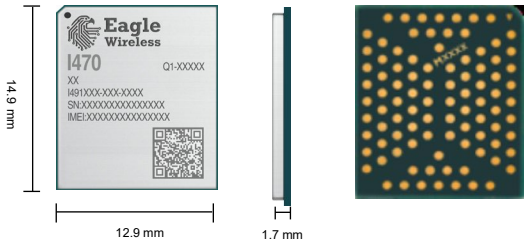
Eagle I470

Ultra-Compact
LTE Cat M1/Cat NB2 Module



I470 is an ultra-compact LPWA module supporting LTE Cat M1, LTE Cat NB2 and integrated GNSS. It is fully compliant with 3GPP Rel-14 specification and provides maximum data rates of 588 kbps downlink and 1119 kbps uplink. It features ultra-low power consumption by leveraging the integrated RAM/flash as well as the ARM Cortex A7 processor supporting ThreadX, achieving up to 70 % reduction in PSM leakage and 85 % reduction in eDRX current consumption compared to its predecessor.

I470 boasts a comprehensive set of hardware-based security features and enables trusted applications to run directly on the Cortex A7 TrustZone engine. With an ultra-compact SMT form factor of 14.9 mm × 12.9 mm × 1.7 mm and high integration level, it enables integrators and developers to easily design their applications and take advantage from the module's low power consumption and mechanical intensity. Its advanced LGA package allows fully automated manufacturing for high-volume applications.

A rich set of Internet protocols, industry-standard interfaces and abundant functionalities extend the applicability of the module to a wide range of M2M applications such as wireless POS, smart metering, tracking, wearable devices, etc.

Key Features

- Extremely compact LTE Cat M1/Cat NB2 module with ultra-low power consumption
- Integrated RAM and flash in baseband chipset
- Comprehensive set of hardware-based security features
- Super slim profile in LGA package
- Support VoLTE (Cat M1 only), DFOTA, etc.
- Fast time-to-market: reference designs, evaluation tools and timely technical support minimize design-in time and development efforts
- Robust mounting and interfaces

LTE Cat M1 & Cat NB2

LGA Package

Super Compact Size

Embedded Abundant Protocols

DFOTA

USB 2.0 Interface

Ultra-low Power Consumption

Enhanced AT Commands

Integrated RAM/ Flash in Chipset

Version: 1.2 | Status: Released

Eagle I470

LPWA	I470
Region/Operator	Global
Dimensions (mm)	14.9 × 12.9 × 1.7
Temperature Range	
Operating Temperature	-35 °C to +75 °C
Extended Temperature	-40 °C to +85 °C
Frequency Bands	
LTE HD-FDD	**Cat M1:** LTE-FDD: B1/ 2/ 3/ 4/ 5/ 8/ 12/ 13/ 18/ 19/ 20/ 25/ 26/ 27/ 28/ 66/ 85* **Cat NB2:** LTE-FDD: B1/ 2/ 3/ 4/ 5/ 8/ 12/ 13/ 18/ 19/ 20/ 25/ 28/ 66/ 71/ 85*
Certifications	
Carrier	**America:** AT&T/Verizon/T-Mobile
Regulatory/ Conformance	**Global:** GCF **North America:** PTCRB* **America:** FCC*
Others	RoHS
Max. Data Rates	
LTE HD-FDD	**Cat M1:** Max. 588 kbps (DL)/ 1119 kbps (UL) **Cat NB2:** Max. 127 kbps (DL)/ 158.5 kbps (UL) **Cat NB1:** Max. 32 kbps (DL)/ 70 kbps (DL)
Interfaces	
USB 2.0	× 1
UART	× 3
PCM	× 1 (for VoLTE Only)
I2C	× 1 (for VoLTE Only)
ADC	× 2
(U)SIM	× 1
GPIO	× 7
GRFC	× 2
NET_STATUS	× 1 (For Network Status Indication)
STATUS	× 1 (For Power ON/OFF Indication)
Antenna	× 2 (For LTE & GNSS Antennas)
Voice	
Voice	VoLTE (For Cat M1 Only)
SMS	
Short Message Service	Point-to-point MO and MT SMS Cell Broadcast Text and PDU Mode
Enhanced Features	
DFOTA	Delta Firmware Upgrade Over-the-Air
Firmware Upgrade	via USB interface
Processor	ARM A7 Processor
GNSS	GPS/ GLONASS/ BDS/ Galileo/ QZSS

NOTE:
*: Under development / In progress.

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Eagle Wireless

Eagle I470

LPWA	I470
General Features	
Package	LGA
-	3GPP E-UTRA Release 14
AT Command	3GPP TS27.007, 3GPP TS 27.005 and Enhanced AT Commands
Software Features	
Protocols	PPP/ TCP/ UDP/ SSL/ TLS/ FTP(S)/ HTTP(S)/ NITZ/ PING/ MQTT/ LwM2M/ CoAP/ IPv6
USB Serial Driver	Windows 10/ 11, Linux 2.6–6.7, Android 4.x–14.x
GNSS/ RIL Driver	Android 4.x–14.x
Electrical Features	
Supply Voltage Range①	2.6–4.8 V, typ. 3.3 V
Max Output Power	21 dBm
Power Consumption @ LTE Cat M1 (Typical)	Power Saving Mode: 3.44 µA **Sleep Mode:** 1.61 mA @ DRX = 1.28 s 0.67 mA @ e-I-DRX = 81.92 s **Idle Mode:** 19.7 mA @ DRX = 1.28 s 19.3 mA @ e-I-DRX = 81.92 s **Active Mode:** 228 mA @ 21dBm, GNSS off
Power Consumption @ LTE Cat NB1 (Typical)	Power Saving Mode: 3.44 µA **Sleep State:** 1.55 mA @ DRX = 1.28 s 0.66 mA @ e-I-DRX = 81.92 s **Idle State:** 15.8 mA @ DRX = 1.28 s 15.4 mA @ e-I-DRX = 81.92 s **Active Mode:** 165 mA @ 21 dBm, GNSS off

NOTE:
①: please refer to the hardware design document for more specific requirements on the minimum power supply voltage.

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