



# Appendix B

## GSM 850 & 1900



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## 1. Effective (Isotropic) Radiated Power Output Data

### 1.1. Test Result

| Band            | Channel | Slot | Conducted Power (dBm) | ERP (dBm) | Limit(dBm) | Verdict |
|-----------------|---------|------|-----------------------|-----------|------------|---------|
| GSM850          | 128     | ---  | 31.29                 | 27.27     | 38.45      | PASS    |
| GSM850          | 190     | ---  | 31.15                 | 27.13     | 38.45      | PASS    |
| GSM850          | 251     | ---  | 31.13                 | 27.11     | 38.45      | PASS    |
| EGPRS850 (GMSK) | 128     | 1    | 31.27                 | 27.25     | 38.45      | PASS    |
| EGPRS850 (GMSK) | 128     | 2    | 28.46                 | 24.44     | 38.45      | PASS    |
| EGPRS850 (GMSK) | 128     | 3    | 27.41                 | 23.39     | 38.45      | PASS    |
| EGPRS850 (GMSK) | 128     | 4    | 26.18                 | 22.16     | 38.45      | PASS    |
| EGPRS850 (GMSK) | 190     | 1    | 31.19                 | 27.17     | 38.45      | PASS    |
| EGPRS850 (GMSK) | 190     | 2    | 28.25                 | 24.23     | 38.45      | PASS    |
| EGPRS850 (GMSK) | 190     | 3    | 27.17                 | 23.15     | 38.45      | PASS    |
| EGPRS850 (GMSK) | 190     | 4    | 25.98                 | 21.96     | 38.45      | PASS    |
| EGPRS850 (GMSK) | 251     | 1    | 31.16                 | 27.14     | 38.45      | PASS    |
| EGPRS850 (GMSK) | 251     | 2    | 28.07                 | 24.05     | 38.45      | PASS    |
| EGPRS850 (GMSK) | 251     | 3    | 26.97                 | 22.95     | 38.45      | PASS    |
| EGPRS850 (GMSK) | 251     | 4    | 25.68                 | 21.66     | 38.45      | PASS    |
| EGPRS850 (8PSK) | 128     | 1    | 26.42                 | 22.40     | 38.45      | PASS    |
| EGPRS850 (8PSK) | 128     | 2    | 23.55                 | 19.53     | 38.45      | PASS    |
| EGPRS850 (8PSK) | 128     | 3    | 21.61                 | 17.59     | 38.45      | PASS    |
| EGPRS850 (8PSK) | 128     | 4    | 20.12                 | 16.10     | 38.45      | PASS    |
| EGPRS850 (8PSK) | 190     | 1    | 26.23                 | 22.21     | 38.45      | PASS    |
| EGPRS850 (8PSK) | 190     | 2    | 23.31                 | 19.29     | 38.45      | PASS    |
| EGPRS850 (8PSK) | 190     | 3    | 21.36                 | 17.34     | 38.45      | PASS    |
| EGPRS850 (8PSK) | 190     | 4    | 19.91                 | 15.89     | 38.45      | PASS    |
| EGPRS850 (8PSK) | 251     | 1    | 26.22                 | 22.20     | 38.45      | PASS    |
| EGPRS850 (8PSK) | 251     | 2    | 23.22                 | 19.20     | 38.45      | PASS    |
| EGPRS850 (8PSK) | 251     | 3    | 21.27                 | 17.25     | 38.45      | PASS    |
| EGPRS850 (8PSK) | 251     | 4    | 19.83                 | 15.81     | 38.45      | PASS    |



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| Band             | Channel | Slot | Conducted Power (dBm) | EIRP (dBm) | Limit(dBm) | Verdict |
|------------------|---------|------|-----------------------|------------|------------|---------|
| GSM1900          | 512     | ---  | 29.51                 | 28.41      | 33.00      | PASS    |
| GSM1900          | 661     | ---  | 29.50                 | 28.40      | 33.00      | PASS    |
| GSM1900          | 810     | ---  | 29.54                 | 28.44      | 33.00      | PASS    |
| EGPRS1900 (GMSK) | 512     | 1    | 29.50                 | 28.40      | 33.00      | PASS    |
| EGPRS1900 (GMSK) | 512     | 2    | 27.44                 | 26.34      | 33.00      | PASS    |
| EGPRS1900 (GMSK) | 512     | 3    | 25.19                 | 24.09      | 33.00      | PASS    |
| EGPRS1900 (GMSK) | 512     | 4    | 24.04                 | 22.94      | 33.00      | PASS    |
| EGPRS1900 (GMSK) | 661     | 1    | 29.49                 | 28.39      | 33.00      | PASS    |
| EGPRS1900 (GMSK) | 661     | 2    | 27.48                 | 26.38      | 33.00      | PASS    |
| EGPRS1900 (GMSK) | 661     | 3    | 25.31                 | 24.21      | 33.00      | PASS    |
| EGPRS1900 (GMSK) | 661     | 4    | 24.13                 | 23.03      | 33.00      | PASS    |
| EGPRS1900 (GMSK) | 810     | 1    | 29.54                 | 28.44      | 33.00      | PASS    |
| EGPRS1900 (GMSK) | 810     | 2    | 27.55                 | 26.45      | 33.00      | PASS    |
| EGPRS1900 (GMSK) | 810     | 3    | 25.38                 | 24.28      | 33.00      | PASS    |
| EGPRS1900 (GMSK) | 810     | 4    | 24.25                 | 23.15      | 33.00      | PASS    |
| EGPRS1900 (8PSK) | 512     | 1    | 25.94                 | 24.84      | 33.00      | PASS    |
| EGPRS1900 (8PSK) | 512     | 2    | 22.86                 | 21.76      | 33.00      | PASS    |
| EGPRS1900 (8PSK) | 512     | 3    | 20.82                 | 19.72      | 33.00      | PASS    |
| EGPRS1900 (8PSK) | 512     | 4    | 19.74                 | 18.64      | 33.00      | PASS    |
| EGPRS1900 (8PSK) | 661     | 1    | 25.92                 | 24.82      | 33.00      | PASS    |
| EGPRS1900 (8PSK) | 661     | 2    | 22.99                 | 21.89      | 33.00      | PASS    |
| EGPRS1900 (8PSK) | 661     | 3    | 20.82                 | 19.72      | 33.00      | PASS    |
| EGPRS1900 (8PSK) | 661     | 4    | 19.73                 | 18.63      | 33.00      | PASS    |
| EGPRS1900 (8PSK) | 810     | 1    | 25.95                 | 24.85      | 33.00      | PASS    |
| EGPRS1900 (8PSK) | 810     | 2    | 23.19                 | 22.09      | 33.00      | PASS    |
| EGPRS1900 (8PSK) | 810     | 3    | 21.05                 | 19.95      | 33.00      | PASS    |
| EGPRS1900 (8PSK) | 810     | 4    | 20.00                 | 18.90      | 33.00      | PASS    |

Remark:

a: For getting the EIRP (Efficient Isotropic Radiated Power), the following formula should be taken to calculate it,

ERP [dBm] = Conducted Power [dBm] + Gain [dBd]

EIRP [dBm] = Conducted Power [dBm] + Gain [dBi]



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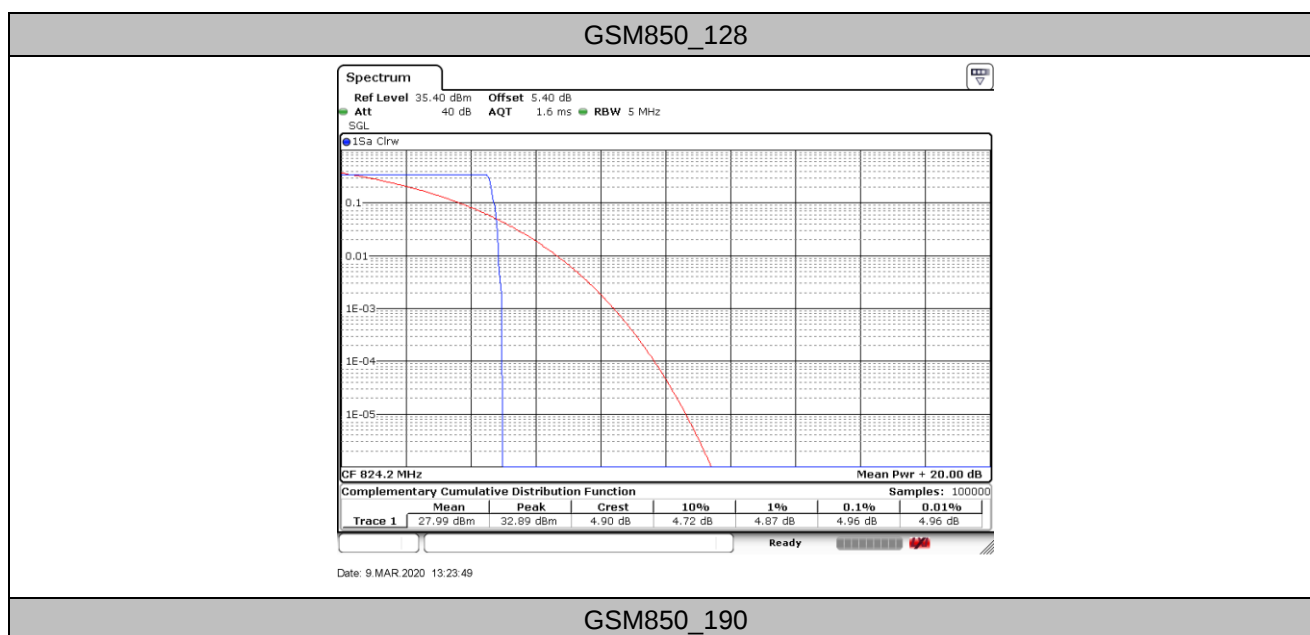
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## 2. Peak-to-Average Ratio

## 2.1. Test Result

| Band      | Channel | Peak-to-Average Ratio(dB) | Limit(dB) | Verdict |
|-----------|---------|---------------------------|-----------|---------|
| GSM850    | 128     | 4.96                      | 13        | PASS    |
| GSM850    | 190     | 5.33                      | 13        | PASS    |
| GSM850    | 251     | 4.90                      | 13        | PASS    |
| EGPRS850  | 128     | 8.55                      | 13        | PASS    |
| EGPRS850  | 190     | 8.46                      | 13        | PASS    |
| EGPRS850  | 251     | 8.35                      | 13        | PASS    |
| GSM1900   | 512     | 4.81                      | 13        | PASS    |
| GSM1900   | 661     | 4.84                      | 13        | PASS    |
| GSM1900   | 810     | 4.78                      | 13        | PASS    |
| EGPRS1900 | 512     | 8.55                      | 13        | PASS    |
| EGPRS1900 | 661     | 8.55                      | 13        | PASS    |
| EGPRS1900 | 810     | 8.29                      | 13        | PASS    |

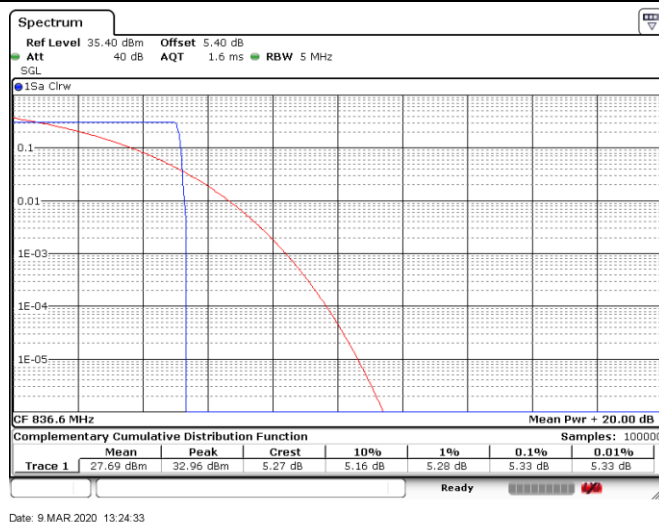
## 2.2.Part II - Test Plots



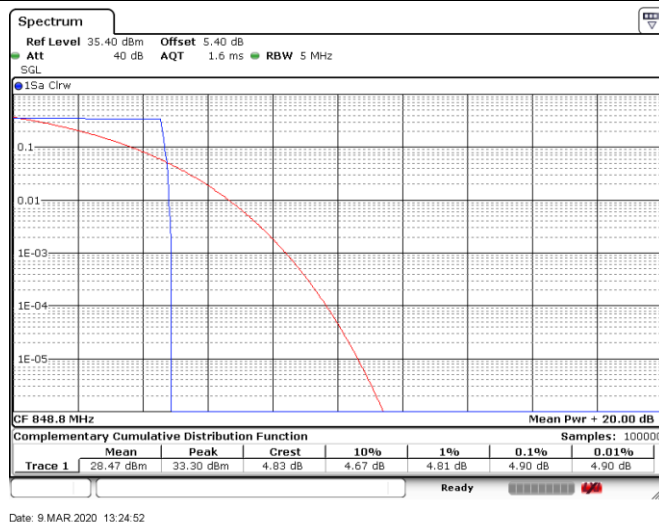
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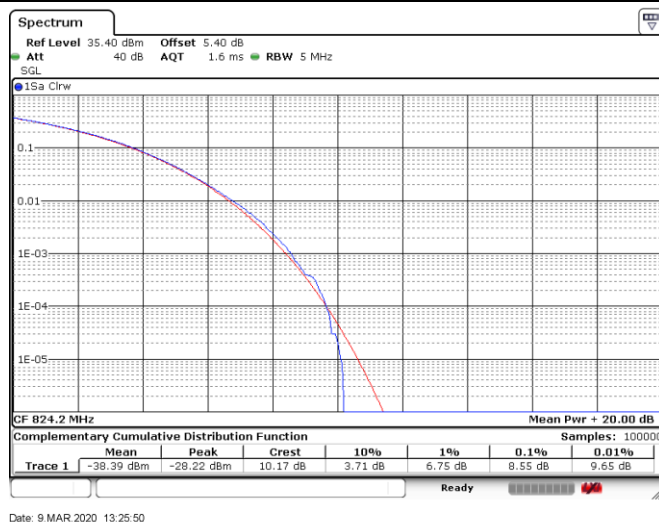


GSM850\_251

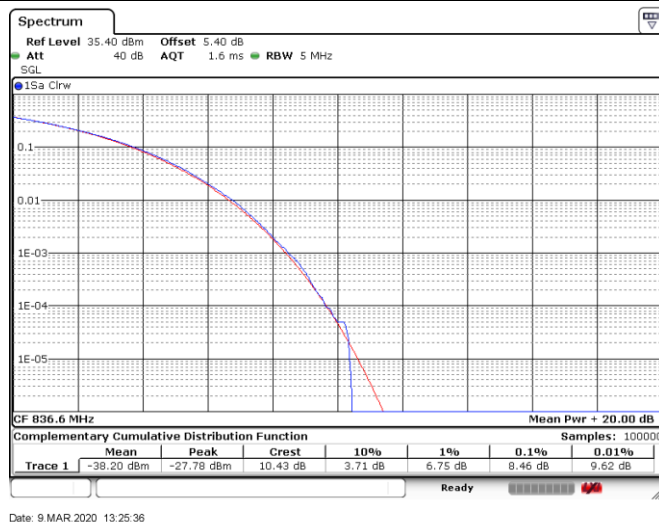


EGPRS850\_128



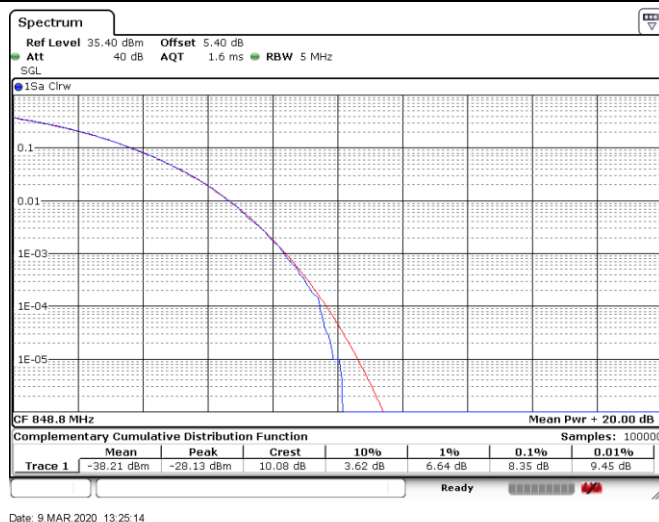


EGPRS850\_190

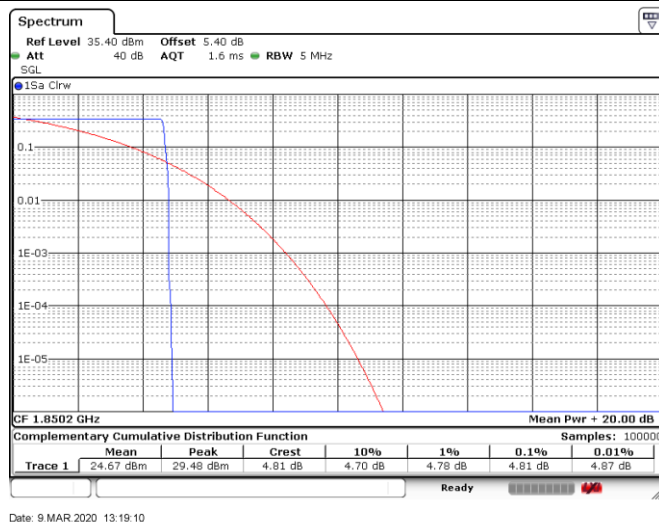


EGPRS850\_251



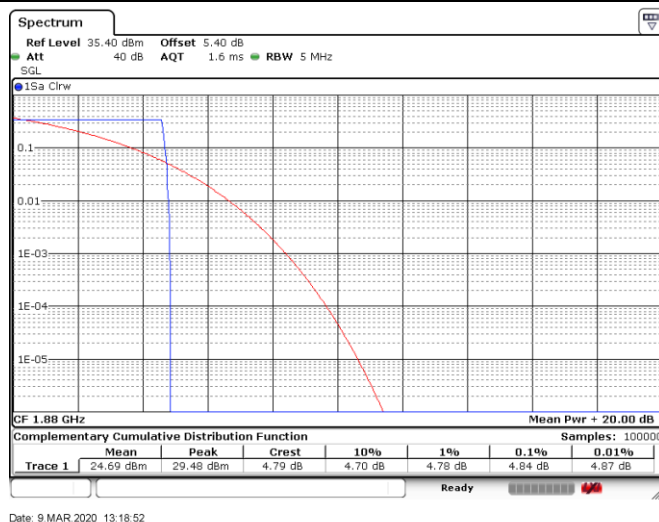


GSM1900\_512

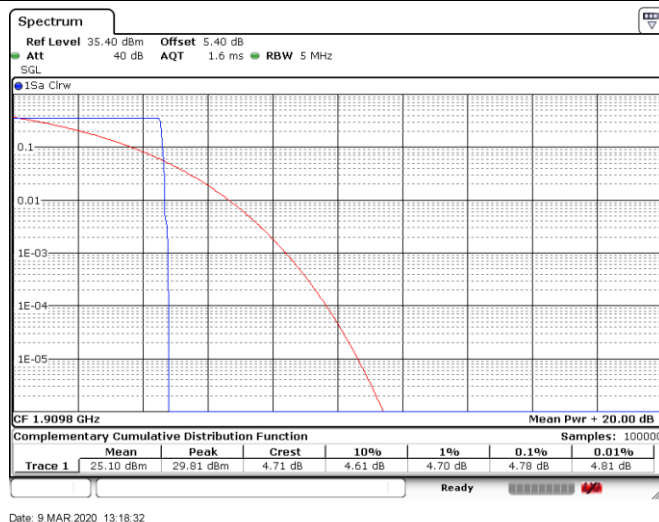


GSM1900\_661



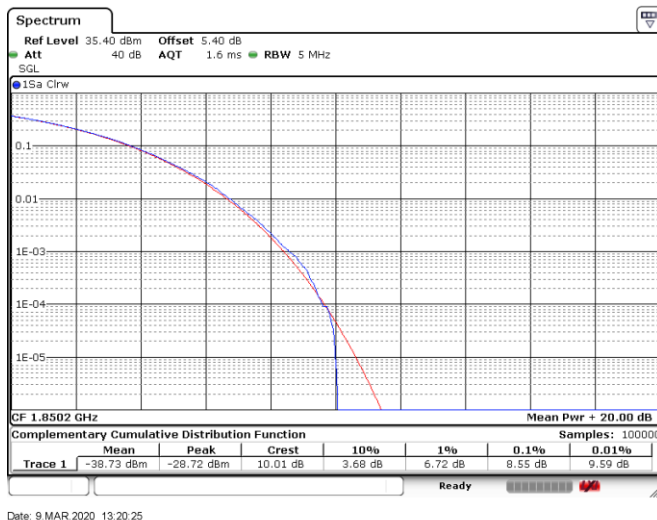


GSM1900\_810

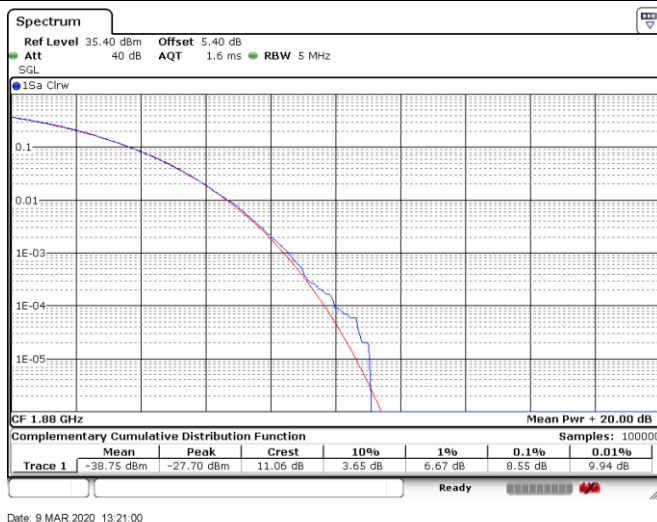


EGPRS1900\_512



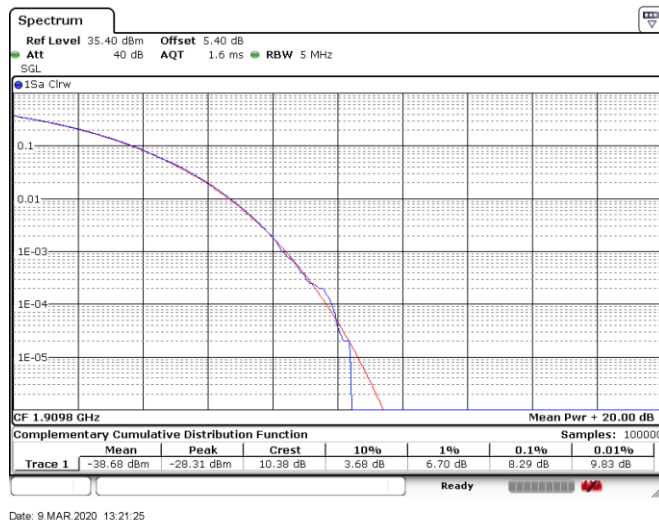


EGPRS1900\_661



EGPRS1900\_810





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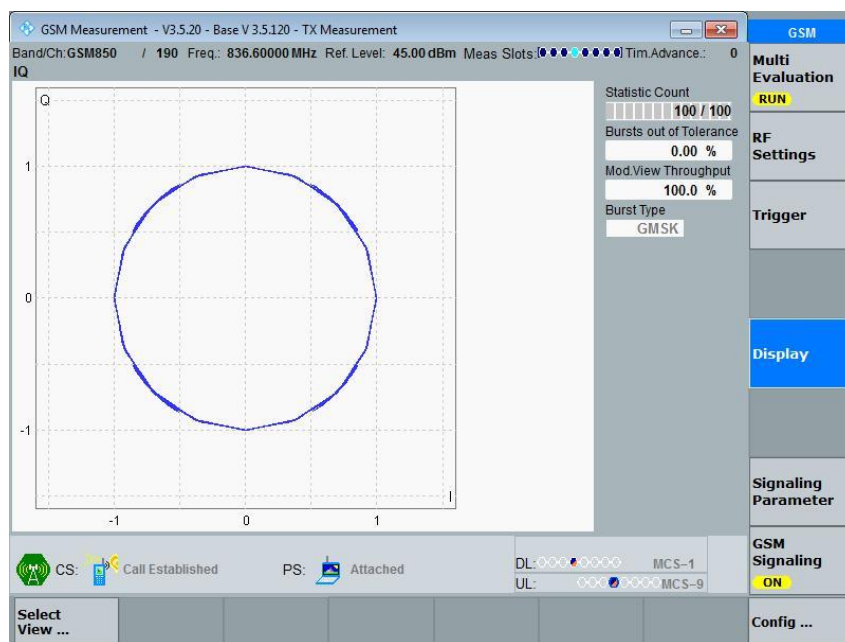
### 3. Modulation Characteristics

#### 3.1. For GSM

##### 3.1.1. Test Band = GSM 850

##### 3.1.1.1. Test Mode = GSM/TM1

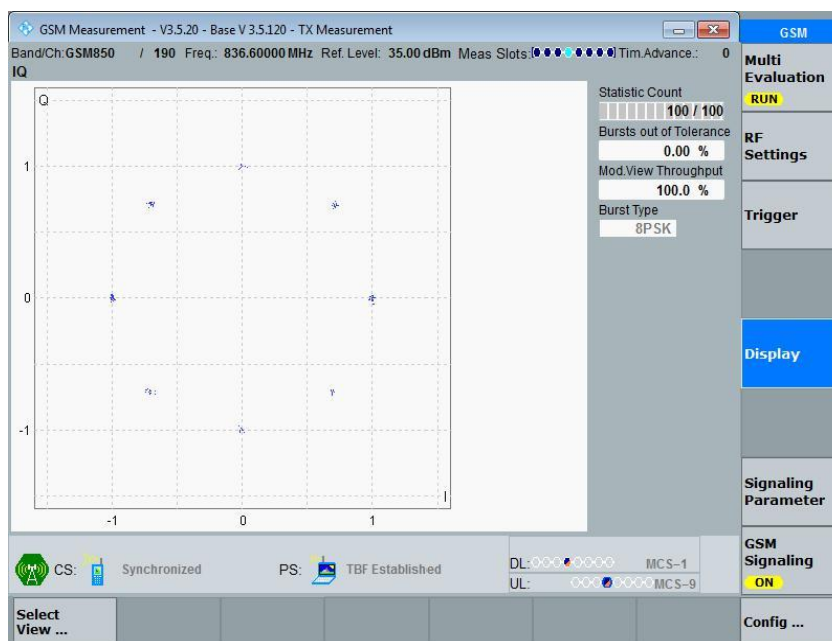
##### 3.1.1.1.1. Test Channel = MCH





### 3.1.1.2. Test Mode = GSM/TM2

#### 3.1.1.2.1. Test Channel = MCH

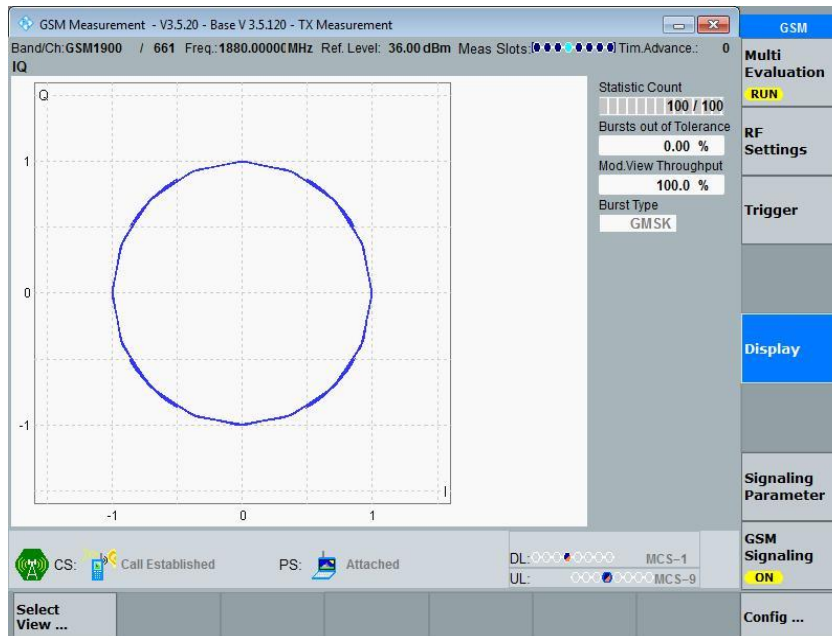




### 3.1.2. Test Band = GSM 1900

#### 3.1.2.1. Test Mode = GSM/TM1

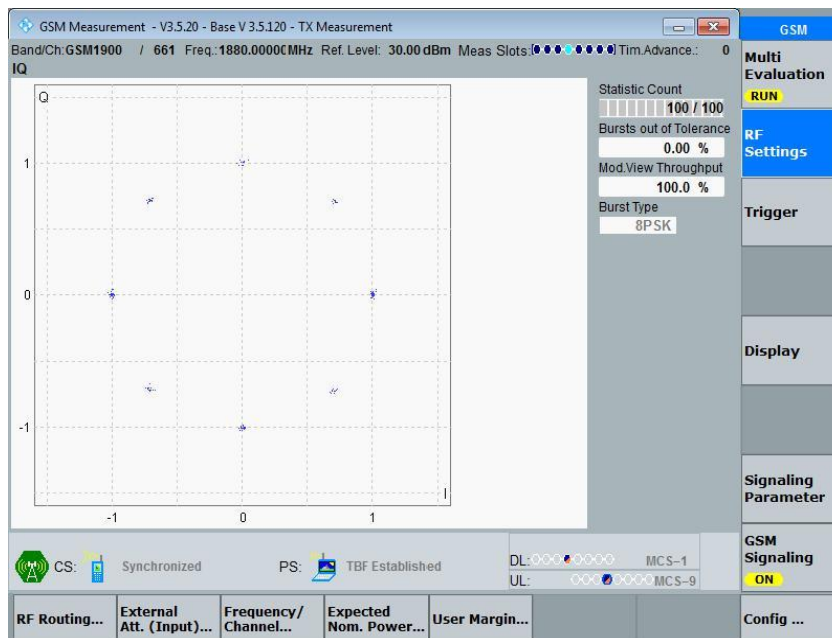
##### 3.1.2.1.1. Test Channel = MCH





### 3.1.2.2. Test Mode = GSM/TM2

#### 3.1.2.2.1. Test Channel = MCH



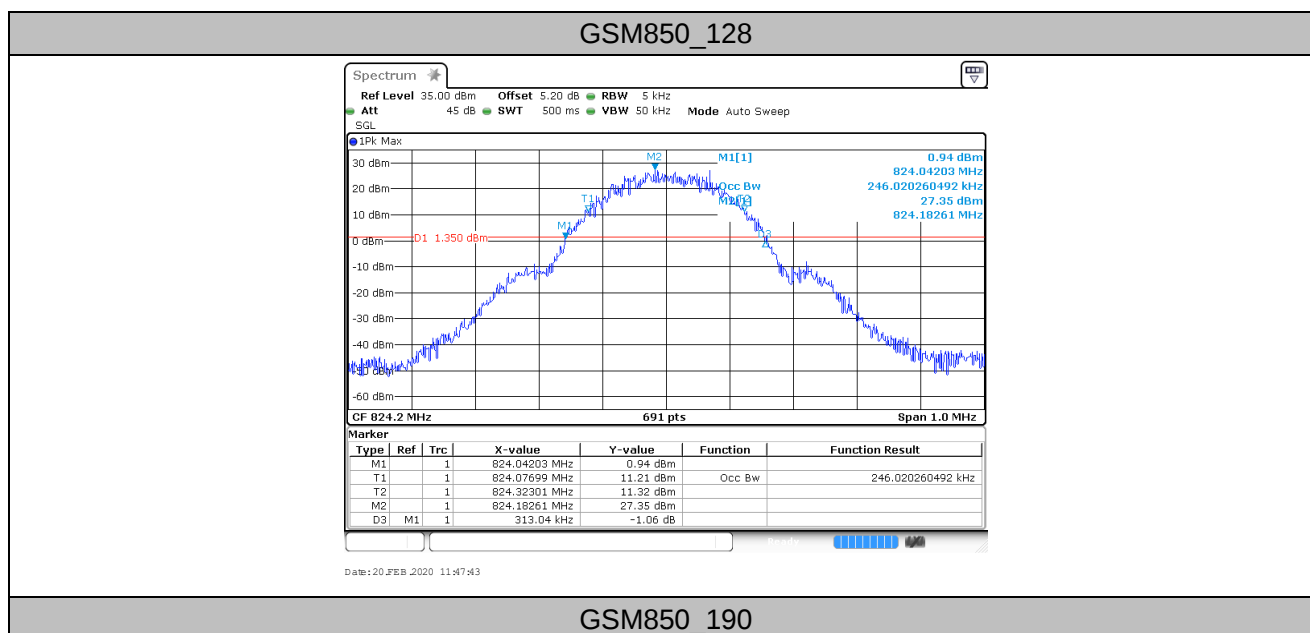


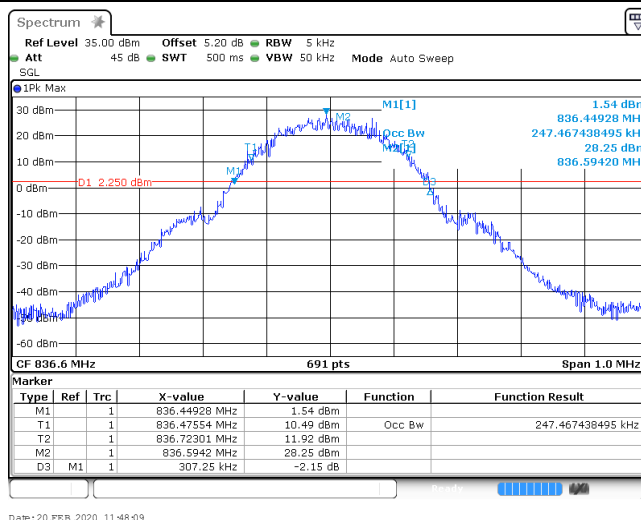
## 4. 26dB Bandwidth and Occupied Bandwidth

### 4.1. Test Result

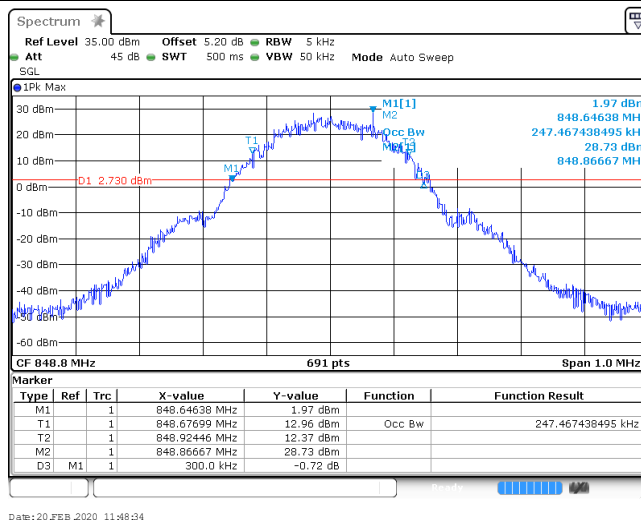
| Band      | Channel | Occupied Bandwidth (kHz) | 26dB Bandwidth (kHz) | Limit(kHz) | Verdict |
|-----------|---------|--------------------------|----------------------|------------|---------|
| GSM850    | 128     | 246.02                   | 313.04               | ---        | PASS    |
| GSM850    | 190     | 247.47                   | 307.25               | ---        | PASS    |
| GSM850    | 251     | 247.47                   | 300.00               | ---        | PASS    |
| EGPRS850  | 128     | 247.47                   | 291.30               | ---        | PASS    |
| EGPRS850  | 190     | 250.36                   | 304.35               | ---        | PASS    |
| EGPRS850  | 251     | 250.36                   | 298.55               | ---        | PASS    |
| GSM1900   | 512     | 244.57                   | 295.65               | ---        | PASS    |
| GSM1900   | 661     | 244.57                   | 295.65               | ---        | PASS    |
| GSM1900   | 810     | 243.13                   | 310.14               | ---        | PASS    |
| EGPRS1900 | 512     | 246.02                   | 294.20               | ---        | PASS    |
| EGPRS1900 | 661     | 247.47                   | 310.14               | ---        | PASS    |
| EGPRS1900 | 810     | 248.91                   | 304.35               | ---        | PASS    |

### 4.2. Test Plots





## GSM850\_251

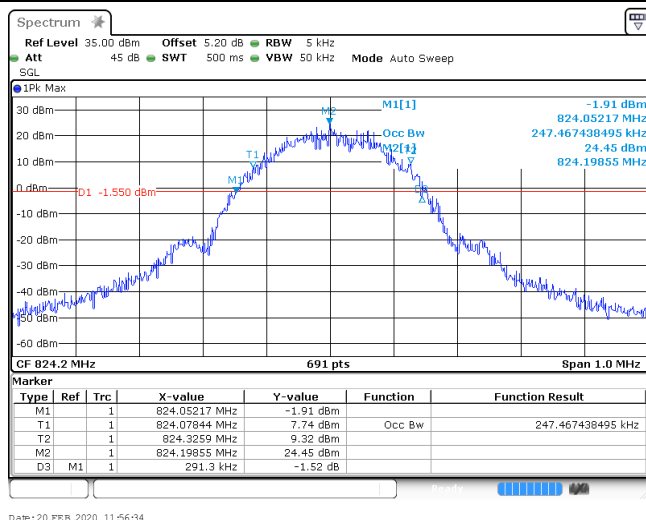


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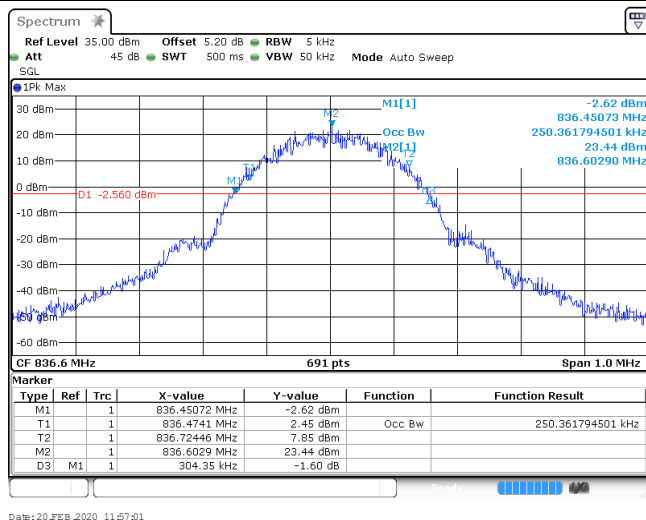


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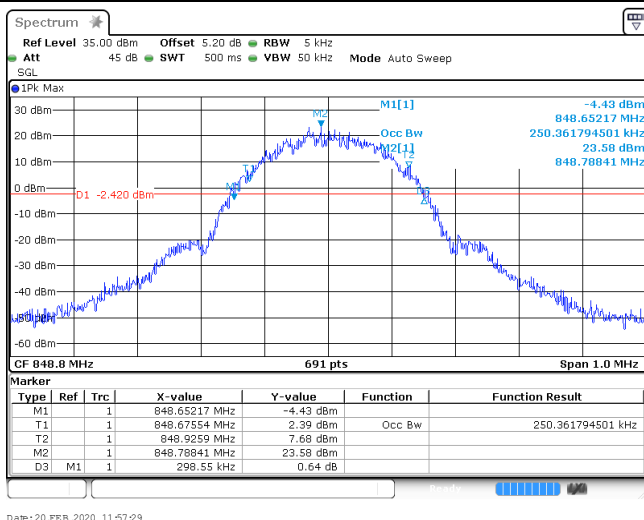


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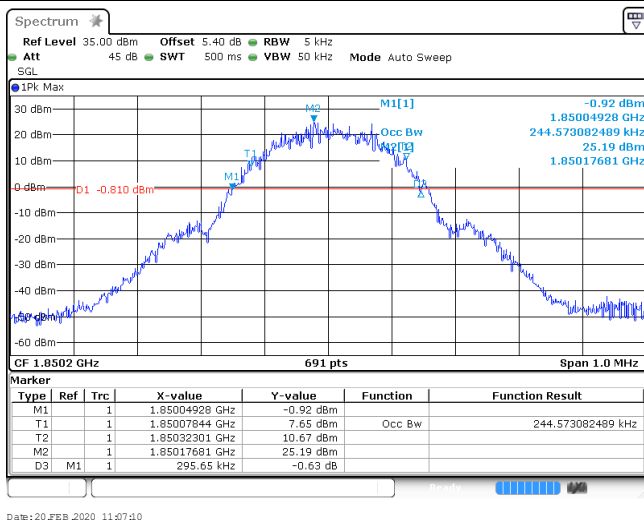


## EGPRS850\_251



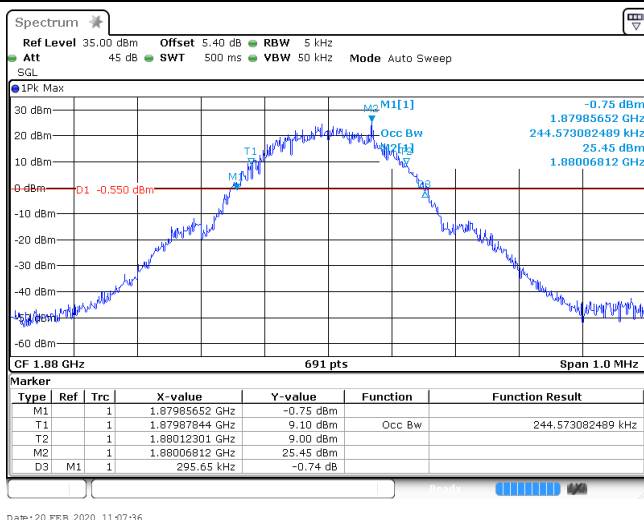


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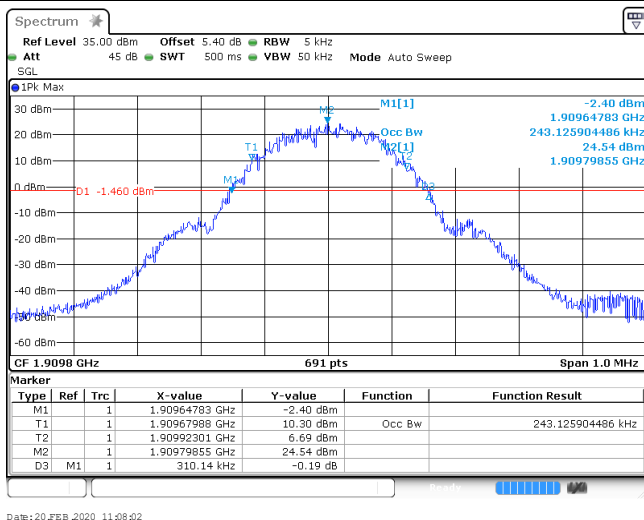


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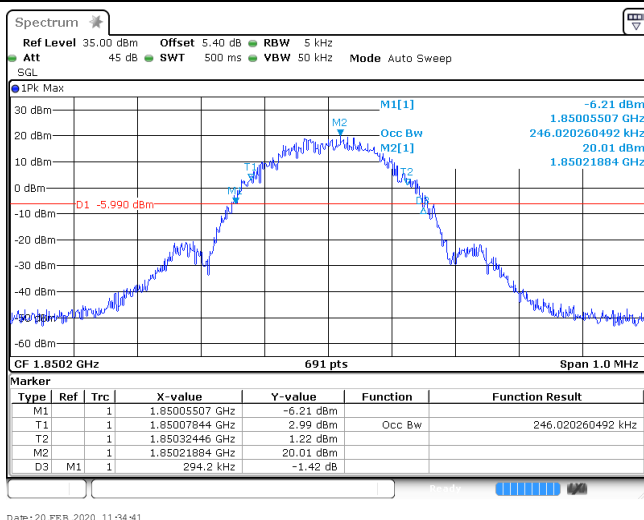


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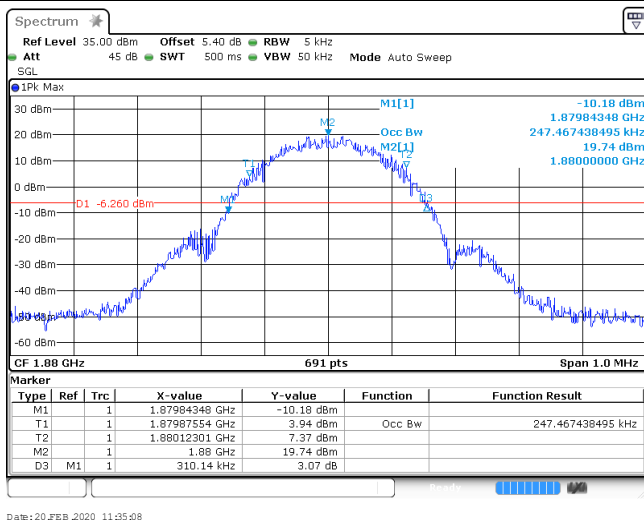


## EGPRS1900\_512



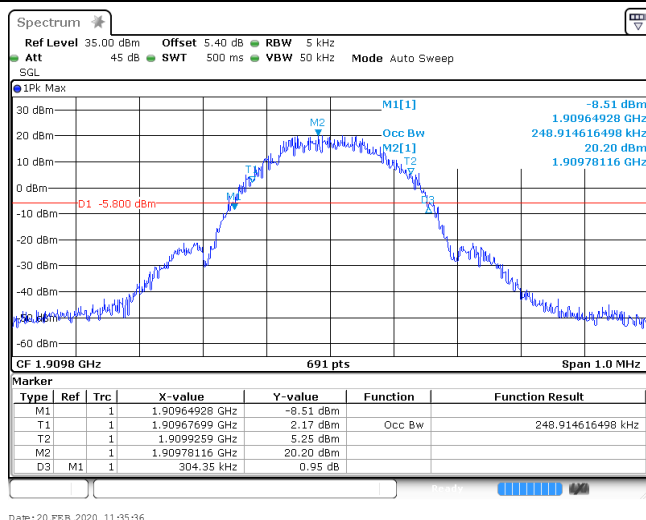


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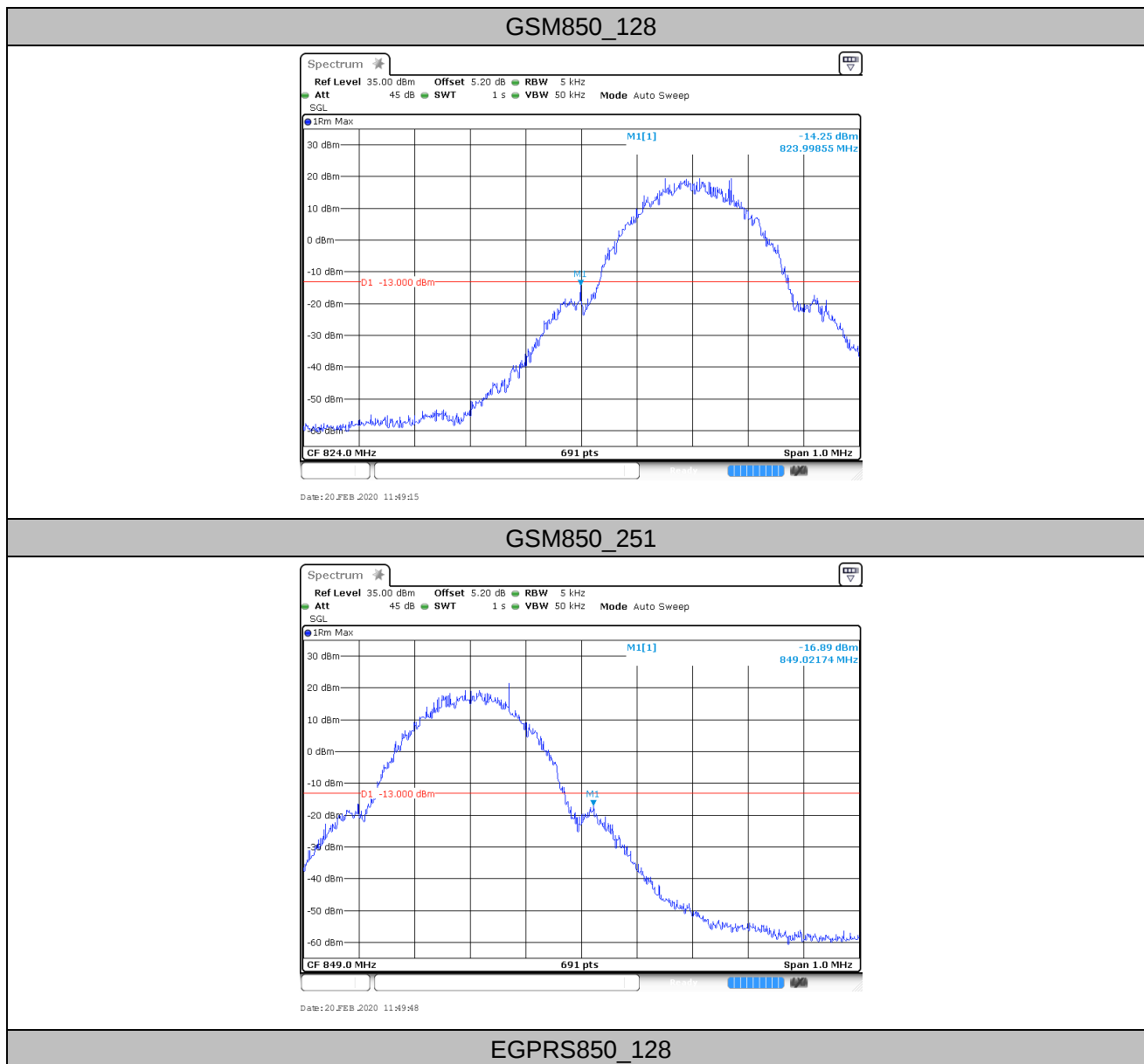
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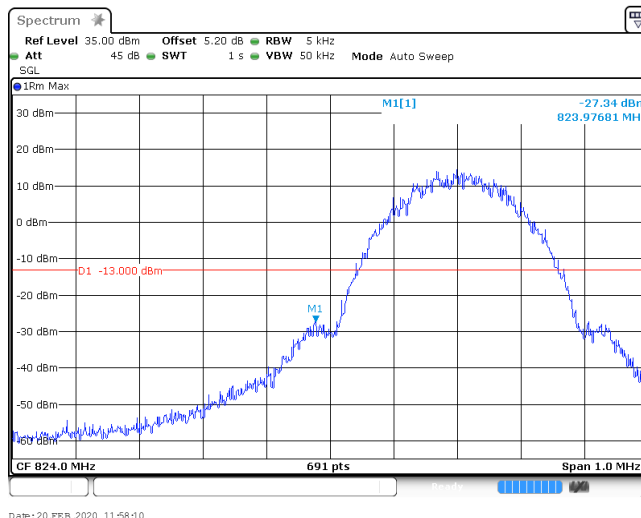




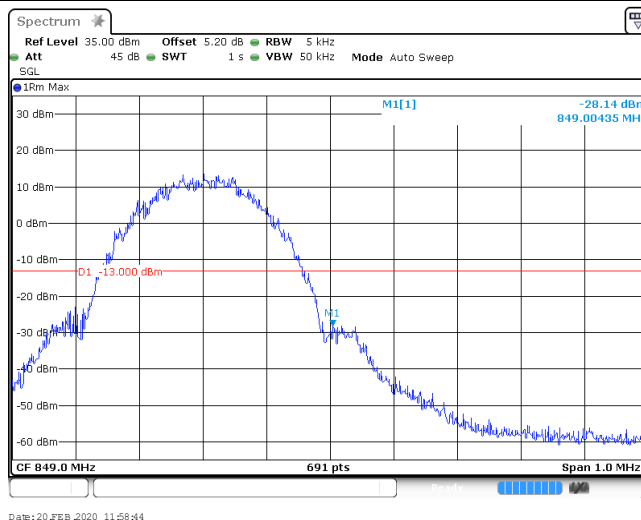
## 5. Band Edge Compliance

### 5.1. Test Plots





EGPRS850\_251



GSM1900\_512

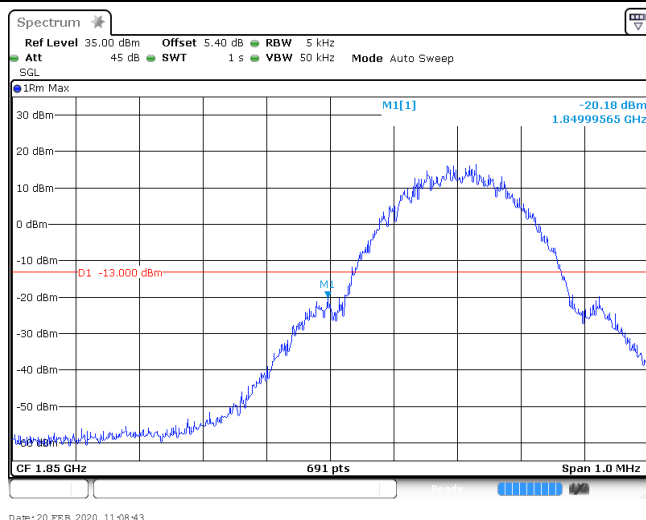


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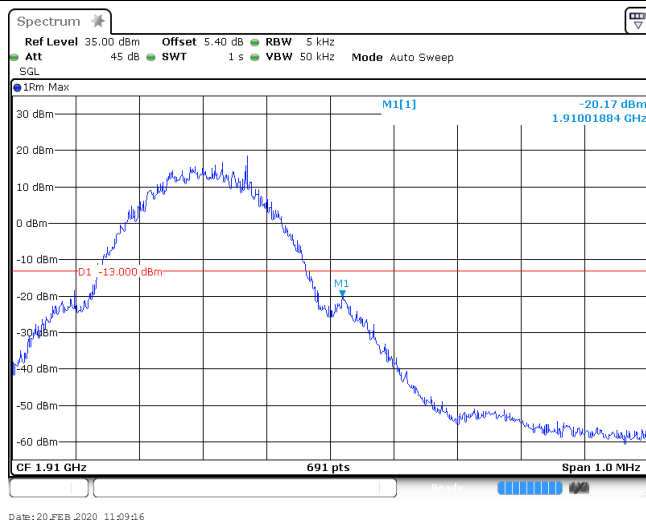
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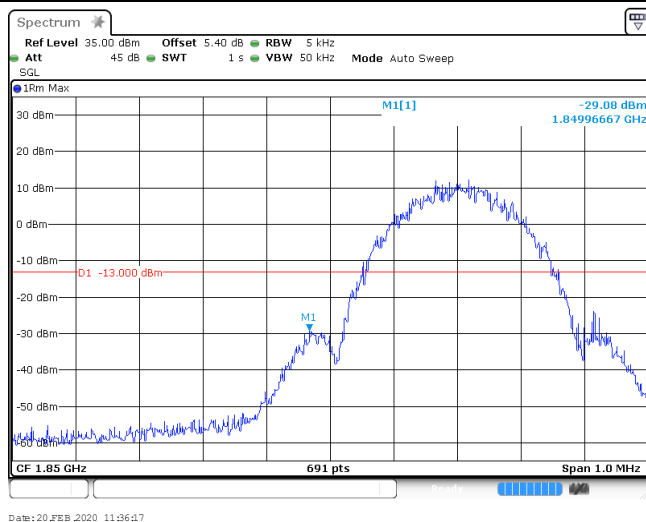


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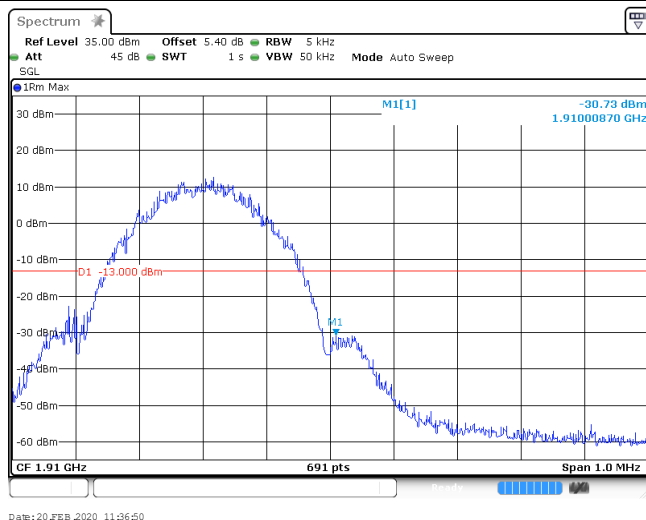


EGPRS1900\_512





### EGPRS1900\_810



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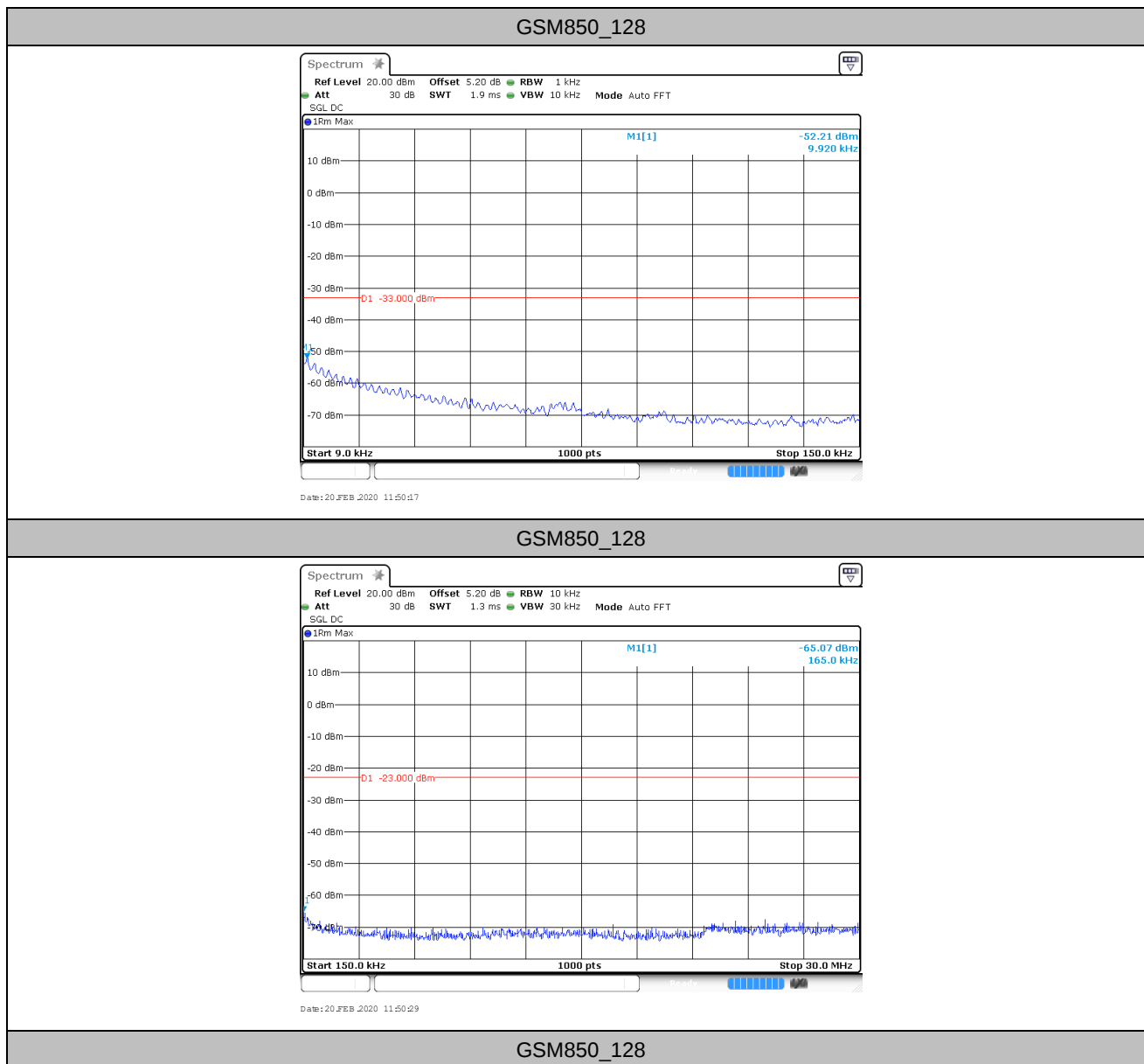


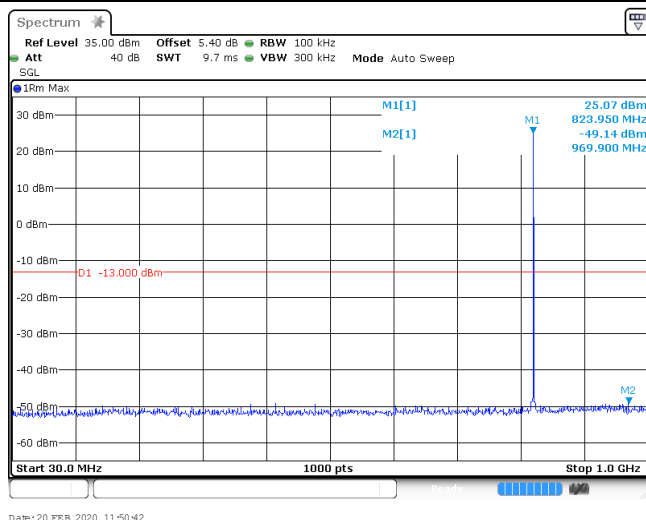
## 6. Spurious Emission at Antenna Terminal

Remark1: For the averaged unwanted emissions measurements, the measurement points in each sweep is greater than twice the Span/RBW in order to ensure bin-to-bin spacing of  $< RBW/2$  so that narrowband signals are not lost between frequency bins. As to the present test item, the "Measurement Points =  $k * (\text{Span} / RBW)$ " with  $k$  between 4 and 5, which results in an acceptable level error of less than 0.5 dB.

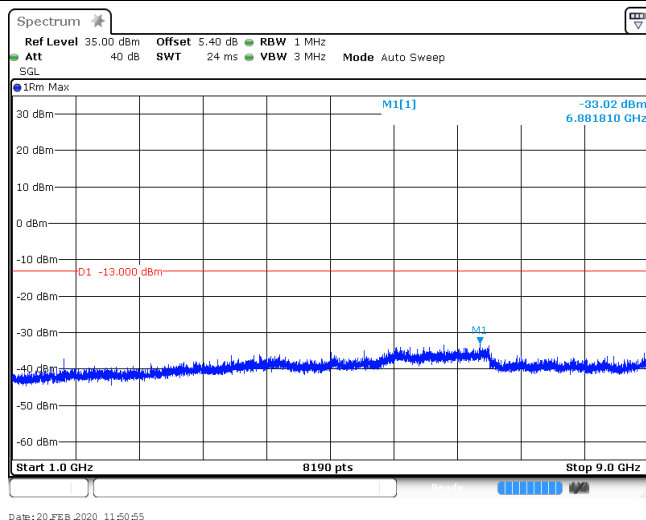
Remark2: only the worst case data displayed in this report.

### 6.1. Test Plots





GSM850\_128

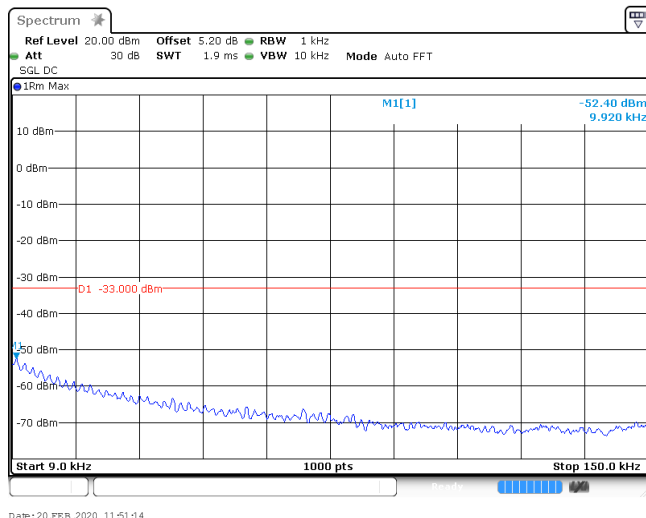


GSM850\_190



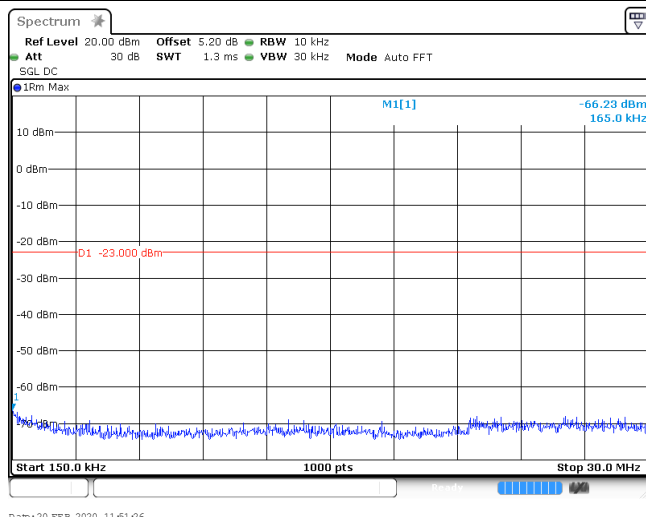
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Date: 20 FEB 2020 11:51:14

GSM850\_190



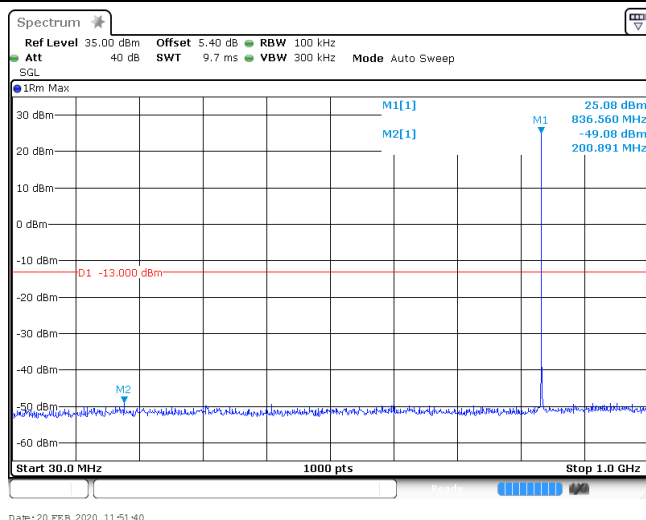
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GSM850\_190

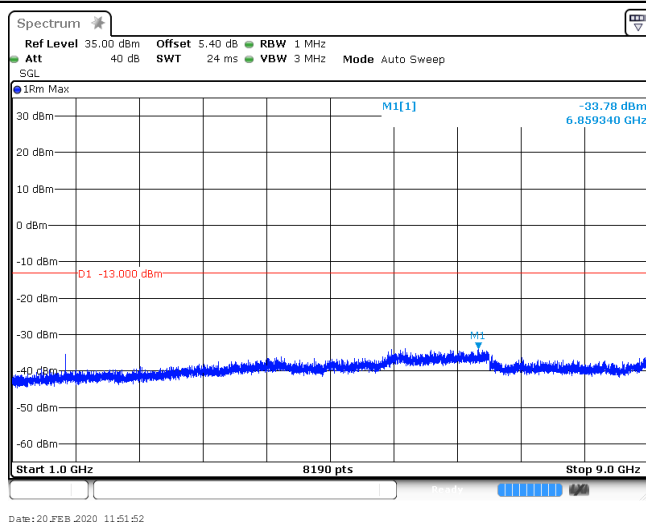


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GSM850\_190



GSM850\_251

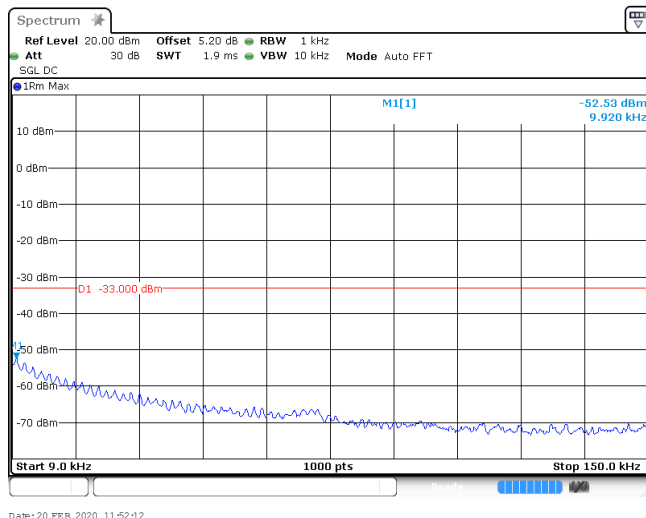


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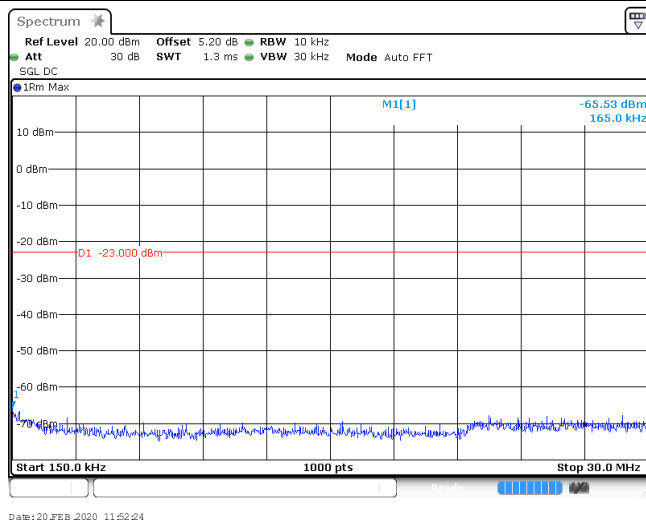
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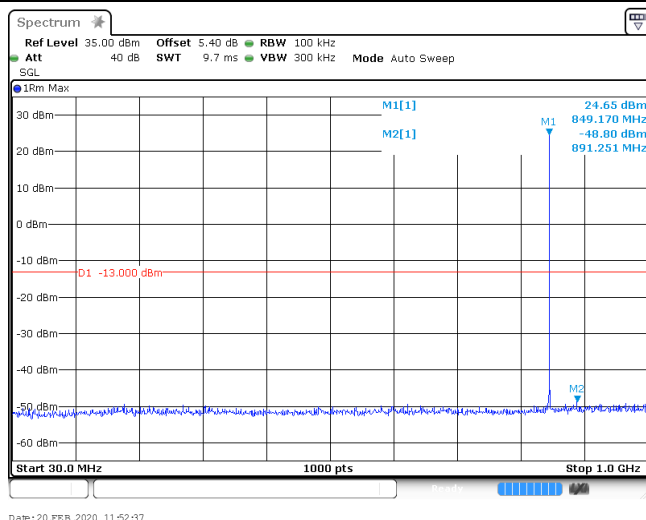


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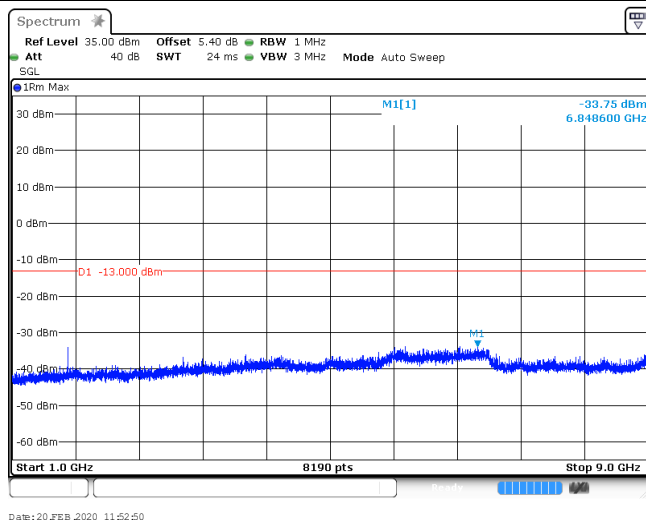
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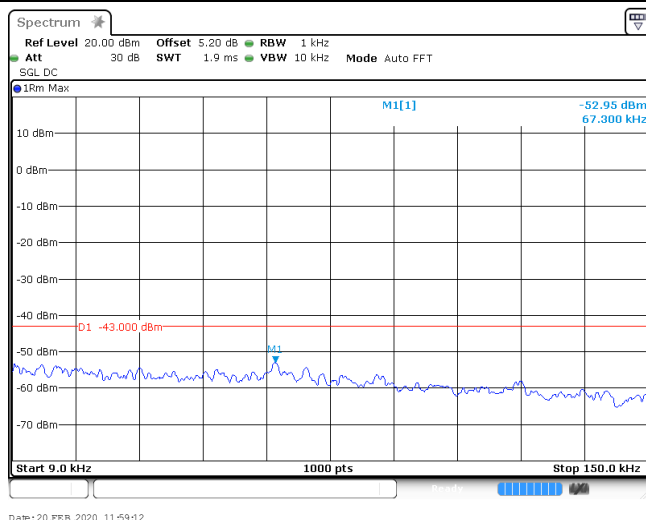


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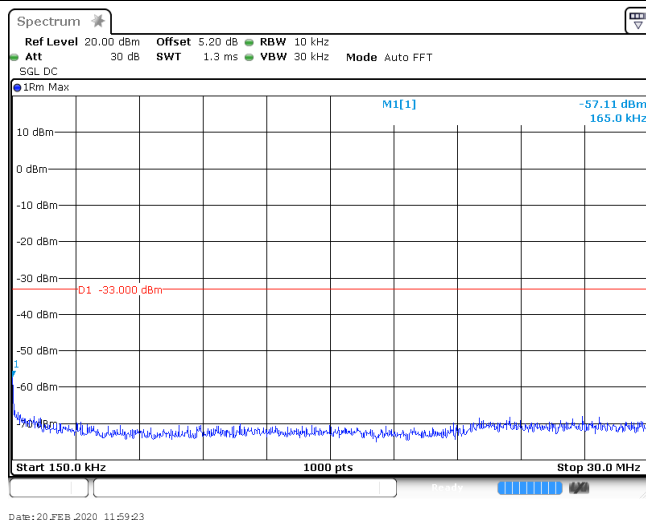


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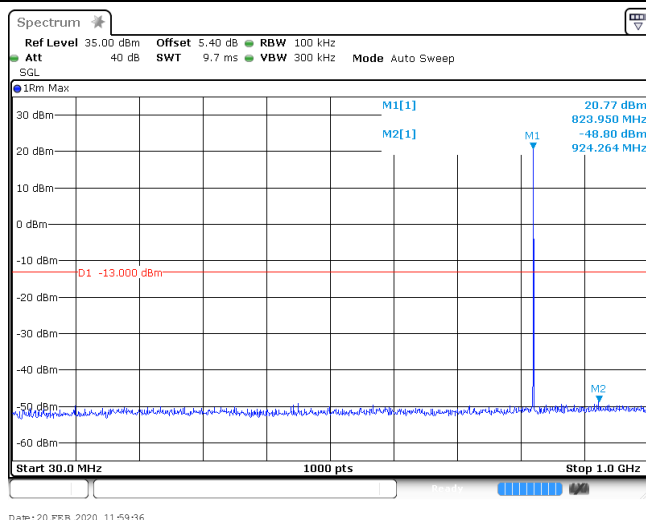


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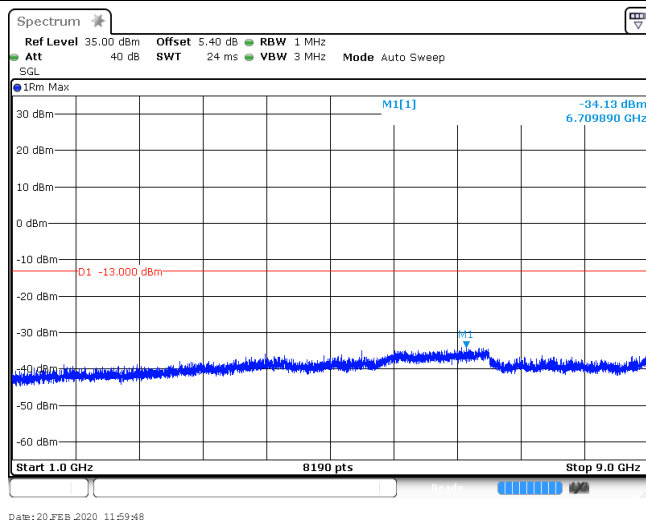
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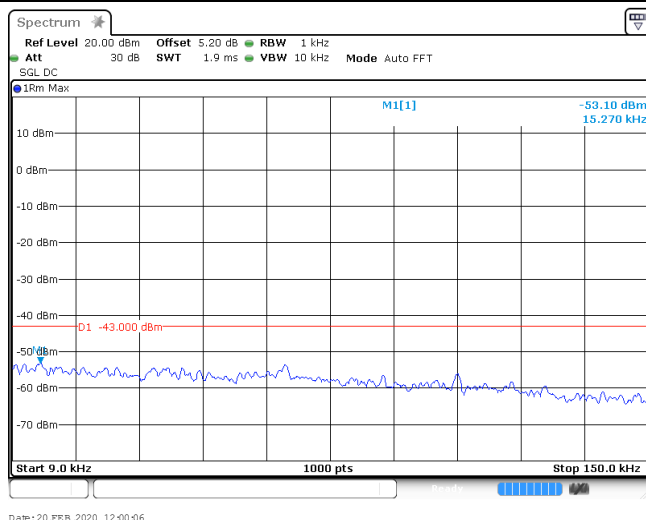


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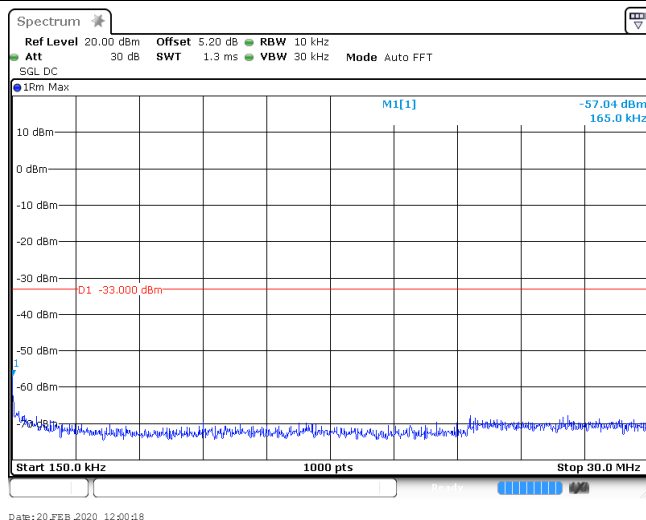


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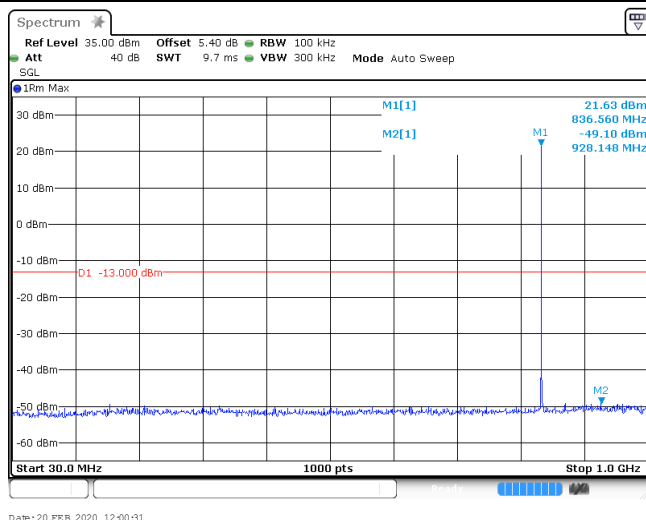


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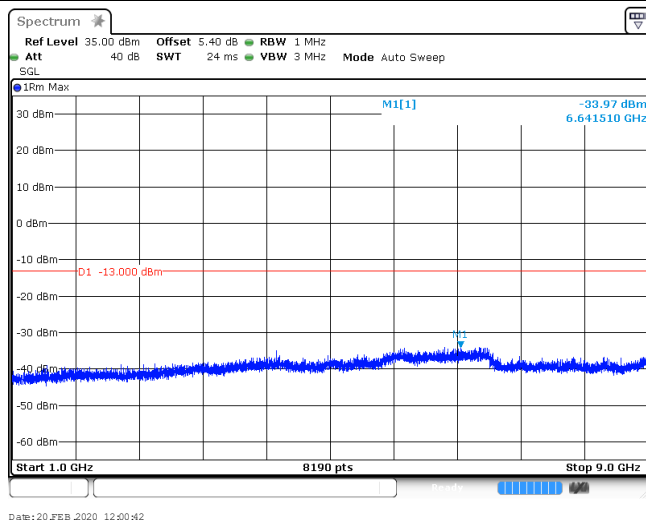
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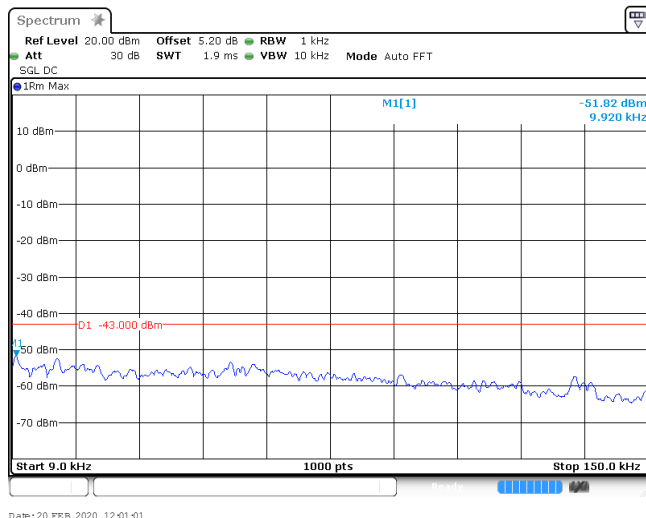
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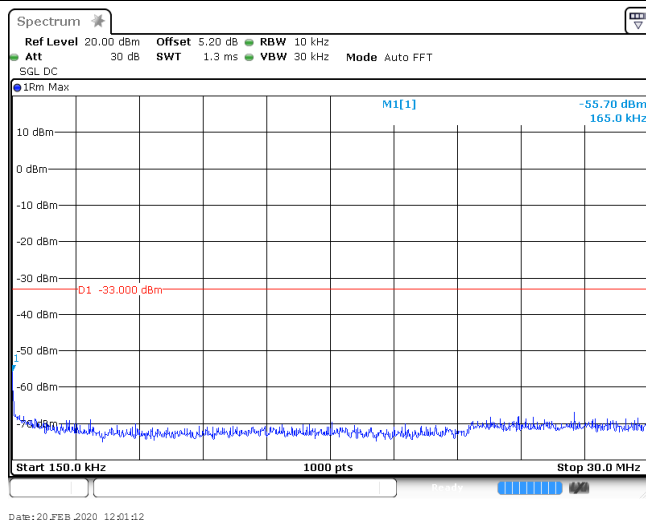


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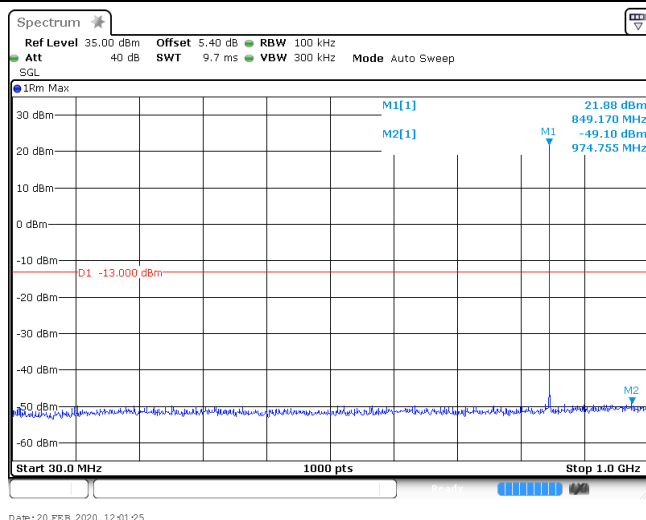


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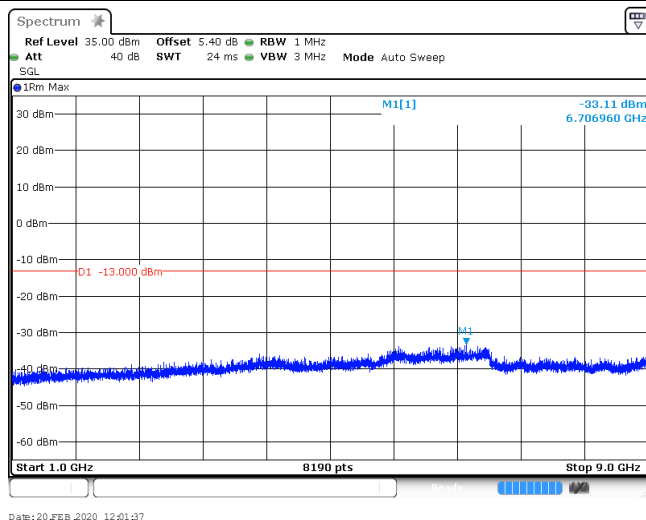


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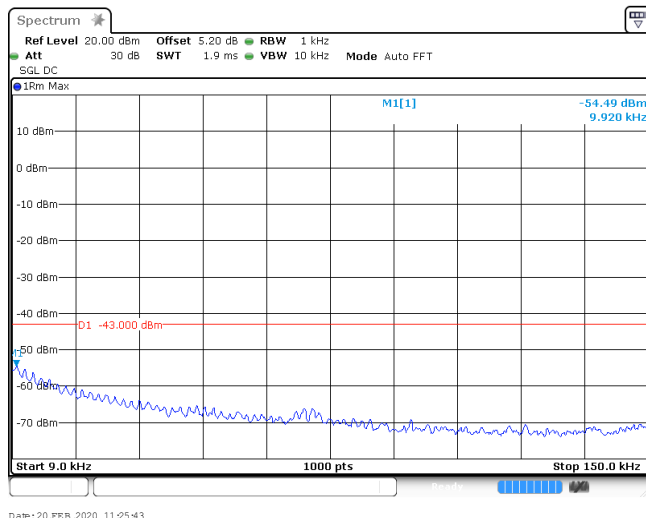


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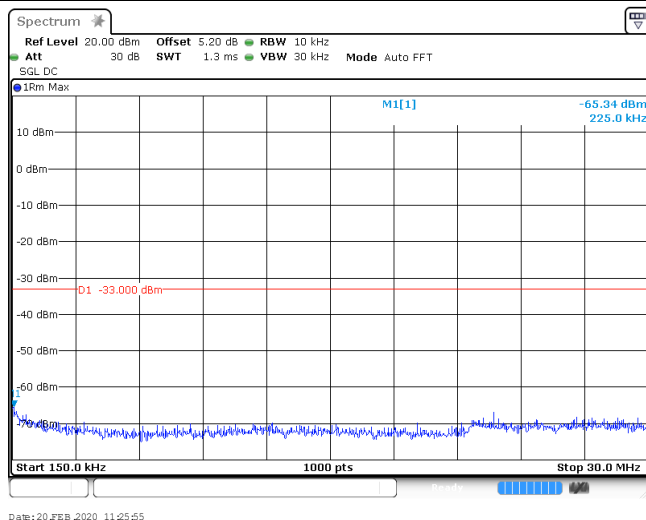


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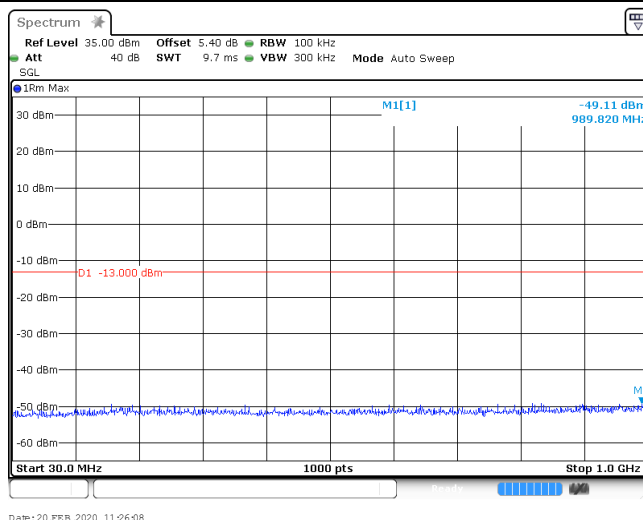


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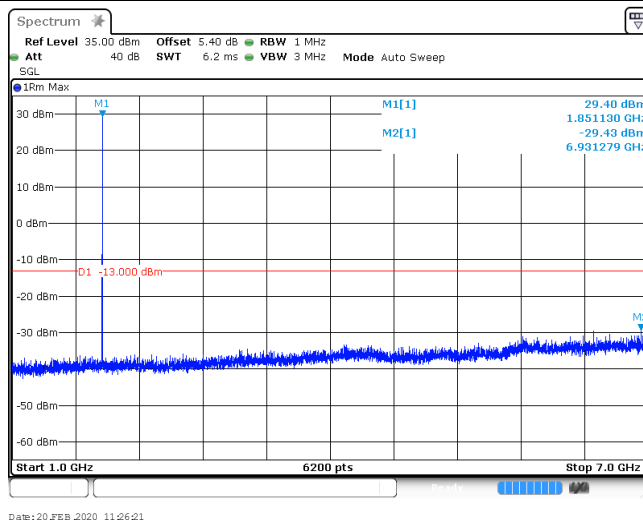
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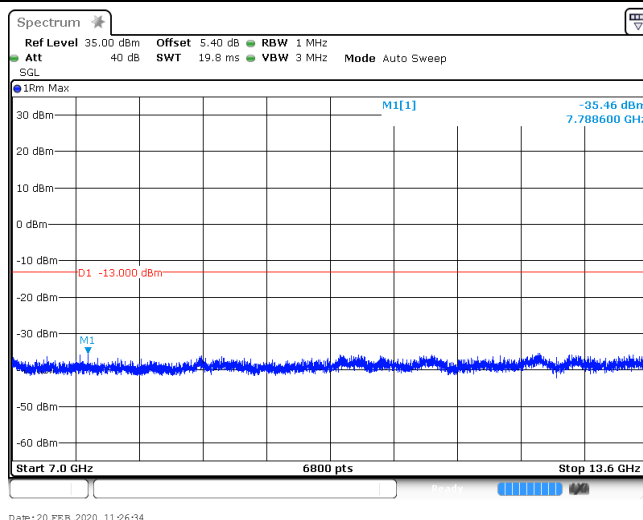


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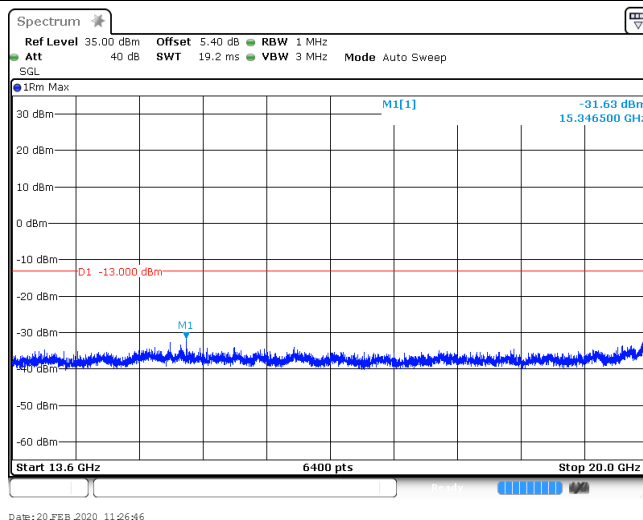


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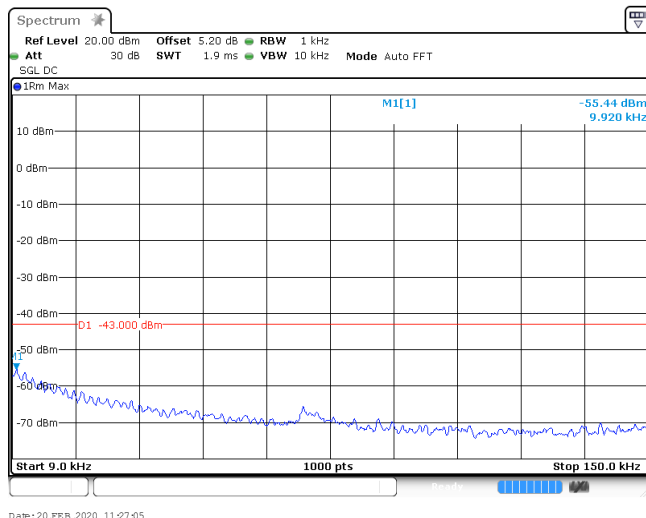


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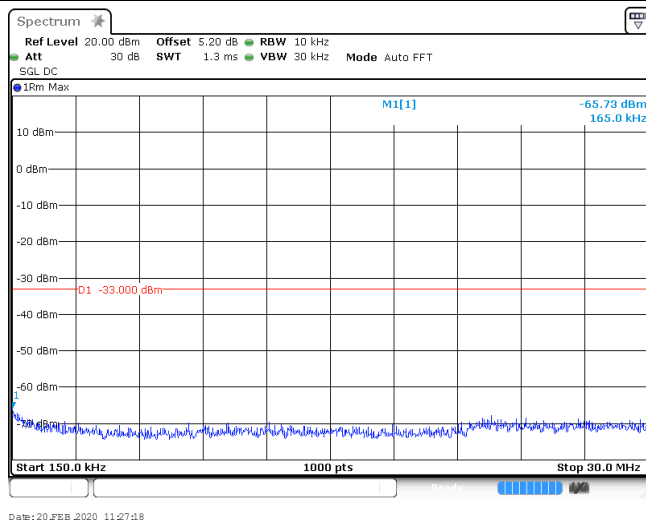


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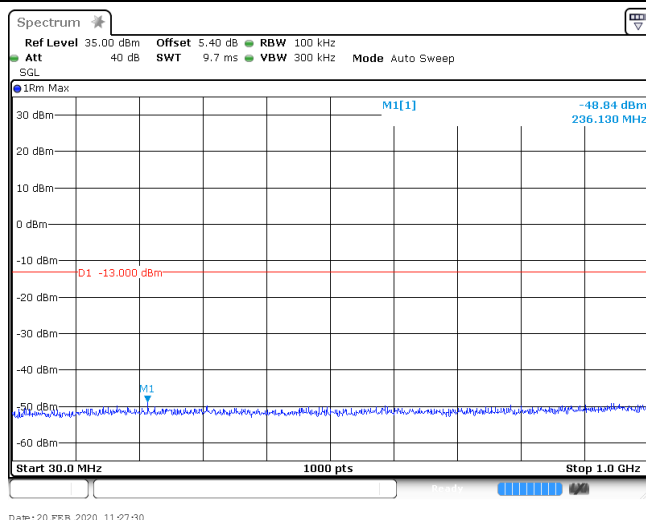
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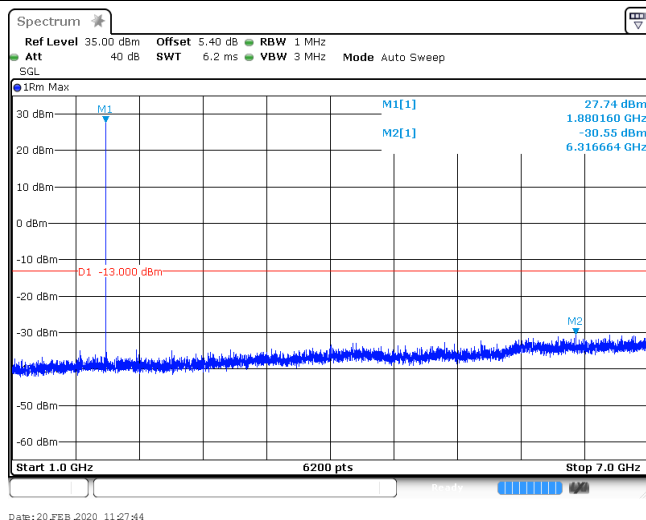
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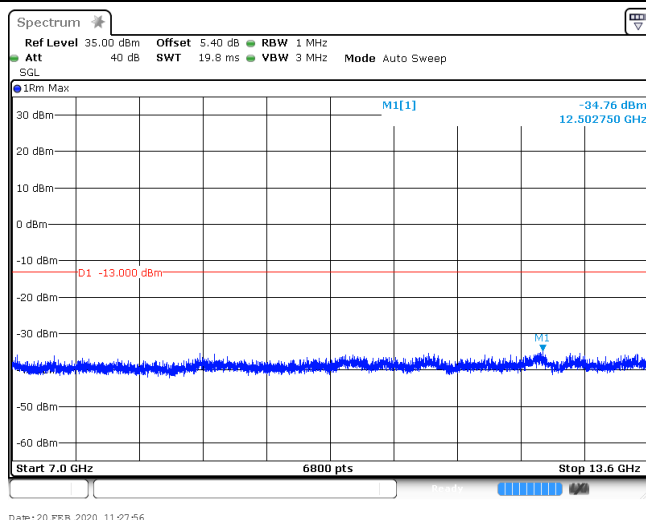


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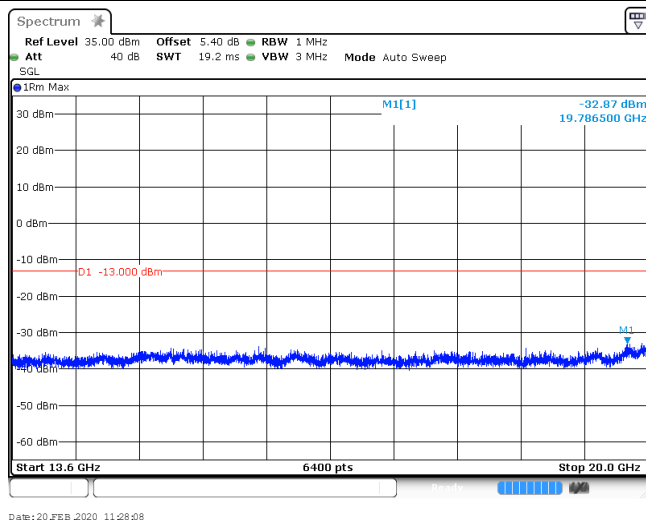


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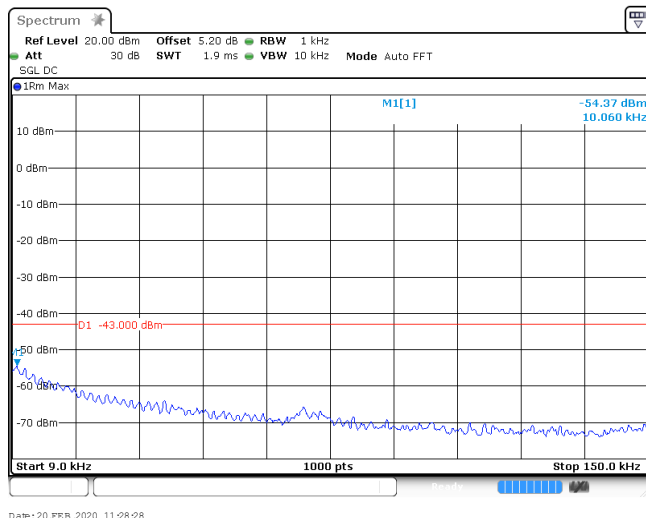


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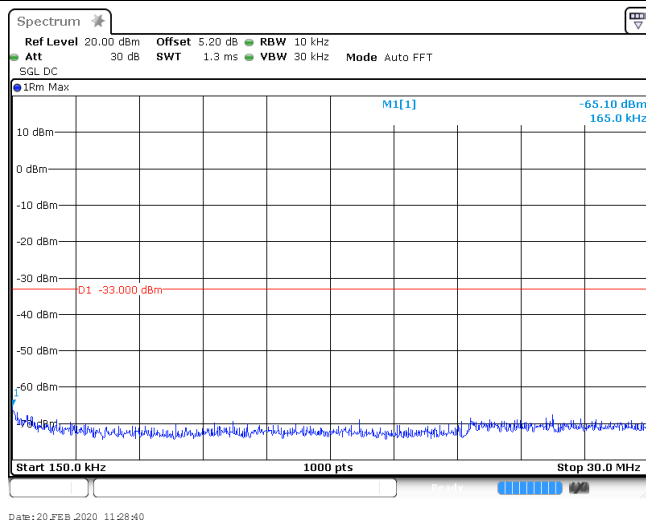


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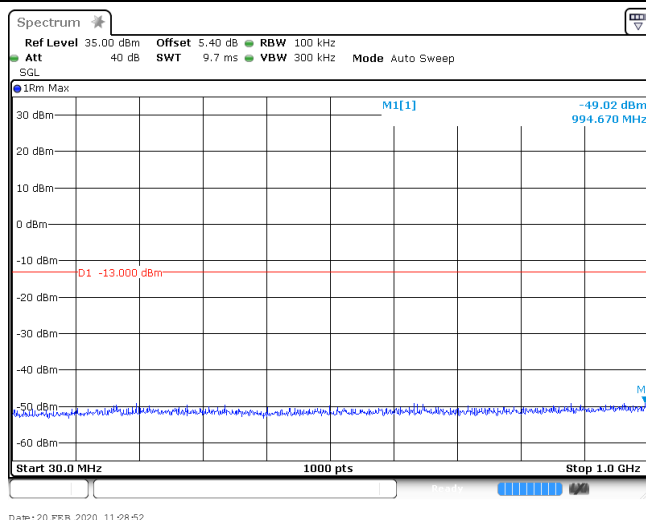


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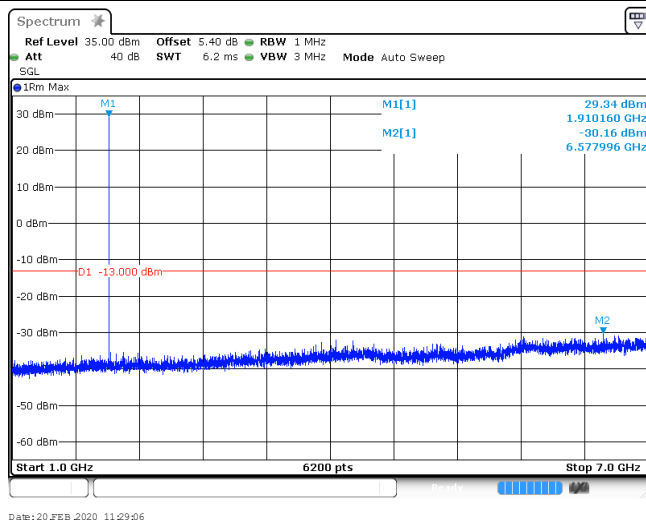


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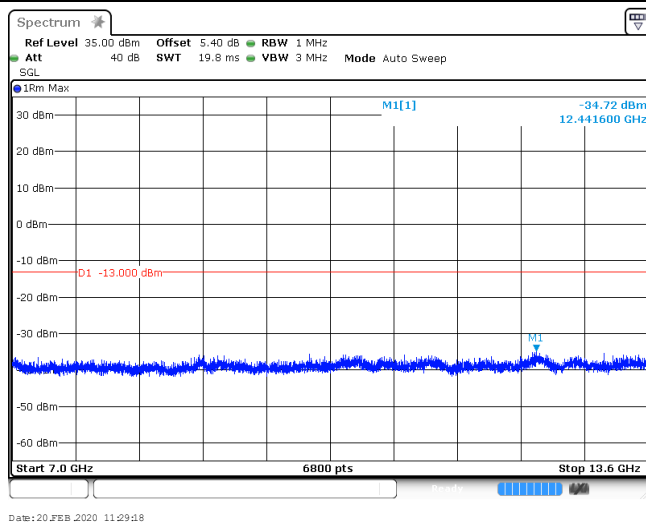


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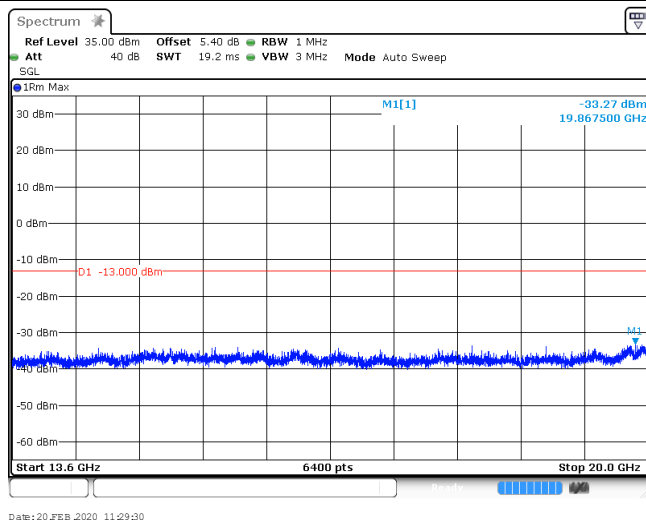


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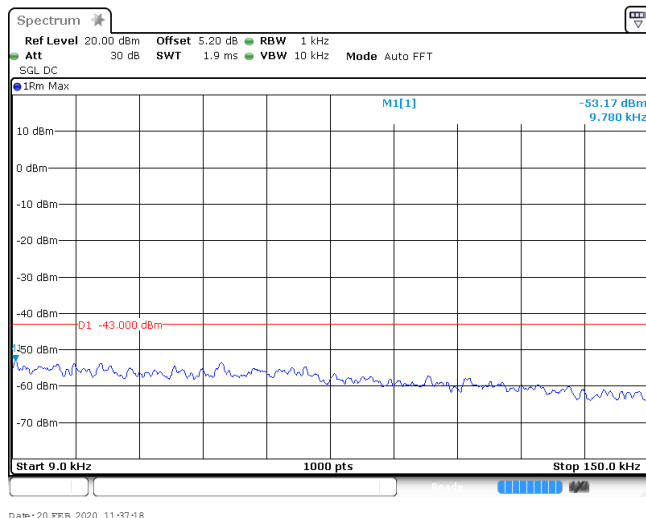
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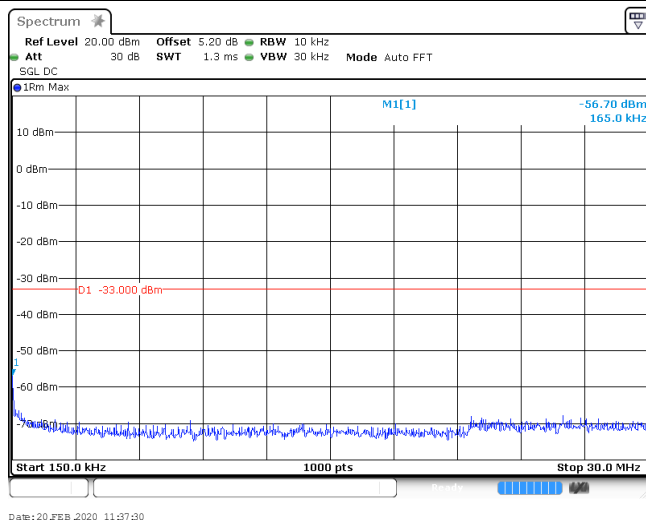
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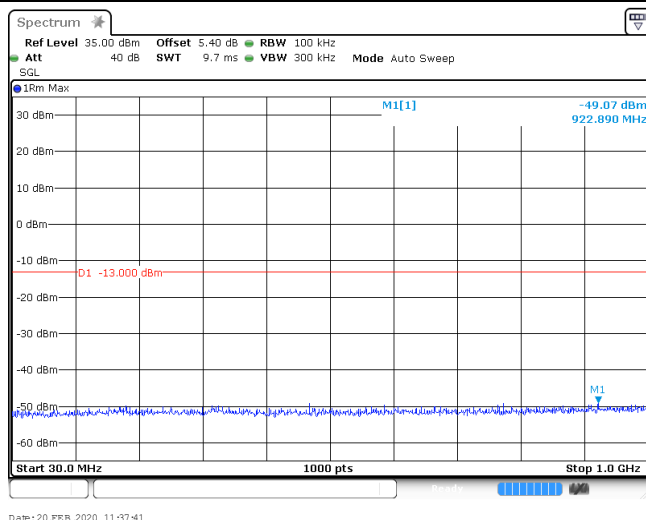
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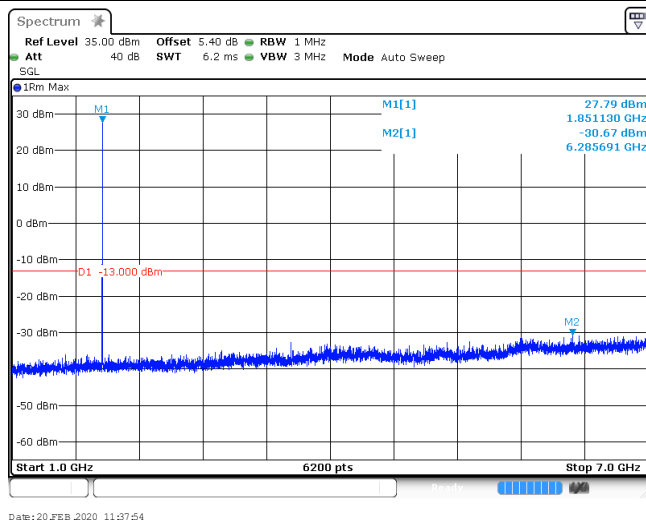
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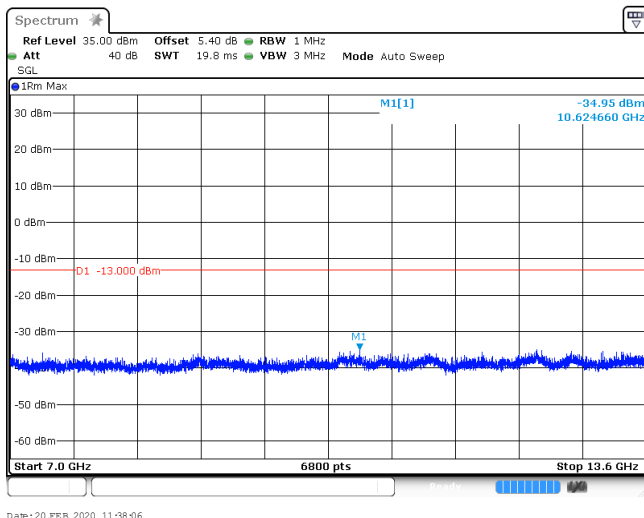


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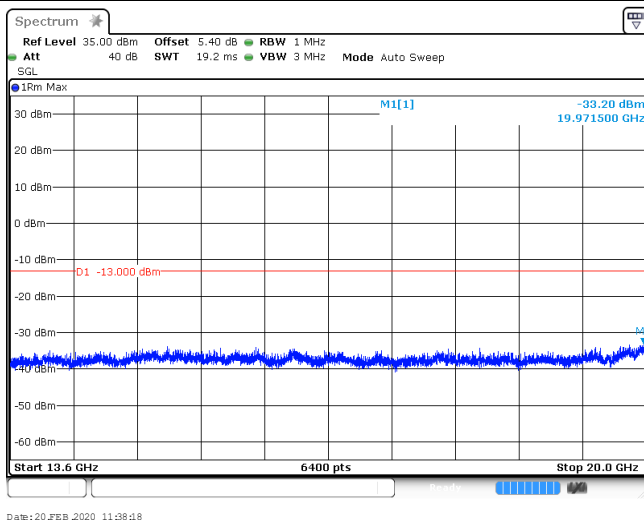


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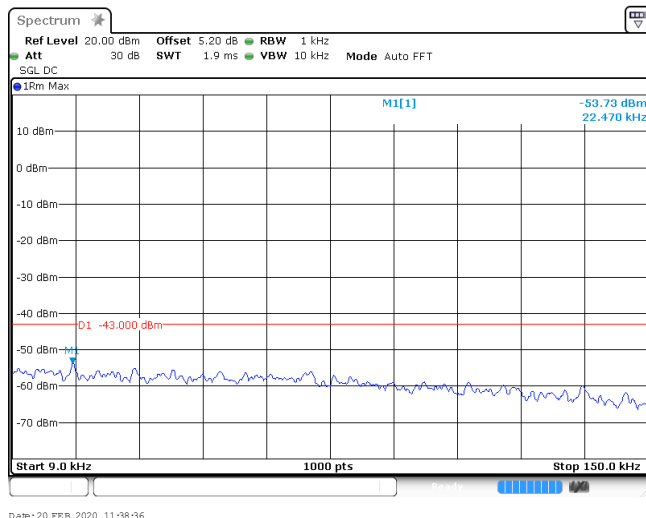
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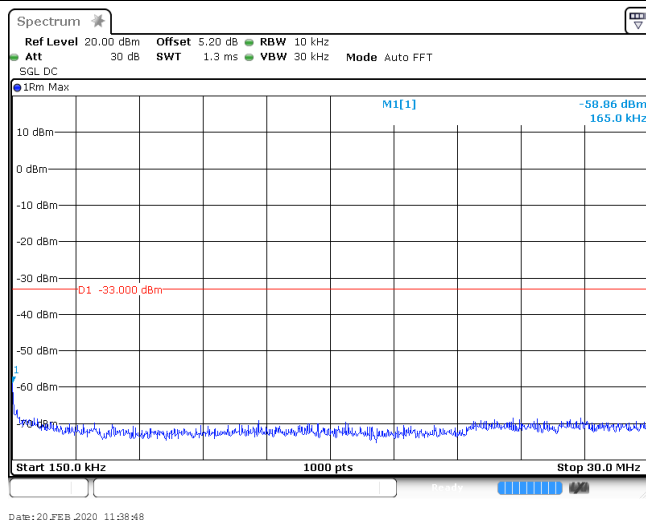
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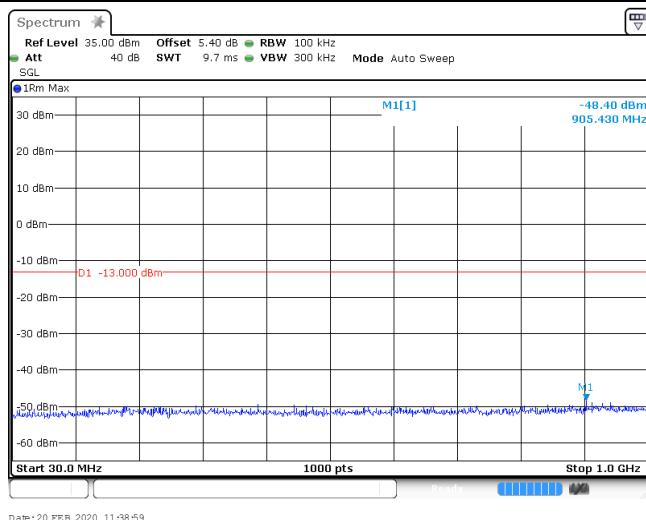


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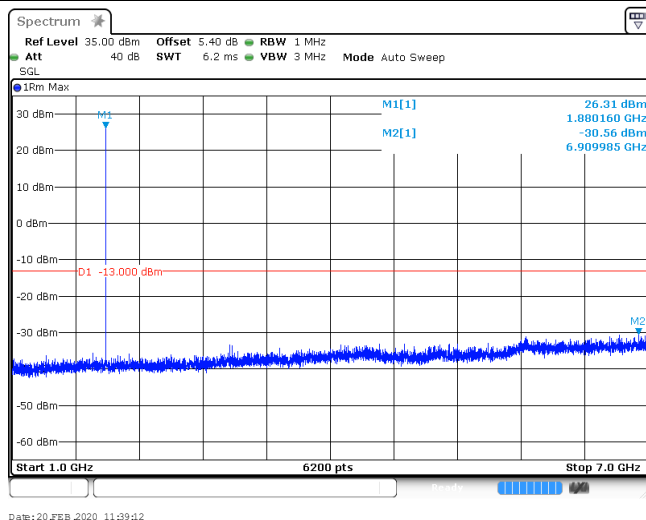
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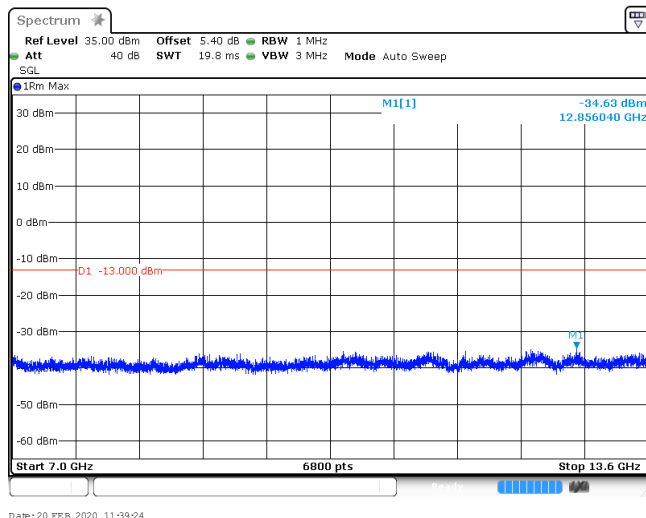
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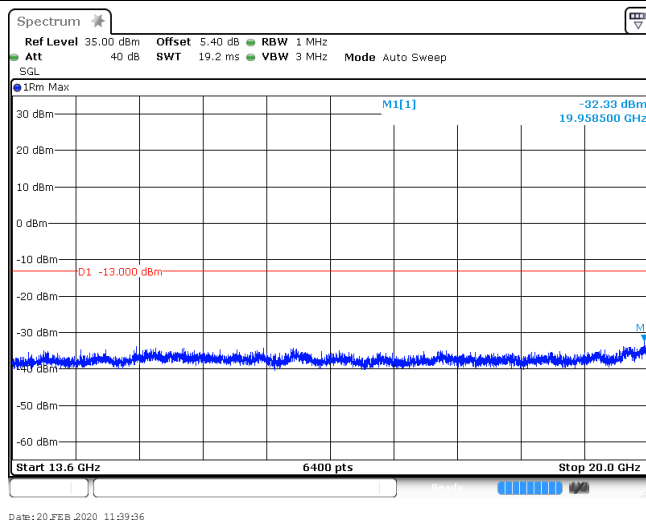
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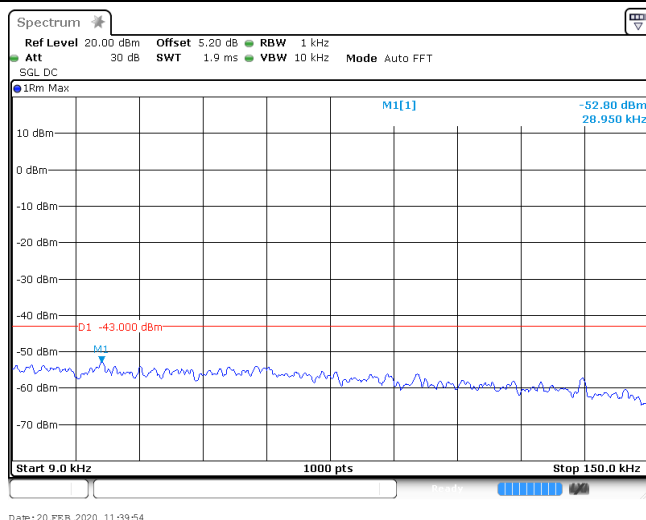


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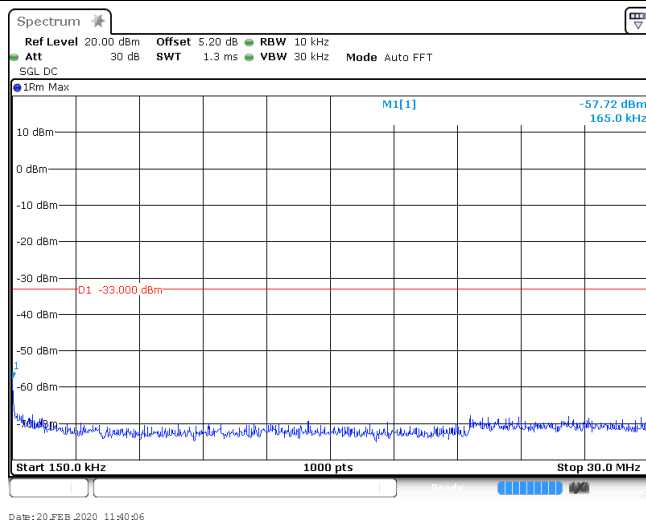


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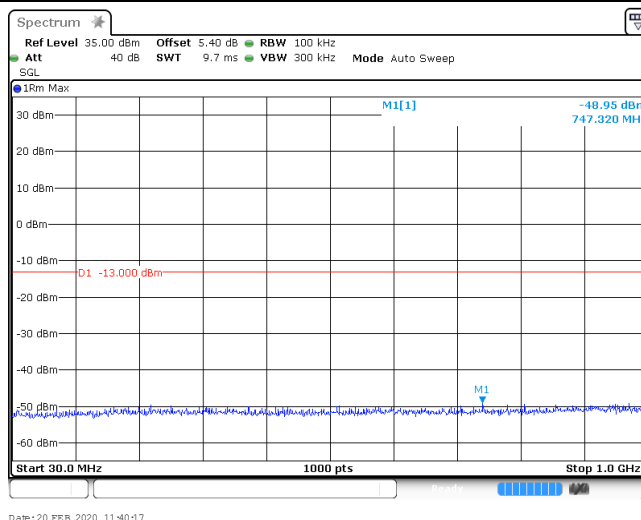


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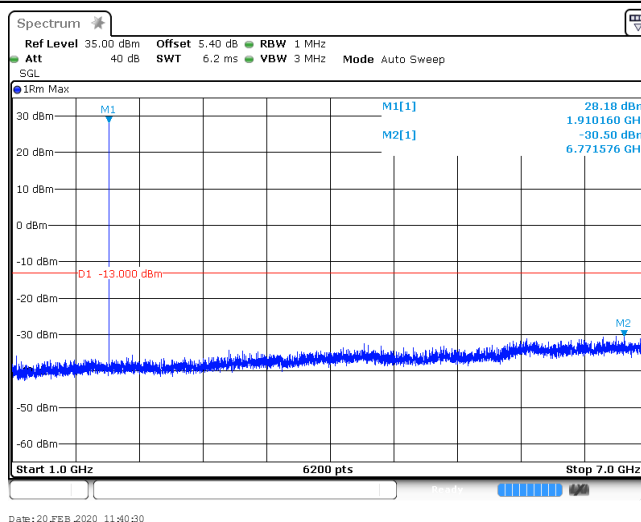


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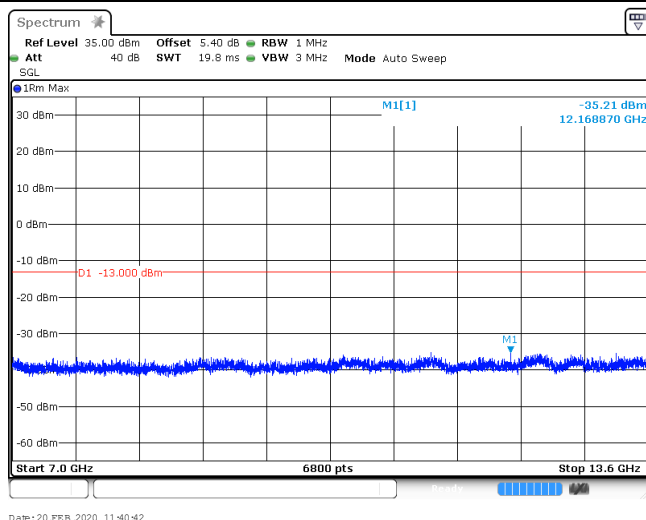


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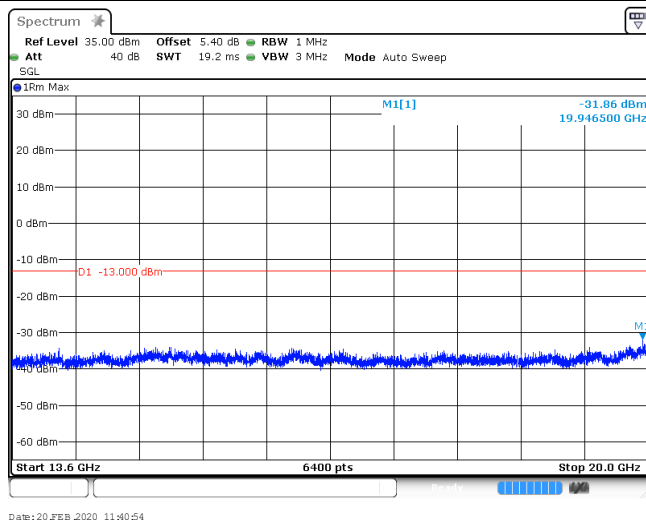
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## EGPRS1900\_810



## 7. Field Strength of Spurious Radiation

### 7.1. Test Band = GSM 1900

#### 7.1.1. Test Channel = LCH

| Frequency (MHz) | Level (dBm) | Limit Line (dBm) | Margin (dB) | Polarization |
|-----------------|-------------|------------------|-------------|--------------|
| 110.2715        | -64.76      | -13.00           | 51.76       | Vertical     |
| 2695.1390       | -37.36      | -13.00           | 24.36       | Vertical     |
| 3700.5234       | -43.73      | -13.00           | 30.73       | Vertical     |
| 5550.5850       | -40.07      | -13.00           | 27.07       | Vertical     |
| 7400.6467       | -46.04      | -13.00           | 33.04       | Vertical     |
| 11101.2700      | -39.34      | -13.00           | 26.34       | Vertical     |
| 42.6591         | -64.19      | -13.00           | 51.19       | Horizontal   |
| 2696.3393       | -36.18      | -13.00           | 23.18       | Horizontal   |
| 3700.5234       | -49.00      | -13.00           | 36.00       | Horizontal   |
| 5550.5850       | -41.73      | -13.00           | 28.73       | Horizontal   |
| 11101.2700      | -47.18      | -13.00           | 34.18       | Horizontal   |
| 16400.4467      | -44.38      | -13.00           | 31.38       | Horizontal   |

#### 7.1.2. Test Channel = MCH

| Frequency (MHz) | Level (dBm) | Limit Line (dBm) | Margin (dB) | Polarization |
|-----------------|-------------|------------------|-------------|--------------|
| 112.6966        | -64.46      | -13.00           | 51.46       | Vertical     |
| 2700.7401       | -37.55      | -13.00           | 24.55       | Vertical     |
| 3760.0253       | -47.63      | -13.00           | 34.63       | Vertical     |
| 5640.0880       | -41.43      | -13.00           | 28.43       | Vertical     |
| 7520.1507       | -48.27      | -13.00           | 35.27       | Vertical     |
| 11280.2760      | -43.58      | -13.00           | 30.58       | Vertical     |
| 41.4951         | -64.45      | -13.00           | 51.45       | Horizontal   |
| 2698.7397       | -36.26      | -13.00           | 23.26       | Horizontal   |
| 3760.0253       | -41.58      | -13.00           | 28.58       | Horizontal   |
| 5640.0880       | -42.87      | -13.00           | 29.87       | Horizontal   |
| 11280.2760      | -48.36      | -13.00           | 35.36       | Horizontal   |
| 16399.9467      | -44.51      | -13.00           | 31.51       | Horizontal   |

#### 7.1.3. Test Channel = HCH

| Frequency (MHz) | Level (dBm) | Limit Line (dBm) | Margin (dB) | Polarization |
|-----------------|-------------|------------------|-------------|--------------|
| 109.9320        | -64.80      | -13.00           | 51.80       | Vertical     |
| 2707.1414       | -37.56      | -13.00           | 24.56       | Vertical     |
| 3819.5273       | -44.93      | -13.00           | 31.93       | Vertical     |
| 5729.5910       | -42.13      | -13.00           | 29.13       | Vertical     |



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|            |        |        |       |            |
|------------|--------|--------|-------|------------|
| 11458.2819 | -43.77 | -13.00 | 30.77 | Vertical   |
| 13368.3456 | -44.13 | -13.00 | 31.13 | Vertical   |
| 46.1028    | -63.29 | -13.00 | 50.29 | Horizontal |
| 2699.9400  | -36.17 | -13.00 | 23.17 | Horizontal |
| 3819.5273  | -44.68 | -13.00 | 31.68 | Horizontal |
| 5729.0910  | -44.92 | -13.00 | 31.92 | Horizontal |
| 11458.7820 | -50.34 | -13.00 | 37.34 | Horizontal |
| 16400.4467 | -44.30 | -13.00 | 31.30 | Horizontal |

## 7.2. Test Band = GSM 850

### 7.2.1. Test Channel = LCH

| Frequency (MHz) | Level (dBm) | Limit Line (dBm) | Margin (dB) | Polarization |
|-----------------|-------------|------------------|-------------|--------------|
| 113.6182        | -62.94      | -13.00           | 49.94       | Vertical     |
| 1648.5297       | -52.83      | -13.00           | 39.83       | Vertical     |
| 2472.6945       | -43.49      | -13.00           | 30.49       | Vertical     |
| 3297.0099       | -47.94      | -13.00           | 34.94       | Vertical     |
| 4121.0374       | -36.53      | -13.00           | 23.53       | Vertical     |
| 14482.3827      | -47.79      | -13.00           | 34.79       | Vertical     |
| 43.9202         | -63.13      | -13.00           | 50.13       | Horizontal   |
| 1648.1296       | -42.54      | -13.00           | 29.54       | Horizontal   |
| 2472.6945       | -44.48      | -13.00           | 31.48       | Horizontal   |
| 3296.5099       | -38.49      | -13.00           | 25.49       | Horizontal   |
| 4121.0374       | -38.85      | -13.00           | 25.85       | Horizontal   |
| 16400.4467      | -44.31      | -13.00           | 31.31       | Horizontal   |

### 7.2.2. Test Channel = MCH

| Frequency (MHz) | Level (dBm) | Limit Line (dBm) | Margin (dB) | Polarization |
|-----------------|-------------|------------------|-------------|--------------|
| 109.8835        | -63.97      | -13.00           | 50.97       | Vertical     |
| 1672.9346       | -49.84      | -13.00           | 36.84       | Vertical     |
| 2509.9020       | -40.03      | -13.00           | 27.03       | Vertical     |
| 3346.5116       | -52.74      | -13.00           | 39.74       | Vertical     |
| 4183.0394       | -37.02      | -13.00           | 24.02       | Vertical     |
| 14464.3821      | -48.15      | -13.00           | 35.15       | Vertical     |
| 37.9059         | -63.20      | -13.00           | 50.20       | Horizontal   |
| 1672.9346       | -39.24      | -13.00           | 26.24       | Horizontal   |
| 2509.5019       | -40.94      | -13.00           | 27.94       | Horizontal   |
| 3346.5116       | -44.18      | -13.00           | 31.18       | Horizontal   |
| 4183.0394       | -41.48      | -13.00           | 28.48       | Horizontal   |
| 16371.9457      | -44.64      | -13.00           | 31.64       | Horizontal   |



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### 7.2.3. Test Channel = HCH

| Frequency (MHz) | Level (dBm) | Limit Line (dBm) | Margin (dB) | Polarization |
|-----------------|-------------|------------------|-------------|--------------|
| 110.4655        | -63.68      | -13.00           | 50.68       | Vertical     |
| 1697.3395       | -45.00      | -13.00           | 32.00       | Vertical     |
| 2546.3093       | -38.56      | -13.00           | 25.56       | Vertical     |
| 3395.0132       | -50.88      | -13.00           | 37.88       | Vertical     |
| 4244.0415       | -38.07      | -13.00           | 25.07       | Vertical     |
| 11882.2961      | -47.50      | -13.00           | 34.50       | Vertical     |
| 40.4765         | -62.94      | -13.00           | 49.94       | Horizontal   |
| 1697.7395       | -35.80      | -13.00           | 22.80       | Horizontal   |
| 2546.3093       | -39.09      | -13.00           | 26.09       | Horizontal   |
| 3395.0132       | -40.54      | -13.00           | 27.54       | Horizontal   |
| 4244.0415       | -42.80      | -13.00           | 29.80       | Horizontal   |
| 16396.4465      | -44.25      | -13.00           | 31.25       | Horizontal   |

#### Remark:

- 1) According to 971168 D01 Power Meas License Digital Systems, The amplitudes of unwanted emissions that are attenuated more than 20 dB below the applicable limit are not required to be reported.
- 2) The disturbance above 12.75GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the worst case data had been displayed.





3)

## 8. Frequency Stability

### 8.1. Frequency Error Vs Voltage

| BAND      | Channel | Voltage (Vdc) | Temperature (°C) | Deviation (Hz) | Deviation (ppm) | Limit (ppm) | Verdict |
|-----------|---------|---------------|------------------|----------------|-----------------|-------------|---------|
| GSM850    | 128     | VL            | TN               | -1.39          | -0.001684       | ±2.5        | PASS    |
| GSM850    | 128     | VN            | TN               | 1.29           | 0.001567        | ±2.5        | PASS    |
| GSM850    | 128     | VH            | TN               | -5.20          | -0.006307       | ±2.5        | PASS    |
| GSM850    | 190     | VL            | TN               | 4.81           | 0.005750        | ±2.5        | PASS    |
| GSM850    | 190     | VN            | TN               | 6.97           | 0.008336        | ±2.5        | PASS    |
| GSM850    | 190     | VH            | TN               | -4.58          | -0.005480       | ±2.5        | PASS    |
| GSM850    | 251     | VL            | TN               | 1.65           | 0.001940        | ±2.5        | PASS    |
| GSM850    | 251     | VN            | TN               | 1.74           | 0.002054        | ±2.5        | PASS    |
| GSM850    | 251     | VH            | TN               | 0.00           | 0.000000        | ±2.5        | PASS    |
| EGPRS850  | 128     | VL            | TN               | 12.14          | 0.014729        | ±2.5        | PASS    |
| EGPRS850  | 128     | VN            | TN               | 15.98          | 0.019390        | ±2.5        | PASS    |
| EGPRS850  | 128     | VH            | TN               | 18.50          | 0.022446        | ±2.5        | PASS    |
| EGPRS850  | 190     | VL            | TN               | 16.98          | 0.020299        | ±2.5        | PASS    |
| EGPRS850  | 190     | VN            | TN               | 13.88          | 0.016594        | ±2.5        | PASS    |
| EGPRS850  | 190     | VH            | TN               | 8.78           | 0.010497        | ±2.5        | PASS    |
| EGPRS850  | 251     | VL            | TN               | 12.46          | 0.014682        | ±2.5        | PASS    |
| EGPRS850  | 251     | VN            | TN               | 9.43           | 0.011107        | ±2.5        | PASS    |
| EGPRS850  | 251     | VH            | TN               | 14.17          | 0.016698        | ±2.5        | PASS    |
| GSM1900   | 512     | VL            | TN               | -3.75          | -0.002024       | ±2.5        | PASS    |
| GSM1900   | 512     | VN            | TN               | 15.11          | 0.008167        | ±2.5        | PASS    |
| GSM1900   | 512     | VH            | TN               | 13.37          | 0.007224        | ±2.5        | PASS    |
| GSM1900   | 661     | VL            | TN               | 13.88          | 0.007385        | ±2.5        | PASS    |
| GSM1900   | 661     | VN            | TN               | 12.53          | 0.006663        | ±2.5        | PASS    |
| GSM1900   | 661     | VH            | TN               | 4.26           | 0.002267        | ±2.5        | PASS    |
| GSM1900   | 810     | VL            | TN               | -10.94         | -0.005731       | ±2.5        | PASS    |
| GSM1900   | 810     | VN            | TN               | -2.36          | -0.001234       | ±2.5        | PASS    |
| GSM1900   | 810     | VH            | TN               | -10.56         | -0.005528       | ±2.5        | PASS    |
| EGPRS1900 | 512     | VL            | TN               | 1.19           | 0.000646        | ±2.5        | PASS    |
| EGPRS1900 | 512     | VN            | TN               | 10.30          | 0.005567        | ±2.5        | PASS    |
| EGPRS1900 | 512     | VH            | TN               | 24.89          | 0.013454        | ±2.5        | PASS    |
| EGPRS1900 | 661     | VL            | TN               | 22.28          | 0.011850        | ±2.5        | PASS    |
| EGPRS1900 | 661     | VN            | TN               | 21.50          | 0.011437        | ±2.5        | PASS    |
| EGPRS1900 | 661     | VH            | TN               | 21.18          | 0.011266        | ±2.5        | PASS    |
| EGPRS1900 | 810     | VL            | TN               | 21.18          | 0.011090        | ±2.5        | PASS    |
| EGPRS1900 | 810     | VN            | TN               | 17.72          | 0.009281        | ±2.5        | PASS    |
| EGPRS1900 | 810     | VH            | TN               | 18.14          | 0.009501        | ±2.5        | PASS    |



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## 8.2.Frequency Error Vs Temperature

| BAND     | Channel | Voltage (Vdc) | Temperature (°C) | Deviation (Hz) | Deviation (ppm) | Limit (ppm) | Verdict |
|----------|---------|---------------|------------------|----------------|-----------------|-------------|---------|
| GSM850   | 128     | VN            | -30              | -3.23          | -0.003917       | ±2.5        | PASS    |
| GSM850   | 128     | VN            | -20              | 0.16           | 0.000196        | ±2.5        | PASS    |
| GSM850   | 128     | VN            | -10              | 3.87           | 0.004701        | ±2.5        | PASS    |
| GSM850   | 128     | VN            | 0                | -1.68          | -0.002037       | ±2.5        | PASS    |
| GSM850   | 128     | VN            | 10               | 2.42           | 0.002938        | ±2.5        | PASS    |
| GSM850   | 128     | VN            | 20               | -2.42          | -0.002938       | ±2.5        | PASS    |
| GSM850   | 128     | VN            | 30               | 0.06           | 0.000078        | ±2.5        | PASS    |
| GSM850   | 128     | VN            | 40               | -7.49          | -0.009088       | ±2.5        | PASS    |
| GSM850   | 128     | VN            | 50               | 4.26           | 0.005171        | ±2.5        | PASS    |
| GSM850   | 190     | VN            | -30              | -5.00          | -0.005982       | ±2.5        | PASS    |
| GSM850   | 190     | VN            | -20              | -5.55          | -0.006638       | ±2.5        | PASS    |
| GSM850   | 190     | VN            | -10              | -5.20          | -0.006213       | ±2.5        | PASS    |
| GSM850   | 190     | VN            | 0                | 3.33           | 0.003975        | ±2.5        | PASS    |
| GSM850   | 190     | VN            | 10               | 0.97           | 0.001158        | ±2.5        | PASS    |
| GSM850   | 190     | VN            | 20               | -0.10          | -0.000116       | ±2.5        | PASS    |
| GSM850   | 190     | VN            | 30               | -2.84          | -0.003396       | ±2.5        | PASS    |
| GSM850   | 190     | VN            | 40               | -3.29          | -0.003936       | ±2.5        | PASS    |
| GSM850   | 190     | VN            | 50               | -4.00          | -0.004785       | ±2.5        | PASS    |
| GSM850   | 251     | VN            | -30              | -0.23          | -0.000266       | ±2.5        | PASS    |
| GSM850   | 251     | VN            | -20              | -1.81          | -0.002130       | ±2.5        | PASS    |
| GSM850   | 251     | VN            | -10              | -4.78          | -0.005629       | ±2.5        | PASS    |
| GSM850   | 251     | VN            | 0                | -5.81          | -0.006847       | ±2.5        | PASS    |
| GSM850   | 251     | VN            | 10               | 2.10           | 0.002472        | ±2.5        | PASS    |
| GSM850   | 251     | VN            | 20               | 0.16           | 0.000190        | ±2.5        | PASS    |
| GSM850   | 251     | VN            | 30               | -1.26          | -0.001483       | ±2.5        | PASS    |
| GSM850   | 251     | VN            | 40               | -4.16          | -0.004907       | ±2.5        | PASS    |
| GSM850   | 251     | VN            | 50               | -5.84          | -0.006885       | ±2.5        | PASS    |
| EGPRS850 | 128     | VN            | -30              | 19.05          | 0.023112        | ±2.5        | PASS    |
| EGPRS850 | 128     | VN            | -20              | 15.69          | 0.019038        | ±2.5        | PASS    |
| EGPRS850 | 128     | VN            | -10              | 16.79          | 0.020370        | ±2.5        | PASS    |
| EGPRS850 | 128     | VN            | 0                | 15.79          | 0.019155        | ±2.5        | PASS    |
| EGPRS850 | 128     | VN            | 10               | 15.34          | 0.018607        | ±2.5        | PASS    |
| EGPRS850 | 128     | VN            | 20               | 14.01          | 0.017001        | ±2.5        | PASS    |
| EGPRS850 | 128     | VN            | 30               | 18.27          | 0.022172        | ±2.5        | PASS    |
| EGPRS850 | 128     | VN            | 40               | 17.50          | 0.021231        | ±2.5        | PASS    |
| EGPRS850 | 128     | VN            | 50               | 15.08          | 0.018293        | ±2.5        | PASS    |
| EGPRS850 | 190     | VN            | -30              | 17.43          | 0.020840        | ±2.5        | PASS    |
| EGPRS850 | 190     | VN            | -20              | 11.98          | 0.014318        | ±2.5        | PASS    |
| EGPRS850 | 190     | VN            | -10              | 9.69           | 0.011578        | ±2.5        | PASS    |
| EGPRS850 | 190     | VN            | 0                | 13.82          | 0.016517        | ±2.5        | PASS    |
| EGPRS850 | 190     | VN            | 10               | 14.63          | 0.017482        | ±2.5        | PASS    |
| EGPRS850 | 190     | VN            | 20               | 10.62          | 0.012697        | ±2.5        | PASS    |
| EGPRS850 | 190     | VN            | 30               | 7.78           | 0.009301        | ±2.5        | PASS    |



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|           |     |    |     |        |           |      |      |
|-----------|-----|----|-----|--------|-----------|------|------|
| EGPRS850  | 190 | VN | 40  | 12.49  | 0.014935  | ±2.5 | PASS |
| EGPRS850  | 190 | VN | 50  | 12.88  | 0.015398  | ±2.5 | PASS |
| EGPRS850  | 251 | VN | -30 | 10.46  | 0.012324  | ±2.5 | PASS |
| EGPRS850  | 251 | VN | -20 | 8.72   | 0.010270  | ±2.5 | PASS |
| EGPRS850  | 251 | VN | -10 | 7.36   | 0.008672  | ±2.5 | PASS |
| EGPRS850  | 251 | VN | 0   | 14.79  | 0.017421  | ±2.5 | PASS |
| EGPRS850  | 251 | VN | 10  | 11.53  | 0.013579  | ±2.5 | PASS |
| EGPRS850  | 251 | VN | 20  | 10.17  | 0.011982  | ±2.5 | PASS |
| EGPRS850  | 251 | VN | 30  | 9.07   | 0.010688  | ±2.5 | PASS |
| EGPRS850  | 251 | VN | 40  | 6.49   | 0.007645  | ±2.5 | PASS |
| EGPRS850  | 251 | VN | 50  | 15.37  | 0.018106  | ±2.5 | PASS |
| GSM1900   | 512 | VN | -30 | 1.00   | 0.000541  | ±2.5 | PASS |
| GSM1900   | 512 | VN | -20 | 2.32   | 0.001256  | ±2.5 | PASS |
| GSM1900   | 512 | VN | -10 | 4.62   | 0.002495  | ±2.5 | PASS |
| GSM1900   | 512 | VN | 0   | 5.59   | 0.003019  | ±2.5 | PASS |
| GSM1900   | 512 | VN | 10  | 8.52   | 0.004607  | ±2.5 | PASS |
| GSM1900   | 512 | VN | 20  | 12.95  | 0.006997  | ±2.5 | PASS |
| GSM1900   | 512 | VN | 30  | -4.36  | -0.002356 | ±2.5 | PASS |
| GSM1900   | 512 | VN | 40  | -6.65  | -0.003595 | ±2.5 | PASS |
| GSM1900   | 512 | VN | 50  | 7.88   | 0.004258  | ±2.5 | PASS |
| GSM1900   | 661 | VN | -30 | 16.11  | 0.008569  | ±2.5 | PASS |
| GSM1900   | 661 | VN | -20 | 1.94   | 0.001030  | ±2.5 | PASS |
| GSM1900   | 661 | VN | -10 | 8.23   | 0.004379  | ±2.5 | PASS |
| GSM1900   | 661 | VN | 0   | 12.95  | 0.006887  | ±2.5 | PASS |
| GSM1900   | 661 | VN | 10  | 2.91   | 0.001546  | ±2.5 | PASS |
| GSM1900   | 661 | VN | 20  | -4.29  | -0.002284 | ±2.5 | PASS |
| GSM1900   | 661 | VN | 30  | 1.32   | 0.000704  | ±2.5 | PASS |
| GSM1900   | 661 | VN | 40  | 5.46   | 0.002902  | ±2.5 | PASS |
| GSM1900   | 661 | VN | 50  | 13.08  | 0.006955  | ±2.5 | PASS |
| GSM1900   | 810 | VN | -30 | -11.85 | -0.006204 | ±2.5 | PASS |
| GSM1900   | 810 | VN | -20 | -7.81  | -0.004091 | ±2.5 | PASS |
| GSM1900   | 810 | VN | -10 | -3.58  | -0.001876 | ±2.5 | PASS |
| GSM1900   | 810 | VN | 0   | 0.10   | 0.000051  | ±2.5 | PASS |
| GSM1900   | 810 | VN | 10  | 1.71   | 0.000896  | ±2.5 | PASS |
| GSM1900   | 810 | VN | 20  | 9.10   | 0.004767  | ±2.5 | PASS |
| GSM1900   | 810 | VN | 30  | -4.75  | -0.002485 | ±2.5 | PASS |
| GSM1900   | 810 | VN | 40  | -0.74  | -0.000389 | ±2.5 | PASS |
| GSM1900   | 810 | VN | 50  | 3.65   | 0.001910  | ±2.5 | PASS |
| EGPRS1900 | 512 | VN | -30 | 17.50  | 0.009458  | ±2.5 | PASS |
| EGPRS1900 | 512 | VN | -20 | 13.14  | 0.007102  | ±2.5 | PASS |
| EGPRS1900 | 512 | VN | -10 | 24.99  | 0.013506  | ±2.5 | PASS |
| EGPRS1900 | 512 | VN | 0   | 25.31  | 0.013681  | ±2.5 | PASS |
| EGPRS1900 | 512 | VN | 10  | 14.85  | 0.008027  | ±2.5 | PASS |
| EGPRS1900 | 512 | VN | 20  | 24.99  | 0.013506  | ±2.5 | PASS |
| EGPRS1900 | 512 | VN | 30  | 23.67  | 0.012791  | ±2.5 | PASS |
| EGPRS1900 | 512 | VN | 40  | 19.79  | 0.010697  | ±2.5 | PASS |
| EGPRS1900 | 512 | VN | 50  | 26.47  | 0.014309  | ±2.5 | PASS |



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|           |     |    |     |       |          |      |      |
|-----------|-----|----|-----|-------|----------|------|------|
| EGPRS1900 | 661 | VN | -30 | 25.15 | 0.013378 | ±2.5 | PASS |
| EGPRS1900 | 661 | VN | -20 | 9.75  | 0.005186 | ±2.5 | PASS |
| EGPRS1900 | 661 | VN | -10 | 10.88 | 0.005787 | ±2.5 | PASS |
| EGPRS1900 | 661 | VN | 0   | 15.14 | 0.008054 | ±2.5 | PASS |
| EGPRS1900 | 661 | VN | 10  | 13.53 | 0.007196 | ±2.5 | PASS |
| EGPRS1900 | 661 | VN | 20  | 14.14 | 0.007522 | ±2.5 | PASS |
| EGPRS1900 | 661 | VN | 30  | 13.75 | 0.007316 | ±2.5 | PASS |
| EGPRS1900 | 661 | VN | 40  | 17.24 | 0.009171 | ±2.5 | PASS |
| EGPRS1900 | 661 | VN | 50  | 18.34 | 0.009754 | ±2.5 | PASS |
| EGPRS1900 | 810 | VN | -30 | 15.17 | 0.007946 | ±2.5 | PASS |
| EGPRS1900 | 810 | VN | -20 | 17.92 | 0.009382 | ±2.5 | PASS |
| EGPRS1900 | 810 | VN | -10 | 18.79 | 0.009839 | ±2.5 | PASS |
| EGPRS1900 | 810 | VN | 0   | 15.50 | 0.008115 | ±2.5 | PASS |
| EGPRS1900 | 810 | VN | 10  | 18.31 | 0.009585 | ±2.5 | PASS |
| EGPRS1900 | 810 | VN | 20  | 15.95 | 0.008351 | ±2.5 | PASS |
| EGPRS1900 | 810 | VN | 30  | 15.14 | 0.007929 | ±2.5 | PASS |
| EGPRS1900 | 810 | VN | 40  | 16.27 | 0.008520 | ±2.5 | PASS |
| EGPRS1900 | 810 | VN | 50  | 16.40 | 0.008588 | ±2.5 | PASS |

The End

