



ARI2444

4TX-4RX 24GHz Radar Transceiver

Datasheet v1.0

General Description

The ARI2444 is a multi-channel 24GHz ISM-band FMCW radar transceiver with an integrated PLL, transmitters, receivers, and baseband. The IQ receiver has the Integrated baluns for single-ended receiver (Rx) inputs and programmable baseband. The transmitter provides the beam forming (5bit phase, 2bit attenuation) controllability. The transceiver features a fractional-N frequency synthesizer with variable waveform generation, and fast chirp time.

Control of all the on-chip registers is through a simple, 4-wire serial peripheral interface (SPI).

The ARI2444 comes in a compact, 40-lead, 5 mm × 5 mm QFN package.

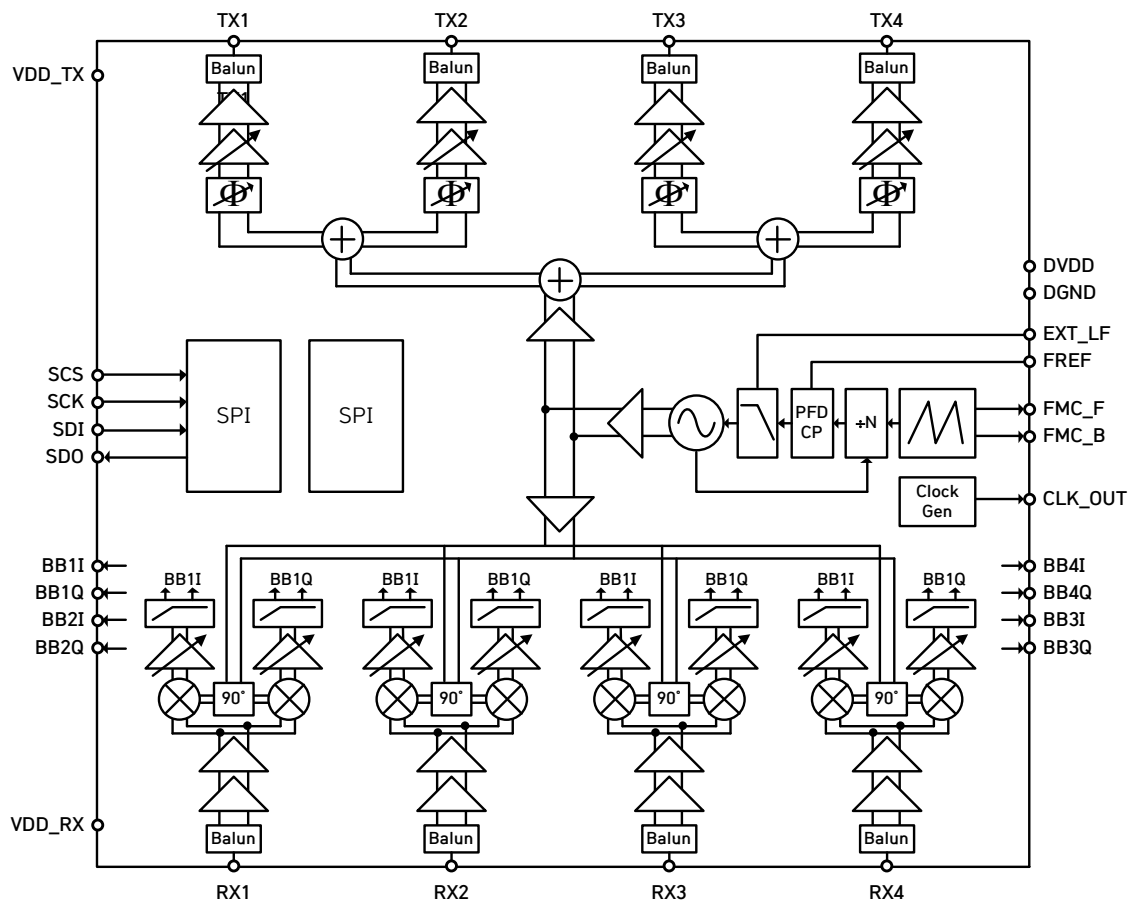
Typical Applications

- Automotive radars
- Industrial radars
- Microwave radar sensors.

Main Features

- 4-Channel I/Q Receiver for Digital Beamforming
 - Rx channel gain: 30-120 dB
 - Noise figure (NF): 12 dB
 - IP1dB: -10 dBm
 - Integrated high-pass filter: f_{HPF} =100k, 200k, 300k, 400k
- Analog Beamforming 4-channel Transmitter
 - Saturated output power: 8dBm
 - Phase Control resolution: 5.625° (5bit)
 - Attenuation Control resolution: 1dB (2bit)
 - Automatic Beamforming Sequence
- Fast Chirp PLL
 - Frequency: 24GHz ~ 24.25GHz
 - Chirp Bandwidth: 0 - 250 MHz
 - Chirp Time: 50 - 10 msec.
 - Sawtooth, Triangle, FSK, CW

Functional Block Diagram



Pin Diagram

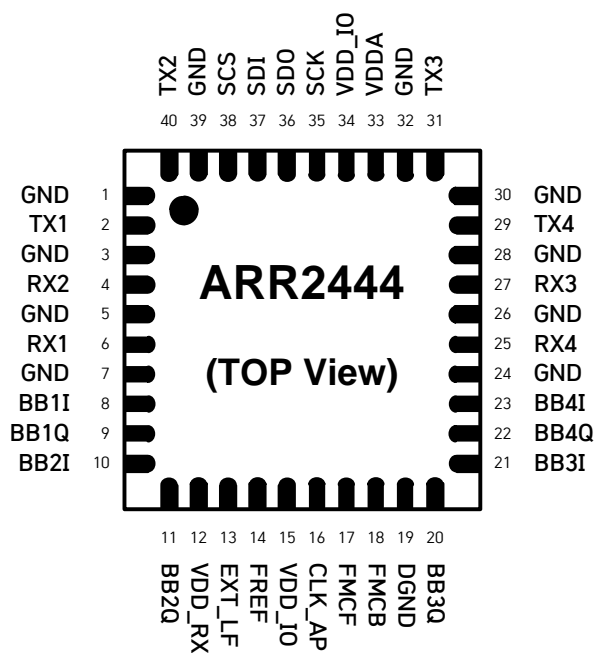


Fig. PIN Configuration

Pin Attributes

Number	Symbol	Description
1,3,5,7,24,25,28,	GND	Grounds
2, 30, 31, 40	TX1, TX2, TX3, TX4	Transmitter Single-Ended Outputs
4, 6, 25, 27	RX1, RX2, RX3, RX4	Receiver Single-Ended Inputs
8,9	BB1I, BB1Q	Channel 1 Baseband Single-Ended I/Q Outputs
10,11	BB2I, BB2Q	Channel 2 Baseband Single-Ended I/Q Outputs
20,21	BB3I, BB3Q	Channel 3 Baseband Single-Ended I/Q Outputs
22,23	BB4I, BB4Q	Channel 4 Baseband Single-Ended I/Q Outputs
12	VDD_RX	Supply Voltage for Receiver and LO
13	EXT_LF	External Loop Filter (Optional)
14	FREF	Reference Voltage (80MHz recommended)
15	VDD_IO	Supply Voltage for IO
16	CLK_AP	Clock Output (Optional)
17	FMCF	Chirp Synchronization Signal
18	FMCB	Automatic Beam Synchronization Signal
19	DGND	Digital Ground
35	SCK	Slave SPI Clock
36	SDO	Slave SPI Data Output
37	SDI	Slave SPI Data Input
38	SCS	Slave SPI Chip Select