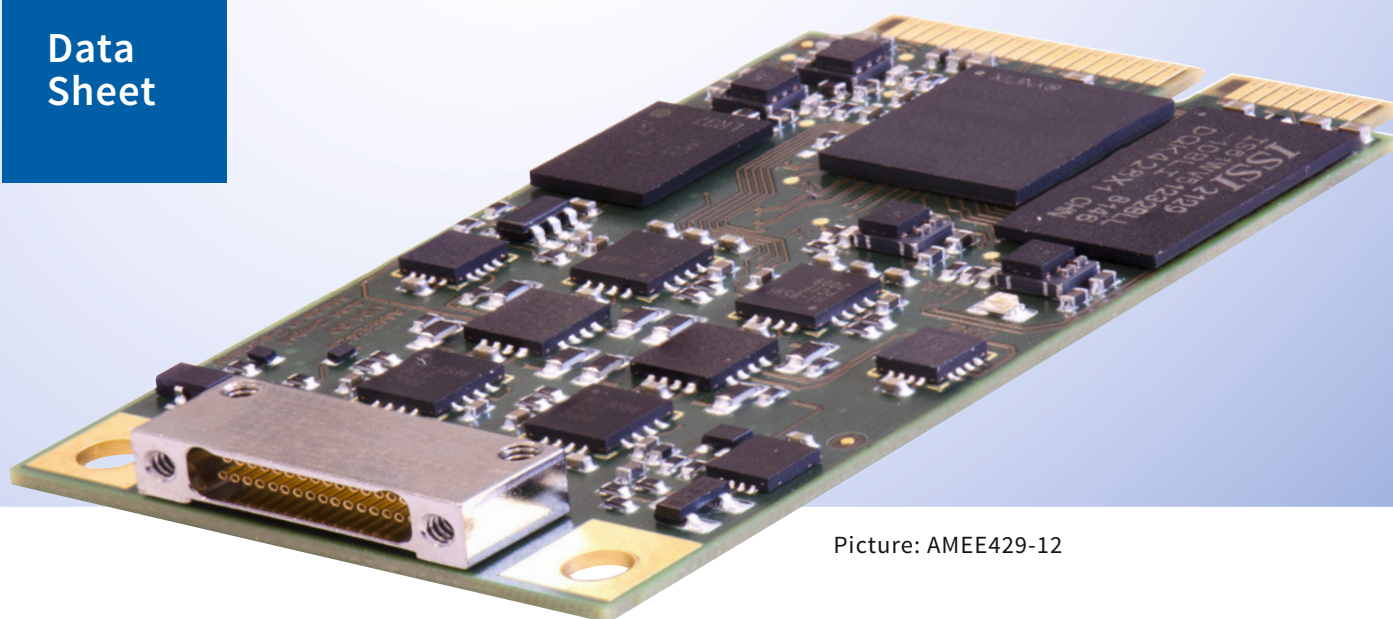


# AMEE429-x

Rugged Embedded ARINC429  
PCI Express Mini Card

Data  
Sheet



Picture: AMEE429-12

# AMEE429-x

## Rugged Embedded ARINC429 PCI Express Mini Card

### General Features

The ► **AMEE429-x** is a PCI Express Mini Card targeted for embedded ARINC429 applications.

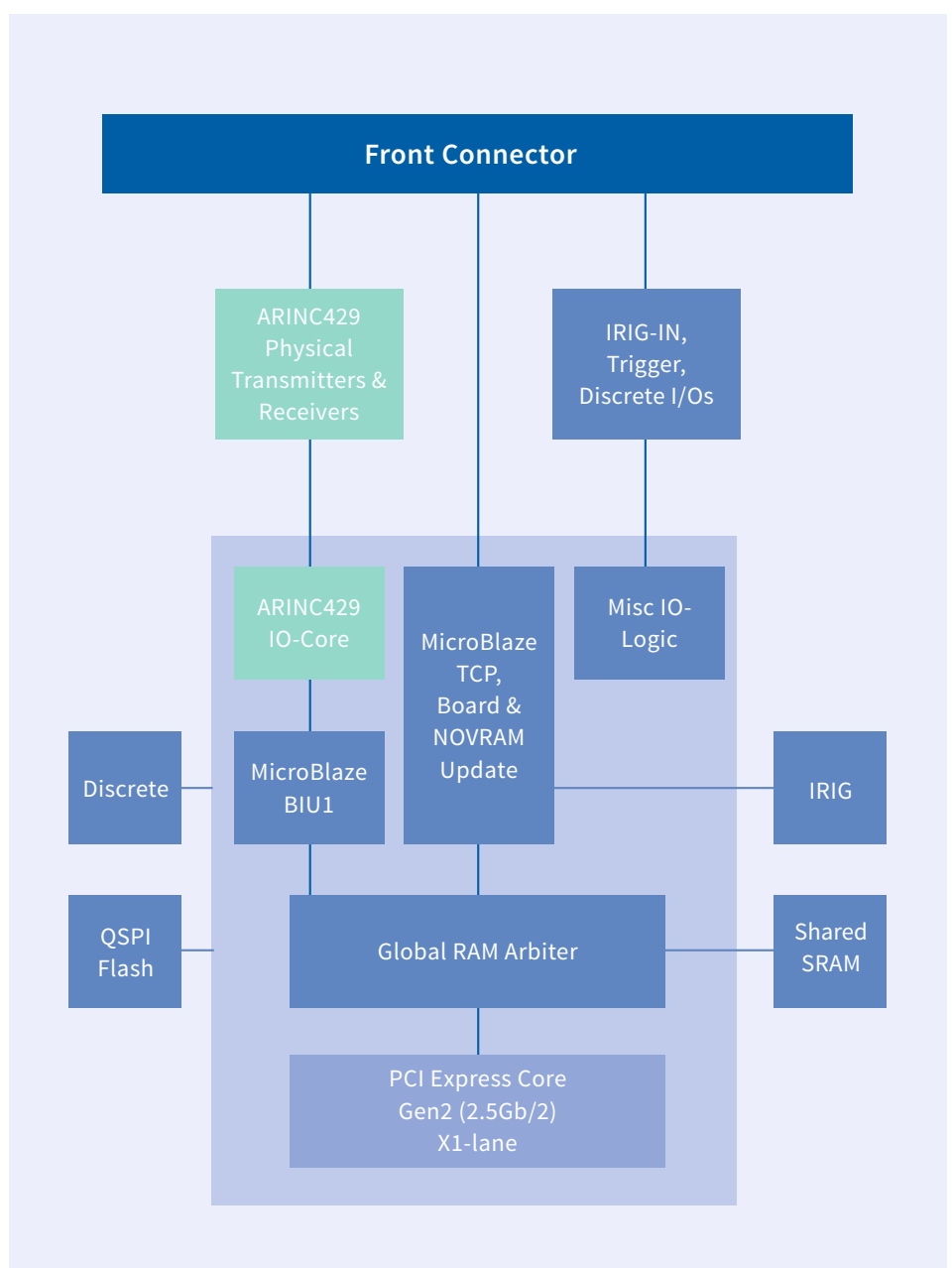
The AMEE429-x module provides full function test, simulation, monitoring and databus analyzer capabilities for ARINC429 applications and is available in configurations for up to 8 receive channels as well as 4 fully software programmable for receive (Rx) or transmit (Tx) channels, which are configurable for high/low bit rates.

The AMEE429-x supports 2 avionic discrete input and 2 avionic discrete output signals to be monitored or generated. In addition 1 trigger output is provided.

An onboard high-precision free-wheeling IRIG-B time decoder supports time tagging on the AMEE429-x model and allows users to accurately synchronize the module to a common IRIG-B time source.

With the provided onboard flash memory the components boot up autonomously after power up. Therefore the cards are well prepared for embedded applications requiring fast and autonomous boot up to operational mode.

A common Application Programming Interface (API) supports all ► **AIM ARINC429** modules.



AMEE429-x Block Diagram



## Key Features

- Robust and low power PCI Express Mini Card
- 4 programmable Tx/Rx ARINC429 Channels plus up to 8 fixed ARINC429 Rx Channels
- Available Variants:
  - Embedded (no Error Injection, no Physical Bus Replay and no Channel Loop/Pollution Mode)
  - Test and Simulation
  - Various number of channels available:
    - > 4 Channels: 4Tx/Rx
    - > 8 Channels: 4Tx/Rx + 4Rx
    - > 12 Channels: 4Tx/Rx + 8 Rx
- Concurrent Operation on all Channels (Simulation/Monitoring)
- Full Error Injection Capability (Test and Simulation Variant only)
- Full Error Detection Capability
- Multi-Level Triggering for Capturing/Filtering
- Real Time Traffic Recording
- Real Time synchronized Bus Replay (Test and Simulation Variant only)
- 31-pin Screw Lock I/O Connector
- IRIG-B Time Decoder for Data Correlation (IRIG-B Input only)
- 2 Avionic Level Discrete Inputs (1 Discrete Input can be programmatically switched to Trigger Input)
- 2 Avionic Level, open Collector Discrete Outputs
- 1 TTL Trigger Output
- Drivers for Windows, Linux and further Operating Systems (contact Factory)
- Compatible with PBA.pro™ and Easy-LOAD-429/EasyDLE Application
- Software compatible with AIM's Family of **► ARINC429 Cards**

## Transmit Channel Operation

- Cyclic/Acyclic Label Transmission
- Error Injection for each Label Transfer:
  - Short Gap, Parity, Bit Count, Coding (Test and Simulation Variant only)
- Programmable Gap between Labels: 0 to 255 Bit
- Simulate Zero-Jitter Scenarios using Virtual Label Transfers
- Multi-Buffering with Real Time Update supported per individual Label Transfer

- Reconstruction of previously recorded ARINC429 Traffic physically to the Bus with excellent Timing Accuracy (Physical Replay/Test and Simulation Variant only)
- Notification on Label Transmit (configurable per Label Transfer)
- Channel Loop/Pollution Mode (Test and Simulation Variant only)

## Receive Channel Operation

- Label Oriented Receive Mode (individual Buffers for each Label with Multi-Buffering and Real Time Updates)
- Chronological Receive Mode per Channel with 1µs Resolution Time Stamping
- Chronological Mode concurrent to Label Oriented Receive Mode
- Local Monitoring (individual Buffer per Channel) or Global Monitoring (common Buffer for all Channels)
- Continuous or Single Shot Capturing Modes
- Complex Triggering and Filtering Functions
- Loop of received Data to configurable transmit Channel with Label Data Modification Capability

## Physical Bus Interface

- 4 ARINC429 Line Transmitters/Receivers and selectable transmission Rate for each Channel independently
- Up to 8 ARINC429 Line Receivers
- Fixed Transmitter Output Amplitude (~11V)
- All ARINC429 Channels are available at the ruggedized I/O Connector

## IRIG-B Time Decoder (Input)

- Onboard, free-wheeling IRIG-B Time Decoder
- Synchronize with multiple **► AIM Modules** or any IRIG-B compatible Module

## Discrete and Trigger I/O

- 2 Avionic Level Discrete Input Signals (1 Discrete Input can be programmatically switched to Trigger Input)
- 2 Avionic Level, open Collector Discrete Output Signals
- 1 TTL Trigger Output

## Driver Software Support

- Common Application Programming Interface **► (API)**
- Drivers for Windows, Linux and further Operating Systems (contact Factory)

## Configuration Options

- Embedded (no Error Injection, no Physical Bus Replay and no Channel Loop/Pollution Mode)
- Test and Simulation (additionally with Error Injection, Physical Bus Replay and Channel Loop/Pollution Mode))
- Various number of channels available:
  - > 4 Channels: 4Tx/Rx
  - > 8 Channels: 4Tx/Rx + 4Rx
  - > 12 Channels: 4Tx/Rx + 8 Rx
- Tx Inhibit (all Channels fixed to Rx)
- Conformal Coating

## Technical Data

### Express Interface

Single Lane Full PCI Express (Gen2) Mini Card, compatible with the PCI Express Base Specification rev. 2.1

### Memory

2MByte, synchronous SRAM

### Processor Core

Multiple FPGA based embedded Processors for ARINC429 Protocol Handling and Time Synchronization

### Encoder/Decoder

Up to 4 Encoders/Decoders with full Error Injection and Detection plus up to 8 Decoders with full Error Detection

### Time Tagging

46-bit absolute IRIG-B formatted

### Discrete I/O

2 Avionic Discrete Inputs;  
2 Avionic Discrete Outputs (Output 3.3V/ Open Collector))

### Trigger I/O

1 Trigger Output Line, TTL compatible

### Physical Bus Interface

4 ARINC429 Transmitters and 4 ARINC429 Line Receivers, which are user programmable Rx or Tx plus up to 8 ARINC429 Receivers

### Connector

Male 31-pin Screw Lock I/O Connector (mating Female Connector Information on Request)

### Dimensions

PCI Express Mini Card (F2 Standard)  
50.95mm x 30mm

**Note:** max. Standard Height (top) is exceeded by the Front Connector

### Supply Voltage

Standard PCI Express Mini Card Supply  
+3.3V, +1.5V

### Power Consumption

@3.3V aux: TBD (approx. 3.6W);  
@1.5V max: TBD (approx. 0.56W)  
With normal Busload on all Channels

### Operating Temperature Range

-40°C to +85°C

### Storage Temperature Range

-40°C to +85°C

### Humidity

5 up to 95% (non-condensing)

## Ordering Information

### AMEE429-x

Rugged Embedded 4/8/12 Channel PCI Express Mini Card

### Common Features

Up to 12 ARINC429 Channels (4 programmable TX/Rx Channels and 0/4/8 Rx Channels), IRIG-B Time Decoder, 2 Avionic Discrete Inputs, 2 Avionic Discrete Outputs, 1 TTL Trigger Output, 2MB Global RAM, Extended Temperature Range

Including Driver Software for Windows, Linux and further Operating Systems (contact factory)

Available as:

- AMEE429-4 (4Tx/Rx Channels)
- AMEE429-8 (4 Tx/Rx Channels + 4 Rx Channels)
- AMEE429-12 (4 Tx/Rx Channels + 8 Rx Channels)

### Options

### Test and Simulation

Including Error Injection, Physical Bus Replay Functionality and Channel Loop/Pollution Mode, add suffix **-T** to Part Number

### Tx Inhibit

All Channels fixed to Rx, add suffix **-I** to Part Number

### Conformal Coating

Available as costed option, add suffix **-COAT** to Part Number

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