GE-830, High Performance, GNSS PCI Express M.2 Card w/ I-PEX MHF4 RF Connector

RoHS Compliant

Overview

GE-830 is equipped with the **u-blox M8** low-power, high-sensitivity engine, RF connector, and optional backup battery. The PCI Express M.2 standard design allows it to be easily applied in devices with PC architecture. Its size of NGFF allows it to be used in dimension demanding environment.

GE-830 supports positioning of multi-satellite systems – GPS, GLONASS, BEIDOU, QZSS, SBAS. It default works with GPS, GLONASS, and QZSS. Different satellite systems could be enabled or disabled by commands.

The backup battery allows faster position fix and it could be optional (not equipped) in case wider temperature range is required.

Our experienced design provides not only excellent GNSS performance but also reliable quality and delivery assurance.

Applications

- Tablet PC / Netbook / Industrial PC / Mobile DVR
- School Bus / Transit / Police / Fleet / POS

Features

- PCI Express M.2 standard compliant
  - Card type: 3042-S3-B,
  - Socket 2 WWAN-SSIC port 0
- Built-in RF connector, reduce RF tuning efforts
- The tiny I-PEX MHF4 RF connector allows flexibly placing a GNSS antenna at a suitable location.
- External active antenna **short circuit protection**
- Optional backup battery for faster position fix.
- GPS, GLONASS, BEIDOU, QZSS, SBAS support
- High sensitivity+:-167dBm tracking/-148dBm acquisition (GPS & GLONASS)
- Up to 10Hz update rate (default 1Hz)
- OMA SUPL compliant A-GPS support
- SBAS (WAAS, EGNOS, MSAS) support
- Windows location sensor support
- Excellent EMI protection

Technical Specifications

Receiver Performance Data+

Receiver Type	72-channel u-blox M8 engine GPS & QZSS: L1 C/A,1575.42MHz, GLONASS: L1OF,1598.0625~1605.375MHz BEIDOU (GM-8204): B1 1561.098 MHz SBAS (WAAS, EGNOS, MSAS): L1 C/A
Horizontal Position Accuracy	Autonomous: 2.5 m (Autonomous) (GPS & GLONASS) (CEP, 50%, 24-hour static, -130dBm)
Velocity Accuracy	<0.05 m/s (speed) (GPS & GLONASS) <0.3° (heading) (GPS & GLONASS) (50% @ 30 m/s)
Time Pulse Signal Accuracy	RMS: 30 ns (GPS & GLONASS) 99%: 60 ns (GPS & GLONASS)

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Time To First Fix (TTFF)	Autonomous (All at -130dBm)
Hot start	1 sec (GPS & GLONASS)
Cold start	26 sec (GPS & GLONASS)
Sensitivity, (Autonomous)	Acquisition: -148 dBm (GPS & GLONASS) Tracking: -167 dBm (GPS & GLONASS)
Navigation. Update Rate	Max. 10Hz (GPS & GLONASS) Default 1Hz (GPS & GLONASS)
Max. Altitude	50,000 m
Max. Velocity	500 m/s
Protocol Support	NMEA 0183 v2.3 and V4.x GGA, GLL, GSA, GSV, RMC, VTG, TXT
Dynamics	< 4g

+ Note. According to IC Spec

Electrical Data

Power Supply	3.3 V ± 5% (VCC)
Backup power	1.8 ~ 3.3V
Power Consumption	41 mA / average tracking (9 SVs) 14.5uA / backup power (card disabled)
USB I/O (V)	V_{IH}: 2 ~ VCC, V_{IL}: 0 ~ 0.8 V_{OH}: >= 2.8, V_{OL}<= 0.3
Digital I/O (V), except nRESET pin	V_{IH}: 0.7*VCC~VCC+0.5, V_{IL}: 0 ~ 0.2*VCC V_{OH}: >= VCC-0.4, V_{OL}<= 0.4
nRESET pin	V_{IH}: >= 1.17V, V_{IL}: <= 0.63V V_{OL}<= 0.1

Environmental Data

Operating temperature	-40 ~ 85℃ w/o battery -20 ~ 60℃ w/ battery
Storage temperature	-40 ~ 85℃ w/o battery -40 ~ 60℃ w/ battery

Mechanical Data –

30 x 42 x 2.3 (mm) without backup battery

30 x 42 x 2.7 (mm) with backup battery

75-Pin definition

Name	PINs	Function	I/O
3.3V	2,4,70,72,74	Power supply,(VCC)	Input
V_BAT	58	1.8~3.3V backup power. Left it open if there is a backup battery on card	Input
GND	1,3,5,11,27,33,39, 45,51,57,71,73	Ground	Input
CFGx_xxx	1,21,69,75	Configuration	Output
USB_D+	7	USB data signal plus	I/O
USB_D-	9	USB data signal minus	I/O
LED	10	GNSS fix indication	Output
nW_Disable	26	GNSS disable; active low, left open if it is not used.	Input
nRESET	67	Card reset, 1.8V, active low, left open if it is not used.	Input
notch	12~19	Card key notch	-
NC	Remaining pins	No connection	-

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Input/Output	Pin	Signal	Signal	Pin	Input/Output
			CFG2_GND	75	Out
In	74	3.3V	GND	73	In
In	72	3.3V	GND	71	In
In	70	3.3V	CFG1_GND	69	Out
	68	NC	nRESET	67	In
	66	NC	NC	65	
	64	NC	NC	63	
	62	NC	NC	61	
	60	NC	NC	59	
In	58	V_BAT	GND	57	In
	56	NC	NC	55	
	54	NC	NC	53	
	52	NC	GND	51	In
	50	NC	NC	49	
	48	NC	NC	47	
	46	NC	GND	45	In
	44	NC	NC	43	
	42	NC	NC	41	
	40	NC	GND	39	In
	38	NC	NC	37	
	36	NC	NC	35	
	34	NC	GND	33	In
	32	NC	NC	31	
	30	NC	NC	29	
	28	NC	GND	27	In
In	26	nW_Disable	NC	25	
	24	NC	NC	23	
	22	NC	CFG0_NC	21	
	20	NC	notch	19	
	18	notch	notch	17	
	16	notch	notch	15	
	14	notch	notch	13	
	12	notch	GND	11	In
Out	10	LED	USB_D-	9	In/Out
	8	NC	USB_D+	7	In/Out
	6	NC	GND	5	In
In	4	3.3V	GND	3	In
In	2	3.3V	CFG3_GND	1	Out

Ordering Information

GE-830X

X=A	without backup battery on card
X=B	with backup battery on card

*This document is subject to change without notice.

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