

# SDR 4130 3D

Ultra High Sensitivity

Ublox 6 GPS module

Super Dead Reckoning GPS Module with  
Gyro on Board

Detect Speed by Can Bus

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Documentation History

<b>Revision</b>	<b>Description</b>	<b>Date</b>	<b>Remark</b>
V0.1	SDR 4130 3D release	Apr/2013	

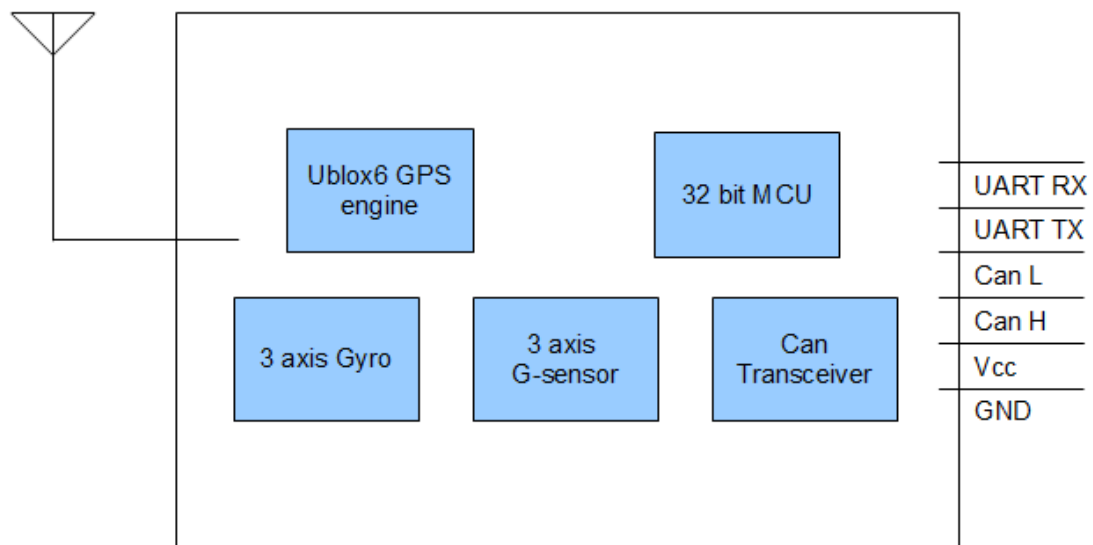
# Content

Features.....	4
Block diagram.....	4
Technical Specifications.....	5
Dimension.....	6
“FPC CONNECTOR” & “1.27 PIN HEADER” Pin Definition.....	11
Part Number:.....	11
Output NMEA Messages .....	12
NMEA Sentence.....	12
Description.....	12

## Features

- ✓ 50 channel ublox 6 -159dBm positioning engine
- ✓ Ultra high sensitivity to -159 dBm
- ✓ SBAS (WAAS, MSAS, MSAS, and EGNOS) support
- ✓ Supports 1Hz update rate
- ✓ Support UART ports
- ✓ Ultra fast cool start 27 sec, warm start 4 sec, hot start 1 sec.
- ✓ Support Dead Reckoning.
- ✓ Detect speed by CAN BUS.
- ✓ Ultra miniature 41 x 30 mm dimension with SMT pad package
- ✓ Operating temperature range: -40 to 85°C
- ✓ RoHS compliant (lead-free)

## Block diagram



## Technical Specifications

### 1. Electrical Characteristics

1.1 Chipset	Ublox	Amy 6
1.2 General	Frequency	L1, 1575.42MHz
	Channels, C/A code	24, 1.023 MHz chip rate, 8192 time/frequency search windows
1.3 Accuracy	Position	2.5 meters CEP
	Time	200m second rms (1 PPS)
1.4 DGPS Accuracy	Position	2.5 meters CEP
1.5 Acquisition Rate	Reacquisition	< 1 sec, typical
	Cold start	27 sec, typical (Open Sky) *
	Warm start	4 sec, typical (Open Sky) *
	Hot start	1 sec, typical (Open Sky) *
1.6 Sensitivity	Tracking	-159dBm
	Cold start	-147dBm
	Hot start	-156dBm
1.7 Dynamic Condition	Gyro	ST micro L3G4200D
	G-sensor	ST micro LIS3DH
	Velocity	300 meters /sec (1000 Knots) max.i
1.8 Power	Main power	5 +/- 3% VDC typical
	Supply current	200 mA maximum
	Backup power	1.4 – 3.3V
	Backup power current	22uA
1.9 Serial Port	Electrical interface	UART
	Protocols	NMEA 0183 v4.0
	Update rate	1 Hz
	Baud rate	115200 default

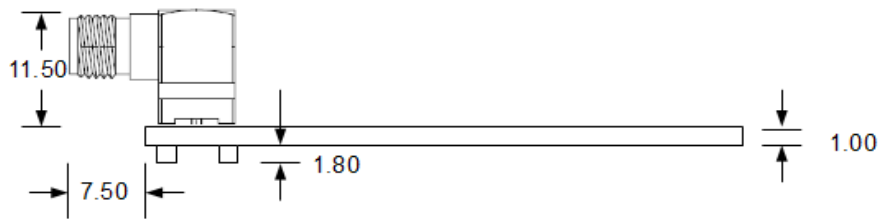
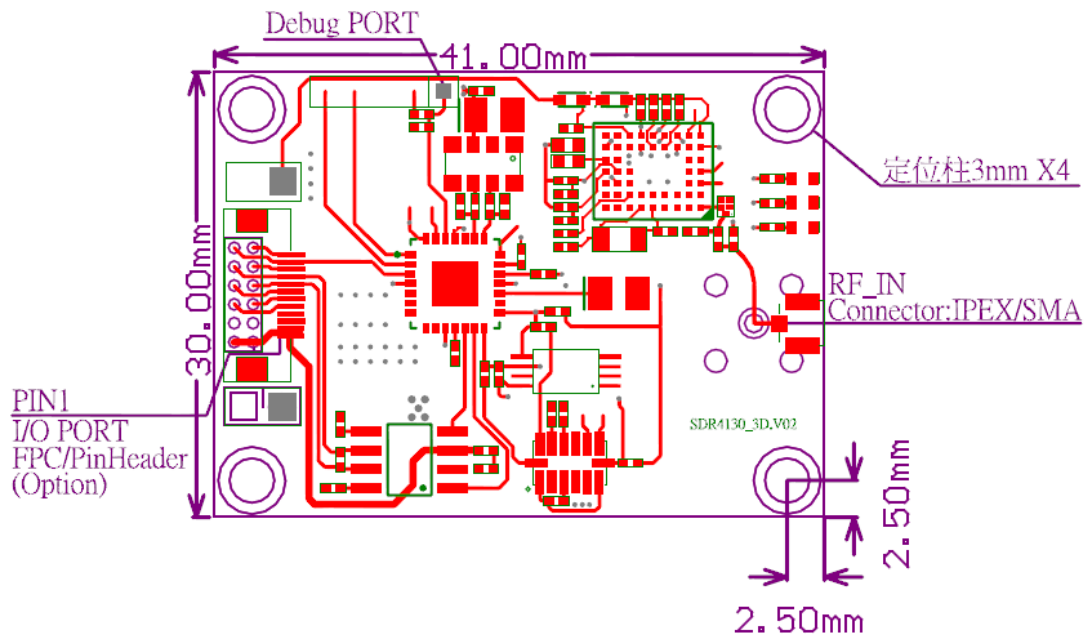
### 2. Environmental Characteristics

2.1 Temperature	Operating range	-40 °C to + 85 °C
	Storage range	-40 °C to + 90 °C
2.2 Mechanical dimensions	L x W x H	41.0 x 30.0 x 14.3mm
2.3 Interface	I/O connector	12 pin FPC ,Patch 2.0 mm or 12 pin

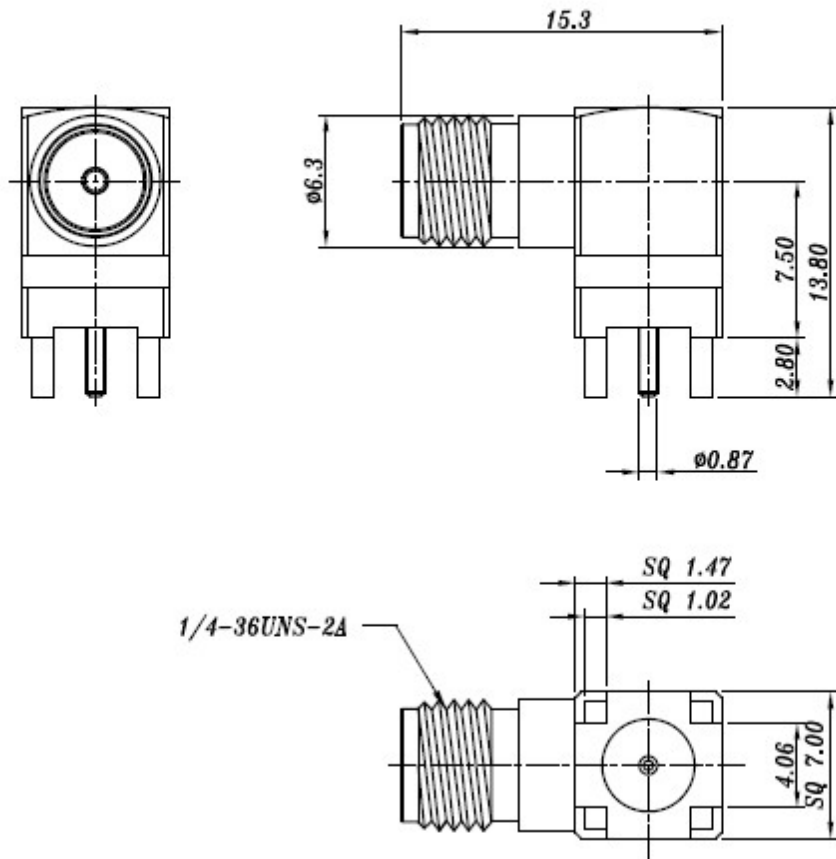
### 3 Antenna

Parameter	Specification
Active Antenna	15 ~ 25 dB Gain recommended 1.5 dB noise figure max. 3.3V input.

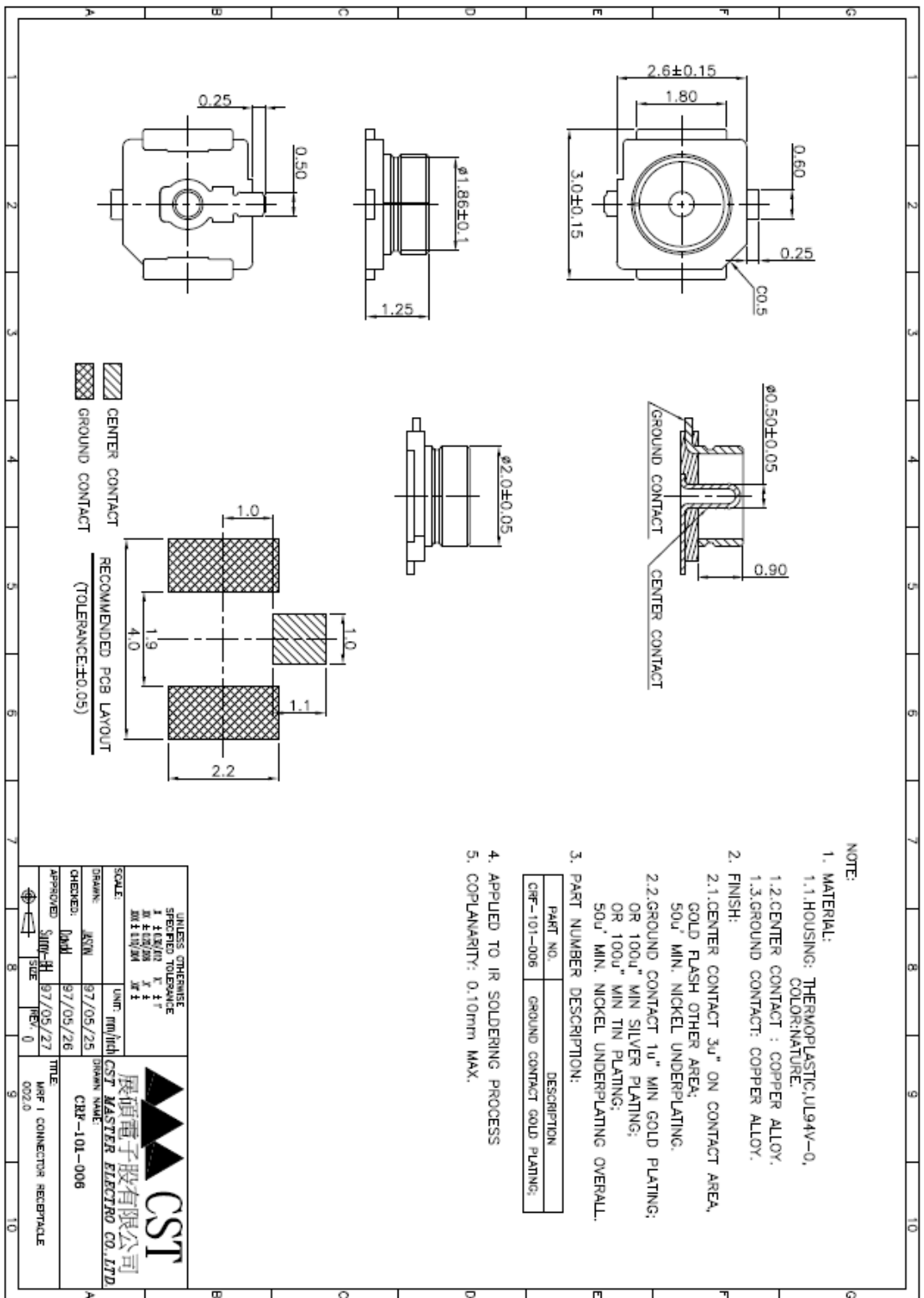
## Dimension



**Module dimension** unit mm



**SMA Connector Dimension**



**NOTE:**

- MATERIAL:**
  - 1.1. HOUSING: THERMOPLASTIC, UL94V-0, COLOR: NATURE
  - 1.2. CENTER CONTACT : COPPER ALLOY.
  - 1.3. GROUND CONTACT: COPPER ALLOY.
- FINISH:**
  - 2.1. CENTER CONTACT 3u" ON CONTACT AREA, GOLD FLASH OTHER AREA; 50u" MIN. NICKEL UNDERPLATING.
  - 2.2. GROUND CONTACT 1u" MIN. GOLD PLATING; OR 100u" MIN. SILVER PLATING; OR 100u" MIN. TIN PLATING; 50u" MIN. NICKEL UNDERPLATING OVERALL.
- PART NUMBER DESCRIPTION:**

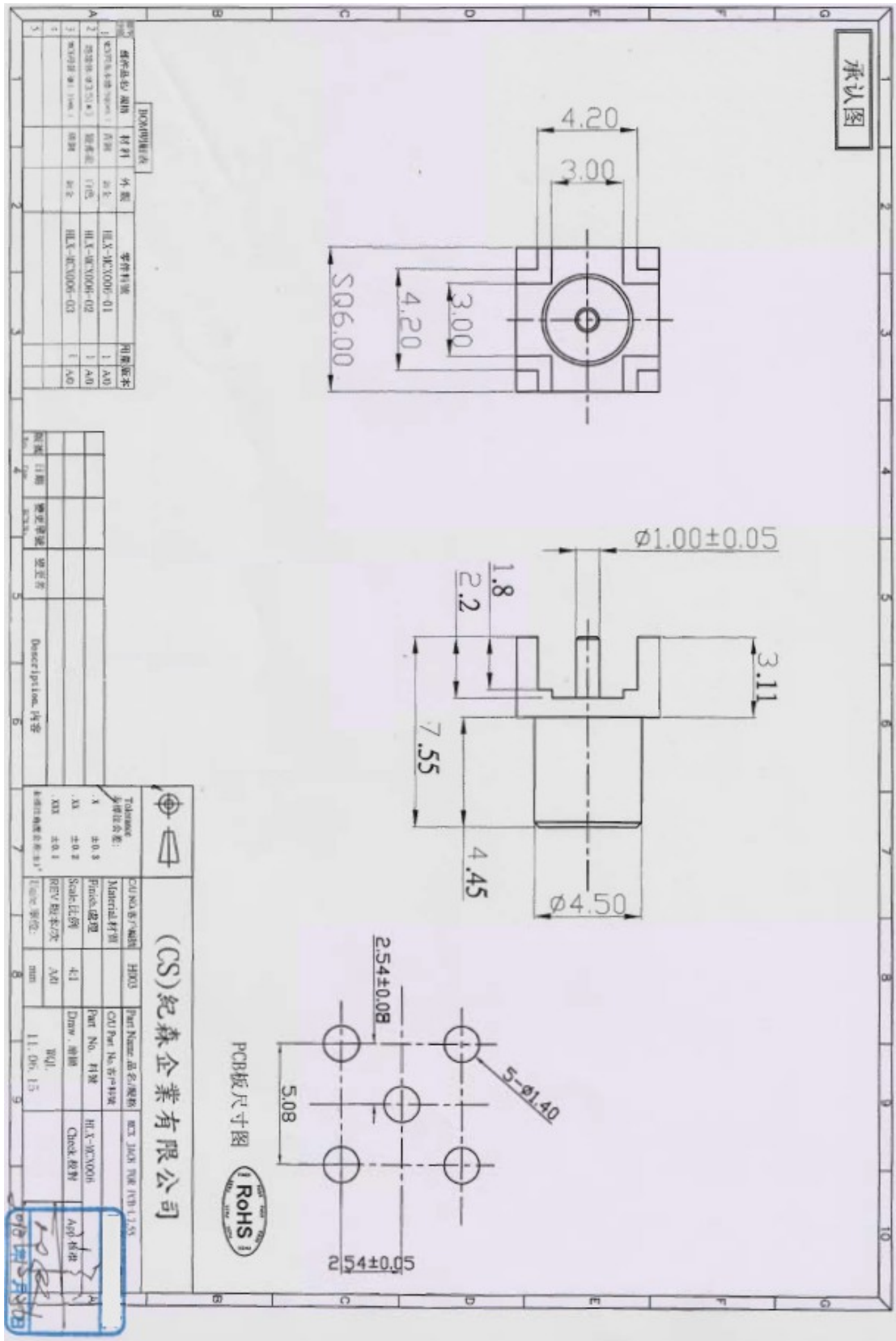
PART NO.	DESCRIPTION
CRF-101-006	GROUND CONTACT GOLD PLATING.

4. APPLIED TO IR SOLDERING PROCESS
5. COPPLANARITY: 0.10mm MAX.

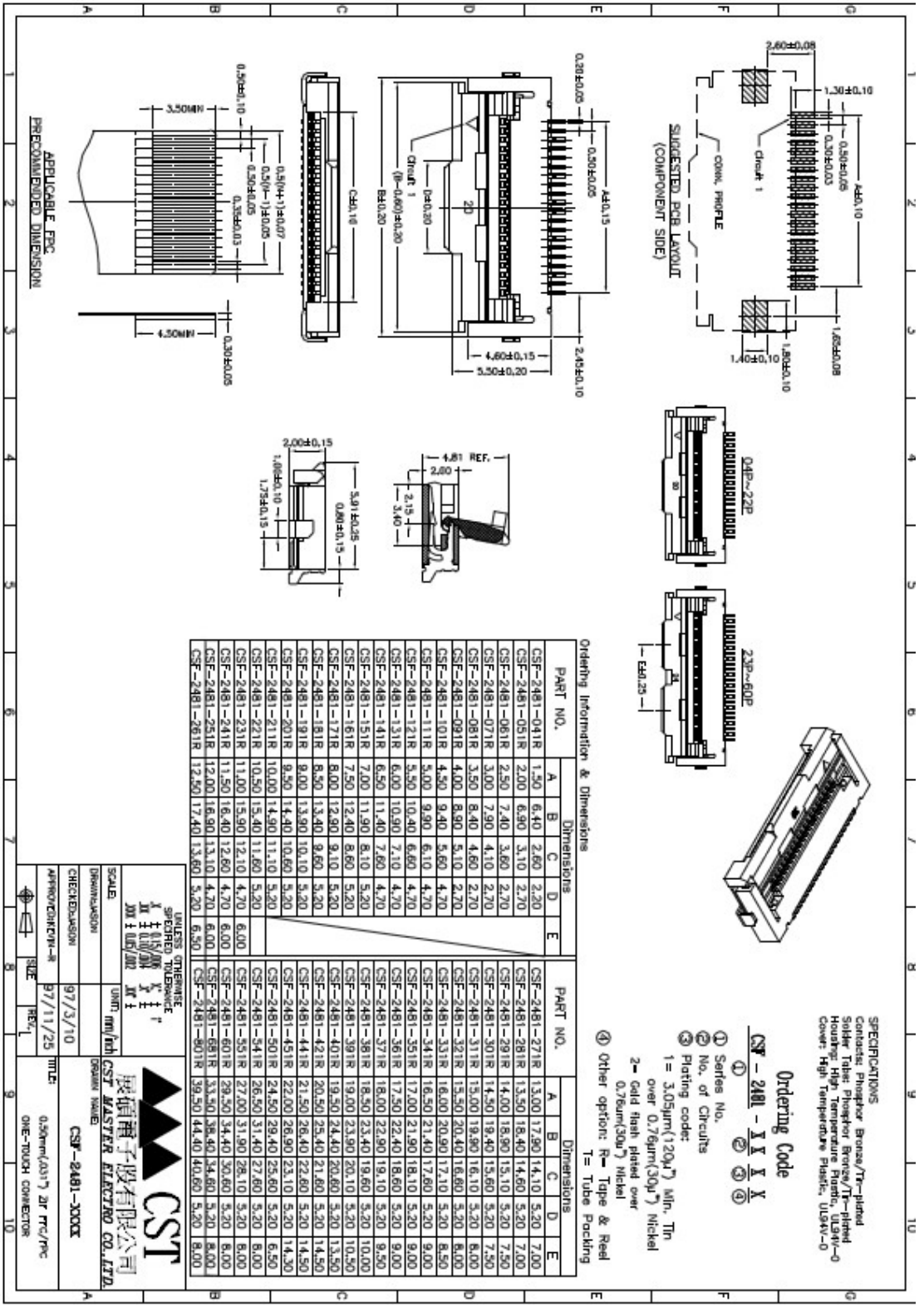
UNLESS OTHERWISE SPECIFIED TOLERANCE		CST 株式会社	
FRAMES	1/16"	DATE	97/05/25
DRILLS	1/32"	DRAWN NAME	CST MASTER ELECTRO CO., LTD.
MILLING	1/32"	DATE	97/05/26
SCALE	1:1	DATE	97/05/27
CHECKED:	DMH	DATE	97/05/26
APPROVED:	SHU-HI	DATE	97/05/27
SIZE	REV. 0	TITLE	MPF 1 CONNECTOR RECEPTACLE
			002.0

**I-pex Connector Dimension**





MCX Connector Dimension



**SPECIFICATIONS**  
 Contacts: Phosphor Bronze/Ti-plated  
 Solder Tabs: Phosphor Bronze/Ti-plated  
 Housing: High Temperature Plastic, UL94V-0  
 Cover: High Temperature Plastic, UL94V-0

**Ordering Code**

- CSF-2481-Y Y Y Y**  
 ① Series No.  
 ② No. of Circuits  
 ③ Plating code:  
 1 = 3.05µm(120µ" ) Min. Tin  
 over 0.76µm(30µ" ) Nickel  
 2 = Gold flash plated over  
 0.76µm(30µ" ) Nickel  
 ④ Other option: R = Tape & Reel  
 T = Tube Packing

Ordering Information & Dimensions

PART NO.	Dimensions					PART NO.	Dimensions				
	A	B	C	D	E		A	B	C	D	E
CSF-2481-041R	1.50	6.40	2.60	2.20		CSF-2481-271R	13.00	17.90	14.10	5.20	7.00
CSF-2481-051R	2.00	6.90	3.10	2.70		CSF-2481-281R	13.50	18.40	14.60	5.20	7.00
CSF-2481-061R	2.50	7.40	3.60	2.70		CSF-2481-291R	14.00	18.90	15.10	5.20	7.50
CSF-2481-071R	3.00	7.90	4.10	2.70		CSF-2481-301R	14.50	19.40	15.60	5.20	7.50
CSF-2481-081R	3.50	8.40	4.60	2.70		CSF-2481-311R	15.00	19.90	16.10	5.20	8.00
CSF-2481-091R	4.00	8.90	5.10	2.70		CSF-2481-321R	15.50	20.40	16.60	5.20	8.00
CSF-2481-101R	4.50	9.40	5.60	4.70		CSF-2481-331R	16.00	20.90	17.10	5.20	8.50
CSF-2481-111R	5.00	9.90	6.10	4.70		CSF-2481-341R	16.50	21.40	17.60	5.20	9.00
CSF-2481-121R	5.50	10.40	6.60	4.70		CSF-2481-351R	17.00	21.90	18.10	5.20	9.00
CSF-2481-131R	6.00	10.90	7.10	4.70		CSF-2481-361R	17.50	22.40	18.60	5.20	9.00
CSF-2481-141R	6.50	11.40	7.60	4.70		CSF-2481-371R	18.00	22.90	19.10	5.20	9.50
CSF-2481-151R	7.00	11.90	8.10	5.20		CSF-2481-381R	18.50	23.40	19.60	5.20	10.00
CSF-2481-161R	7.50	12.40	8.60	5.20		CSF-2481-391R	19.00	23.90	20.10	5.20	10.50
CSF-2481-171R	8.00	12.90	9.10	5.20		CSF-2481-401R	19.50	24.40	20.60	5.20	11.50
CSF-2481-181R	8.50	13.40	9.60	5.20		CSF-2481-421R	20.50	25.40	21.60	5.20	14.50
CSF-2481-191R	9.00	13.90	10.10	5.20		CSF-2481-441R	21.50	26.40	22.60	5.20	14.50
CSF-2481-201R	9.50	14.40	10.60	5.20		CSF-2481-451R	22.00	26.90	23.10	5.20	14.30
CSF-2481-211R	10.00	14.90	11.10	5.20		CSF-2481-501R	24.50	29.40	25.60	5.20	6.50
CSF-2481-221R	10.50	15.40	11.60	5.20		CSF-2481-541R	26.50	31.40	27.60	5.20	8.00
CSF-2481-231R	11.00	15.90	12.10	4.70	6.00	CSF-2481-551R	27.00	31.90	28.10	5.20	8.00
CSF-2481-241R	11.50	16.40	12.60	4.70	6.00	CSF-2481-601R	29.50	34.40	30.60	5.20	8.00
CSF-2481-251R	12.00	16.90	13.10	4.70	6.00	CSF-2481-651R	33.50	38.40	34.60	5.20	8.00
CSF-2481-261R	12.50	17.40	13.60	5.20	6.50	CSF-2481-901R	39.50	44.40	40.60	5.20	8.00

UNITS DIMENSIONS  
 SPECIFIED DIMENSIONS  
 X ± 0.13mm  
 Y ± 0.15mm  
 Z ± 0.20mm  
 100 ± 0.05mm  
 100 ± 0.05mm

SCALE: 1:1  
 DRAWING NO.: 97/3/10  
 CHECKED BY: 97/11/25  
 APPROVED BY: 97/11/25  
 TITLE: CSF-2481-XXXX ONE-TOUCH CONNECTOR

**CST**  
 展碩電子有限公司  
 CST MASTER ELECTRONIC CO., LTD.

**FPC connector Dimension**

## “FPC CONNECTOR” & “1.27 PIN HEADER” Pin Definition

Pin#	Name	Type	Description
1	VIN	PWR	Power input, voltage 5V +/- 5%
2	VIN	PWR	Power input, voltage 5V +/- 5%
3	GND	PWR	Ground
4	GND	PWR	Ground
5	nReset	Input	Reset. Active “L”
6	GPS RX	Input	GPS chip RX
7	GPS TX	Output	GPS chip Tx
8	CAN H	Input	Can bus high
9	CAN L	Input	Can bus Low
10	Vbat	PWR	1.4 to 3.3V
11	UART RX	Input	GPS with DR signal RX
12	UART TX	Output	GPS with DR signal TX

### Part Number:

SDR4130 3D-MF: MCX RF connector

SDR4130 3D-IF : IPEX RF connector

SDR4130 3D-SM: SMA RF connector

## Output NMEA Messages

### NMEA-0183 Output Messages

NMEA Sentence	Description
GGA (default)	Global Positioning System Fixed Data
GLL	Geographic Position - Latitude/Longitude
GSA (default)	GNSS DOP and Active Satellites
GSV (default)	GNSS Satellites in View
RMC (default)	Recommended Minimum Specific GNSS data
VTG	Course Over Ground and Ground Speed
ZDA	Time and Date
GPGDR(default)	DR information

### GPGDR information

\$GPGDR,G/D,PDOP,A/V,LAT,N/S,LOT,W/E,COG,SP,OBD\_SP,+/-,X-GYRO,+/-,Y-Gyro,+/-,Z-Gyro,CHECK SUM

G/D	GPS mode or DR mode
PDOP	GPS Position Dilution of Precision
A/V	GPS Lock/unlock
LAT	GPS LAT
N/S	N= North, S=South
LON	GPS LON
W/E	W= West, E=East
COG	GPS Course over Ground
SP	GPS speed
OBD_SP	OBD speed
XGYRO	X Gyro +/- direction
XGYRO	X Gyro angle
YGYRO	Y Gyro +/- direction
YGYRO	Y Gyro angle
ZGYRO	Z Gyro +/- direction
ZGYRO	Z Gyro angle
CHECK SUM	Check sum

## Labeling information

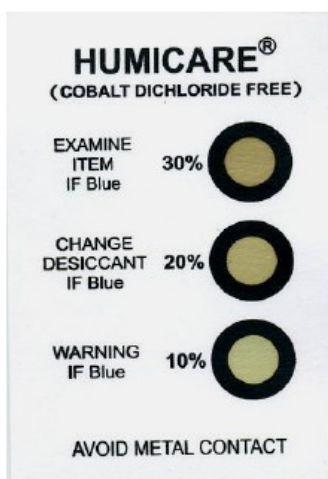
The Labeling of GPS modules includes product information. The location of the product type number and serial number are show in the figure.

Product type number  
Serial number



## Humidity Card

The dry bag provide an MSD label describing the handling requirement to prevent humidity intake. JEDEC J-STD-033B specifications require that MSD sensitive device be packaged together with a Humidity indicator Card and desiccant to absorb humidity. If no moisture has been absorbed, the three field in the HIC indicate blue color.



The calculated shelf life for dry packed SMD packages is a minimum of 12 months from the bag seal date, when stored in a non-condensing atmospheric environment of <math><40^{\circ}\text{C}/90\% \text{RH}</math>. The parts must be processed and soldered within the time specified for the MSL level 3 168 hours. If this time is exceeded, or the humidity indicator card in the sealed package indicates that they have been exposed to moisture, the devices need to be pre-baked before the reflow solder process.

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