

SPECIFICATION FOR APPROVAL

MESSRS : _____

ITEM	GPS MODULE
MODEL	KSG-MG001
Part Number	

DATE : 2006.08.28



株式
會社

光 星 電 子

HEAD OFFICE



KWANG SUNG ELECTRONICS CO.,LTD.
R&D CENTER WORLD MERIDIAN VENTURE CENTER #201,
DIGITAL INDUSTRIAL COMPLEX-2 60-24, GASAN-DONG,
GEUMCHEON-GU, SEOUL 153-801 KOREA

TEL : 82-2-2108-3590 FAX : 82-2-2108-3535
82-2-2108-3595 82-2-2108-3553

HONG KONG OFFICE

KWANG SUNG ELECTRONICS H.K CO.,LTD.
UNIT7-9, 13/F, WAH WAI IND. CENTRE, 38-40
AU PUI WAN ST., FO TAN, N.T., HONG KONG
TEL : 852-2602-6609 FAX : 852-2602-6490

CHINA FACTORY

SHEN ZHEN KWANG SUNG ELECTRONICS CO.,LTD.
BULDING #3,7,8,16TH INDUSTRIAL ZONE,
SHI YAN TOWN, BAO AN, SHEN-ZHEN, CHINA
TEL : 86-755-2765-6002 FAX : 86-755-2765-6007

1. APPLICATION

This specification cover the KWANG SUNG Electronics GPS Engine to be used for Navigation.

2. APPENDED DOCUMENTS

2-1. Dimensions and terminal connection.

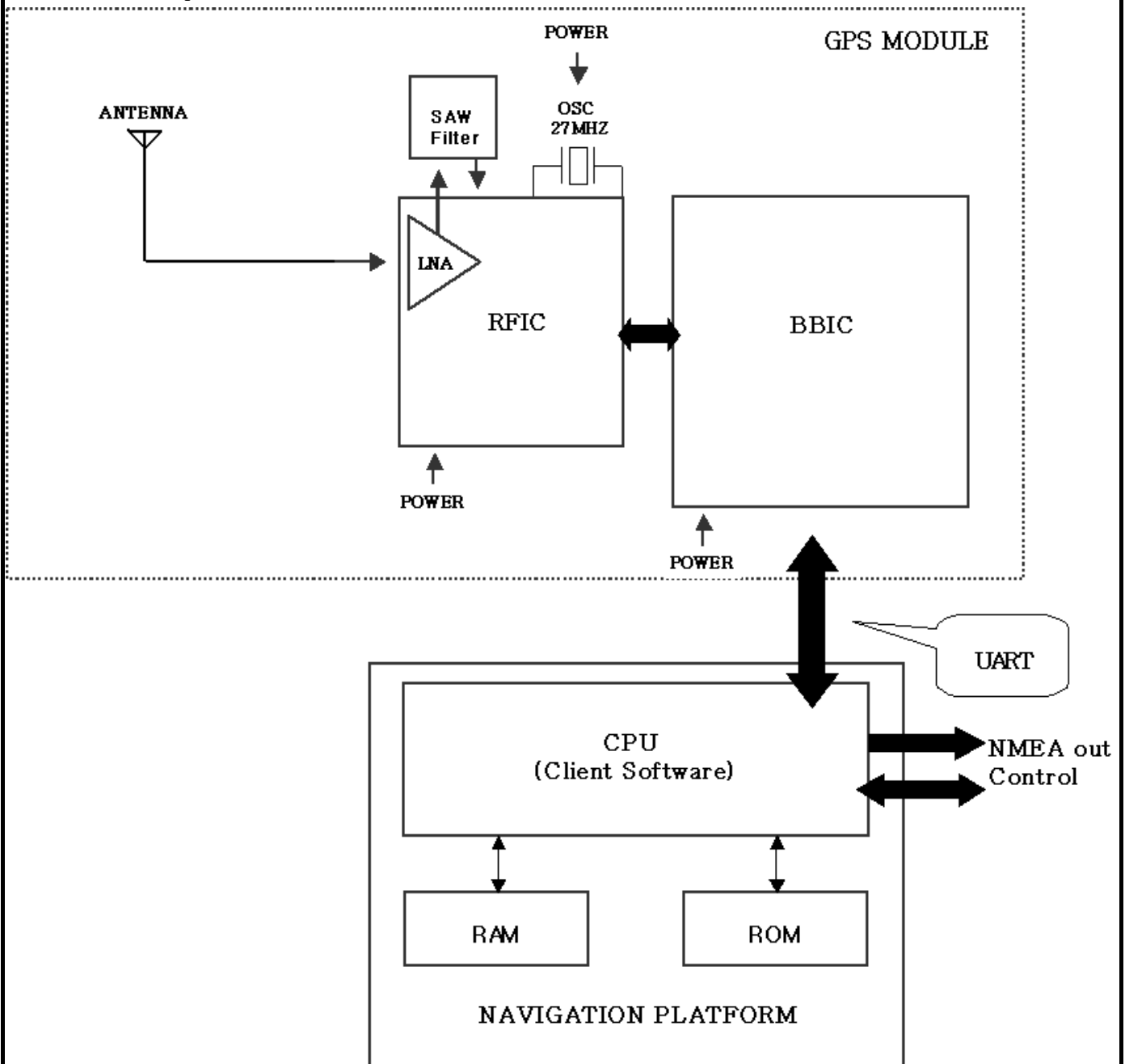
Refer to the attached drawing No. (TOS-250)

2-2. Packing dimension.

Refer to the attached drawing No. (20051216-001)

3. PRODUCT DESCRIPTION

3-1. Block diagram



4. PRODUCT REQUIREMENTS

4-1. General specification

General frequency	L1(1575.42MHz) frequency, C/A Code, 32-channel
Acquisition Sensitivity	-157.5dBm(ISDM)
Communications	UART INTERFACE(4Pin)
Max Up-date Rate	1sec
Accuracy(SA off)	Position < 7m 3Drms(-130dBm, CEP 95%)
Position accuracy	7m outdoors(95% CEP, RMS)
Acquisition(TTFF)	Hot start : 3s(95% CEP)
	Cold start : < 41s(95% CEP)
	Warm start : 5 - 35s(95% CEP)
Operational Limits	Altitude < 18,000(60,000ft)
	Velocity < 515m/s(1,000knots)
Supply Voltage	5V ± 1V
Dual Operating Voltage	3.3V(RF) / 1.2V(Core)
Operating Temperature	-40℃ ~ +85℃
Storage Temperature	-40℃ ~ +85℃
Package Size	35(L)*35(W)*7.45(H)mm

4-2. Electrical requirements

4-2-1. Recommended operating conditions

Item	Symbol	Min	Type	Max	Unit
Supply Voltage	1.2V	1.1	1.2	1.3	V
	3.3V	2.7	3.3	3.6	V
"H" Level Input Voltage	VIH	2.0	-	3.6	V
"L" Level Input Voltage	VIL	0	-	0.5	V

4-2-2. Power consumption

Items	Chipset power consumption
Acquisition indoor	177mW
After Fix Tracking (steady)	115mW
RTC standby	2mW
Deep Sleep	99mW

4-3. INTERFACE

4-3-1. UART

This port is provided through 4 Circle ports.(Refer to the attached drawing No(TOS-252))

This should be RS232 compatible.

This port outputs NMEA 0183 data format.

UART driver is capable of transferring and receiving strings of characters via the serial communication port.

Max Baud-rate can be used to extend this up to 115200 baud if required.

Default Baud-rate is 9600.

*To use serial communication, RS-232 should be installed in an external circuit.

4-4. CONNECTION ASSIGNMENT

* Refer to the attached drawing No. (TOS-250)

Pin No.	Items	PIN NO.	Description
4-4-1	GND	1	Ground
4-4-2	3V3_RF	2	External 3.3V supply for RFIC and the TCXO.
4-4-3	GND	3	Ground
4-4-4	N/C	4	N/C
4-4-5	RESET	5	Reset(0 = Reset, 1 = Active)
4-4-6	TCXO_ENABLE	6	TCXO power supply FET gate(0 = TCXO enabled)
4-4-7	GND	7	Ground
4-4-8	ANT	8	Antenna input
4-4-9	GND	9	Ground
4-4-10	GND	10	Ground
4-4-11	1V2	11	External 1.2V supply for BBIC
4-4-12	3V3	12	External 3.3V supply for BBIC
4-4-13	RX	13	UART input
4-4-14	TX	14	UART output
4-4-15	GND	15	Ground
4-4-16	PPS	16	Pulse per second output
4-4-17	FRQCK	17	Accurate reference frequency input
4-4-18	EPPS	18	External pulse per second input
4-4-19	MSEC	19	1msec output

4-5. PERFORMANCE

4-5-1. TTFF(Time To First Fix), Sensitivity, Accuracy

at Ref -130 dBm, 3D, SV 4EA

NO	Test Items	Test Condition	Specification			Unit	
			MIN	TYP	MAX		
1	Tracking Sensitivity(C/N)	3D(C/N avg.18dB)	--	-153.5	--	dBm	
2	Re-acquisition Sensitivity(C/N)	3D(C/N avg.18dB)	--	-144.8	--	dBm	
3	Cold start Sensitivity(C/N)	3D(SV 4EA in view)	--	-136.6	--	dBm	
4	Cold start time	at -130 dBm	32.7	43.7	49.4	sec	
5	Warm start time	at -130 dBm	28.4	41.3	46.4	sec	
6	Hot start time	at -130 dBm	3.0	3.4	4.0	sec	
7	Re-acquisition time(5sec)	at -130 dBm	1.2	1.8	2.9	sec	
	Re-acquisition time(60sec)	at -130 dBm	1.8	2.3	3.6		
8	Position error	Elevation	at -130 dBm	0.3	1.44	3.5	m
		Latitude,Longitude		0.2	1.9	5.1	m
9	PDDP	at -130 dBm	1.3	1.6	1.8	m	

* The module is tested using STR 4500 GPS simulator instead of Passive Antenna.

5. RELIABILITY TEST

5-1. VIBRATION TEST

At condition, amplitude and oscillation shall be 2mm and 1,000 C.P.M respectively.
There shall be no change after each 2hours of top-bottom back-forth and right-left vibrations. After this test for the gain variation shall be less than 3dB and frequency drift shall be less than 20 kHz.

5-2. HIGH TEMPERATURE TEST

Initially, the transmitter should be tested for electrical characteristics.
After the transmitter is exposed for 96 hours in a test chamber of 60°C and then for 24 hours in a constant temperature, the electrical characteristics of transmitter should be in the specification of electrical characteristics.

5-3. LOW TEMPERATURE TEST

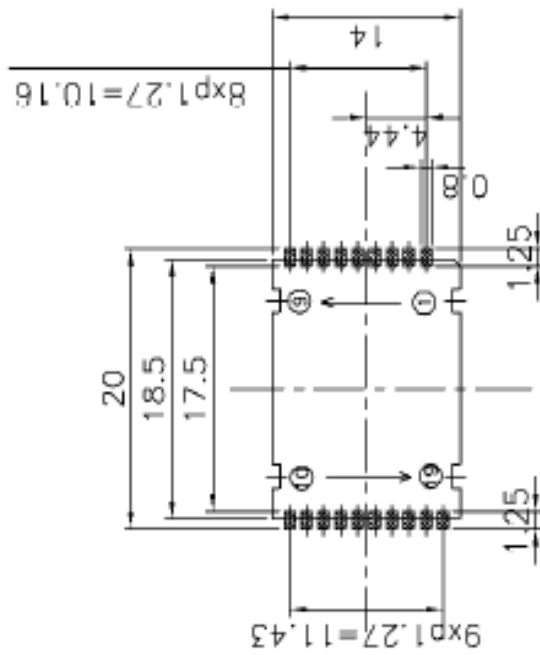
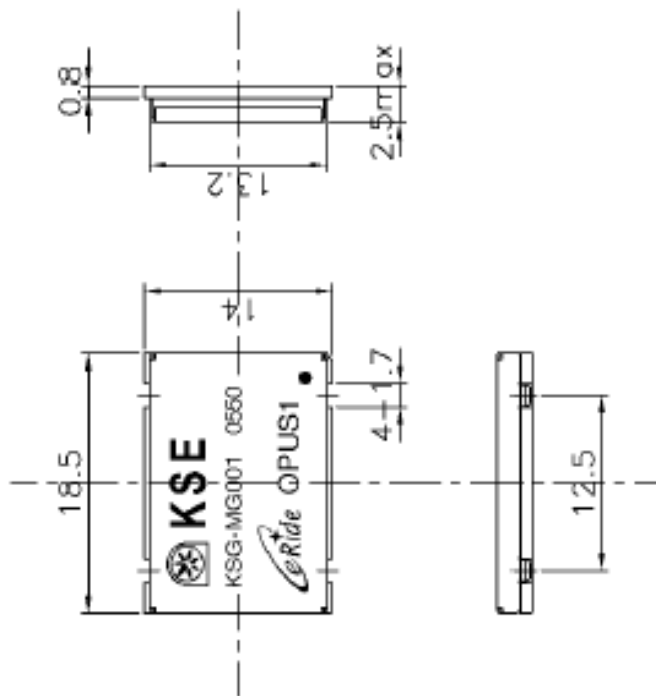
Initially, the transmitter should be tested for electrical characteristics.
After the transmitter is exposed for 96 hours in a test chamber of -20°C and then for 24 hours in a constant temperature, the electrical characteristics of transmitter should be in the specification of electrical characteristics.

5-4. HIGH TEMPERATURE HUMIDITY TEST

Initially, the transmitter should be tested for electrical characteristics.
After the transmitter is exposed for 96 hours in a test chamber of 50°C, 95% and then for 24 hours in a constant temperature, the electrical characteristics of transmitter should be in the specification of electrical characteristics.

5-5. TEMPERATURE SHOCK TEST

Initially, the transmitter should be tested for electrical characteristics.
After the transmitter is exposed for 2 hours in each test chamber of 70°C, -20°C (they are totally 10cycles.)and then for 24 hours in a constant temperature, the electrical characteristic of transmitter should be in the specifaion of electrical characteristics.



PCB SOLDER MASK AREA
PCB TOP VIEW

CONNECTION	
1	GND
2	1.2V
3	3.3V (RF)
4	3.3V
5	UART Rx
6	UART Tx
7	RESET
8	GND
9	TCXO em
10	PPS
11	FROCK
12	ANTENNA
13	EPPS
14	MSEC
15	GND

NO	PART'S NO	PART'S NAME	MATERIAL	SIZE	TREATMENT	REMARK
	MODEL NO :	KSG-MG001	UNIT: mm	SCALE: 1:1	DATE :	2005. 11. 28.
	DESIGN	HECKER	APPROVED	DRAW NO	TOS-250	
	2005. 11. 28	(株)光星電子 技術部		NAME	GPS MODULE	

Production Packing Method

DESIGNED

CHECKED

APPROVED

CLASS: TUNER MODULE

ITEM : KSG-MG001

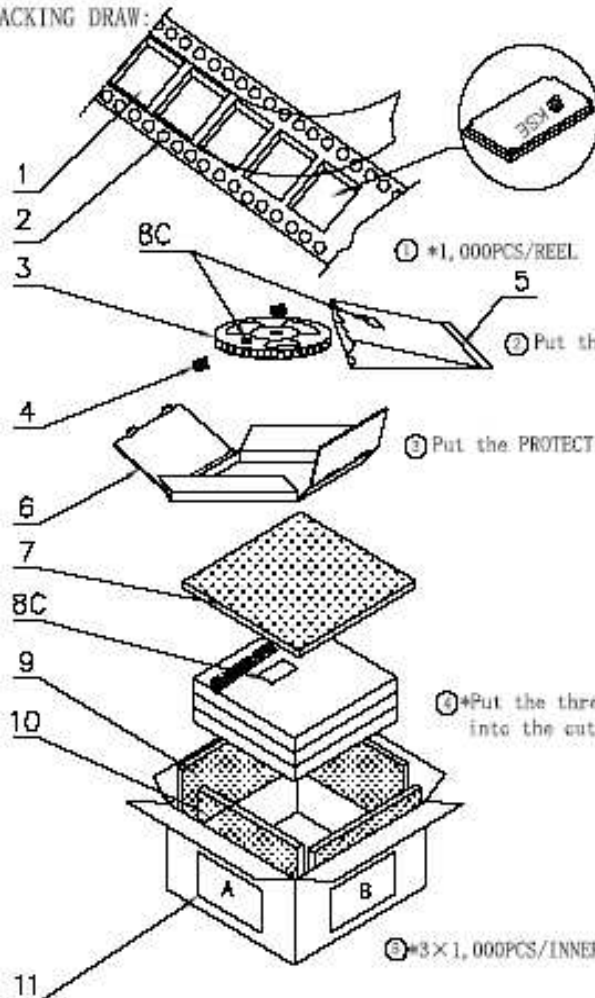
ERP Code No.:

NUMBER: 20051216-001

DATE: 05.12.16

Edition:A

PACKING DRAW:



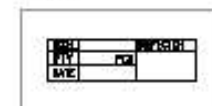
Packing note:

1. Can't use the NG material of packing when to make the packing
2. Please to attention according to the in turn of direction when to make the packing
3. The quantity of packing can change according to the PACKING-LIST
4. The box dimension is inner standard

A-SIDE



B-SIDE



C-LABEL

MODEL	INSPECTOR
NAME	
Q'ty	pos
DATE	

UNITS:mm

NO	ERP CODE NO.	NAME	PART NO.	SPEC	Q'TY	MARK	REASONABLE REVISIONS	DATE
12		TAPE	60mm30yd	60mm30yd (T=0.046)	3150mm			
11		CARTON BOX	CT-81	430x430x170	1PCS			
10		FROTH BOARD	ST-003	425x165x20	2PCS			
9		FROTH BOARD	ST-002	385x165x20	2PCS			
8		LABEL	7x3.5	7X35mm (TAPE)	7PCS			
7		FROTH BOARD	ST-001	425x425x20	2PCS			
6		INNER BOX	CT-81D	405x405x40	3PCS			
5		PROTECT PACKING		400x400x0.05	3PCS			
4		SILICAGEL GEL	SG-8G	50x40x5G	6PCS			
3		REEL PLASTIC	REEL44	Φ330x80	3PCS			
2		CARRIER TAPE	CART44-04	W25.5x1000PCS	26.4M			
1		COVER TAPE	COV744	W32.0	26.4M			