

2023.10.19

RA-N2310-52

APPROVAL SHEET

MODEL : X-COM3 PRO
DIV ANT
Antenna layout

| Review | Consent | Approval |
|--------|---------|----------|
| | | |
| | | |

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1. Revision History

| NO. | Before | After | Reason | Date |
|-----|--------|-------|--------|------|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
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2. Product Information

2.1 General Features

| | |
|--------------|----------------|
| PART NUMBER | GRSN22128MS51 |
| ANTENNA TYPE | Dipole Antenna |
| APPLICATIONS | Mesh |

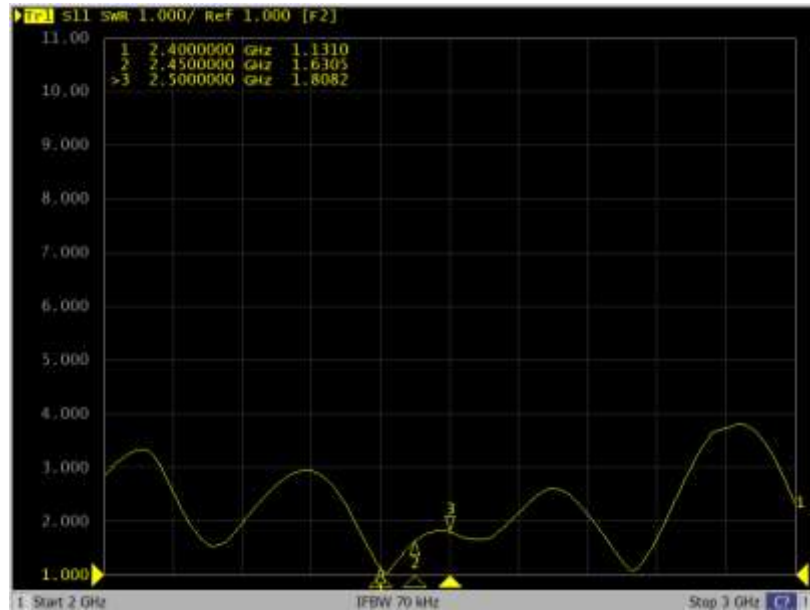
2.2 Electrical Specifications

| | | | |
|-----------------------|----|------------------|---------|
| Frequency Range1 (TX) | | 2400MHz~2485MHz | |
| Frequency Range1 (RX) | | 2400MHz~2485MHz | |
| IMPEDANCE | | 50 Ω | |
| V.S.W.R | TX | 2400MHz | 2485MHz |
| | | 3 ↓ | 3 ↓ |
| | RX | 2400MHz | 2485MHz |
| | | 3 ↓ | 3 ↓ |
| RADIATION PATTERN | | Omni-directional | |
| POLARIZATION | | Linear | |

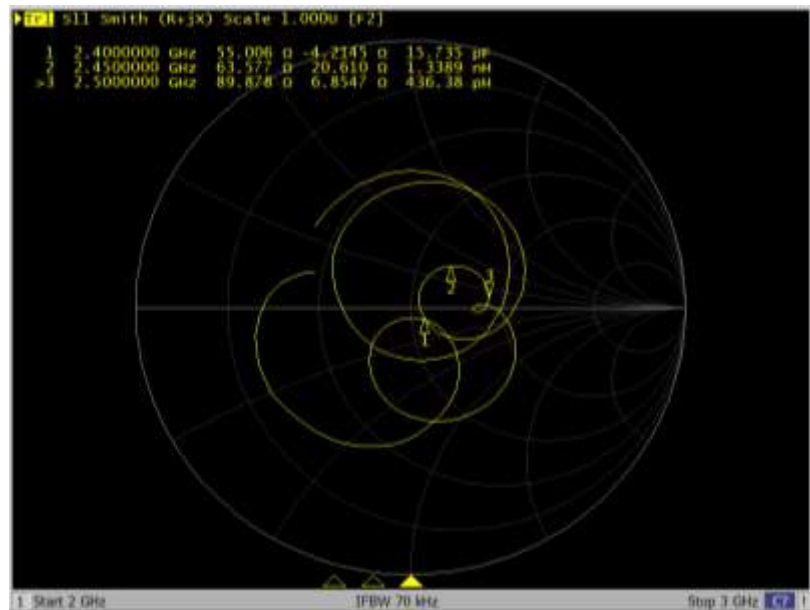
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3. Electrical Characteristics

3.1 VSWR

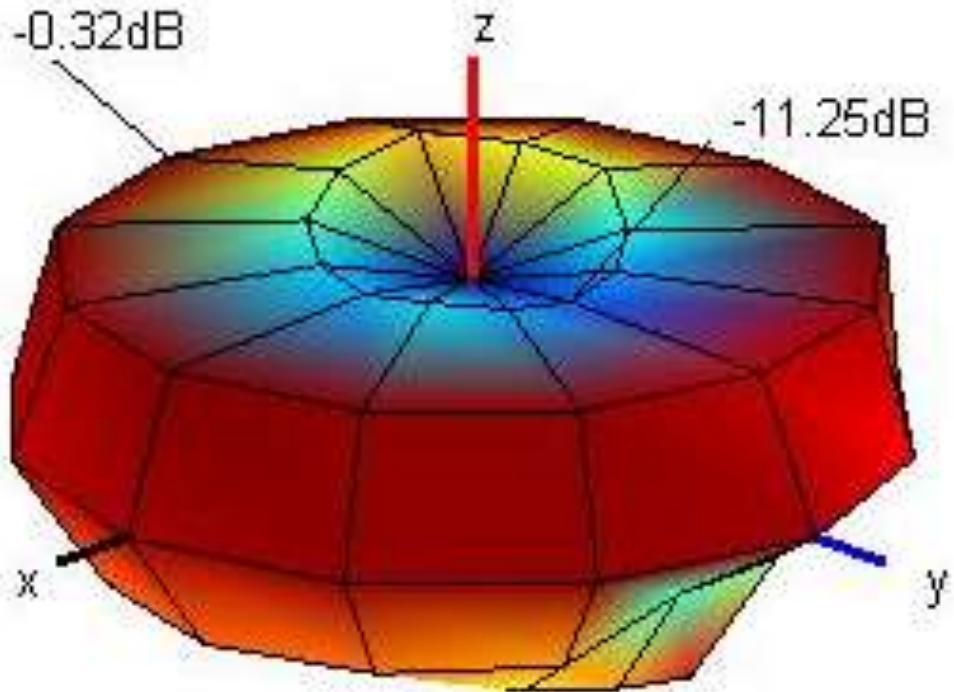


3.2 SMITH CHART

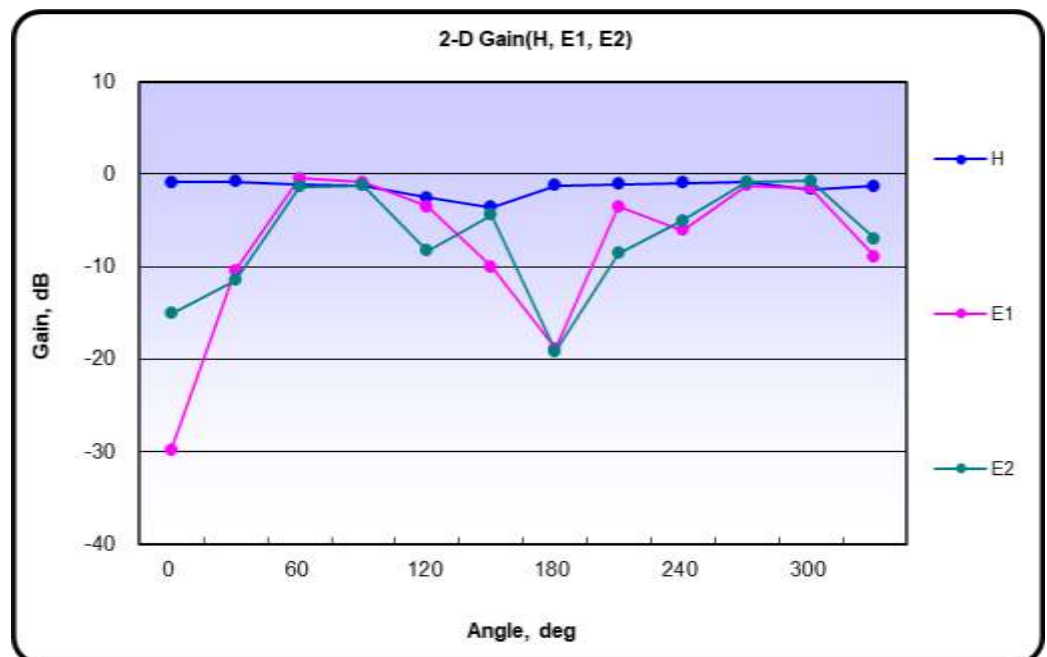


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3.3 3D-PLOT



3.4 2D-GAIN





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4. Passive Measurement

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-----------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Frequency [MHz] | 2400 | 2405 | 2410 | 2415 | 2420 | 2425 | 2430 | 2435 | 2440 | 2445 |
| Efficiency [dB] | -2.98 | -2.88 | -2.85 | -2.96 | -3.04 | -3.18 | -2.97 | -2.79 | -2.72 | -2.78 |
| Efficiency [%] | 50.4 | 51.6 | 51.9 | 50.6 | 49.7 | 48.0 | 50.5 | 52.6 | 53.4 | 52.7 |
| TRG _θ [dB] | -3.41 | -3.31 | -3.24 | -3.35 | -3.39 | -3.55 | -3.31 | -3.11 | -3.03 | -3.06 |
| Gain _{θ Peak} [dB] | -0.23 | -0.02 | -0.16 | -0.12 | -0.28 | -0.25 | -0.16 | -0.06 | -0.42 | -0.49 |
| Gain _{θ Min} [dB] | -16.17 | -17.70 | -17.04 | -15.31 | -14.60 | -13.17 | -12.55 | -12.21 | -11.39 | -11.52 |
| TRG _φ [dB] | -13.17 | -13.06 | -13.56 | -13.66 | -14.07 | -14.09 | -14.18 | -14.28 | -14.37 | -14.90 |
| Gain _{φ Peak} [dB] | -6.76 | -5.90 | -7.35 | -6.93 | -6.66 | -7.11 | -8.23 | -7.59 | -7.69 | -8.23 |
| Gain _{φ Min} [dB] | -31.99 | -46.51 | -33.14 | -33.67 | -32.14 | -35.21 | -32.67 | -44.84 | -36.58 | -40.57 |
| UHRG [dB] | -5.08 | -4.99 | -4.95 | -5.05 | -5.12 | -5.30 | -5.12 | -4.93 | -4.92 | -5.02 |
| UHRG/TRG [%] | 61.7 | 61.5 | 61.6 | 61.8 | 61.9 | 61.4 | 60.9 | 61.1 | 60.3 | 59.7 |
| H-Plane | -2.07 | -2.03 | -1.81 | -1.93 | -2.03 | -2.04 | -1.83 | -1.59 | -1.31 | -1.38 |
| E1-Plane, AVG [dB] | -4.46 | -4.45 | -4.31 | -4.44 | -4.45 | -4.61 | -4.45 | -4.15 | -4.21 | -4.12 |
| E2-Plane, AVG [dB] | -4.73 | -4.67 | -4.70 | -4.40 | -4.71 | -4.97 | -4.56 | -4.31 | -4.40 | -4.34 |
| Peak Gain [dB] | -0.23 | -0.02 | -0.10 | 0.01 | 0.03 | -0.05 | -0.16 | 0.18 | -0.32 | -0.32 |
| Directivity [dB] | 2.75 | 2.86 | 2.75 | 2.97 | 3.07 | 3.14 | 2.81 | 2.97 | 2.40 | 2.46 |
| Minimum Gain [dB] | -15.30 | -14.40 | -13.87 | -14.38 | -13.98 | -12.87 | -12.37 | -11.72 | -11.03 | -11.25 |

| | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
|-----------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Frequency [MHz] | 2450 | 2455 | 2460 | 2465 | 2470 | 2475 | 2480 | 2485 | 2490 | 2497 |
| Efficiency [dB] | -2.91 | -3.03 | -3.22 | -3.16 | -2.77 | -2.91 | -2.97 | -3.52 | -3.73 | -3.60 |
| Efficiency [%] | 51.1 | 49.8 | 47.7 | 48.3 | 52.9 | 51.2 | 50.5 | 44.4 | 42.4 | 43.6 |
| TRG _θ [dB] | -3.17 | -3.28 | -3.47 | -3.40 | -3.01 | -3.12 | -3.19 | -3.75 | -3.93 | -3.79 |
| Gain _{θ Peak} [dB] | -0.40 | -0.16 | -0.76 | -0.85 | -0.59 | -0.36 | -0.68 | -1.00 | -1.26 | -1.19 |
| Gain _{θ Min} [dB] | -11.13 | -10.79 | -11.22 | -10.20 | -9.84 | -9.11 | -8.71 | -9.44 | -9.81 | -9.45 |
| TRG _φ [dB] | -15.35 | -15.50 | -15.74 | -15.81 | -15.51 | -15.99 | -16.05 | -16.53 | -17.13 | -17.46 |
| Gain _{φ Peak} [dB] | -8.55 | -9.50 | -9.44 | -9.86 | -10.02 | -9.83 | -9.68 | -10.22 | -10.71 | -11.71 |
| Gain _{φ Min} [dB] | -35.58 | -33.03 | -33.07 | -33.48 | -45.47 | -38.95 | -31.33 | -38.42 | -39.68 | -33.21 |
| UHRG [dB] | -5.13 | -5.27 | -5.52 | -5.48 | -5.12 | -5.33 | -5.33 | -5.96 | -6.19 | -6.00 |
| UHRG/TRG [%] | 60.0 | 59.7 | 58.9 | 58.5 | 58.2 | 57.2 | 58.0 | 57.1 | 56.7 | 57.6 |
| H-Plane | -1.54 | -1.65 | -1.73 | -1.63 | -1.21 | -1.30 | -1.34 | -1.87 | -1.98 | -2.13 |
| E1-Plane, AVG [dB] | -4.27 | -4.33 | -4.41 | -4.56 | -4.03 | -4.13 | -4.21 | -4.96 | -5.09 | -5.07 |
| E2-Plane, AVG [dB] | -4.40 | -4.43 | -4.72 | -4.65 | -4.12 | -4.54 | -4.32 | -4.84 | -5.29 | -5.00 |
| Peak Gain [dB] | -0.14 | -0.13 | -0.74 | -0.58 | -0.44 | -0.33 | -0.53 | -0.75 | -0.90 | -1.08 |
| Directivity [dB] | 2.77 | 2.89 | 2.48 | 2.58 | 2.32 | 2.57 | 2.43 | 2.78 | 2.83 | 2.52 |
| Minimum Gain [dB] | -10.60 | -10.57 | -10.60 | -9.98 | -9.69 | -9.07 | -8.57 | -9.20 | -9.66 | -9.27 |


Average Efficiency

-3.04dB

49.67%


Average Efficiency

0.18dB

| | | | | | | |
|---|------------------------|-------------------------|---------------|-----|------|-------|
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5. Measurement Process

5.1 SWR / Return loss

| | |
|------------------|---|
| | Set Condition |
| Network Analyzer | Agilent 8753ES |
| Cable | Semi-rigid (40mm, 60mm) |
| Test condition |  |

5.2 Gain

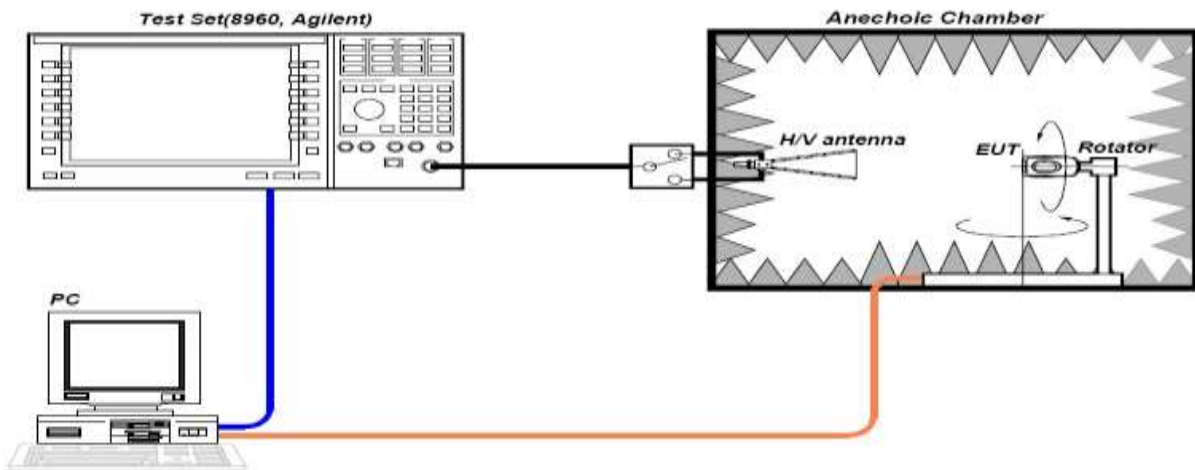
Antenna gain is measured in the anechoic chamber of this company.



5.3 Gain test block diagram

Active test System

- TRP, NHPRP, UHRP
- TIS, NHPIS, UHIS
- Relative Sensitivity



Passive test System

- Efficiency
- Peak Gain, Avg, Gain
- Min, Max PWR

