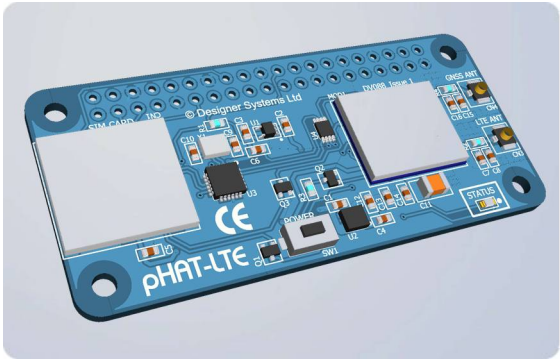
pHAT-LTE

LTE Cat M1/NB2 + GNSS modem module

for Raspberry-Pi boards



pHAT-LTE is a multi-band LTE Cat M1/NB2 module that works on Cat M1 bands B1/B2/B3/B4/B5/B8/B12/B13/B14/B18/ B19/B20/B25/B26/ B27/B28/B66/B85 and Cat NB2 bands B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B26/B28/B66/ B71/B85 and also includes GNSS positioning using GPS, GLONASS, BeiDou, Galileo and QZSS.

Specifically designed for the Raspberry-Pi Zero user (can also be used on all the other Raspberry-Pi variants) the pHAT-LTE features I^2C communication to leave the Raspberry-Pi UART for other functions eg. Sensors, debug etc.

pHAT-LTE features full AT command control over the embedded I^2C to UART bridge allowing the Raspberry-Pi to create UDP/TCP/MQTT data links with downlink transfers at up to 588kbps (Cat M1 download) and 127kbps (Cat NB2 download).

The compact form factor, low power consumption and extended temperature range make pHAT-LTE a best choice for M2M applications when using Raspberry-Pi modules.

Key Benefits

- ✓ Compact LTE Cat M1 and Cat NB2 + GNSS module with ultra-low power consumption.
- ✓ Data transfer rates up to 588kbps supporting embedded Internet service protocols for M2M applications.
- ✓ Text and PDU mode Small-Message-System (SMS) support.
- ✓ Standard 3GPP Rel.14 AT command set with extended commands for embedded Internet Service Protocols.
- ✓ Manual power on/off button or IO controlled power on/off for embedded applications.
- ✓ SC16IS750 I^2C to UART bridge supports serial speeds up to 115.2kbps.
- ✓ UF.L antennas and micro-SIM interface for 1.8/3.0V SIM cards.

Multi-Band

GNSS Positioning

Extended temperature Range: -20°C ~ +85°C

Fully Raspberry-Pi compatible

Supports M2H interfacing

Supports M2M interfacing

Ultra-low Power Consumption

External UFL Antennas

pHAT-LTE

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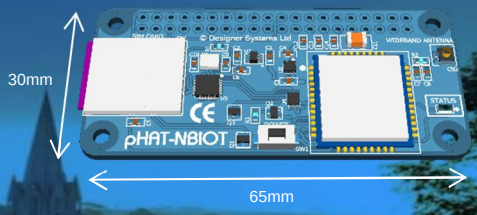

Frequency Bands

Cat M1 Multi-band:

B1/B2/B3/B4/B5/B8/B12/B13/ B14/B18/B19/B20/B25/B26/ B27/B28/B66/B85

Cat NB2 Multi-band:

B1/B2/B3/B4/B5/B8/B12/B13/ B18/B19/B20/B25/B26/B28/B 66/B71/B85

Data

Data Rate:

Cat M1:

588kbps (DL)/1119kbps (UL)

Cat NB2:

127kbps (DL)/158.5kbps (UL)

Protocols:

PPP/TCP/UDP/SSL/TLS/FTP(S)/ HTTP(S)/NITZ/PING/MQTT

SMS (TBC)

Text and PDU mode

SIM Card

Support:

Micro SIM (3.0/1.8V)

Type:

Push-push card

Indication

Blue STATUS LED:

TBC

Antennas

Impedance:

50ohm

Connection:

UF.L socket

GNSS features:

GNSS support:

GPS/GLONASS/BeiDou/Galileo/ QZSS

I²C and IO:

I²C Signals:

SDA, SCL & IRQ (GPIO25)

IO Signals:

PWR_CTL (GPIO23) [power on/off]

MDM_DTR (GPIO17) [DTR control]

Voltage level:

3.3V

I²C Pullups:

None (within Raspberry-Pi)

I²C Speed:

100kHz and 400kHz

I²C address:

0x4C

Connection:

40pin Raspberry-Pi header

Controls

Power Button:

Tactile (Hold to power on/off)

I²C-UART Modem Bridge

Bridge device:

SC16IS750

Modem serial speed:

1200 ~ 115200 bps

Modem protocol:

8 data, no parity, 1 stop

Modem flow control:

None

Electrical & Sensitivity

Supply Voltage:

4.5V ~ 5.5VDC

Power Consumption:

1mA @ 5VDC Idle

200mA @ 5VDC Peak GNSS off

250mA @ 5VDC Peak GNSS on

Output Power:

21dBm ± 2dB

Sensitivity:

-101dBm Typ.

General Features

Supplied with Wideband antenna

3GPP Rel.14 AT command set

Firmware update over UART

Temperature range: -20°C ~ +85°C

Dimensions: 65 x 30 x 4mm

Weight: 12g approx.

Carriers

O2 (UK)

Vodafone (Global)

AT&T (North America)

Approvals

RoHS Compliant

RED Compliant

CE (Europe)

UKCA (UK)

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