Xilinx ZCU102 with Renesas ClockMatrix, ITU-T G.8263

Contents

1. Results Summary

Standard	Test Case	Results
G.8263	Noise Generation	Pass
G.8263	Holdover	Pass
G.8261	Test Case 12 [1]	Pass
G.8261	Test Case 13 Network Traffic Model 2 [1]	Pass
G.8261	Test Case 14 Network Traffic Model 2 [1]	Pass
G.8261	Test Case 15 Network Traffic Model 2 [1]	Pass
G.8261	Test Case 16 Network Traffic Model 2 [1]	Pass
G.8261	Test Case 17(10µs) Network Traffic Model 2 [1]	Pass
G.8261	Test Case 17(200µs) Network Traffic Model 2 [1]	Pass
G.8263	Noise Tolerance - Method 1	Pass
G.8263	Noise Tolerance - Method 2 (50µs)	Pass
G.8263	Noise Tolerance - Method 2 (75µs)	Pass
G.8263	Noise Tolerance - Method 2 (150µs)	Pass
G.8263	Noise Tolerance - Method 3 (High Frequency)	Pass
G.8263	Noise Tolerance - Method 3 (Low Frequency)	Pass

1. Results for information only, not part of ITU-T required performance testing.

2. Test Configuration

Table 1. Test Configuration

Device Under Test	Xilinx + CM
Oscillator	Rakon M6141
1pps Source	Symmetricom TP5000
Instrument	Paragon Neo
Instrument Serial Number	00036081
Ethernet Interface	Optical

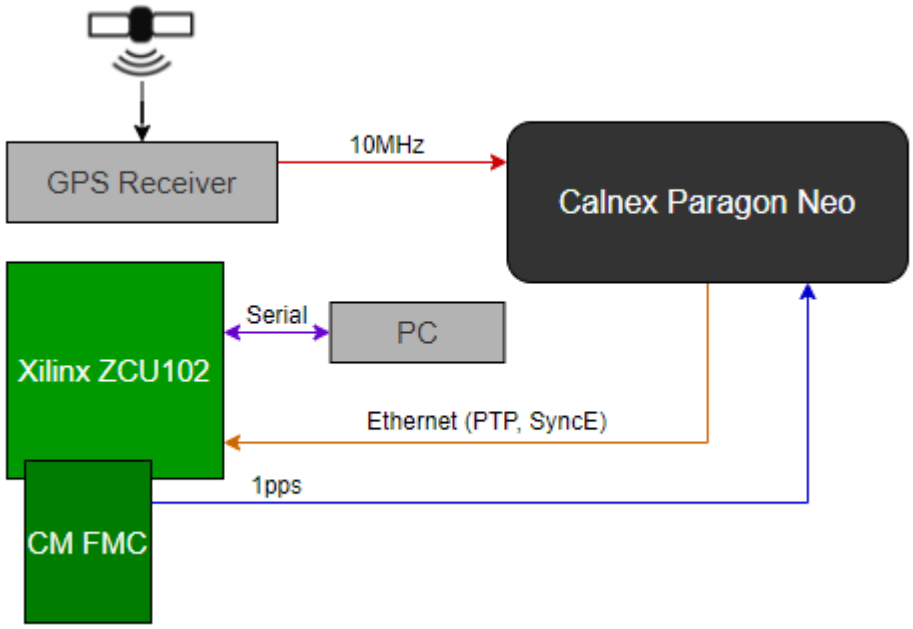


Figure 1. Equipment Configuration

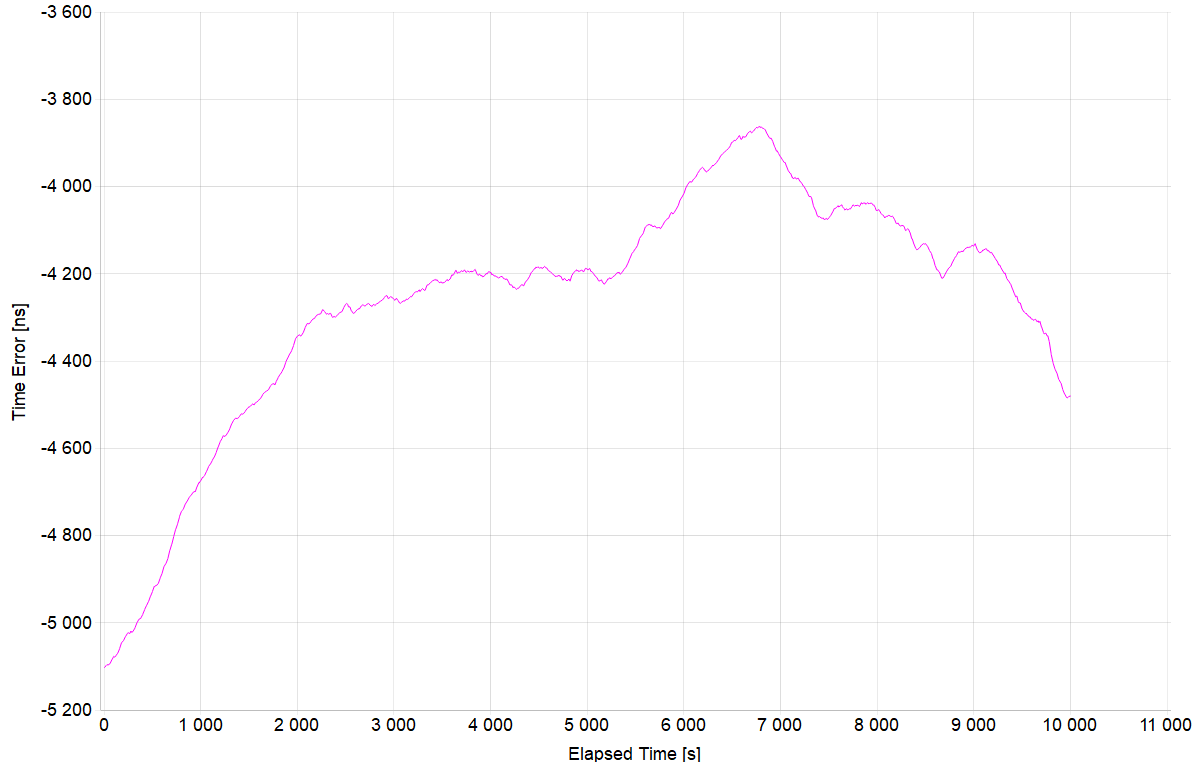
3. G.8263: Noise Generation

Test Description	Noise Generation
Report Date	22-10-18_13-29-39
Packet Rate (pkt/s)	16
Test Duration	02:46:40
Test Configuration	2
Time to Phase Lock (s)	70

All Mask Results	**Pass**
Mask ONEPPS	-
Mask ONEPPS Result	No Mask
Mask MTIE	G.8263 PEC-S-F Wander Gen Const. Temp.
Mask MTIE Result	**Pass**

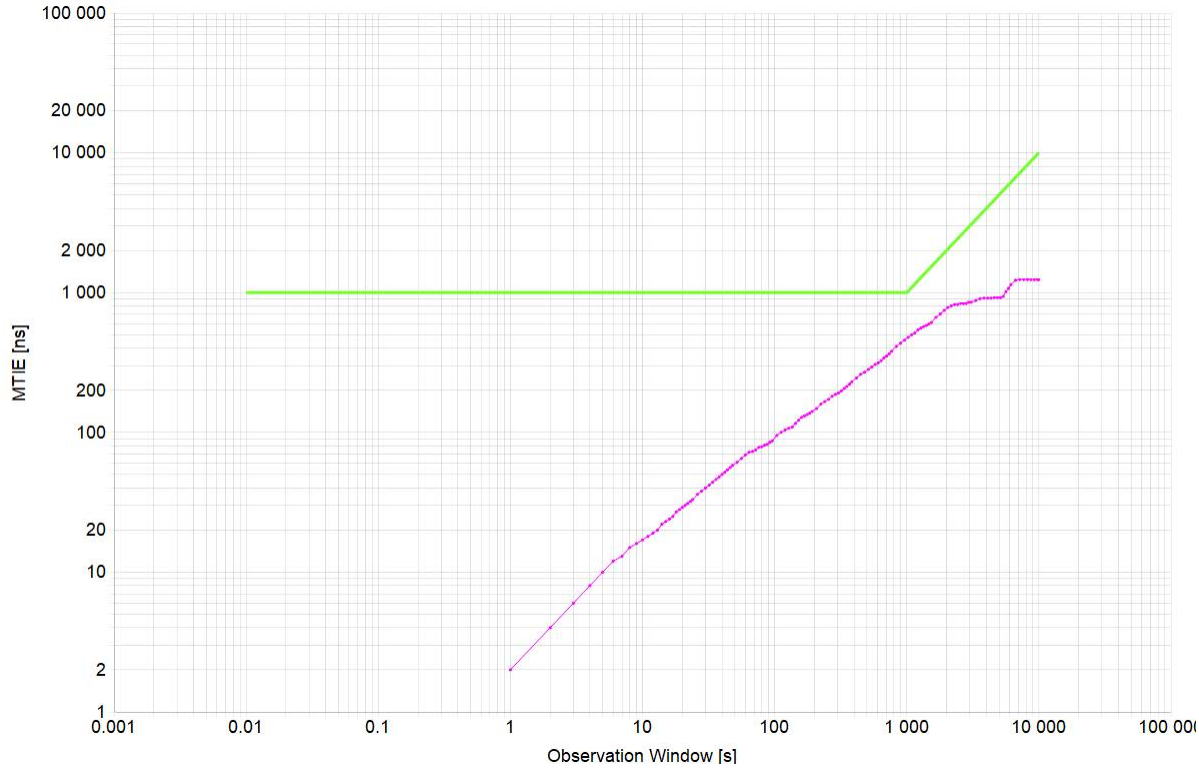
3.1 ONEPPS Analysis

Offset Removal Applied	Off
Zero Offset	-5103ns



Mean [ns]	-4263.029
Min [ns]	-5103
Max [ns]	-3863
Max-Min [ns]	1240

3.2 MTIE Analysis



Min [ns]	2
Max [ns]	1240
Max-Min [ns]	1238

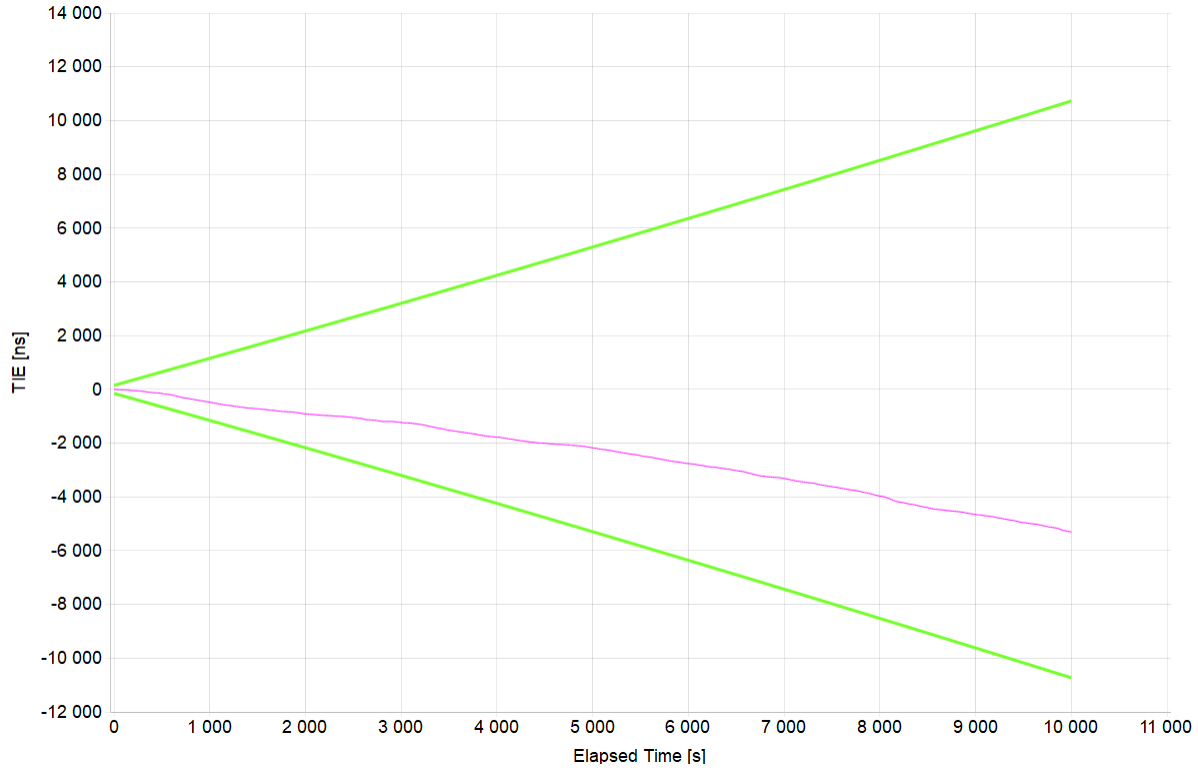
4. G.8263: Holdover

Test Description	Holdover
Report Date	22-10-18_13-29-39
Packet Rate (pkt/s)	16
Test Duration	02:46:40
Test Configuration	2
Time to Phase Lock (s)	N/A

All Mask Results	**Pass**
Mask TIE	G.8263 PEC-S-F Long-Term Holdover Const. Temp.
Mask TIE Result	**Pass**

1. This test is a continuation of the previous Noise Generation test. This allows for an appropriate amount of settling time before collecting holdover data (10 000s). The results are split because holdover requires a different mask than noise generation.

4.1 TIE Analysis



Mean [ns]	-2392.1
Min [ns]	-5304
Max [ns]	0
Max-Min [ns]	5304

5. G.8261: Test Case 12

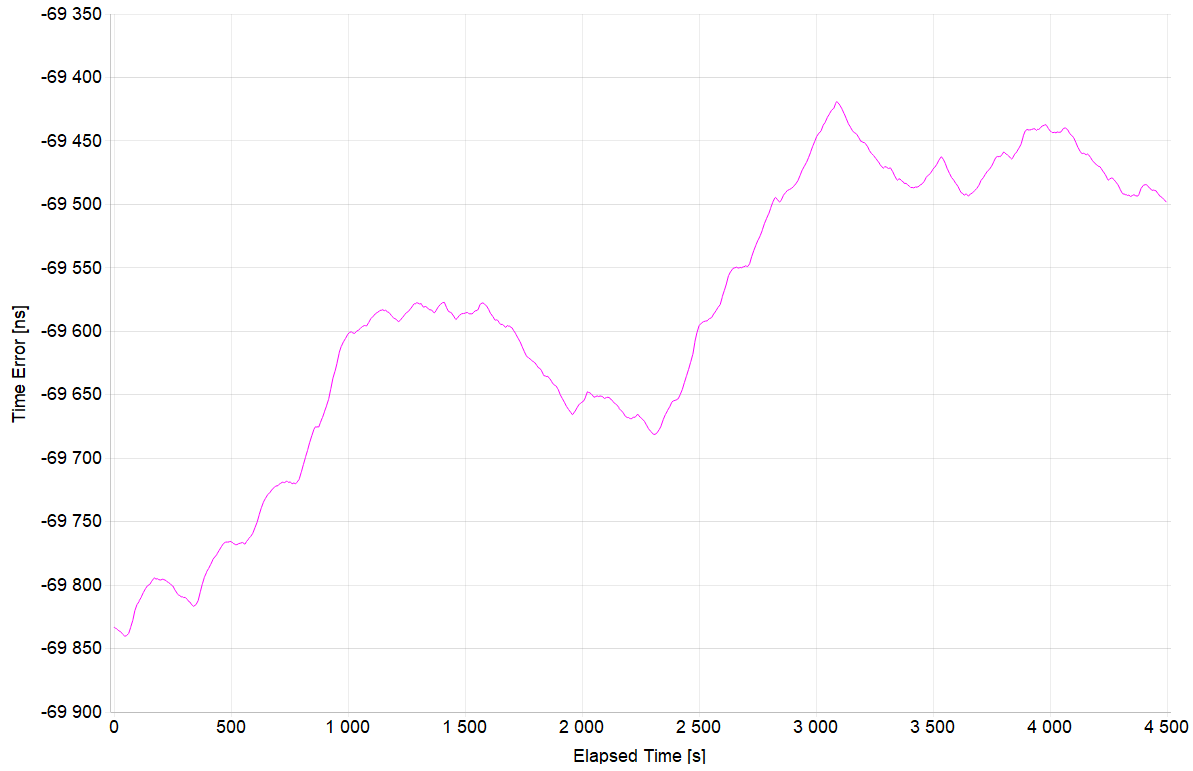
Note: Results for information only; not part of ITU-T required performance testing.

Test Description	Test Case 12
Report Date	22-06-06_09-02-08
Packet Rate (pkt/s)	16
Test Duration	01:14:57
Time to Frequency Lock (s)	206

All Mask Results	**Pass**
Mask ONEPPS	-
Mask ONEPPS Result	No Mask
Mask CLKFFO	16ppb
Mask CLKFFO Result	**Pass**

5.1 ONEPPS Analysis

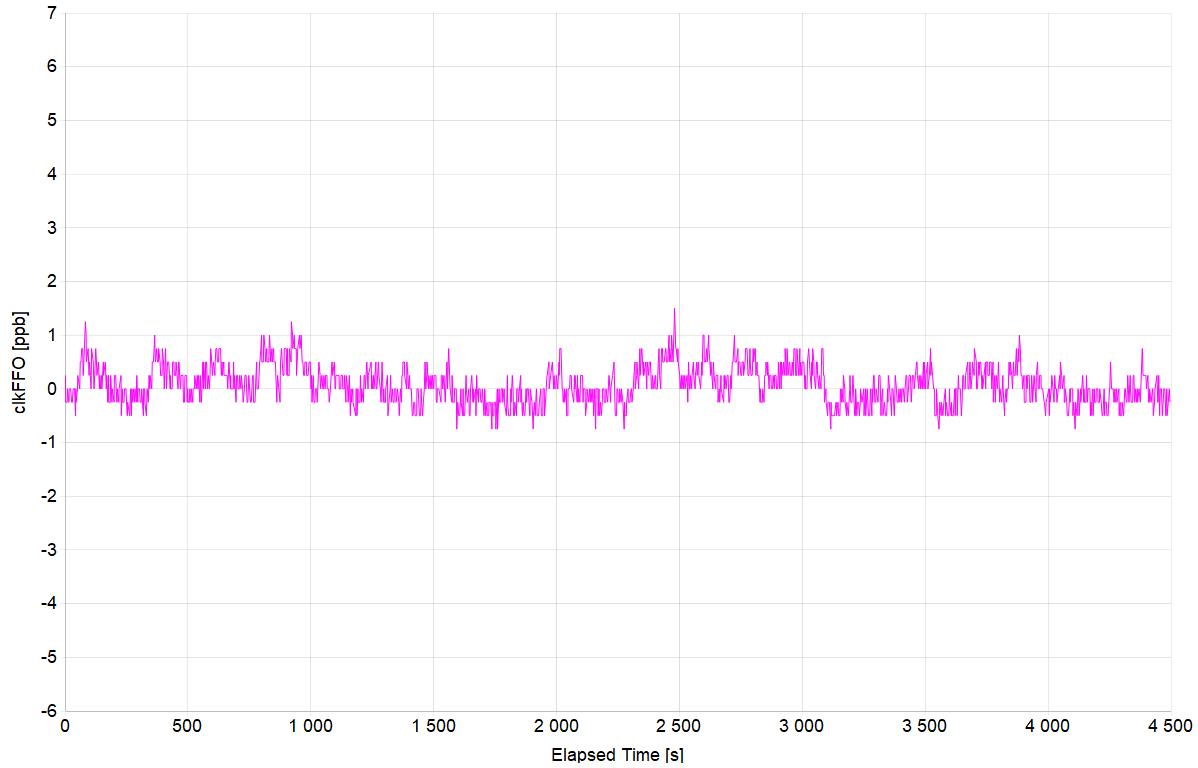
Offset Removal Applied	Off
Zero Offset	-69833.733ns



Mean [ns]	-69588.197
Min [ns]	-69840.233
Max [ns]	-69418.983
Max-Min [ns]	421.25

5.2 CLKFFO Analysis

Averaging Time (s)	2



Mean [ppb]	0.075
Min [ppb]	-0.75
Max [ppb]	1.5
Max-Min [ppb]	2.25

6. G.8261: Test Case 13 Network Traffic Model 2

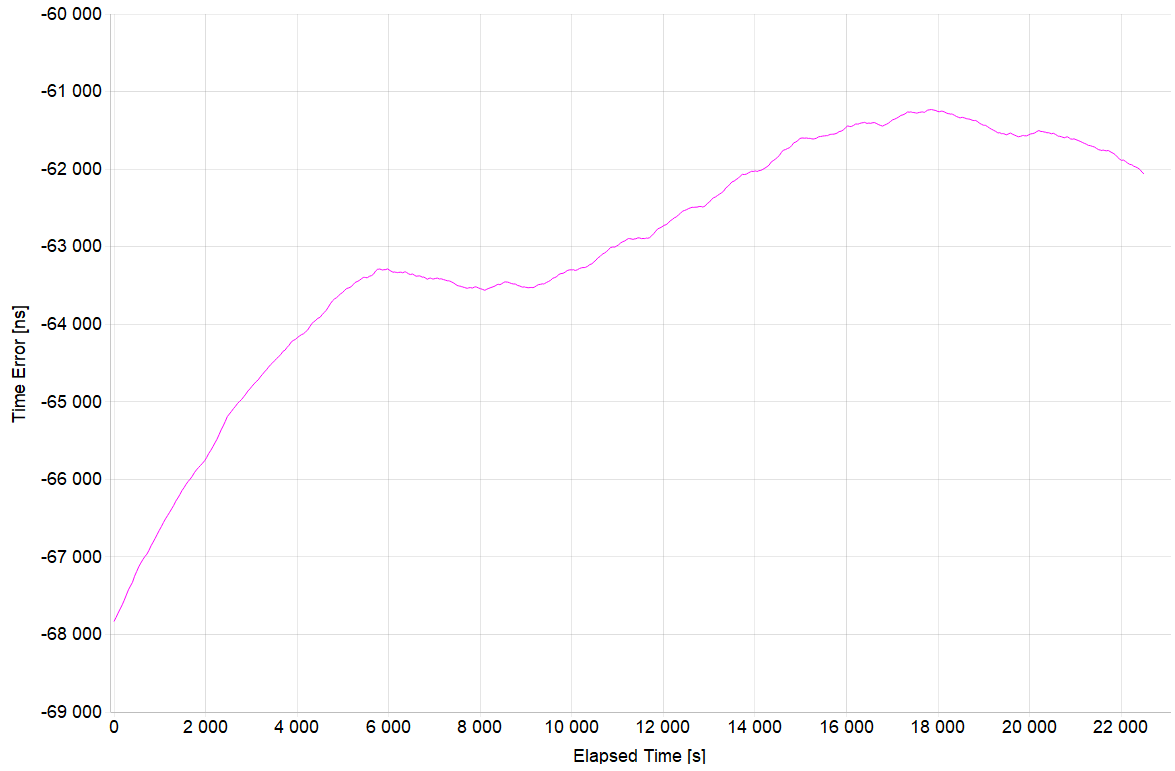
Note: Results for information only; not part of ITU-T required performance testing.

Test Description	Test Case 13 Network Traffic Model 2
Report Date	22-06-06_09-02-08
Packet Rate (pkt/s)	16
Test Duration	06:14:57
Time to Frequency Lock (s)	285

All Mask Results	**Pass**
Mask ONEPPS	-
Mask ONEPPS Result	No Mask
Mask CLKFFO	16ppb
Mask CLKFFO Result	**Pass**

6.1 ONEPPS Analysis

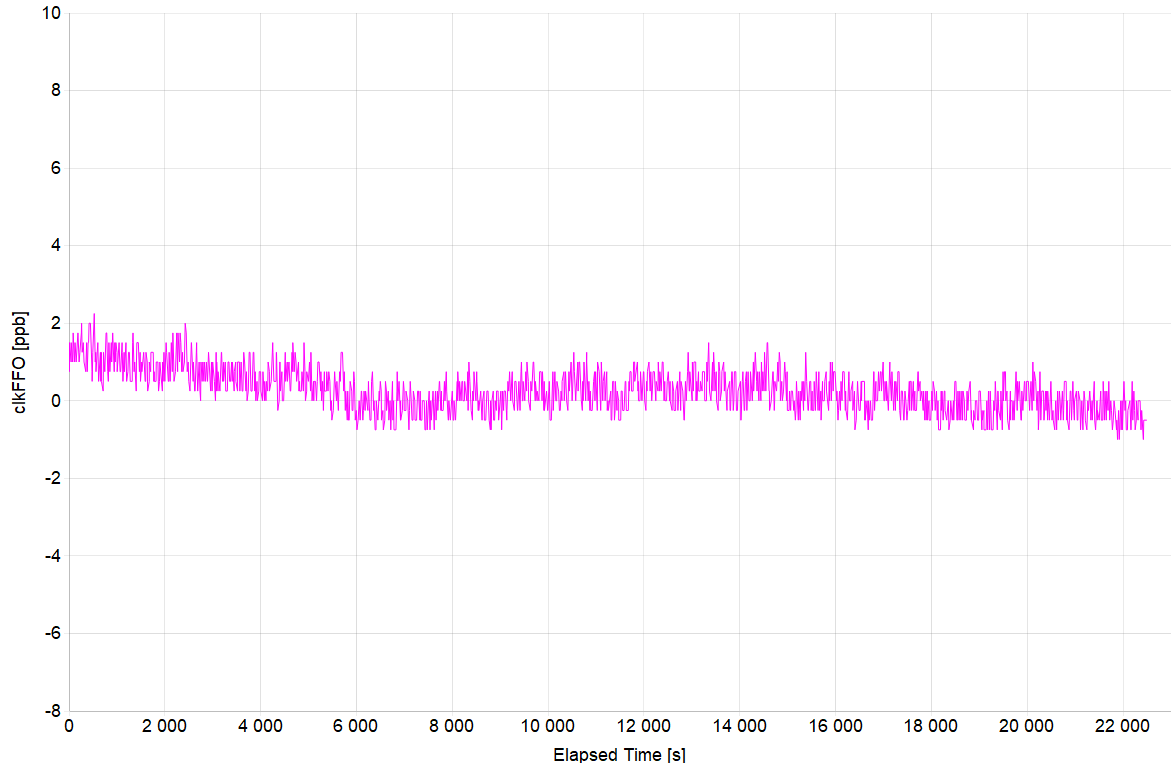
Offset Removal Applied	Off
Zero Offset	-67833.233ns



Mean [ns]	-63030.232
Min [ns]	-67833.233
Max [ns]	-61231.733
Max-Min [ns]	6601.5

6.2 CLKFFO Analysis

Averaging Time (s)	2



Mean [ppb]	0.257
Min [ppb]	-1
Max [ppb]	2.25
Max-Min [ppb]	3.25

7. G.8261: Test Case 14 Network Traffic Model 2

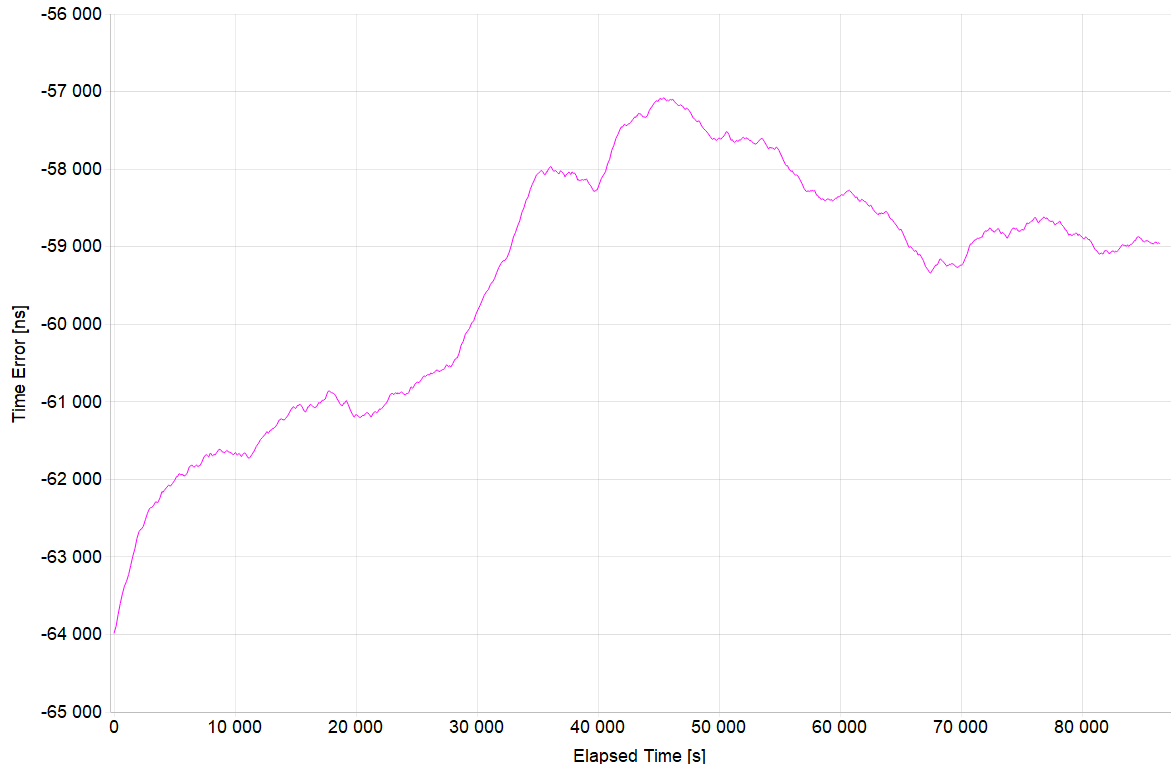
Note: Results for information only, not part of ITU-T required performance testing.

Test Description	Test Case 14 Network Traffic Model 2
Report Date	22-06-06_09-02-08
Packet Rate (pkt/s)	16
Test Duration	23:59:57
Time to Frequency Lock (s)	264

All Mask Results	**Pass**
Mask ONEPPS	-
Mask ONEPPS Result	No Mask
Mask CLKFFO	16ppb
Mask CLKFFO Result	**Pass**

7.1 ONEPPS Analysis

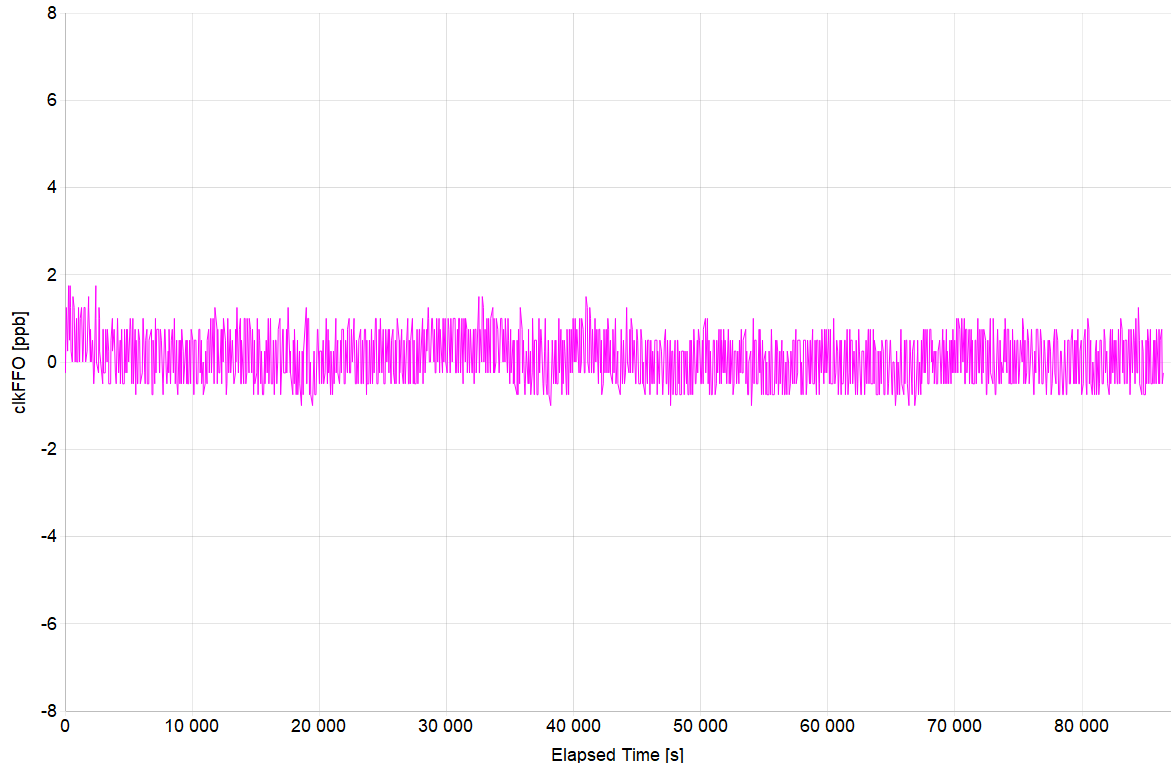
Offset Removal Applied	Off
Zero Offset	-63986.733ns



Mean [ns]	-59428.301
Min [ns]	-63986.733
Max [ns]	-57079.733
Max-Min [ns]	6907

7.2 CLKFFO Analysis

Averaging Time (s)	2



Mean [ppb]	0.058
Min [ppb]	-1
Max [ppb]	1.75
Max-Min [ppb]	2.75

8. G.8261: Test Case 15 Network Traffic Model 2

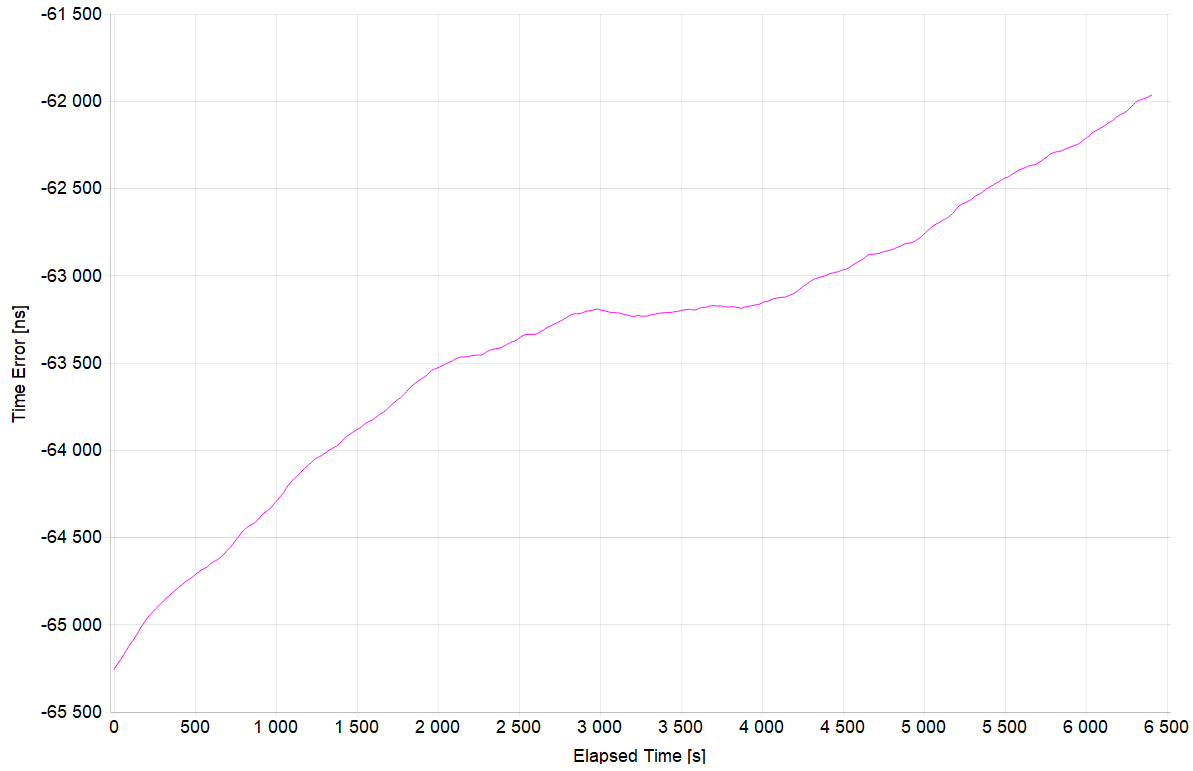
Note: Results for information only, not part of ITU-T required performance testing.

Test Description	Test Case 15 Network Traffic Model 2
Report Date	22-06-06_09-02-08
Packet Rate (pkt/s)	16
Test Duration	01:46:47
Time to Frequency Lock (s)	265

All Mask Results	**Pass**
Mask ONEPPS	-
Mask ONEPPS Result	No Mask
Mask CLKFFO	16ppb
Mask CLKFFO Result	**Pass**

8.1 ONEPPS Analysis

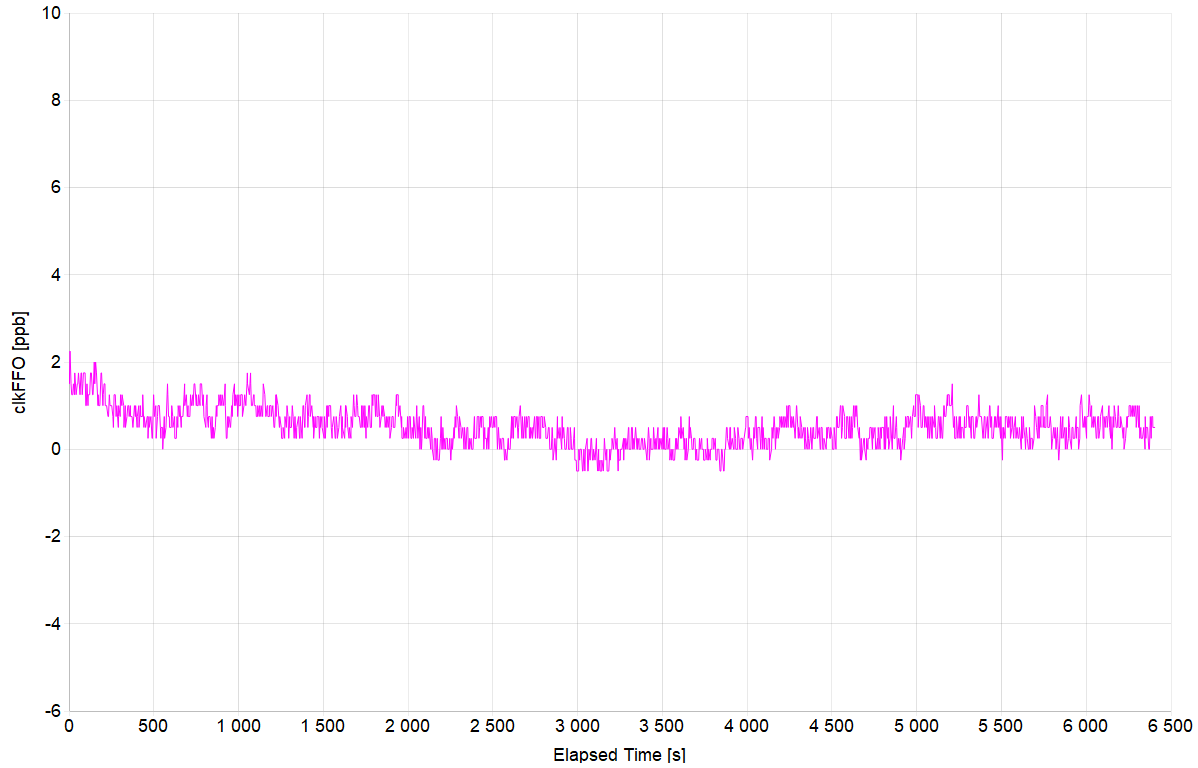
Offset Removal Applied	Off
Zero Offset	-65258.233ns



Mean [ns]	-63346.293
Min [ns]	-65258.233
Max [ns]	-61963.233
Max-Min [ns]	3295

8.2 CLKFFO Analysis

Averaging Time (s)	2



Mean [ppb]	0.514
Min [ppb]	-0.5
Max [ppb]	2.25
Max-Min [ppb]	2.75

9. G.8261: Test Case 16 Network Traffic Model 2

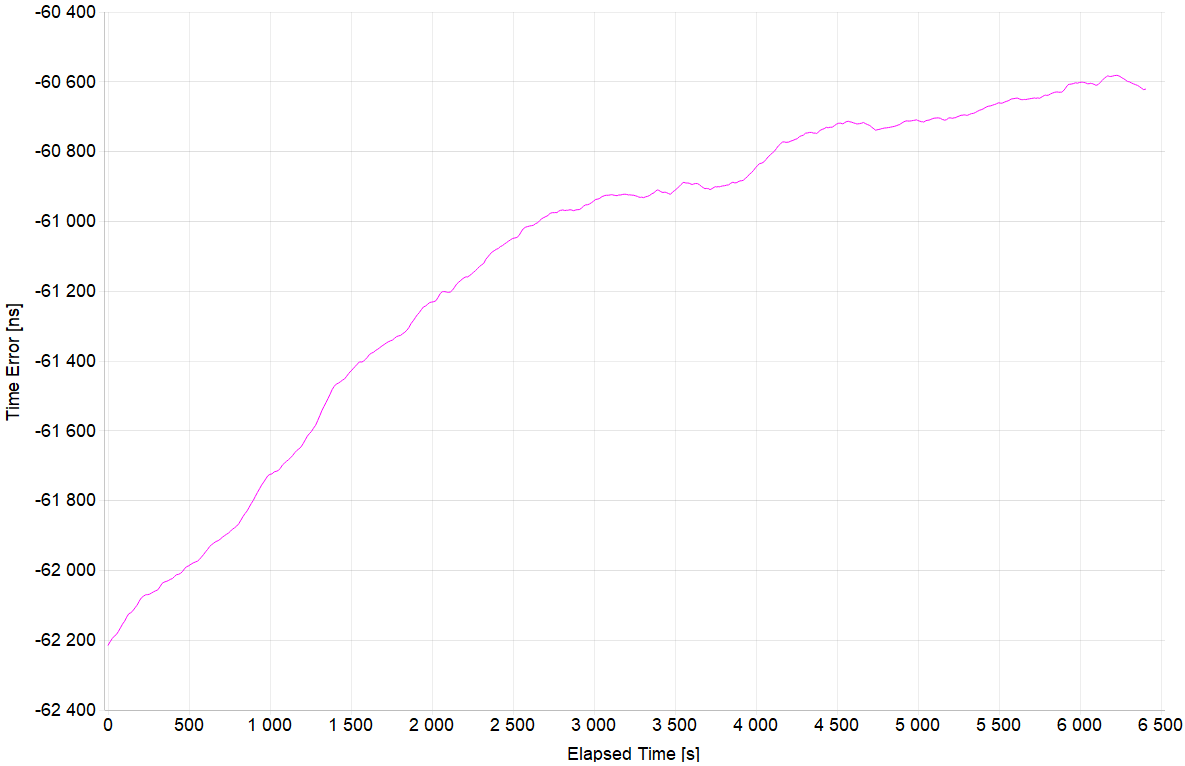
Note: Results for information only, not part of ITU-T required performance testing.

Test Description	Test Case 16 Network Traffic Model 2
Report Date	22-06-06_09-02-08
Packet Rate (pkt/s)	16
Test Duration	01:46:47
Time to Phase Lock (s)	262

All Mask Results	**Pass**
Mask ONEPPS	-
Mask ONEPPS Result	No Mask
Mask CLKFFO	16ppb
Mask CLKFFO Result	**Pass**

9.1 ONEPPS Analysis

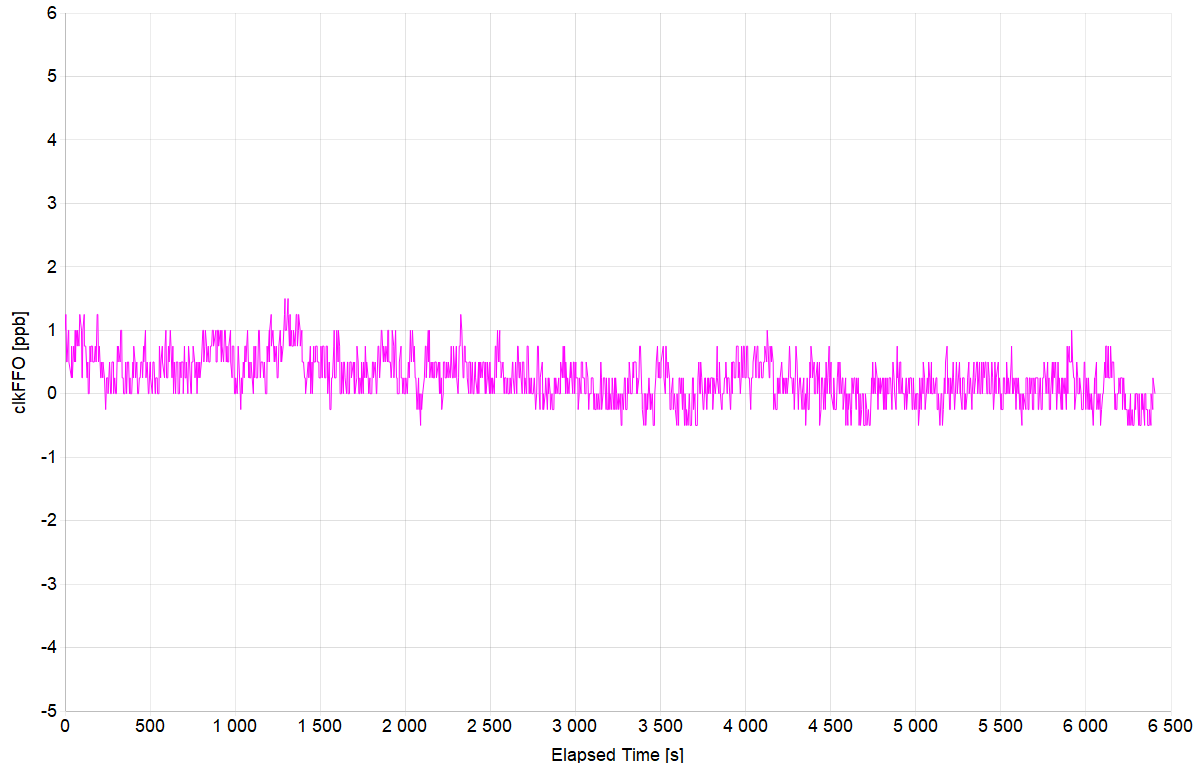
Offset Removal Applied	Off
Zero Offset	-62215.233ns



Mean [ns]	-61103.07
Min [ns]	-62215.233
Max [ns]	-60581.233
Max-Min [ns]	1634

9.2 CLKFFO Analysis

Averaging Time (s)	2



Mean [ppb]	0.249
Min [ppb]	-0.5
Max [ppb]	1.5
Max-Min [ppb]	2

10. G.8261: Test Case 17(10µs) Network Traffic Model 2

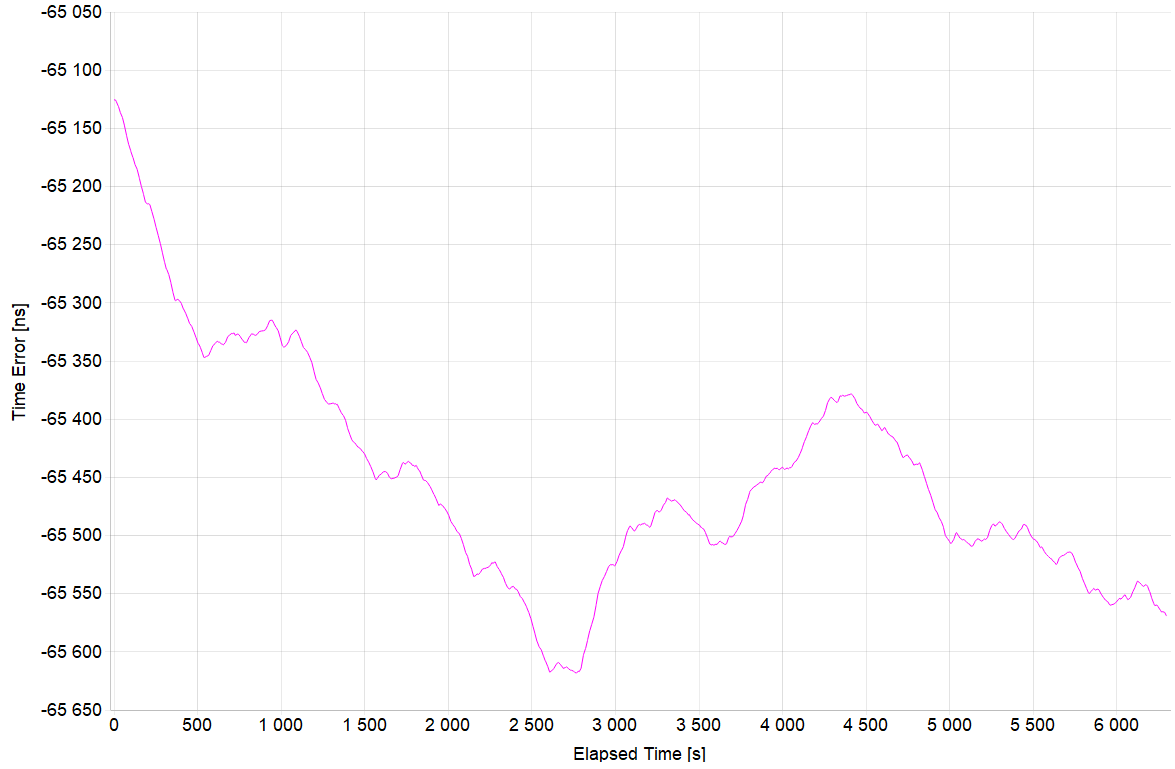
Note: Results for information only, not part of ITU-T required performance testing.

Test Description	Test Case 17(10µs) Network Traffic Model 2
Report Date	22-06-06_09-02-08
Packet Rate (pkt/s)	16
Test Duration	01:44:57
Time to Phase Lock (s)	265

All Mask Results	**Pass**
Mask ONEPPS	-
Mask ONEPPS Result	No Mask
Mask CLKFFO	16ppb
Mask CLKFFO Result	**Pass**

10.1 ONEPPS Analysis

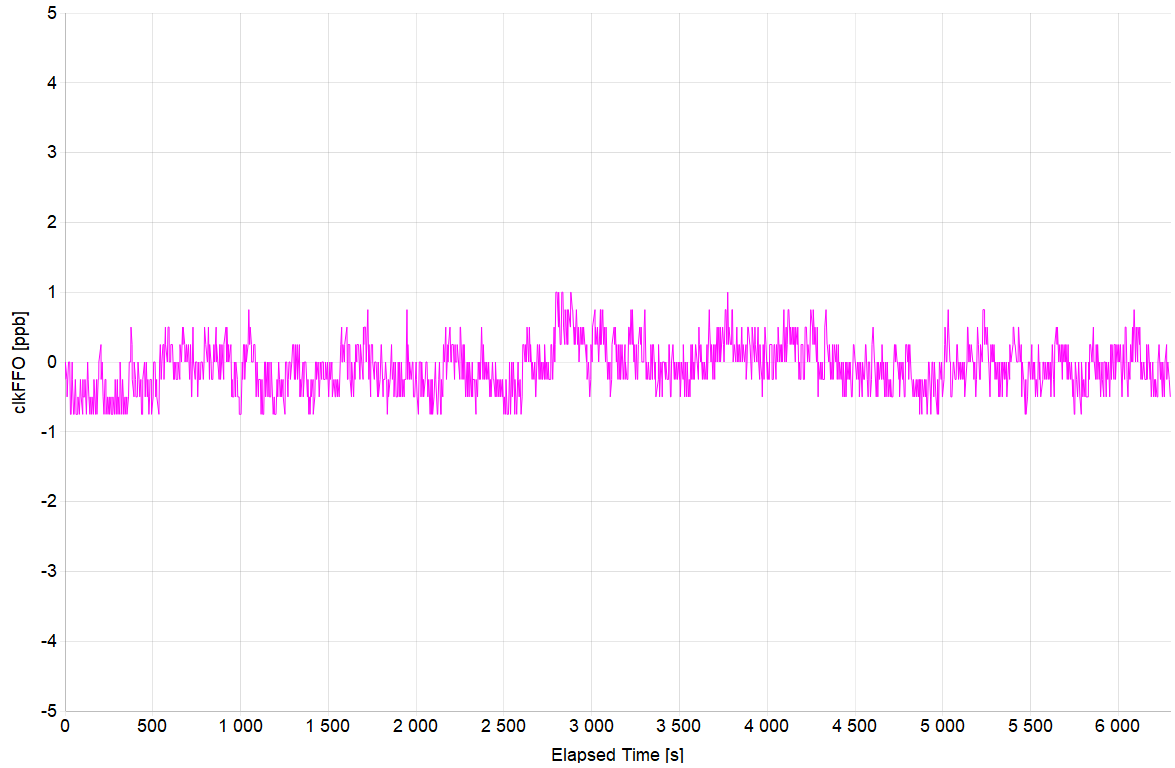
Offset Removal Applied	Off
Zero Offset	-65125.483ns



Mean [ns]	-65450.292
Min [ns]	-65618.233
Max [ns]	-65125.483
Max-Min [ns]	492.75

10.2 CLKFFO Analysis

Averaging Time (s)	2



Mean [ppb]	-0.07
Min [ppb]	-0.75
Max [ppb]	1
Max-Min [ppb]	1.75

11. G.8261: Test Case 17(200µs) Network Traffic Model 2

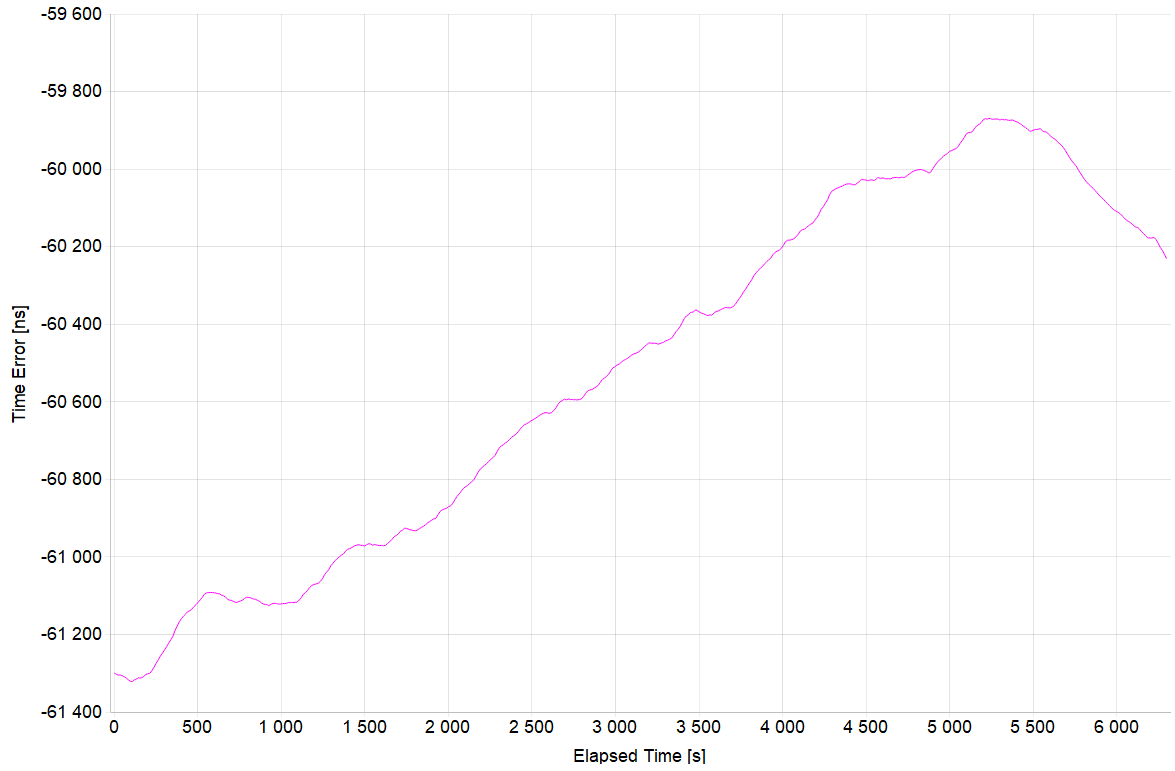
Note: Results for information only, not part of ITU-T required performance testing.

Test Description	Test Case 17(200µs) Network Traffic Model 2
Report Date	22-06-06_09-02-08
Packet Rate (pkt/s)	16
Test Duration	01:44:57
Time to Phase Lock (s)	265

All Mask Results	**Pass**
Mask ONEPPS	-
Mask ONEPPS Result	No Mask
Mask CLKFFO	16ppb
Mask CLKFFO Result	**Pass**

11.1 ONEPPS Analysis

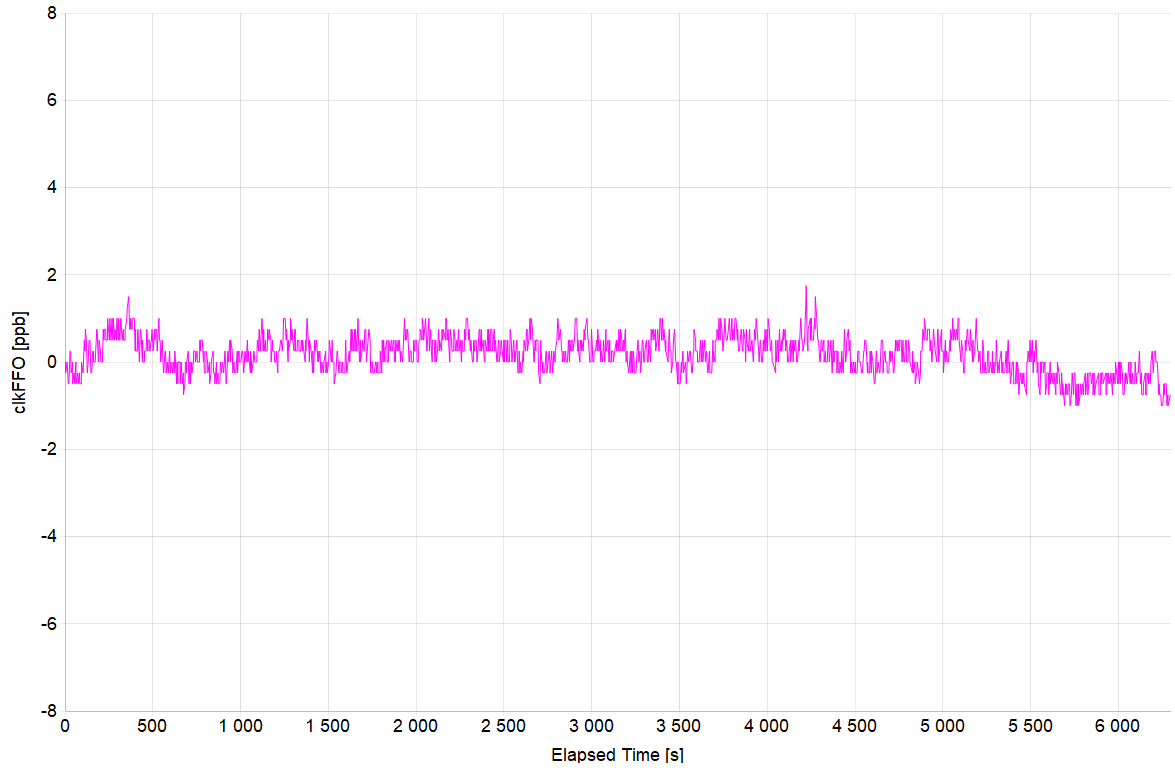
Offset Removal Applied	Off
Zero Offset	-61300.233ns



Mean [ns]	-60517.605
Min [ns]	-61321.733
Max [ns]	-59869.233
Max-Min [ns]	1452.5

11.2 CLKFFO Analysis

Averaging Time (s)	2



Mean [ppb]	0.17
Min [ppb]	-1.25
Max [ppb]	1.75
Max-Min [ppb]	3

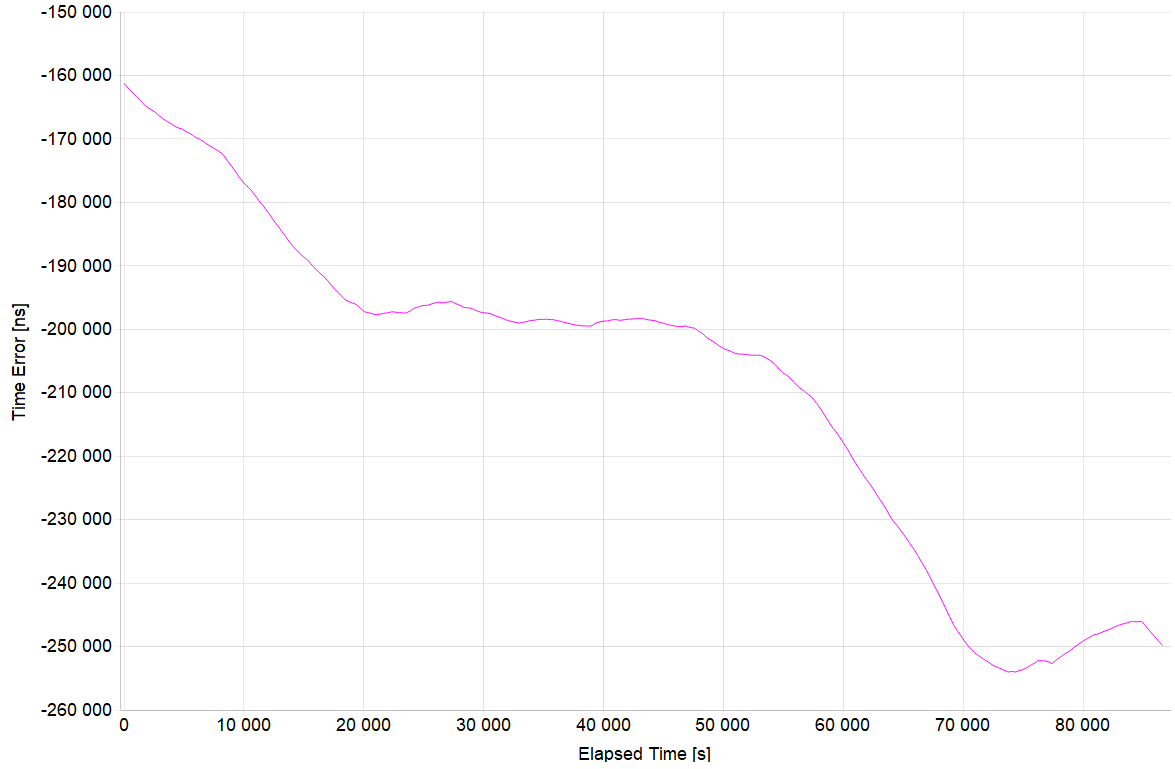
12. G.8263: Noise Tolerance - Method 1

Test Description	Noise Tolerance - Method 1
Report Date	22-06-06_15-27-12
Packet Rate (pkt/s)	16
Test Duration	24:03:43
Time to Frequency Lock (s)	311

All Mask Results	**Pass**
Mask ONEPPS	-
Mask ONEPPS Result	No Mask
Mask MTIE	G.8261.1 PEC-S-F Wander Limit Case 3
Mask MTIE Result	**Pass**
Mask CLKFFO	-
Mask CLKFFO Result	No Mask

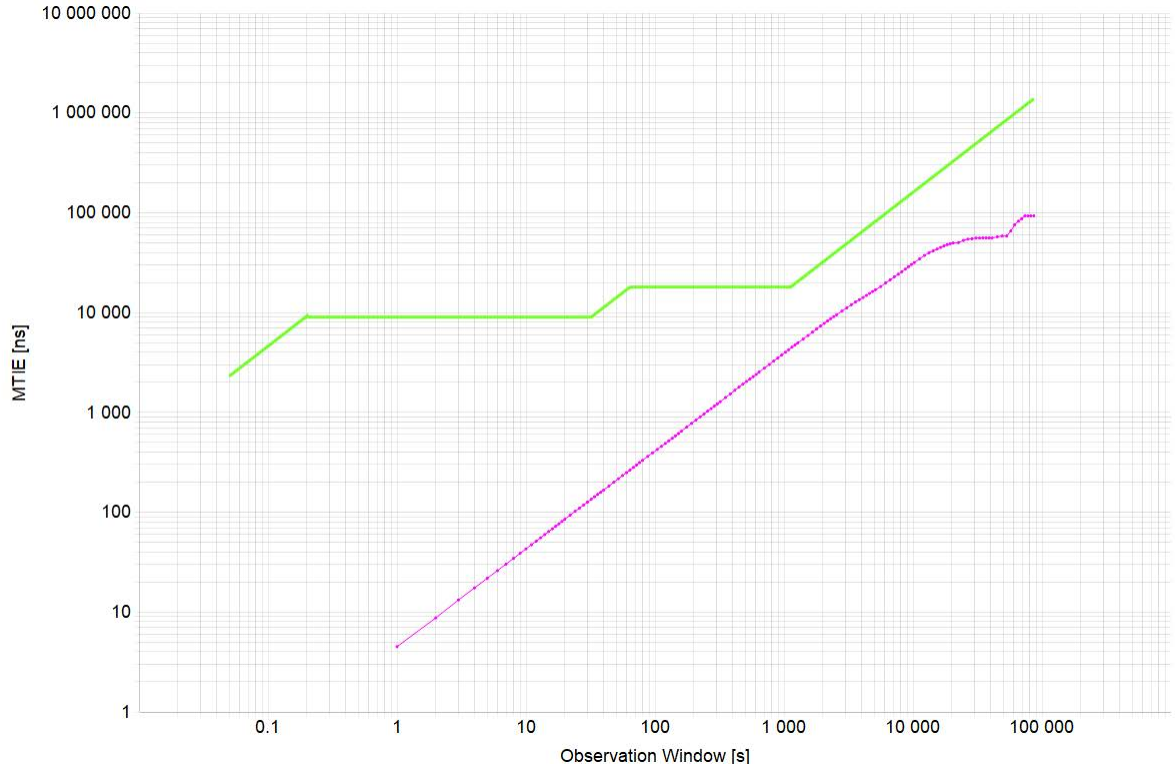
12.1 ONEPPS Analysis

Offset Removal Applied	Off
Zero Offset	-161214.483ns



Mean [ns]	-208770.37
Min [ns]	-254032.733
Max [ns]	-161214.483
Max-Min [ns]	92818.25

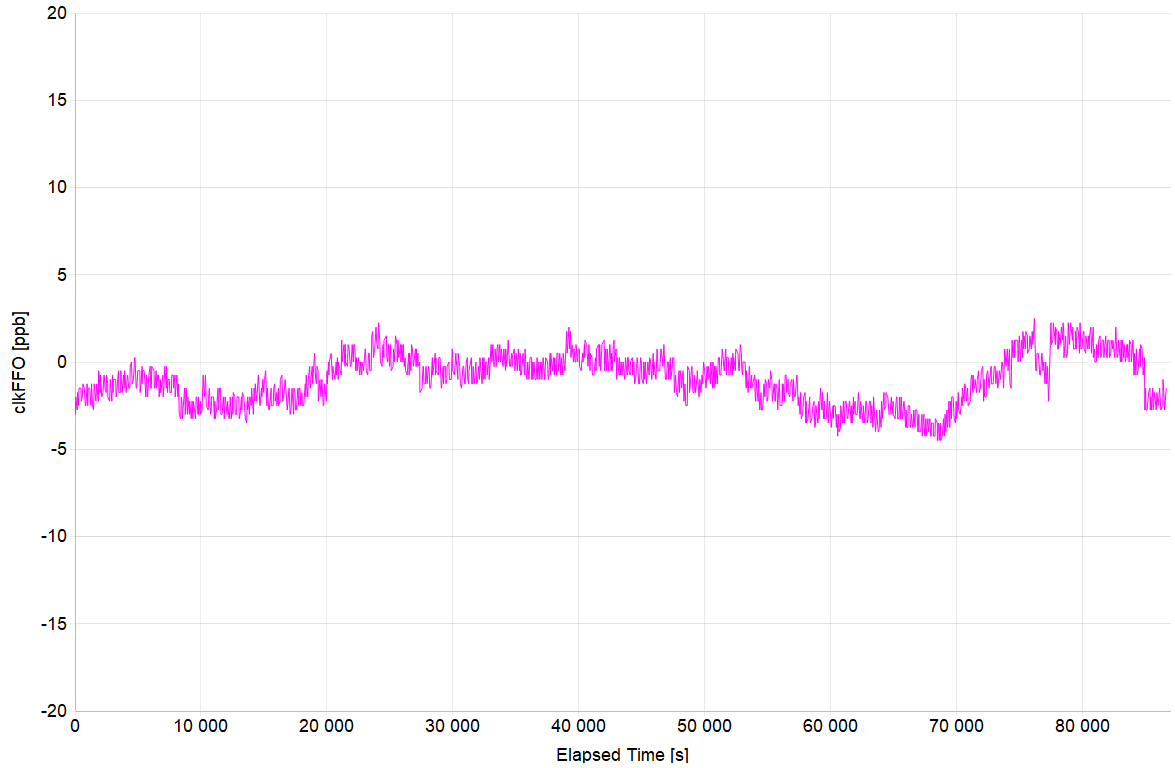
12.2 MTIE Analysis



Min [ns]	4.5
Max [ns]	92818.25
Max-Min [ns]	92813.75

12.3 CLKFFO Analysis

Averaging Time (s)	2



Mean [ppb]	-1.023
Min [ppb]	-4.5
Max [ppb]	2.5
Max-Min [ppb]	7

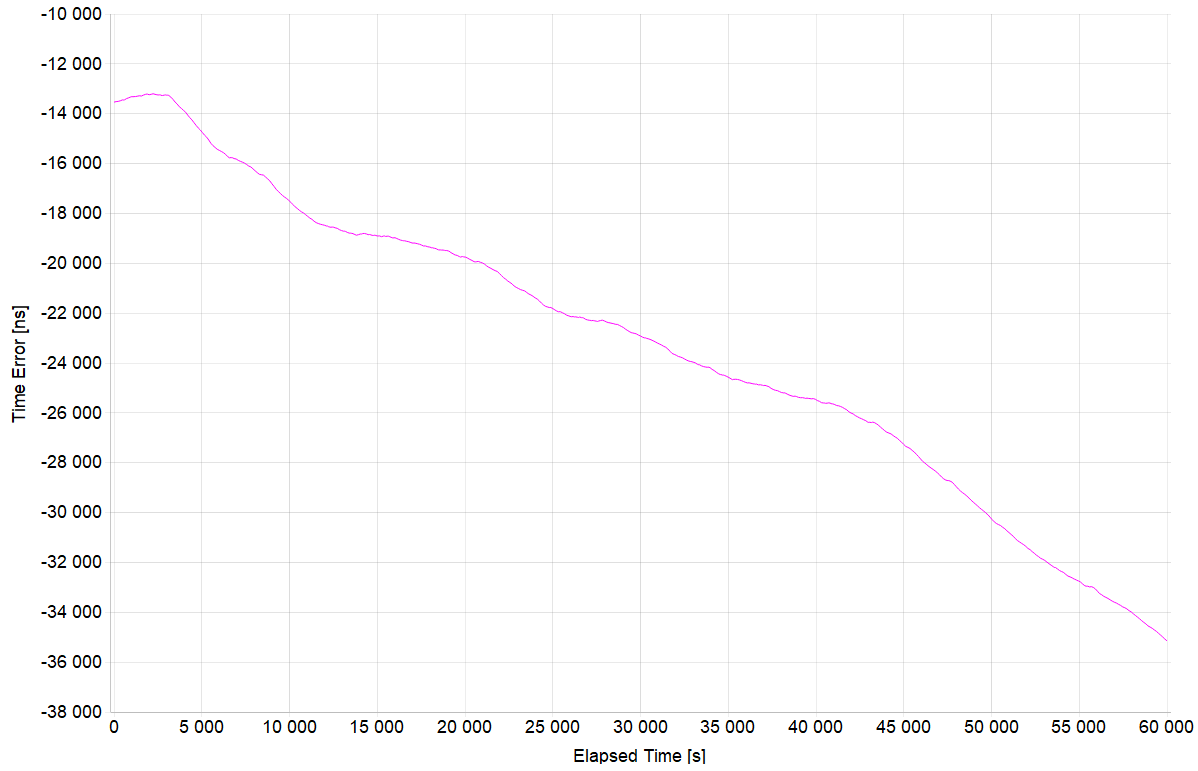
13. G.8263: Noise Tolerance - Method 2 (50µs)

Test Description	Noise Tolerance - Method 2 (50µs)
Report Date	22-06-06_11-31-25
Packet Rate (pkt/s)	16
Test Duration	16:39:57
Time to Frequency Lock (s)	72

All Mask Results	**Pass**
Mask ONEPPS	-
Mask ONEPPS Result	No Mask
Mask MTIE	G.8261.1 PEC-S-F Wander Limit Case 3
Mask MTIE Result	**Pass**

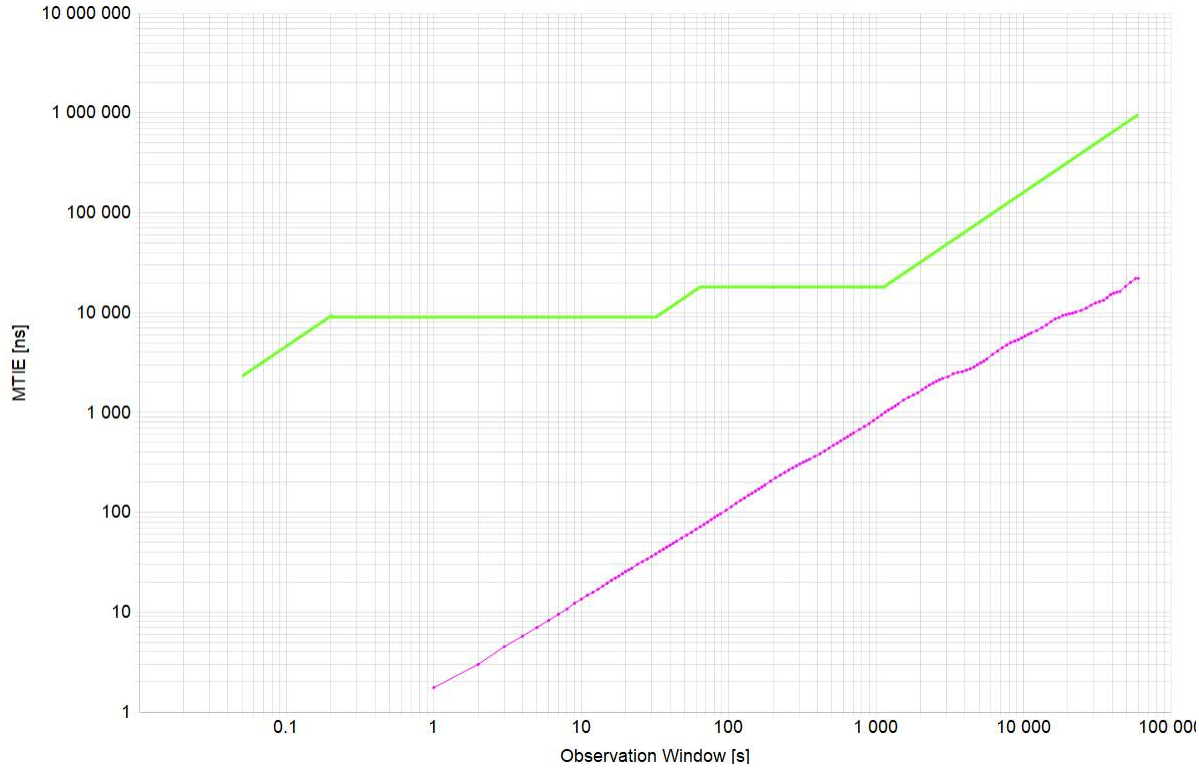
13.1 ONEPPS Analysis

Offset Removal Applied	Off
Zero Offset	-13536.233 ns



Mean [ns]	-23307.121
Min [ns]	-35143.983
Max [ns]	-13199.733
Max-Min [ns]	21944.25

13.2 MTIE Analysis



Min [ns]	1.75
Max [ns]	21944.25
Max-Min [ns]	21942.5

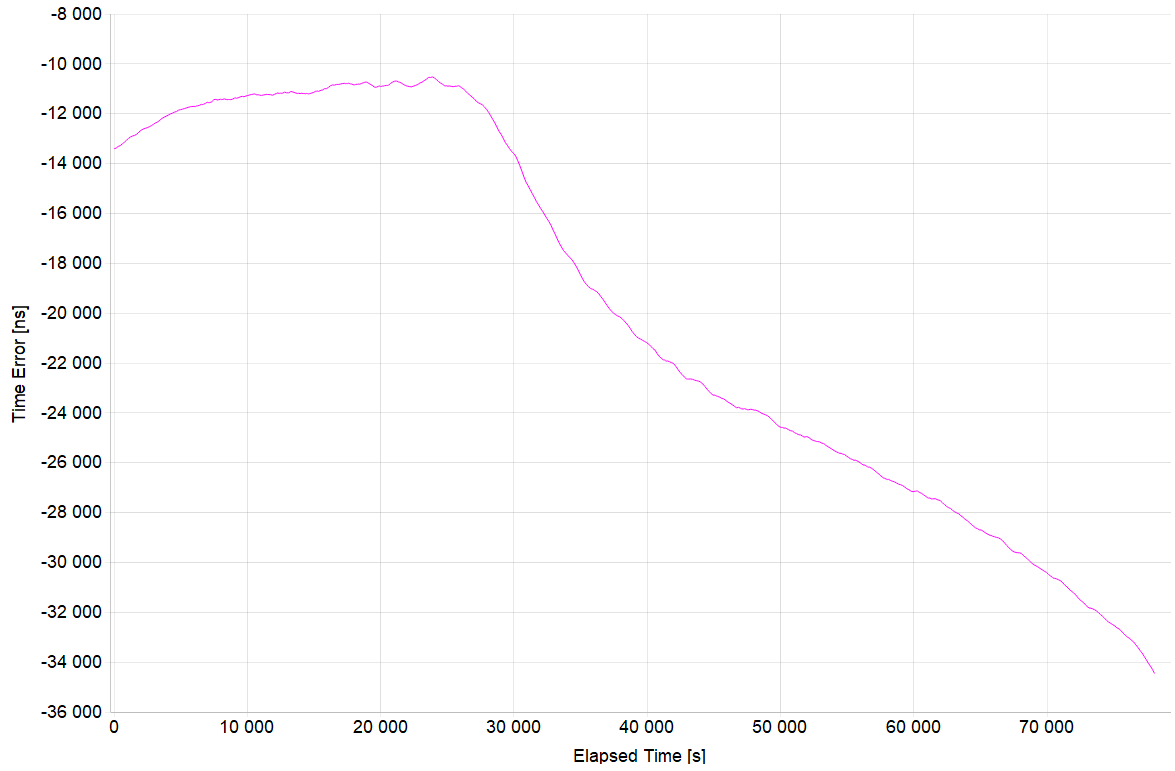
14. G.8263: Noise Tolerance - Method 2 (75µs)

Test Description	Noise Tolerance - Method 2 (75µs)
Report Date	22-06-06_11-31-25
Packet Rate (pkt/s)	16
Test Duration	21:41:05
Time to Frequency Lock (s)	70

All Mask Results	**Pass**
Mask ONEPPS	-
Mask ONEPPS Result	No Mask
Mask MTIE	G.8261.1 PEC-S-F Wander Limit Case 3
Mask MTIE Result	**Pass**

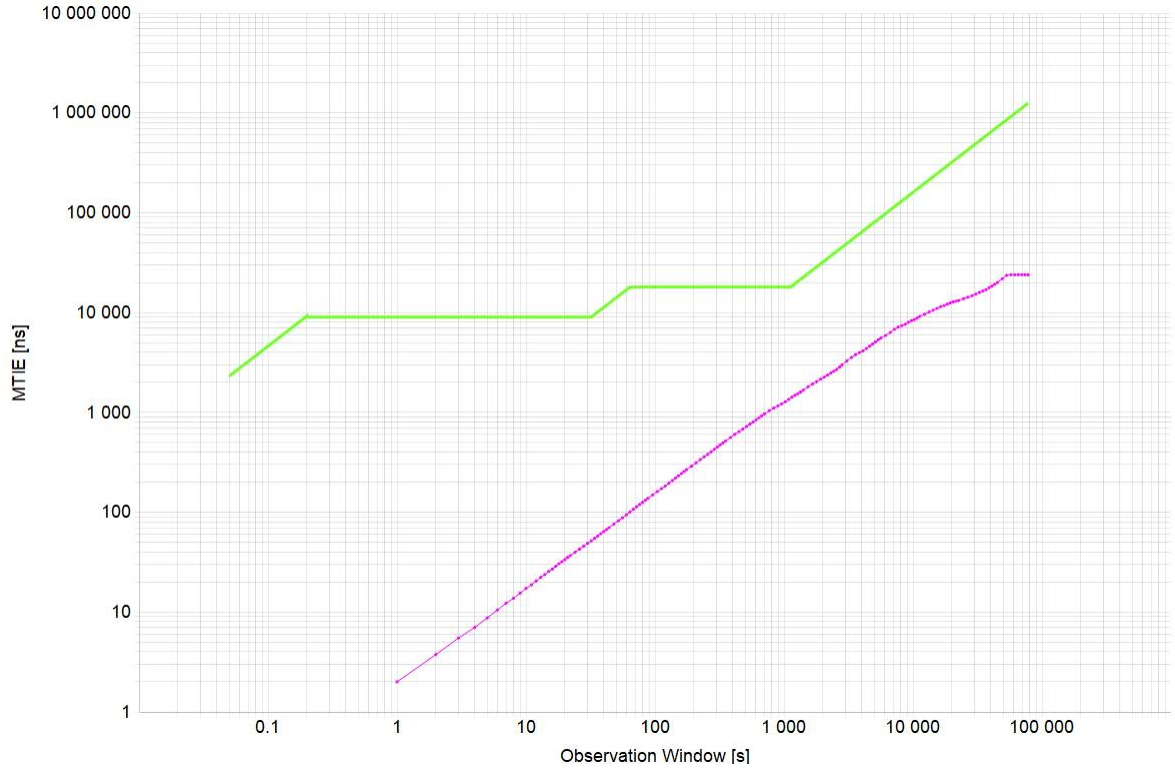
14.1 ONEPPS Analysis

Offset Removal Applied	Off
Zero Offset	-13397.483ns



Mean [ns]	-19975.532
Min [ns]	-34453.983
Max [ns]	-10525.983
Max-Min [ns]	23928

14.2 MTIE Analysis



Min [ns]	2
Max [ns]	23928
Max-Min [ns]	23926

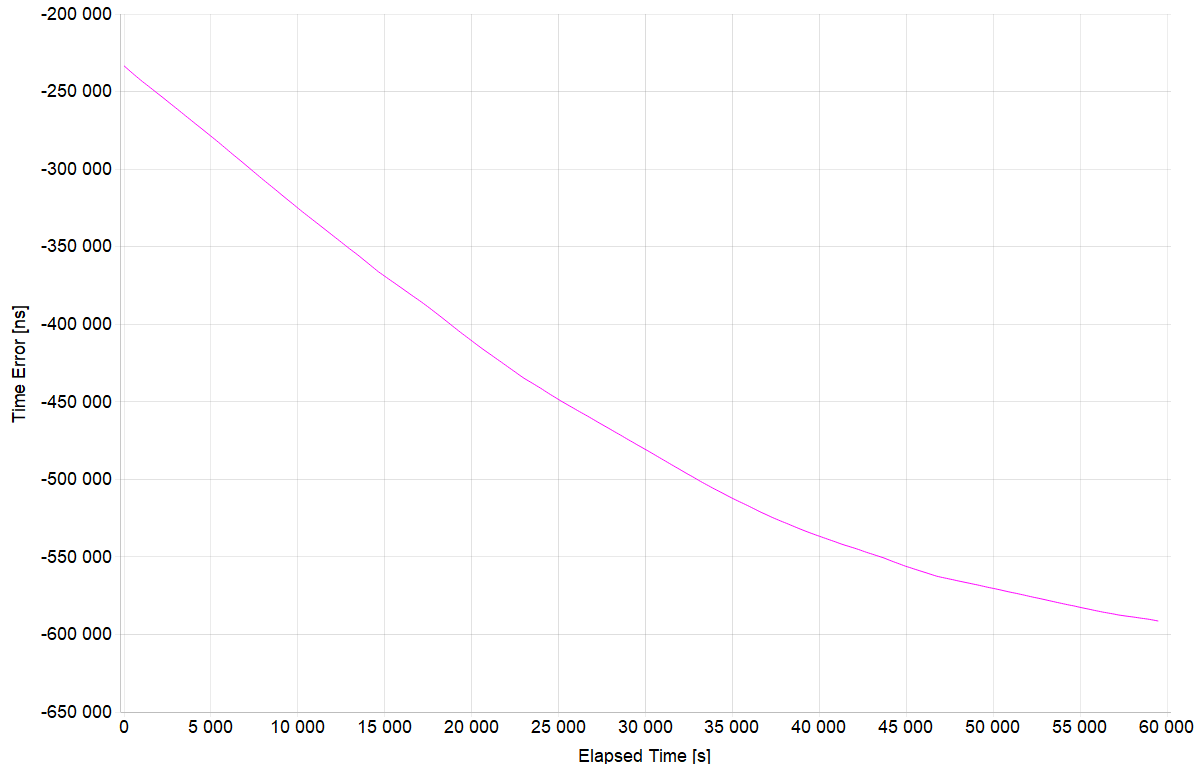
15. G.8263: Noise Tolerance - Method 2 (150µs)

Test Description	Noise Tolerance - Method 2 (150µs)
Report Date	22-06-06_11-31-25
Packet Rate (pkt/s)	16
Test Duration	16:31:37
Time to Frequency Lock (s)	799

All Mask Results	**Pass**
Mask ONEPPS	-
Mask ONEPPS Result	No Mask
Mask MTIE	G.8261.1 PEC-S-F Wander Limit Case 3
Mask MTIE Result	**Pass**

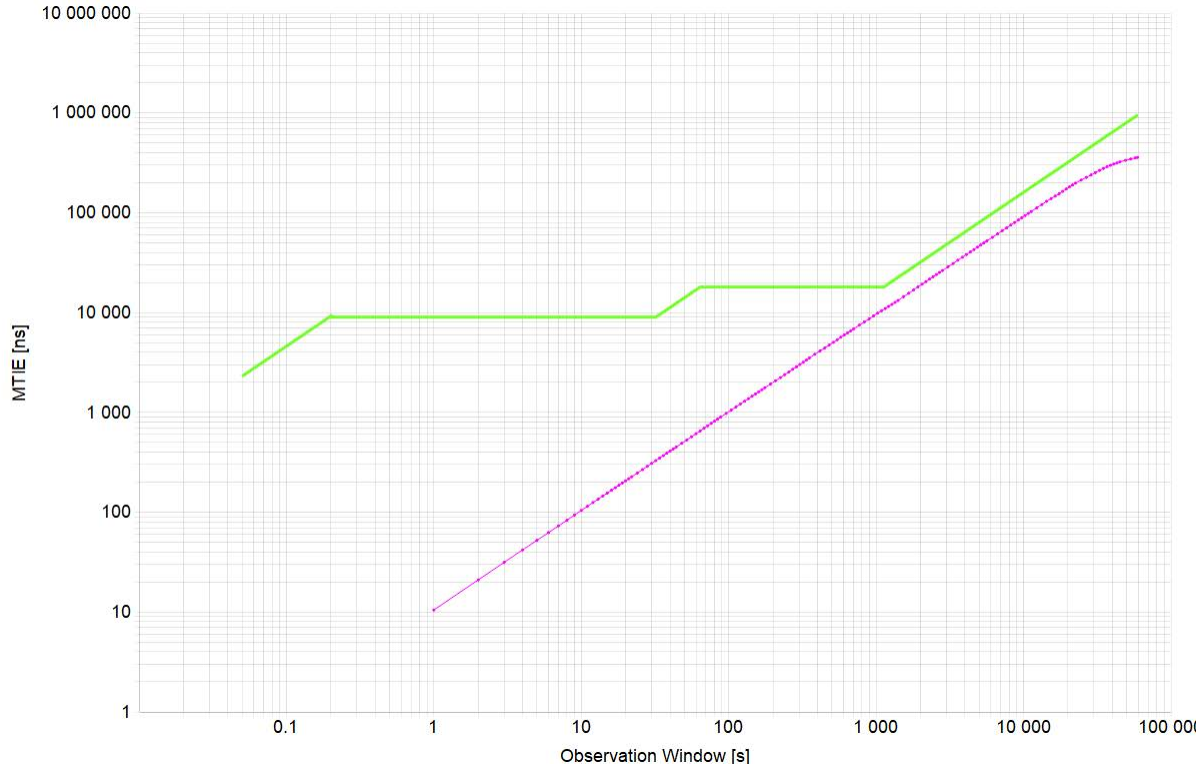
15.1 ONEPPS Analysis

Offset Removal Applied	Off
Zero Offset	-233388.733 ns



Mean [ns]	-456037.089
Min [ns]	-591349.983
Max [ns]	-233388.733
Max-Min [ns]	357961.25

15.2 MTIE Analysis



Min [ns]	10.5
Max [ns]	357963.75
Max-Min [ns]	357953.25

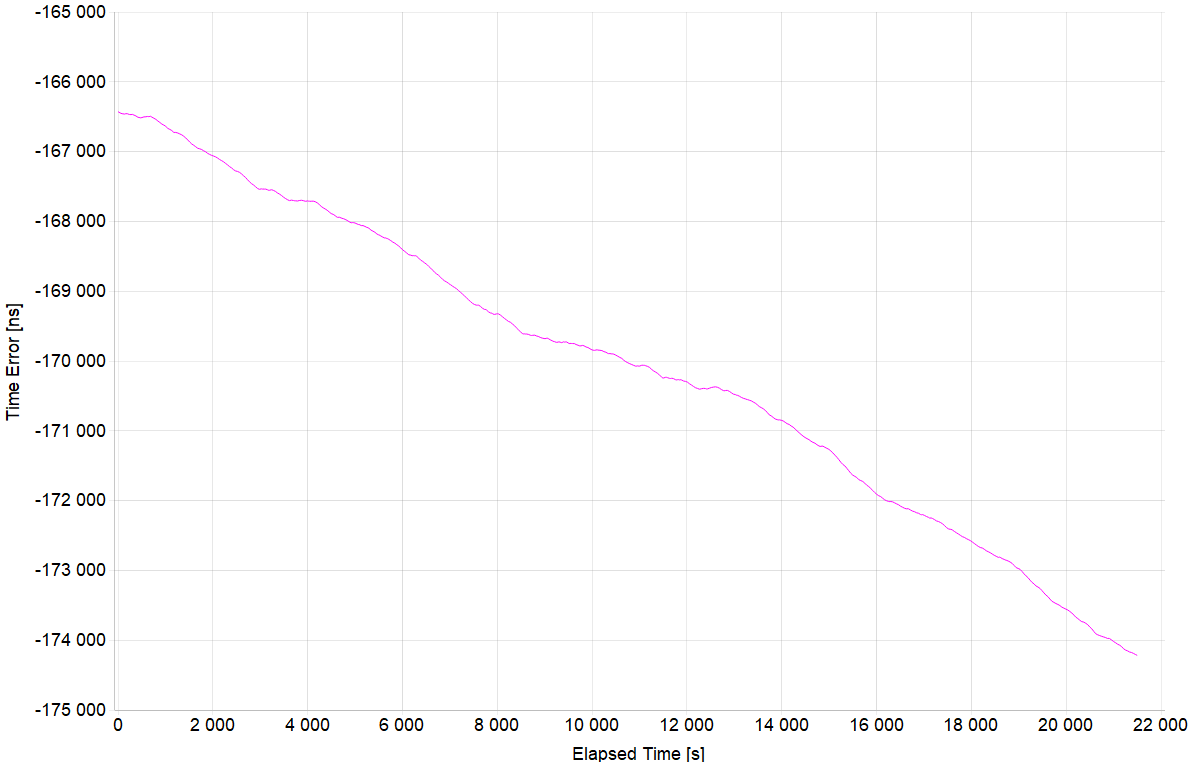
16. G.8263: Noise Tolerance - Method 3 (High Frequency)

Test Description	Noise Tolerance – Method 3 (High Frequency)
Report Date	22-06-06_11-31-25
Packet Rate (pkt/s)	16
Test Duration	05:58:17
Time to Frequency Lock (s)	689

All Mask Results	**Pass**
Mask ONEPPS	-
Mask ONEPPS Result	No Mask
Mask MTIE	G.8261.1 PEC-S-F Wander Limit Case 3
Mask MTIE Result	**Pass**

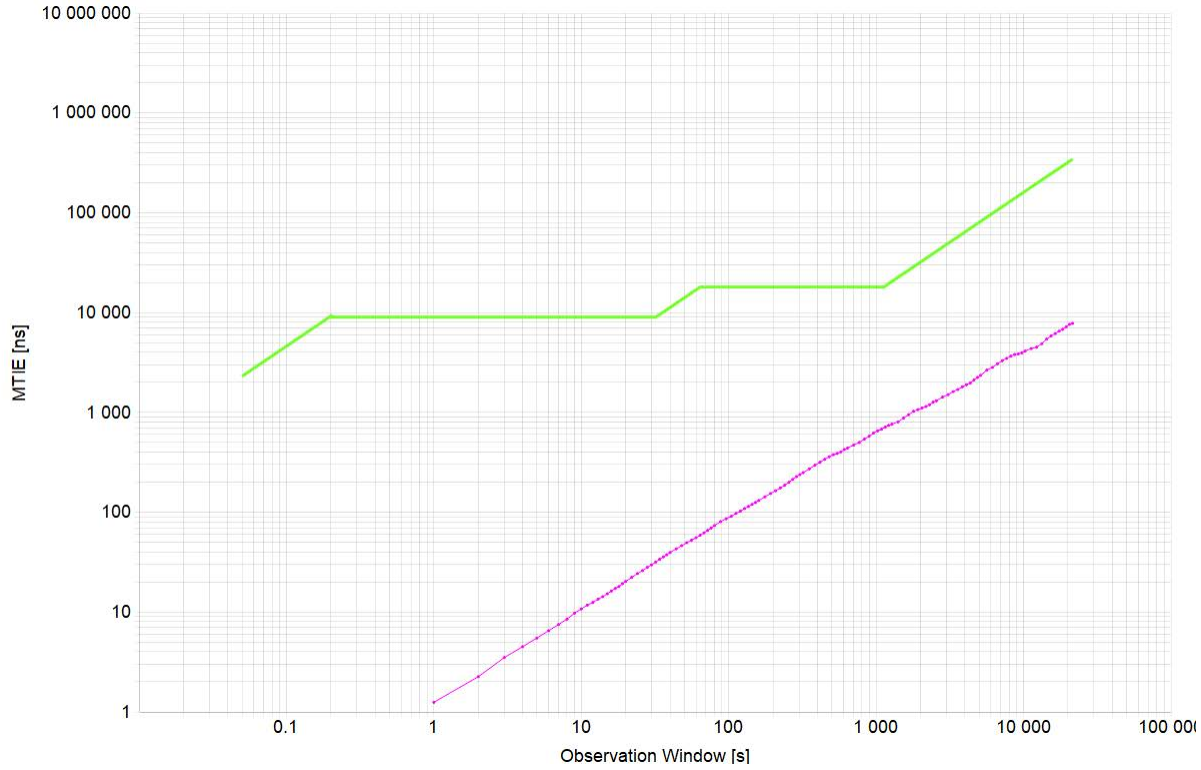
16.1 ONEPPS Analysis

Offset Removal Applied	Off
Zero Offset	-166427.733 ns



Mean [ns]	-170077.769
Min [ns]	-174216.733
Max [ns]	-166427.733
Max-Min [ns]	7789

16.2 MTIE Analysis



Min [ns]	1.25
Max [ns]	7789.25
Max-Min [ns]	7788

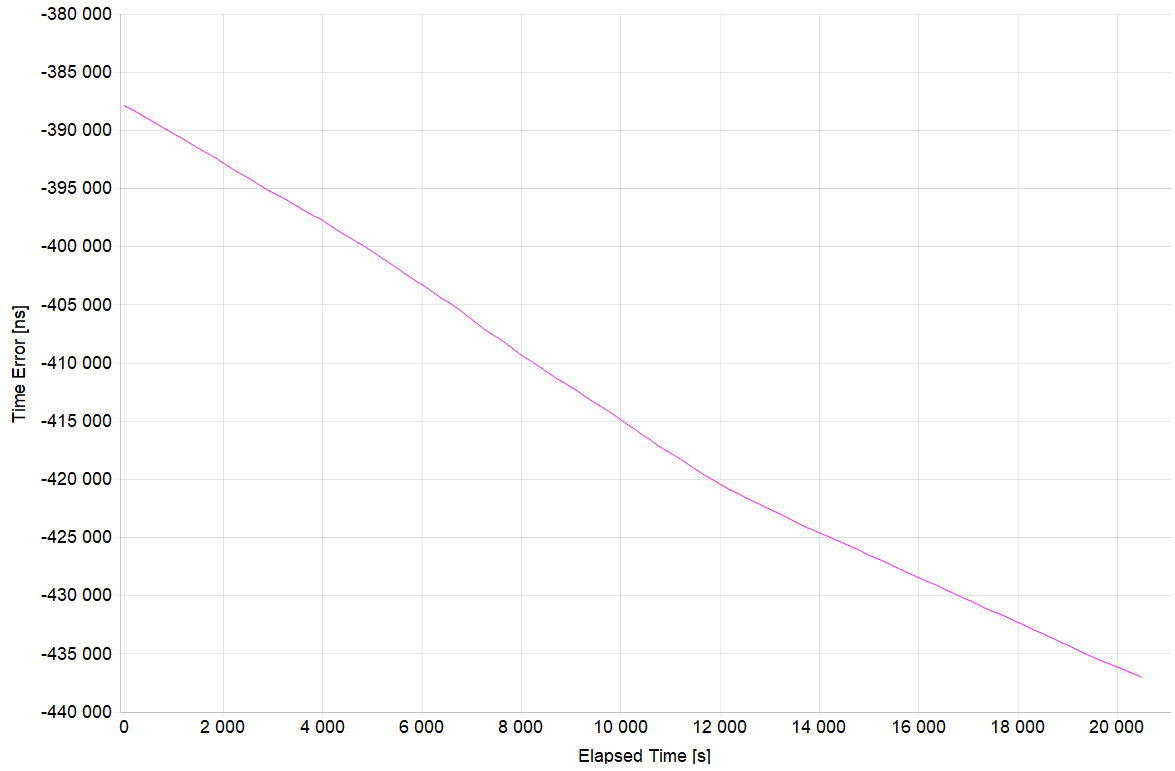
17. G.8263: Noise Tolerance - Method 3 (Low Frequency)

Test Description	Noise Tolerance – Method 3 (Low Frequency)
Report Date	22-06-06_11-31-25
Packet Rate (pkt/s)	16
Test Duration	05:41:37
Time to Frequency Lock (s)	895

All Mask Results	**Pass**
Mask ONEPPS	-
Mask ONEPPS Result	No Mask
Mask MTIE	G.8261.1 PEC-S-F Wander Limit Case 3
Mask MTIE Result	**Pass**

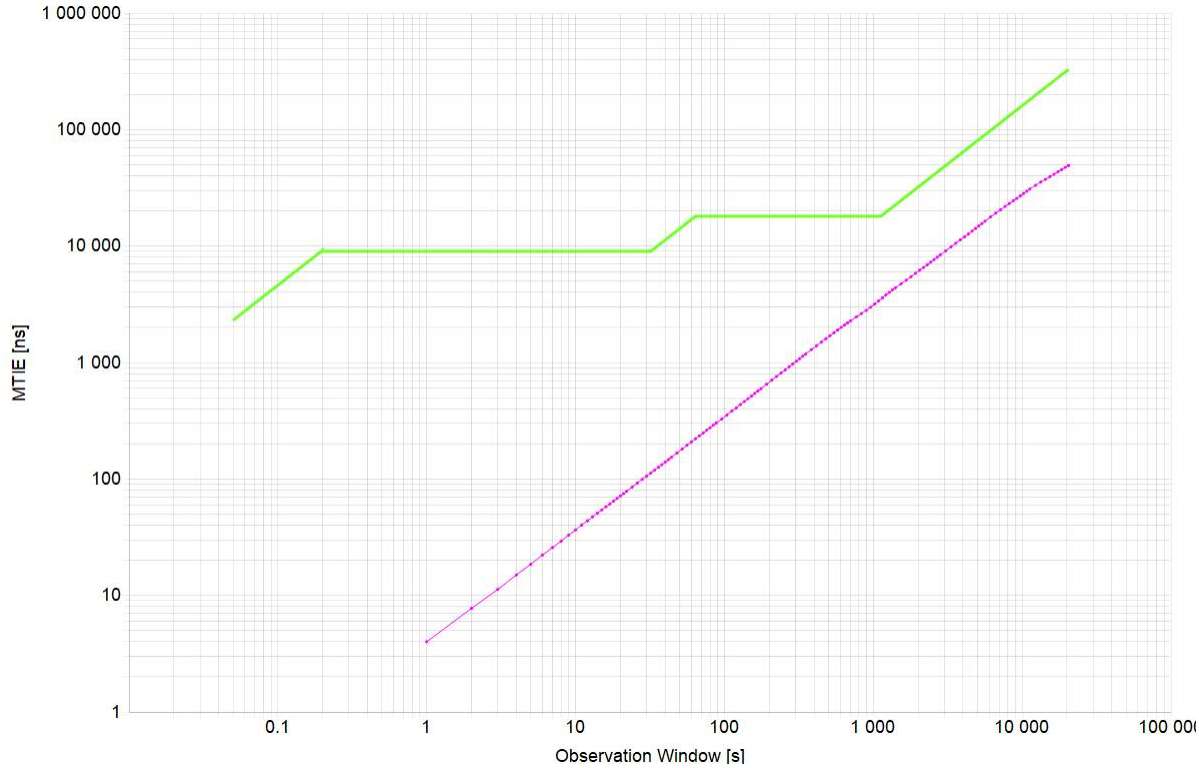
17.1 ONEPPS Analysis

Offset Removal Applied	Off
Zero Offset	-387857.483ns



Mean [ns]	-414143.482
Min [ns]	-437019.233
Max [ns]	-387857.483
Max-Min [ns]	49161.75

17.2 MTIE Analysis



Min [ns]	4
Max [ns]	49163.75
Max-Min [ns]	49159.75

18. Revision History

Revision	Date	Description
1.00	May 5, 2023	Initial release.

IMPORTANT NOTICE AND DISCLAIMER

RENESAS ELECTRONICS CORPORATION AND ITS SUBSIDIARIES (“RENESAS”) PROVIDES TECHNICAL SPECIFICATIONS AND RELIABILITY DATA (INCLUDING DATASHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES “AS IS” AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT OF THIRD-PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for developers who are designing with Renesas products. You are solely responsible for (1) selecting the appropriate products for your application, (2) designing, validating, and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, or other requirements. These resources are subject to change without notice. Renesas grants you permission to use these resources only to develop an application that uses Renesas products. Other reproduction or use of these resources is strictly prohibited. No license is granted to any other Renesas intellectual property or to any third-party intellectual property. Renesas disclaims responsibility for, and you will fully indemnify Renesas and its representatives against, any claims, damages, costs, losses, or liabilities arising from your use of these resources. Renesas' products are provided only subject to Renesas' Terms and Conditions of Sale or other applicable terms agreed to in writing. No use of any Renesas resources expands or otherwise alters any applicable warranties or warranty disclaimers for these products.

(Disclaimer Rev.1.01 Jan 2024)

Corporate Headquarters

TOYOSU FORESIA, 3-2-24 Toyosu,
Koto-ku, Tokyo 135-0061, Japan
www.renesas.com

Contact Information

For further information on a product, technology, the most up-to-date version of a document, or your nearest sales office, please visit www.renesas.com/contact-us/.

Trademarks

Renesas and the Renesas logo are trademarks of Renesas Electronics Corporation. All trademarks and registered trademarks are the property of their respective owners.