

RF EXPOSURE REPORT



Applicant: Telit Communications S.p.A.
Via Stazione di Prosecco 5/b 34010 Sgonico - Trieste

Product Name: LN920A12-WW / LN920A6-WW

Brand Name: Telit

Model No.: LN920A12-WW / LN920A6-WW

Model Difference: 1. Internal Component is different between two model.
2. Capability is different between two model.

Report Number: ER/2021/A0031

FCC ID RI7LN920

IC: 5131A-LN920

Issue Date: February 16, 2022

Date of EUT Received: October 6, 2021

Approved By

John Yeh

We hereby certify that:

The above equipment was evaluate by SGS Taiwan Ltd. The evaluation in this report is in compliance with FCC Rule Part §2.1091 and RSS-102.

The results of this report relate only to the sample identified in this report.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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Revision History

Report Number	Revision	Description	Issue Date	Revised By	Remark
ER/2021/A0031	00	Original.	February 16, 2022	Susan Lin	

Note:

- 1、The remark "*" indicates modification of the report upon requests from certification body.
- 2、Variant information of model numbers is provided by the applicant, test results of this report are applicable to the sample EUT(s) received and are assessed as identical in hardware and firmware to each other.

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1 DESCRIPTION OF EQUIPMENT UNDER TEST (EUT)

1.1 Product Description

Product Name:	LN920A12-WW / LN920A6-WW
Brand Name:	Telit
Model No.:	LN920A12-WW / LN920A6-WW
Model Difference:	1. Internal Component is different between two model. 2. Capability is different between two model.
Hardware Version:	1.0
Firmware Version:	LN920A12-WW: M0L.000001 / LN920A6-WW : M0L.010001
EUT Series No.:	35417570001280
Power Supply:	3.3Vdc

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1.2 Antenna Information:

1.2.1 WWAN

Antenna Type	Antenna Part No.
Monopole	TG.55.8113 (Ant0)
Dipole	WE14-S3-2 (Ant1)

Operating Frequency (MHz)		Ant 0 Peak Gain (dBi)	Ant 1 Peak Gain (dBi)
WCDMA / HSPA Band II	1850 ~ 1910	3.05	N/A
WCDMA / HSPA Band IV	1710 ~ 1753	3.40	N/A
WCDMA / HSPA Band V	824 ~ 849	3.20	N/A
LTE-Band 2	1850 ~ 1910	3.05	N/A
LTE-Band 4	1710 ~ 1755	3.40	N/A
LTE-Band 5	824 ~ 849	3.20	N/A
LTE-Band 7	2500 ~ 2570	3.12	N/A
LTE-Band 12	699 ~ 716	2.51	N/A
LTE-Band 13	777 ~ 787	2.51	N/A
LTE-Band 14	788 ~ 798	2.51	N/A
LTE-Band 17	704 ~ 716	2.51	N/A
LTE-Band 25	1850 ~ 1915	3.05	N/A
LTE-Band 26	824 ~ 849	2.51	N/A
LTE-Band 26 Part 90	814 ~ 824	3.20	N/A
LTE-Band 30	2305 ~ 2315	3.12	N/A
LTE-Band 38	2570 ~ 2620	3.12	N/A
LTE-Band 41	2496 ~ 2690	3.12	N/A
LTE-Band 41(HPUE)	2496 ~ 2690	3.12	N/A
LTE-Band 48	3550 ~ 3700	N/A	1.00
LTE-Band 66	1710 ~ 1780	3.40	N/A
LTE-Band 71	663 ~ 698	1.26	N/A

Note: Antenna information is provided by the applicant.

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1.3 Rated Power

1.3.1 WWAN:

Operating Frequency (MHz)		Max. Output Power (dBm)	Antenna Gain (dBi)	EIRP / ERP (dBm)	FCC					ISED			
					Operation Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)	Density / Limit	FCC Worst Case	Power Density (W/m ²)	Limit (W/m ²)	Density / Limit	IC Worst Case
WCDMA / HSPA Band II	1850 ~ 1910	24.50	3.05	27.55	20	0.11	1.00	0.11		1.13	4.48	0.25	
WCDMA / HSPA Band IV	1710 ~ 1753	24.50	3.40	27.90	20	0.12	1.00	0.12		1.23	4.24	0.29	
WCDMA / HSPA Band V	824 ~ 849	24.50	3.20	27.70	20	0.12	0.55	0.22	V	1.17	2.58	0.45	V
LTE-Band 2	1850 ~ 1910	23.50	3.05	26.55	20	0.09	1.00	0.09		0.90	4.48	0.20	
LTE-Band 4	1710 ~ 1755	23.50	3.40	26.90	20	0.10	1.00	0.10		0.97	4.24	0.23	
LTE-Band 5	824 ~ 849	23.50	3.20	26.70	20	0.09	0.55	0.16		0.93	2.58	0.36	
LTE-Band 7	2500 ~ 2570	23.50	3.12	26.62	20	0.09	1.00	0.09		0.91	5.50	0.17	
LTE-Band 12	699 ~ 716	23.50	2.51	26.01	20	0.08	0.47	0.17		0.79	2.30	0.34	
LTE-Band 13	777 ~ 787	23.50	2.51	26.01	20	0.08	0.52	0.15		0.79	2.47	0.32	
LTE-Band 14	788 ~ 798	23.50	2.51	26.01	20	0.08	0.53	0.15		0.79	2.50	0.32	
LTE-Band 17	704 ~ 716	23.50	2.51	26.01	20	0.08	0.47	0.17		0.79	2.31	0.34	
LTE-Band 25	1850 ~ 1915	23.50	3.05	26.55	20	0.09	1.00	0.09		0.90	4.48	0.20	
LTE-Band 26	824 ~ 849	23.50	2.51	26.01	20	0.08	0.55	0.15		0.79	2.58	0.31	
LTE-Band 26 Part 90	814 ~ 824	23.50	3.20	26.70	20	0.09	0.54	0.17		0.93	2.55	0.36	
LTE-Band 30	2305 ~ 2315	23.00	3.12	26.12	20	0.08	1.00	0.08		0.81	5.20	0.16	
LTE-Band 38	2570 ~ 2620	23.50	3.12	26.62	20	0.09	1.00	0.09		0.91	5.60	0.16	
LTE-Band 41	2496 ~ 2690	23.50	3.12	26.62	20	0.09	1.00	0.09		0.91	5.49	0.17	
LTE-Band 41(HPUE)	2496 ~ 2690	26.50	3.12	29.62	20	0.18	1.00	0.18		1.82	5.49	0.33	
LTE-Band 48	3550 ~ 3700	22.00	1.00	23.00	20	0.04	1.00	0.04		0.40	6.99	0.06	
LTE-Band 66	1710 ~ 1780	23.50	3.40	26.90	20	0.10	1.00	0.10		0.97	4.24	0.23	
LTE-Band 71	663 ~ 698	23.50	1.26	24.76	20	0.06	0.44	0.14		0.60	2.22	0.27	
LTE-Band 5C	824 ~ 849	24.00	3.20	27.20	20	0.10	0.55	0.18		1.04	2.58	0.40	
LTE-Band 7C	2500 ~ 2570	24.00	3.12	27.12	20	0.10	1.00	0.10		1.03	5.50	0.19	
LTE-Band 38C	2570 ~ 2620	23.50	3.12	26.62	20	0.09	1.00	0.09		0.91	5.60	0.16	
LTE-Band 41C	2496 ~ 2690	24.00	3.12	27.12	20	0.10	1.00	0.10		1.03	5.49	0.19	

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2 MAXIMUM PERMISSIBLE EXPOSURE (MPE)

2.1 FCC Standard Applicable

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

This is a Mobile device, the MPE is required.

According to §1.1310 and §2.1091 RF exposure is calculated.

Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f ²)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100000	/	/	1.0	30

f = frequency in MHz

* = Plane-wave equipment power density

Prediction of MPE limit at a given distance

$$S = PG / 4\pi R^2$$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

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2.2 ISED Standard Applicable

This submittal(s) (test report) is intended to comply with RSS-102 issue 5 Radio frequency Radiation Exposure requirement.

This is a Mobile device, the MPE is required.

Limits for Maximum Permissible Exposure (MPE)

RF Field Strength Limits for Devices Used by the General Public (Uncontrolled Environment)				
Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field Strength (A/m rms)	Power Density (W/m ²)	Reference Period (minutes)
0.003-10	83	90	-	Instantaneous*
0.1-10	-	$0.73/f$	-	6**
1.1-10	$87/f^{0.5}$	-	-	6**
10-20	27.46	0.0728	2	6
20-48	$58.07/f^{0.25}$	$0.1540/f^{0.25}$	$8.944/f^{0.5}$	6
48-300	22.06	0.05852	1.291	6
300-6000	$3.142 f^{0.3417}$	$0.008335 f^{0.3417}$	$0.02619 f^{0.6834}$	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	$616000/f^{1.2}$
150000-300000	$0.158 f^{0.5}$	$4.21 \times 10^{-4} f^{0.5}$	$6.67 \times 10^{-5} f$	$616000/f^{1.2}$

F = frequency in MHz

* = Based on nerve stimulation (NS).

** = Based on specific absorption rate (SAR)

Maximum Permissible Exposure (MPE) Evaluation

Prediction of MPE limit at a given distance

$$S = PG/4\pi R^2$$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

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2.3 Power Density Calculation (Worst Case)

FCC Standalone MPE

Operation Mode	Evaluation Frequency (MHz)	Operation Distance (cm)	Max. Output Power Include Tolerance (dBm)	Antenna Gain (dBi)	Max. EIRP (mW)	Power Density (PD) (mW/cm ²)	Limit (mW/cm ²)	Pass / Fail	Power Density / Limit
WCDMA / HSPA Band 2	1852.40	20	24.5	3.05	568.85	0.113	1.000	Pass	0.113
WCDMA / HSPA Band 4	1712.40	20	24.5	3.40	616.60	0.123	1.000	Pass	0.123
WCDMA / HSPA Band 5	826.40	20	24.5	3.20	588.84	0.117	0.551	Pass	0.212
LTE-Band 2	1850.70	20	23.5	3.05	451.86	0.090	1.000	Pass	0.090
LTE-Band 4	1710.70	20	23.5	3.40	489.78	0.097	1.000	Pass	0.097
LTE-Band 5	824.70	20	23.5	3.20	467.74	0.093	0.550	Pass	0.169
LTE-Band 7	2502.50	20	23.5	3.12	459.20	0.091	1.000	Pass	0.091
LTE-Band 12	699.70	20	23.5	2.51	399.02	0.079	0.466	Pass	0.170
LTE-Band 13	779.50	20	23.5	2.51	399.02	0.079	0.520	Pass	0.152
LTE-Band 14	788.00	20	23.5	2.51	399.02	0.079	0.525	Pass	0.150
LTE-Band 17	706.50	20	23.5	2.51	399.02	0.079	0.471	Pass	0.168
LTE-Band 25	1850.70	20	23.5	3.05	451.86	0.090	1.000	Pass	0.090
LTE-Band 26	824.70	20	23.5	2.51	399.02	0.079	0.550	Pass	0.144
LTE-Band 26 Part 90	814.70	20	23.5	3.20	467.74	0.093	0.543	Pass	0.171
LTE-Band 30	2307.50	20	23.5	3.12	459.20	0.091	1.000	Pass	0.091
LTE-Band 38	2572.50	20	23.5	3.12	459.20	0.091	1.000	Pass	0.091
LTE-Band 41	2498.50	20	23.5	3.12	459.20	0.091	1.000	Pass	0.091
LTE-Band 41(HPUE)	2498.50	20	26.5	3.12	916.22	0.182	1.000	Pass	0.182
LTE-Band 48	3550.00	20	22	1.00	199.53	0.040	1.000	Pass	0.040
LTE-Band 66	1710.70	20	23.5	3.40	489.78	0.097	1.000	Pass	0.097
LTE-Band 71	665.50	20	23.5	1.26	299.23	0.060	0.444	Pass	0.135
LTE-Band 5C	824.7	20	24.0	3.20	524.81	0.104	0.550	Pass	0.189
LTE-Band 7C	2502.5	20	24.0	3.12	515.23	0.103	1.000	Pass	0.103
LTE-Band 38C	2572.5	20	23.5	3.12	459.20	0.091	1.000	Pass	0.091
LTE-Band 41C	2498.5	20	24.0	3.12	515.23	0.103	1.000	Pass	0.103

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ISED Standalone MPE

Operation Mode	Evaluation Frequency (MHz)	Operation Distance (cm)	Max. Output Power Include Tolerance (dBm)	Antenna Gain (dBi)	Max. EIRP (mW)	Power Density (PD) (W/m ²)	Limit (W/m ²)	Pass / Fail	Power Density / Limit
WWAN	1712.40	20	24.5	3.40	616.60	1.227	4.246	Pass	0.289
LTE-Band 2	1850.70	20	23.5	3.05	451.86	0.899	4.477	Pass	0.201
LTE-Band 4	1710.70	20	23.5	3.40	489.78	0.975	4.243	Pass	0.230
LTE-Band 5	824.70	20	23.5	3.20	467.74	0.931	2.577	Pass	0.361
LTE-Band 7	2502.50	20	23.5	3.12	459.20	0.914	5.503	Pass	0.166
LTE-Band 12	699.70	20	23.5	2.51	399.02	0.794	2.303	Pass	0.345
LTE-Band 13	779.50	20	23.5	2.51	399.02	0.794	2.480	Pass	0.320
LTE-Band 14	788.00	20	23.5	2.51	399.02	0.794	2.498	Pass	0.318
LTE-Band 17	706.50	20	23.5	2.51	399.02	0.794	2.319	Pass	0.342
LTE-Band 25	1850.70	20	23.5	3.05	451.86	0.899	4.477	Pass	0.201
LTE-Band 26	824.70	20	23.5	2.51	399.02	0.794	2.577	Pass	0.308
LTE-Band 26 Part 90	814.70	20	23.5	3.20	467.74	0.931	2.556	Pass	0.364
LTE-Band 30	2307.50	20	23.5	3.12	459.20	0.914	5.206	Pass	0.176
LTE-Band 38	2572.50	20	23.5	3.12	459.20	0.914	5.608	Pass	0.163
LTE-Band 41	2498.50	20	23.5	3.12	459.20	0.914	5.497	Pass	0.166
LTE-Band 41(HPUE)	2498.50	20	26.5	3.12	916.22	1.824	5.497	Pass	0.332
LTE-Band 42	3450.00	20	22	2.62	289.73	0.577	6.853	Pass	0.084
LTE-Band 48	3550.00	20	22	1.00	199.53	0.397	6.988	Pass	0.057
LTE-Band 66	1710.70	20	23.5	3.40	489.78	0.975	4.243	Pass	0.230
LTE-Band 71	665.50	20	23.5	1.26	299.23	0.596	2.226	Pass	0.268
LTE-Band 5C	824.7	20	24.0	3.20	524.81	1.045	2.577	Pass	0.406
LTE-Band 7C	2502.5	20	24.0	3.12	515.23	1.026	5.503	Pass	0.186
LTE-Band 38C	2572.5	20	23.5	3.12	459.20	0.914	5.608	Pass	0.163
LTE-Band 41C	2498.5	20	24.0	3.12	515.23	1.026	5.497	Pass	0.187

Note: For conservativeness, the lowest uplink frequency of each band is used to determine the MPE limit of that band.

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2.4 Maximum Allowable Antenna Gain

FCC

Operation Mode	Freq. (MHz)	Operation Distance (cm)	Max. output Power include tolerance (dBm)	Max. Allowable Antenna Gain (dBi)	EIRP (ERP) Limit (dBm)	Max. output Power (mW)	Power Density (PD) (mW/cm ²)	PD Limit (mW/cm ²)	Allowable Gain according to EIRP (dBi)	Allowable Gain according to PD (dBi)	Power Density / Limit
WCDMA / HSPA Band 2	1852.4	20	24.50	8.50	33.00	1995.26	0.397	1.000	8.50	12.51	0.397
WCDMA / HSPA Band 4	1712.4	20	24.50	5.50	30.00	1000.00	0.199	1.000	5.50	12.51	0.199
WCDMA / HSPA Band 5	826.4	20	24.50	9.92	38.45	2766.94	0.551	0.551	13.95	9.92	1.000
LTE-Band 2	1850.7	20	23.50	9.50	33.00	1995.26	0.397	1.000	9.50	13.51	0.397
LTE-Band 4	1710.7	20	23.50	6.50	30.00	1000.00	0.199	1.000	6.50	13.51	0.199
LTE-Band 5	824.7	20	23.50	10.91	38.45	2760.58	0.549	0.550	14.95	10.91	0.998
LTE-Band 7	2502.5	20	23.50	9.50	33.00	1995.26	0.397	1.000	9.50	13.51	0.397
LTE-Band 12	699.7	20	23.50	10.19	34.77	2338.84	0.466	0.466	11.27	10.19	1.000
LTE-Band 13	779.5	20	23.50	10.67	34.77	2612.16	0.520	0.520	11.27	10.67	1.000
LTE-Band 14	788.0	20	23.50	10.71	34.77	2636.33	0.525	0.525	11.27	10.71	1.000
LTE-Band 17	704.0	20	23.50	10.22	34.77	2355.05	0.469	0.469	11.27	10.22	1.000
LTE-Band 25	1850.7	20	23.50	9.50	33.00	1995.26	0.397	1.000	9.50	13.51	0.397
LTE-Band 26	824.7	20	23.50	10.91	38.45	2760.58	0.549	0.550	14.95	10.91	0.998
LTE-Band 26 Part 90	814.7	20	23.50	10.86	50.00	2728.98	0.543	0.543	26.50	10.86	1.000
LTE-Band 30	2307.5	20	23.00	1.00	24.00	251.19	0.050	1.000	1.00	14.01	0.050
LTE-Band 38	2572.5	20	23.50	9.50	33.00	1995.26	0.397	1.000	9.50	13.51	0.397
LTE-Band 41	2498.5	20	23.50	9.50	33.00	1995.26	0.397	1.000	9.50	13.51	0.397
LTE-Band 41(HPUE)	2498.5	20	26.50	6.50	33.00	1995.26	0.397	1.000	6.50	10.51	0.397
LTE-Band 48	3550.0	20	22.00	1.00	23.00	199.53	0.040	1.000	1.00	15.01	0.040
LTE-Band 66	1710.70	20	23.50	6.50	30.00	1000.00	0.199	1.000	6.50	13.51	0.199
LTE-Band 71	665.50	20	23.50	9.98	34.77	2228.44	0.444	0.444	11.27	9.98	1.000
LTE-Band 5C	824.7	20	24.00	10.41	38.45	2760.58	0.549	0.550	14.45	10.41	0.998
LTE-Band 7C	2502.5	20	24.00	9.00	33.00	1995.26	0.397	1.000	9.00	13.01	0.397
LTE-Band 38C	2572.5	20	23.50	9.50	33.00	1995.26	0.397	1.000	9.50	13.51	0.397
LTE-Band 41C	2498.5	20	24.00	9.00	33.00	1995.26	0.397	1.000	9.00	13.01	0.397

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Operation Mode	Freq. (MHz)	Operation Distance (cm)	Max. output Power include tolerance (dBm)	Max. Allowable Antenna Gain (dBi)	EIRP (ERP) Limit (dBm)	Max. output Power (mW)	Power Density (PD) (W/m ²)	Limit (W/m ²)	Allowable Gain according to EIRP (dBi)	Allowable Gain according to PD (dBi)	Power Density / Limit
WCDMA / HSPA Band 2	1852.4	20	24.50	8.50	33.00	1995.26	3.971	4.480	8.50	9.02	0.886
WCDMA / HSPA Band 4	1712.4	20	24.50	5.50	30.00	1000.00	1.990	4.246	5.50	8.79	0.469
WCDMA / HSPA Band 5	826.4	20	24.50	6.63	38.45	1297.18	2.582	2.581	13.95	6.63	1.000
LTE-Band 2	1850.7	20	23.50	9.50	33.00	1995.26	3.971	4.477	9.50	10.02	0.887
LTE-Band 4	1710.7	20	23.50	6.50	30.00	1000.00	1.990	4.243	6.50	9.79	0.469
LTE-Band 5	824.7	20	23.50	7.62	38.45	1294.20	2.576	2.577	14.95	7.62	1.000
LTE-Band 7	2502.5	20	23.50	9.50	33.00	1995.26	3.971	5.503	9.50	10.92	0.722
LTE-Band 12	699.7	20	23.50	7.13	34.77	1156.11	2.301	2.303	11.27	7.13	0.999
LTE-Band 13	779.5	20	23.50	7.46	34.77	1247.38	2.483	2.480	11.27	7.46	1.001
LTE-Band 14	788.0	20	23.50	7.49	34.77	1256.03	2.500	2.498	11.27	7.49	1.001
LTE-Band 17	704.0	20	23.50	7.15	34.77	1161.45	2.312	2.313	11.27	7.15	1.000
LTE-Band 25	1850.7	20	23.50	9.50	33.00	1995.26	3.971	4.477	9.50	10.02	0.887
LTE-Band 26	824.7	20	23.50	7.62	40.61	1294.20	2.576	2.577	17.11	7.62	1.000
LTE-Band 26 Part 90	814.7	20	23.50	7.59	50.00	1285.29	2.558	2.556	26.50	7.59	1.001
LTE-Band 30	2307.5	20	23.00	1.00	24.00	251.19	0.500	5.206	1.00	11.18	0.096
LTE-Band 38	2572.5	20	23.50	9.50	33.00	1995.26	3.971	5.608	9.50	11.00	0.708
LTE-Band 41	2498.5	20	23.50	9.50	33.00	1995.26	3.971	5.497	9.50	10.91	0.722
LTE-Band 41(HPUE)	2498.5	20	26.50	6.50	33.00	1995.26	3.971	5.497	6.50	7.91	0.722
LTE-Band 48	3550.0	20	22.00	1.00	23.00	199.53	0.397	6.988	1.00	13.45	0.057
LTE-Band 66	1710.70	20	23.50	6.50	30.00	1000.00	1.990	4.243	6.50	9.79	0.469
LTE-Band 71	665.50	20	23.50	6.99	34.77	1119.44	2.228	2.226	11.27	6.99	1.001
LTE-Band 5C	824.7	20	24.00	7.12	38.45	1294.20	2.576	2.577	14.45	7.12	1.000
LTE-Band 7C	2502.5	20	24.00	9.00	33.00	1995.26	3.971	5.503	9.00	10.42	0.722
LTE-Band 38C	2572.5	20	23.50	9.50	33.00	1995.26	3.971	5.608	9.50	11.00	0.708
LTE-Band 41C	2498.5	20	24.00	9.00	33.00	1995.26	3.971	5.497	9.00	10.41	0.722

~ End of Report ~

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