Single-Chip RF Transmitter and Receivers

Micrel's QwikRadio™ RF devices are completely integrated ICs developed to simplify the design and manufacture of RF products. They require a minimum of external components and do not require tuning in production.

QwikRadio™ transmitters and receivers provide a cost-effective replacement for hundreds of feet of wiring in systems ranging from household remote controls to industrial automation.

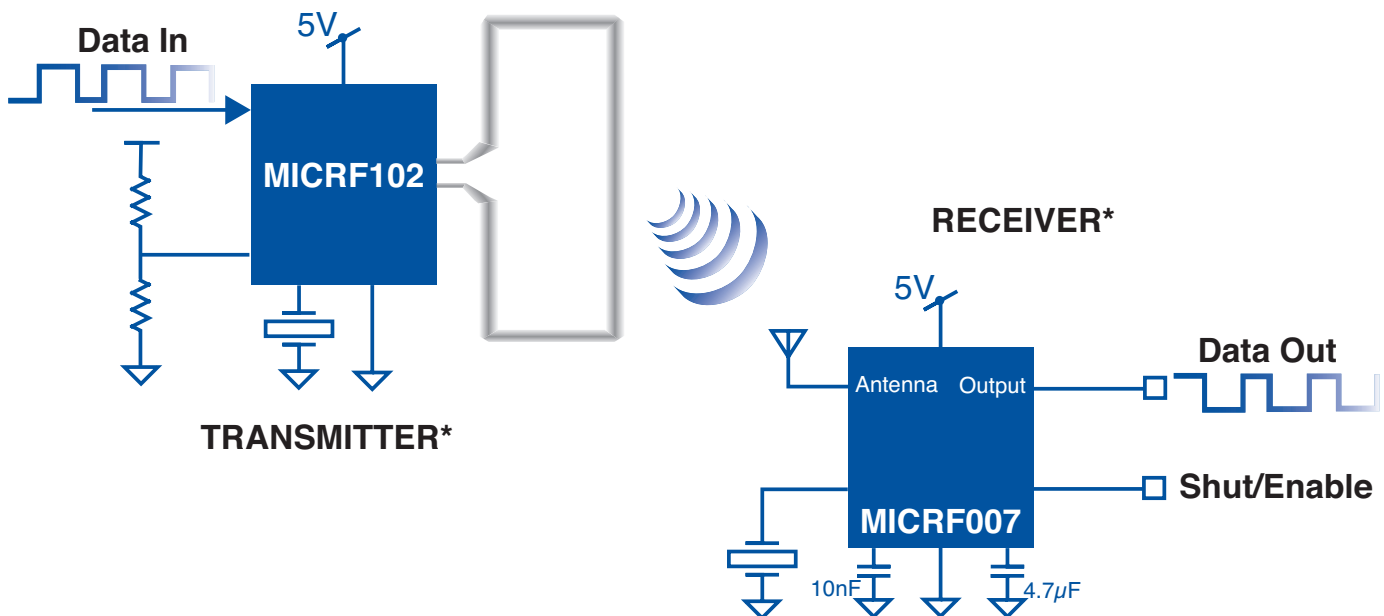
The receivers are intended for ASK/OOK (Amplitude-Shift Keyed/On-Off Keyed) modulation. The transmitter supports ASK modulation.

#### Benefits

- ◆ Easy to design
- ◆ Easy to manufacture (requires no tuning)
- ◆ Low component count
- ◆ Low cost

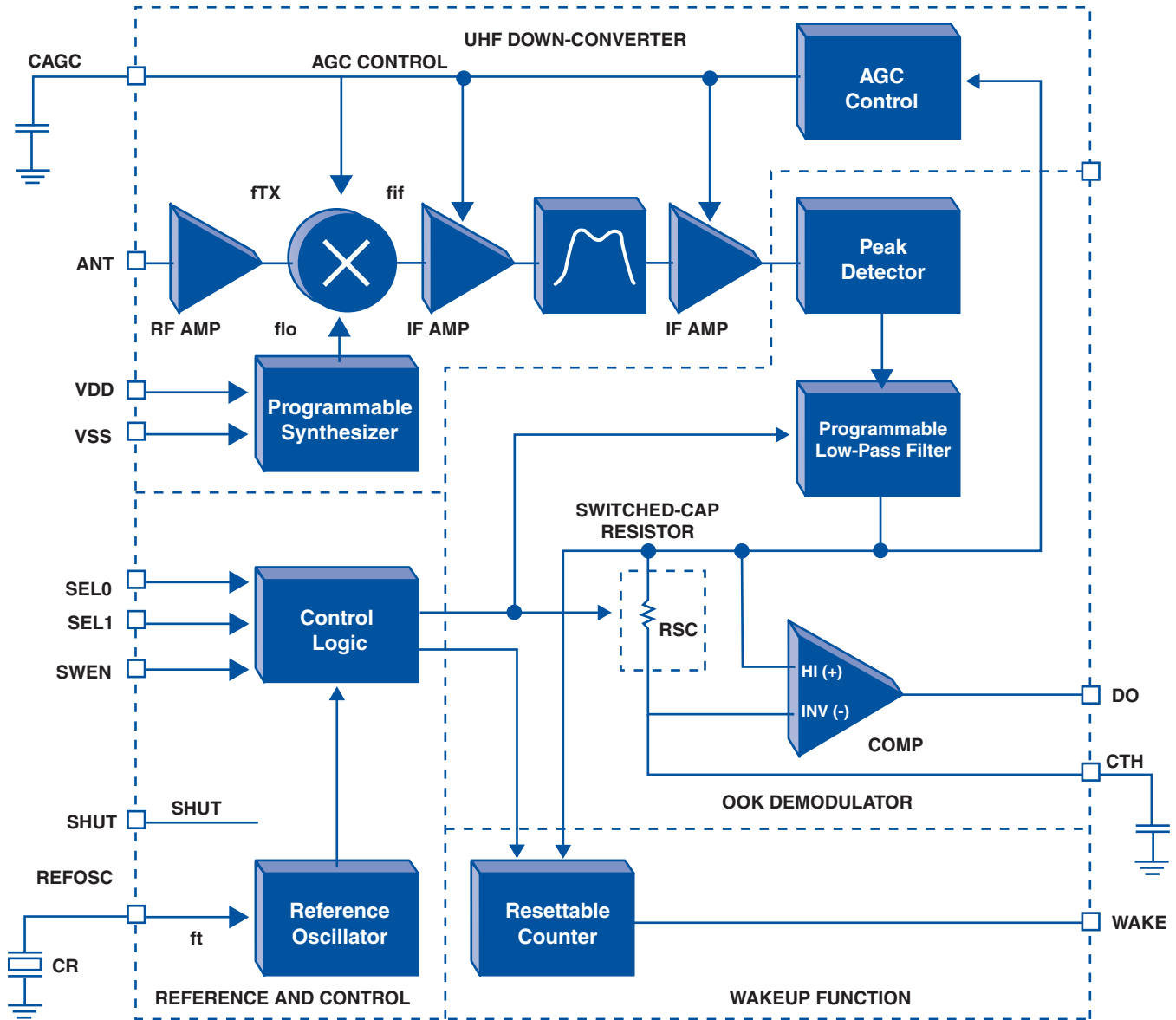
#### Receiver Features

- ◆ Data-rates up to 115kbps
- ◆ Frequency bands:
  - 300MHz to 440MHz
  - 800MHz to 1GHz
- ◆ Low Power
- ◆ 1.7mA fully operational (MICRF007)
- ◆ Shutdown for polled operation



\*Only 3 external components required.

# QwikRadio Receiver Detail

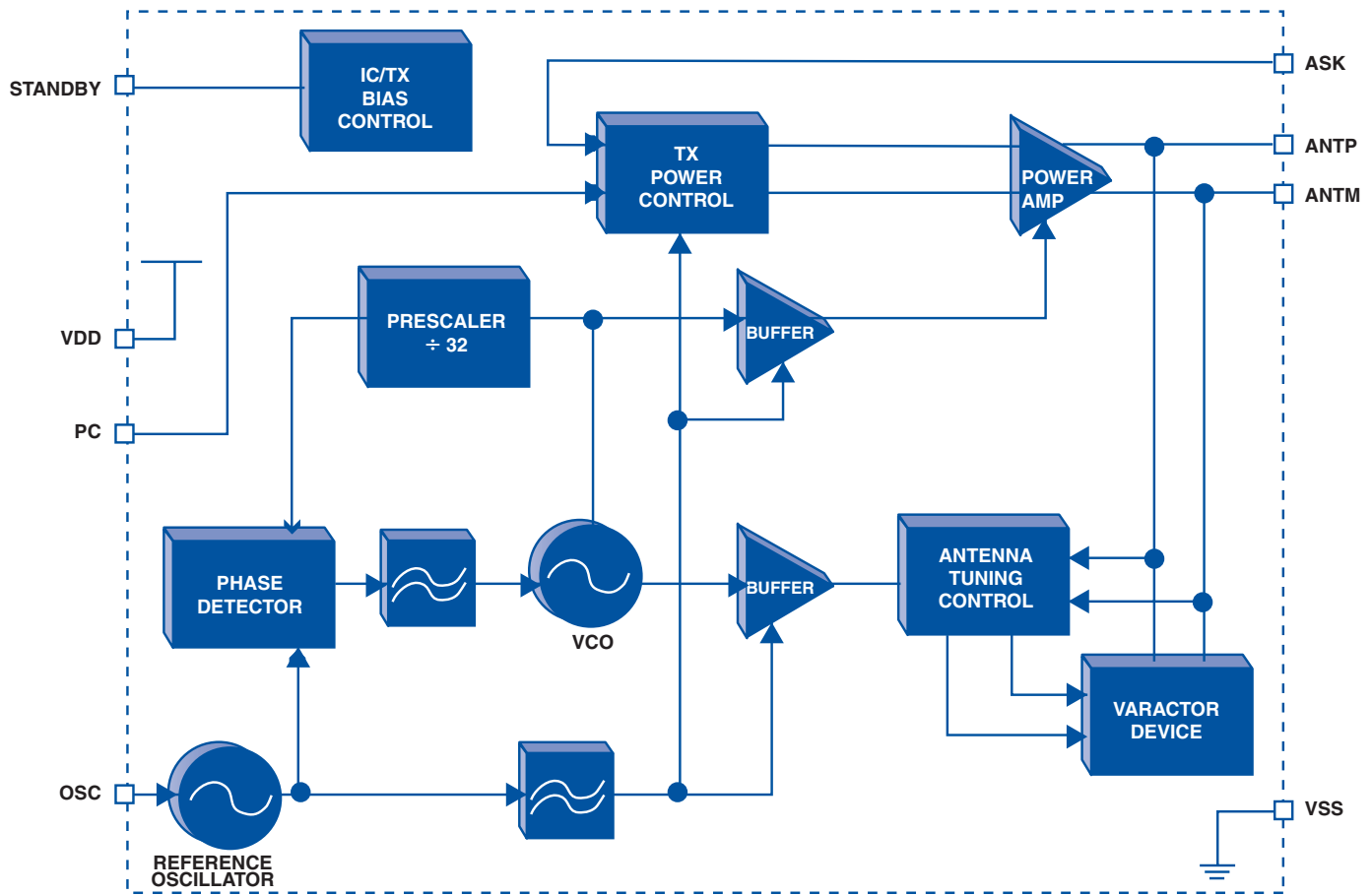


All QwikRadio receivers share the same basic topology, but differ in terms of frequency, supply current, maximum data rate and packaging.

The table below provides details on key specifications for each device.

Part Number	Frequency Range	Maximum Data Rate	$I_0$	Power Cycle	Package	Comment
MICRF001	300MHz – 440MHz	4.8kbps	6.3mA	No	SO-14	
MICRF011	300MHz – 440MHz	10kbps	2.4mA	No	SO-14	Lower power
MICRF002	300MHz – 440MHz	10kbps	2.4mA	Yes	SO-16	Power cycle mode, lower power
MICRF022BM-FS24	300MHz – 440MHz	2.4kbps	2.4mA	Yes	SO-8	Smaller packaging
MICRF022BM-FS48	300MHz – 440MHz	4.8kbps	2.4mA	Yes	SO-8	Smaller packaging
MICRF003	800MHz – 1GHz	20kbps	4mA	Yes	SO-16	MICRF005 recommended for new designs
MICRF005	800MHz – 1GHz	1.2kbps	1.7mA	Yes	SO-8	Highest data-rate
MICRF007	300MHz – 440MHz	1.2kbps	1.7mA	Yes	SO-8	Smaller packaging, lowest power
MICRF008	300MHz – 440MHz	4.8kbps	6.3mA	No	SO-8	Sweep-mode, lowest cost, smaller packaging

# QwikRadio Transmitter Detail



The QwikRadio transmitter is designed specifically to meet the needs of low-cost loop antenna transmitters.

Loop antenna transmitters are popular in many low cost or space limited applications, but come with inherent manufacturing problems. Previously, the high-Q inherent to a loop antenna, combined with manufacturing tolerances, required manufacturers to manually tune the transmitter antenna in production. Even then, a users hand in close proximity to the antenna will modify the resonant

properties of the antenna circuit and de-tune it. The MICRF102 overcomes both of these problems with internal automatic tuning.

Automatic tuning of the antenna eliminates the need for manual tuning in production making it much easier to manufacture than any existing solution.

What's more, closed loop power control ensures consistent output power across varying operating conditions and over the lifetime of a battery.

Part Number	Frequency Range	Data Rate	$I_q$	Package	Key Features
MICRF102	280MHz to 460MHz	20kbps	5.75mA	SOIC-8	Automatic antenna tuning. Output power control.
MICRF103	800MHz – 1GHz	115kbps	16mA	SOIC-8	High data-rate
MICRF104	280MHz – 460MHz	20kbps	10mA	SOIC-14	Automatic antenna tuning. Output power control.

## Why Use Wires?

It used to be simple economics that limited RF to all but the highest-end, or highest volume applications.

Even today, most low-cost RF implementations take time to design, requiring high production volumes (or high unit price) to justify the developers' cost. The alternative has been pre-manufactured modules, but they are expensive. Receiver development can be the most difficult part of RF design. QwikRadio receivers are the first complete monolithic RF receiver solutions. They are

as easy to use as modules at a much lower cost.

Many QwikRadio users are RF experts who appreciate the manufacturing advantages of this low component count solution; just as many users are new to RF design.

Now there's no need to string wires across the room or through a building, since a cost-effective, easy to use RF solution exists!

## Infrared Upgrade

IR offers some advantages over *conventional* RF solutions: it is low cost, easy to design, and simple to manufacture.

However, *many existing IR users are converting to QwikRadio RF* because it offers many of the same

features with two significant advantages — no line of site restriction, and better range. What's more, QwikRadio devices are on/off keyed, just like IR.

*QwikRadio receivers are replacing IR links* in existing designs, ranging from remote controls to wireless keyboards.

## The Frequency Bands

QwikRadio ICs are intended for use in the unlicensed ISM (Industrial Scientific and Medical) bands.

Generally speaking, the 300–440MHz devices are intended for remote actuation: garage door openers, security system activation, set-top boxes remote control, etc.

The 800MHz–1GHz devices are ideal for serial data communication up to 20kbps. Applications range from

wireless video game controllers to remote sensing in industrial automation. In addition, wireless PC peripheral applications such as keyboards and mice are also ideal for QwikRadio.

The 150MHz receivers were developed to meet the specialized needs of remote metering.

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