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Product name	Description	Version
SC-1513	Datasheet of SC-1513 GPS module	1.4

1 Introduction

Locosys GPS SC-1513 module features high sensitivity, low power and ultra small form factor. This GPS module is powered by SiRF Star III, it can provide you with superior sensitivity and performance even in urban canyon and dense foliage environment. The miniature size makes the module easy and the best choice to integrate into portable device like mobile phone, PDAs, camera and vehicle locators.

2 Features

- SiRF Star III high sensitivity solution
- Support 20-channel GPS
- Fast TTFF at low signal level
- Capable of SBAS (WAAS, EGNOS, MSAS)
- 6 GPIO available
- Built-in LNA and SAW filter
- Small form factor 15 x 13 x 2.2 mm
- SMD type with stamp holes; RoHS compliant

3 Application

- Personal positioning and navigation
- Automotive navigation
- Marine navigation

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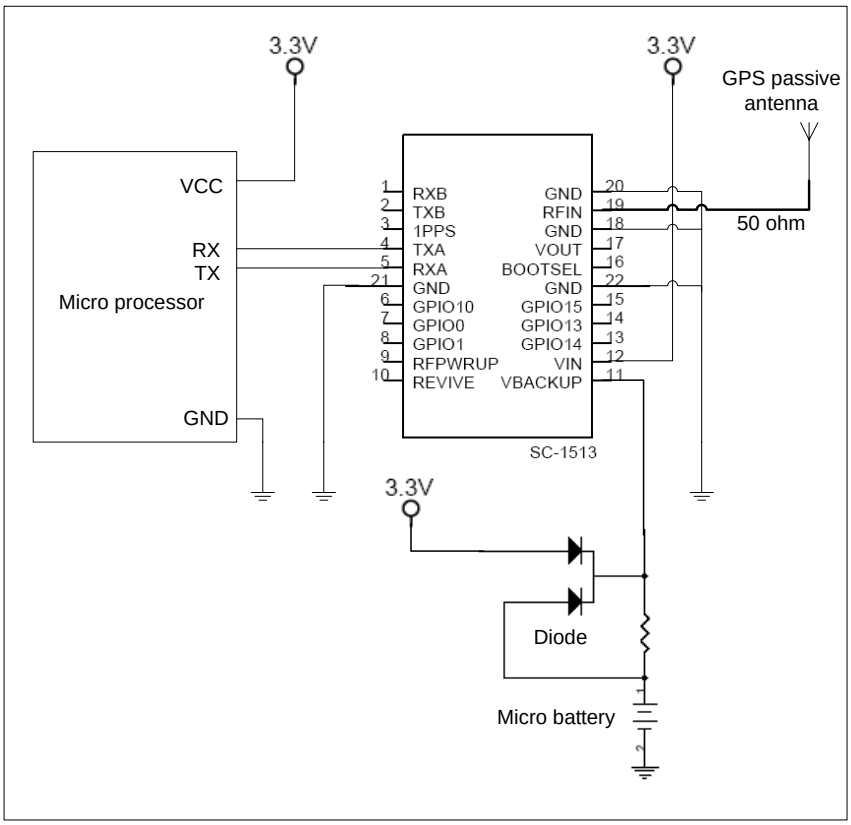

Fig 3-1 Typical application circuit that uses passive antenna.

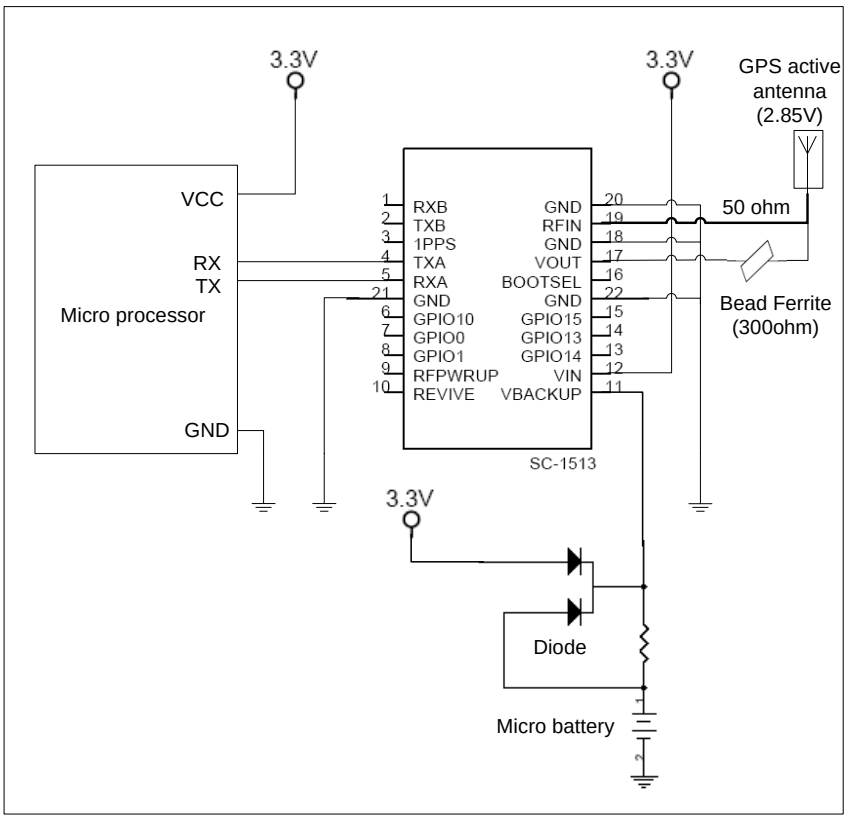

Fig 3-2 Typical application circuit that uses active antenna

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4 GPS receiver

Chip	SiRF Star III, GSC3f/LPx 7989	
Frequency	L1 1575.42MHz, C/A code	
Channels	20	
Update rate	1Hz	
Sensitivity	Tracking	-159dBm
	Cold start	-144dBm
Acquisition Time	Hot start (Open Sky)	< 2s
	Hot start (Indoor)	< 15s
	Cold Start (Open Sky)	35s (typical)
Position Accuracy	Autonomous	< 10m (2D RMS)
	SBAS	< 5m (2D RMS)
Max. Altitude	< 60,000 ft	
Max. Velocity	< 1,000 knots	
Protocol Support	NMEA 0183 ver 3.0	9600 bps (1), 8 data bits, no parity, 1 stop bits (default) 1Hz: GGA, GLL, GSA, GSV, RMC, VTG
	SiRF Binary	38400 bps, 8 data bits, no parity, 1 stop bits

Note 1: Both baud rate and output message rate are configurable.

Table 4.1 Navigation Parameters

Track smooth mode	Disabled
Static navigation mode	Enabled

5 Software interface

5.1 NMEA output message

Table 5.1-1 NMEA output message

NMEA record	**Description**
GGA	Global positioning system fixed data
GLL	Geographic position - latitude/longitude
GSA	GNSS DOP and active satellites
GSV	GNSS satellites in view
RMC	Recommended minimum specific GNSS data
VTG	Course over ground and ground speed

- **GGA--- Global Positioning System Fixed Data**

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Table 5.1-2 contains the values for the following example:

$GPGGA,053740.000,2503.6319,N,12136.0099,E,1,08,1.1,63.8,M,15.2,M,,0000*64

Table5.1- 2 GGA Data Format

Name	**Example**	**Units**	**Description**
Message ID	$GPGGA		GGA protocol header
UTC Time	053740.000		hhmmss.sss
Latitude	2503.6319		ddmm.mmmm
N/S indicator	N		N=north or S=south
Longitude	12136.0099		dddmm.mmmm
E/W Indicator	E		E=east or W=west
Position Fix Indicator	1		See Table 5.1-3
Satellites Used	08		Range 0 to 12
HDOP	1.1		Horizontal Dilution of Precision
MSL Altitude	63.8	mters	
Units	M	mters	
Geoid Separation	15.2	mters	
Units	M	mters	
Age of Diff. Corr.		second	Null fields when DGPS is not used
Diff. Ref. Station ID	0000		
Checksum	*64		
<CR> <LF>			End of message termination

Table 5.1-3 Position Fix Indicators

Value	Description
0	Fix not available or invalid
1	GPS SPS Mode, fix valid
2	Differential GPS, SPS Mode, fix valid
3-5	Not supported
6	Dead Reckoning Mode, fix valid

● GLL--- Geographic Position – Latitude/Longitude

Table 5.1-4 contains the values for the following example:

$GPGLL,2503.6319,N,12136.0099,E,053740.000,A,A*52

Table 5.1-4 GLL Data Format

Name	**Example**	**Units**	**Description**
Message ID	$GPGLL		GLL protocol header
Latitude	2503.6319		ddmm.mmmm

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N/S indicator	N		N=north or S=south
Longitude	12136.0099		dddmm.mmmm
E/W indicator	E		E=east or W=west
UTC Time	053740.000		hhmmss.sss
Status	A		A=data valid or V=data not valid
Mode	A		A=autonomous, D=DGPS, E=DR
Checksum	*52		
<CR> <LF>			End of message termination

● GSA---GNSS DOP and Active Satellites

Table 5.1-5 contains the values for the following example:

$GPGSA,A,3,24,07,17,11,28,08,20,04,,,,,2.0,1.1,1.7*35

Table 5.1-5 GSA Data Format

Name	**Example**	**Units**	**Description**
Message ID	$GPGSA		GSA protocol header
Mode 1	A		See Table 5.1-6
Mode 2	3		See Table 5.1-7
ID of satellite used	24		Sv on Channel 1
ID of satellite used	07		Sv on Channel 2
….			….
ID of satellite used			Sv on Channel 12
PDOP	2.0		Position Dilution of Precision
HDOP	1.1		Horizontal Dilution of Precision
VDOP	1.7		Vertical Dilution of Precision
Checksum	*35		
<CR> <LF>			End of message termination

Table 5.1-6 Mode 1

Value	Description
M	Manual- forced to operate in 2D or 3D mode
A	Automatic-allowed to automatically switch 2D/3D

Table 5.1-7 Mode 2

Value	Description
1	Fix not available
2	2D
3	3D

● GSV---GNSS Satellites in View

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Table 5.1-8 contains the values for the following example:

$GPGSV,3,1,12,28,81,285,42,24,67,302,46,31,54,354,,20,51,077,46*73

$GPGSV,3,2,12,17,41,328,45,07,32,315,45,04,31,250,40,11,25,046,41*75

$GPGSV,3,3,12,08,22,214,38,27,08,190,16,19,05,092,33,23,04,127,*7B

Table 5.1-8 GSV Data Format

Name	Example	Units	Description
Message ID	$GPGSV		GSV protocol header
Total number of messages[1]	3		Range 1 to 3
Message number[1]	1		Range 1 to 3
Satellites in view	12		
Satellite ID	28		Channel 1 (Range 01 to 32)
Elevation	81	degrees	Channel 1 (Range 00 to 90)
Azimuth	285	degrees	Channel 1 (Range 000 to 359)
SNR (C/No)	42	dB-Hz	Channel 1 (Range 00 to 99, null when not tracking)
Satellite ID	20		Channel 4 (Range 01 to 32)
Elevation	51	degrees	Channel 4 (Range 00 to 90)
Azimuth	077	degrees	Channel 4 (Range 000 to 359)
SNR (C/No)	46	dB-Hz	Channel 4 (Range 00 to 99, null when not tracking)
Checksum	*73		
<CR> <LF>			End of message termination

1. Depending on the number of satellites tracked multiple messages of GSV data may be required.

- **RMC---Recommended Minimum Specific GNSS Data**

Table 5.1-9 contains the values for the following example:

$GPRMC,053740.000,A,2503.6319,N,12136.0099,E,2.69,79.65,100106,,,A*53

Table 5.1-9 RMC Data Format

Name	Example	Units	Description
Message ID	$GPRMC		RMC protocol header
UTC Time	053740.000		hhmmss.sss
Status	A		A=data valid or V=data not valid
Latitude	2503.6319		ddmm.mmmm
N/S Indicator	N		N=north or S=south
Longitude	12136.0099		dddmm.mmmm
E/W Indicator	E		E=east or W=west
Speed over ground	2.69	knots	True
Course over ground	79.65	degrees	
Date	100106		ddmmyy

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Magnetic variation		degrees	
Variation sense			E=east or W=west (Not shown)
Mode	A		A=autonomous, D=DGPS, E=DR
Checksum	*53		
<CR> <LF>			End of message termination

- **VTG---Course Over Ground and Ground Speed**

Table 5.1-10 contains the values for the following example:

$GPVTG,79.65,T,,M,2.69,N,5.0,K,A*38

Table 5.1-10 VTG Data Format

Name	**Example**	**Units**	**Description**
Message ID	$GPVTG		VTG protocol header
Course over ground	79.65	degrees	Measured heading
Reference	T		True
Course over ground		degrees	Measured heading
Reference	M		Magnetic
Speed over ground	2.69	knots	Measured speed
Units	N		Knots
Speed over ground	5.0	km/hr	Measured speed
Units	K		Kilometer per hour
Mode	A		A=autonomous, D=DGPS, E=DR
Checksum	*38		
<CR> <LF>			End of message termination

5.2 Proprietary NMEA input message

Table 5.2-1 Message Parameters

Start Sequence	Payload	Checksum	End Sequence
$PSRF<MID>[1]	Data[2]	*CKSUM[3]	<CR><LF>[4]

1. Message Identifier consisting of three numeric characters. Input messages begin at MID 100.
2. Message specific data. Refer to a specific message section for <data>…<data> definition.
3. CKSUM is a two-hex character checksum as defined in the NMEA specification, *NMEA-0183Standard For Interfacing Marine Electronic Devices.* Use of checksums is required on all input messages.
4. Each message is terminated using Carriage Return (CR) Line Feed (LF) which is \r\n which is hex 0D0A. Because \r\n are not printable ASCII characters, they are omitted from the example strings, but must be sent to terminate the message and cause the receiver to process that input message.

Note: All fields in all proprietary NMEA messages are required, none are optional. All NMEA messages are comma delimited.

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Table 5.2-2 Proprietary NMEA input messages

Message	MID[1]	Description
SetSerialPort	100	Set PORT A parameters and protocol
NavigationInitialization	101	Parameters required for start using X/Y/Z[2]
SetDGPSPort	102	Set PORT B parameters for DGPS input
Query/Rate Control	103	Query standard NMEA message and/or set output rate
LLANavigationInitialization	104	Parameters required for start using Lat/Lon/Alt[3]
Development Data On/Off	105	Development Data messages On/Off
Select Datum	106	Selection of datum to be used for coordinate transformations

1. Message Identification (MID).
2. Input coordinates must be WGS84.
3. Input coordinates must be WGS84

● 100---SetSerialPort

This command message is used to set the protocol (SiRF binary or NMEA) and/or the communication parameters (Baud, data bits, stop bits, and parity). Generally, this command is used to switch the module back to SiRF binary protocol mode where a more extensive command message set is available. When a valid message is received, the parameters are stored in battery-backed SRAM and the Evaluation Receiver restarts using the saved parameters.

Table 5.2-3 contains the input values for the following example:

Switch to SiRF binary protocol at 9600,8,N,1

$PSRF100,0,9600,8,1,0*0C

Table 5.2-3 Set Serial Port Data Format

Name	**Example**	**Units**	**Description**
Message ID	$PSRF100		PSRF100 protocol header
Protocol	0		0=SiRF binary, 1=NMEA
Baud	9600		4800,9600,19200,38400,57600
DataBits	8		8,7[1]
StopBits	1		0,1
Parity	0		0=None, 1=Odd, 2=Even
Checksum	*0C		
<CR><LF>			End of message termination

1. SiRF protocol is only valid for 8 data bits, 1 stop bit, and no parity.

● 101---NavigationInitialization

This command is used to initialize the Evaluation Receiver by providing current position (in X, Y, Z coordinates), clock offset, and time. This enables the Evaluation Receiver to search for the correct satellite signals at the correct signal parameters. Correct initialization parameters enable the Evaluation Receiver to acquire signals quickly.

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Table 5.2-4 contains the input values for the following example:

Start using known position and time

$PSRF101,-2686700,-4304200,3851624,96000,497260,921,12,3*1C

Table 5.2-4 Navigation Initialization Data Format

Name	Example	Units	Description
Message ID	$PSRF101		PSRF101 protocol header
ECEF X	-2686700	meters	X coordinate position
ECEF Y	-4304200	meters	Y coordinate position
ECEF Z	3851624	meters	Z coordinate position
ClkOffset	96000	Hz	Clock Offset of the Evaluation Receiver[1]
TimeOfWeek	497260	seconds	GPS Time Of Week
WeekNo	921		GPS Week Number
ChannelCount	12		Range 1 to 12
ResetCfg	3		See Table 5.2-5
Checksum	*1C		
<CR><LF>			End of message termination

1. Use 0 for last saved value if available. If this is unavailable, a default value of 96000 is used.

Table 5.2-5 Reset Configuration

Hex	Description
0x01	Hot Start – All data valid
0x02	Warm Start – Ephemeris cleared
0x03	Warm Start (with Init) – Ephemeris cleared, initialization data loaded
0x04	Cold Start – Clears all data in memory
0x08	Clear Memory – Clears all data in memory and resets the receiver back to factory defaults

● 102---SetDGPSPort

This command is used to control the serial port used to receive RTCM differential corrections. Differential receivers may output corrections using different communication parameters. If a DGPS receiver is used that has different communication parameters, use this command to allow the receiver to correctly decode the data. When a valid message is received, the parameters are stored in battery-backed SRAM and the receiver restarts using the saved parameters.

Table 5.2-6 contains the input values for the following example:

Set DGPS Port to be 9600,8,N,1.

$PSRF102,9600,8,1,0*12

Table 5.2-6 Set GPS Port Data Format

Name	Example	Units	Description
Message ID	$PSRF102		PSRF102 protocol header

Baud	9600		4800,9600,19200,38400
DataBits	8		8,7
StopBits	1		0,1
Parity	0		0=None, 1=Odd, 2=Even
Checksum	*12		
<CR><LF>			End of message termination

Note: RTCM is not supported.

- **103---Query/Rate Control**

This command is used to control the output of standard NMEA messages GGA, GLL, GSA, GSV, RMC, and VTG. Using this command message, standard NMEA messages may be polled once, or setup for periodic output. Checksums may also be enabled or disabled depending on the needs of the receiving program. NMEA message settings are saved in battery-backed memory for each entry when the message is accepted.

Table 5.2-7 contains the input values for the following example:

1. Query the GGA message with checksum enabled

   $PSRF103,00,01,00,01*25

2. Enable VTG message for a 1 Hz constant output with checksum enabled

   $PSRF103,05,00,01,01*20

3. Disable VTG message

   $PSRF103,05,00,00,01*21

Table 5.2-7 Query/Rate Control Data Format (See example 1)

Name	**Example**	**Units**	**Description**
Message ID	$PSRF103		PSRF103 protocol header
Msg	00		See Table 5.2-8
Mode	01		0=SetRate, 1=Query
Rate	00	seconds	Output – off=0, max=255
CksumEnable	01		0=Disable Checksum, 1=Enable Checksum
Checksum	*25		
<CR><LF>			End of message termination

Table 5.2-8 Messages

Value	**Description**
0	GGA
1	GLL
2	GSA
3	GSV

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4	RMC
5	VTG
6	MSS (If internal beacon is supported)
7	Not defined
8	ZDA (if 1PPS output is supported)
9	Not defined

- **104---LLANavigationInitialization**

This command is used to initialize the Evaluation Receiver by providing current position (in latitude, longitude, and altitude coordinates), clock offset, and time. This enables the receiver to search for the correct satellite signals at the correct signal parameters. Correct initialization parameters enable the receiver to acquire signals quickly.

Table 5.2-9 contains the input values for the following example:

Start using known position and time.

$PSRF104,37.3875111,-121.97232,0,96000,237759,1946,12,1*07

Table 5.2-9 LLA Navigation Initialization Data Format

Name	Example	Units	Description
Message ID	$PSRF104		PSRF104 protocol header
Lat	37.3875111	degrees	Latitude position (Range 90 to –90)
Lon	-121.97232	degrees	Longitude position (Range 180 to –180)
Alt	0	meters	Altitude position
ClkOffset	96000	Hz	Clock Offset of the Evaluation Receiver[1]
TimeOfWeek	237759	seconds	GPS Time Of Week
WeekNo	1946		Extended GPS Week Number (1024 added)
ChannelCount	12		Range 1 to 12
ResetCfg	1		See Table 5.2-10
Checksum	*07		
<CR><LF>			End of message termination

1. Use 0 for last saved value if available. If this is unavailable, a default value of 96000 is used.

Table 5.2-10 Messages

Hex	Description
0x01	Hot Start – All data valid
0x02	Warm Start – Ephemeris cleared
0x03	Warm Start (with Init) – Ephemeris cleared, initialization data loaded
0x04	Cold Start – Clears all data in memory

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0x08	Clear Memory – Clears all data in memory and resets receiver back to factory defaults

● 105---Development Data On/Off

Use this command to enable development data information if you are having trouble getting commands accepted. Invalid commands generate debug information that enables you to determine the source of the command rejection. Common reasons for input command rejection are invalid checksum or parameter out of specified range.

Table 5.2-11 contains the input values for the following example:

1. Debug On

   $PSRF105,1*3E

2. Debug Off

   $PSRF105,0*3F

Table 5.2-11 Development Data On/Off Data Format

Name	**Example**	**Units**	**Description**
Message ID	$PSRF105		PSRF105 protocol header
Debug	1		0=Off, 1=On
Checksum	*3E		
<CR><LF>			End of message termination

● 106---Select Datum

$PSGPS receivers perform initial position and velocity calculations using an earth-centered earth-fixed (ECEF) coordinate system. Results may be converted to an earth model (geoid) defined by the selected datum. The default datum is WGS 84 (World Geodetic System 1984) which provides a worldwide common grid system that may be translated into local coordinate systems or map datums. (Local map datums are a best fit to the local shape of the earth and not valid worldwide.)

Table 5.2-12 contains the input values for the following example:

Datum select TOKYO_MEAN

$PSRF106,178*32

Table 5.2-12 Development Data On/Off Data Format

Name	**Example**	**Units**	**Description**
Message ID	$PSRF106		PSRF106 protocol header
Datum	178		21=WGS84 178=TOKYO_MEAN 179=TOKYO_JAPAN 180=TOKYO_KOREA 181=TOKYO_OKINAWA
Checksum	*32		
<CR><LF>			End of message termination

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6 Pin assignment and descriptions

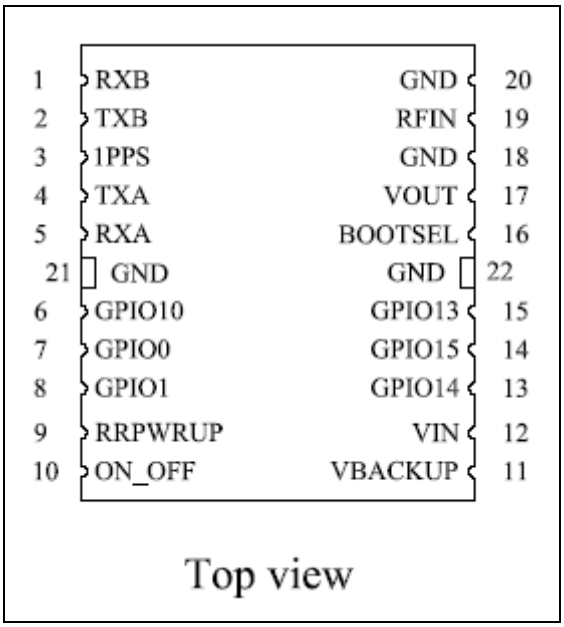

Table 6-1 Pin descriptions

Pin #	Name	Type	Description	Note
1	RXB	I	Serial input for channel B (Default null)	2
2	TXB	O	Serial output for channel B (Default null)	
3	1PPS	O	Pulse per second (1 us pulse)	
4	TXA	O	Serial output for channel A (Default NMEA)	
5	RXA	I	Serial input for channel A (Default NMEA)	2
6	GPIO10	I/O	General purpose I/O	1
7	GPIO0	I/O	General purpose I/O (Default indicator, see Fig. 6-1)	1,2
8	GPIO1	I/O	General purpose I/O	1,2
9	RFPWRUP	O	Indicate power state (See Table 6-2)	
10	ON_OFF	I	Edge triggered soft on/off request. Should only be used to wake up module when RFPWRUP pin is low.	4
11	VBACKUP	P	Backup battery supply voltage. This pin must be powered to enable the module.	
12	VIN	P	DC supply voltage	
13	GPIO14	I/O	General purpose I/O	1,3
14	GPIO15	I/O	General purpose I/O	1,3
15	GPIO13	I/O	General purpose I/O	1,3
16	BOOTSEL	I	Boot mode select (Do not connect in normal operation)	5
17	VOUT	P	Linear regulator power output, 2.85V (Do not use this as	

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			power source of backup battery) (See Table 6-2)	
18	GND	P	Ground	
19	RFIN	I	GPS RF signal input	
20	GND	P	Ground	
21	GND	P	Ground	
22	GND	P	Ground	

<Note>

1. Default input at reset
2. Internal 100KΩ pull down
3. Internal 100KΩ pull up
4. Internal 15KΩ pull down
5. Internal 115KΩ pull down

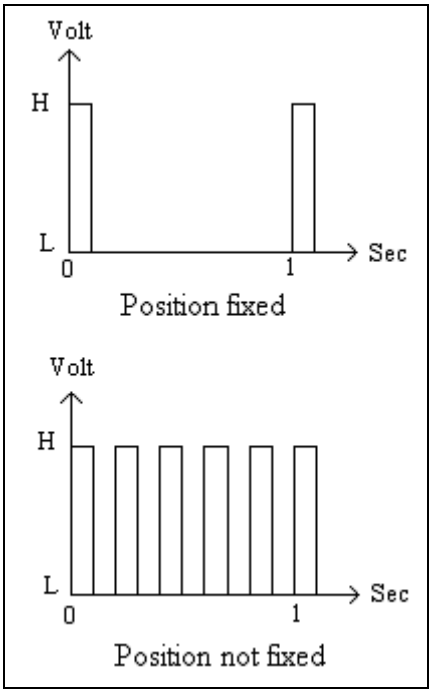

Fig. 6-1 Indicator of position fixed condition

Table 6-2 Pin levels of system states

	RFPWRUP	VOUT
Full power	H	Enable
Stand by	L	Enable
Hibernate	L	Disable

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7 DC & Temperature characteristics

7.1 Absolute maximum ratings

Parameter	Symbol	Ratings	Units
Input Voltage	VIN	6.5	V
Input Backup Battery Voltage	VBACKUP	7	V
2.85V Output Current	Iout	50	mA
Operating Temperature Range	Topr	-30 ~ 85	℃
Storage Temperature Range	Tstg	-40 ~ 125	℃

7.2 DC Electrical characteristics

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Input Voltage	VIN	Iout = 0	3.0		4.2	V
Input Backup Battery Voltage	VBACKUP		1.3		6.0	V
2.85V Output Voltage	VOUT		2.79	2.85	2.91	V
Supply Current	Iss	VIN = 3.3V, Iout = 0, Peak Acquisition Tracking Standby		 32 28 1.5	46	mA
Backup Battery Current	Ibat			10		uA
2.85V Output Current	Iout	VIN = 3.3V			30	mA
High Level Input Voltage	V_{IH}		0.7*VOUT		3.6	V
Low Level Input Voltage	V_{IL}		-0.3		0.3*VOUT	V
High Level Input Current	I_{IH}	 with pull-down	-10		10 60	uA
Low Level Input Current	I_{IL}	 with pull-down	-10		10 60	uA
High Level Output Voltage	V_{OH}		0.75*VOUT			V
Low Level Output Voltage	V_{OL}				0.25*VOUT	V
High Level Output Current	I_{OH}			2		mA
Low Level Output Current	I_{OL}			2		mA
Input Capacitance	C_{IN}				4	pF
Output Capacitance	C_{OUT}	Output buffer			4	pF

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7.3 LNA characteristics

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Insertion power gain	$\|S_{21}\|^2$	T_A = 25℃		18		dB
Noise figure	NF	T_A = 25℃		0.9		dB

7.4 Temperature characteristics

Parameter	Symbol	Min.	Typ.	Max.	Units
Operating Temperature	Topr	-30	-	85	℃
Storage Temperature	Tstg	-40	25	85	℃

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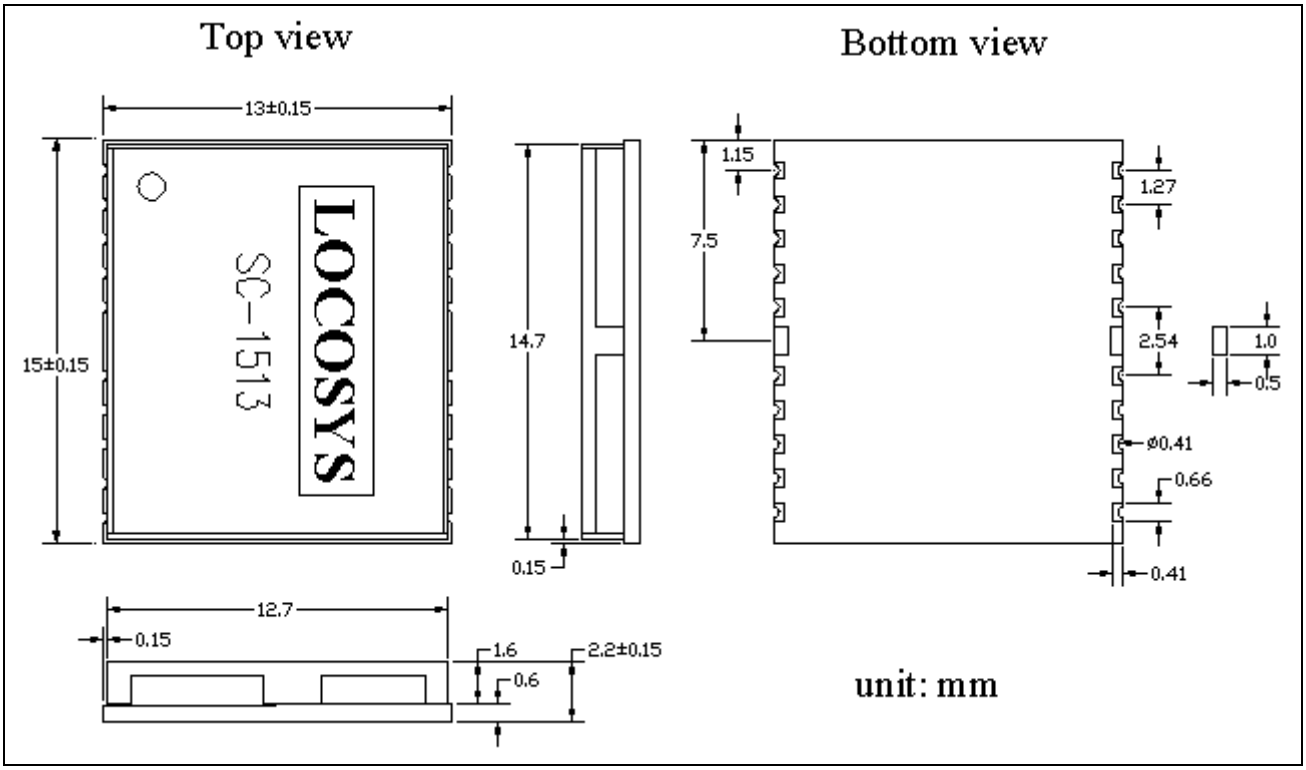
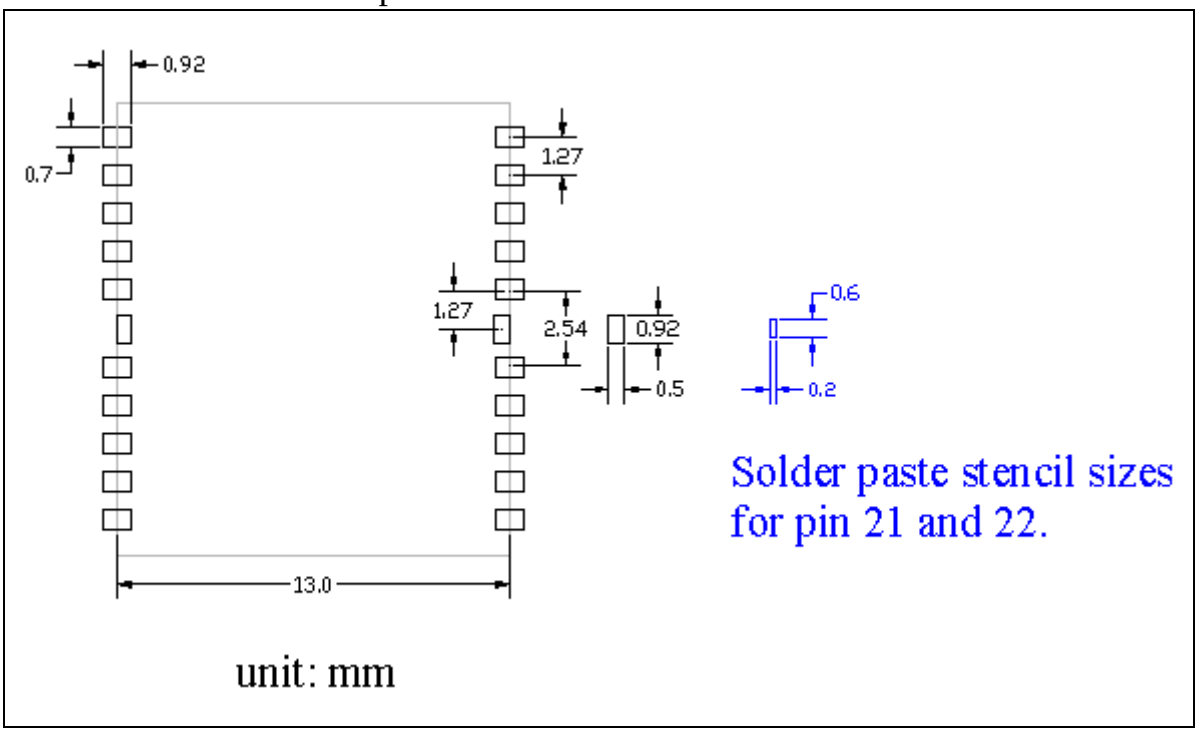
8 Mechanical specification

8.1 Outline dimensions



8.2 Recommended land pattern dimensions



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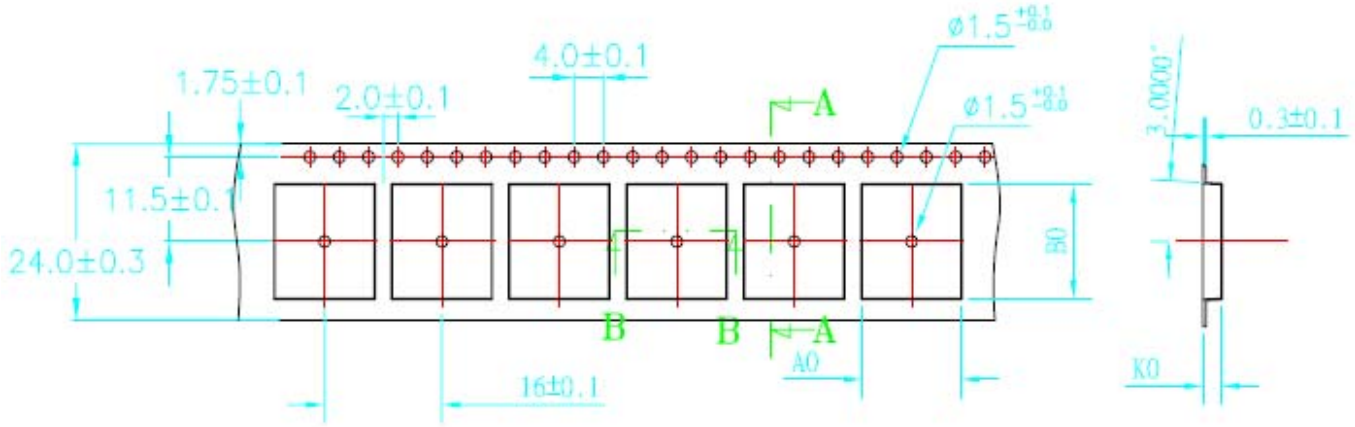
9 Reel Packing information



ITEM	DIM	ALTERNATE
A0	$13.5^{+0.10}_{-0.10}$	
B0	$15.5^{+0.10}_{-0.10}$	
K0	$2.5^{+0.10}_{-0.10}$	

1. 10 sprocket hole pitch cumulative tolerance ±0.20mm.
2. Carrier camber not to exceed 1mm in 100mm.
3. A0 and B0 measured on a plane 0.3mm above the bottom of the pocket.
4. K0 measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
5. All dimensions meet EIA-481-2 requirements.
6. Material: Black Anti-Static Polystyrene.
7. Component load per 13" reel :1000 pcs.

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Document change list

Revision 1.0 to Revision 1.1

- Added (2D RMS) at Position Accuracy on page 3.
- Revised Table 6-1 Pin levels of system states (Stand by for RFPWRUP should be Low) on page 14.
- Revised 9. Reel Packing information for 1000 pcs per reel on page 18.

Revision 1.1 to Revision 1.2

- Corrected the name for HDOP in Table 5.1-2 on page 4.
- Corrected the name for "UTC Time" in Table 5.1-2, 5.1-4 and 5.1-9 on page 4, 5 and 6.
- Updated Table 5.1-3, "Position Fix Indicators", on page 4.
- Revised Table 6.1 to Table 6.2 on page 15.
- Added "Note: RTCM is not supported" on page 10.
- Added tolerance ±0.15 in section 8.1 on page 18.

Revision 1.2 to Revision 1.3 (June 20, 2007)

- Changed GPS chip to SiRF star III Low power GSC3f/LP-7979 on page 3. The units with date code after 0713 were changed to low power chip.
- Revised Hot start time to 2s on page 3.
- Revised Cold start time to typical 38s on page 3.
- Revised Supply current on page 15.
- Added Solder paste stencil size on page 17.

Revision 1.3 to Revision 1.4 (June 24, 2008)

- Changed default baud rate to 9600bps on page 4.
- Changed GPS chip from GSC3f/LP 7979 to GSC3f/LPx 7989 on page 4. The units with date code after 0827 will be changed to new chip.
- Changed typical cold start time from 38s to 35s on page 4.
- Changed "Track smooth mode" to default disabled on page 4.
- Added "This pin must be powered to enable the module." on page 13.
- Changed the minimum voltage of VBACKUP from 1.6V to 1.3V on page 15.
- Changed the maximum supply current from 69mA to 46mA on page 15.
- Changed the typical supply current of acquisition, tracking and standby to 32mA, 28mA and 1.5mA, respectively on page 15.

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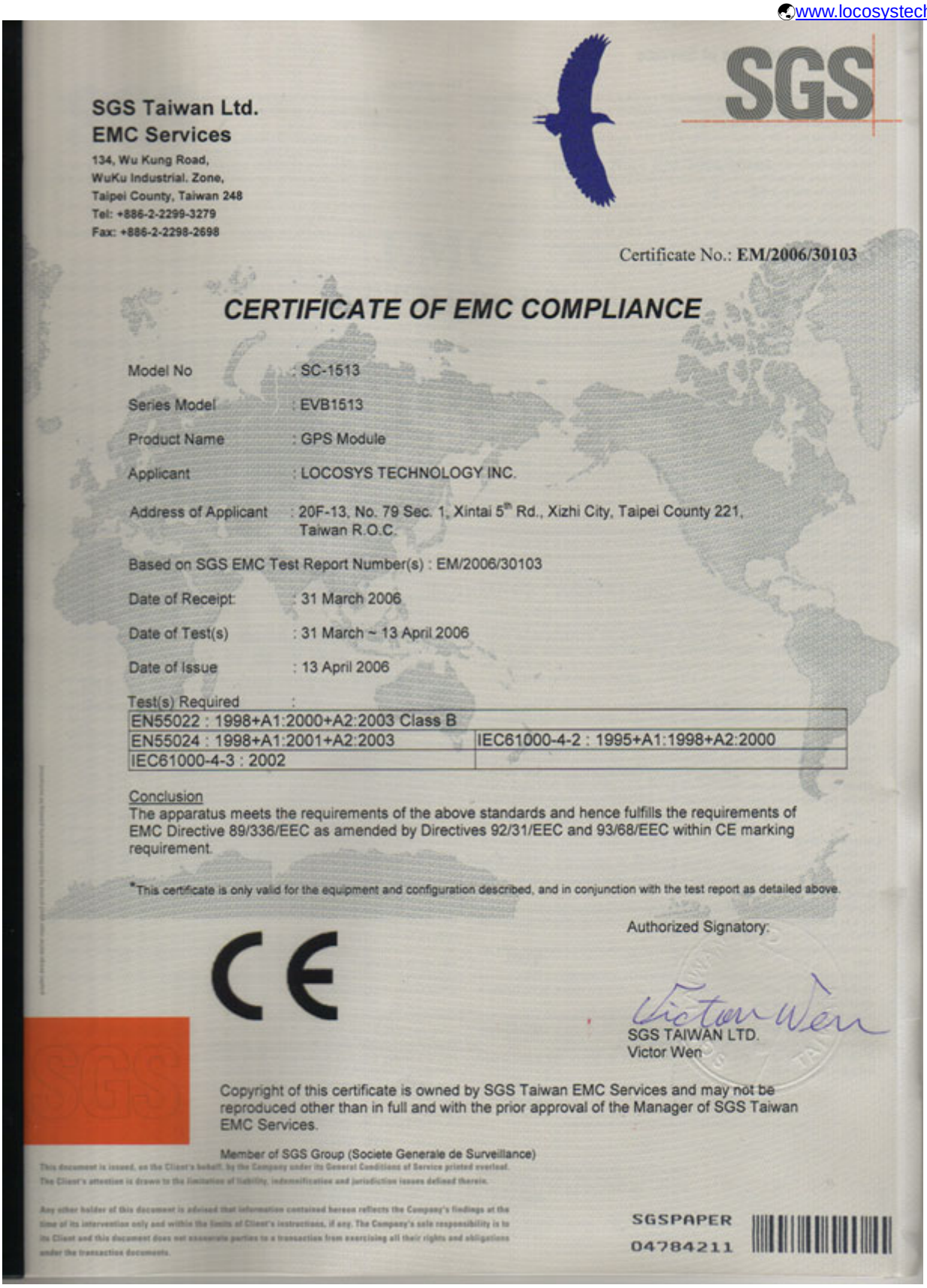

SGS Taiwan Ltd.
EMC Services
134, Wu Kung Road,
WuKu Industrial. Zone,
Taipei County, Taiwan 248
Tel: +886-2-2299-3279
Fax: +886-2-2298-2698

Certificate No.: EM/2006/30103

CERTIFICATE OF EMC COMPLIANCE

Model No : SC-1513

Series Model : EVB1513

Product Name : GPS Module

Applicant : LOCOSYS TECHNOLOGY INC.

Address of Applicant : 20F-13, No. 79 Sec. 1, Xintai 5th Rd., Xizhi City, Taipei County 221, Taiwan R.O.C.

Based on SGS EMC Test Report Number(s) : EM/2006/30103

Date of Receipt: : 31 March 2006

Date of Test(s) : 31 March ~ 13 April 2006

Date of Issue : 13 April 2006

Test(s) Required :

EN55022 : 1998+A1:2000+A2:2003 Class B	
EN55024 : 1998+A1:2001+A2:2003	IEC61000-4-2 : 1995+A1:1998+A2:2000
IEC61000-4-3 : 2002	

Conclusion
The apparatus meets the requirements of the above standards and hence fulfills the requirements of EMC Directive 89/336/EEC as amended by Directives 92/31/EEC and 93/68/EEC within CE marking requirement.

*This certificate is only valid for the equipment and configuration described, and in conjunction with the test report as detailed above.

Authorized Signatory:

SGS TAIWAN LTD.
Victor Wen

SGSPAPER
04784211

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20F.-13, No.79, Sec. 1, Xintai 5th Rd.,
Xizhi City, Taipei County 221, Taiwan
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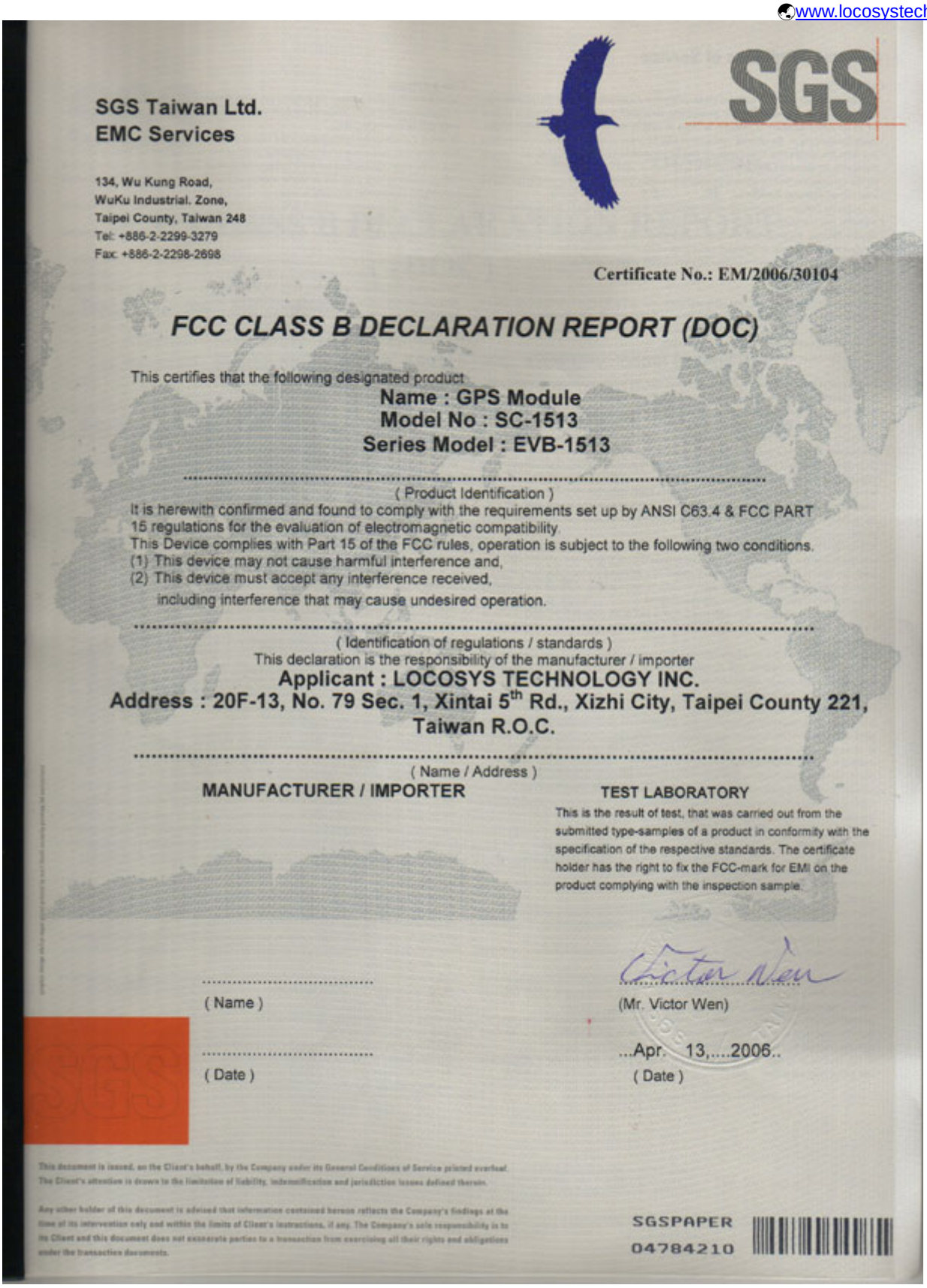

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SGS

Certificate No.: EM/2006/30104

FCC CLASS B DECLARATION REPORT (DOC)

This certifies that the following designated product

Name : GPS Module
Model No : SC-1513
Series Model : EVB-1513

(Product Identification)

It is herewith confirmed and found to comply with the requirements set up by ANSI C63.4 & FCC PART 15 regulations for the evaluation of electromagnetic compatibility.
This Device complies with Part 15 of the FCC rules, operation is subject to the following two conditions.
(1) This device may not cause harmful interference and,
(2) This device must accept any interference received,
including interference that may cause undesired operation.

(Identification of regulations / standards)

This declaration is the responsibility of the manufacturer / importer

Applicant : LOCOSYS TECHNOLOGY INC.
Address : 20F-13, No. 79 Sec. 1, Xintai 5th Rd., Xizhi City, Taipei County 221, Taiwan R.O.C.

(Name / Address)

MANUFACTURER / IMPORTER

TEST LABORATORY

This is the result of test, that was carried out from the submitted type-samples of a product in conformity with the specification of the respective standards. The certificate holder has the right to fix the FCC-mark for EMI on the product complying with the inspection sample.

(Name)

(Mr. Victor Wen)

(Date)

...Apr. 13,....2006..
(Date)

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