

■ **ELECTRICAL SPECIFICATION**

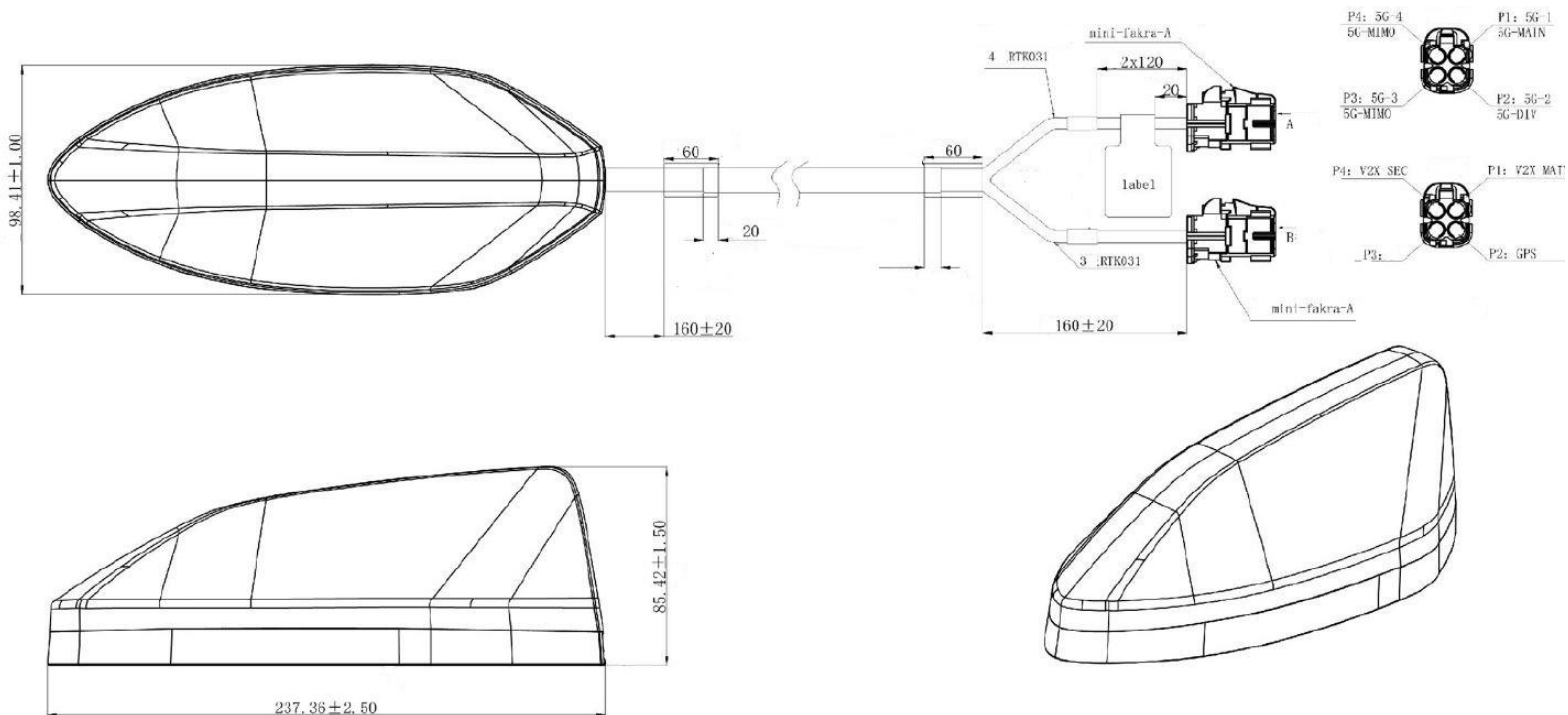
PARAMETER		VALUE			UNIT
Frequency Range	5G	698 ~ 960	1710 ~ 2690	3300 ~ 5000	MHz
	V2X	5850 ~ 5930			MHz
	GNSS-L1	1559 ~ 1606			MHz
	GNSS-L2	1197 ~ 1249			MHz
Efficiency	698 ~ 960 MHz	≥20			%
	1710 ~ 2690 MHz	≥20			%
	3300 ~ 5000 MHz	≥20			%
	5850 ~ 5930	≥20			%
Gain, min	5G-1&5G-2&5G-3&5G-4	2			dB
	GNSS L1 @ Zenith	3.65 ~ 4.35			dBi
	GNSS L2 @ Zenith	3.01 ~ 4.76			dBi
	V2X-1	1.19 ~ 2.51			dB
	V2X-2	0.54 ~ 1.27			dB
Isolation, min	V2X	20			dB
	700 ~ 960 MHz	10			dB
	1710 ~ 2690 MHz	12			dB
	3300 ~ 5000 MHz	15			dB
GNSS Axial Ratio, max	@ Zenith	2.1			dB
GNSS LNA VSWR, max	2			dB	
GNSS LNA Gain	28 ±2			dB	
GNSS Total Gain	28 ±3			dB	
GNSS Noise Factor, max	2			dB	
GNSS P1dB, min	-25			dBm	
GNSS Out of Band Rejection, min	@ F0±100 MHz	40			dB
Polarization	Vertical Polarization			-	
Radiation Pattern	Omni-Directional			-	
Impedance	50			Ω	
Current, max	50			mA	
Voltage	3 ~ 5.5			V	
Sense Resistor	100 ±1%			kΩ	
Operating Temperature Range	-40 ~ +85			°C	

## 5G/4G/V2X/GNSS-L1&L2 COMBINATION ANTENNA

**RSK-MBL3-A-23798-FK-P-001**

PARAMETER	VALUE	UNIT
Protection	Waterproof, Dustproof	-
Antenna	PCB	-
RF Cable	Dacar302-3	mm
Connector	FAKRA	g
Cable Length	3000	mm

### ■ DIMENSIONS



Unit: m

### ■ FREQUENCY CHARACTERISTICS



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# 5G/4G/V2X/GNSS-L1&L2 COMBINATION ANTENNA

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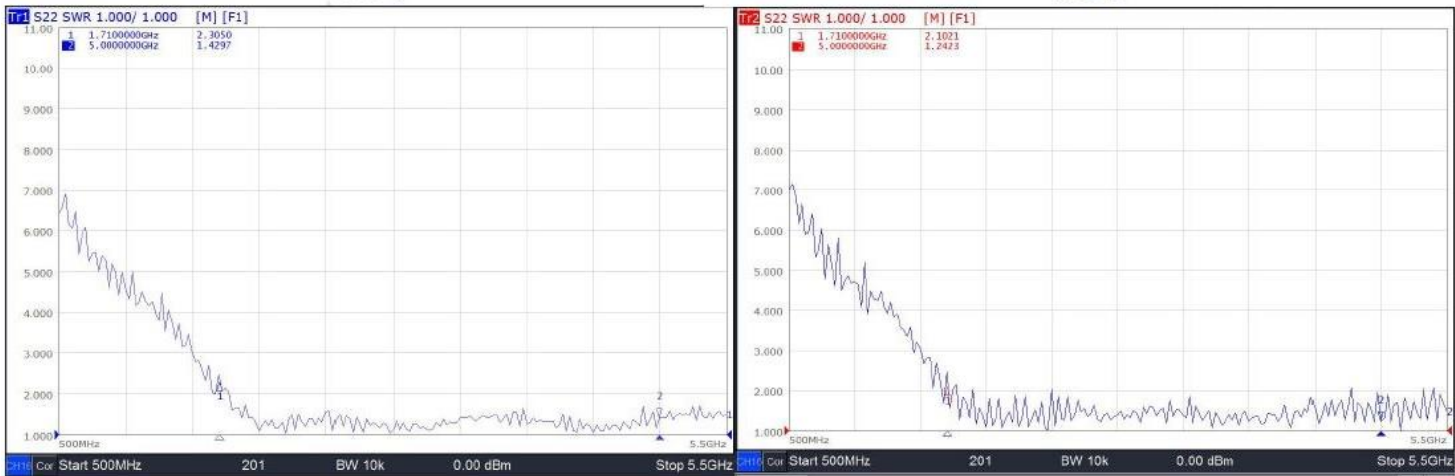
RSK-MBL3-A-23798-FK-P-001

## VSWR



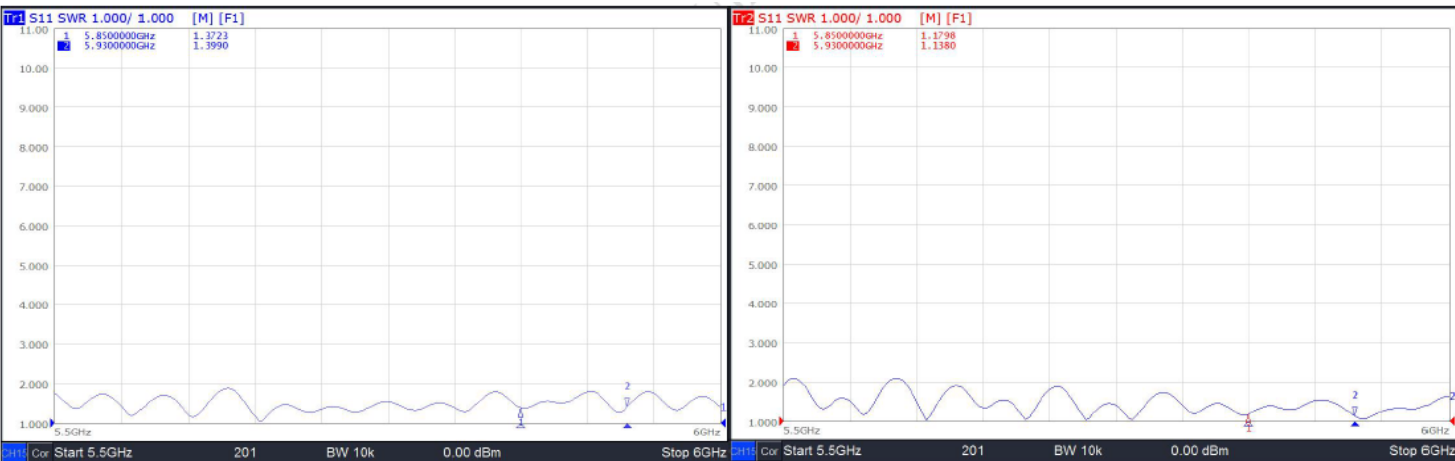
5G-1

5G-2



5G-3

5G-4



V2X-1

V2X-2



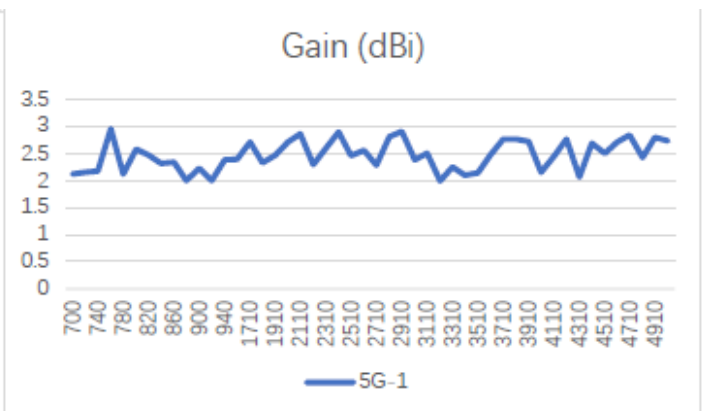
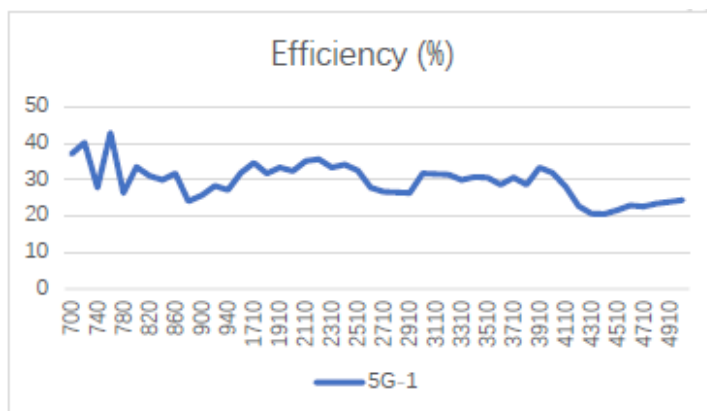
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## 5G/4G/V2X/GNSS-L1&L2 COMBINATION ANTENNA

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### RSK-MBL3-A-23798-FK-P-001

Frequency (MHz)	Efficiency (dB)	Efficiency (%)	Gain (dBi)	Frequency (MHz)	Efficiency (dB)	Efficiency (%)	Gain (dBi)
700	-4.3	37.1	2.1	2710	-5.7	26.7	2.3
720	-4.0	40.2	2.2	2810	-5.8	26.5	2.8
740	-5.6	27.8	2.2	2910	-5.8	26.4	2.9
760	-3.7	43.0	3.0	3010	-5.0	31.8	2.4
780	-5.8	26.4	2.1	3110	-5.0	31.6	2.5
800	-4.7	33.6	2.6	3210	-5.0	31.5	2.0
820	-5.1	31.1	2.5	3310	-5.2	30.0	2.3
840	-5.2	29.9	2.3	3410	-5.1	30.8	2.1
860	-5.0	31.8	2.3	3510	-5.1	30.6	2.2
880	-6.2	24.0	2.0	3610	-5.4	28.8	2.5
900	-5.9	25.7	2.2	3710	-5.1	30.6	2.8
920	-5.5	28.4	2.0	3810	-5.4	28.7	2.8
940	-5.6	27.3	2.4	3910	-4.8	33.4	2.7
960	-5.0	31.9	2.4	4010	-5.0	31.9	2.2
1710	-4.6	34.6	2.7	4110	-5.5	28.1	2.5
1810	-5.0	31.7	2.3	4210	-6.4	22.8	2.8
1910	-4.8	33.5	2.5	4310	-6.9	20.6	2.1
2010	-4.9	32.4	2.7	4410	-6.9	20.6	2.7
2110	-4.5	35.3	2.9	4510	-6.6	21.6	2.5
2210	-4.5	35.8	2.3	4610	-6.4	23.0	2.7
2310	-4.8	33.4	2.6	4710	-6.5	22.6	2.9
2410	-4.7	34.1	2.9	4810	-6.3	23.4	2.4
2510	-4.9	32.7	2.5	4910	-6.2	23.9	2.8
2610	-5.5	27.9	2.6	5000	-6.1	24.4	2.4



#### 5G-2 Efficiency & Gain

Frequency (MHz)	Efficiency (dB)	Efficiency (%)	Gain (dBi)	Frequency (MHz)	Efficiency (dB)	Efficiency (%)	Gain (dBi)
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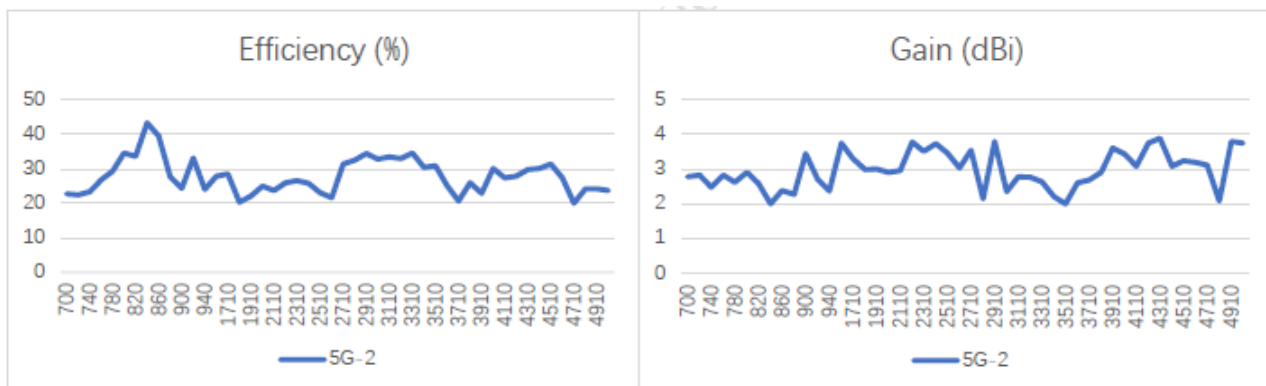
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## 5G/4G/V2X/GNSS-L1&L2 COMBINATION ANTENNA

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### RSK-MBL3-A-23798-FK-P-001

700	-6.4	22.8	2.8	2710	-5.0	31.4	3.5
720	-6.5	22.4	2.8	2810	-4.9	32.6	2.1
740	-6.3	23.5	2.5	2910	-4.6	34.5	3.8
760	-5.7	26.8	2.8	3010	-4.8	32.9	2.4
780	-5.3	29.3	2.6	3110	-4.7	33.5	2.8
800	-4.6	34.6	2.9	3210	-4.8	33.0	2.8
820	-4.7	33.7	2.6	3310	-4.6	34.7	2.6
840	-3.6	43.4	2.0	3410	-5.2	30.4	2.2
860	-4.0	39.6	2.4	3510	-5.1	31.0	2.0
880	-5.6	27.8	2.3	3610	-6.0	25.2	2.6
900	-6.1	24.4	3.5	3710	-6.8	20.8	2.7
920	-4.8	33.2	2.7	3810	-5.9	25.9	2.9
940	-6.2	24.0	2.4	3910	-6.4	22.9	3.6
960	-5.6	27.8	3.7	4010	-5.2	30.1	3.4
1710	-5.5	28.5	3.3	4110	-5.6	27.4	3.1
1810	-6.9	20.3	3.0	4210	-5.5	27.9	3.7
1910	-6.6	22.1	3.0	4310	-5.3	29.8	3.9
2010	-6.0	25.1	2.9	4410	-5.2	30.1	3.1
2110	-6.3	23.7	3.0	4510	-5.0	31.4	3.2
2210	-5.9	26.0	3.8	4610	-5.6	27.4	3.2
2310	-5.7	26.6	3.5	4710	-7.0	20.1	3.1
2410	-5.9	25.8	3.7	4810	-6.2	24.2	2.1
2510	-6.4	23.1	3.5	4910	-6.2	24.2	3.8
2610	-6.7	21.6	3.0	5000	-6.2	23.8	3.8



#### 5G-3 Efficiency & Gain



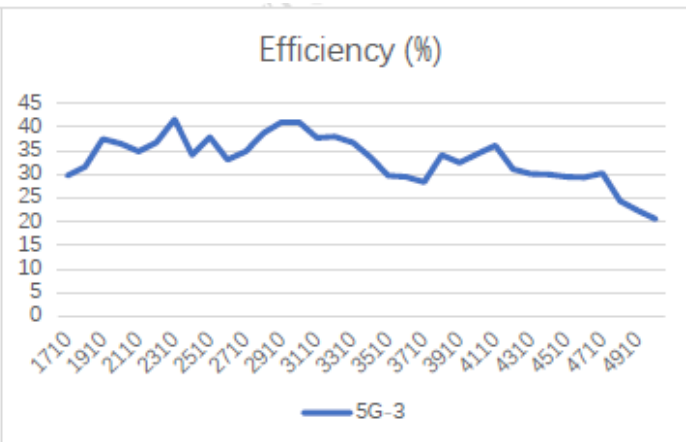
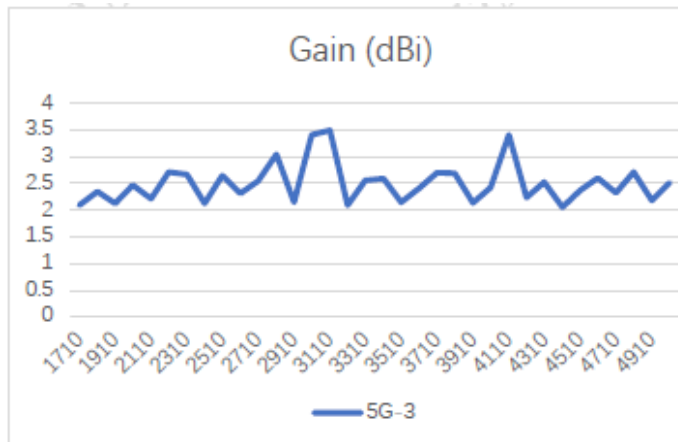
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# 5G/4G/V2X/GNSS-L1&L2 COMBINATION ANTENNA

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## RSK-MBL3-A-23798-FK-P-001

Frequency (MHz)	Efficiency (dB)	Efficiency (%)	Gain (dBi)	Frequency (MHz)	Efficiency (dB)	Efficiency (%)	Gain (dBi)
1710	-5.3	29.7	2.1	3410	-4.7	33.6	2.6
1810	-5.0	31.6	2.4	3510	-5.3	29.7	2.1
1910	-4.3	37.5	2.1	3610	-5.3	29.5	2.4
2010	-4.4	36.6	2.5	3710	-5.5	28.4	2.7
2110	-4.6	34.9	2.2	3810	-5.7	34.1	2.7
2210	-4.3	36.8	2.7	3910	-4.9	32.5	2.1
2310	-3.8	41.6	2.7	4010	-4.6	34.3	2.4
2410	-4.7	34.1	2.1	4110	-4.4	36.2	3.4
2510	-4.2	37.9	2.6	4210	-5.1	31.2	2.2
2610	-4.8	33.2	2.3	4310	-5.2	30.1	2.5
2710	-4.6	34.9	2.5	4410	-5.2	30.0	2.1
2810	-4.1	38.8	3.1	4510	-5.3	29.5	2.4
2910	-3.9	41.0	2.1	4610	-5.3	29.5	2.6
3010	-3.9	41.0	3.4	4710	-5.2	30.3	2.3
3110	-4.2	37.8	3.5	4810	-6.1	24.4	2.7
3210	-4.2	38.0	2.1	4910	-6.5	22.5	2.2
3310	-4.3	36.8	2.6	5000	-6.9	20.6	2.5



### 5G-3 Efficiency & Gain



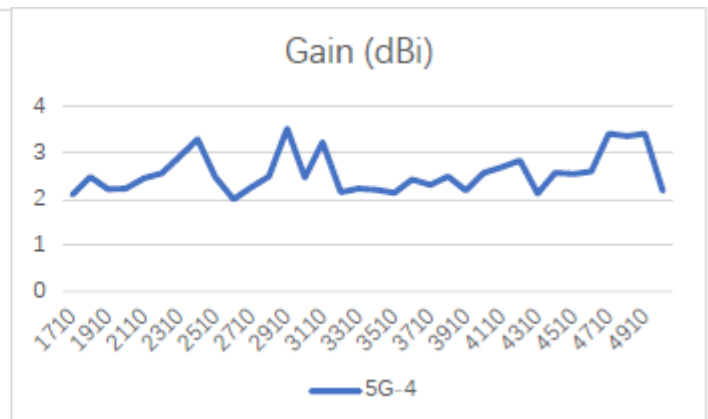
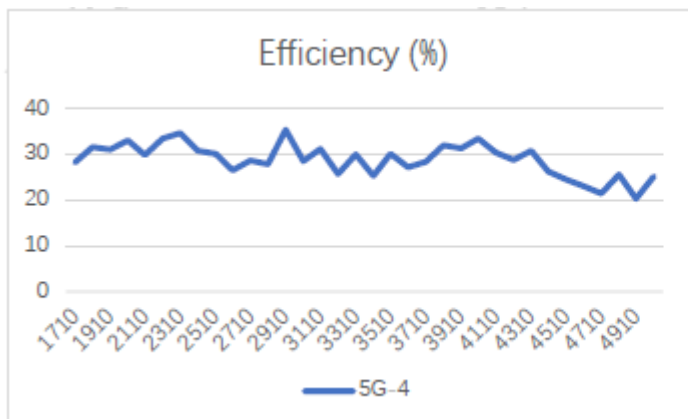
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# 5G/4G/V2X/GNSS-L1&L2 COMBINATION ANTENNA

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## RSK-MBL3-A-23798-FK-P-001

Frequency (MHz)	Efficiency (dB)	Efficiency (%)	Gain (dBi)	Frequency (MHz)	Efficiency (dB)	Efficiency (%)	Gain (dBi)
1710	-5.5	28.3	2.1	3410	-5.9	25.4	2.2
1810	-5.0	31.7	2.5	3510	-5.2	30.2	2.1
1910	-5.1	31.1	2.2	3610	-5.6	27.3	2.4
2010	-4.8	33.1	2.2	3710	-5.5	28.4	2.3
2110	-5.2	30.0	2.5	3810	-4.9	32.1	2.5
2210	-4.7	33.5	2.6	3910	-5.0	31.5	2.2
2310	-4.6	34.7	2.9	4010	-4.7	33.6	2.6
2410	-5.1	30.9	3.3	4110	-5.2	30.5	2.7
2510	-5.2	30.3	2.5	4210	-5.4	28.9	2.8
2610	-5.7	26.6	2.0	4310	-5.1	30.8	2.1
2710	-5.4	28.8	2.3	4410	-5.8	26.4	2.6
2810	-5.5	28.0	2.5	4510	-6.1	24.6	2.6
2910	-4.5	35.5	3.5	4610	-6.4	23.1	2.6
3010	-5.4	28.6	2.5	4710	-6.7	21.5	3.4
3110	-5.1	31.3	3.2	4810	-5.9	25.6	3.4
3210	-5.9	25.9	2.2	4910	-6.9	20.4	3.4
3310	-5.2	30.1	2.2	5000	-6.0	25.3	2.2



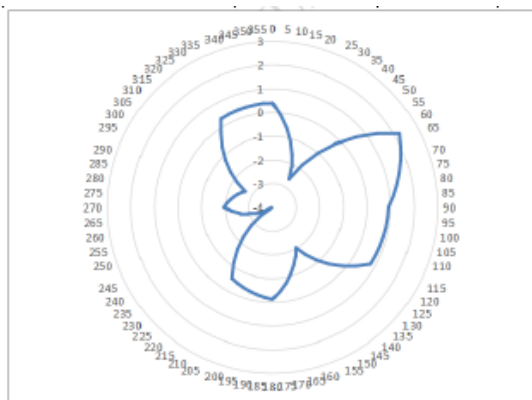
### V2X Antenna Efficiency & Gain & 2D Pattern



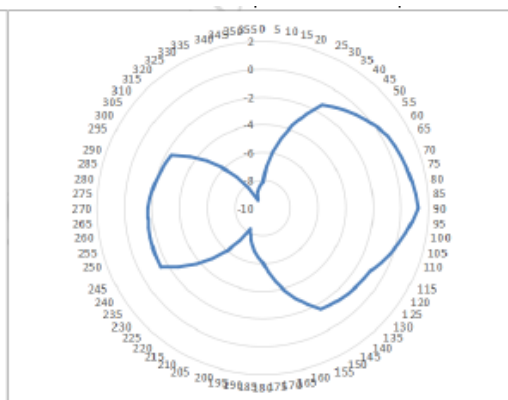
## 5G/4G/V2X/GNSS-L1&L2 COMBINATION ANTENNA

### RSK-MBL3-A-23798-FK-P-001

Frequency (MHz)	Efficiency (%)	Gain (dBi)	Frequency (MHz)	Efficiency (%)	Gain (dBi)
5850	39.75	2.20	5850	42.51	0.61
5855	40.97	2.14	5855	43.06	0.55
5860	38.41	1.96	5860	43.35	0.69
5865	34.83	1.41	5865	43.97	1.02
5870	33.09	1.24	5870	43.23	0.84
5875	33.71	1.19	5875	43.98	1.26
5880	35.32	1.27	5880	44.95	1.25
5885	39.22	1.63	5885	44.50	0.98
5890	44.16	2.26	5890	46.63	1.27
5895	44.10	2.37	5895	45.50	1.07
5900	41.43	2.26	5900	44.89	0.94
5905	37.63	2.14	5905	42.78	0.62
5910	35.98	1.83	5910	43.18	0.64
5915	34.87	1.65	5915	42.51	0.54
5920	38.53	1.97	5920	44.22	0.79
5925	41.57	2.24	5925	42.51	0.61
5930	44.61	2.51	5930	43.06	0.55



V2X-1 Theta90°

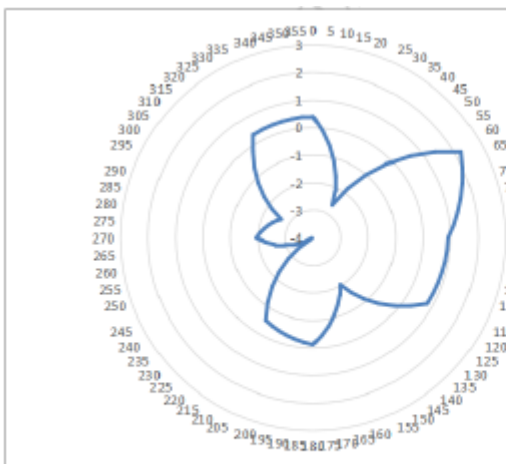


V2X-2 Theta90°

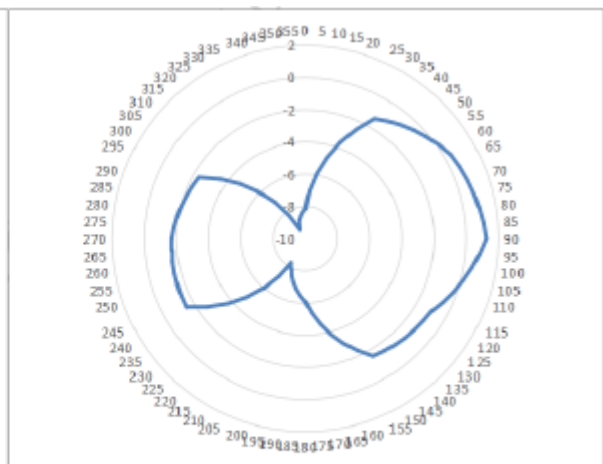
### V2X Antenna Efficiency & Gain & 2D Pattern



V2X-1			V2X-2		
Frequency (MHz)	Efficiency (%)	Gain (dBi)	Frequency (MHz)	Efficiency (%)	Gain (dBi)
5850	39.75	2.20	5850	42.51	0.61
5855	40.97	2.14	5855	43.06	0.55
5860	38.41	1.96	5860	43.35	0.69
5865	34.83	1.41	5865	43.97	1.02
5870	33.09	1.24	5870	43.23	0.84
5875	33.71	1.19	5875	43.98	1.26
5880	35.32	1.27	5880	44.95	1.25
5885	39.22	1.63	5885	44.50	0.98
5890	44.16	2.26	5890	46.63	1.27
5895	44.10	2.37	5895	45.50	1.07
5900	41.43	2.26	5900	44.89	0.94
5905	37.63	2.14	5905	42.78	0.62
5910	35.98	1.83	5910	43.18	0.64
5915	34.87	1.65	5915	42.51	0.54
5920	38.53	1.97	5920	44.22	0.79
5925	41.57	2.24	5925	42.51	0.61
5930	44.61	2.51	5930	43.06	0.55



V2X-1 Theta90°



V2X-2 Theta90°

### GNSS ANTENNA Gain & AR

L1			L2		
Frequency (MHz)	AR theta=0°	Gain theta=0°	Frequency (MHz)	Efficiency (%)	Gain (dBi)



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# 5G/4G/V2X/GNSS-L1&L2 COMBINATION ANTENNA

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**RSK-MBL3-A-23798-FK-P-001**

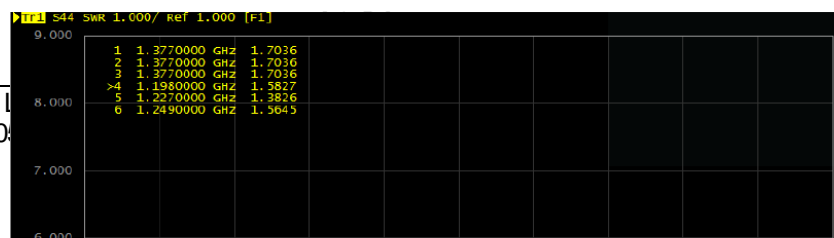
1559	39.75	3.659544	1197	1.87	3.014831
1562	40.97	3.816869	1201	1.85	3.391781
1565	38.41	3.922321	1205	1.84	3.752516
1568	34.83	3.992165	1209	1.81	4.089471
1571	33.09	4.070847	1213	1.79	4.368568
1574	33.71	4.149208	1217	1.78	4.556956
1577	35.32	4.201608	1221	1.76	4.672439
1580	39.22	4.236258	1225	1.73	4.738643
1583	44.16	4.249995	1229	1.65	4.762717
1586	44.10	4.309014	1233	1.57	4.685315
1589	41.43	4.353975	1237	1.55	4.503313
1592	37.63	4.321554	1241	1.64	4.260285
1595	35.98	4.310423	1245	1.68	4.103565
1598	34.87	4.321878	1249	1.73	3.920792
1601	38.53	4.16229			
1604	41.57	4.16229			
1606	44.61	4.075364			

## GNSS Antenna LNA VSWR

L1



L2



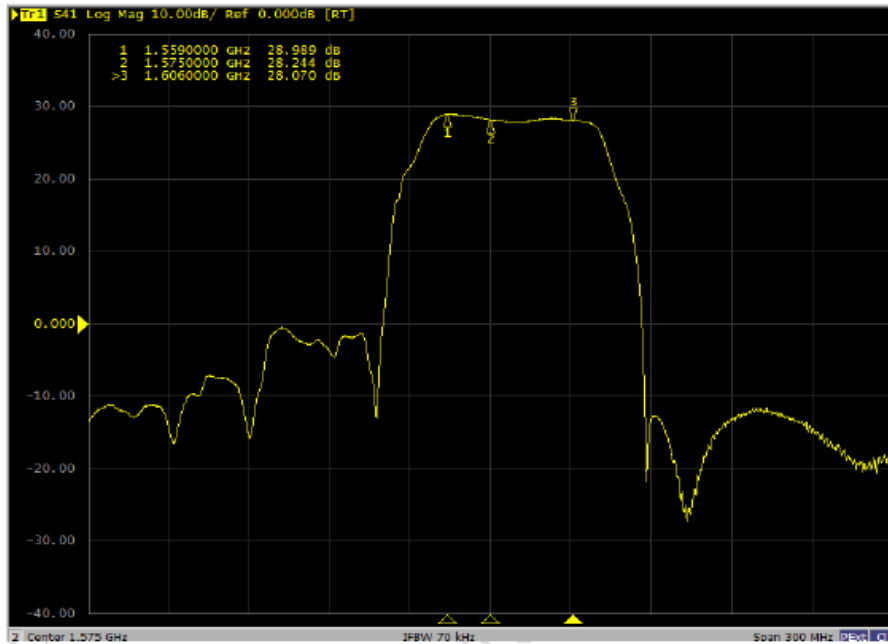
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33172 ■ U.S.A.  
<http://www.raltron.com>

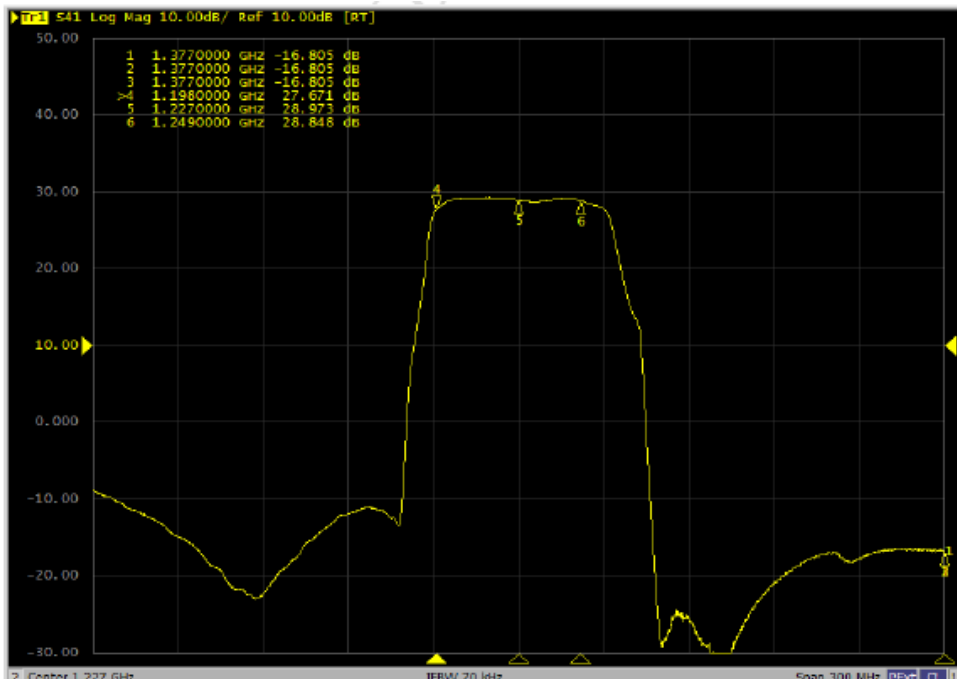
	Frequency (MHz)	VSWR	Specification	Remark
L1	1575	1.44	<2	OK
	1559	1.55		OK
	1606	1.44		OK
L2	1198	1.58		OK
	1227	1.38		OK
	1249	1.56		OK

**GNSS Antenna LNA Gain**

L1

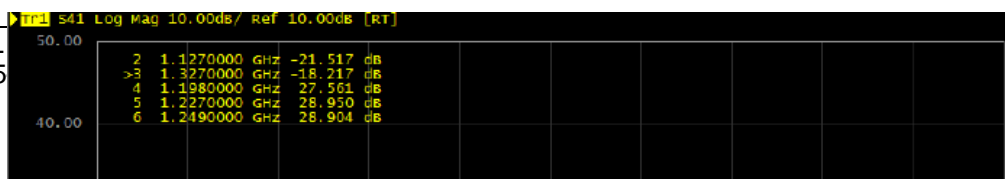
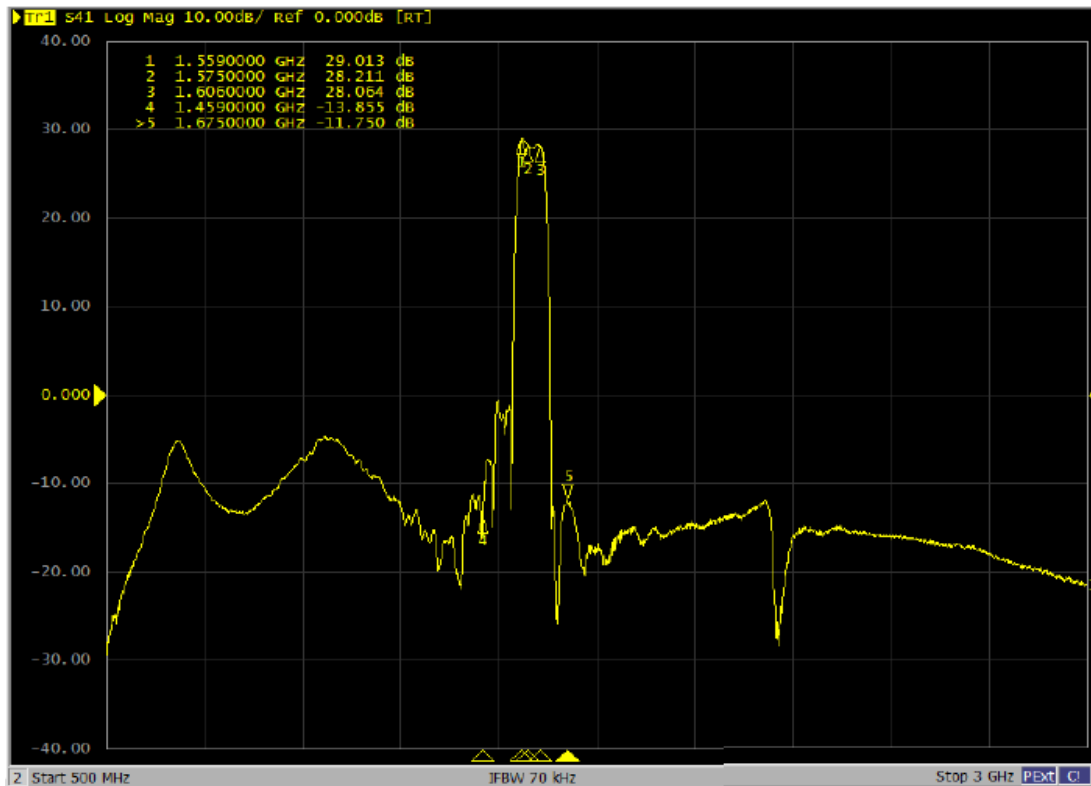


L2



	Frequency (MHz)	Gain	Specification	Remark
L1	1575	28.98		OK
	1559	28.24		OK
	1606	28.07		OK

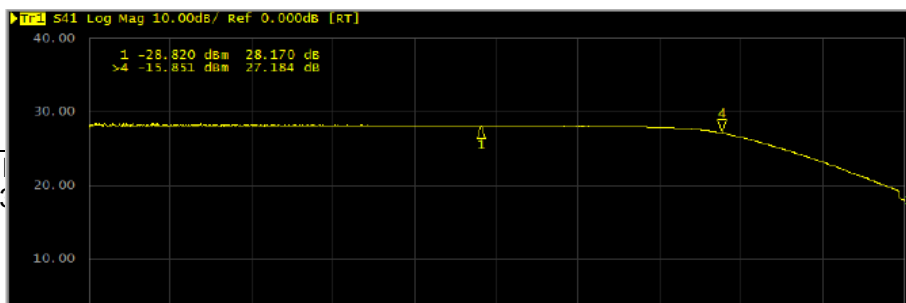
### GNSS Antenna Out-of-band rejection



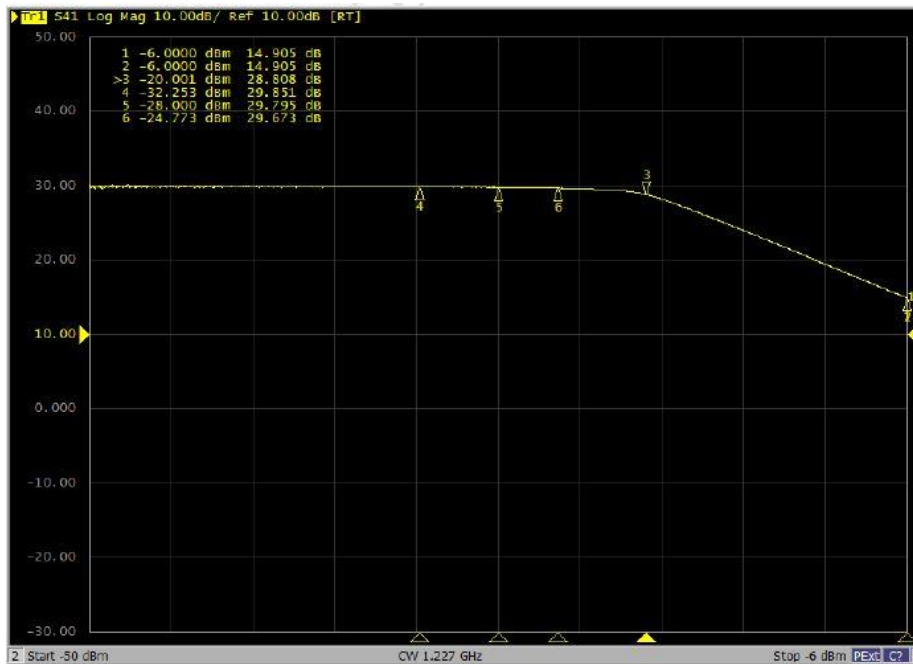
	Frequency (MHz)	Out-of-band rejection(dB)	Specification	Remark
L1	1575	40	≥ 40dB @ F0±100MHz	OK
L2	1227	46		OK

### GNSS Antenna P1Db

L1



L2

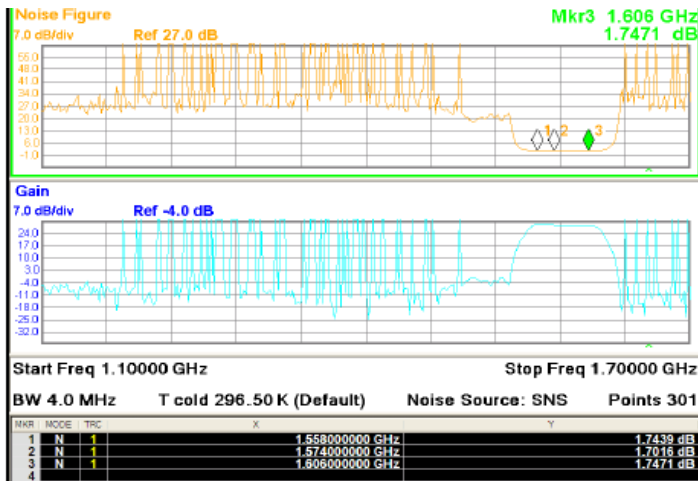


	P1dB	Specification	Remark
L1	-15	≥ -25dB	OK
L2	-20		OK

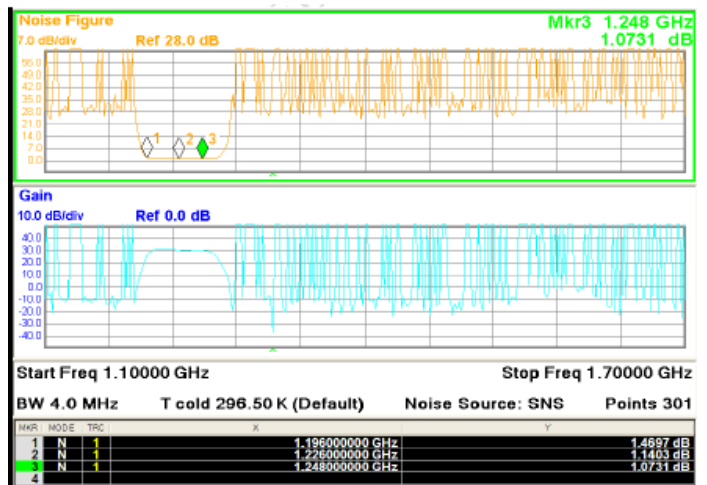


### GNSS Antenna LNA Noise factor

L1



L2



	Frequency (MHz)	Noise factor	Specification	Remark
L1	1574	1.74	≤2dB	OK
	1558	1.70		OK
	1606	1.74		OK
L2	1198	1.46		OK
	1227	1.14		OK
	1249	1.07		OK

#### ENVIRONMENTAL

RALTRON ELECTRONICS ■ 10400 N.W.  
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mi, Florida  
com ■ web



.A.  
.com

PARAMETER	VALUE
RoHS	Compliant
REACH SVHC	Compliant
HALOGEN-FREE	Compliant

#### ■ APPROVAL

RALTRON	
DRAWN BY:	AR, October 17, 2023
APPROVED BY:	CP, October 17, 2023
REVISION:	A, Initial Release

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