GPS RECEIVER- 4

Genel amaçlı uygulamalar için yüksek duyarlıklı seramik antenli mini GPS alıcı.

KISA TEKNİK ÖZELLİKLER

Chipset MTK MT3329

Frequency L1, 1575.42MHz

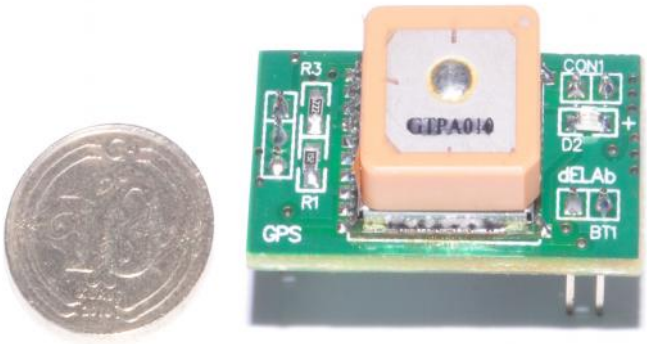
C/A Code 1.023 MHz

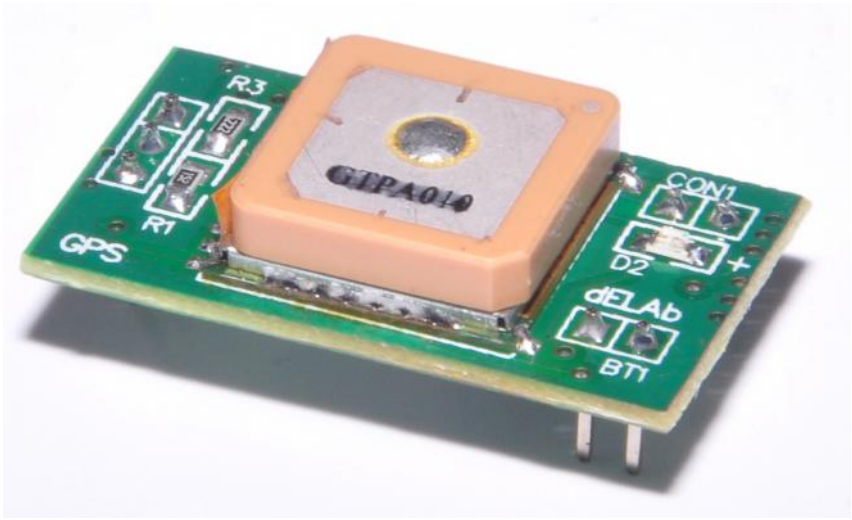
Channels 66 channels

SBAS WAAS, EGNOS,MSAS Supported

Datum WGS84(Default), Tokyo-M, Tokyo-A, User Define

CPU ARM7EJ-S





Mcu uygulamalar için ttl grirş ve çıkış

Rs232 uygulamalar için uygun çıkış portlu

9600 baud hızında data transfer özellikli

GPS Nedir ?

GPS; çok hassas yörüngeleri olan, her biri bu yörüngesini günde iki kez turlayan, dünyamızı bir ağ gibi saran 24 adet uydunun yaydığı sinyaller vasıtasıyla bulunulan konumun belirlenmesine yarayan bir sistemdir.

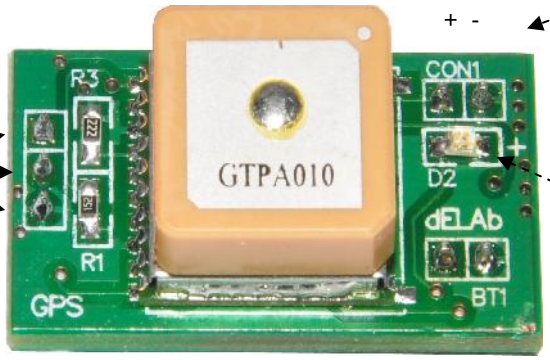
GPS projesi askeri amaçlı olarak başlamış ancak 1980 yılından itibaren sivil kullanıma da açılmıştır. GPS, dünyanın her yerinde, her türlü hava şartında ve 24 saat kesintisiz çalışmaktadır. Kullanımı için herhangi bir ücret gerektirmez.

GPS uyduları çok hassas yörüngelere sahiptirler ve bu yörüngeyi günde iki kez turlamaktadırlar. GPS uyduları bilgileri bu yörüngelerden dünyamıza iletirler. GPS alıcıları bu bilgiler ışığında en az üç uydu sinyalini yakalayarak bir üçgen oluştururlar ve bundan yola çıkarak da dünya üzerinde bulunulan konumu kesin olarak saptarlar. Kesinlik açısından en az 3 uydu sinyalinin yakalanması gerekir.

Mini gps alıcı-bağlantı örnekleri

9-12V DC güç kaynağı

Mikro işlemci uygula-
malarında bu bölüm
kullanılmayacak



Led durum göstergesi.

Uydu bilgileri yeterli olduğun-
da flash kesilerek sabit olarak
ışıldar.

3,3V Hafıza pili (isteğe bağlı)

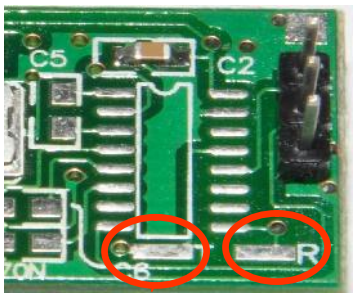
TX-RX portları alçak seviyelidir. (3V) MCU için direkt olarak kullanılabilirler.

RS232 için bir PNP transistorü ile terslenerek PC girişine bağlanabilir.

İsteğe göre USB adapter kullanılarak USB bağlantısı sağlanmış olur.

RX giriş değişik amaçlar için isteğe göre kullanılabilir.

Sadece çıkış için TX portunu kullanmak yeterlidir.



TX çıkış (3V Cmos)

RX giriş (3V Cmos)

USB

dELAb USB adapter

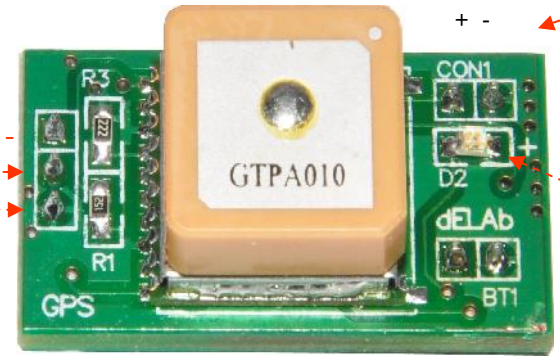
Mini gps alıcı-bağlantı örnekleri

9-12V DC güç kaynağı

Rs 232 port

Txd
Rxd
Gnd

9600 baud



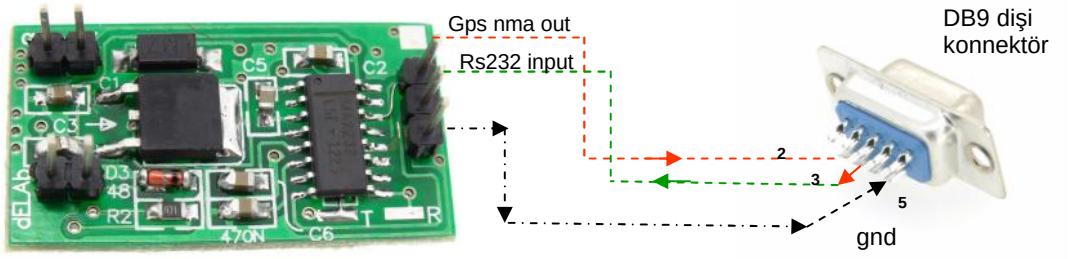
Led durum göstergesi.

Uydu bilgileri yetersiz olduğunda flash yapar.

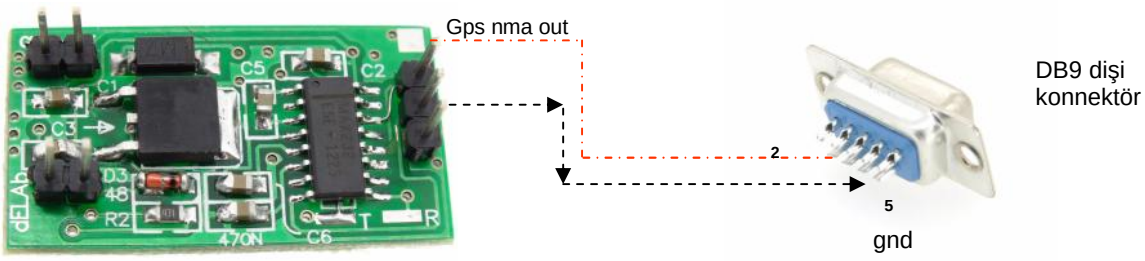
+ -

3,3V Hafıza pili (isteğe bağlı)

8-12v dc



GPS modül içine uygulama yapacaklar için genel haberleşme bağlantısı.



Sadece pc çıkışı için bu bağlantı şekli.

Features

Dimension：16mm x 16mm x 6mm

Patch Antenna Size：15mm x 15mm x 4mm

L1 Frequency, C/A code, 66 channels

Embedded LNA and SAW filter

With Active patch antenna

High Sensitivity：Up to -163 dBm tracking, superior urban performances

Position Accuracy：< 3m CEP (50%) without SA (horizontal)

Cold Start is Under 35 seconds (Typical)

Warm Start is Under 34 seconds (Typical)

Hot Start is Under 1 second (Typical)

Low Power Consumption：48mA @ acquisition, 37mA @ tracking

Low shut-down current consumption：15uA, typical

DGPS(WAAS, EGNOS, MSAS) support (optional by firmware)

Max. Update Rate：up to 5Hz

USB/UART Interface

SMD TYPE

Support AGPS function (Offline mode : EPO valid up to 14 days)

Specifications

General

Chipset MTK MT3329

Frequency L1, 1575.42MHz

C/A Code 1.023 MHz

Channels 66 channels

SBAS WAAS, EGNOS,MSAS Supported

Datum WGS84(Default), Tokyo-M, Tokyo-A, User Define

CPU ARM7EJ-S

Dimensions

Length/Width/Height 16*16*6 mm

Weight 6g

Performance Characteristics

Without aid：3.0m 2D-RMS

Position Accuracy < 3m CEP (50%) without SA (horizontal)

DGPS (RTCM, SBAS (WAAS, EGNOS, MSAS))：2.5m

Without aid：0.1 m/s

Velocity Accuracy

DGPS (RTCM, SBAS (WAAS, EGNOS, MSAS))：0.05m/s

Without aid：0.1 m/s^2

Acceleration Accuracy

DGPS (RTCM, SBAS (WAAS, EGNOS, MSAS))：0.05m/s^2

Timing Accuracy 100 ns RMS

Acquisition：-148dBm (Cold Start)

Sensitivity Reacquisition：-157dBm

Tracking：-163dBm

Maximum Update Rate Up to 5Hz(Default: 1Hz)

Acquisition (Open sky, stationary)

Reacquisition Time Less than 1 second

Hot start 1.0s (Typical)

Warm start 34s (Typical)

Cold start 35s (Typical)

Dynamic

Altitude Maximum 18,000m

Velocity Maximum 515m/s

Acceleration Maximum 4G

Power

Input Voltage DC 3.3V Typical

Acquisition：48mA Typical

Power Consumption @ 3.3V

Tracking：37mA Typical

I/O

Signal Output 8 data bits, no parity, 1 stop bit

Available Baud Rates 4800/9600/38400/57600/115200 bps(Default：9600)

Protocols

DC Characteristics

Parameter Condition Min. Typ. Max. Unit
Operation supply Voltage VCC 3.2 3.3 5.0 V
Operation supply Ripple Voltage — — — 50 mVpp
Backup Battery Voltage — 2.0 3.0 4.3 V
RXA TTL H Level VCC=3.3V 2.1 — VCC V
RXA TTL L Level VCC=3.3V 0 — 0.9 V
TXA TTL H Level VCC=3.3V 2.1 — 2.8 V
TXA TTL L Level VCC=3.3V 0 — 0.8 V

NMEA Output Sentence

Table-1 lists each of the NMEA output sentences specifically developed and defined by MTK for use within MTK products

NMEA Output Sentence Table-1

Option Description

GGA Time, position and fix type data.
GSA GPS receiver operating mode, active satellites used in the position solution, and DOP values.
GSV The number of GPS satellites in view satellite ID numbers, elevation, azimuth, and SNR values.
RMC Time, date, position, course and speed data. Recommended Minimum Navigation Information.
VTG Course and speed information relative to the ground.

GGA—Global Positioning System Fixed Data. Time, Position and fix related data for a GPS receiver

Table-2

contains the values for the following example：

$GPGGA,064951.000,2307.1256,N,12016.4438,E,1,8,0.95,39.9,M,17.8,M,,*65

GGA Data Format Table-2

Name	Example	Units	Description
Message ID	$GPGGA		GGA protocol header
UTC Time	064951.000		hhmmss.sss
Latitude	2307.1256		ddmm.mmmm
N/S Indicator	N		N=north or S=south
Longitude	12016.4438		dddmm.mmmm
E/W Indicator	E		E=east or W=west
Position Fix Indicator	1		See **Table-3**
Satellites Used	8		Range 0 to 14
HDOP	0.95		Horizontal Dilution of Precision
MSL Altitude	39.9	meters	Antenna Altitude above/below mean-sae-level
Units	M	meters	Units of antenna altitude
Geoidal Separation	17.8	meters	
Units	M	meters	Units of geoidal separation
Age of Diff. Corr.	second		Null fields when DGPS is not used
Checksum	*65		
<CR> <LF>			End of message termination

Position Fix Indicator Table-3

Value	Description
0	Fix not available
1	GPS fix

GSA—GNSS DOP and Active Satellites

Table-4

contains the values for the following example：

$GPGSA,A,3,29,21,26,15,18,09,06,10,,,,,2.32,0.95,2.11*00

GSA Data Format Table-4

Name Example Units Description

Message ID $GPGSA GSA protocol header

Mode 1 A See **Table-5**

Mode 2 3 See **Table-6**

Satellite Used 29 SV on Channel 1

Satellite Used 21 SV on Channel 2

....

Satellite Used SV on Channel 12

PDOP 2.32 Position Dilution of Precision

HDOP 0.95 Horizontal Dilution of Precision

VDOP 2.11 Vertical Dilution of Precision

Checksum *00

<CR> <LF> End of message termination

Mode 1 Table-5

Value Description

M Manual—forced to operate in 2D or 3D mode

A 2D Automatic—allowed to automatically switch 2D/3D

Mode 2 Table-6

Value Description

1 Fix not available

2 2D (＜4 SVs used)

3 3D (≧4 SVs used)

GSV—GNSS Satellites in View

Table-7

contains the values for the following example：

$GPGSV,3,1,09,29,36,029,42,21,46,314,43,26,44,020,43,15,21,321,39*7D

$GPGSV,3,2,09,18,26,314,40,09,57,170,44,06,20,229,37,10,26,084,37*77

$GPGSV,3,3,09,07,,,26*73

GSV Data Format Table-7

Name Example Units Description

Message ID $GPGSV GSV protocol header

Number of
Messages
3 Range 1 to 3
(Depending on the number of
satellites tracked, multiple
messages of GSV data may be
required.)

Message Number1 1 Range 1 to 3

Satellites in View 09

Satellite ID 29 Channel 1 (Range 1 to 32)

Elevation 36 degrees Channel 1 (Maximum 90)

Azimuth 029 degrees Channel 1 (True, Range 0 to
359)

SNR (C/No) 42 dBHz Range 0 to 99,
(null when not tracking)

.... …. …. ....

Satellite ID 15 Channel 4 (Range 1 to 32)

Elevation 21 degrees Channel 4 (Maximum 90)

Azimuth 321 degrees Channel 4 (True, Range 0 to
359)

SNR (C/No) 39 dBHz Range 0 to 99,
(null when not tracking)

Checksum *7D

<CR> <LF> End of message termination

RMC—Recommended Minimum Navigation Information

Table-8

contains the values for the following example：

$GPRMC,064951.000,A,2307.1256,N,12016.4438,E,0.03,165.48,260406,,,A*55

RMC Data Format Table-8

Name	Example	Units	Description
Message ID	$GPRMC		RMC protocol header
UTC Time	064951.000		hhmmss.sss
Status	A		A=data valid or V=data not valid
Latitude	2307.1256		ddmm.mmmm
N/S Indicator	N		N=north or S=south
Longitude	12016.4438		dddmm.mmmm
E/W Indicator	E		E=east or W=west
Speed Over Ground	0.03	knots	
Course Over Ground	165.48	degrees True	
Date	260406		ddmmyy
Magnetic Variation		degrees	E=east or W=west *(MTK does support magnetic declination)*
Mode	A		A= Autonomous mode D= Differential mode E= Estimated mode
Checksum	*65		
<CR> <LF>			End of message termination

VTG—Course and speed information relative to the ground.

Table-9

contains the values for the following example：

$GPVTG,165.48,T,,M,0.03,N,0.06,K,A*37

VTG Data Format Table-9

Name Example Units Description

Message ID $GPVTG VTG protocol header
Course 165.48 degrees Measured heading
Reference T True
Course degrees Measured heading
Reference M Magnetic
(MTK does not support
magnetic declination.)
Speed 0.03 knots Measured horizontal speed
Units N Knots
Speed 0.06 km/hr Measured horizontal speed
Units K Kilometers per hour
Mode A A= Autonomous mode
D= Differential mode
E= Estimated mode
Checksum *06
<CR> <LF> End of message termination

MTK NMEA Command Protocol

Packet Type：

103 PMTK_CMD_COLD_START

Packet Meaning：

Cold Start：Don’t use Time, Position, Almanacs and Ephemeris data at re-start.

Example：

$PMTK103*30<CR><LF>