



CEEDTec Benchmark Report for USB HSDPA Modems Dec 2007

CEEDTec Confidential

This is an antenna performance benchmark between Vigsys VM10, Competitor-N and Competitor-H devices

Early User Feedback



- “Vigsys VM10 looks very stable (now already 22MB download/4.7MB upload). I am happy with it.”
- “Using speedtest - can get 2.8M download, about 400K upload (Starhub rating is up to 7.2M download, 1.0M upload). Did about 5 tests, quite consistent”.
- “Earlier today, I happened to be at a place where the M1 Competitor-H modem showed no bars (went into GPRS network) - but Vigsys VM10 showed between 1 & 2 bars! So I am happy to report Vigsys VM10 is better at reception than the Competitor-H USB modem!”

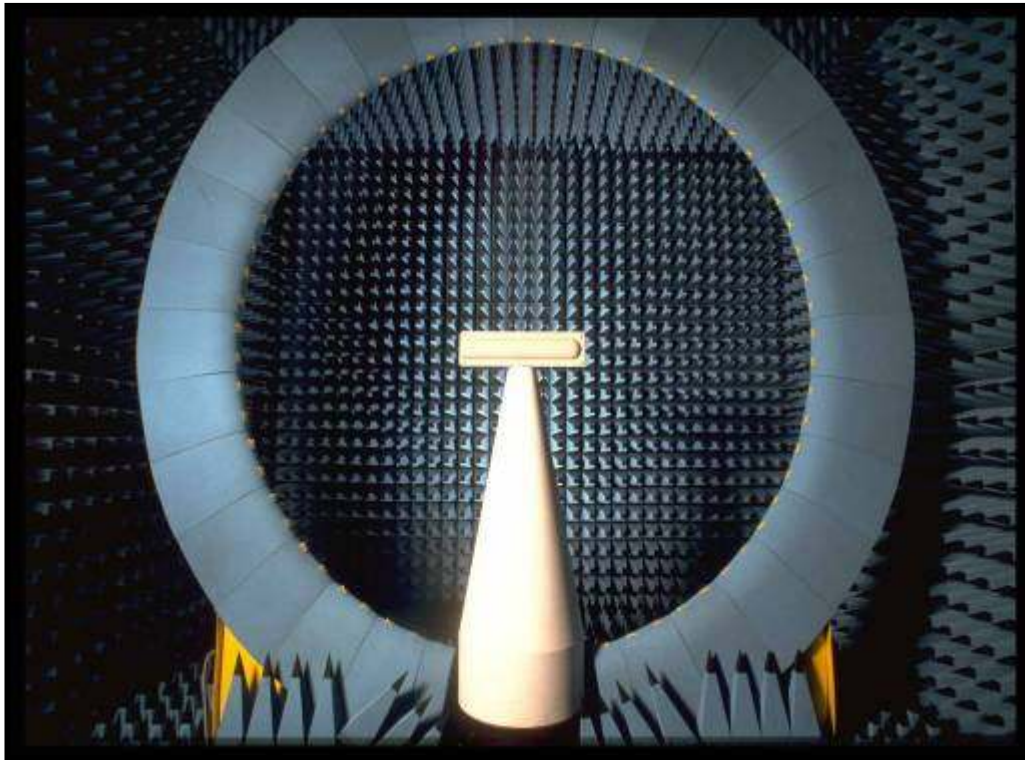
So we decided to find out more.....

Introduction



- Competitor products were purchased for teardown.
- **Vigsys VM10** is using a penta-band PIFA antenna with matching network.
- **Competitor-H** is using a penta-band folded-J antenna with a “pi” matching network.
- **Competitor-N** is using a penta-band folded-J antenna similar to those used in mobile phones.
- All the antennas were implemented using metal stamped radiator on plastic carrier.
- Benchmark measurements were conducted in passive mode (driven test).

Measurement System Main Features



- 32 dual polarised probes for the 0.45 - 6.0 GHz band.
- 14 dual polarised probes for the 120 - 450 MHz band.
- Real-Time Display of Radiation Pattern Cuts.
- Complete Radiation Pattern and Gain with Single +/-180° Mechanical Rotation.

Photo for Vigsys VM10 antenna

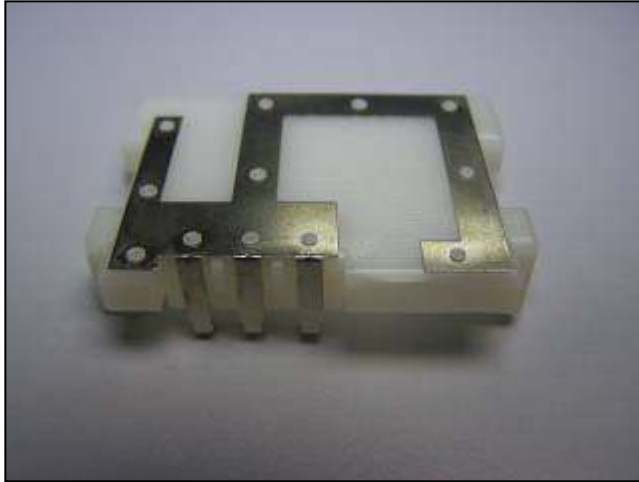


Photo for Competitor-H's antenna

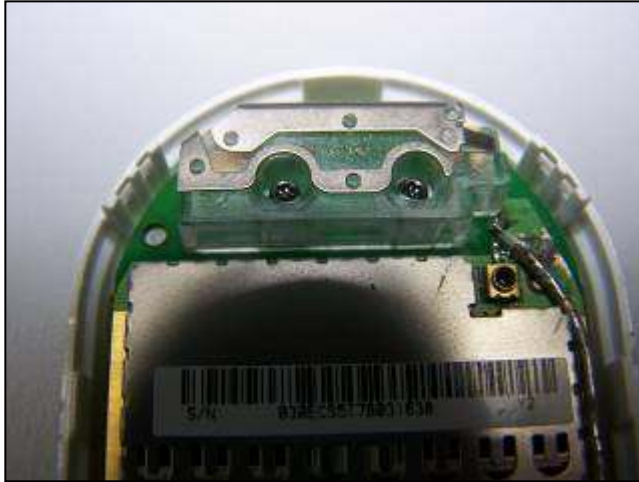
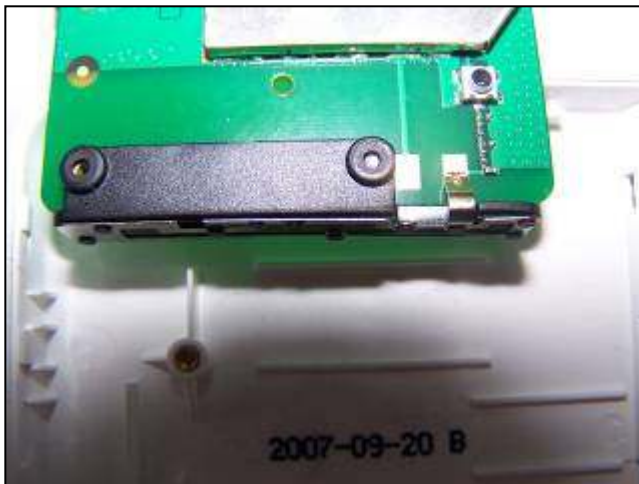
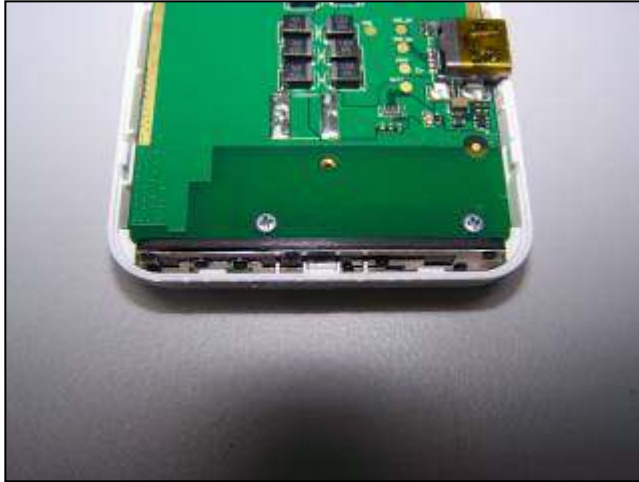
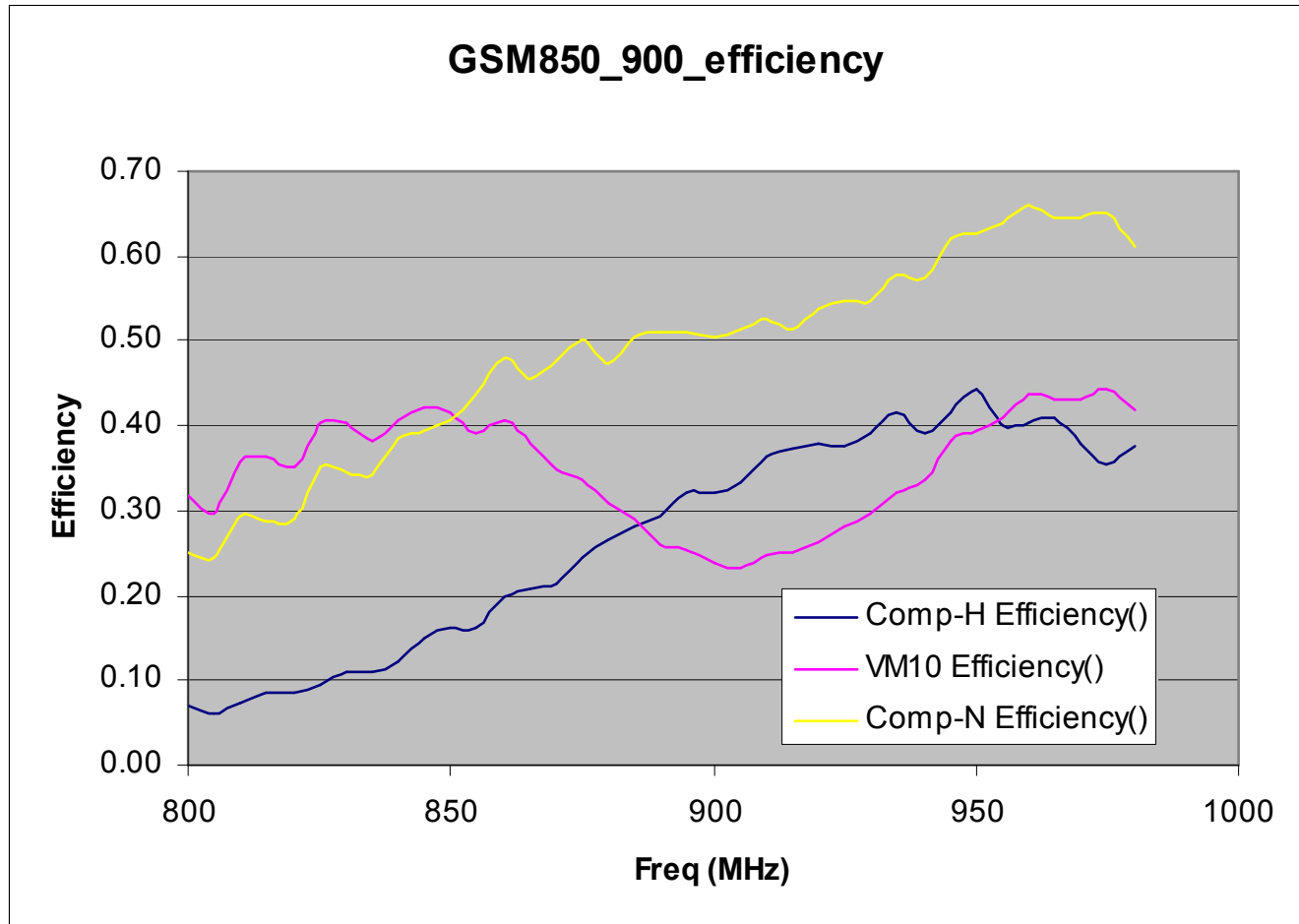


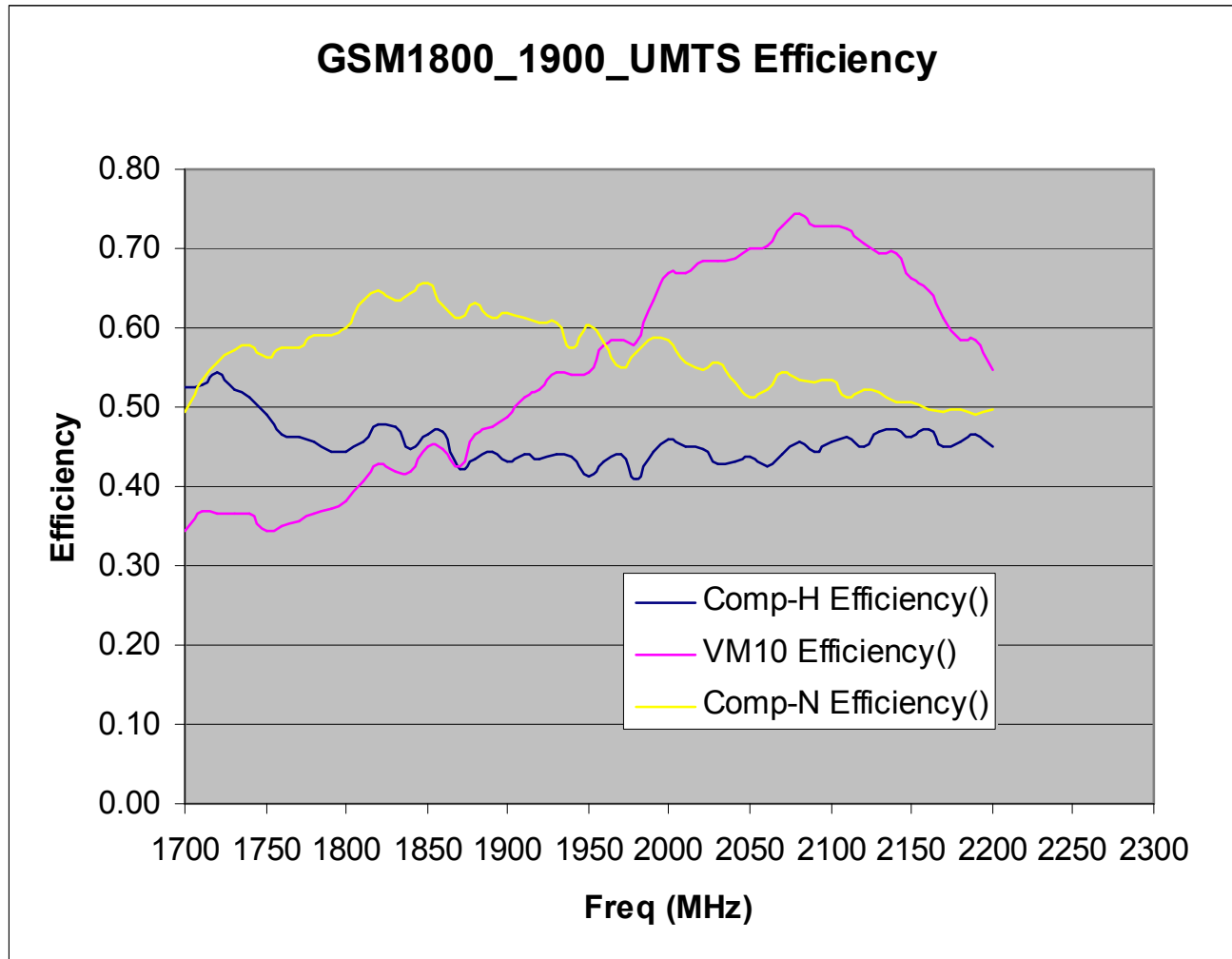
Photo for Competitor-N's antenna



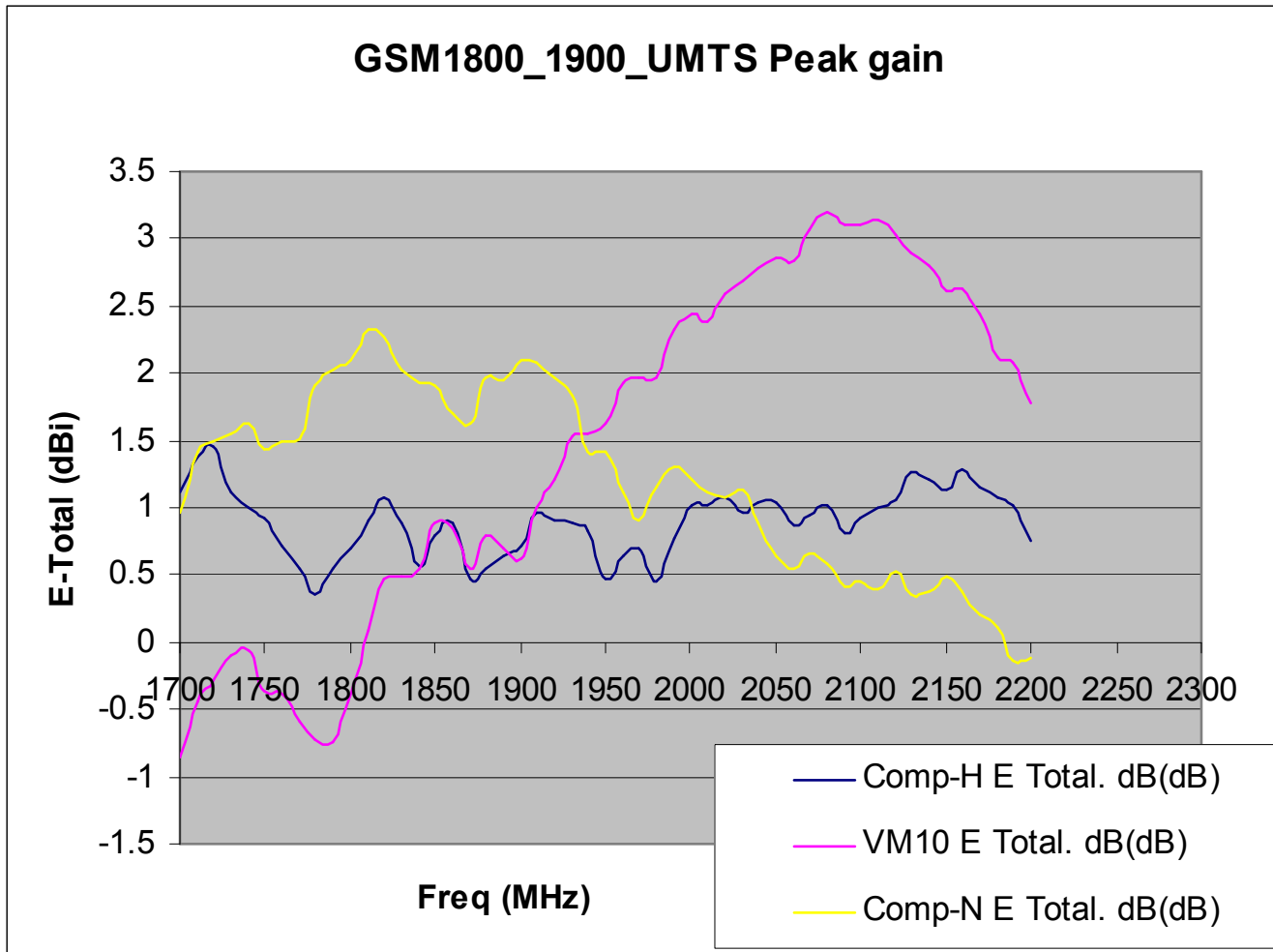
GSM850_900 Efficiency (Free space)



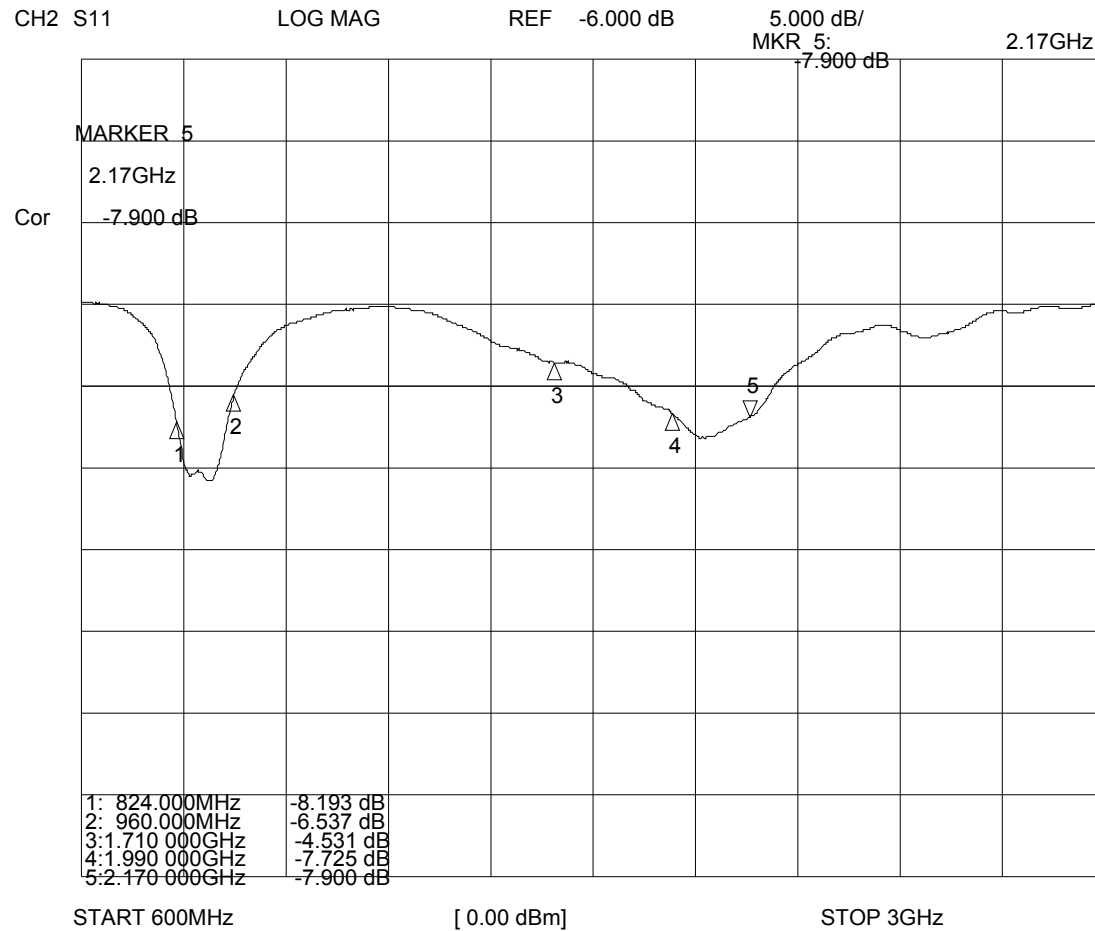
GSM1800_1900_UMTS Efficiency (Free space)



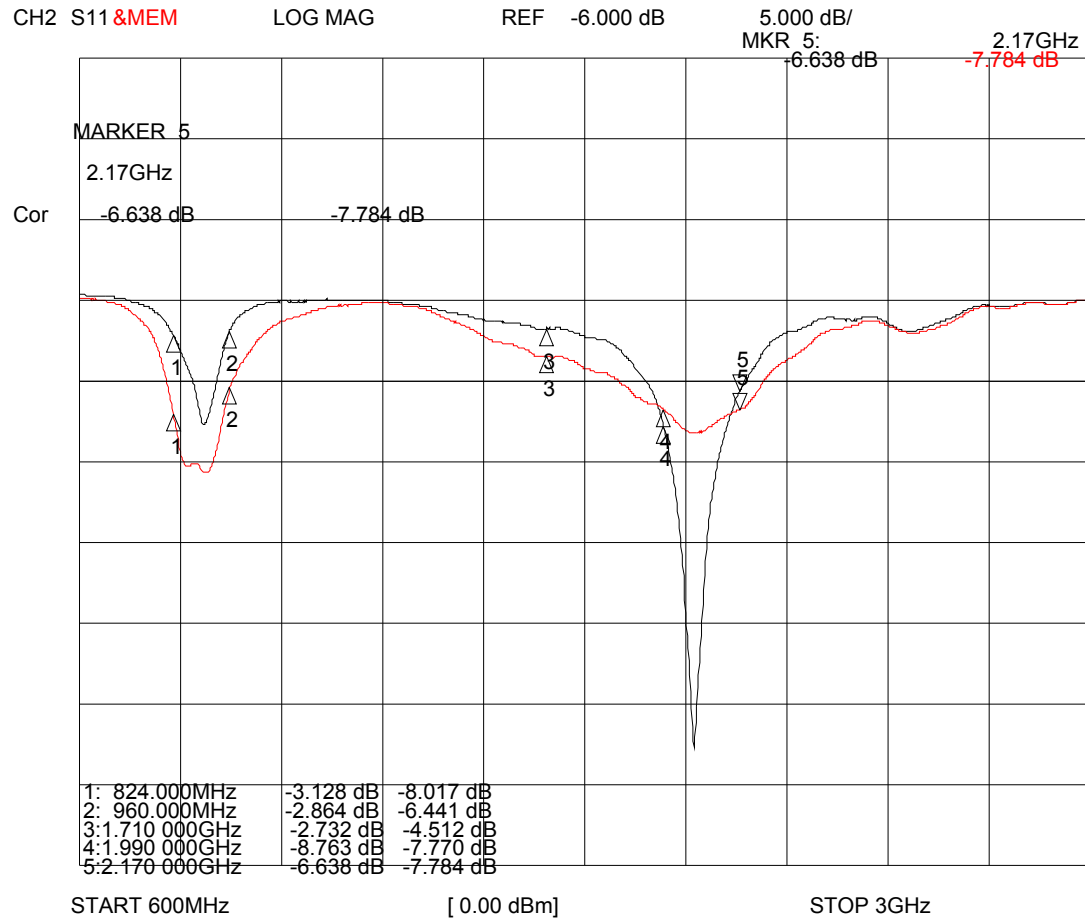
GSM1800_1900_UMTS Gain (Free space)



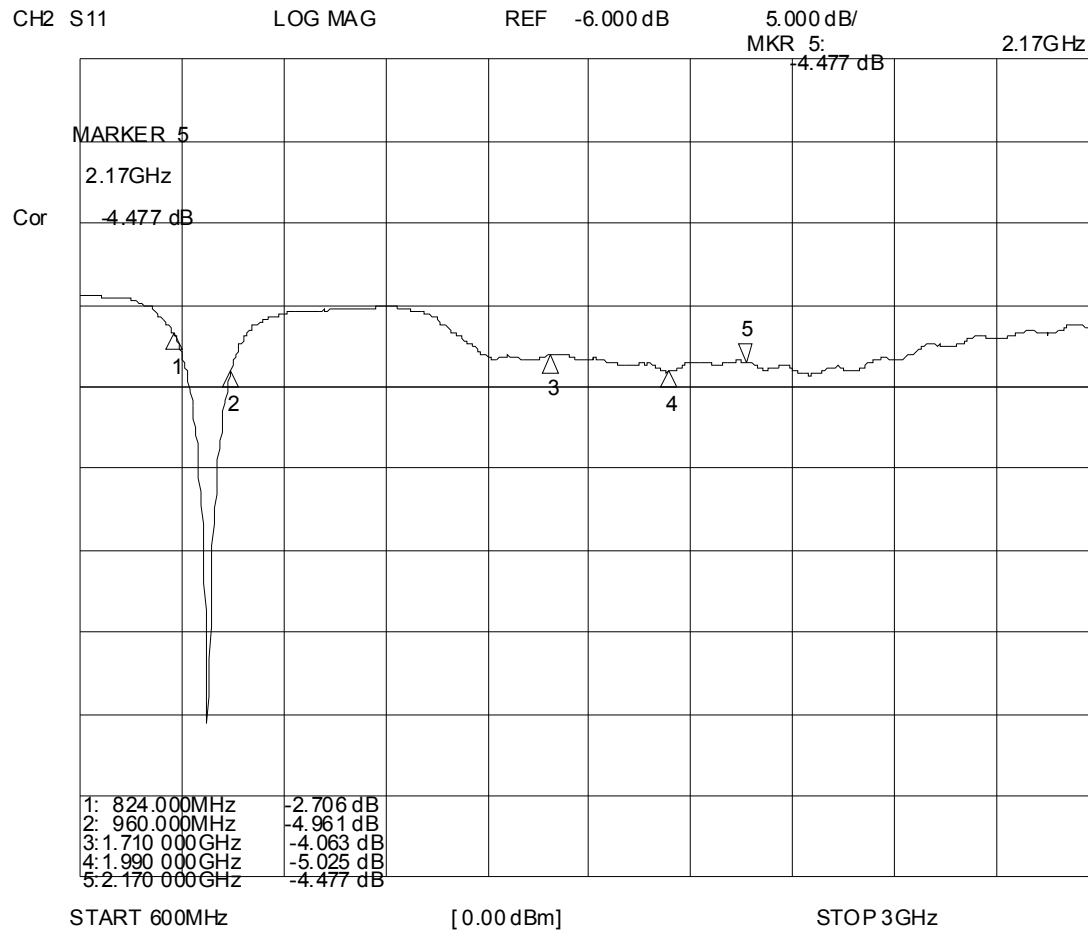
Return Loss for Vigsys VM10 (Free-space)



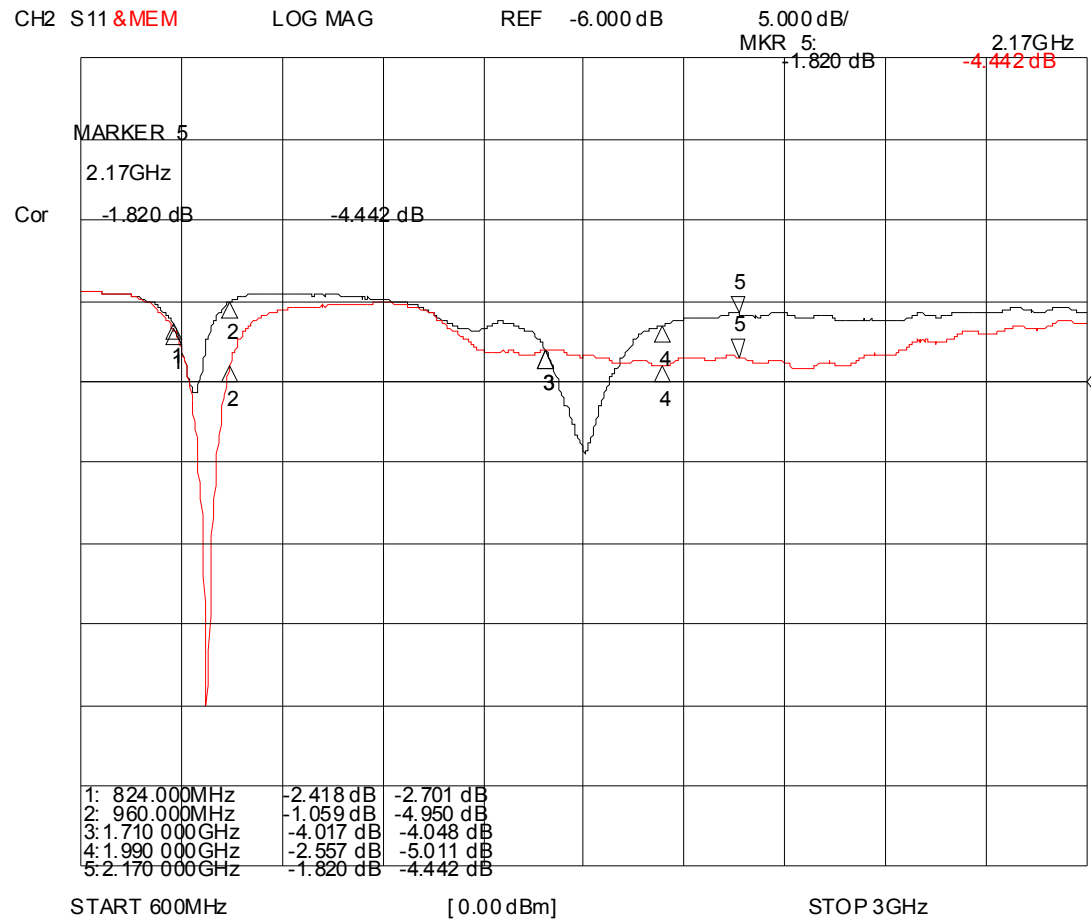
Return loss for Vigsys VM10 (Free space & with GND plane)



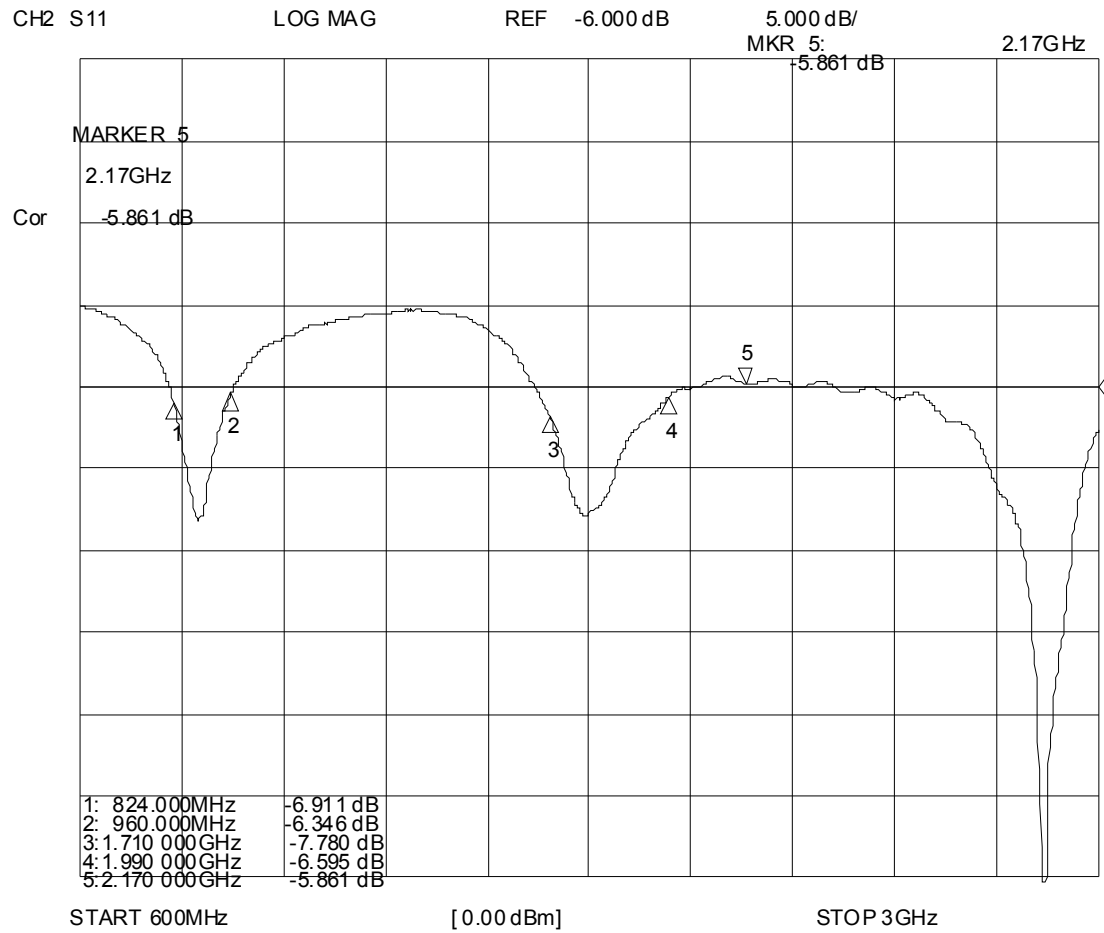
Return Loss for Competitor-H (Free-space)



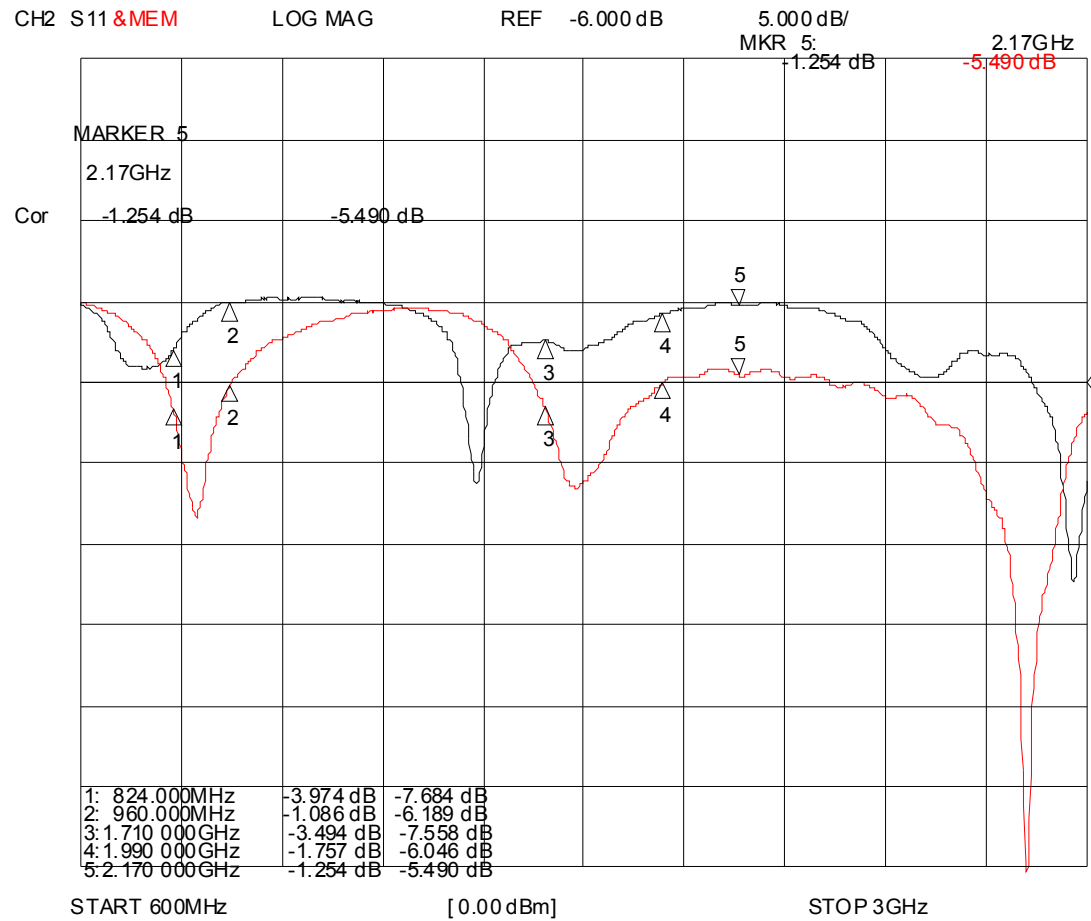
Return loss for Competitor-H (Free space & with GND plane)



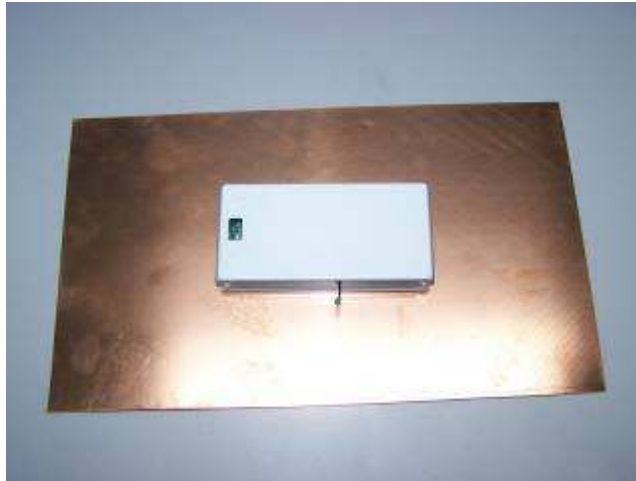
Return Loss for Competitor-N (Free-space)



Return loss for Competitor-N (Free space & with GND plane)



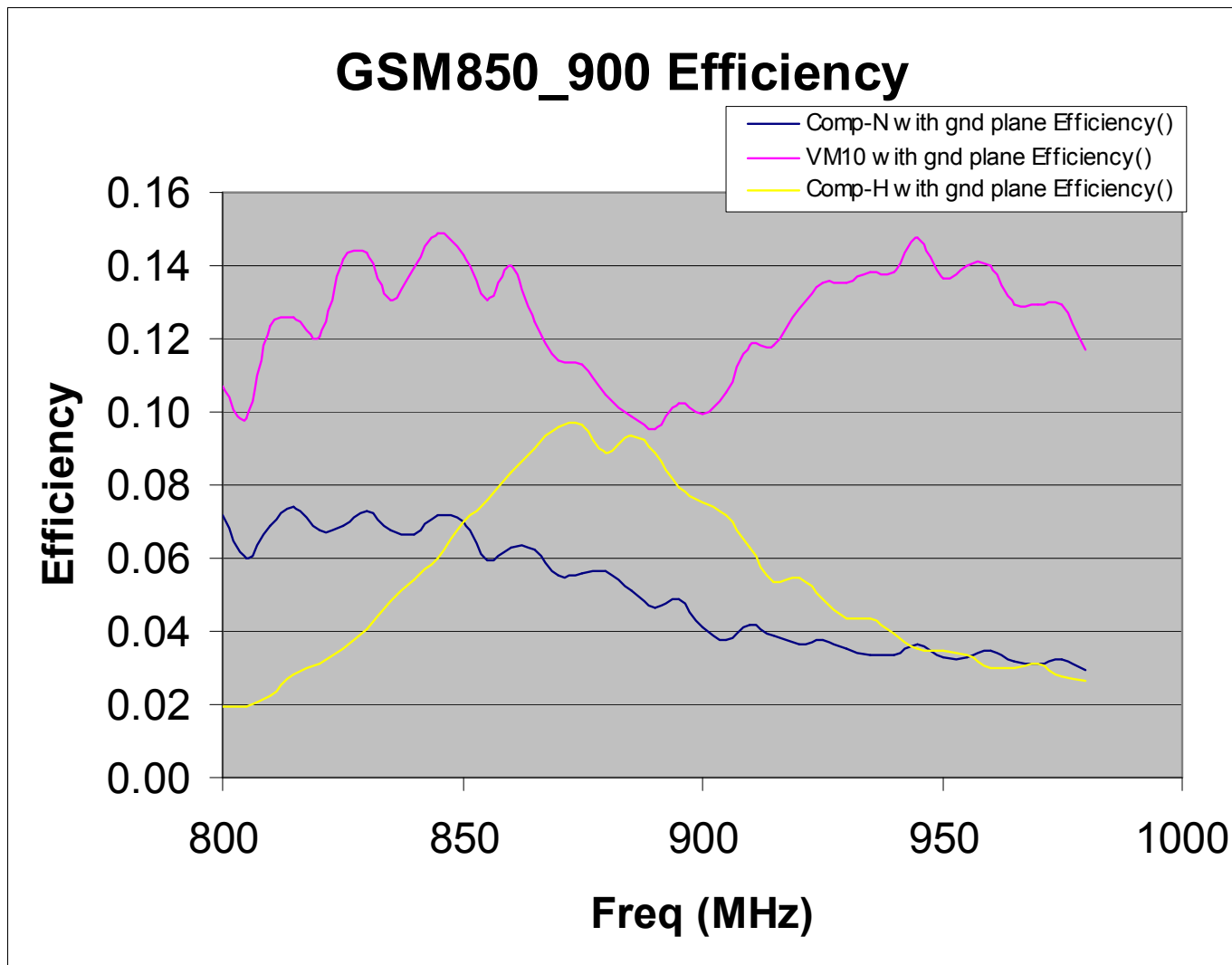
Photos of device under test with GND plane



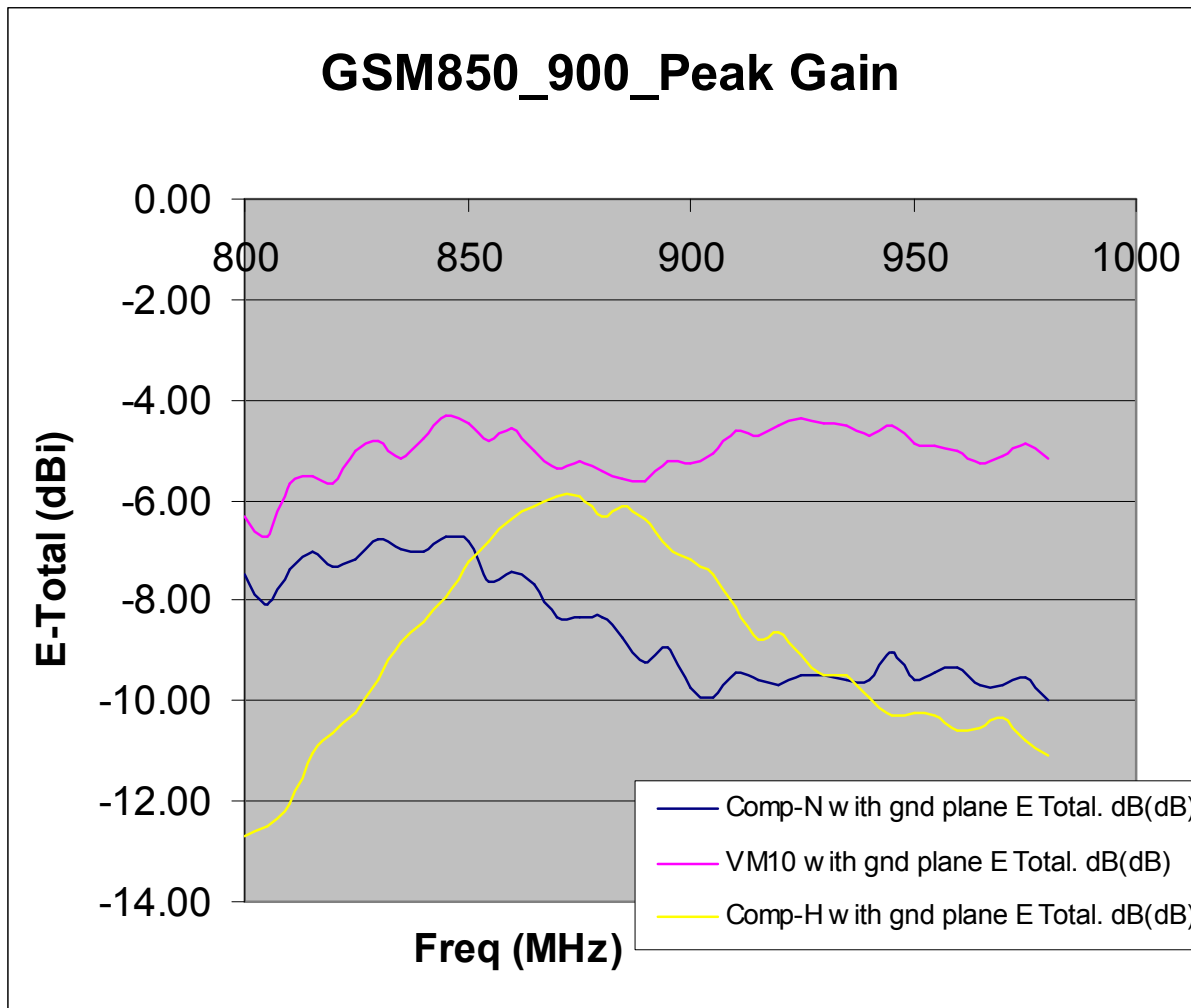
Vigsys VM10

Note: Comp-H and Comp-N products are tested with same test setup

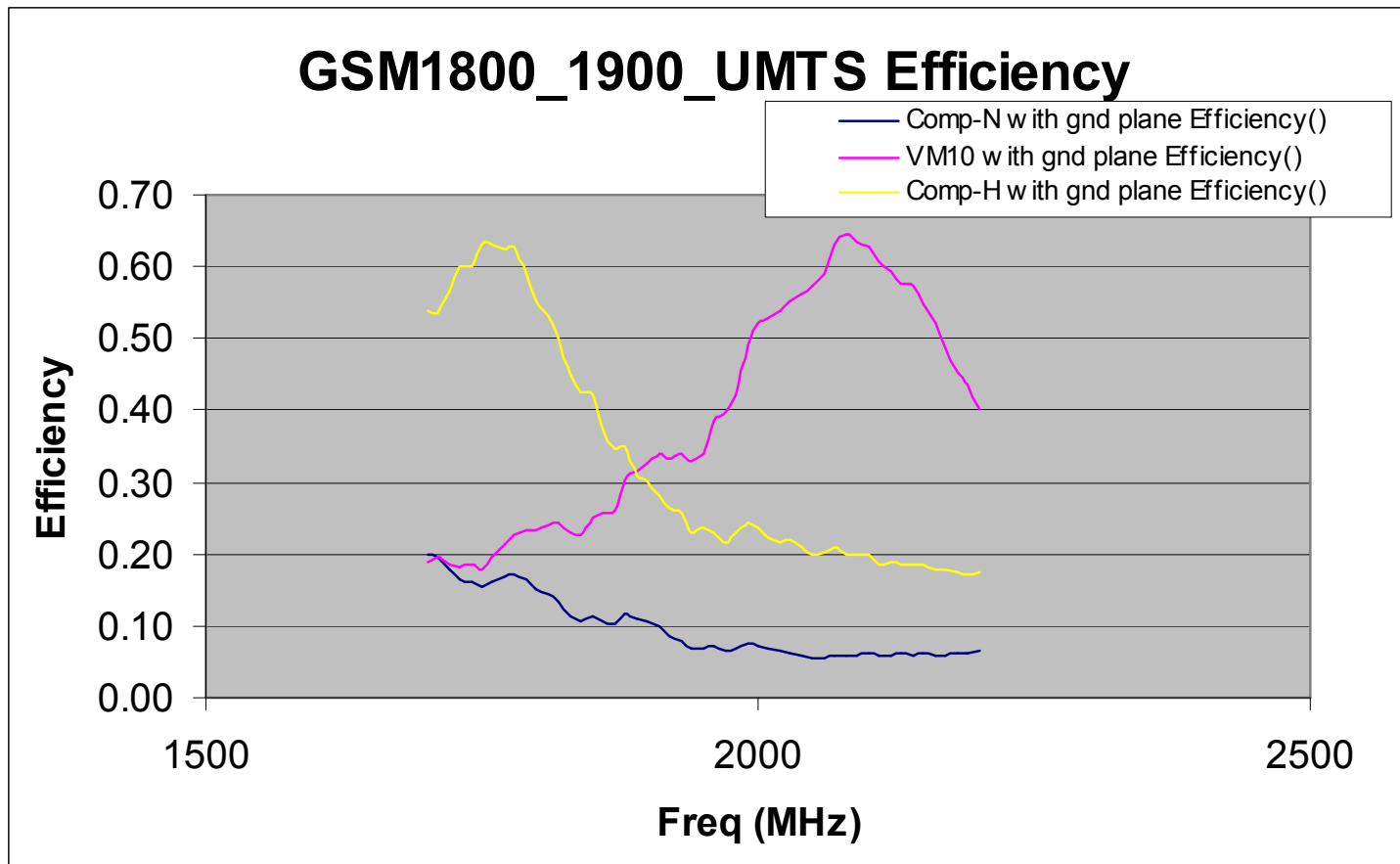
GSM850_900 Efficiency (GND plane)



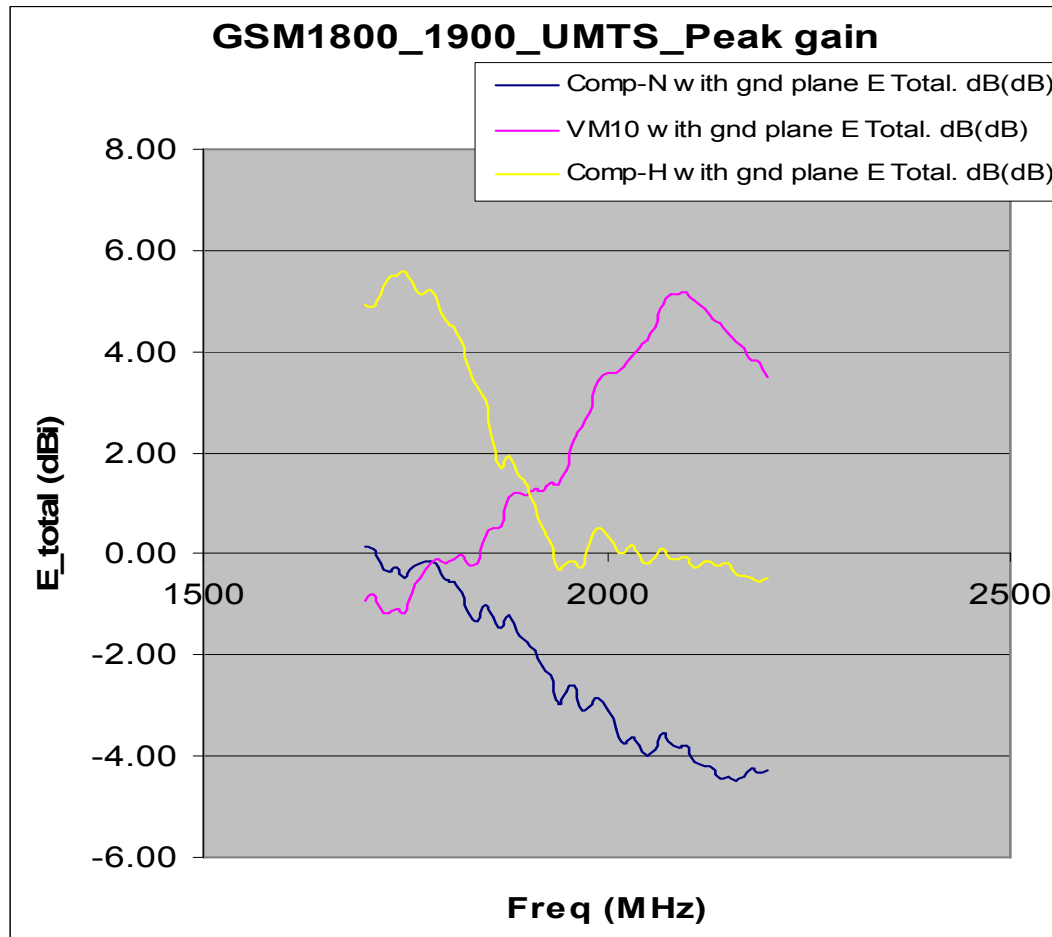
GSM850_900 Gain (GND plane)



GSM1800_1900_UMTS Efficiency (GND plane)



GSM1800_1900_UMTS Gain (GND plane)



Conclusion



- On average, in free space condition, Competitor-N's antenna performs better than the rest of the competitions.
- However, Vigsys VM10's antenna performs the best in UMTS band.
- Based on the return-loss plots of the various antennas, Vigsys VM10's antenna showed minimum degradation when placed over a ground plane.
- Both Competitor-N and Competitor-H antenna would not perform well at UMTS band once the device is placed over a large ground plane such as casing of a desktop PC.
- This explains why Vigsys VM10's solution has better overall performance – especially in the UMTS band.

Thank You & Discussion

