MAX-M10M-20B

Standard precision GNSS module
Professional grade

Data sheet

Abstract

This document describes the features and application of the u-blox MAX-M10M-20B module. The MAX-M10M-20B module is a standard precision GNSS receiver for high-performance asset-tracking applications.

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This document applies to the following products:

Product name	Type number	FW version	IN/PCN reference	Product status
MAX-M10M	MAX-M10M-20B-01	ROM SPG 5.10	UBXDOC-304424225-20550	Mass production

Contents

1 Functional description

1.1 Overview

The MAX-M10M-20B module is built on the ultra-low-power u-blox M10 GNSS platform, which supports concurrent reception of four GNSS (GPS, GLONASS, Galileo, and BeiDou) and provides exceptional sensitivity and fast acquisition times for all L1 GNSS systems.

The cost-efficient MAX-M10M-20B module integrates an LNA followed by a SAW filter in the RF path for maximum sensitivity, making it ideal for passive antenna designs. Its wide supply voltage range enhances design flexibility and versatility. In applications using a 1.8 V power supply, MAX-M10M-20B consumes as little as 41 mW in continuous tracking mode with four concurrent GNSSs, providing excellent power autonomy for battery-operated devices without compromising on GNSS performance.

MAX-M10M-20B benefits from u-blox Super-Signal (Super-S) technology, which offers great RF sensitivity and can improve the dynamic position accuracy with small antennas or in a non-line-of-sight scenario. It also detects jamming and spoofing attempts and reports them to the host, so that the system can react to such events.

MAX-M10M-20B offers backwards pin-to-pin compatibility with previous MAX generations. This saves designers time and cost when upgrading their designs to advanced low-power u-blox M10 GNSS technology.

1.2 Performance

Parameter	Specification	Value
Receiver type		u-blox M10 receiver
Accuracy of time pulse signal	RMS	30 ns
	99%	60 ns
Frequency of time pulse signal		Default 1PPS (0.25 Hz to 10 MHz configurable)
Operational limits[1]	Dynamics	≤ 4 g
	Altitude	80,000 m
	Velocity	500 m/s
Velocity accuracy [2]		0.05 m/s
Dynamic heading accuracy [2]		0.3 deg

Table 1: MAX-M10M-20B specifications

Parameter		GPS+GAL	GPS+GAL +GLO	GPS+GAL +BDS B1I (default)	GPS+GAL +BDS B1C	GPS+GAL +BDS B1C +GLO
Max navigation update rate [3]	Default	10 Hz	6 Hz	3 Hz	8 Hz	4 Hz
Position accuracy (CEP) [4, 5]		1.5 m	1.5 m	1.5 m	1.5 m	1.5 m

1 Assuming Airborne 4 g platform.

2 50% at 30 m/s for dynamic operation.

3 Minimum 98% fix rate under typical conditions.

4 GPS is always in combination with SBAS and QZSS.

Parameter		GPS+GAL	GPS+GAL +GLO	GPS+GAL +BDS B1I (default)	GPS+GAL +BDS B1C	GPS+GAL +BDS B1C +GLO
Time To First Fix (TTFF) [4, 6, 7]	Cold start	28 s	23 s	27 s	28 s	23 s
	Hot start	1 s	1 s	1 s	1 s	1 s
	AssistNow Online [8]	1 s	1 s	1 s	1 s	1 s
	AssistNow Offline [9]	2 s	2 s	3 s	2 s	2 s
	AssistNow Autonomous [10]	3 s	4 s	4 s	4 s	4 s
Sensitivity [11]	Tracking and navigation	–165 dBm	–165 dBm	–164 dBm	–163 dBm	–165 dBm
	Reacquisition	–160 dBm	–160 dBm	–160 dBm	–160 dBm	–160 dBm
	Cold Start	–148 dBm	–148 dBm	–148 dBm	–148 dBm	–148 dBm
	Hot start [6]	–159 dBm	–159 dBm	–159 dBm	–159 dBm	–159 dBm

Table 2: MAX-M10M-20B typical performance in multi-constellation GNSS modes.

Parameter		GPS	GLONASS	BDS B1I	GALILEO	BDS B1C
Max navigation update rate [3]	Default	18 Hz	18 Hz	18 Hz	18 Hz	18 Hz
Position accuracy (CEP) [4, 5]		1.5 m	4 m	2 m	3 m	2 m
Time To First Fix (TTFF) [4, 6, 7]	Cold start	29 s	27 s	30 s	41 s	58 s
	Hot start	1 s	1 s	1 s	1 s	1 s
	AssistNow Online [8]	1 s	1 s	2 s	7 s	N/A
Sensitivity [11]	Tracking and navigation	–165 dBm	–165 dBm	–159 dBm	–159 dBm	–159 dBm
	Reacquisition	–160 dBm	–158 dBm	–158 dBm	–155 dBm	–156 dBm
	Cold Start	–148 dBm	–147 dBm	–145 dBm	–137 dBm	–134 dBm
	Hot start [6]	–159 dBm	–159 dBm	–159 dBm	–155 dBm	–157 dBm

Table 3: MAX-M10M-20B typical performance in single-GNSS modes

1.3 Supported GNSS constellations

MAX-M10M-20B is a concurrent GNSS receiver that can receive and track multiple GNSS systems. To achieve lower power consumption, the receiver can be configured for a subset of GNSS constellations.

The default configuration on MAX-M10M-20B is concurrent reception of GPS, Galileo, and BeiDou B1I with QZSS and SBAS enabled.

The following GNSS and their signals are supported:

System	Signals
GPS / QZSS	L1C/A (1575.42 MHz)
Galileo	E1-B/C (1575.42 MHz)

5 CEP, 50%, 24 hours static, –130 dBm, > 6 SVs for each GNSS system.
6 Commanded starts.
7 All satellites at –130 dBm. Measured at room temperature.
8 Dependent on the speed and latency of the aiding data connection, commanded starts.
9 Using seven days old AssistNow Offline data. External memory may be required.
10 Using two days old orbital predicted data. External memory may be required.
11 Demonstrated with a good external LNA. Measured at room temperature.

System	Signals
GLONASS	L1OF (1602 MHz + k*562.5 kHz, k = -7,..., 5, 6)
BeiDou[12]	B1I (1561.098 MHz), B1C (1575.42 MHz)

Table 4: Supported GNSS and signals on MAX-M10M-20B

The following GNSS assistance services are supported:

Service	Support
AssistNow Online	GPS L1C/A, Galileo E1, QZSS L1C/A, GLONASS L1OF, BeiDou B1I
AssistNow Offline	GPS L1C/A, Galileo E1 , GLONASS L1OF
AssistNow Autonomous	GPS L1C/A, Galileo E1, GLONASS L1OF, QZSS L1C/A, BeiDou B1I

Table 5: Supported Assisted GNSS (A-GNSS) services

The following augmentation systems are supported:

System	Support
SBAS	EGNOS, GAGAN, MSAS, WAAS, BDSBAS, KASS and SouthPAN
QZSS	L1S (SLAS)

Table 6: Supported augmentation systems

☞ The SBAS and QZSS augmentation systems can be enabled only if GPS operation is also enabled.

1.4 Supported protocols

MAX-M10M-20B supports the following interface protocols:

Protocol	Type
UBX	Input/output, binary, u-blox proprietary
NMEA versions 2.1, 2.3, 4.0, 4.10 and 4.11 (default)	Input/output, ASCII

Table 7: Supported protocols

1.5 Firmware features

Feature	Description
Antenna supervisor[13]	Antenna supervisor for active antenna control and short detection
CloudLocate GNSS	Extends the life of energy-constrained IoT applications. Small payload messages supported.
Assisted GNSS	AssistNow Online, AssistNow Offline and AssistNow Autonomous
Backup modes	Hardware backup mode, hardware standby mode[14], and software standby mode, all with optional RTC Hardware backup mode, hardware standby mode, and software standby mode
Power save modes	On/off, cyclic tracking
Super-S	Improved accuracy with small antennas
Galileo return link messages	Galileo search and rescue (SAR) return link messages (RLM) via Galileo satellite signal

12 BeiDou B1I cannot be enabled simultaneously with BeiDou B1C or GLONASS L1OF.

13 External components required, some pins need to be reconfigured.

14 Requires OTP memory configuration and a minimum voltage at V_CORE = 1.35 V.

Feature	Description
Data batching	Stores position/velocity/time information over up to 10 min in RAM without host interaction
Odometer	Measures traveled distance with support for different user profiles

Table 8: Firmware features

Feature	Description
Anti-jamming	RF interference and jamming detection and reporting
Anti-spoofing	Spoofing detection and reporting
Configuration lockdown	Receiver configuration can be locked by command
Message integrity	All messages can be cryptographically signed
Secure boot	Only signed firmware images are executed

Table 9: Security features

2 Block diagram

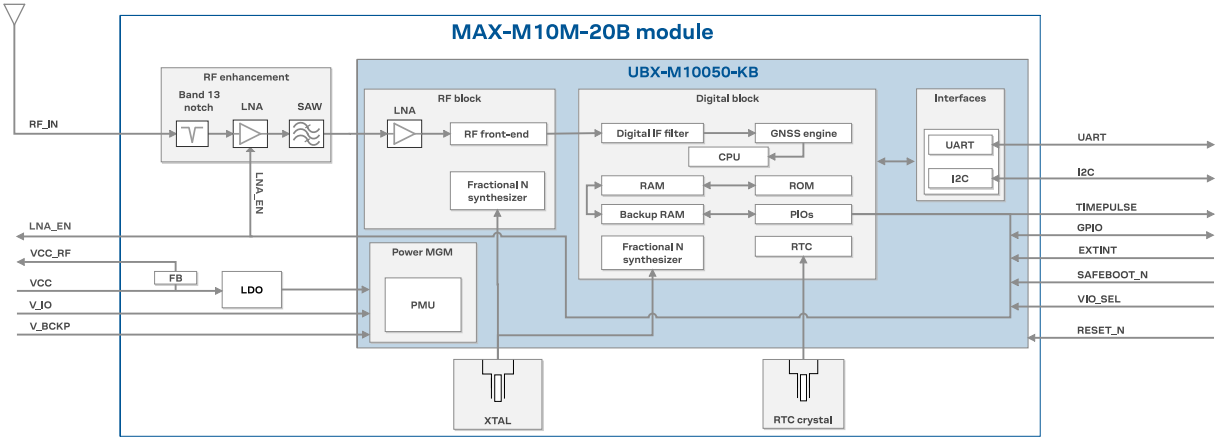


Figure 1: MAX-M10M-20B block diagram

3 Pin definition

3.1 Pin assignment

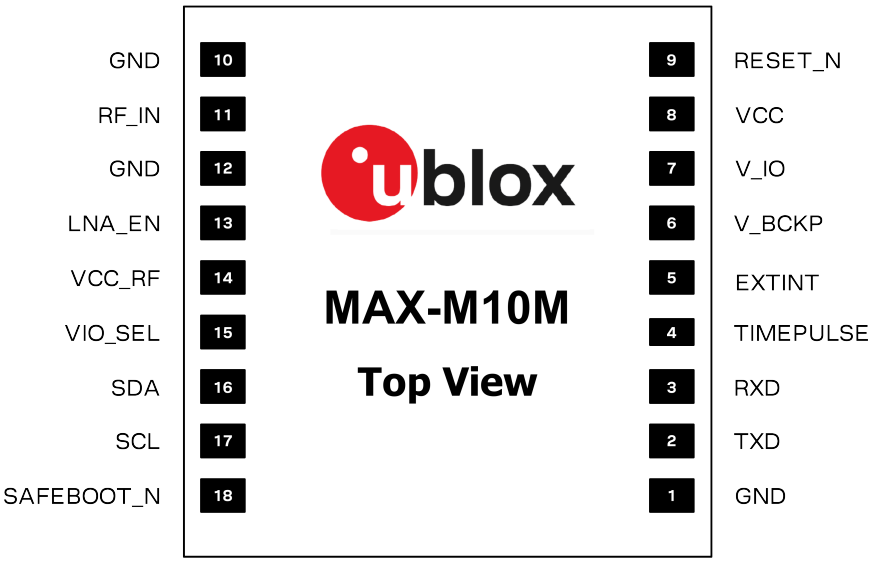


Figure 2: MAX-M10M-20B pin assignment

Pin no.	Name	PIO no.	I/O	Description
1	GND	-	-	Connect to GND
2	TXD	1	O	UART TX. Leave open if not used.
3	RXD	0	I	UART RX. Leave open if not used.
4	TIMEPULSE	4	O	Time pulse signal (shared with SAFEBOOT_N pin)[15]
5	EXTINT	5	I	External interrupt. Leave open if not used.
6	V_BCKP	-	I	Backup voltage supply
7	V_IO	-	I	IO voltage supply
8	VCC	-	I	Main voltage supply
9	RESET_N	-	I	System reset (active low). Has to be low for at least 1 ms to trigger a reset.
10	GND	-	-	Connect to GND
11	RF_IN	-	I	GNSS signal input
12	GND	-	-	Connect to GND
13	LNA_EN	-	O	On/Off external LNA or active antenna
14	VCC_RF	-	O	Output voltage RF section
15	VIO_SEL	-	I	Voltage selector for V_IO supply. Connect to GND for 1.8 V supply, or leave open for 3.3 V supply.
16	SDA	2	I/O	I2C data. Leave open if not used
17	SCL	3	I	I2C clock. Leave open if not used.
18	SAFEBOOT_N	-	I	Safeboot mode (active low). Leave open if not used.[15]

Table 10: MAX-M10M-20B pin assignment

[15] The receiver enters safeboot mode if this pin is low at start up. The SAFEBOOT_N pin is internally connected to TIMEPULSE pin through a 1 kΩ series resistor.

3.2 Pin state

Table 11 defines the state of the PIOs and RESET_N pins in different modes. The functions of the PIOs are as defined in the default configuration.

PIO no.	Pin no.	Default function	Continuous mode	Software standby mode	Safe boot mode
0	3	RXD	Input pull-up	Input pull-up	Input pull-up
1	2	TXD	Output	Input pull-up	Output
2	16	SDA	Input pull-up	Input pull-up	Input pull-up
3	17	SCL	Input pull-up	Input pull-up	Input pull-up
4[15]	18	SAFEBOOT_N	Output	Input pull-up	Output (low)
	4	TIMEPULSE	Output	Input pull-up	Output (low)
5	5	EXTINT	Input pull-up	Input pull-up	Input pull-up
7	13	LNA_EN	Output (high)	Input pull-down	Input pull-up
-	9	RESET_N	Input pull-up	Input pull-up	Input pull-up

Table 11: Pin state

☞ In reset mode (RESET_N = low), all PIOs are configured as input pull-up.

☞ In hardware backup mode (VCC = 0 V and V_IO = 0 V), PIOs must not be driven.

4 Electrical specifications

4.1 Absolute maximum ratings

⚠ CAUTION. Risk of device damage. Exceeding the absolute maximum ratings may affect the lifetime and reliability of the device or permanently damage it. Do not exceed the absolute maximum ratings.

⚠ This product is not protected against overvoltage or reversed voltages. Use appropriate protection to avoid device damage from voltage spikes exceeding the specified boundaries.

Symbol	Parameter	Min	Max	Unit
VCC	Main supply voltage	–0.3	6	V
V_IO	IO supply voltage, VIO_SEL = GND	–0.3	1.98	V
	IO supply voltage, VIO_SEL = open	–0.3	3.6	V
	Voltage ramp on V_IO [16]	25	35000	µs/V
V_BCKP	Backup supply voltage	–0.3	3.6	V
V_PIO	Input voltage on RESET_N and digital pins VIO_SEL = GND	–0.3	V_IO + 0.3 (max 1.98)	V
	Input voltage on RESET_N and digital pins VIO_SEL = open	–0.3	V_IO + 0.3 (max 3.6)	V
I_PIO	Max source / sink current, digital pins [17]	–10	10	mA
ICC_RF	Max source current, VCC_RF		250	mA
V_DC_{rfin}	DC voltage at RF_IN	–5.5	+5.5	V
P_{rfin}	RF input power at RF_IN [18]		0	dBm
T_{amb}	Ambient temperature	–40	+85	°C
T_s	Storage temperature	–40	+85	°C

Table 12: Absolute maximum ratings

4.2 Operating conditions

Table 13 shows the general operating conditions. Table 14 shows the electrical parameters for digital I/O.

☞ The V_IO voltage range is selected with the VIO_SEL pin.

Symbol	Parameter	Min	Typical	Max	Unit
VCC	Main supply voltage	1.76	1.8, 3.3	5.5	V
V_IO	IO supply voltage, VIO_SEL = GND	1.68	1.8	1.98	V
	IO supply voltage, VIO_SEL = open	2.7	3.3	3.6	V
V_BCKP	Supply voltage, backup domain	1.65		3.6	V
V_IO_{SWITCH}	V_IO voltage threshold to switch an internal supply for the backup domain from V_IO to V_BCKP		1.45		V
VCC_RF	VCC_RF output voltage		VCC - 0.1		V
ICC_RF	VCC_RF output current			50	mA

16 Exceeding the voltage ramp speed may permanently damage the device.

17 The SAFEBOOT_N pin has an internal 1 kΩ series resistor.

18 Test conditions: source impedance = 50 Ω, continuous wave.

Symbol	Parameter	Min	Typical	Max	Unit
Z_{in} [19]	Input impedance at RF_IN		50		Ω
NF_{tot}	Receiver chain noise figure		2		dB
Ext_gain [20]	External gain at RF_IN, low gain mode (default)			30	dB
	External gain at RF_IN, bypass mode	10	25	40	dB
T_{opr}	Operating temperature	-40		+85	°C

Table 13: General operating conditions

Symbol	Parameter	Min	Typical	Max	Unit
I_{leak}	Leakage current input pins [21]		25		nA
V_{in}	Input pin voltage range	0		V_IO	V
V_{il}	Low-level input voltage			0.63	V
V_{ih}	High-level input voltage	0.68 x V_IO			V
V_{ol}	Low-level output voltage, Iout = -2 mA [22]			0.4	V
V_{oh}	High-level output voltage, Iout = 2 mA [22]	V_IO - 0.4			V
$R_{pu, IO}$	Pull-up resistance, Digital IO [23]. VIO_SEL = GND	6	17	72	kΩ
$R_{pu, IO}$	Pull-up resistance, Digital IO [23]. VIO_SEL = open	8	18	40	kΩ
$R_{pd, IO}$	Pull-down resistance, Digital IO	21	80	180	kΩ
$R_{pu, SAFEBOOT\_N}$	Pull-up resistance, SAFEBOOT_N [24]	6	17	72	kΩ
$R_{pu, RESET\_N}$	Pull-up resistance, RESET_N	7	10	13	kΩ

Table 14: Digital IO

4.3 Indicative power requirements

This section provides examples of typical current requirements. They are characterized on samples using a cold start command. The actual power requirements may vary depending on the firmware version used, the external circuitry, the number of satellites tracked, the signal strength, the type and time of start, duration, internal LNA gain mode, and the test conditions.

All values in Table 15 and Table 16 have been measured at 25 °C ambient temperature with the default configuration unless otherwise stated. SBAS and QZSS are active in all measurements.

Table 15 shows indicative current consumption for VCC and V_IO with a 1.8 V and 3.0 V supply.

Symbol (Parameter)	Conditions	GPS	GPS+GAL	GPS+GAL +GLO	GPS+GAL +BDS B1I (default)	GPS+GAL +BDS B1C	GPS+GAL +BDS B1C +GLO	Unit
I_{VCC} [25, 26] (Current at VCC)	Acquisition	15	20	25	24	24	28	mA
	Tracking (Continuous mode)	12.5	14	17.5	18.5	16	19.5	mA

19 The RF_IN input integrates a built-in DC block.

20 The internal LNA gain is configurable.

21 V_{in} = V_IO, at room temperature.

22 TIMEPULSE (PIO4) has 4 mA and LNA_EN (PIO7) has 4 mA current drive/sink capability.

23 TXD, RXD, TIMEPULSE, EXTINT, SCL, SDA, and LNA_EN.

24 The SAFEBOOT_N pin has an additional 1 kΩ series resistor.

25 1 Hz navigation update rate.

26 Internal LNA set to low gain. Simulated signal using power levels of -130 dBm.

Symbol (Parameter)	Conditions	GPS	GPS+GAL	GPS+GAL +GLO	GPS+GAL +BDS B1I (default)	GPS+GAL +BDS B1C	GPS+GAL +BDS B1C +GLO	Unit
	Tracking (Power save mode)	5	5.5	6.5	6.5	-	-	mA
I_{V_IO} [25] (Current at V_IO)	Acquisition and Tracking (Continuous mode)	2.9	2.9	3.0	3.0	3.0	3.1	mA
	Tracking (Power save mode)	2.7	2.7	2.7	2.7	-	-	mA

Table 15: Typical currents for 1.8 V and 3.0 V supply at VCC and V_IO

☞ The inrush current can go up to 100 mA at startup. Ensure that the external power supply is able to deliver up to 100 mA.

Table 16 shows current consumption for the backup modes.

Symbol	Parameter	Conditions	Typ.	Unit
I_{V_BCKP} [27]	Total current in hardware backup mode	V_BCKP = 3.3 V, V_IO = VCC = 0 V	28	µA
I_{V_IO}	V_IO current in software standby mode or in hardware standby mode	V_IO = 1.8 V	37	µA
		V_IO = 3.3 V	46	µA
I_{VCC}	VCC current in software standby mode	VCC = 1.8 V	3	µA

Table 16: Backup currents

☞ Extreme operating temperatures can significantly impact the specified values. If an application operates near the min or max temperature limits, ensure the specified values are not exceeded.

[27] I_{V_BCKP} current in normal operation (V_BCKP = 3.3 V, V_IO = VCC = 3.3V) is ~3 µA.

5 Communication interfaces

The receiver supports communication over the UART

All the inputs have an internal pull-up resistor in normal operation and can be left open if not used. The voltage level at the PIO pins is related to the V_IO supply voltage.

5.1 UART

The UART interface supports configurable baud rates. Hardware flow control is not supported. UART specifications are described in Table 17.

Symbol	Parameter	Min	Max	Unit
R_u	Baud rate	9600	921600	bit/s
Δ_{Tx}	Tx baud rate accuracy	-1%	+1%	-
Δ_{Rx}	Rx baud rate tolerance	-2.5%	+2.5%	-

Table 17: UART specifications

5.2 I2C

An I2C interface is available for communication with an external host CPU in the I2C Fast-mode. Backwards compatibility with the Standard-mode I2C bus operation is not supported. The interface can be operated only in the peripheral mode with a maximum clock frequency of 400 kHz[28].

The interface can make use of clock stretching by holding the SCL line LOW to pause a transaction. In this case, the bit transfer rate is reduced. The maximum clock stretching time is 20 ms.

[28] External pull-up resistors may be needed to achieve 400 kbit/s communication speed, as the internal pull-up resistance can be very large.

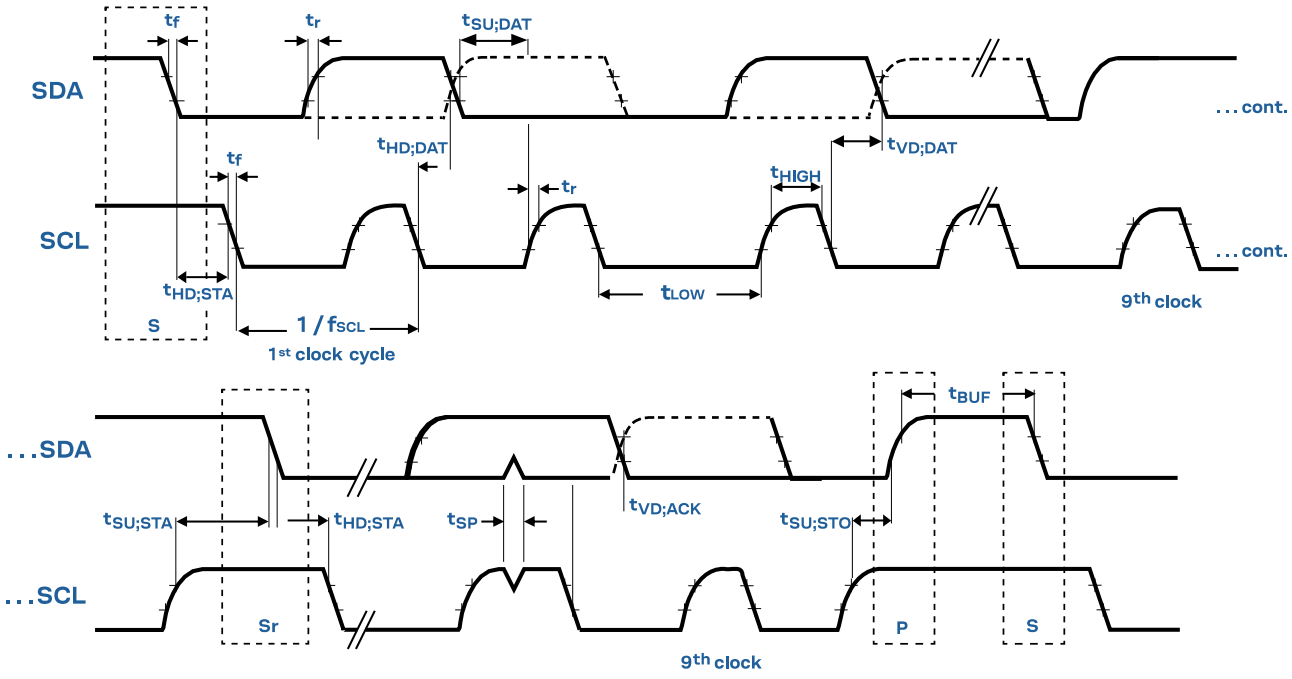


Figure 3: I2C peripheral specification

		I2C Fast-mode		
Symbol	**Parameter**	**Min**	**Max**	**Unit**
f_{SCL}	SCL clock frequency	0	400	kHz
$t_{HD;STA}$	Hold time (repeated) START condition	0.6	-	µs
t_{LOW}	Low period of the SCL clock	1.3	-	µs
t_{HIGH}	High period of the SCL clock	0.6	-	µs
$t_{SU;STA}$	Setup time for a repeated START condition	0.6	-	µs
$t_{HD;DAT}$	Data hold time	0 [29]	- [30]	µs
$t_{SU;DAT}$	Data setup time	100		ns
t_r	Rise time of both SDA and SCL signals	-	300 (for C = 400pF)	ns
t_f	Fall time of both SDA and SCL signals	-	300 (for C = 400pF)	ns
$t_{SU;STO}$	Setup time for STOP condition	0.6	-	µs
t_{BUF}	Bus-free time between a STOP and START condition	1.3	-	µs
$t_{VD;DAT}$	Data valid time	-	0.9 [30]	µs
$t_{VD;ACK}$	Data valid acknowledge time	-	0.9 [30]	µs
V_{nL}	Noise margin at the low level	0.1 V_IO	-	V

29 External device must provide a hold time of at least one transition time (max 300 ns) for the SDA signal (with respect to the min Vih of the SCL signal) to bridge the undefined region of the falling edge of SCL.

30 The maximum $t_{HD;DAT}$ must be less than the maximum $t_{VD;DAT}$ or $t_{VD;ACK}$ with a maximum of 0.9 µs by a transition time. This maximum must only be met if the device does not stretch the LOW period (tLOW) of the SCL signal. If the clock stretches the SCL, the data must be valid by the set-up time before it releases the clock.

		I2C Fast-mode		
Symbol	**Parameter**	**Min**	**Max**	**Unit**
V_{nH}	Noise margin at the high level	0.2 V_IO	-	V

Table 18: MAX-M10M-20B I2C peripheral timing and specifications

5.3 Default interface settings

Interface	Settings
UART	• 9600 baud, 8 bits, no parity bit, 1 stop bit. • Input messages: NMEA and UBX • Output messages: NMEA GGA, GLL, GSA, GSV[31], RMC, VTG and TXT
I2C	• 7-bit I2C address (0x42). • Input messages: NMEA and UBX • Output messages: NMEA GGA, GLL, GSA, GSV[31], RMC, VTG and TXT

Table 19: Default interface settings

[31] In the default configuration, the NMEA-GSV messages are sent at 5-second intervals to avoid overflow in the TX buffer.

6 Mechanical specifications

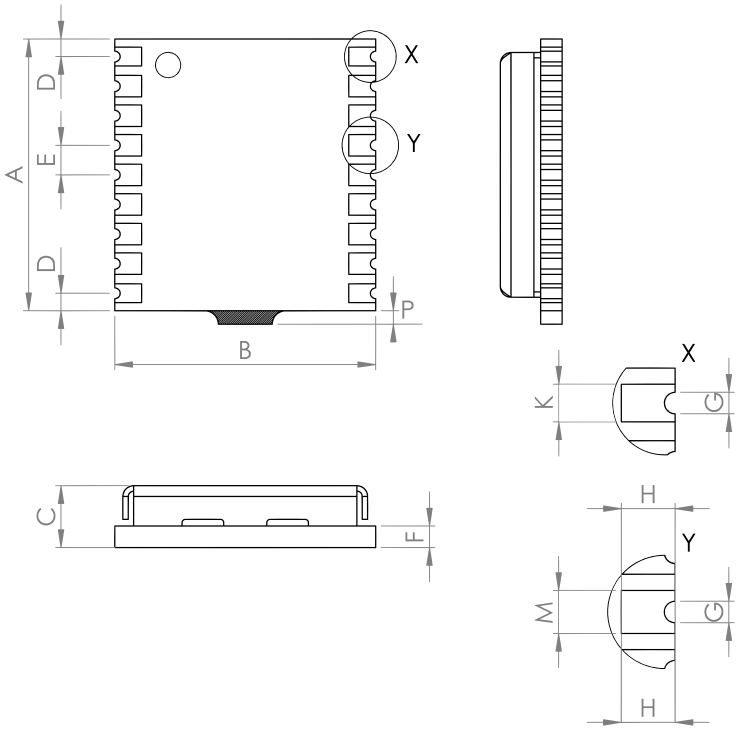


Figure 4: MAX-M10M-20B mechanical drawing

Symbol	Min (mm)	Typical (mm)	Max (mm)
A	10.0	10.1	10.7
B	9.6	9.7	9.8
C	2.2	2.5	2.7
D	0.55	0.65	0.95
E	1.0	1.1	1.2
F	-	0.76	-
G	0.3	0.4	0.5
H	0.9	1.0	1.1
K	0.6	0.7	0.8
M	0.7	0.8	0.9
P	0.0	0.3	0.6
Weight		0.5 g	

Table 20: MAX-M10M-20B mechanical dimensions

☞ The mechanical picture of the de-paneling residual tab (P) is an approximate representation, shape and position may vary.

☞ Take the size of the de-paneling residual tabs into account when designing the component keepout area.

☞ The width (K) applies to all four corner pins.

☞ The pitch (E) applies to all pins.

7 Qualifications and approvals

Type	Description
Quality and reliability	
Product qualification	Qualified according to u-blox qualification policy, based on a subset of AEC-Q104
Manufacturing	Manufactured at IATF 16949 certified sites
Environmental	
RoHS compliance	Yes
Moisture sensitivity level (MSL)[32, 33]	4
Type approvals	
European RED certification (CE)	Declaration of Conformity (DoC) is available on the u-blox website.
UK conformity assessment (UKCA)	Yes

Table 21: Qualifications and approvals

32 For MSL standard see IPC/JEDEC J-STD-020 and J-STD-033 [5].

33 For more information regarding moisture sensitivity levels, labeling, storage, and drying, see the Product packaging reference guide [4].

8 Product handling

8.1 Packaging

The MAX-M10M-20B modules are delivered as hermetically sealed, reeled tapes to enable efficient production, production lot set-up and tear-down. For more information, see the Product packaging reference guide [4].

8.1.1 Reels

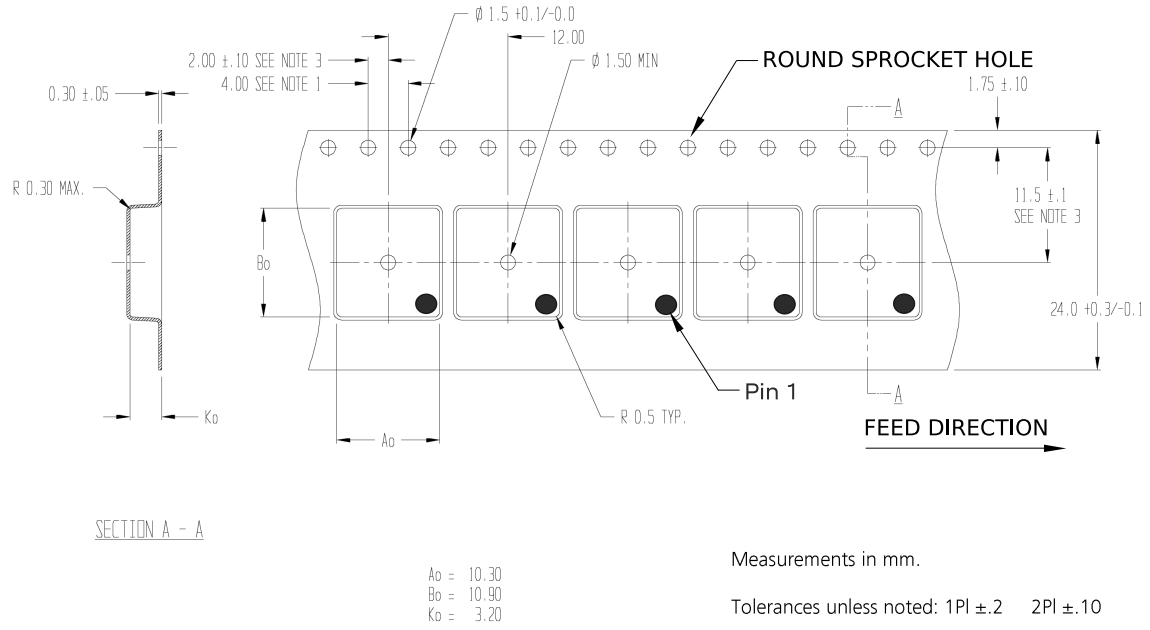
MAX-M10M-20B modules are deliverable in quantities of 1000 pieces on a reel. They are shipped on reel type A3, as specified in the Product packaging reference guide [4].

8.1.2 Tapes

Figure 5 illustrates the orientation of the components on the tape.

Figure 5: Orientation of the components on the tape

Figure 6 shows the feed direction, orientation and dimensions of the MAX-M10M-20B modules on the tape (measurements in mm).



Notes:
1. 10 sprocket hole pitch cumulative tollerance ± 0.2
2. Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole.
3 Ao and Bo are calculated on a plane at a distance "R" above the bottom of the pocket.

Figure 6: Tape specification

8.2 Soldering

Reflow soldering is described in the IPC/JEDEC J-STD-020 standard [5].

9 Product marking and ordering information

This section provides information about product marking and ordering.

9.1 Product marking

The product marking provides information on MAX-M10M-20B and its revision, as in Figure 7. For a description of the product marking, see Table 22

The product marking is done by laser etching on the MAX-M10M-20B module metal shield cover.

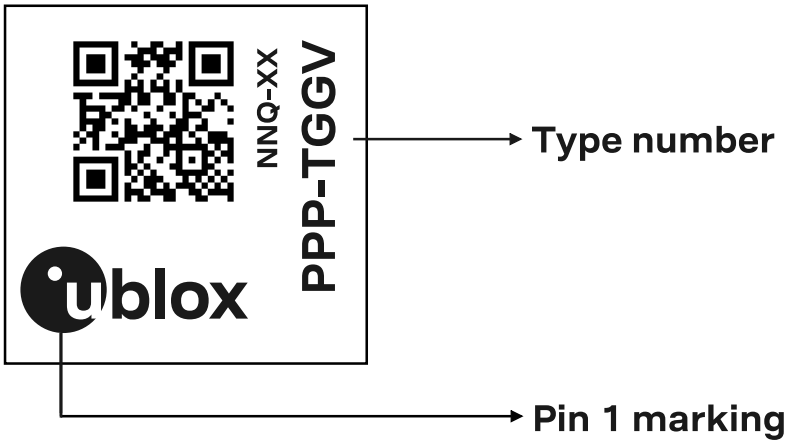


Figure 7: Example of MAX-M10M-20B product marking

Code	Meaning	Example
PPP	Form factor	MAX
TGG	Platform	M10 = u-blox M10
V	Variant	M = Standard precision, ROM and XTAL
NN	Major product version	00, 01, 02, ...
Q	Product grade	A = Automotive, B = Professional
XX	Revision	Hardware and firmware versions

Table 22: Description of product marking

9.2 Product identifiers

The MAX-M10M-20B marking features three product identifiers: product name, ordering code and type number. The product name identifies all u-blox products, independent of packaging and product grade, and it is used in documentation such as this data sheet. The ordering code includes the major product version and product grade, while the type number additionally includes the hardware and firmware versions.

Table 23 describes the three different product identifiers used in the MAX-M10M-20B module product marking.

Identifier	Format	Example
Product name	PPP-TGGV	MAX-M10M
Ordering code	PPP-TGGV-NNQ	MAX-M10M-20B
Type number	PPP-TGGV-NNQ-XX	MAX-M10M-20B-01

Table 23: Product identifiers

9.3 Ordering codes

Ordering code	Product	Remark
MAX-M10M-20B	u-blox M10 GNSS receiver module, professional grade	

Table 24: Product ordering codes

u-blox provides information on product changes affecting the form factor, size or function of the product. For the Product change notifications (PCNs), see our website at: https://www.u-blox.com/en/product-resources.

Related documents

[1] MAX-M10M-20B Integration manual, UBXDOC-963802114-13064
[2] u-blox M10 SPG 5.10 Interface description, UBX-21035062
[3] u-blox M10 SPG 5.10 Release note, UBX-22001426
[4] Product packaging reference guide, UBX-14001652
[5] Joint IPC/JEDEC standard, www.jedec.org

☞ For regular updates to u-blox documentation and to receive product change notifications please register on our homepage https://www.u-blox.com.

Revision history

Revision	Date	Status / comments
R01	01-Nov-2024	Initial release
R02	07-Mar-2025	Engineering sample Updated sections • Performance: updated performance values • Indicative power requirements: updated power consumption values • Operating conditions: updated receiver chain noise figure, increased drive strength on LNA_EN (PIO7) • Reels
R03	04-Jul-2025	Initial production Updated sections • Updated product image on the cover page • Qualifications and approvals • Product handling: updated tape orientation figure with new product laser marking and tape specification figure with pin1, sprocket hole and feed direction markings • Product marking: updated MAX-M10M-20B product marking figure
R04	16-Oct-2025	Disclosure restriction changed to C1-Public
R05	28-Nov-2025	Mass production Updated sections • Qualifications and approvals

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For further support and contact information, visit us at www.u-blox.com/support.