RIF
Radar Interface

Key Features

- Input selection
- Data formatting
- Safety features

Highlights

- The RIF is responsible for the interface between the Radar ADC (Internal or External) and an SPU module
- The RIF handles formatting the incoming data so it matches the SPU RIF input format
- The RIF can assert a safe communication with external ADC and SPU

Customer Benefits

- Compatibility with many MMIC and not only Infineon products
- Wide range of data formats can be used
- Enabling ASIL-B radar processing

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Key Features

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RIF

Input selection

- The RIF can retrieve the data from up to 4 channels
- The data can come either from internal ADC or external ADC via LVDS lines
RIF
Data formatting

- SPU expects 16bit signed Qm.n integers as an input from the RIF, which are delivered to the SPU in 32bit packet

- On the other hand, the RIF accepts a wider range of formats and is responsible for adjusting the direction (lsb/msb), data length (16 bits) and format of the incoming ADC data so it fits the SPU RIF input format

### Diagram

![Diagram of RIF data formatting]

- **Internal ADC**
  - uint 12 bit

- **External ADC**
  - uint 10-16 bit
  - int 10-16 bit
  - signed/unsigned Q1.9, Q1.11, Q1.13
  - unsigned fixed point Q1.15

- **RIF**
  - 16bit signed Qm.n integer

- **SPU**
In order to enable up to ASIL-B safety requirements, the RIF implements several safety features:

- For external ADC: the possibility to add a CRC check at the end of every ramp
- Safety critical configuration register can be CRC checked
- CRC check can be added to the output data of the RIF in order to assert safe communication with the SPU
- Partial Lockstep: certain safety critical sub-blocks are duplicated to create redundancy. If enabled, an alarm can be raised in case of mismatch
RIF
System integration

- The RIF is connected to the internal ADC, the LVDS pad and the SPU in order to enable ADC data transfers.
- The RIF is capable of communicating events and errors to the application via several Interrupt and Error lines through the Interrupt router.
In this example, the RIF is programmed to receive a frame from 4 channels

1. Receiving a complete frame from 4 channels
2. Signaling a frame is ready to be transmitted
3. Transmit the formatted frame in 32bit packets to the SPU
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