



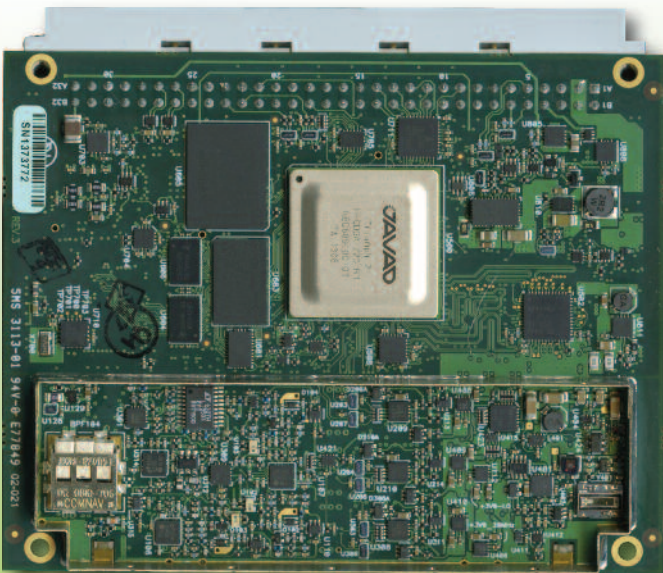
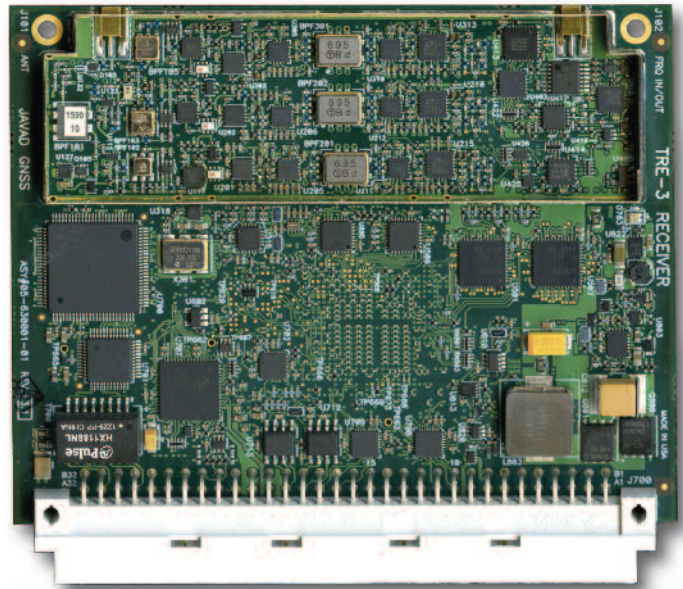
# TRE-3

GPS L1/L2/L2C/L5, Galileo E1/E5A/E5B/AlBoc/E6  
GLONASS L1/L2/L3, BeiDou B1/B2/B3

864 GNSS channels of this board allow tracking all current and future satellite signals. TRE-3 is the only receiver in the market that can track and decode the QZSS LEX messages.

We offer highly stable digital filters (band characteristics do not change with age, input voltages, or temperature), improved GLONASS inter-channel bias performance (due to our flat digital filter shape), excellent new multipath rejection technique, the best ever.

Excellent features for time transfer applications: In



time sources where the zero crossing of the input frequency defines the exact moment of the time second, we monitor zero crossings and accurately define the moment of the time second. External time interval measurement unit is not required to measure zero crossing and 1-PPS offset.

Embedded calibrator measures phase and code delays of each of these nine bands in timing applications. External calibration is not required.

TRE-3 is form, pin-out, and command compatible with the TRE-G3T.

# TRE-3 OEM BOARD

Description	I/O	Signal Name	Pin #	Pin #	Signal Name	I/O	Description
Power Ground		PGND	<b>A1</b>	<b>B1</b>	PGND		Power Ground
+4.5 to +40 VDC Power Input	I	PWR_IN	<b>A2</b>	<b>B2</b>	PWR_IN	I	+4.5 to +40 VDC Power Input
Factory use only, must be left open		FUO	<b>A3</b>	<b>B3</b>	COMMSW#	I	Active Low Command Input (FN Button) *1
Reserved		-	<b>A4</b>	<b>B4</b>	KA_PWR	I	Keep-Alive Power input for Real-Time Clock (+4.5 to +40 VDC, 10µA typ)
External LED Control *2	0	LED2_RED	<b>A5</b>	<b>B5</b>	LED1_RED	0	External LED Control *2
External LED Control *2	0	LED2_GRN	<b>A6</b>	<b>B6</b>	LED1_GRN	0	External LED Control *2
Signal Ground		GND	<b>A7</b>	<b>B7</b>	USB_PWR	I	USB port Power Input line
USB port D- line	I/O	USB_D-	<b>A8</b>	<b>B8</b>	USB_D+	I/O	USB port D+ line
Serial port A TXD line	0	TXDA	<b>A9</b>	<b>B9</b>	CTSA	I	Serial port A CTS line
Serial port A RXD line	I	RXDA	<b>A10</b>	<b>B10</b>	RTSA	0	Serial port A RTS line
Serial port C: RS232 TXD line or RS422 TX- line	0	TXDC/TXC-	<b>A11</b>	<b>B11</b>	CTSC/RXC+	I	Serial port C: RS232 CTS line or RS422 RX+ line
Serial port C: RS232 RXD line or RS422 RX- line	I	RXDC/RXC-	<b>A12</b>	<b>B12</b>	RTSC/TXC+	0	Serial port C: RS232 RTS line or RS422 TX+ line
Serial port D: RS232 RTS line or RS422 TX+ line	0	RTSD/TXD+	<b>A13</b>	<b>B13</b>	TXDD/TXD-	0	Serial port D: RS232 TXD line or RS422 TX- line
Serial port D: RS232 CTS line or RS422 RX+ line	I	CTSD/RXD+	<b>A14</b>	<b>B14</b>	RXDD/RXD-	I	Serial port D: RS232 RXD line or RS422 RX- line
Signal Ground		GND	<b>A15</b>	<b>B15</b>	-		Reserved
Reserved		-	<b>A16</b>	<b>B16</b>	-		Reserved
Serial port B TXD line	0	TXDB	<b>A17</b>	<b>B17</b>	CTSB	I	Serial port B CTS line
Serial port B RXD line	I	RXDB	<b>A18</b>	<b>B18</b>	RTSB	0	Serial port B RTS line
CAN1 port CAN-H line	I/O	CAN1H	<b>A19</b>	<b>B19</b>	CAN1L	I/O	CAN1 port CAN-L line
CAN2 port CAN-H line	I/O	CAN2H	<b>A20</b>	<b>B20</b>	CAN2L	I/O	CAN2 port CAN-L line
Factory use only, must be left open		FUO	<b>A21</b>	<b>B21</b>	-		Reserved
Signal Ground		GND	<b>A22</b>	<b>B22</b>	1PPSA	0	1 Pulse Per Second output A *3
Signal Ground		GND	<b>A23</b>	<b>B23</b>	1PPSB	0	1 Pulse Per Second output B *3
Signal Ground		GND	<b>A24</b>	<b>B24</b>	EVENTA	I	Event input A *4
Signal Ground		GND	<b>A25</b>	<b>B25</b>	EVENTB	I	Event input B *4
Configurable Logic-Level I/O 0 line	I/O	GPIO0	<b>A26</b>	<b>B26</b>	GPIO1	I/O	Configurable Logic-Level I/O 1 line
Configurable Logic-Level I/O 2 line	I/O	GPIO2	<b>A27</b>	<b>B27</b>	GPIO3	I/O	Configurable Logic-Level I/O 3 line
Signal Ground		GND	<b>A28</b>	<b>B28</b>	RESET_IN#	I	Active Low Reset input *5
Ethernet port TX+ line	0	LAN_TX+	<b>A29</b>	<b>B29</b>	LAN_TX-	0	Ethernet port TX- line
Reserved		-	<b>A30</b>	<b>B30</b>	LAN_LED	0	Ethernet port control for external LED
Ethernet port RX+ line	I	LAN_RX+	<b>A31</b>	<b>B31</b>	LAN_RX-	I	Ethernet port RX- line
Active Low input for ON/OFF switch *7	I	ONOFFSW#	<b>A32</b>	<b>B32</b>	IRIG_OUT	0	IRIG port output line *6

\*1. Active Low input from the FN button of the MinPad. Must be left open if not used.

\*2. LED1\_GRN and LED1\_RED are used to control the STAT LED of the MinPad. LED2\_GRN and LED2\_RED are equivalent to the REC\_LED of the MinPad. The output is a +3.3V driver in series with 100 Ohm resistor for each LED. LEDs should be with common cathode.

\*3. Voh>1.8V at 50 Ohm load.

\*4. Internal pull-up 5 kOhm to +3.3V

\*5. Connect to ground to activate. Internal pull-up 2 kOhm to +3.3V.

\*6. AM sine-wave signal; 2.1Vp-p (Mark), 0.7Vp-p (Space).

\*7. Active Low input which is equivalent to ON/OFF button of the MinPad. After abnormal turn off because of external power failure, the boards turn on automatically when external power is restored.

## Tracking Features

- Total 864 channels: all-in-view
- GPS C/A, P1, P2, L2C (L+M), L5 (I+Q)
- Galileo E1 (B+C), E5A (I+Q), E5B (I+Q), AltBoc, E6
- GLONASS C/A, L2C, P1, P2, L3 (I+Q)
- QZSS C/A, L1C(I+Q), L2C (L+M), L5 (I+Q), SAIF, LEX
- BeiDou B1, B2, B3
- SBAS L1, L5
- In-Band Interference Rejection
- Advanced Multipath Reduction
- Fast acquisition channels
- High accuracy velocity measurement
- Almost unlimited altitude and velocity (for authorized users)

## Data Features

- Up to 100 Hz update rate for real time position and raw data (code and carrier)
- 10 cm code phase and 1 mm carrier phase precision
- IEEE 1588 protocol support
- Hardware Viterbi decoder
- RTCM SC104 versions 2.x and 3.x Input/Output
- NMEA 0183 versions 2.x and 3.0 Output
- Code Differential Rover
- Code Differential Base
- Geoid and Magnetic Variation models
- RAIM
- Different DATUMs support
- Output of grid coordinates

## Data Storage

- Up to 16 GB of onboard non-removable memory for data storage

## Input/Output

- Two high speed RS232 serial ports (up to 460.8 Kbps)
- Two high speed configurable RS232/RS422 serial ports (up to 460.8 Kbps)
- High speed USB 2.0 device port (480 Mbps)
- Full-duplex 10BASE-T/100BASE-TX Ethernet port
- Two CAN 2.0 A/B ports
- IRIG timecode output A134, A137, B124, B137
- Two 1 PPS outputs synchronized to GPS, GLONASS or UTC
- Two Event Marker inputs
- External Reference Frequency Input/Output
- MinPad interface: Four external LED drivers, ON/OFF control and External Command inputs
- Four Configurable Logic-Level GPIO ports V=3.3V

## Electrical

- On-board power supply accepts any unregulated voltage between +4.5 to +40 Volts
- Keep-Alive Power input accepts any unregulated voltage between +4.5 to +40 Volts
- The central pin of the antenna connector outputs +5 VDC to power LNA. The sourced current is 0.12 A max.
- Power consumption: 8 Watt

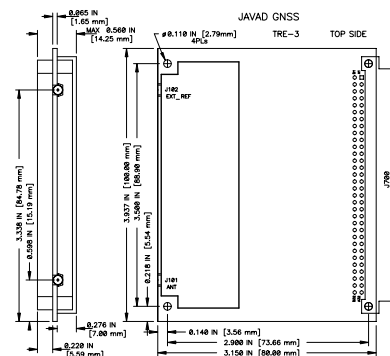
## Environmental

- Operating Temperature: -40°C to +70°C
- Storage Temperature: -40°C to +85°C
- High shock and vibration resistance

## Physical

- Dimensions: 3.9 x 3.1 inches (100x80 mm)

- Weight: 0.19 lbs (87 g)
  - Digital connector: 64-pin DIN41612 type B Right Angle, AMP p/n 536052-5.
  - RF connectors: MMCX Jack, edge mount, AMPHENOL, P/N 908-22100
- J101 is GNSS antenna input connector.  
J102 is External Reference Frequency connector.  
Analog reference clock input (0.6Vpp to 3Vpp, 5/10/20MHz). This input can be configured as internal reference oscillator output with frequency values: 5(sinlike)/10(sinlike) MHz (about 0.5Vpp@50 Ohmload).



Specifications are subject to change without notice.



**JAVAD GNSS**  
www.javad.com

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