

KNCTEK GPS Smart Antenna Module KSTO-1711 Specification

Version 2.0
2009/04/11

This document contains information highly confidential to KNCTEK Company LTD (KNCTEK). It is provided for the sole purpose of the business discussions between supplier and KNCTEK and is covered under the terms of the applicable Non-Disclosure Agreements. Disclosure of this information to other parties is prohibited without the written consent of KNCTEK.

KNCTEK Company LTD.

14F-14, Byucksan Digital Valley 5th, 60-73,

Gasangdong, Geumcheon-gu

SEOUL, KOREA

TEL: 82-2-839-5701

FAX: 82-2-830-5703

E-Mail: sales@knctek.com

<http://www.knctek.com>



KSTO-1711 Specification

REVISION HISTORY	3
INTRODUCTION	4
PRODUCT FEATURES	4
PRODUCT APPLICATIONS	5
PRODUCT PICTURE	5
KSTO-1711 SYSTEM BLOCK DIAGRAM	5
TECHNICAL SPECIFICATION	6
MECHANICAL LAYOUT	9
RECOMMENDED LAND PATTERN DIMENSION	10
HARDWARE INTERFACE	10
PACKING SPECIFICATION	12
GPS RECEIVER USER'S TIP	13
CONTACT INFORMATION SECTION	14

Revision History

1. 2008-10-20 : Original Draft 1.0
2. 2008-12-15 : Updated Version 1.0.1 for Mechanical Dimension
3. 2009-04-11 : Updated Version 2.0 for re-organized Electrical characteristics and performance characteristics chart on page 6&7.

KSTO-1711 Operational Manual

INTRODUCTION

The **KSTO-1711** is the newest generation of KNCTEK GPS Smart Antenna Receiver used Omni direction Antenna. The GPS Smart Antenna receiver is powered by STMicroelectronics technology and KNCTEK proprietary navigation algorithm that providing you more stable navigation data. The miniature design is the best choice to be embedded in a portable device like PND, PDA, Telematics and vehicle locator. The excellent sensitivity of **KSTO-1711** gets the great performance when going though the urban canyon and foliage environmental condition.

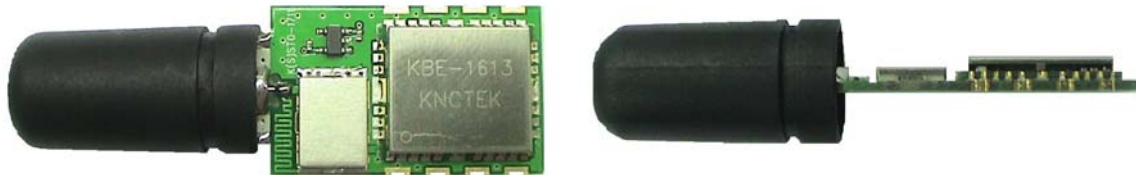
PRODUCT FEATURES

- ✧ 16 Channels High Performance GPS(HPGPS)
- ✧ 66MHz ARM7TDMI & Complete Embedded Memory System
 - Flash 256K bytes + 16K bytes and 64K bytes SRAM
- ✧ Operable from 3.3V/80mA Continuous Mode
- ✧ Galileo Ready GPS module in RF Front End
- ✧ Achieved -159dBm in Tracking Sensitivity
- ✧ Enhanced Warm/Hot Acquisition Sensitivity at -148dBm
- ✧ Fast TTFF <35seconds in Warm Start
- ✧ Enhanced Algorithm for Navigation Stability
- ✧ Excellent Sensitive for Urban Canyon and Foliage Environmental condition
- ✧ Dual Multi-path Rejection
- ✧ Applied Static and Prediction Filters
- ✧ SBAS(WAAS and EGNOS) supported
- ✧ NMEA-0183 compliant protocol/custom protocol
- ✧ Automotive-grade Quality GPS solution
- ✧ Small form factor (17.0mm X 53.0mm X 13.0pi)
- ✧ ODM/OEM development is fully supported Application Engineering
- ✧ Hardware and Software support from a dedicated GPS team

PRODUCT APPLICATION

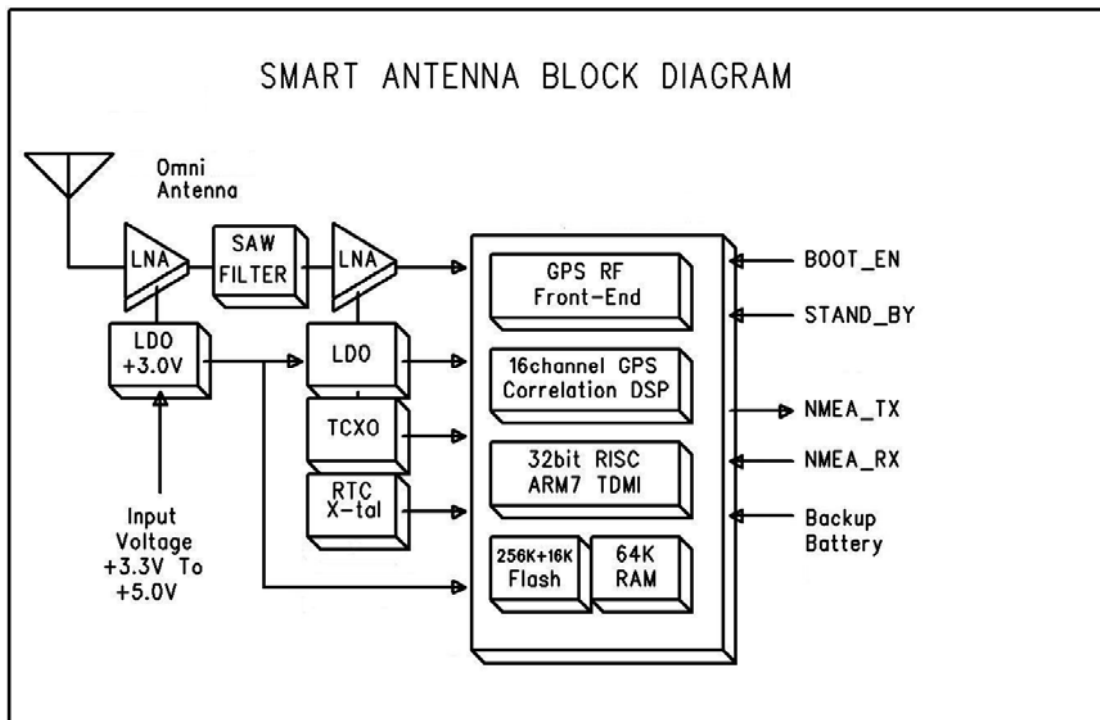
- ✧ Automotive applications
- ✧ Speed camera detector
- ✧ Personal and Car navigation
- ✧ Marine navigation
- ✧ Timing application

PRODUCT PICTURE



KSTO-1711 SYSTEM BLOCK DIAGRAM

The KSTO-1711 consists of STMicroelectronics MCM chipsets Technology, KNCTEK LNA and proprietary software. The system is described as follows.



TECHNICAL SPECIFICATION

1. Electrical Characteristics

1.1 Absolute Maximum Rating

Parameter	Symbol	Min	Max	Units
Power Supply				
Power Supply Volt.	VCC	-0.3	8	V
Input Pins				
Input Pin Voltage I/O	RX	-0.3	3.6	V
Backup Battery	Vbat	1.8	3.6	V
Environment				
Operating Temperature	Topr	-40	85	°C
Storage Temperature	Tstg	-40	125	°C
Backup Battery operating temperature ¹	Tbat	-20	65	°C
Peak Reflow Soldering Temperature < 10S	Tpeak		260	°C
Humidity			95	%

** ¹ Backup Battery operating temperature depends on Battery characteristics

Note : Absolute maximum ratings are stress ratings only, and functional operation at the maximums is not guaranteed. Stress beyond the limits specified in this table may affect device reliability or cause permanent damage to the device.

For functional operating conditions, please refer to the operating conditions tables as follow.

1.2 Operating Condition

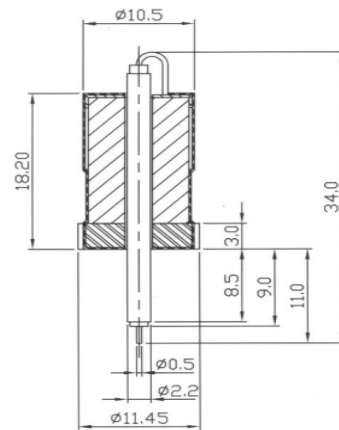
Parameter	Symbol	Condition	Min	Typ	Max	Units
Power supply voltage	Vcc		3.3	5.0	6.0	V
Power Supply voltage ripple	Vcc_PP	Vcc = 5.0V			30	mV
Acquisition current	IccA	Vcc = 3.3V		80	85	mA
Tracking current	IccT	Vcc = 3.3V		80	85	mA
Input high voltage	V _{IH}		2.0			V
Input low voltage	V _{IL}				0.8	V
Output high voltage	V _{OH}		2.9			V
Output low voltage	V _{OL}				0.4	V

2. General & Performance Specification

Parameter	Specification
Receiver Type	L1 frequency band, 1575.42MHz, 16 Channels
Sensitivity	Tracking -159dBm Re-acquisition -151dBm Acquisition(Warm Start) Sensitivity -146dBm
Accuracy	Position 2.0m CEP
Acquisition Time	Cold Start 39 sec. typical (Open sky ¹) Warm Start 34 sec. typical (Open sky) Hot Start 2.5 sec. typical (Open sky) Reacquisition Time 1 sec
Power Consumption	Tracking & Acquisition 80mA @ 3.3V Back-up 30uA @ 3V
Navigation Data Update Rate	1Hz
Operational Limits	Velocity Max 515 m/s Altitude Max 18,000m Acceleration Less than 4g
Mechanical data	Dimension 15.0X13.0X2.2mm Weight 10grams ±5%
Protocol	NMEA-0183 V3.0

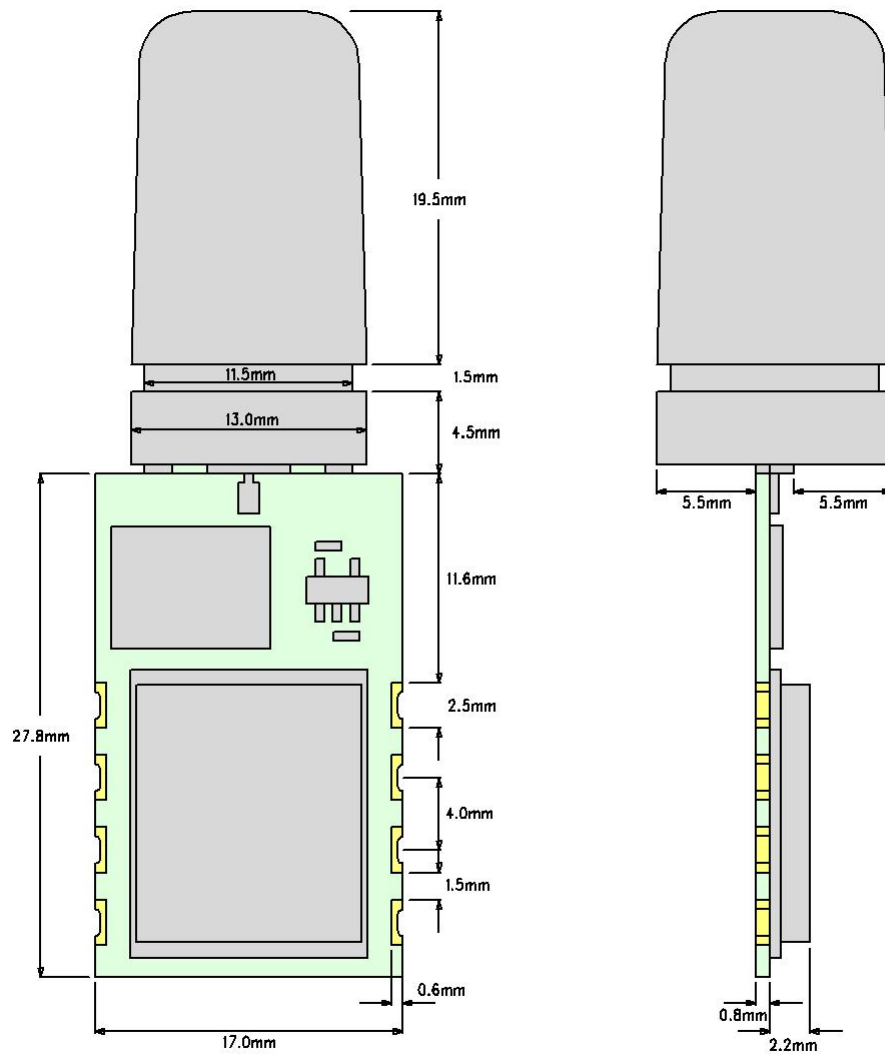
** ¹Open Sky means no obstructions in the sky

3. Omni direction Antenna Specification

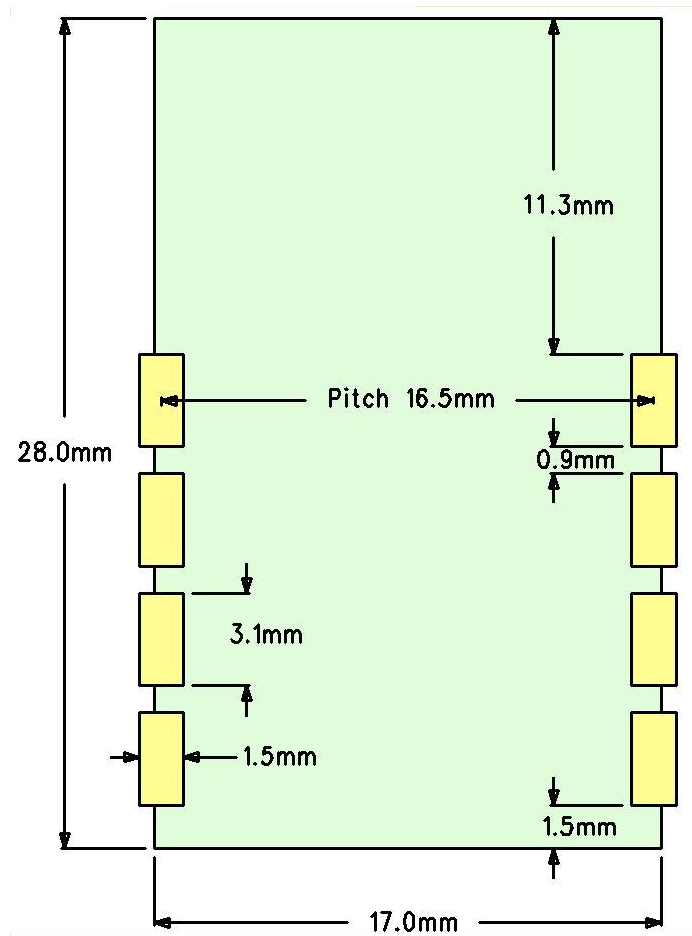


Parameter	Specification
Dimension	Cylinder type, 10.5 pi x 18.2mm(without tube)
Center Frequency	1575.43MHz
Impedance	50 ohm
Gain@Zenith	-5.0~0 dBi typical
Polarization	RHCP
VSWR	1.5 : 1 Max

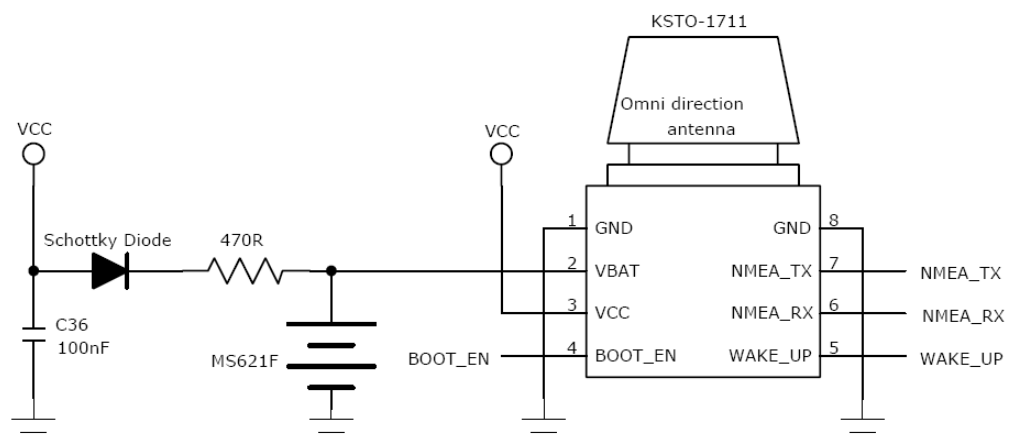
MECHANICAL LAYOUT



RECOMMENDED LAND PATTERN DIMENSION



HARDWARE INTERFACE



Pin Description

PIN	SIGNAL NAME	I/O	DESCRIPTION	CHARACTER
1	GND	P	Ground	Ground
2	VBAT	I	Backup Battery supply	DC +1.8V ~ +3.3V
3	VCC	P	DC Power Supply Voltage input	DC +3.3V \pm 5%
4	BOOT_EN	I	BOOT MODE(Active HIGH)	
5	WAKE_UP	I	Enable Standby Mode	Active Low
6	NMEA_RX	I	UART RXA	NMEA_RXA
7	NMEA_TX	O	UART TXA	NMEA_TXA
8	GND	P	Ground	Ground

VCC

This is the main power supply for the Engine board. The power range is DC +3.3V \pm 5%.

GND

GND provides the ground for the Engine board. Connect all grounds.

NMEA_TX

NMEA_TX, UART output, 3.3V LVTTTL logic level. This is the main transmit channel and is used to output navigation and measurement data to user written software. The default setup is NMEA Output, 9600bps, 8 data bits, no parity, 1 stop bit.

NMEA_RX

NMEA_RX, UART input, 3.3V LVTTTL logic level. This is the main receiving channel and is used to receive software commands to the Engine board from user written software.

BOOT_EN

Pull BOOT_EN pin high, then it will get into boot mode.



Packing Information

TBD : To be determined

GPS Receiver User's Tip

1. GPS signal will be affected by weather and environment conditions, thus suggest to use the GPS receiver under less shielding environments to ensure GPS receiver has better receiving performance.
2. When GPS receiver is moving, it will prolong the time to fix the position, so suggest to wait for the satellite signals to be locked at a fixed point when first power-on the GPS receiver to ensure to lock the GPS signal at the shortest time.
3. The following situation will affect the GPS receiving performance:
 - a. Solar control filmed windows.
 - b. Metal shielded, such as umbrella, or in vehicle.
 - c. Among high buildings.
 - d. Under bridges or tunnels.
 - e. Under high voltage cables or near by radio wave sources, such as mobile phone base stations.
 - f. Bad or heavy cloudy weather.
4. If the satellite signals can not be locked or encounter receiving problem (while in the urban area), the following steps are suggested:
 - a. Please plug the external active antenna into GPS receiver and put the antenna on outdoor or the roof of the vehicle for better receiving performance.
 - b. Move to another open space or reposition GPS receiver toward the direction with fewer blockages.
 - c. Move the GPS receiver away from the interference resources.
 - d. Wait until the weather condition is improved.

While a GPS with a backup battery, the GPS receiver can fix a position immediately at next power-on if the build-in backup battery is full-recharged.



Contact Information Section

Contact : sales@knctek.com

Web Site: www.knctek.com

Headquarter :

**14F-14, 60-73 Byucksan Digital Valley 5th,
Gasang-dong, Geumcheon-gu
SEOUL, KOREA
TEL: 82-2-839-5701
FAX: 82-2-830-5703**

*** As for the explantion of NMEA-0183 V3.0 Protocol : Please refer to
KNCTEK Website (www.knctek.com)**