

TST Solution for GPS Systems



TAI-SAW TECHNOLOGY CO., LTD.

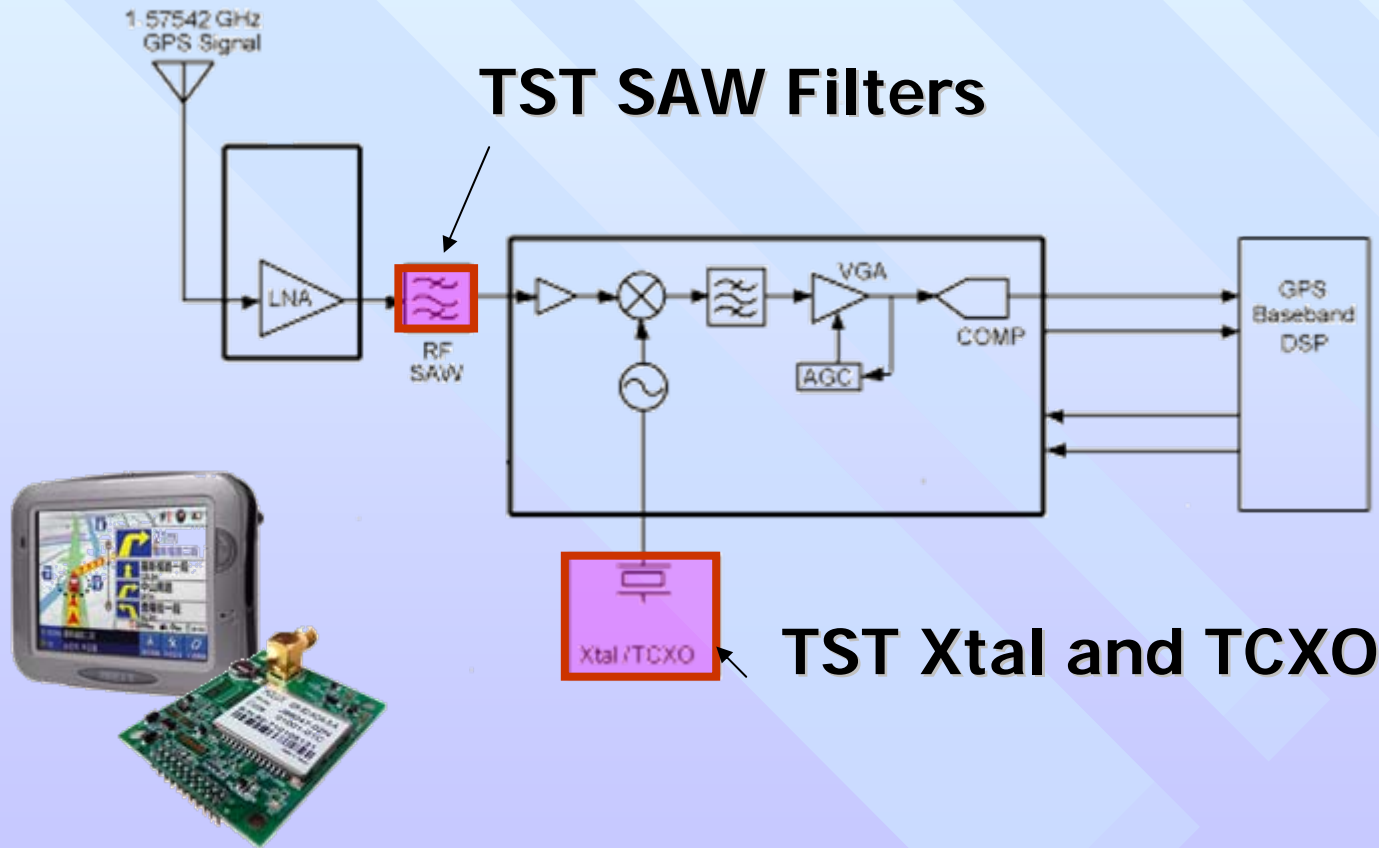


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Frequency Components Total Solution Provider

RF Key components for GPS



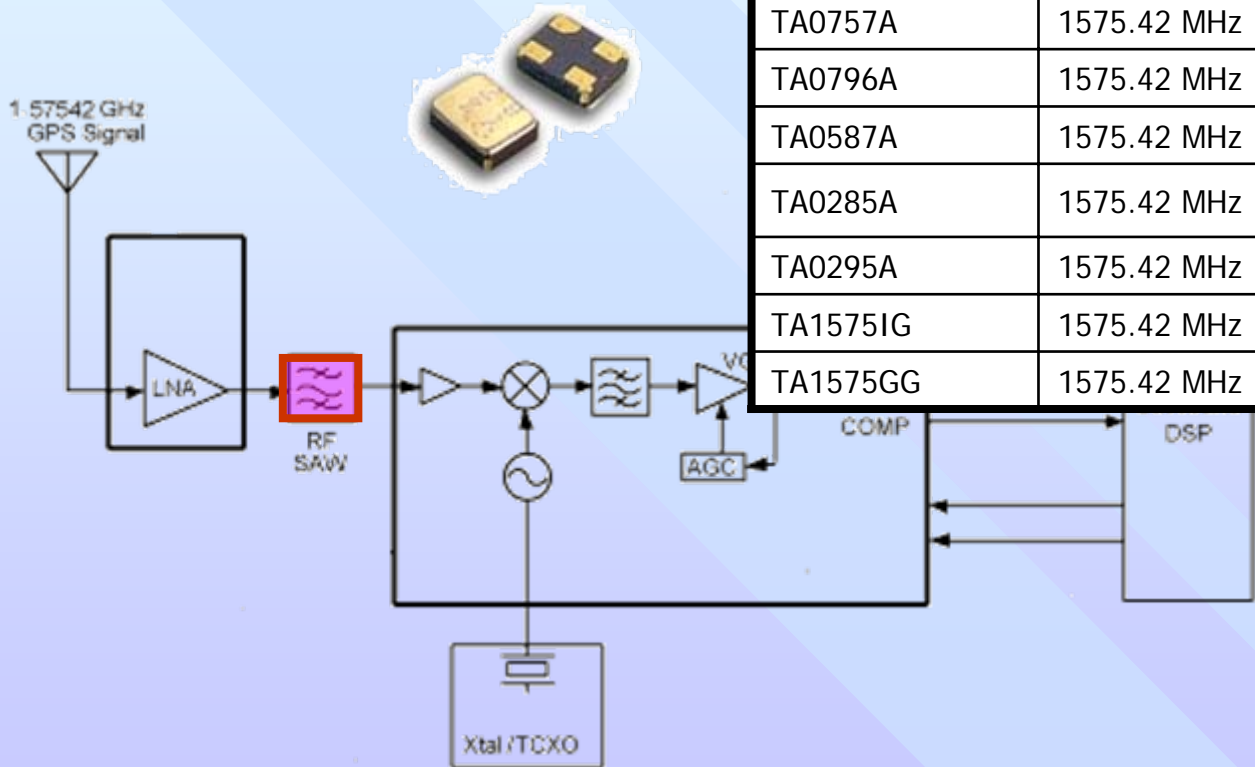
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TST – SAW Filters

Part Number	Band	Size	Pin	Mode
TA0757A	1575.42 MHz	1.4 x 1.1	5	
TA0796A	1575.42 MHz	1.4 x 1.1	5	50 // 100
TA0587A	1575.42 MHz	2.0 x 1.6	4	
TA0285A	1575.42 MHz	2.5 x 2.0	4	Lo Loss
TA0295A	1575.42 MHz	2.5 x 2.0	4	Hi Att
TA1575IG	1575.42 MHz	3.0 x 3.0	6	Lo Loss
TA1575GG	1575.42 MHz	3.0 x 3.0	6	Hi Att

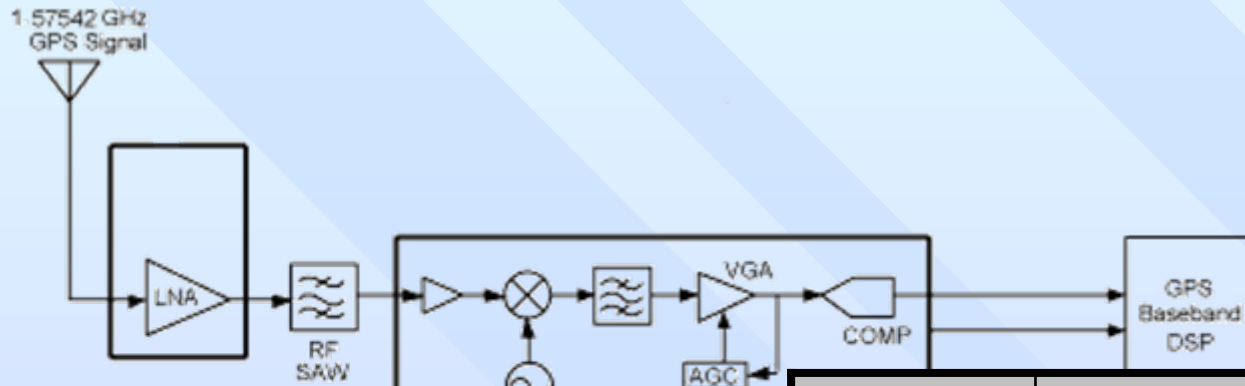


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TST – Xtal and TCXO



Part Number	Frequency	Size	Vcc	Tolerance
TX0275A	16.368 MHz	3.2 x 2.5	2.85	+/-0.5 ppm
TX0275E	16.368 MHz	3.2 x 2.5	2.85	+/-1.5 ppm
TX0275D	16.368 MHz	3.2 x 2.5	2.85	+/-2 ppm
TX0275C	16.368 MHz	3.2 x 2.5	1.8	+/-0.5 ppm
TX0309A	16.368 MHz	2.5 x 2.0	2.85	+/-0.5 ppm
TX0280A	16.369 MHz	3.2 x 2.5	2.85	+/-0.5 ppm
TX0279A	16.367667 MHz	3.2 x 2.5	2.85	+/-0.5 ppm
TX0287A	16.3676 MHz	3.2 x 2.5	2.85	+/-0.5 ppm
TX0203E	26 MHz	3.2 x 2.5	2.85	+/-0.5 ppm
TZ0260B	26 MHz	3.2 x 2.5		


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GPS – MediaTek MT33xx series



TST SAW filter (1411 1575.42M TA0757A)



Vender list

Component	Part number	Manufacturer	Vendor
SAW	TA0757A	TAI-SAW	台灣嘉碩
	TA0757A	TAI-SAW	台灣嘉碩
	TA0757A	TAI-SAW	台灣嘉碩
	TA0757A	TAI-SAW	台灣嘉碩
LDO	TA0757A	TAI-SAW	台灣嘉碩
	TA0757A	TAI-SAW	台灣嘉碩
	TA0757A	TAI-SAW	台灣嘉碩
	TA0757A	TAI-SAW	台灣嘉碩
	TA0757A	TAI-SAW	台灣嘉碩
	TA0757A	TAI-SAW	台灣嘉碩
	TA0757A	TAI-SAW	台灣嘉碩

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GPS – MediaTek MT33xx series

TST TCXO (3225 16.368M TX0275A)

Mediatek TCXO QVL for GPS Application (MT3328/MT3329/MT3318)

Component	Part number	Manufacturer	Vendor
TCXO 3225 (16.368 MHz, 0.5ppm)	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]
		TX0275A	TST



GPS – Skytraq Venus series

TST TCXO (3225 16.367667M TX0279A)

SkyTraq Venus 624LP/120 Engine Board Reference Design (without LNA)

Bill Of Materials November 8, 2007 Page 1

Item	Quantity	Size	Reference	Part
1	2	0402	AC1, AC5	[REDACTED]
2	5	0402	AC2, AC3, AC7, AC8, AC10	[REDACTED]
3	1	0402	AC4	[REDACTED]
4	1	0402	AC6	[REDACTED]
5	2	0402	AC11, AC9	[REDACTED]
6	1	2.0x1.5	AF1	1575.42MHz GPS SAW filter
7	2	0402	AL3, AL1	[REDACTED]
8	1	0402	AL2	[REDACTED]
9	1	0402	AL4	[REDACTED]
10	1	0402	AR1	[REDACTED]
11	1	0402	AR2	[REDACTED]
12	1	QFN24	AU1	SkyTraq Venus 120 GPS RFIC
13	1	0402	AX1	[REDACTED]
14	1	3.2x2.5	AY1	16.367667MHz +/-0.5ppm TCXO (Rakon or TEW or TaiSaw)

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Benchmark – GPS TCXO

- **TST 16.368MHz TCXO (TX0275A).**
- **Rakon 16.368MHz TCXO**

Glossary

- **TTFF** : Time To First Fix.
- **DOP** : Dilution of Precision. Including GDOP(Geometric), PDOP(Position), HDOP(Horizontal), VDOP(Vertical) and TDOP(Time).
- **Cold Test** : were performed when both Pocket PC and GPS receiver were powered off (if GPS receiver has a separate power source, the GPS receiver was unplugged) for a period of between 8 to 12 hours requiring a cold start.
- **Warm Test** : Warm tests were performed when both Pocket PC and GPS receiver were powered off (if GPS receiver has a separate power source, the GPS receiver was unplugged) for a period of 30 minutes.
- **Hot Test** : Hot tests were performed when both Pocket PC and GPS receiver were powered off (if GPS receiver has a separate power source, the GPS receiver was unplugged) for a period of 15 minutes.

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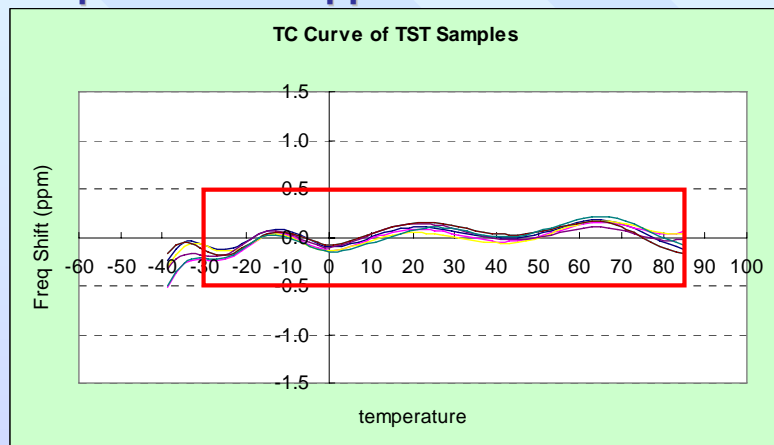
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Benchmark – GPS TCXO

(1) Temp Characters Performance

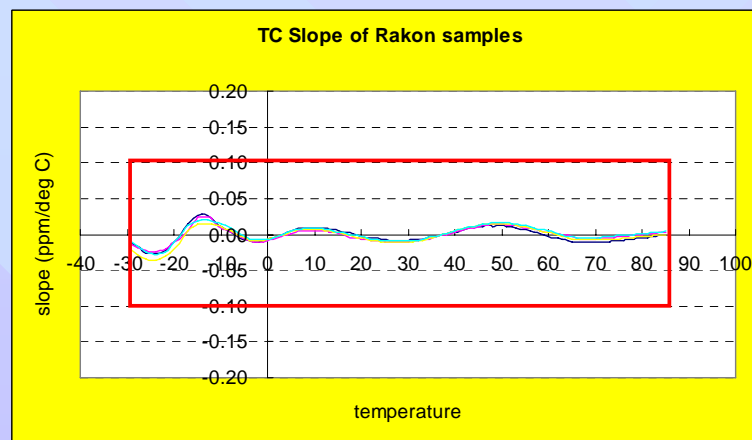
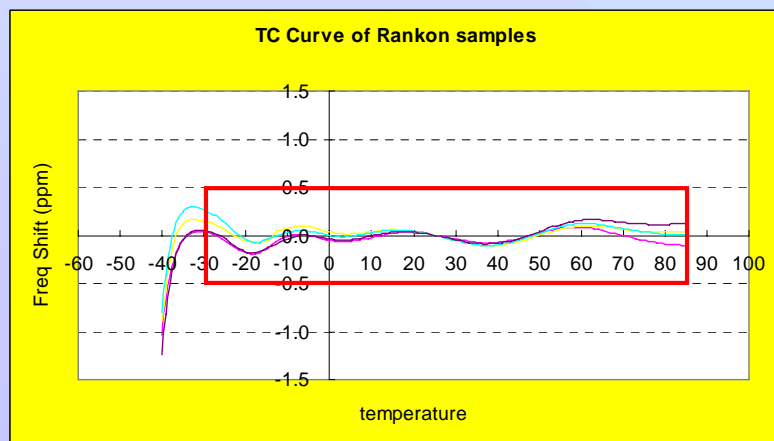
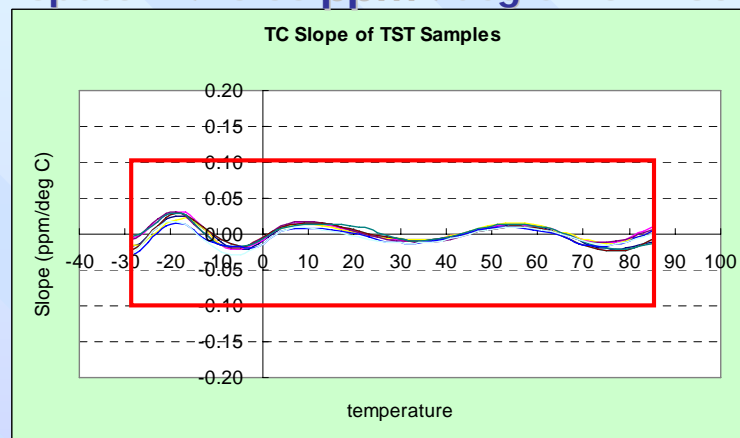
TC Frequency Stability

Specs: +/-0.5 ppm from -30~85C



TC Frequency Slope

Specs: +/-0.05 ppm /deg C from -30~85C



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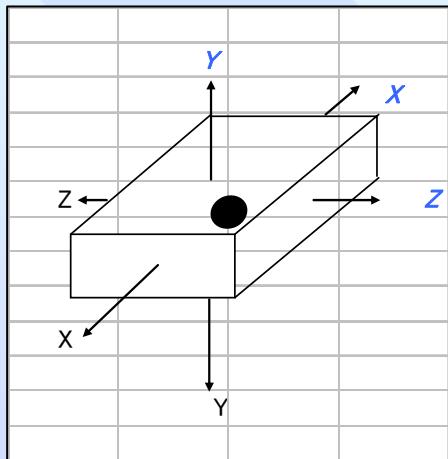
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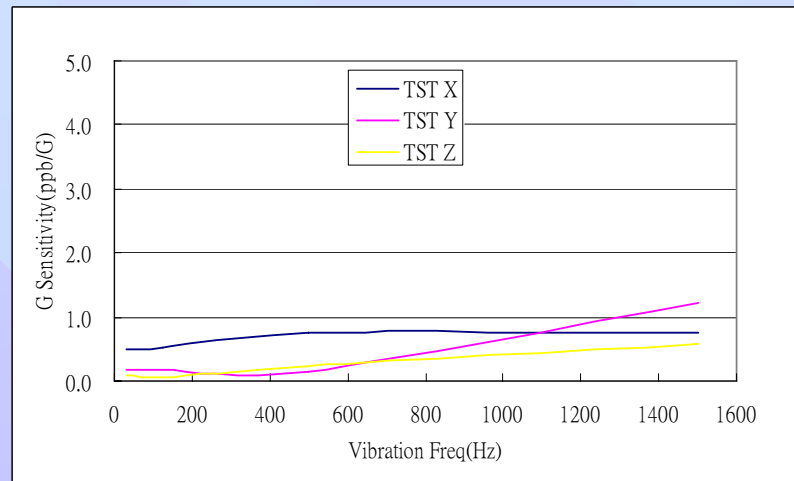
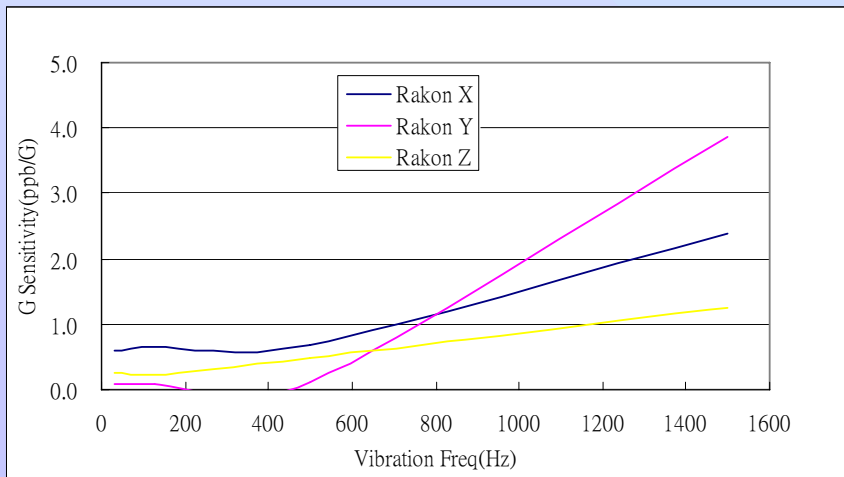
Benchmark – GPS TCXO

(2) G Sensitivity

G sensitivity spec: 5ppb/g . To detect X,Y,Z 3 directions. In the bottom graph, Y-axis is G sensitivity (ppb/g), and X-axis is vibration freq. (30Hz~1500Hz)



	30	125	500	1500
Rakon X	0.6	0.7	0.7	2.4
Rakon Y	0.1	0.1	0.1	3.9
Rakon Z	0.3	0.2	0.5	1.2
	30	125	500	1500
TST X	0.5	0.5	0.7	0.8
TST Y	0.2	0.2	0.2	1.2
TST Z	0.1	0.1	0.2	0.6



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Benchmark – GPS TCXO

(3) Road Test - Test Environment

Conditions of Road Test:

- A.** Street with Tall Buildings on One Side.
- B.** Street with Tall Building on Both Sides.
- C.** Turn Around on The Street with Tall Buildings on Three Sides.
(U Turn)



A



B



C

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Benchmark – GPS TCXO

(4) Road Test - DOP

HDOP		Condition A (count: 28)	Condition B (count: 26)	Condition C (count: 40)
TST	mean	0.8	0.9	0.9
	sigma	0.1	0.1	0.1
Rakon	mean	1.0	1.0	0.9
	sigma	0.2	0.2	0.1
VDOP		Condition A (count: 28)	Condition B (count: 26)	Condition C (count: 40)
TST	mean	1.2	0.9	1.0
	sigma	0.5	0.1	0.2
Rakon	mean	1.1	0.9	1.0
	sigma	0.5	0.0	0.4
PDOP		Condition A (count: 28)	Condition B (count: 26)	Condition C (count: 40)
TST	mean	1.5	1.3	1.4
	sigma	0.4	0.1	0.2
Rakon	mean	1.5	1.4	1.4
	sigma	0.4	0.1	0.4

No Significant Difference!!

Benchmark – GPS TCXO

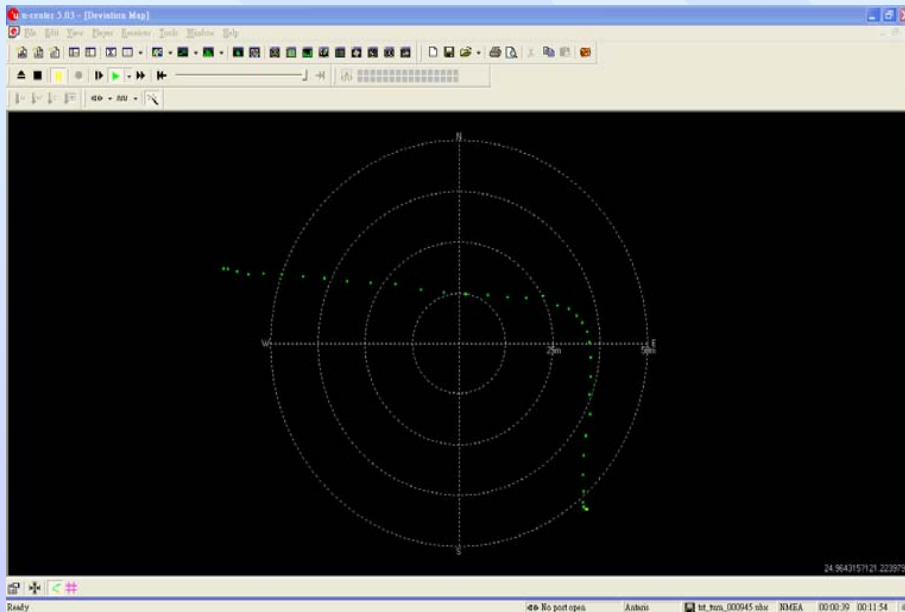
(5) Road Test - TTFF, hot test

	Condition B	Condition A
TST	17s	16.5s
Rakon	17.5s	15.5s

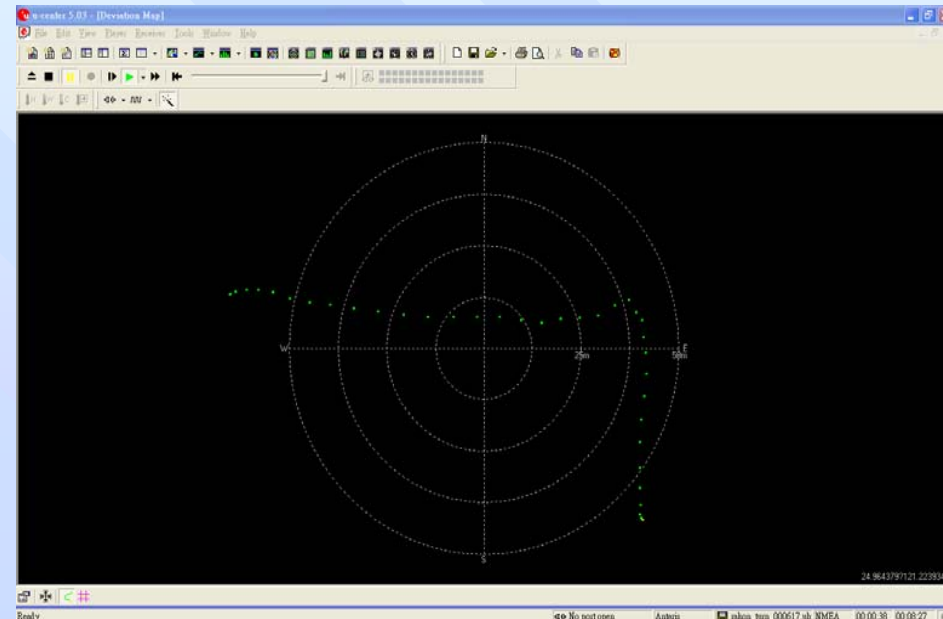
No Significant Difference !!

Benchmark – GPS TCXO

(6) Road Test - Trace, Turn Around on The Street with Tall Buildings on Three Sides



TST



Rakon

No Significant Difference !!

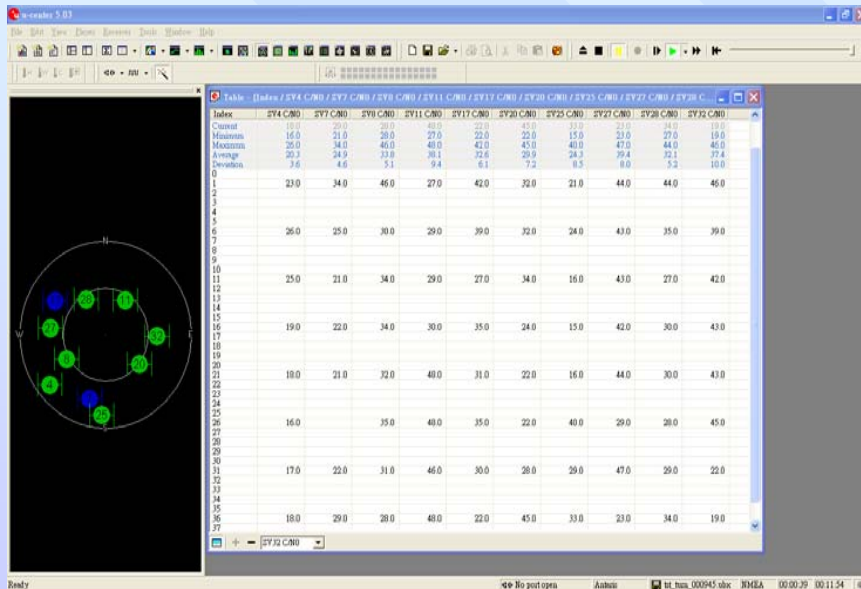
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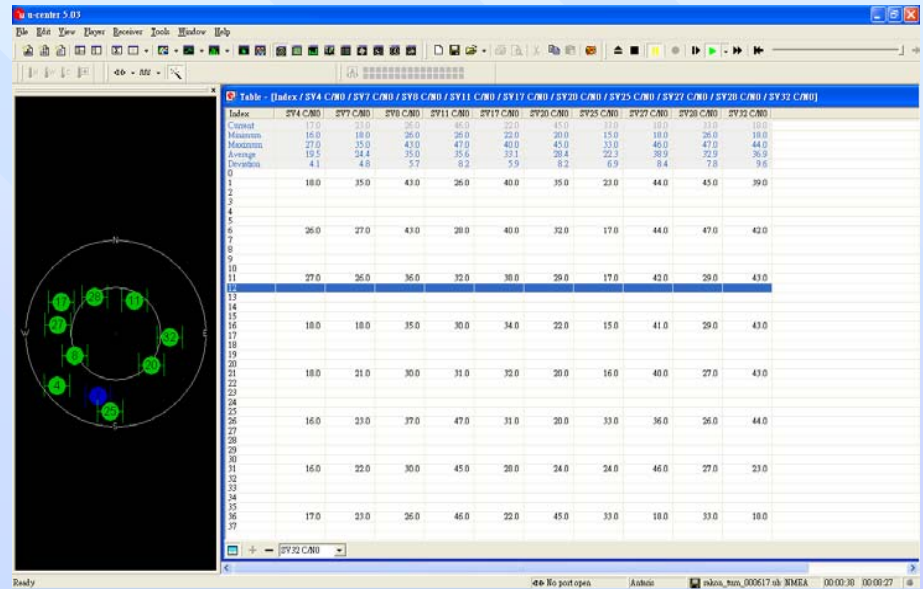
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Benchmark – GPS TCXO

(7) Road Test - CN Variance, Turn Around on The Street with Tall Buildings on Three Sides



TST



Rakon

No Significant Difference !!

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Benchmark – GPS TCXO

(8) Road Test - 3D Fix through a long tunnel

Time to lose 3D Fix, into tunnel

(sec)	TST	Rakon
Into tunnel 1	15	13.68
Into tunnel 2	18	13

Time to 3D Fix, out of tunnel

(sec)	TST	Rakon
Out of tunnel 1	3.9	7.2
Out of tunnel 2	5.5	4.9

No Significant Difference !!

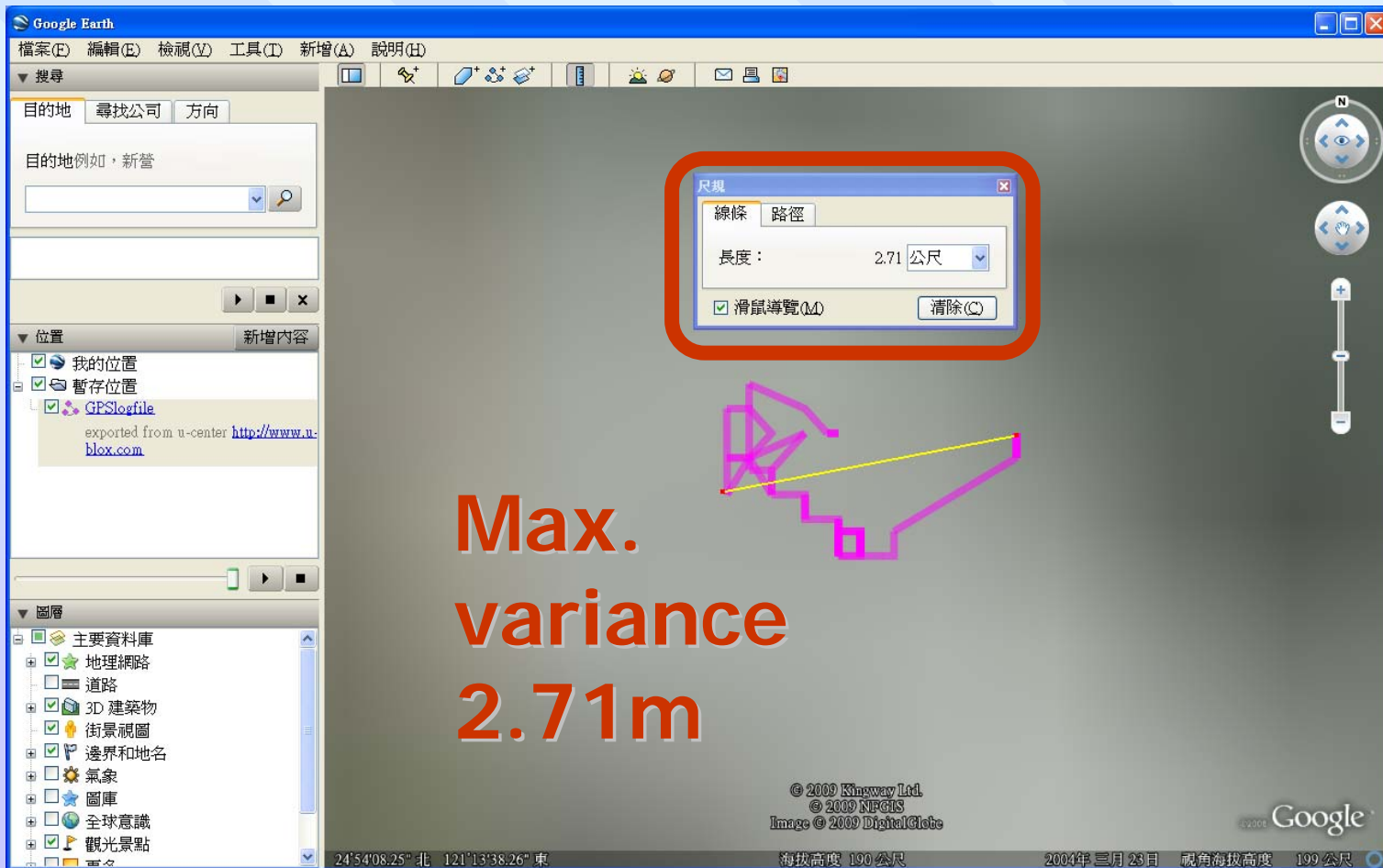
Tunnel 1 : 3.1 km (北宜高速公路 石碇隧道)

Tunnel 2 : 3.8 km (北宜高速公路 彭山隧道)

Car Speed : 60 Km/hr

Benchmark – GPS TCXO

(9) Road Test - 24hrs outdoor steady test



The screenshot shows the Google Earth interface with a path measurement tool. A red box highlights the '尺規' (Ruler) dialog box, which displays '長度: 2.71 公尺' (Length: 2.71 meters). The path is shown as a yellow line connecting two points on a pink road network. The interface includes a search bar, a location list, and a layer list. The status bar at the bottom shows coordinates (24°54'08.25" N, 121°13'38.26" E), altitude (190m), and date (2004年 三月 23日).

**Max.
variance
2.71m**

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Thank You

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<http://www.taisaw.com>

or

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