Figure B32: GSM15 one mode envelope, Band 2.

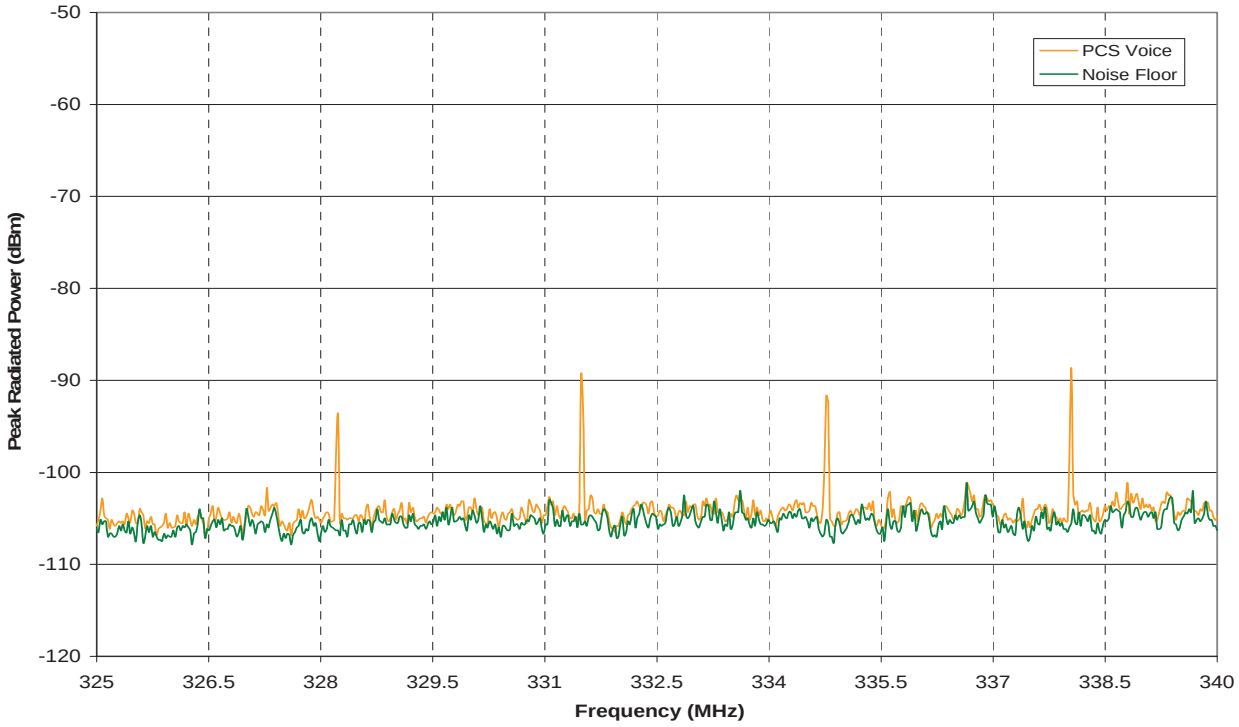

Figure B33: GSM16 one mode envelope, Band 2.

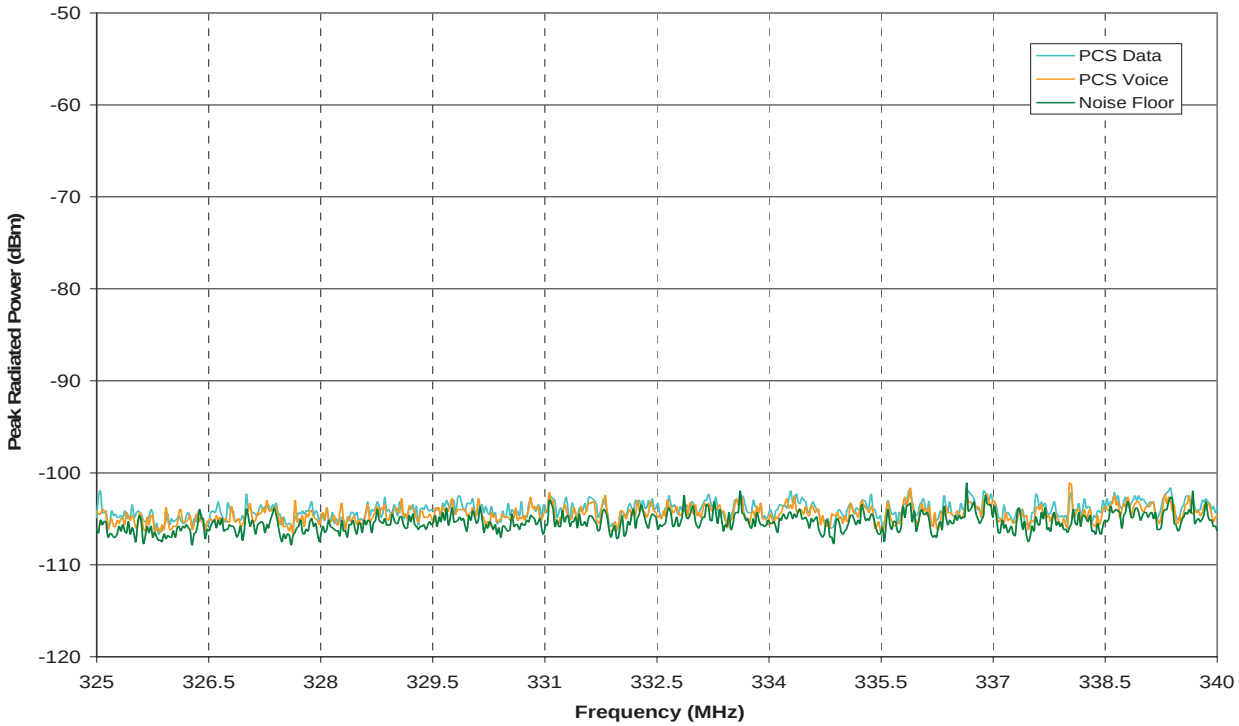

Figure B34: GSM17 two mode envelopes, Band 2.

B.3 Band 3

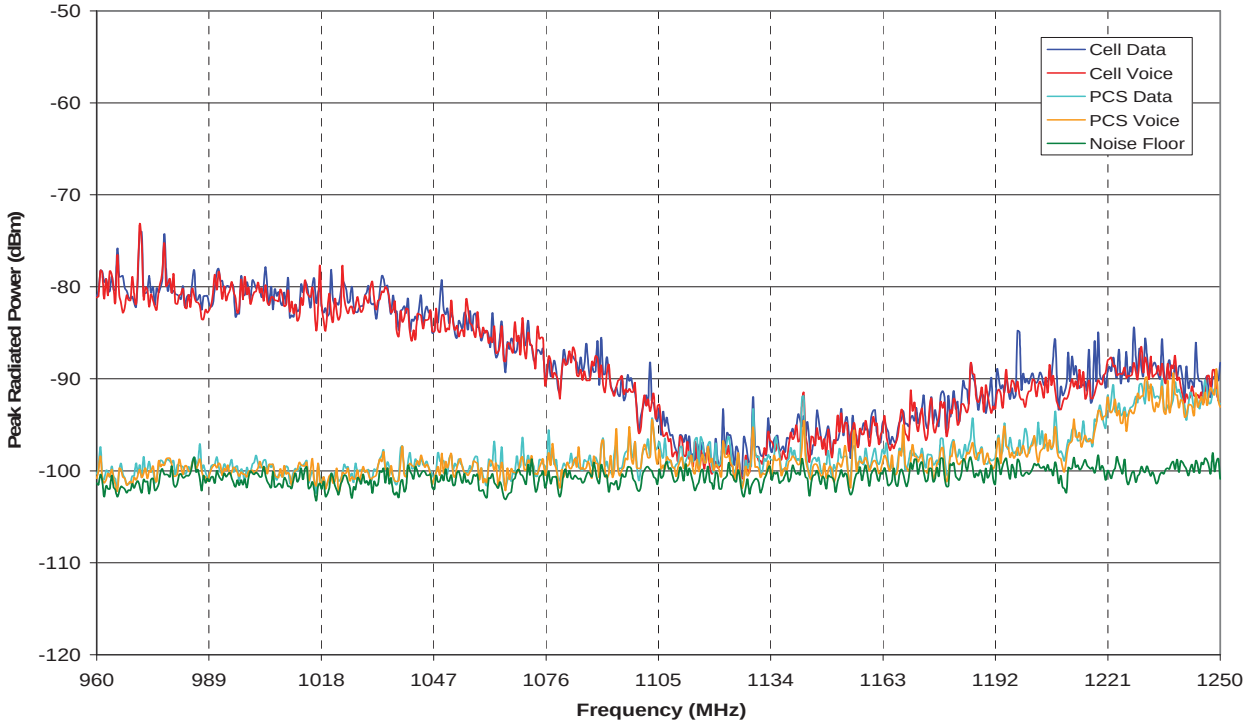

Figure B35: GSM01 four mode envelopes, Band 2.

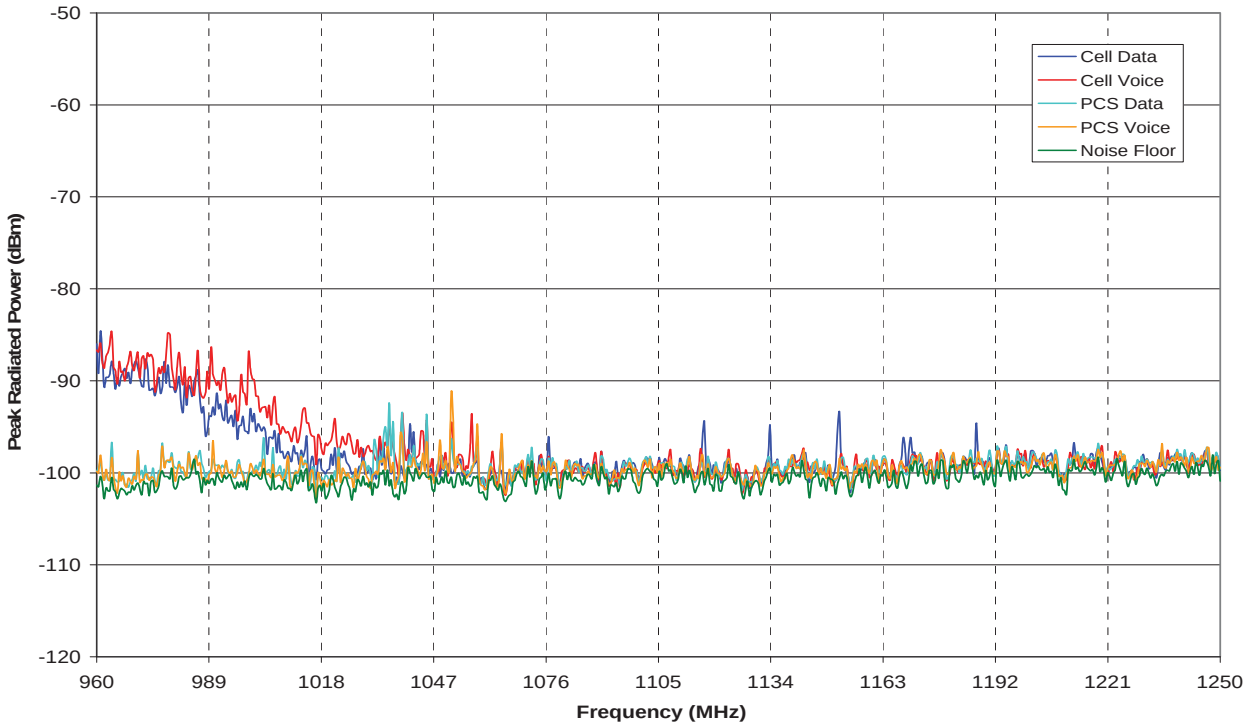

Figure B36: GSM02 four mode envelopes, Band 3.

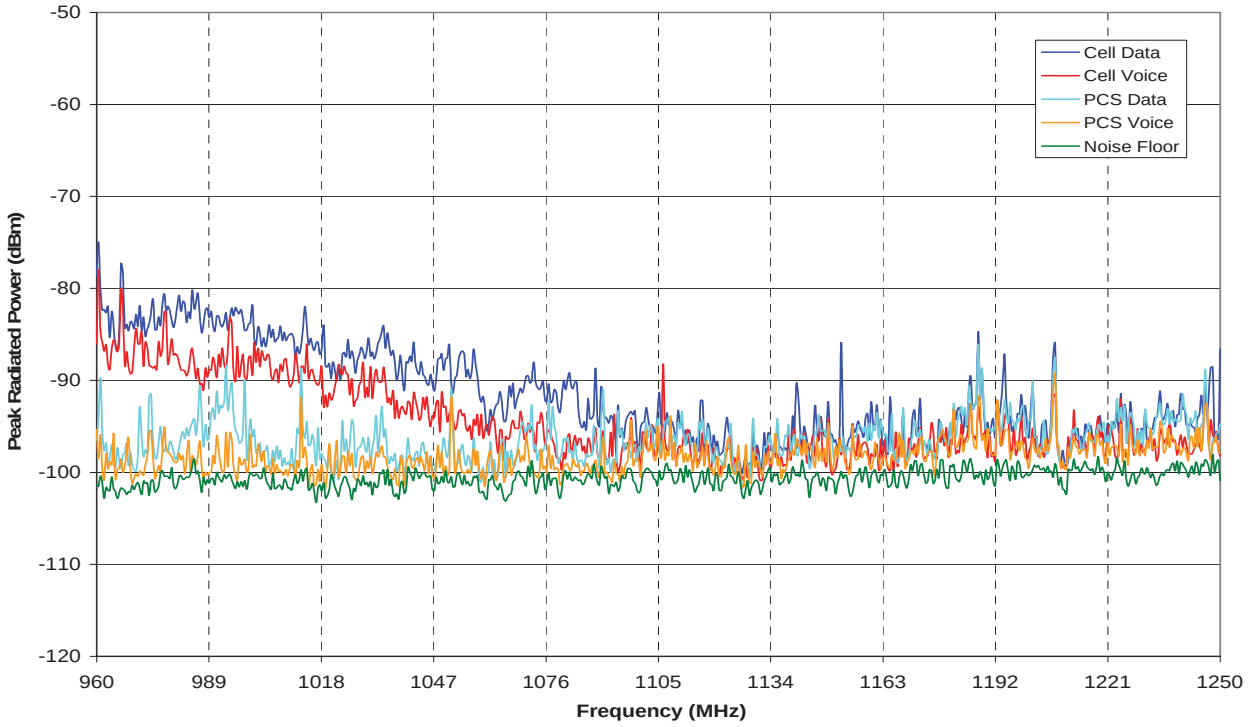

Figure B37: GSM03 four mode envelopes, Band 3.

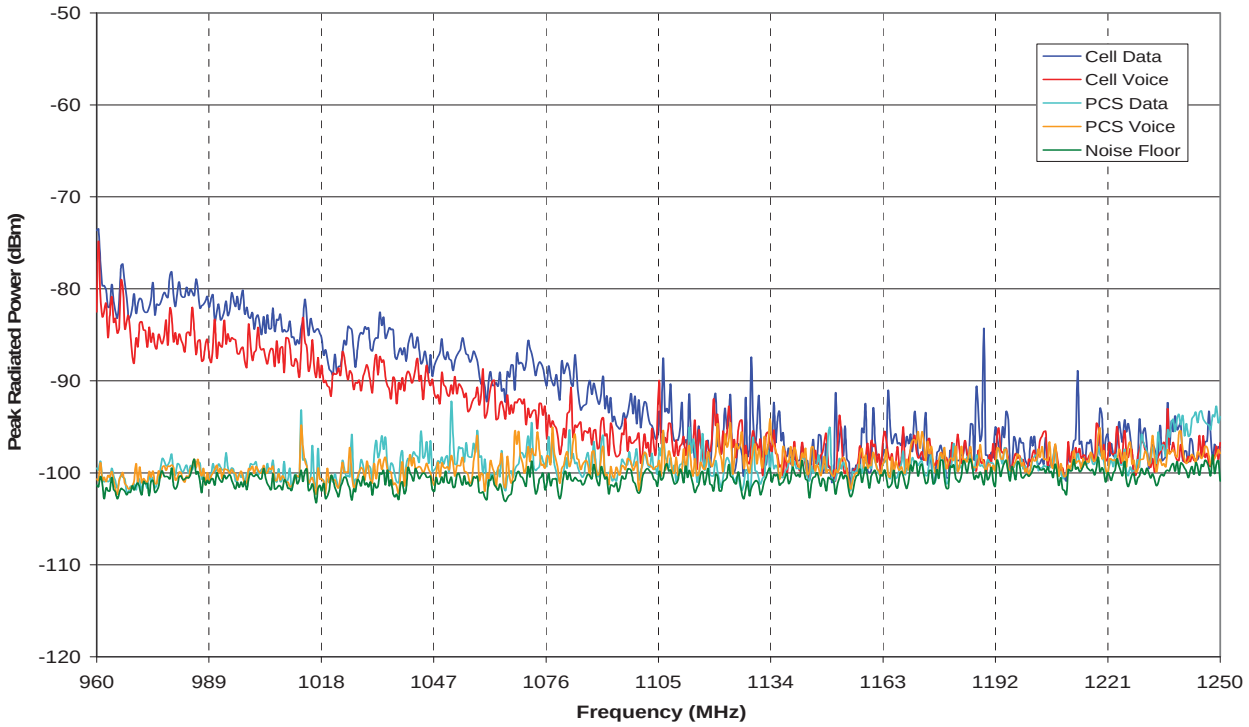

Figure B38: GSM04 four mode envelopes, Band 3.

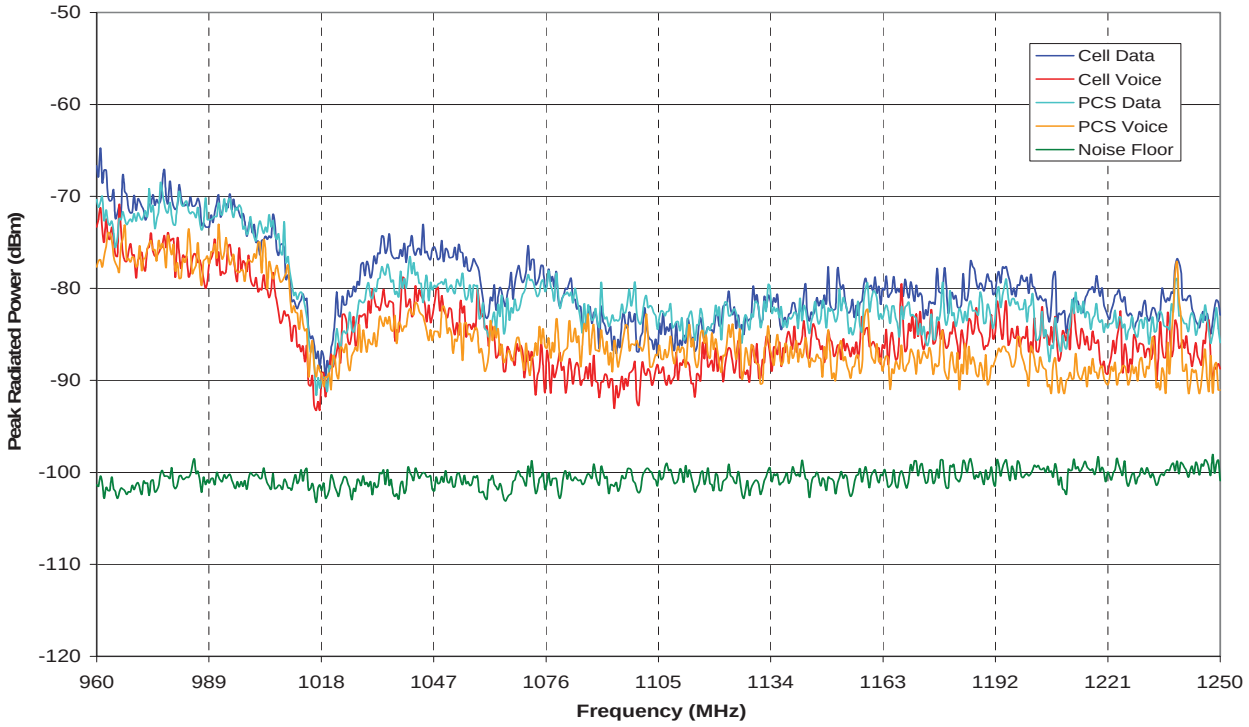

Figure B39: GSM05 four mode envelopes, Band 3.

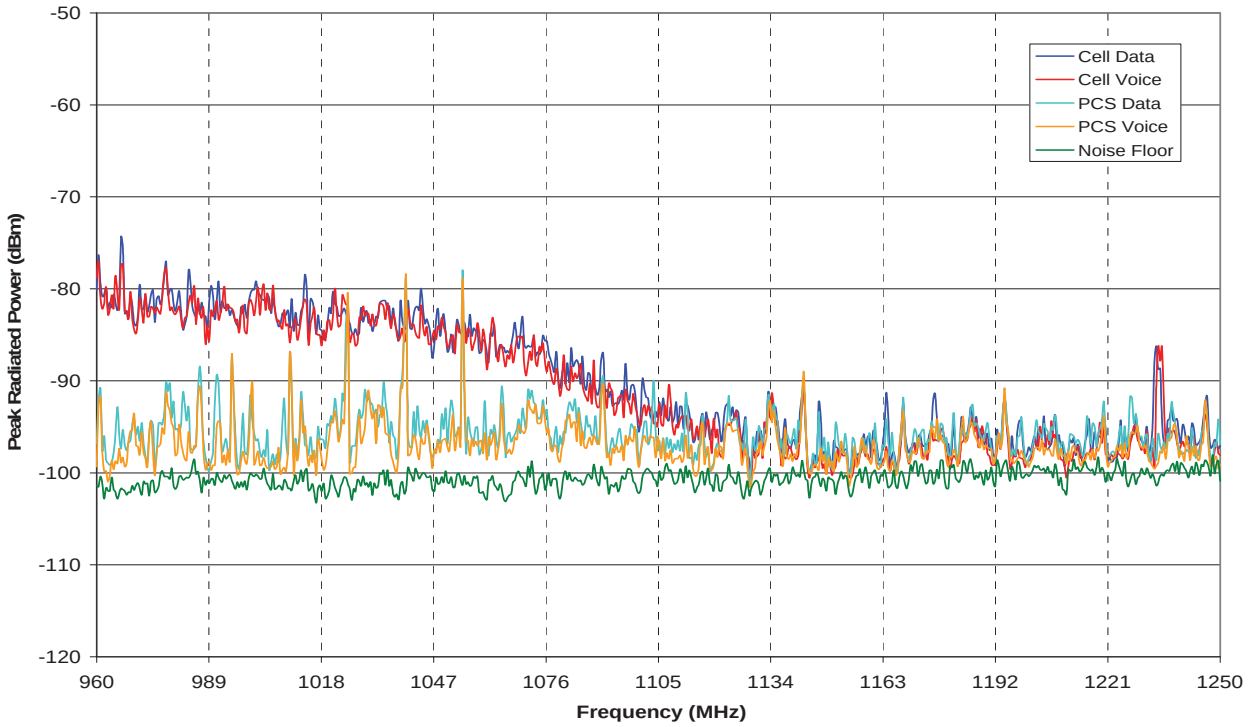

Figure B40: GSM06 four mode envelopes, Band 3.

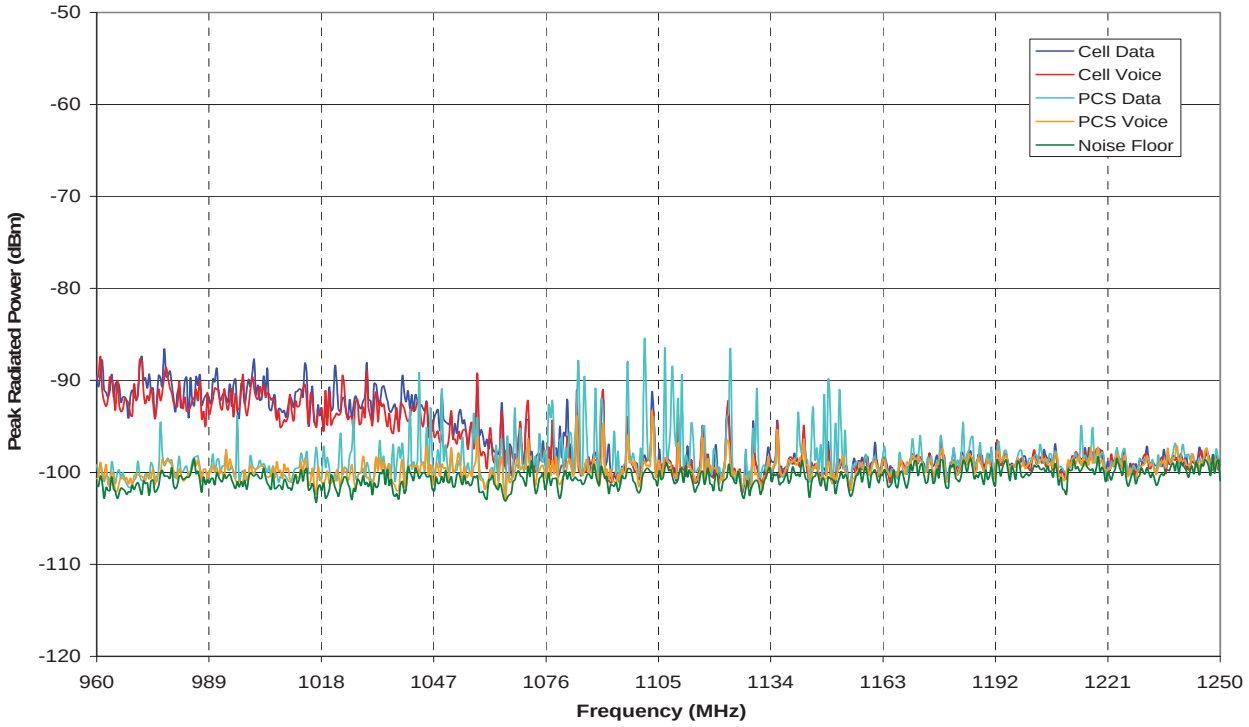

Figure B41: GSM07 four mode envelopes, Band 3.

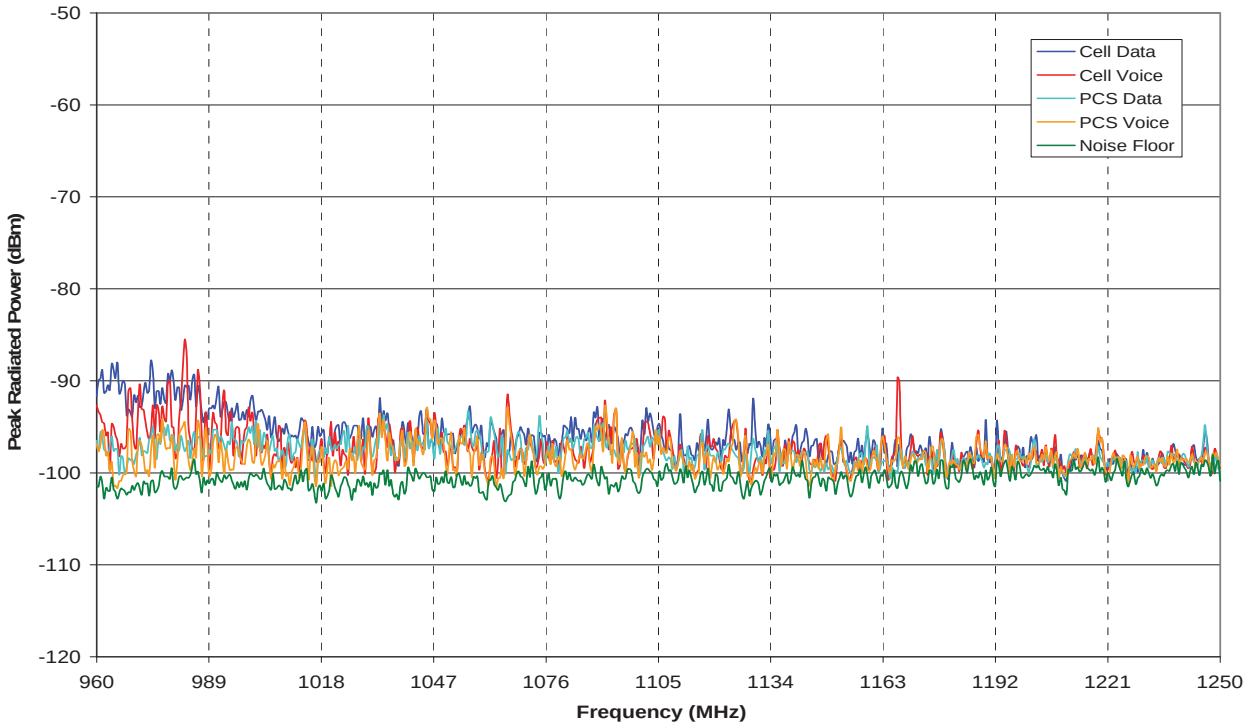

Figure B42: GSM08 four mode envelope, Band 3.

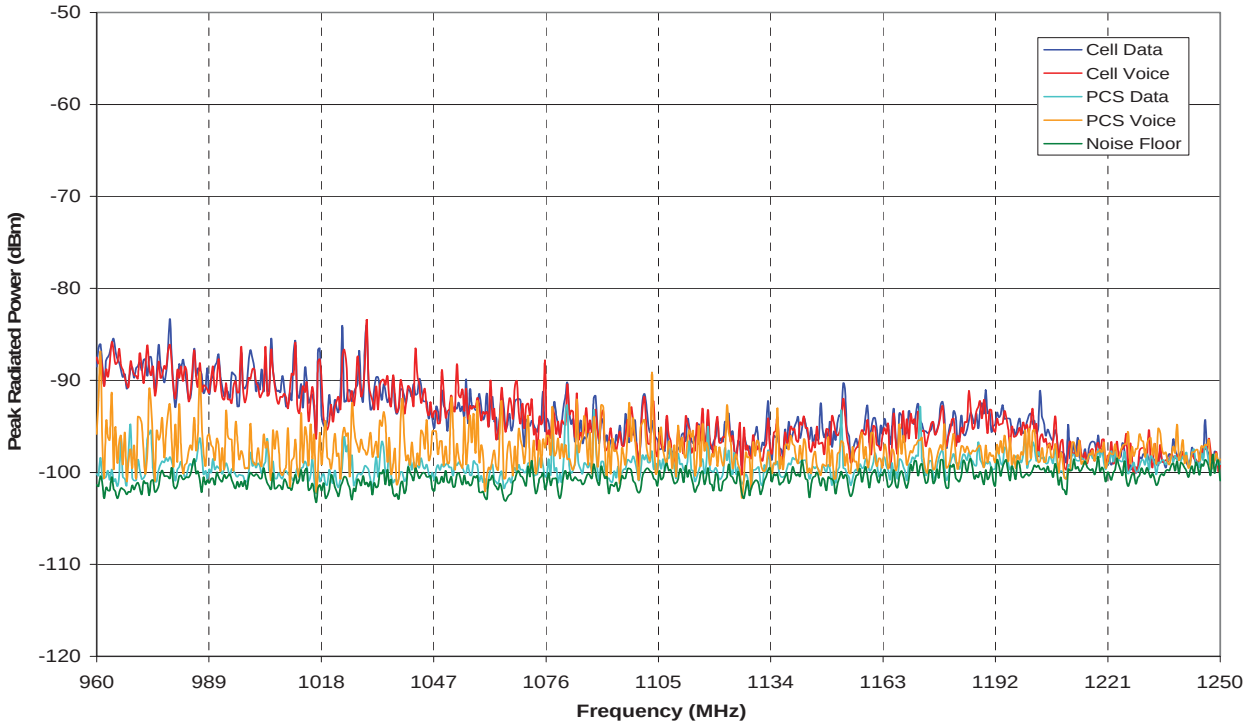

Figure B43: GSM09 four mode envelopes, Band 3.

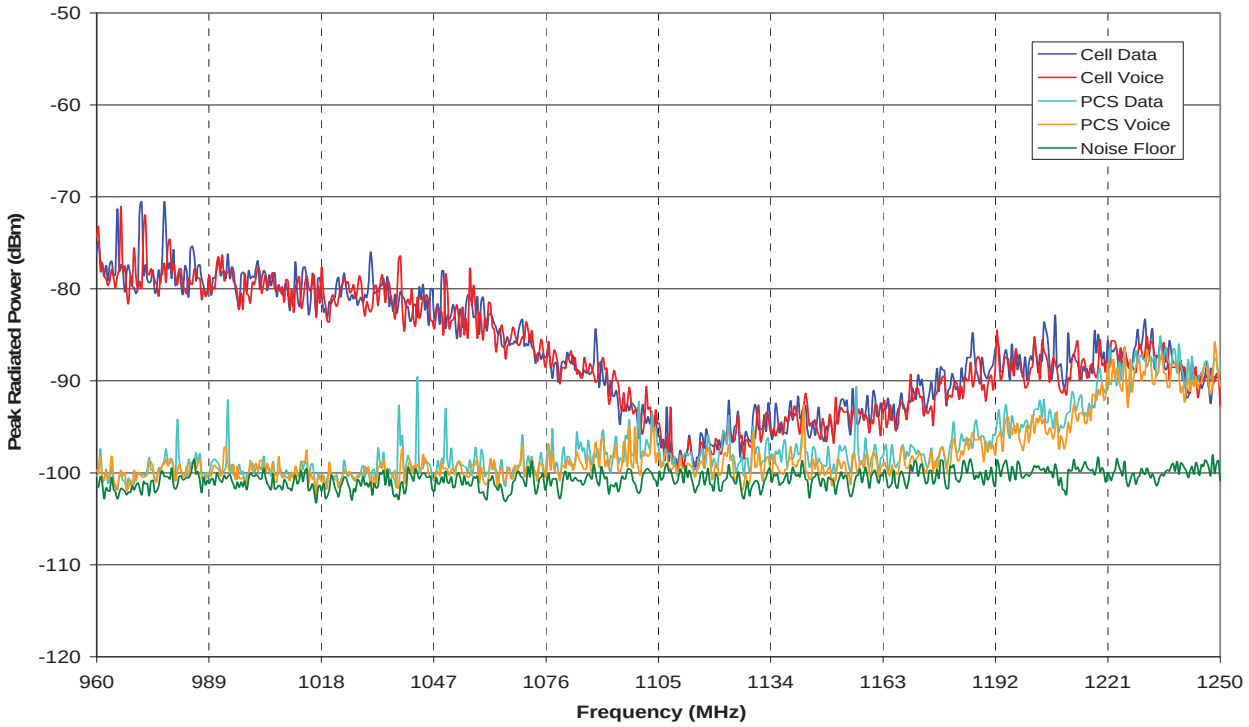

Figure B44: GSM10 four mode envelopes, Band 3.

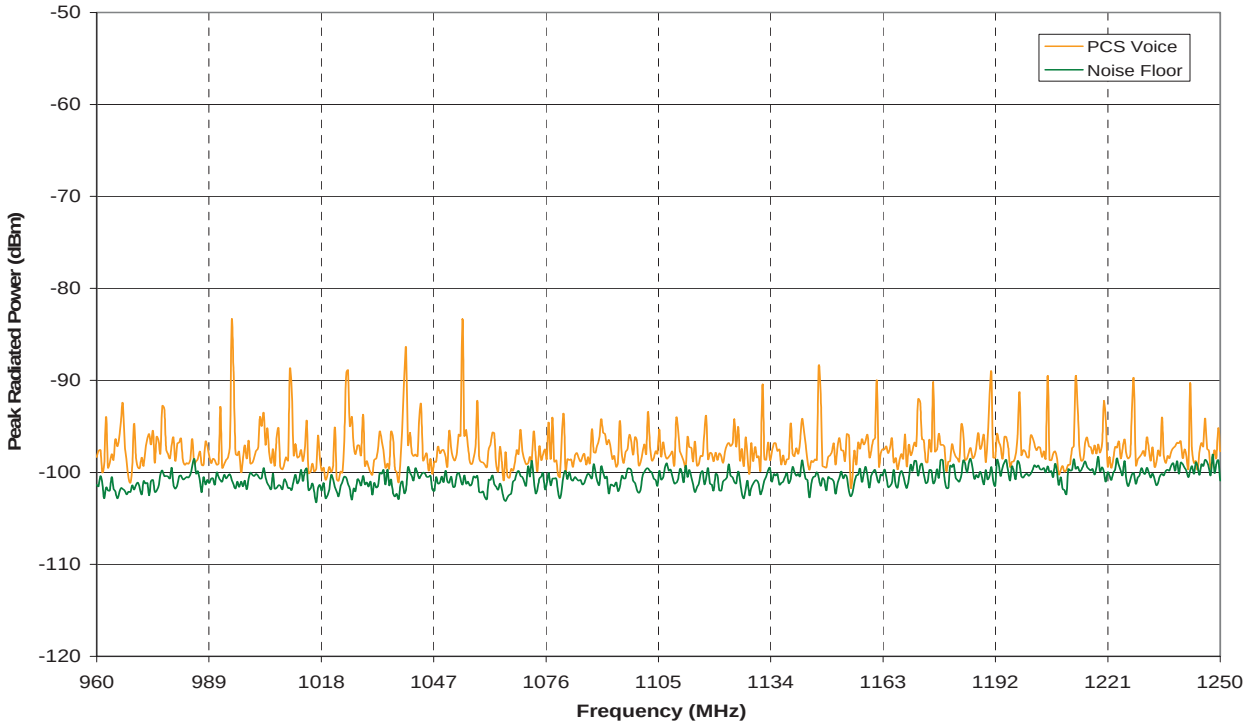

Figure B45: GSM11 four mode envelopes, Band 3.

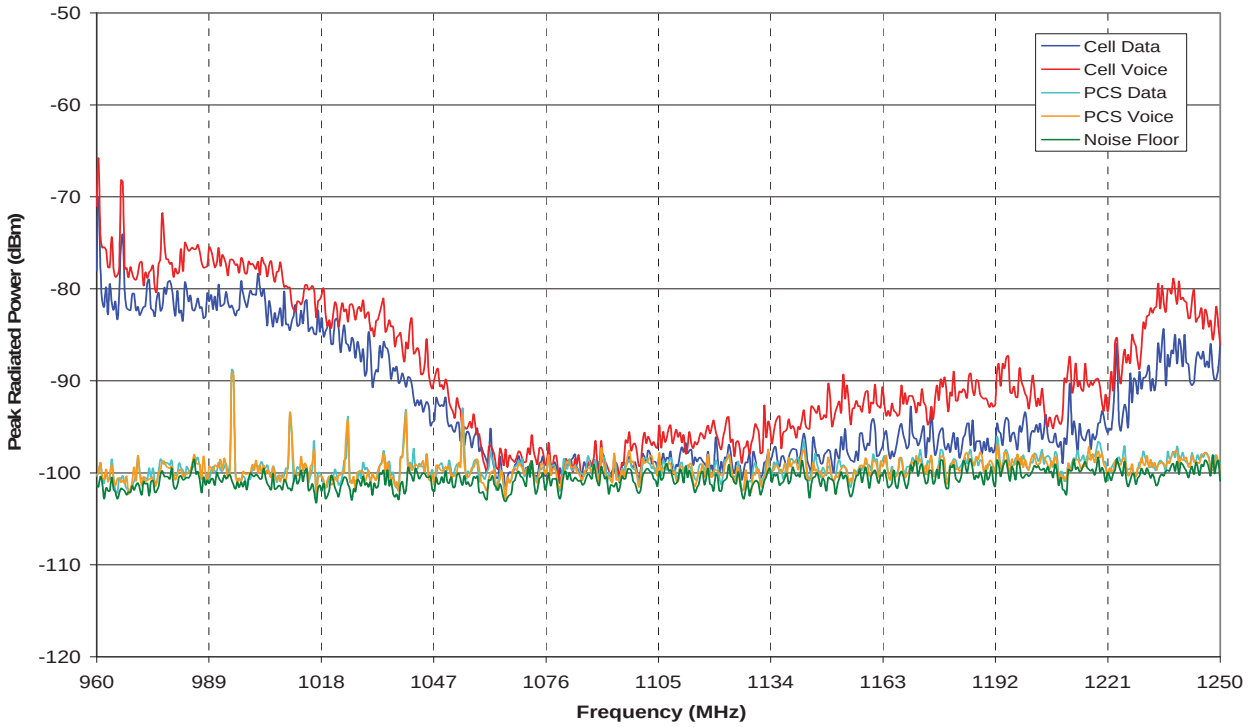

Figure B46: GSM12 four mode envelopes, Band 3.

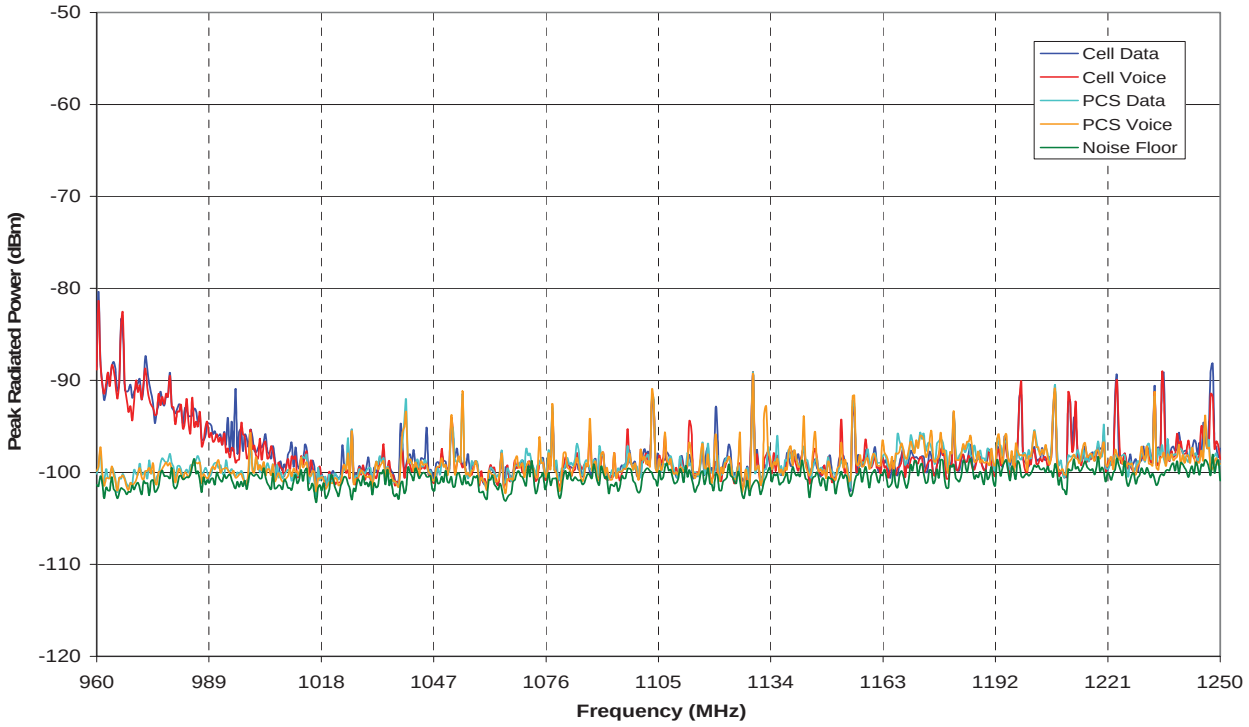

Figure B47: GSM13 four mode envelopes, Band 3.

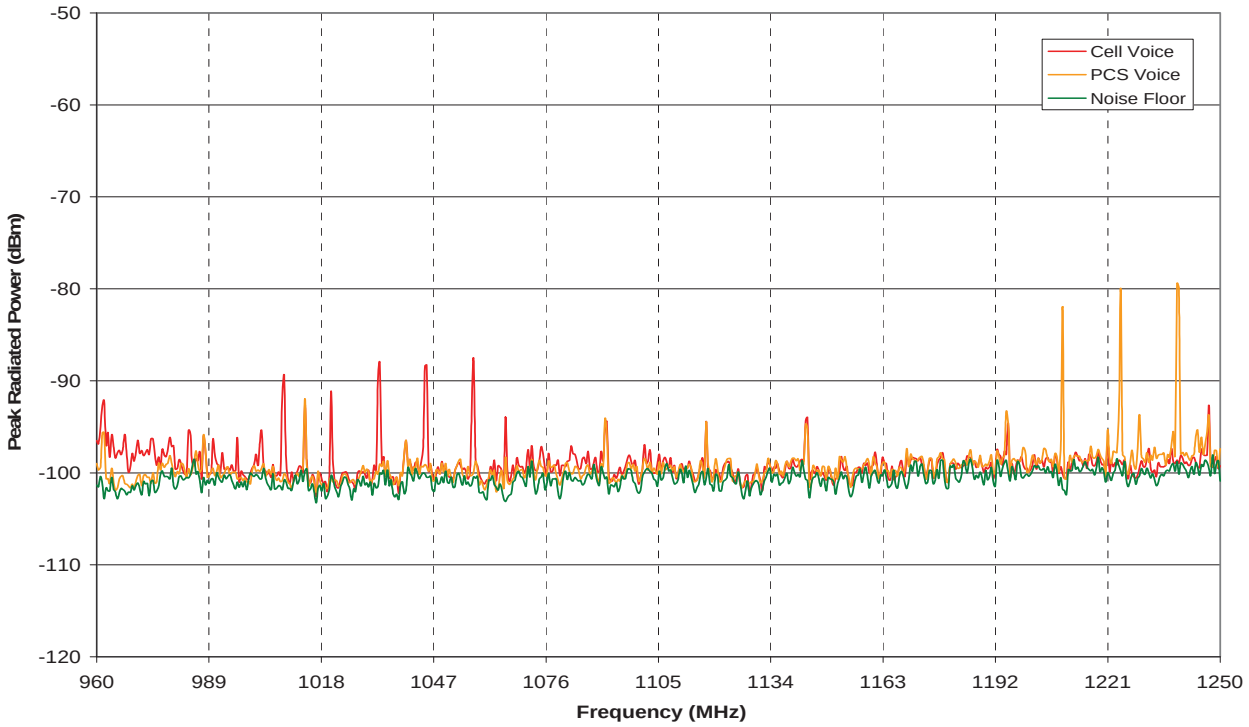

Figure B48: GSM14 two mode envelopes, Band 3.

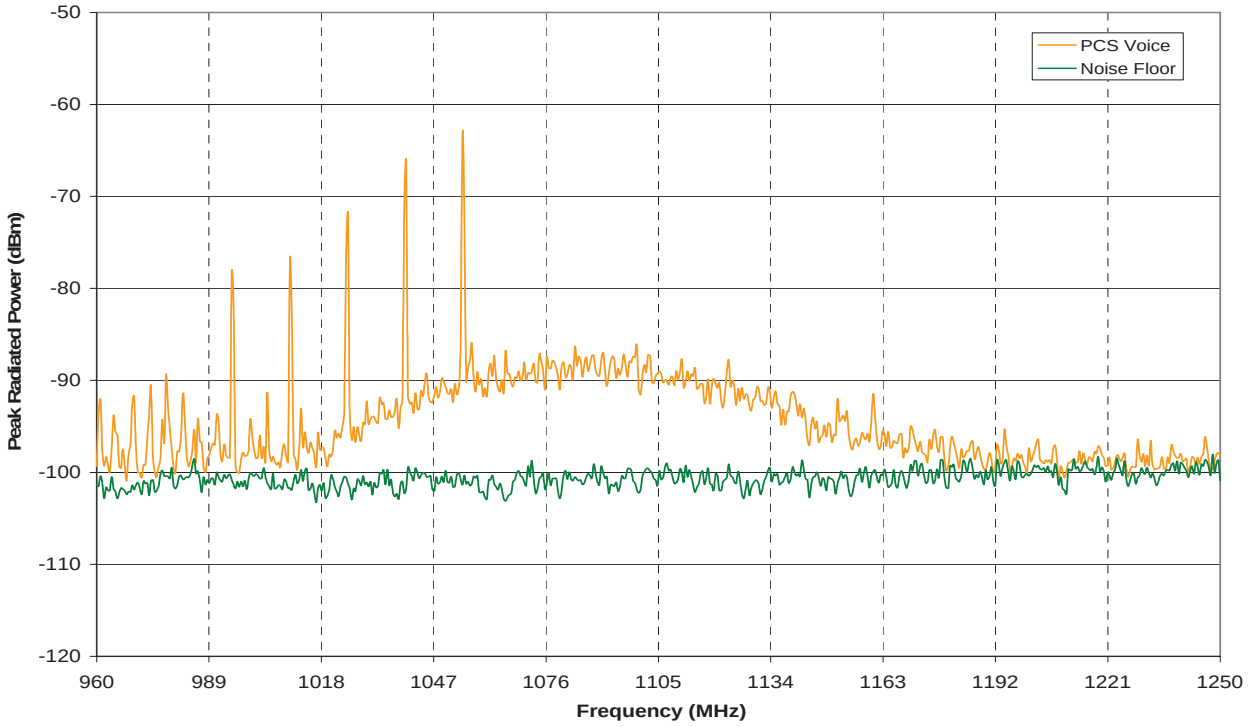

Figure B49: GSM15 one mode envelope, Band 3.

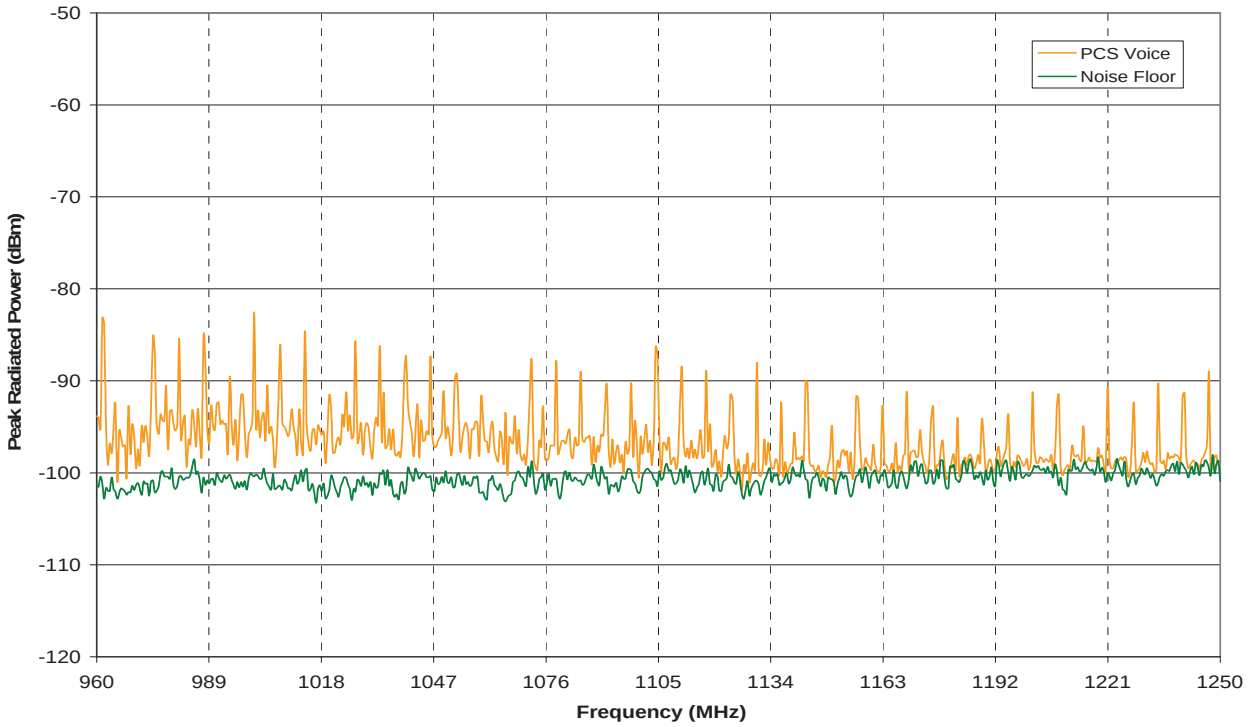

Figure B50: GSM16 one mode envelope, Band 3.

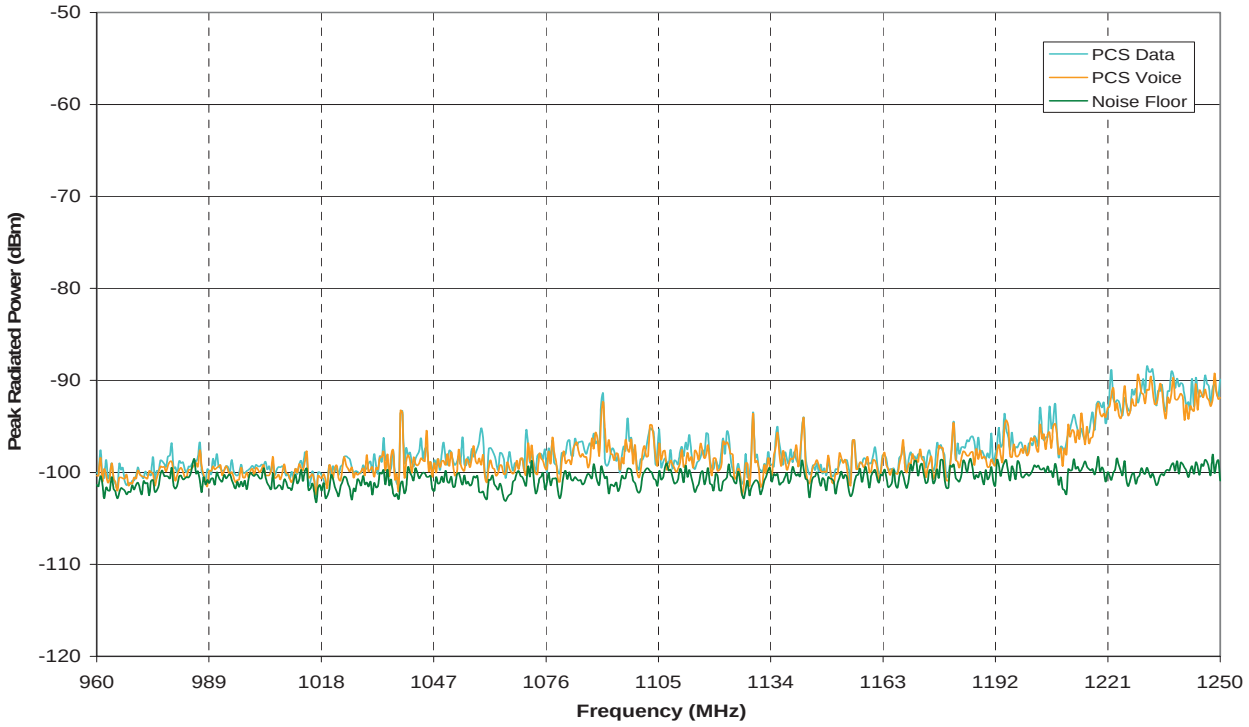

Figure B51: GSM17 two mode envelopes, Band 3.

B.4 Band 4

Figure B52: GSM01 four mode envelopes, Band 4.

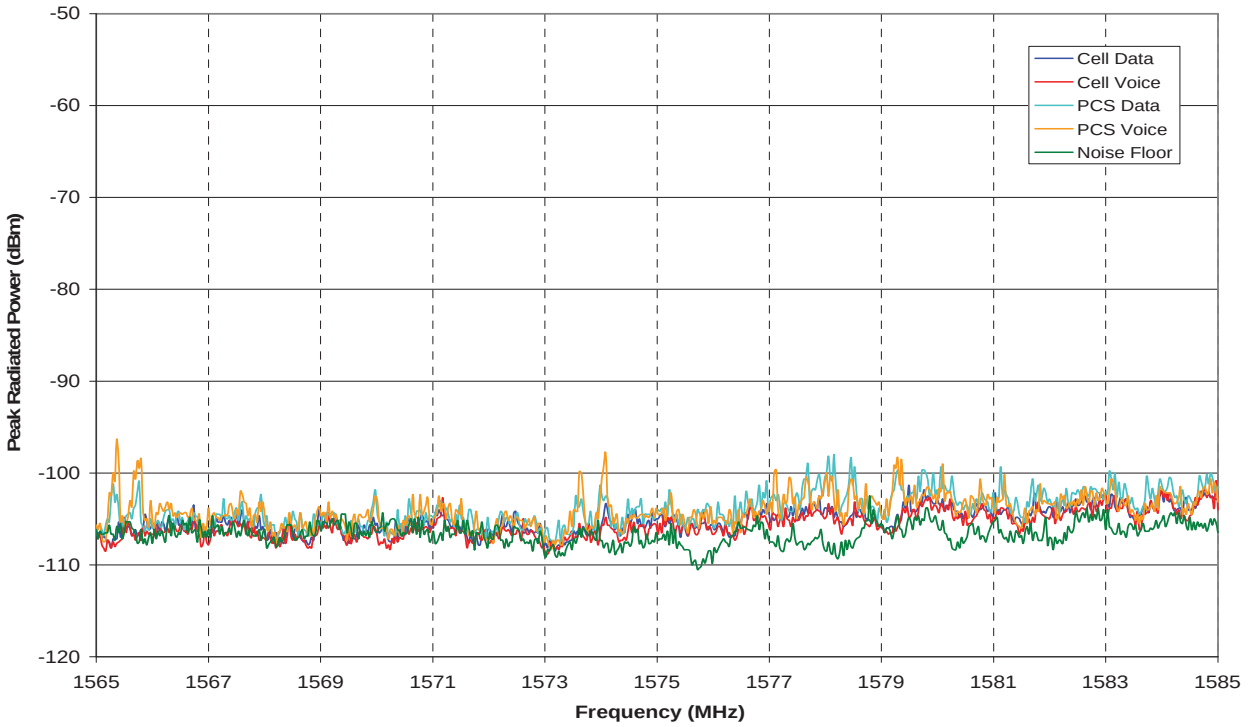

Figure B53: GSM02 four mode envelopes, Band 4.

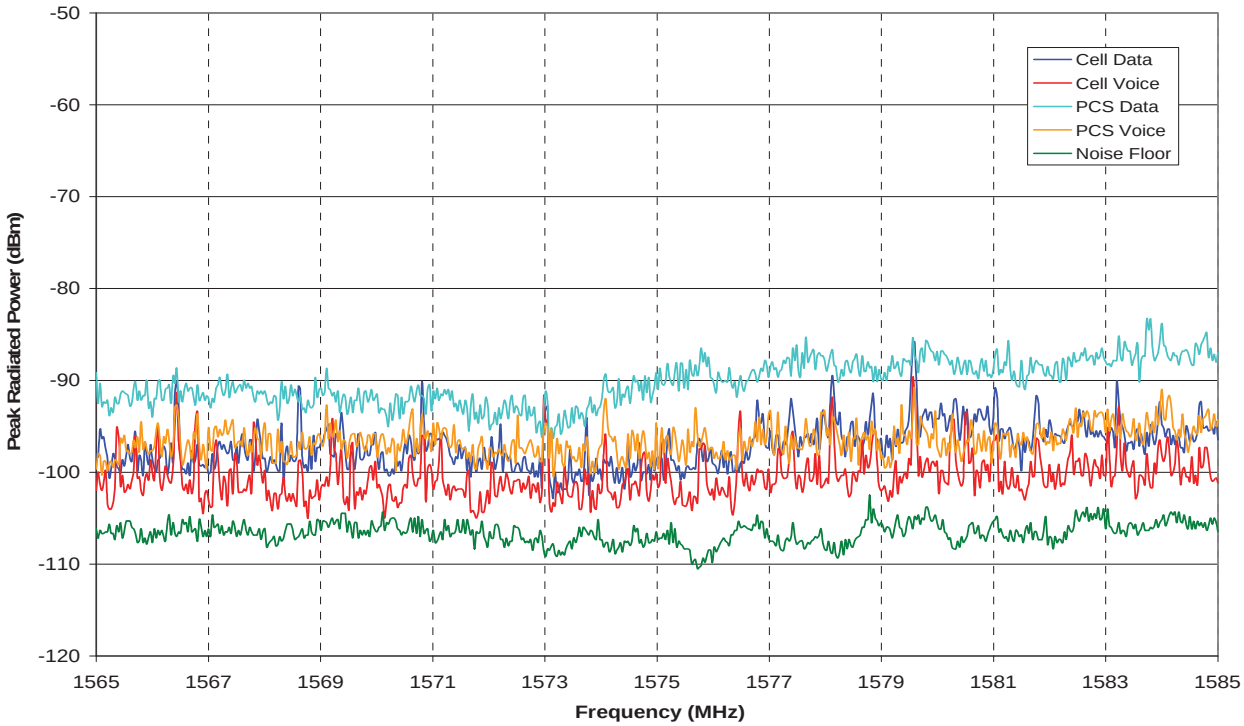

Figure B54: GSM03 four mode envelope, Band 4.

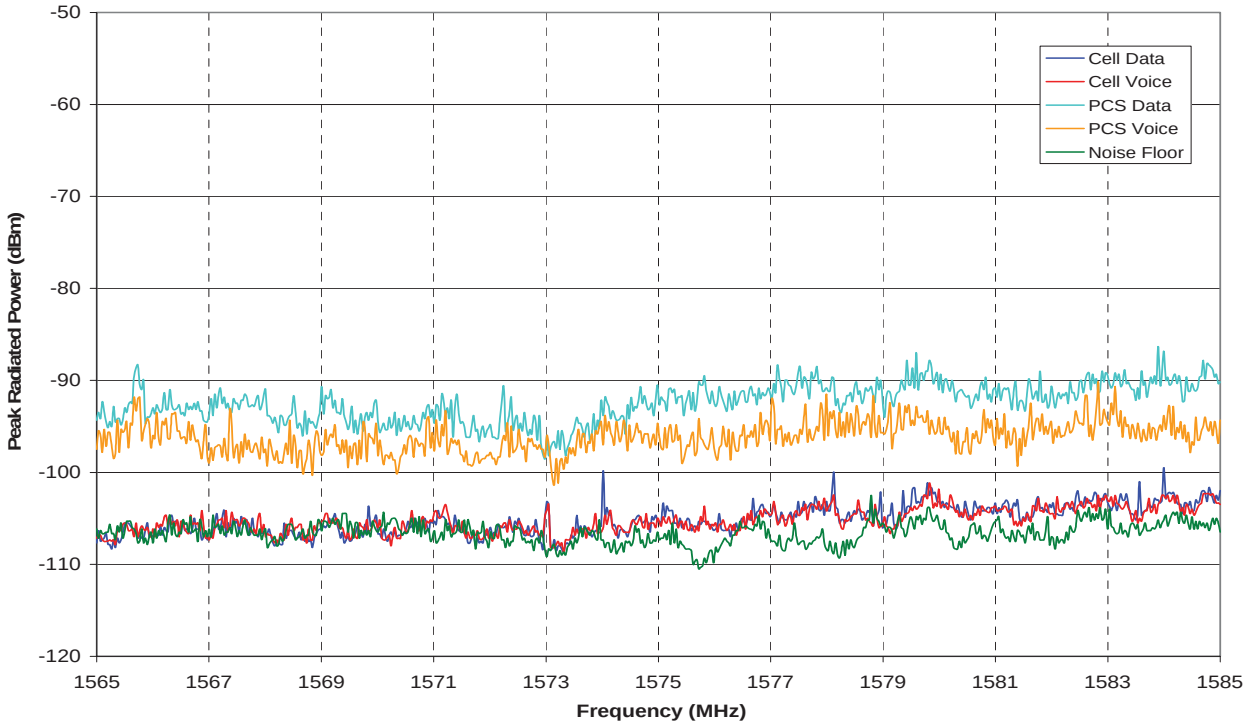

Figure B55: GSM04 four mode envelopes, Band 4.

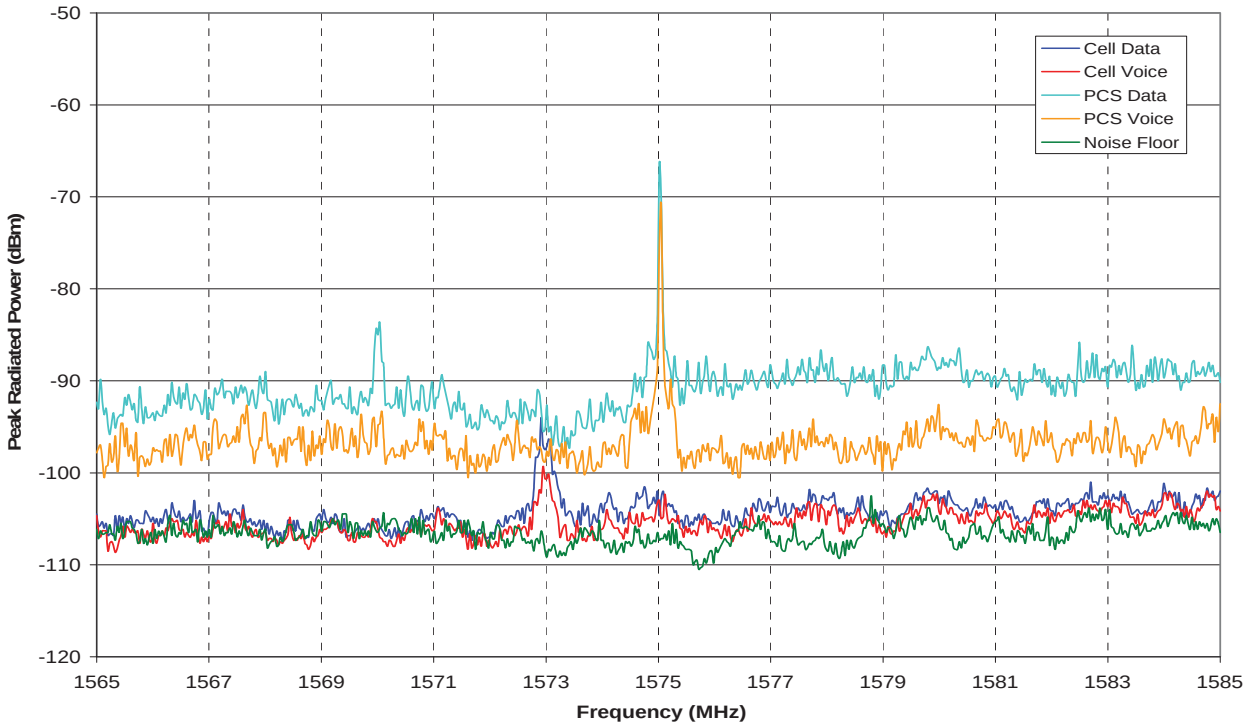

Figure B56: GSM05 four mode envelopes, Band 4.

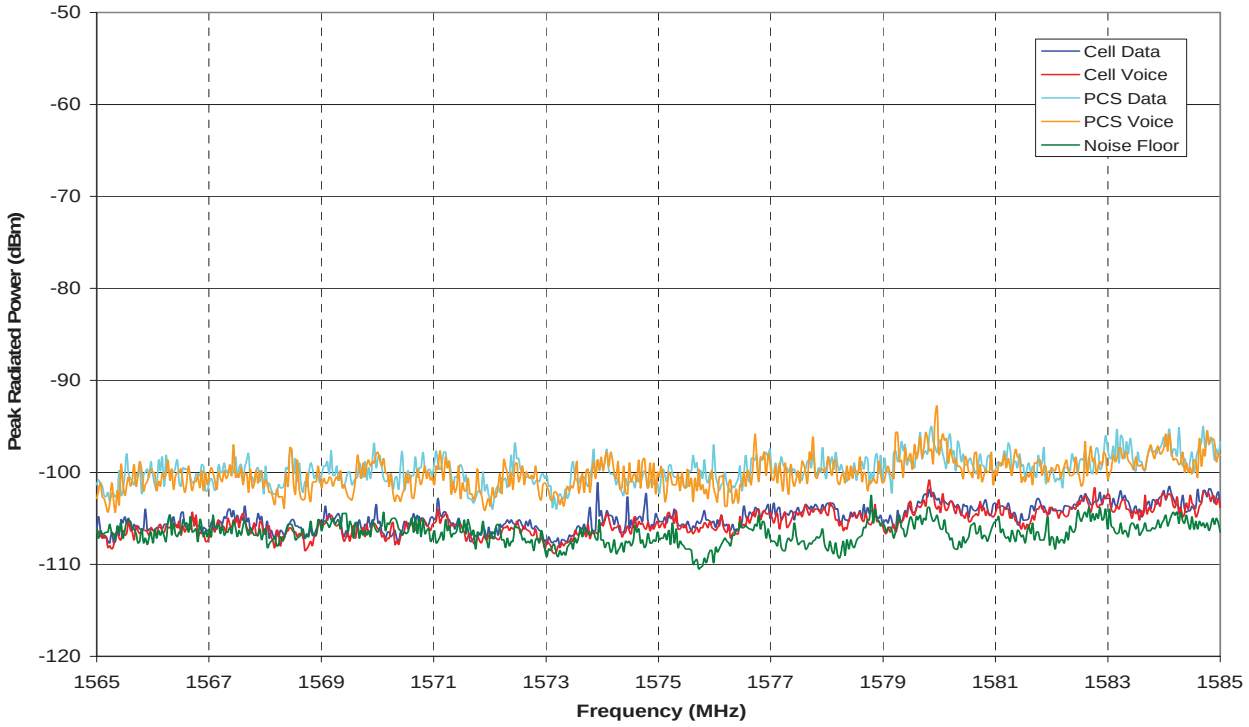

Figure B57: GSM06 four mode envelopes, Band 4.

Figure B58: GSM07 four mode envelopes, Band 4.

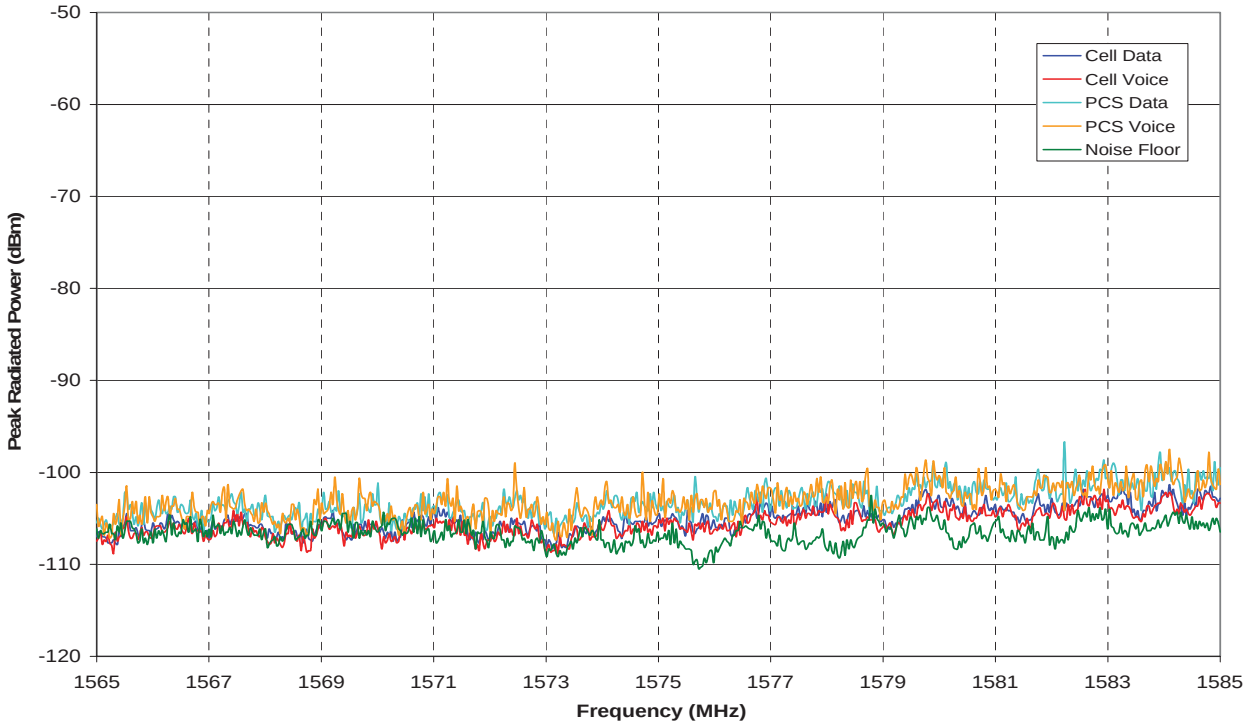

Figure B59: GSM08 four mode envelope, Band 4.

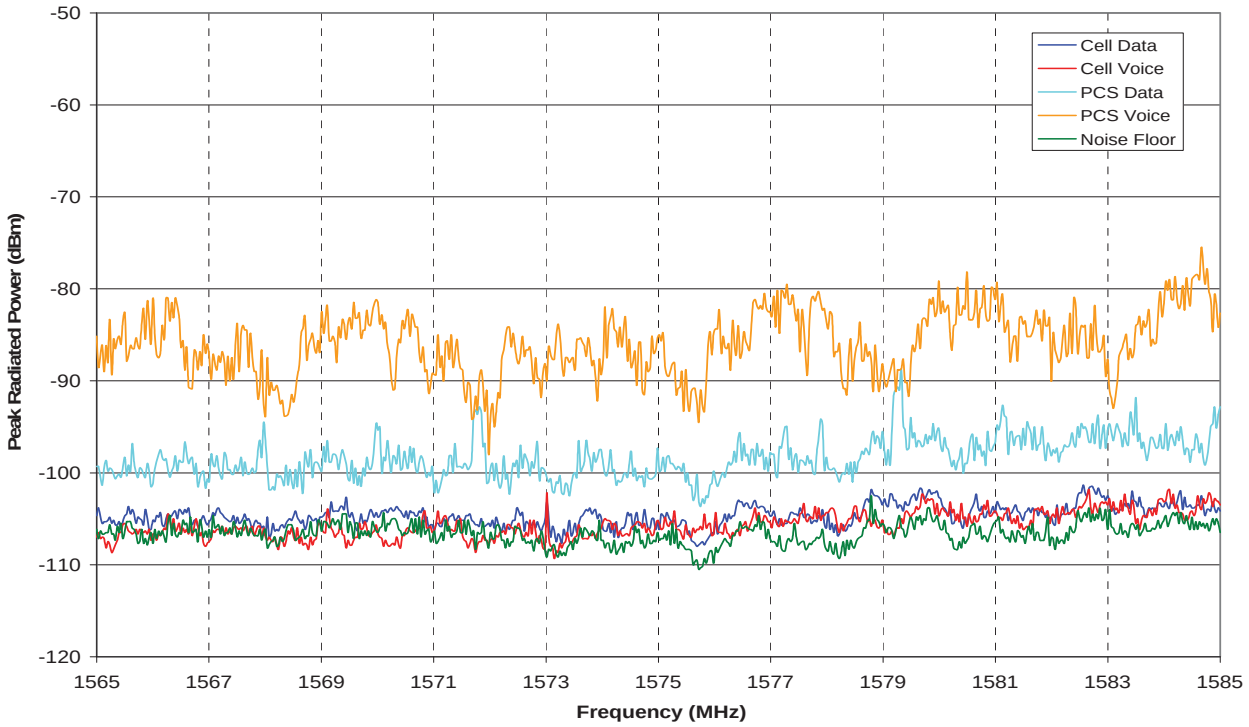

Figure B60: GSM09 four mode envelope, Band 4.

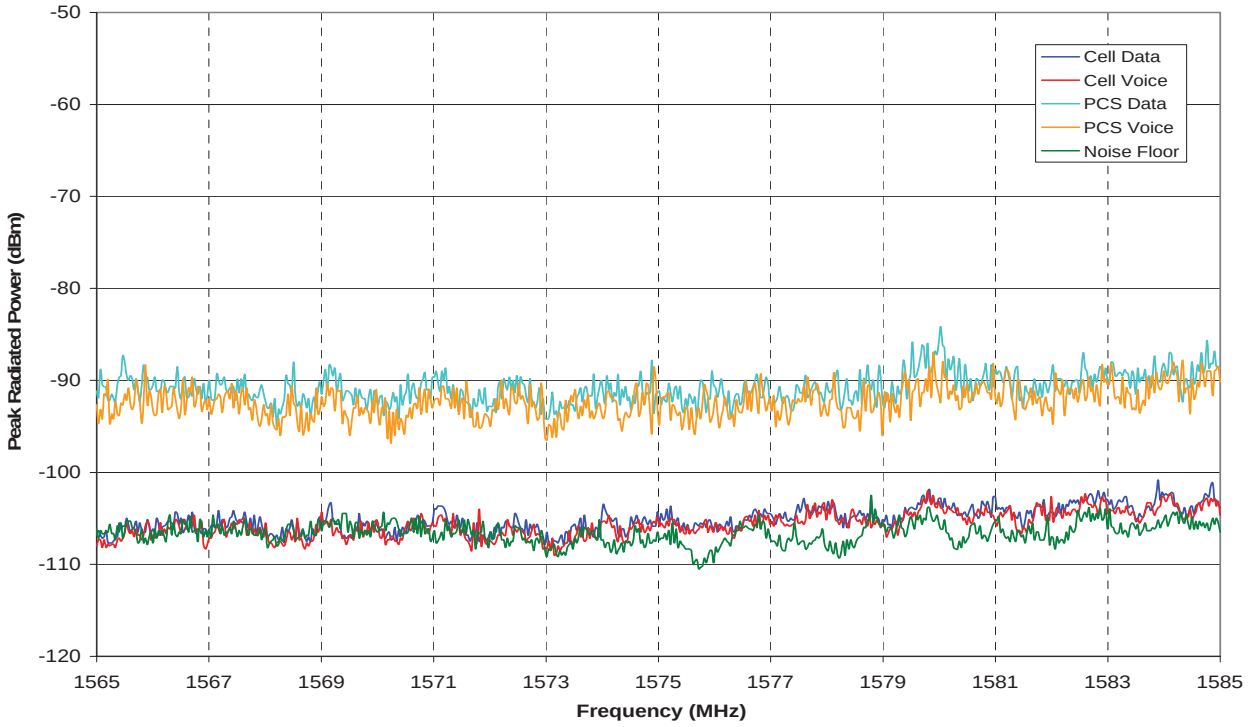

Figure B61: GSM10 four mode envelopes, Band 4.

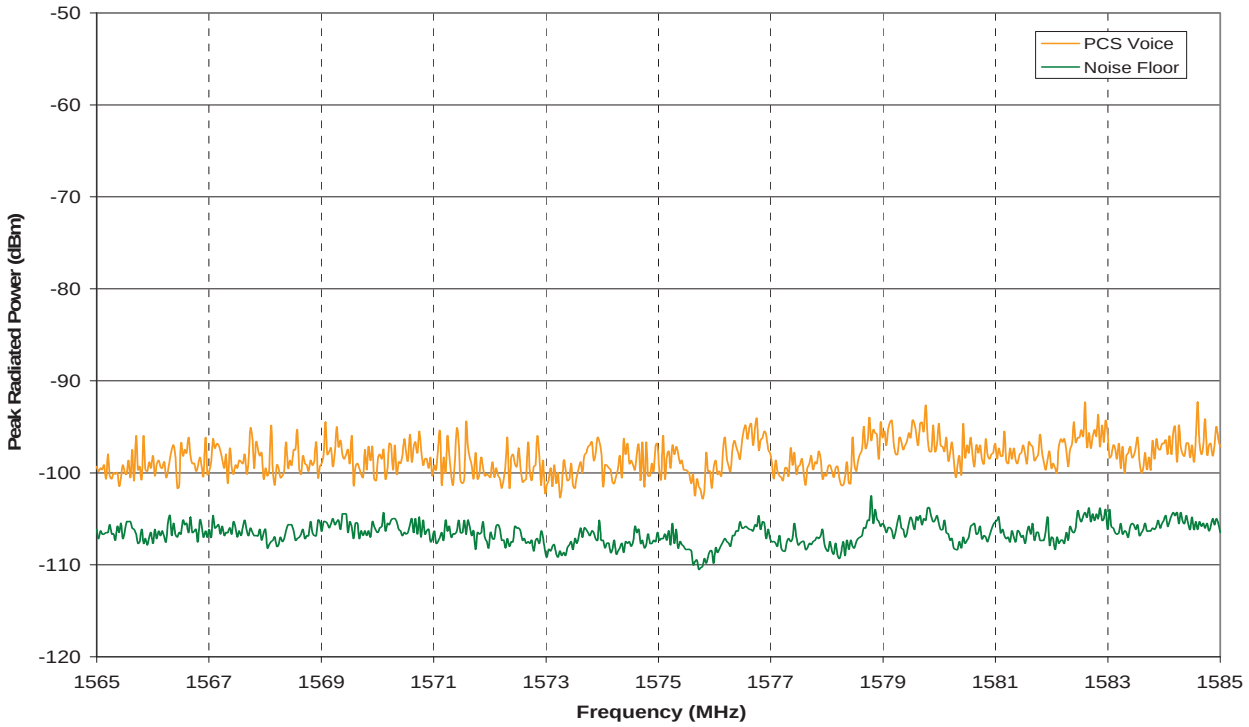

Figure B62: GSM11 one mode envelope, Band 4.

Figure B63: GSM12 four mode envelopes, Band 4.

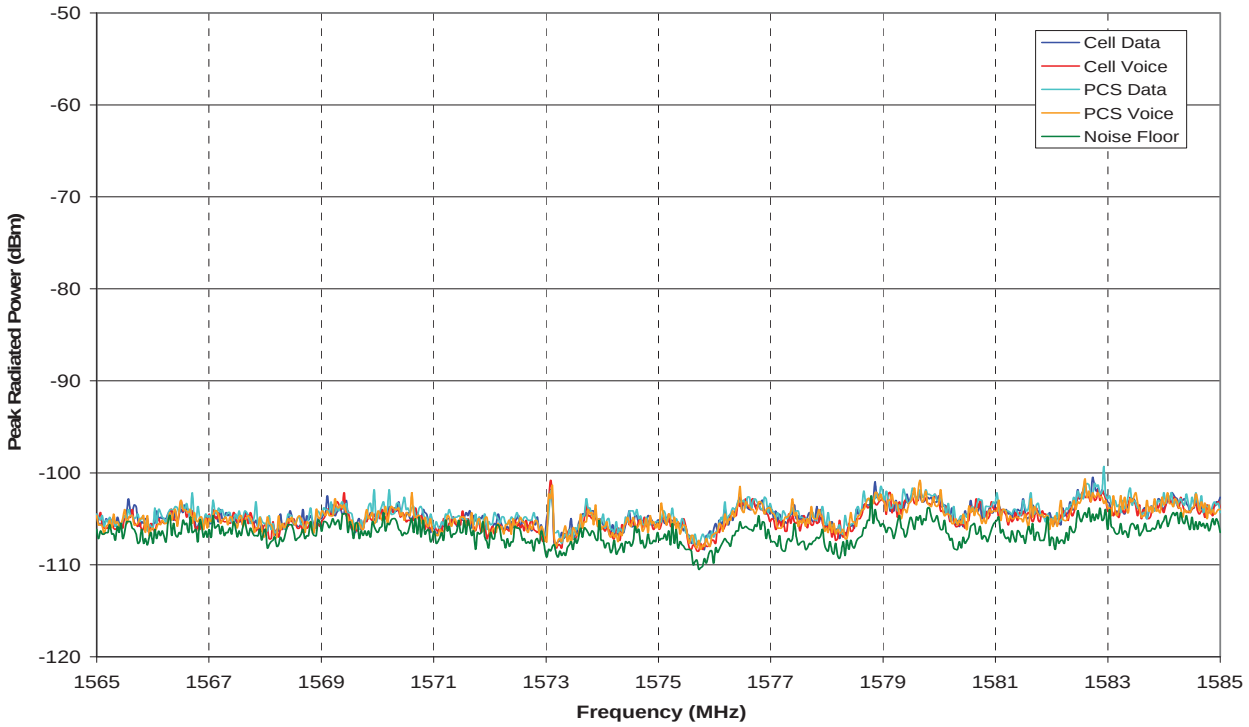

Figure B64: GSM13 four mode envelopes, Band 4.

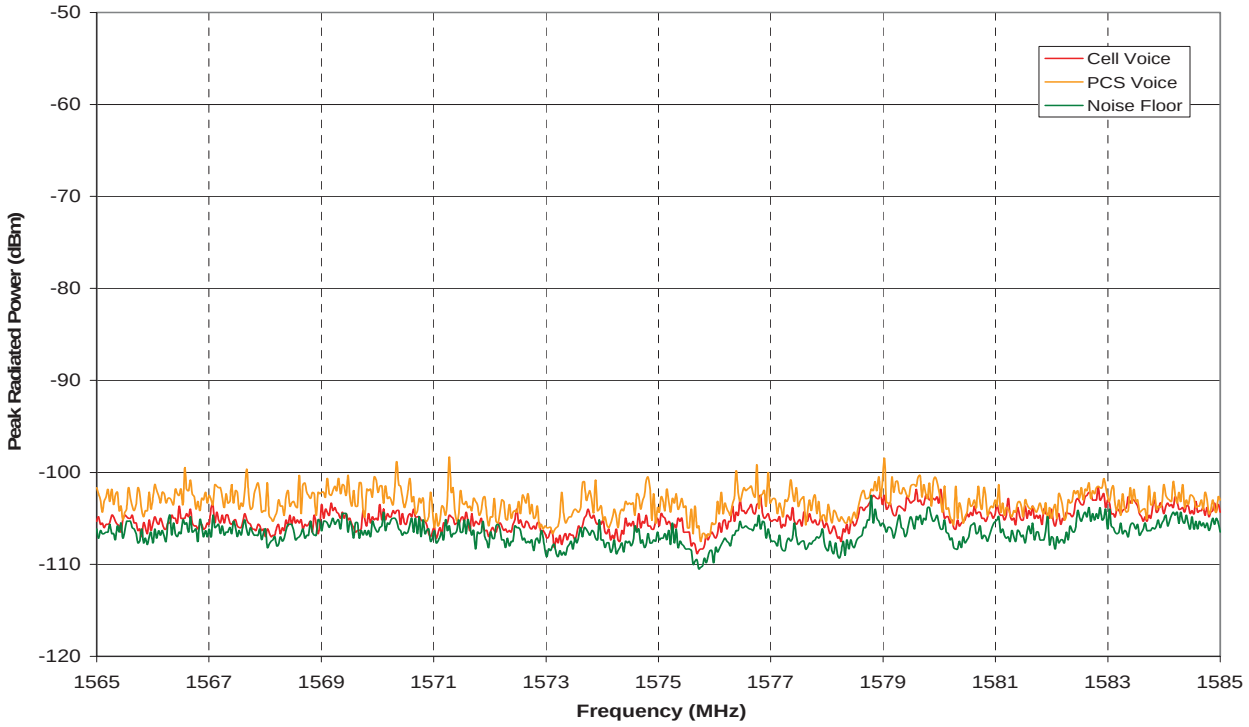

Figure B65: GSM14 two mode envelopes, Band 4.

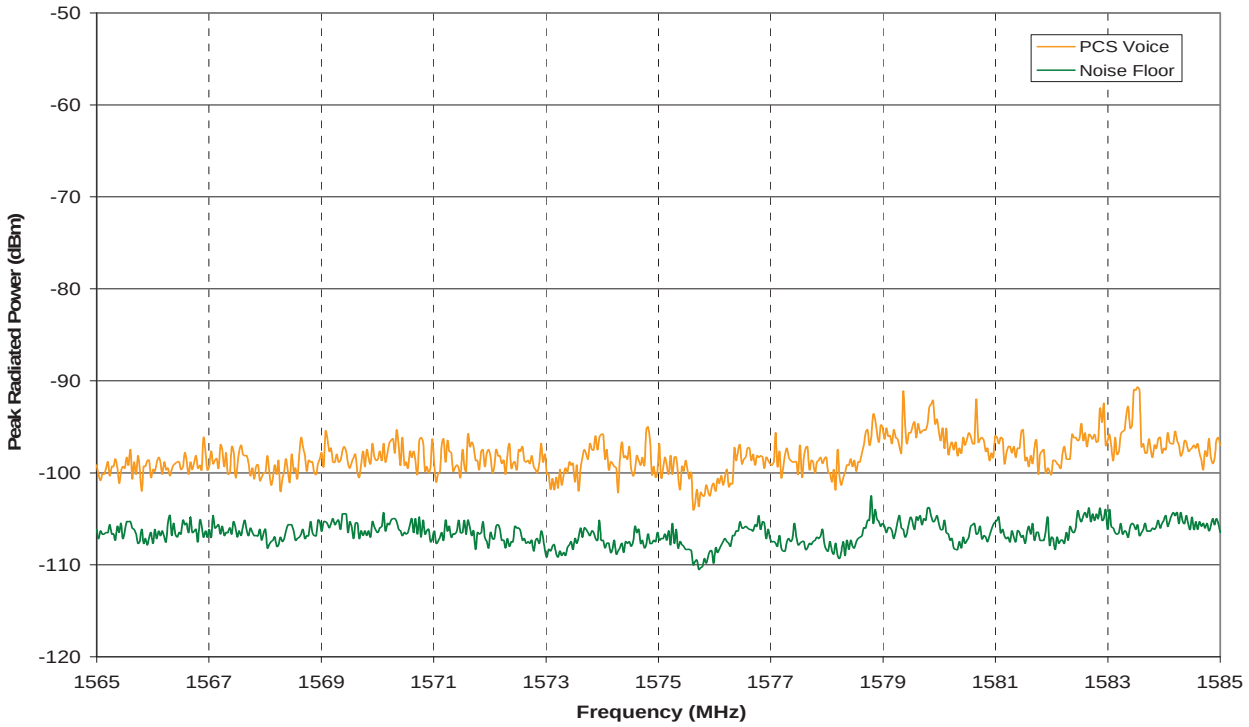

Figure B66: GSM15 one mode envelope, Band 4.

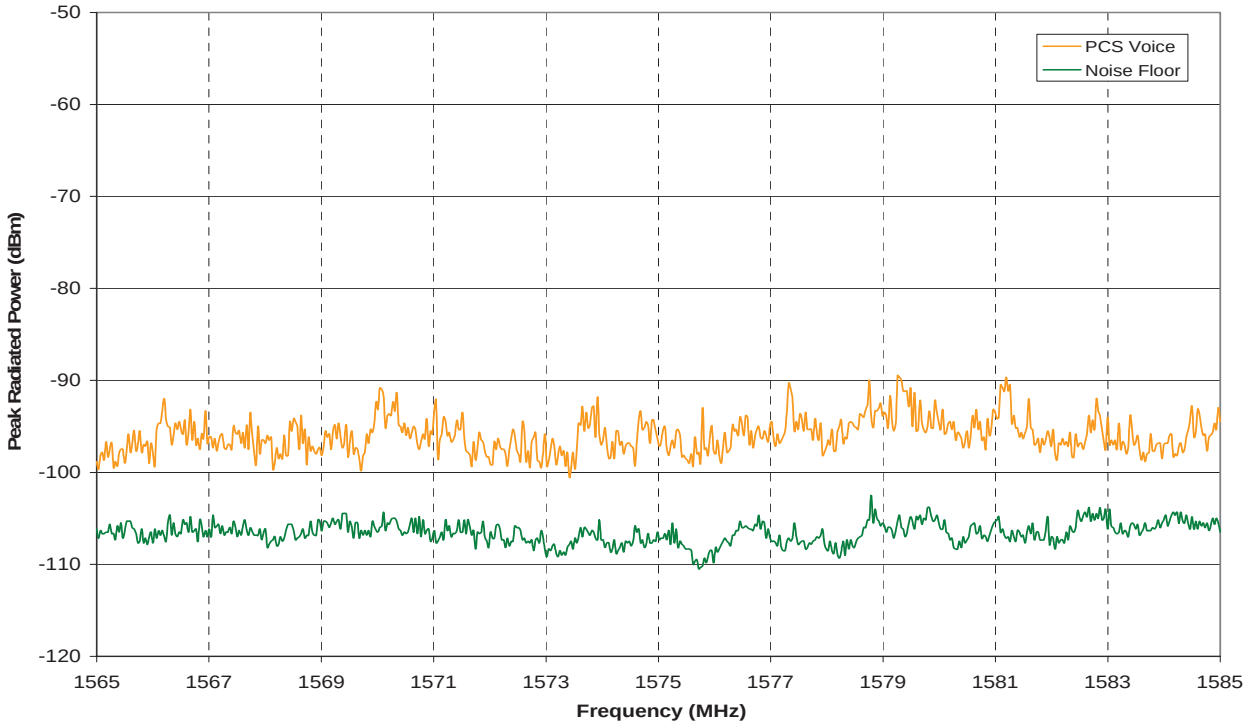

Figure B67: GSM16 one mode envelope, Band 4.

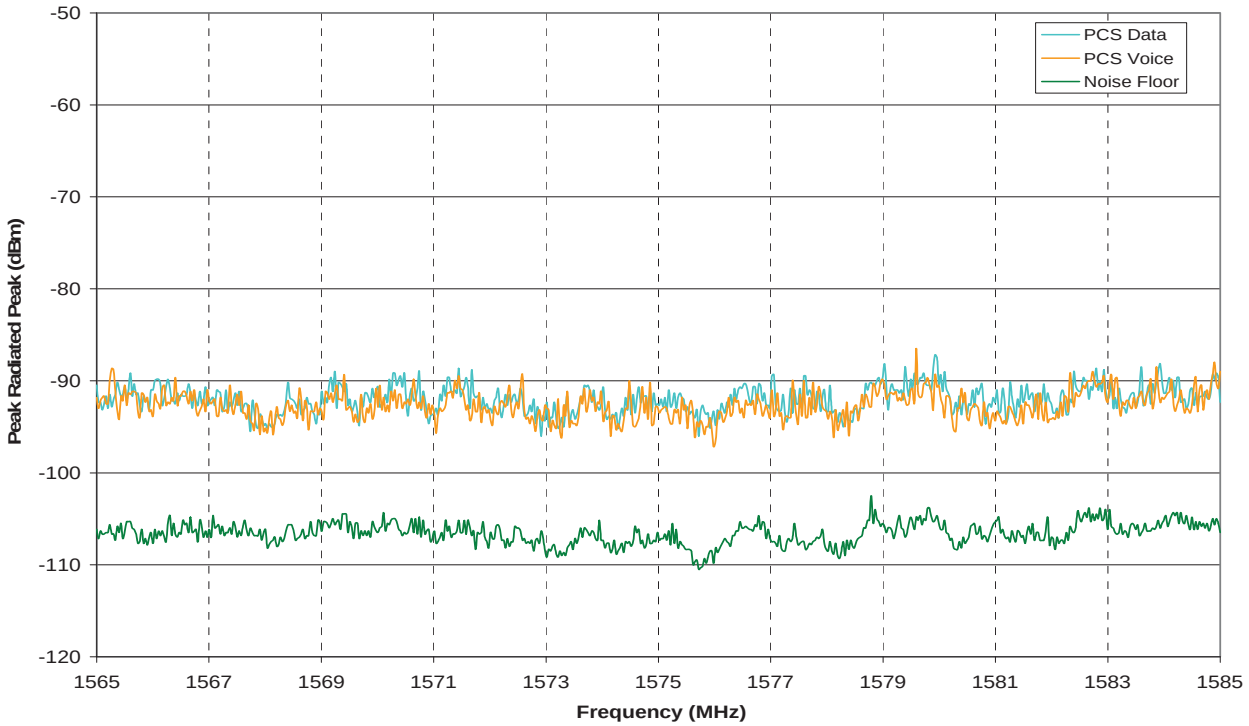

Figure B68: GSM17 two mode envelopes, Band 4.

B.5 Band 5

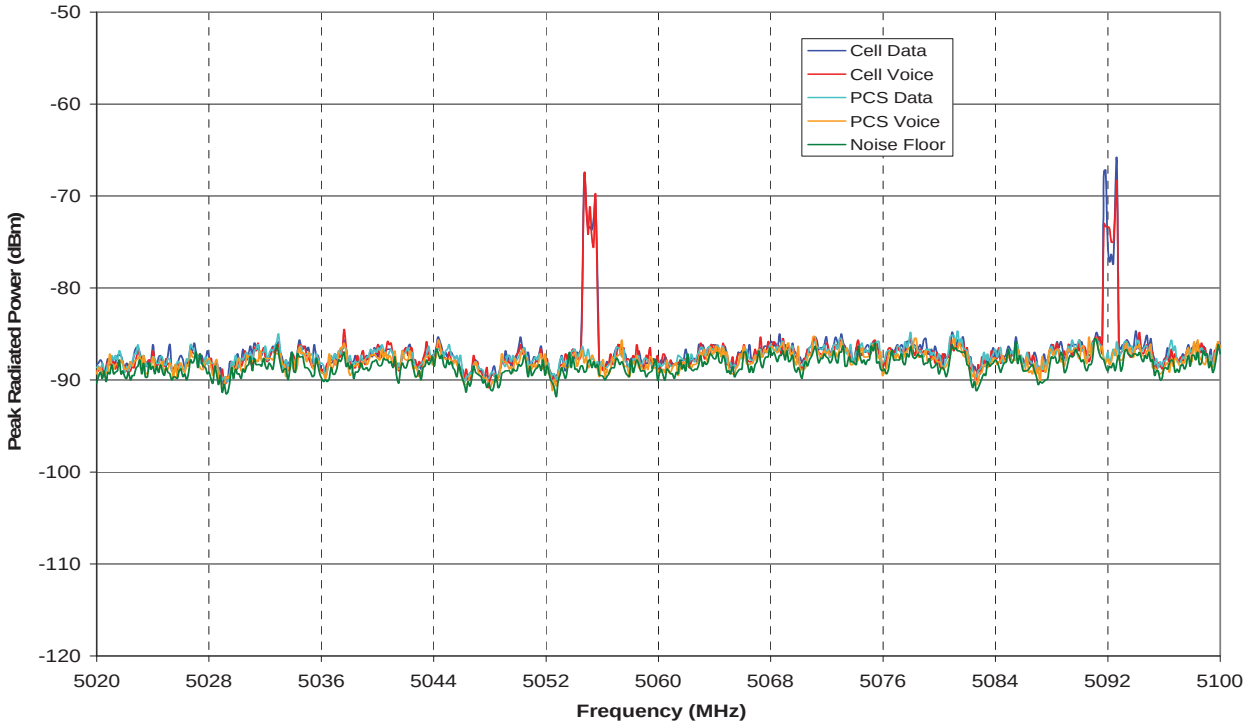

Figure B69: GSM01 four mode envelopes, Band 5.

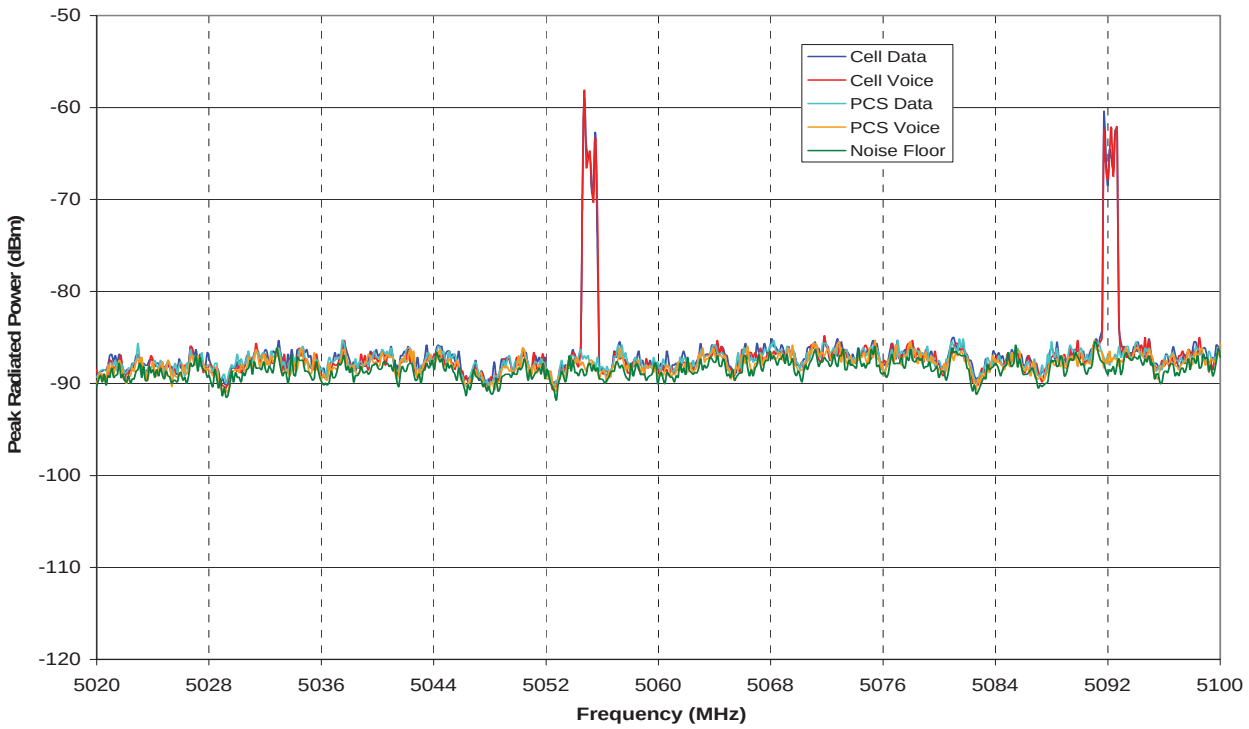

Figure B70: GSM02 four mode envelopes, Band 5.

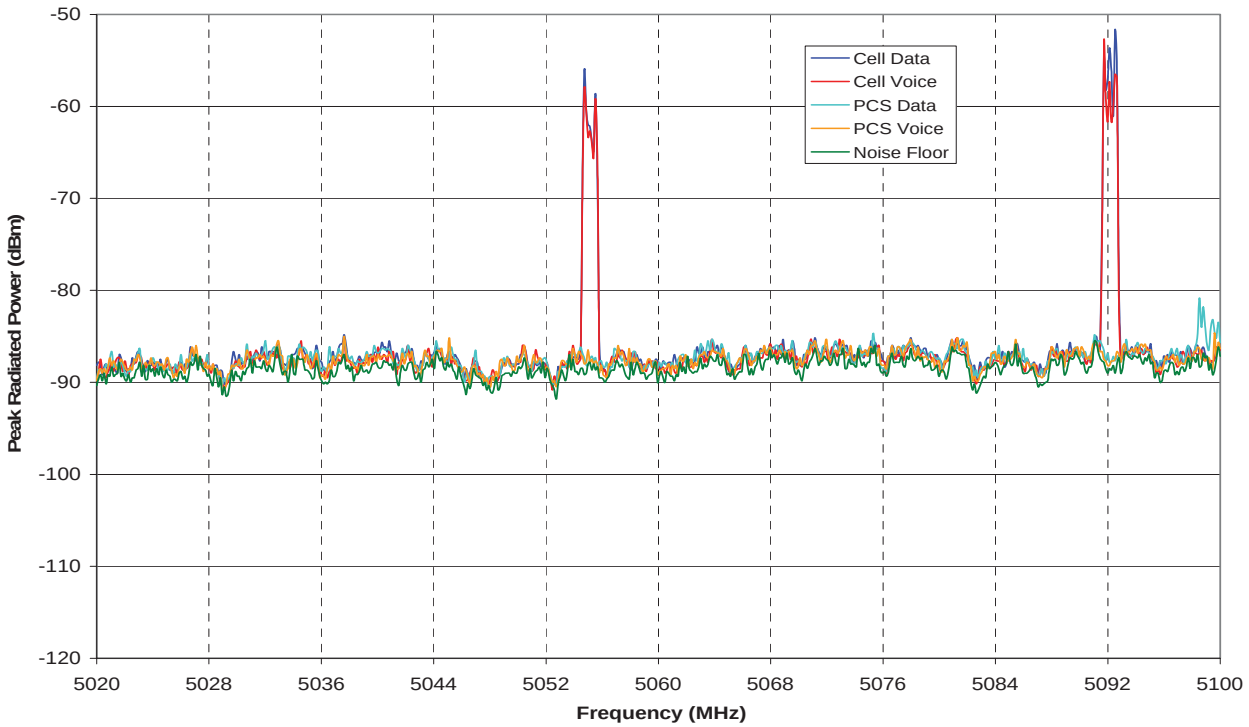

Figure B71: GSM03 four mode envelopes, Band 5.

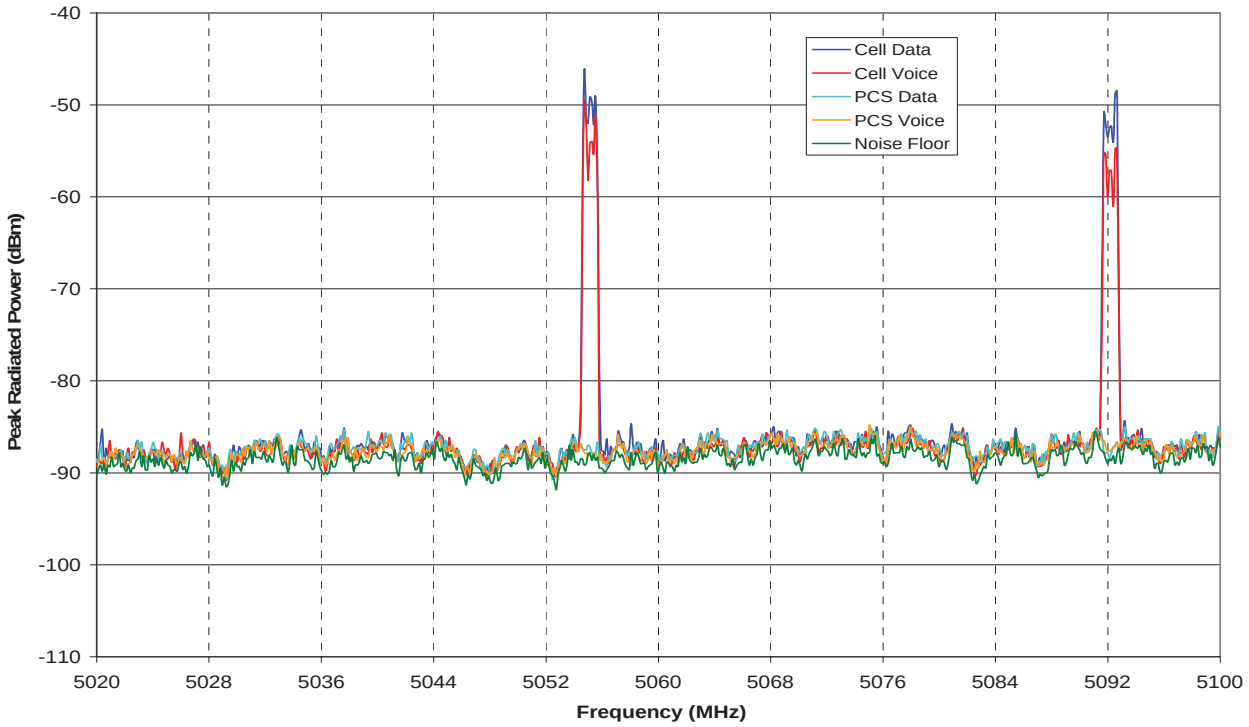

Figure B72: GSM04 four mode envelopes, Band 5.

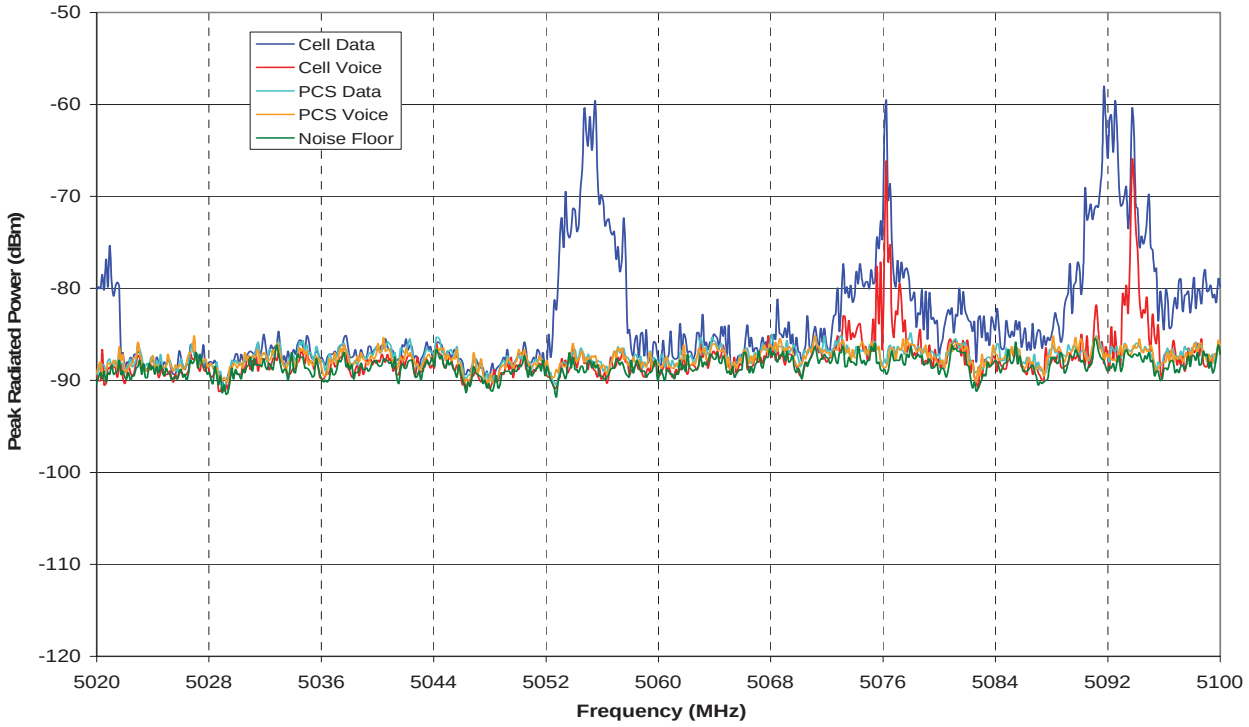

Figure B73: GSM05 four mode envelopes, Band 5.

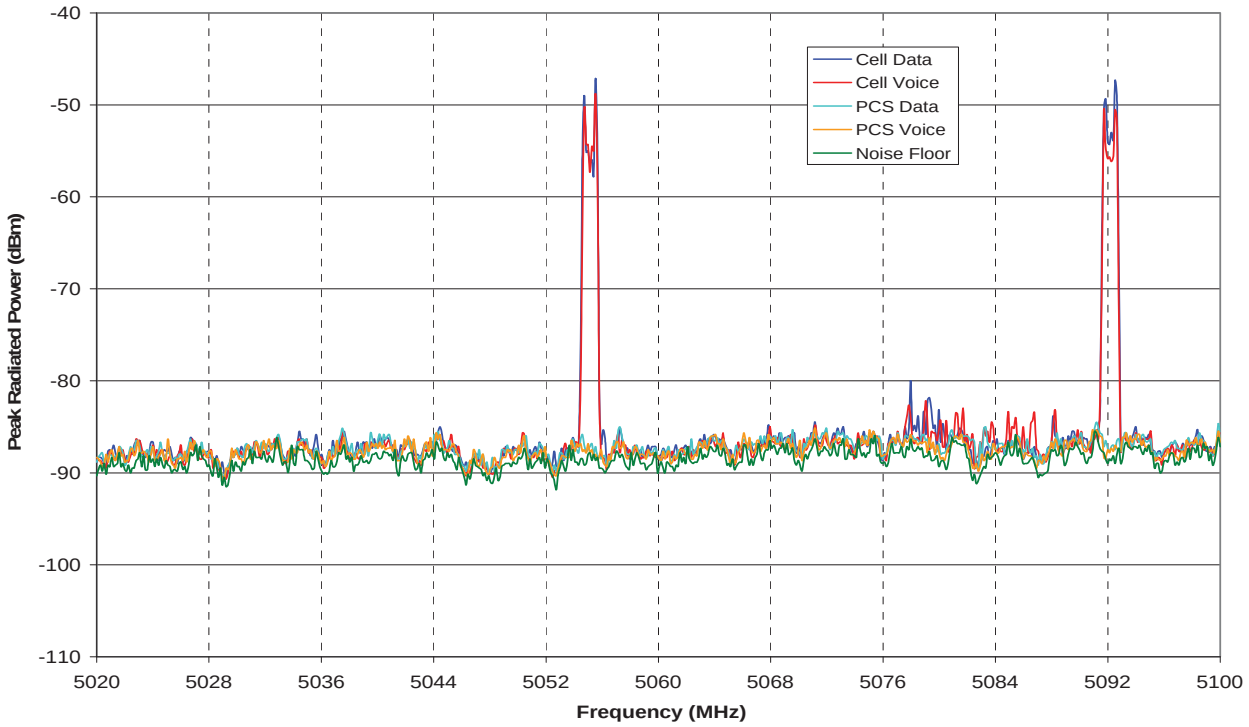

Figure B74: GSM06 four mode envelopes, Band 5.

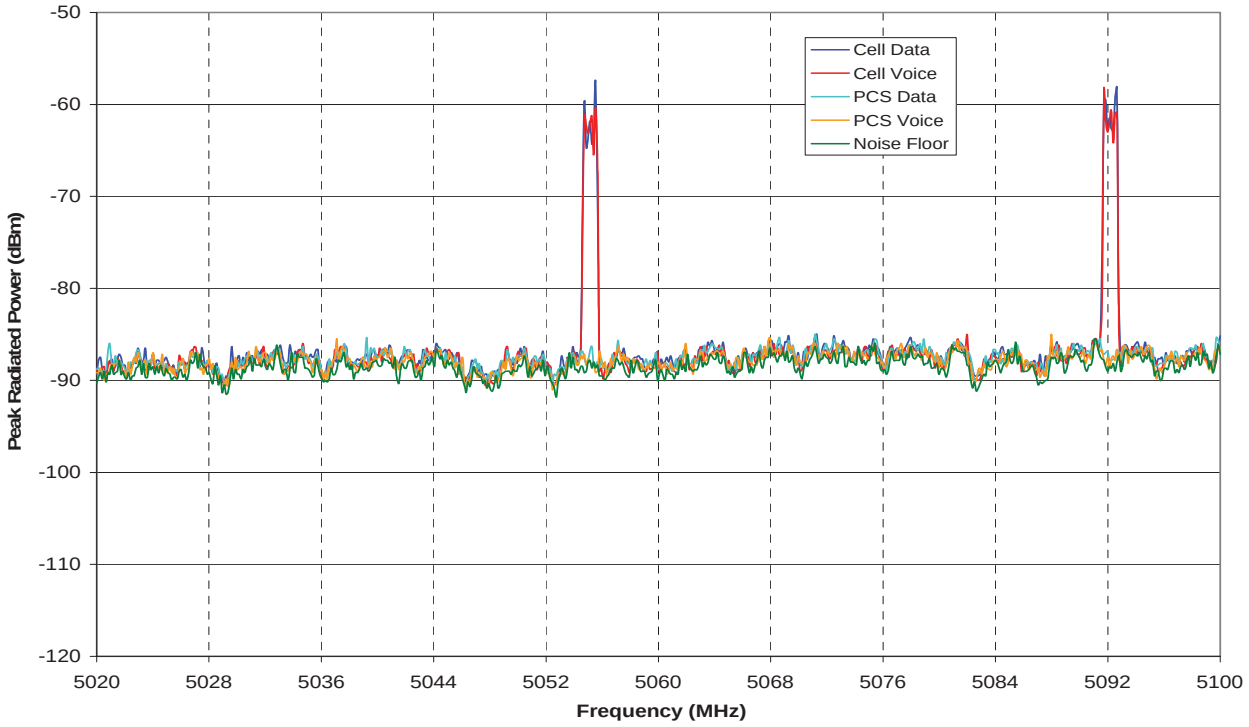

Figure B75: GSM07 four mode envelopes, Band 5.

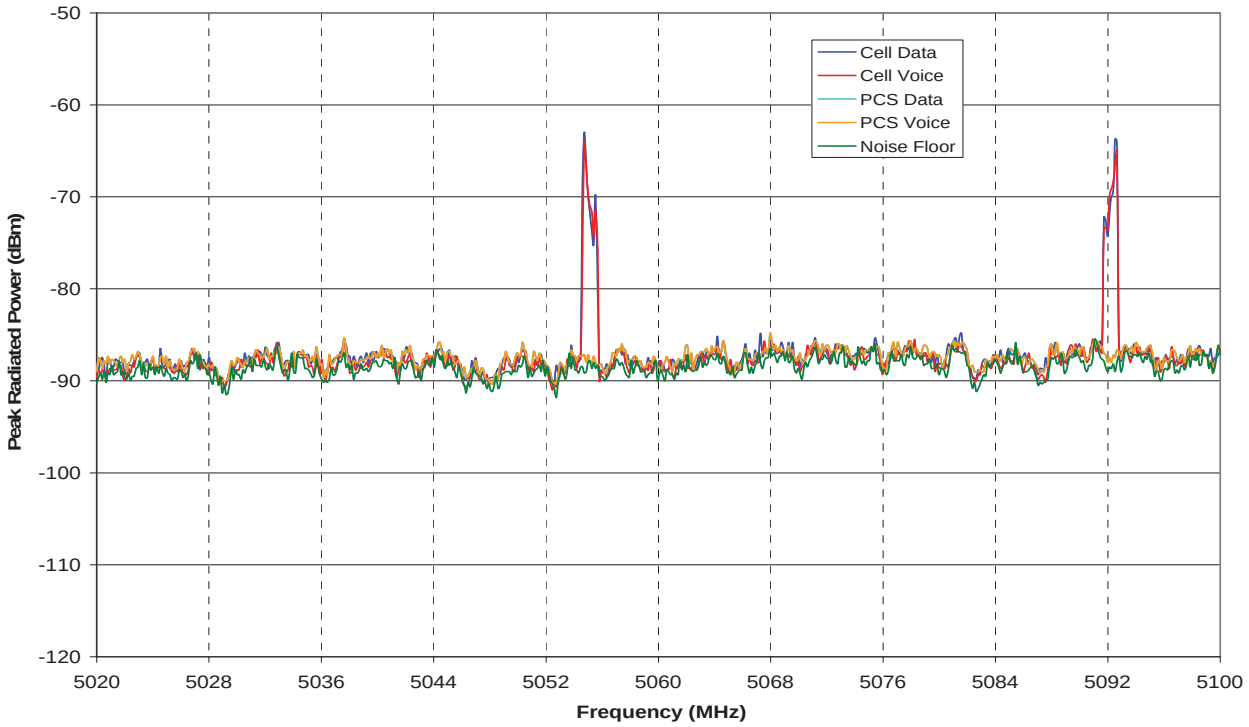

Figure B76: GSM08 four mode envelopes, Band 5.

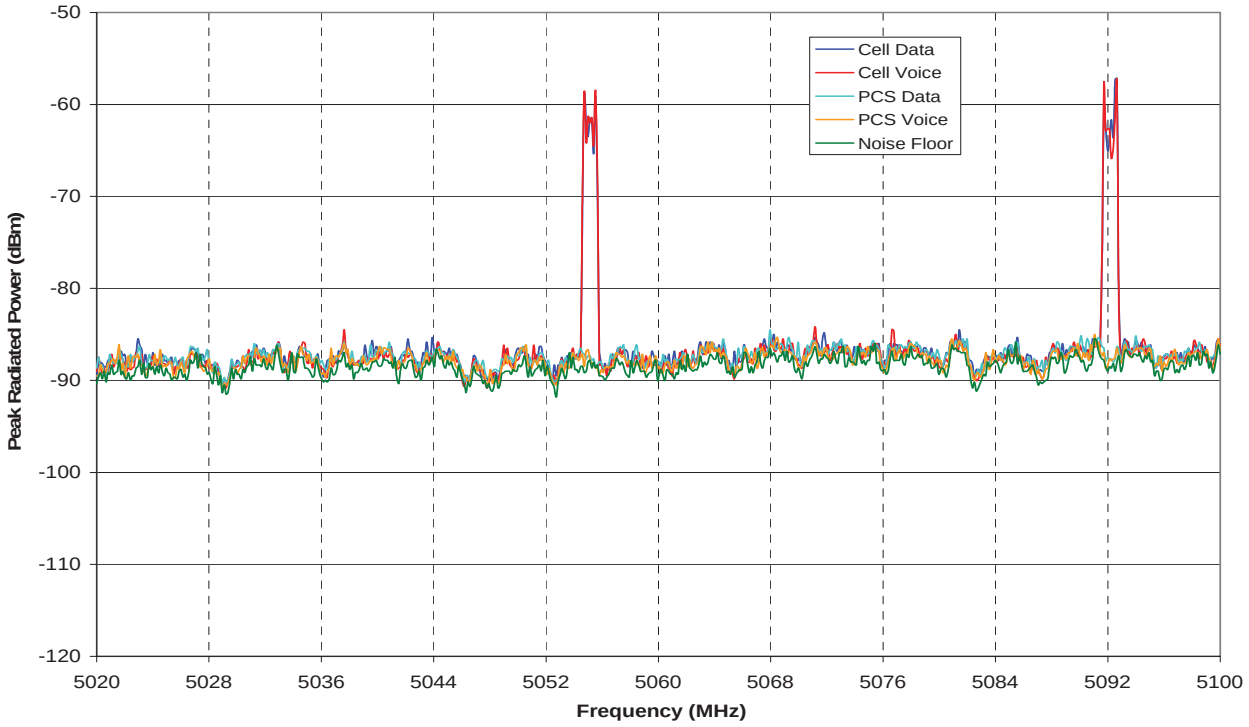

Figure B77: GSM09 four mode envelopes: Band 5.

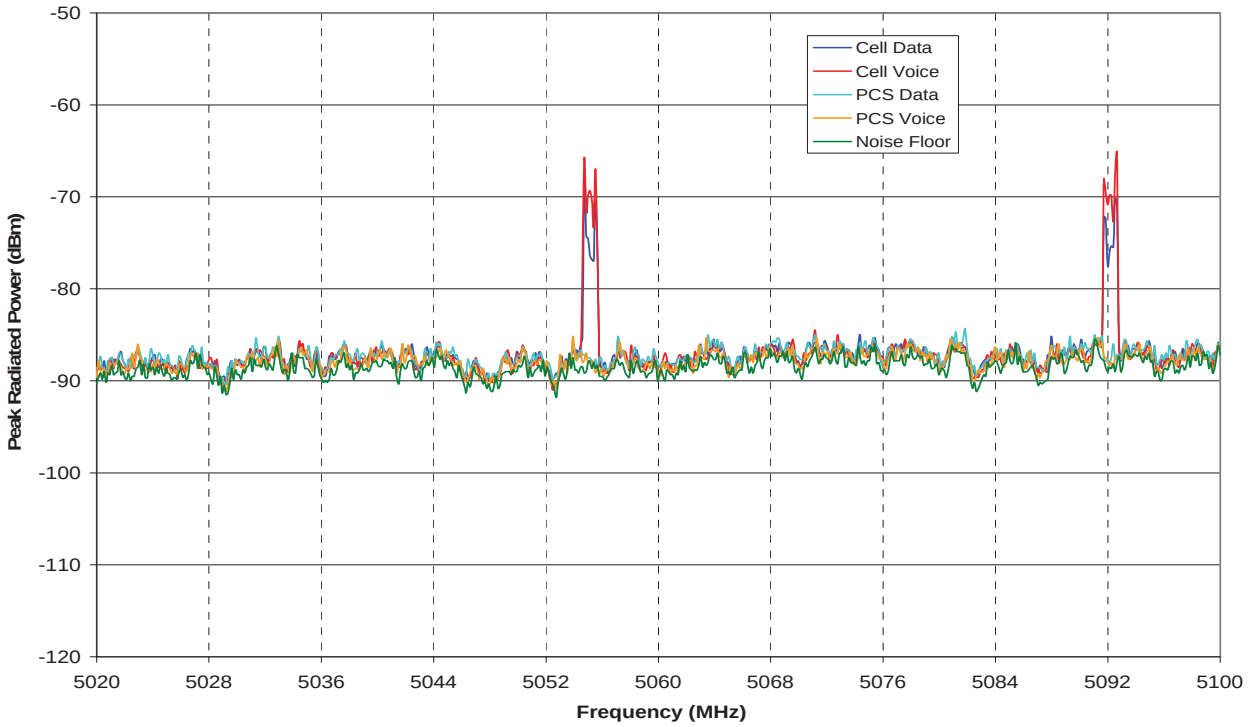

Figure B78: GSM10 four mode envelopes, Band 5.

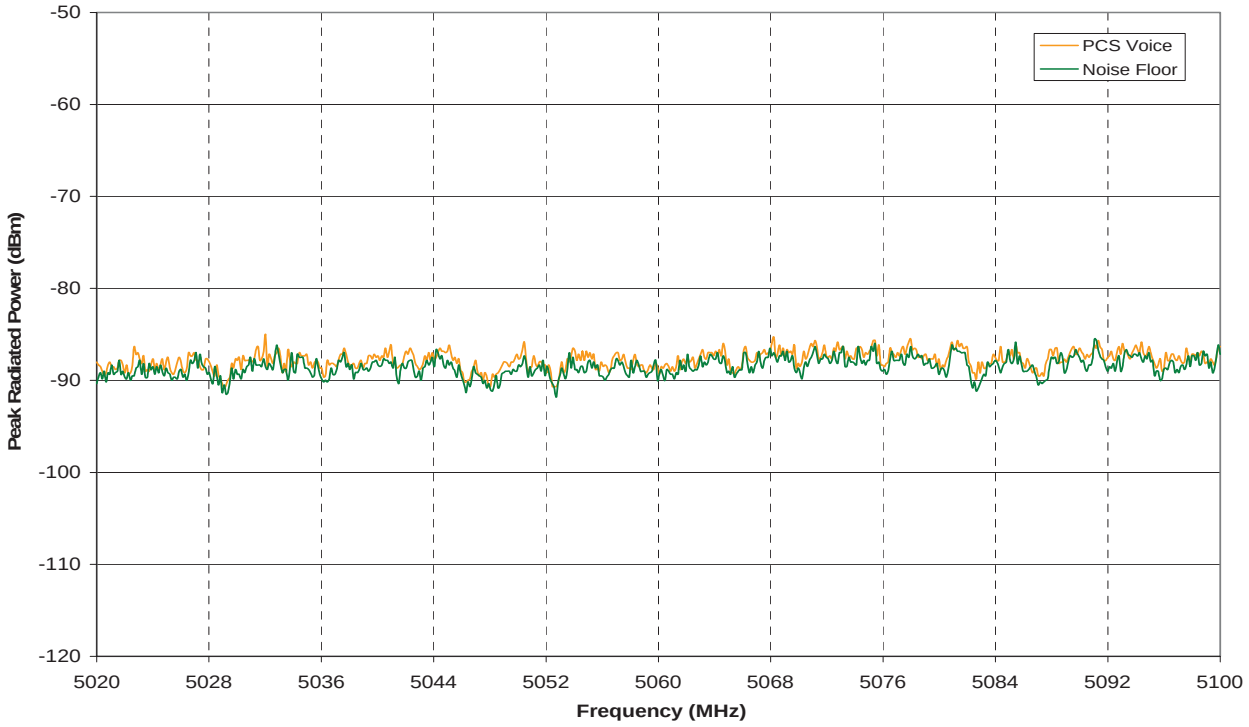

Figure B79: GSM11 one mode envelope, Band 5.

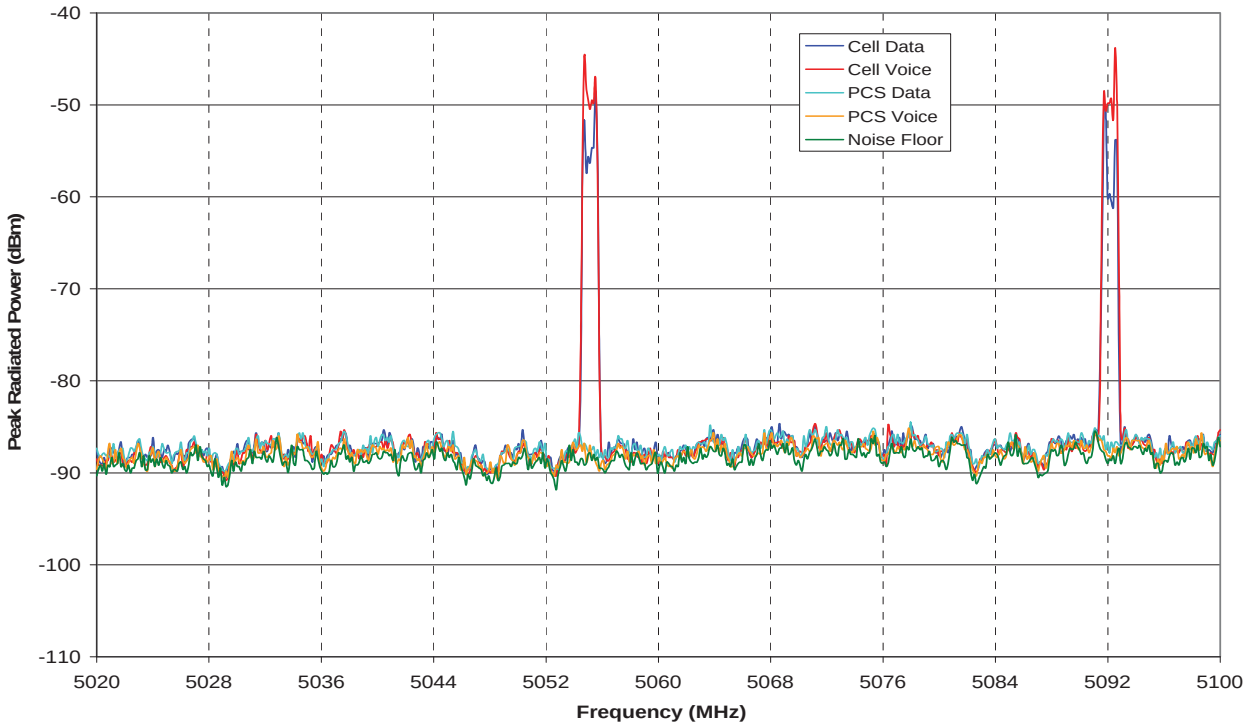

Figure B80: GSM12 four mode envelopes, Band 5.

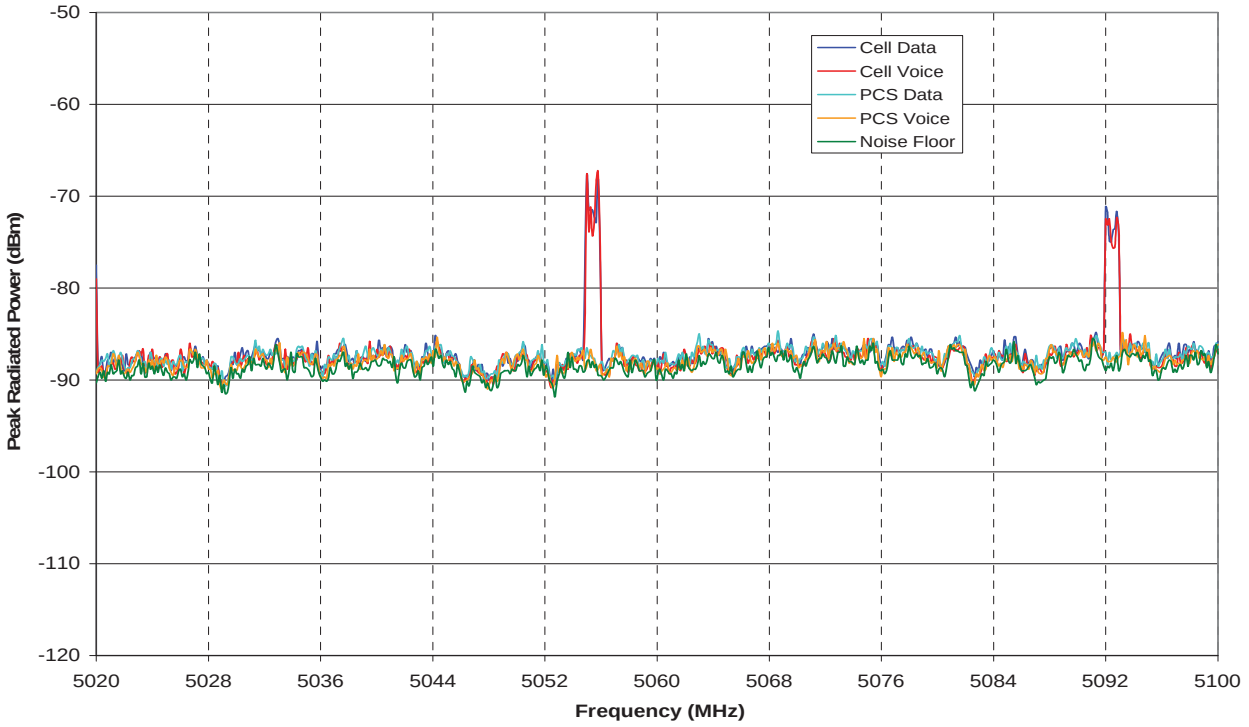

Figure B81: GSM13 four mode envelopes, Band 5.

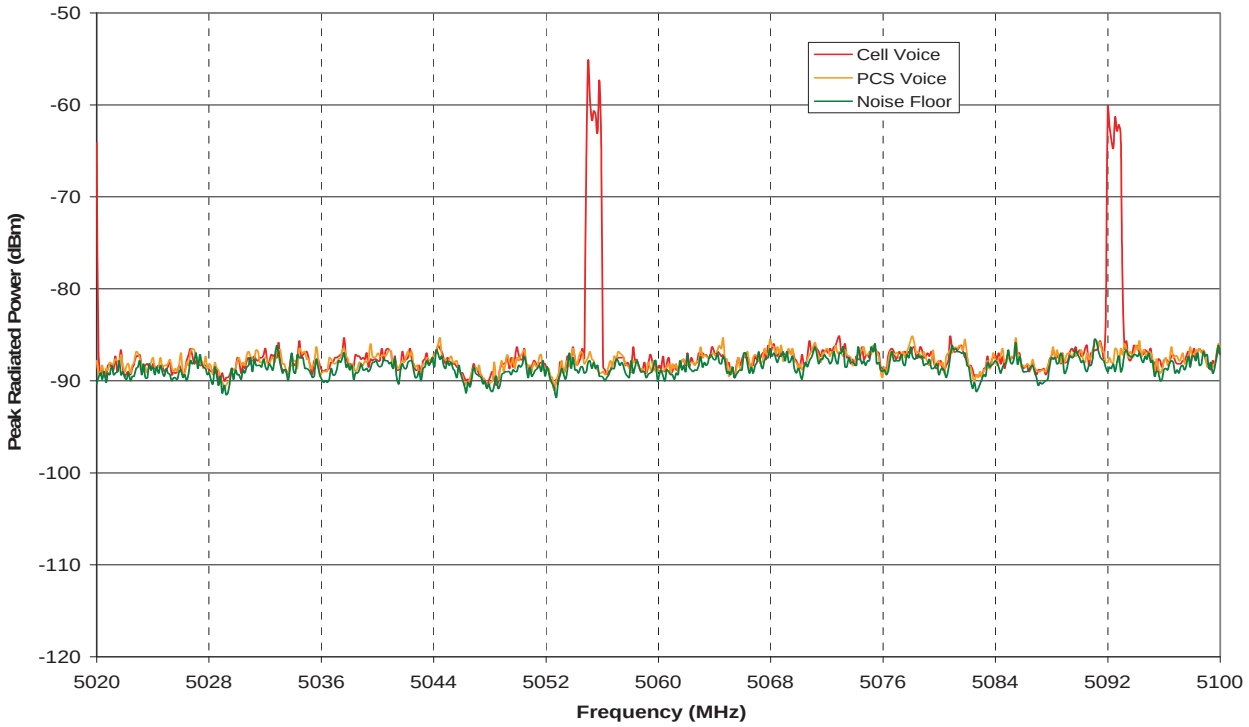

Figure B82: GSM14 two mode envelopes, Band 5.

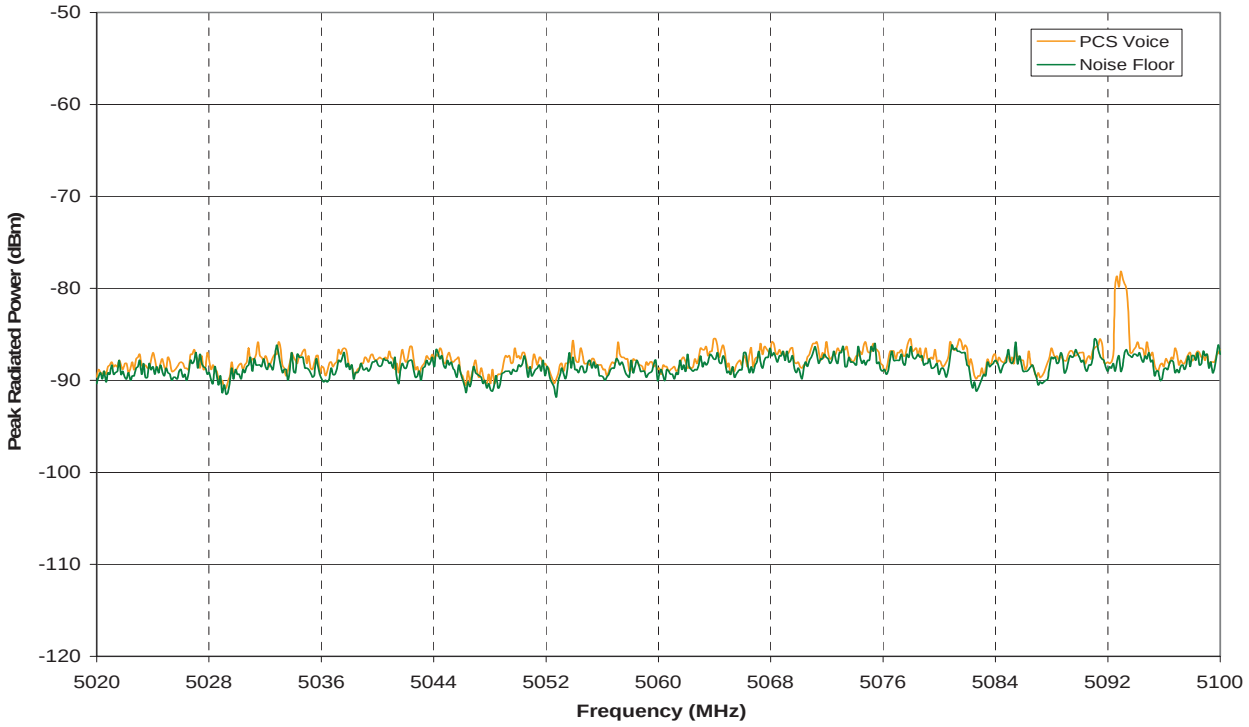

Figure B83: GSM15 one mode envelope, Band 5.

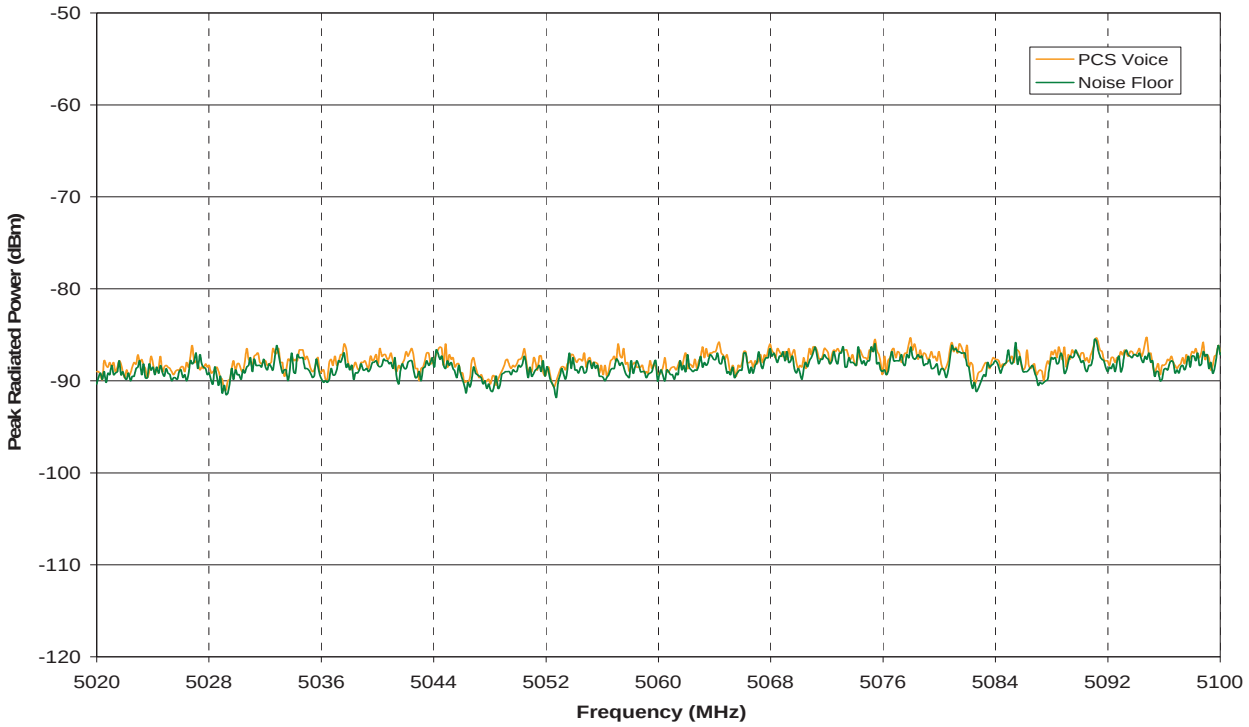

Figure B84: GSM16 one mode envelope, Band 5.

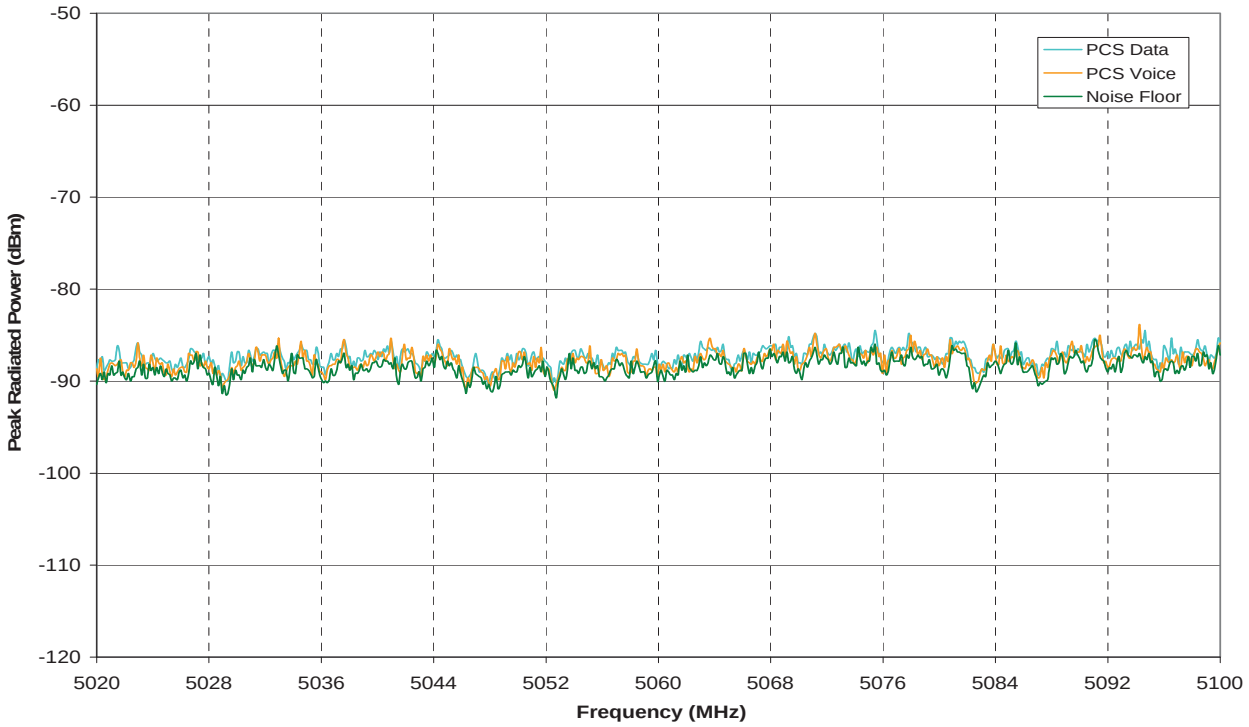

Figure B85: GSM17 two mode envelopes, Band 5.

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Appendix C: Comparisons of MEF Using Window IPL

Section 6 data show that *full-aircraft* MEF can be determined within approximately 1 dB by using the *window* IPL data. (For simplicity MEF_{window} refers to MEF computed from window IPL data as described in Section 6). While this observation needs further validation, it would be of interest to compare MEF_{window} for different aircraft. This comparison may provide an insight into of aircraft-to-aircraft variations of the true MEF.

Window IPLs for six B737 aircraft were reported in Section 6. These aircrafts were measured using the same method, thus variations associated caused by test methodology is minimized. Using these data, MEF_{window} are computed and compared in Figures C1 to C4 for LOC/VOR, VHF-Com, and TCAS. In addition, similar comparison for the GPS system is also shown in C-4, even though full-aircraft IPLs were not available for comparison in Section 6.

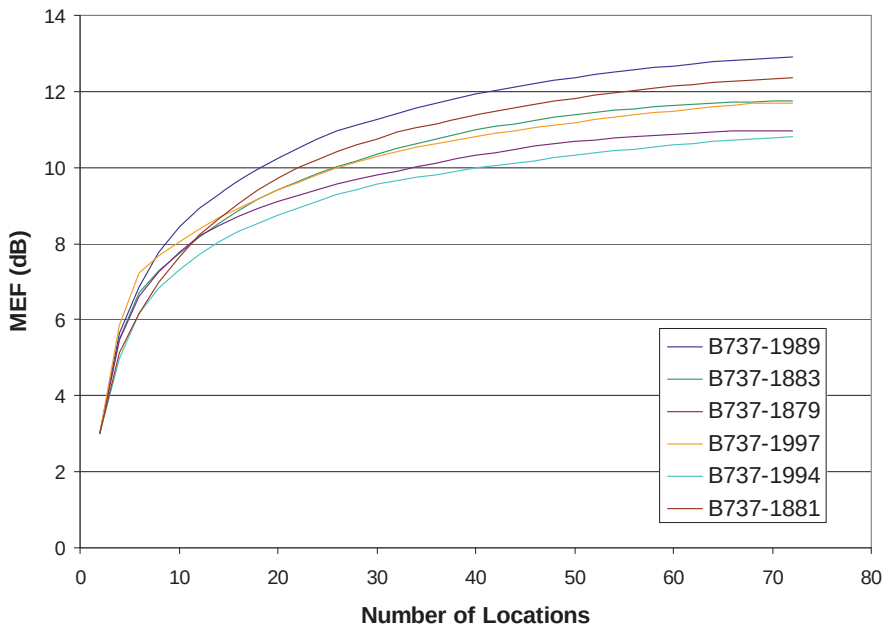

Figure C1: MEF computed using window IPL. LOC/VOR Tail.

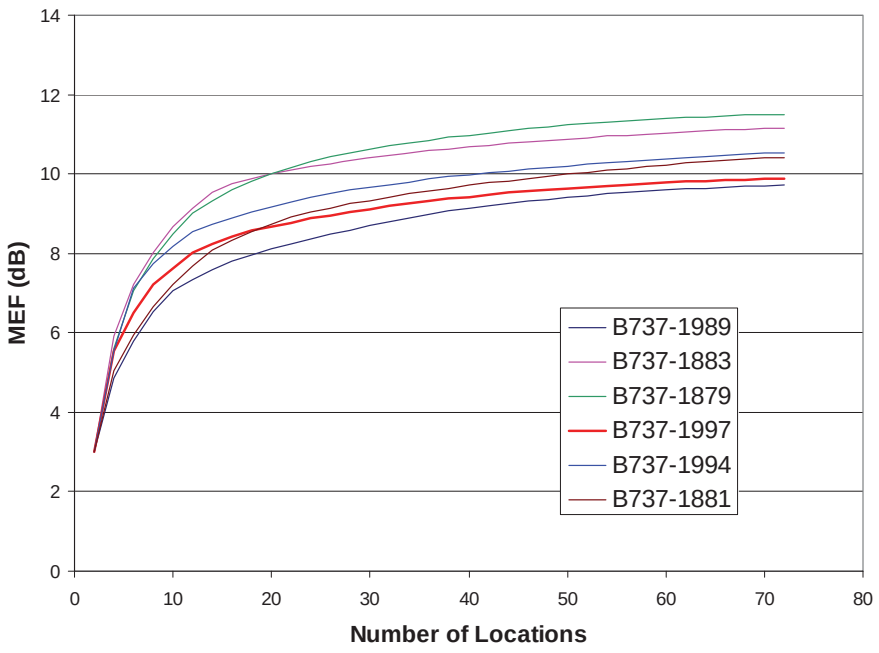

Figure C2: MEF computed using window IPL. TCAS-Top

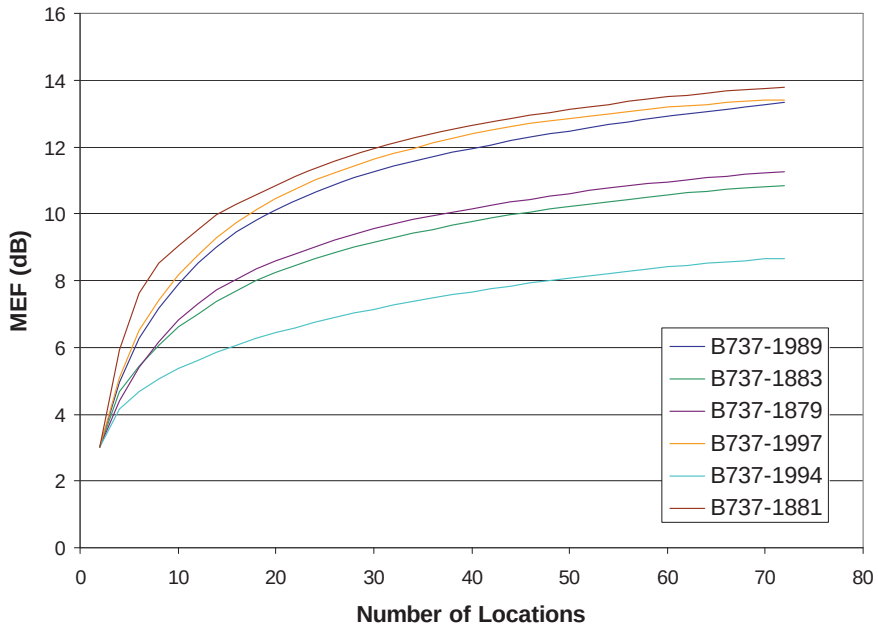

Figure C3: MEF computed using window IPL. VHF-Top.

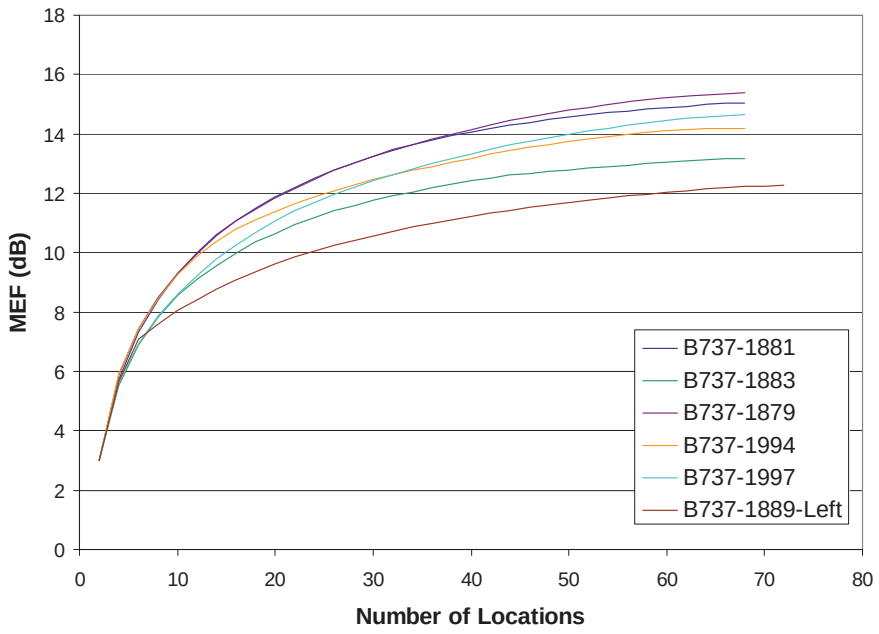

Figure C4: MEF computed using window IPL. GPS-Top.

It is observed that MEF_{window} varies between 2 and 3.5 dB, with the exception of one aircraft in the VHF band (B737-1994). The most likely source of the deviation is suspected to be the differences in airplane configuration. Many of the airplanes were empty (without seats) at the time of measurement. In other cases, seats were blocking the windows that were closest to the aircraft antennas of interest, thereby reducing radiation efficiency out of the windows. It is expected that similar variations would appear in the MEF calculated using the full-aircraft IPL data.

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14. ABSTRACT
Radiated emissions in aircraft communication and navigation bands are measured from third generation (3G) wireless mobile phones. The two wireless technologies considered are the latest available to general consumers in the US. The measurements are conducted using reverberation chambers. The results are compared against baseline emissions from laptop computers and personal digital assistant devices that are currently allowed to operate on aircraft. Using existing interference path loss data and receivers' interference threshold, a risk assessment is performed for several aircraft communication and navigation radio systems. In addition, cumulative interference effects of multiple similar devices are conservatively estimated or bounded. The effects are computed by summing the interference power from individual devices that is scaled according to the interference path loss at its location.

15. SUBJECT TERMS
3G; Aircraft; CDMA; Communication; Cumulative effects; GSM; Interference; Navigation; Radiated emission; Wireless phone

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