

FLARM Atom System-on-Chip

See & be seen collision avoidance for manned and unmanned aircraft

Every year, around 40 aircraft are involved in mid-air collisions. Half of these are fatal. Most of these accidents happen in good visibility and daylight. FLARM brings affordable, active, and cooperative traffic information and collision warnings to manned and unmanned aviation. Over 40,000 manned aircraft and many UAVs are already equipped with FLARM and the number is rapidly increasing.

When Size Matters

There are applications where our proven and robust PowerFLARM OEM modules are too large to fit. The new FLARM Atom system-on-chip (SoC) fills this gap: It packs the FLARM radio transceiver and protocol as well as the collision algorithms into a tiny (7x7 mm) package that can easily be integrated in any host device. It runs the standard FLARM software stack and is thus fully interoperable with all existing FLARM systems by design. State-of-the-art technology achieves high RF sensitivity and output power for optimum range. Integration is straightforward: Only the GNSS navigation source plus some discrete components need to be added. Development kits are available.

Product Integration Use Cases

- Size-constrained designs
- R/C models
- UAS and drones
- Portable Electronic Conspicuity devices
- Portable collision-avoidance solutions in airplanes and rotorcraft
- Dedicated and integrated displays (MFD/CDTI)
- Handheld solutions for air sports
- Remote identification
- Ground receiver stations for ATC and fleet management

Integration Design Requirements

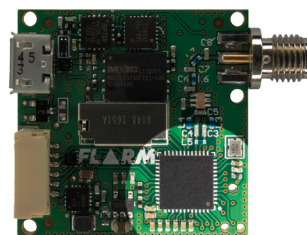
- QFN48 (7 x 7 mm) package
- 3.3 VDC regulated power supply
- Compatible with most u-blox Gen. 8 GNSS receivers
- 1 Hz time pulse, < 5 ms jitter
- Radio antenna 868 - 928 MHz, depending on region
- NMEA and binary communication for UI and configuration
- Annual firmware updates

Atom SoC Features

- FLARM transmit and receive
- FLARM ICD protocol
- Output received signal strength (RSSI)
- Collision warnings
- Proximate traffic information
- Alert zones
- Data for navigation, situational awareness, and geofencing
- Configuration, status, and error messages

Options

- Fixed obstacle warnings
- Protocols: MAVLink, JSON, GDL-90



Development Kit with
Atom SoC highlighted
Actual size



Features

Module Type	System-on-Chip
Interoperability	All FLARM devices
Frequency Range	868 - 928 MHz (license-free) automatically selected
Geographic area	Worldwide
Max Transmit Power	100 mW regionally limited (automatic)
Max Range TX+RX	Typically 8 km depending on antenna and installation
FLARM Functions	Collision warnings Proximate traffic information Obstacle warnings Alert Zone warnings Remote identification Tracking Navigation data Status and error conditions Configuration Annual firmware updates

Interfaces

Serial	2 UART
UART Functions	Traffic, navigation, firmware update, configuration, flight record download
GNSS	Dedicated or Host controlled
GNSS Time Pulse	1 Hz, < 5 ms jitter
Antenna	50 Ω, omnidirectional, dipole, vertically polarized

Optional Add-on Interfaces

Mass Storage	1 USB or 1 MCI (SD Card)
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Electrical Data

Power Supply	3.3 VDC Regulated
Power Consumption	15 mA @ 3.3 V (Typical) 140 mA @ 3.3 V (Max)

Environmental Data and Approvals

Operating Temperature	-15 to 70 °C (non-condensing)
Compliance	Europe (ETSI RED) US (FCC/CFR 47 part 15)* Canada (IC RSS)*

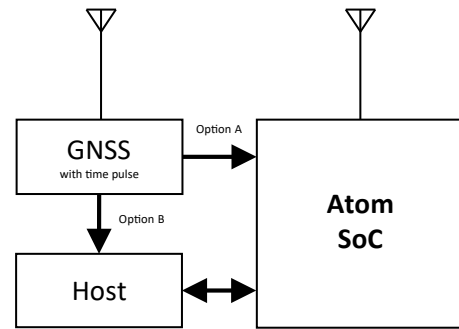
Aircraft Certification FLARM is EASA approved

* Pending

Development Kit

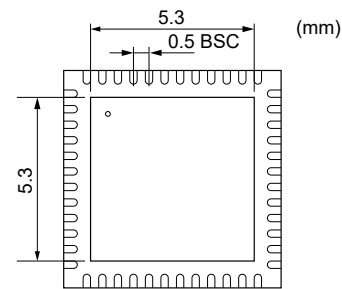
Atom Dev Kit	Atom SoC, GNSS with integrated antenna, UART, USB, SMA RF connector
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Block Diagram



Dimensions

SoC 7 x 7 mm QFN48



Further Information

Standard order quantity is 100 pcs per module, 2 pcs per dev kit.

Full documentation and support package for integration subject to signed OEM agreement.

For more information and quotes, contact info@flarm.com

Comparison of OEM Products

	Classic FLARM (deprecated)	FLARM Atom SoC	PowerFLARM OEM
Technology	Classic FLARM	PowerFLARM	PowerFLARM
Interoperability	Full	Full	Full
Geographic area	Europe	Worldwide	Worldwide
Module Type	Diverse	SoC	PCB-based LCC
Range	3-5 km	5-8 km	> 10 km
Size	Diverse	7 x 7 mm	64 x 28 mm
Mass	Diverse	< 1 g	9 g
Antenna Diversity	No	No	Yes
1090 Receiver	No	No	Yes

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