## 7.2 Disturbance Power Test, 30MHz to 300MHz

Test Requirement: EN 55014-1 & BS EN 55014-1

Test Method: EN 55014-1 & BS EN 55014-1

Test Date: 2011-07-08

Test voltage: AC 230V 50Hz

Frequency Range: 30MHz to 300MHz

Detector: Peak for pre-scan

Quasi-Peak and Average at frequency with maximum peak (120kHz resolution bandwidth)

Limit:

Table 2a, Columns 2&3 for household and similar appliances

Disturbance power limits for the frequency range 30 MHz to 300 MHz

| **Frequency range** MHz | **At mains terminals** (dB (pW)) | |
|---|---|---|
| | Quasi-peak | Average |
| 30 to 300 | 45 to 55 | 35 to 45 |
| Note1: The limit increases linearly with the frequency in the range 30 MHz to 300 MHz. | | |

Table 2b, Columns 2&3 for household and similar appliances

Margin when performing disturbance power measurement in the frequency range 30 MHz to 300 MHz

| **Frequency range** MHz | **Margin** (dB) | |
|---|---|---|
| | Quasi-peak | Average |
| 200 to 300 | 0 to 10 dB | - |

NOTE 1: Appliances are deemed to comply in the frequency range from 300 MHz to 1 000 MHz if both of the following conditions ( 1) and 2)) are fulfilled:

1) all the measurement result are lower than the applicable limits (Table 2a) minus the corresponding margin (Table 2b); or the limit for the measurement with the average detector is met when using a receiver with a quasi-peak detector;

2) No clock frequency or oscillator frequency of the EUT is more than or equal to 30 MHz.

NOTE 2: The measured result at a particular frequency shall be less than the relevant limit minus the corresponding margin (at that frequency).

### 7.2.1 E.U.T. Operation

Operating Environment:

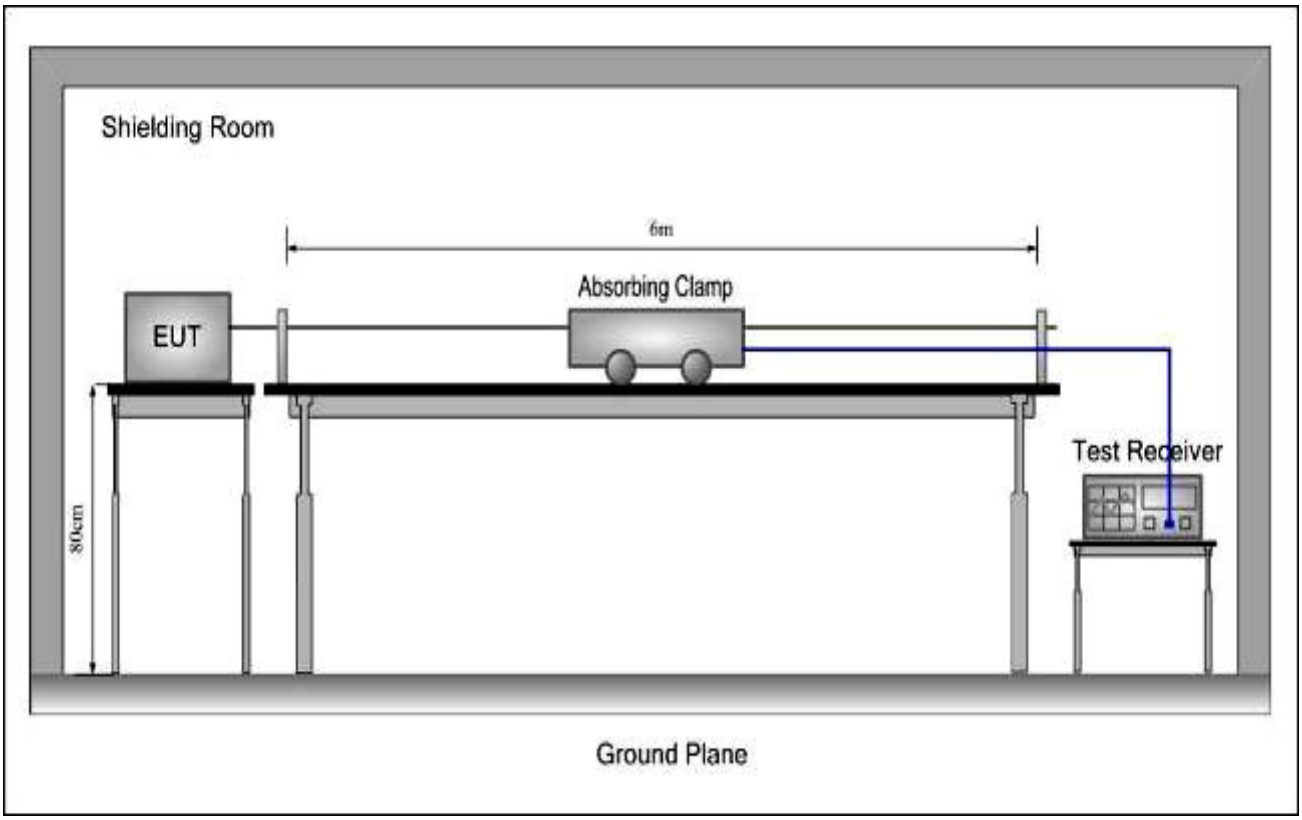
Temperature: 25.0 °C Humidity: 52% RH Atmospheric Pressure: 1003 mbar

EUT Operation: Test the EUT in motor running and heating mode.

A pre-test at 30MHz shall be made over a range of 0.9 to 1.1 times the rated voltage in order to check the level of disturbance varies considerably with the supply voltage,

Compliance test at AC 230V as no worse case was found.

### 7.2.2 Test Setup




1. The disturbance power was measured with the EUT in a shielded room.
2. The distance between the clamp test set-up (the appliance, the lead to be measured and the absorbing clamp) and any other conductive objects (including persons, walls and ceiling, but excluding the floor) shall be at least 0,8 m. The appliance to be tested shall be placed on a non-metallic support table parallel to the floor. The height of the table shall be 0,1 m ± 0,025 m for appliances primarily intended to be positioned on the floor in normal use, and 0,8 m ± 0,05 m for other appliances.
3. Auxiliary leads normally extendible by the user, for instance with a loose end or leads fitted with a (by the user) easily replaceable plug or socket on one or both ends, shall in accordance with 6.2.3 be extended to a length of about 6 m. Any plug or socket which will not pass through the absorbing clamp due to its size shall be removed (see 6.2.3).
4. If the auxiliary lead is permanently fixed to the appliance and to the auxiliary apparatus and:
   – is shorter than 0,25 m, measurement are not to be made on these leads;
   – is longer than 0,25 m but shorter than twice the length of the absorbing clamp, it shall be extended to twice the length of the absorbing clamp;
   – is longer than twice the length of the absorbing clamp, measurements shall be made using the original lead.
5. The absorbing clamp was moved along the lead to obtain maximum disturbance.

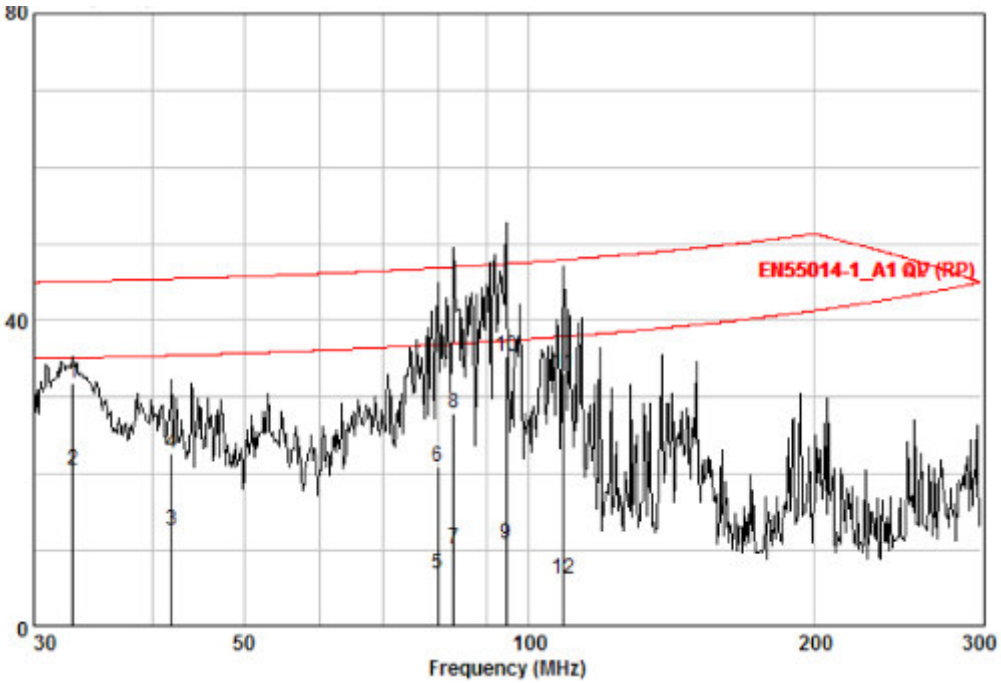
### 7.2.3 Measurement Data

For EN 55014-1

DC IN:

Peak Scan:

Level (dBpW)




Quasi-peak and Average measurement:

| Freq | Read Level | Trans. | RF Switch Loss | Level | Limit Line | Over Limit | Detector |
|---|---|---|---|---|---|---|---|
| MHz | (dBµV) | dB | dB | (dBpW) | (dBpW) | dB | |
| 32.970 | 29.82 | 1.91 | 0.00 | 31.73 | 45.11 | -13.38 | QP |
| 32.970 | 18.57 | 1.91 | 0.00 | 20.48 | 35.11 | -14.63 | AVERAGE |
| 41.891 | 10.55 | 2.14 | 0.00 | 12.69 | 35.44 | -22.75 | AVERAGE |
| 41.891 | 20.45 | 2.14 | 0.00 | 22.59 | 45.44 | -22.85 | QP |
| 80.006 | 6.30 | 0.70 | 0.00 | 7.00 | 36.85 | -29.85 | AVERAGE |
| 80.006 | 20.16 | 0.70 | 0.00 | 20.86 | 46.85 | -25.99 | QP |
| 83.200 | 9.54 | 0.63 | 0.00 | 10.17 | 36.97 | -26.80 | AVERAGE |
| 83.200 | 27.24 | 0.63 | 0.00 | 27.87 | 46.97 | -19.10 | QP |
| 94.650 | 10.18 | 0.61 | 0.00 | 10.79 | 37.39 | -26.60 | AVERAGE |
| 94.650 | 34.64 | 0.61 | 0.00 | 35.25 | 47.40 | -12.14 | QP |
| 108.673 | 31.70 | 1.43 | 0.00 | 33.13 | 47.92 | -14.79 | QP |
| 108.673 | 4.93 | 1.43 | 0.00 | 6.36 | 37.91 | -31.56 | AVERAGE |

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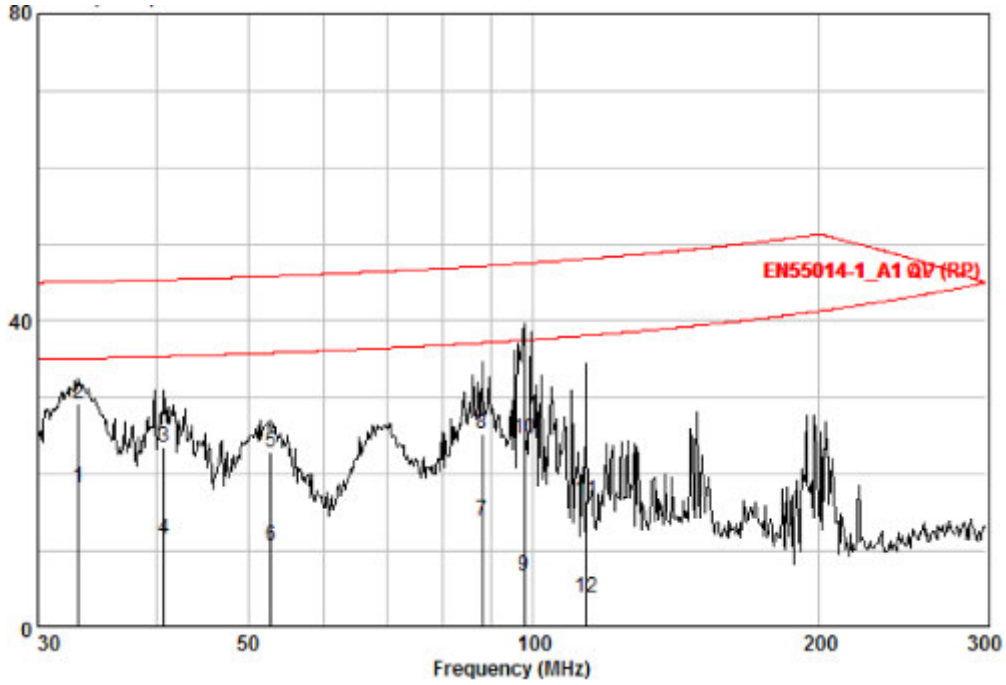
AC MAINS:

Peak Scan:

Level (dBpW)




Quasi-peak and Average measurement:

| Freq | Read Level | Trans. | RF Switch Loss | Level | Limit Line | Over Limit | Detector |
|---|---|---|---|---|---|---|---|
| MHz | (dBµV) | dB | dB | (dBpW) | (dBpW) | dB | |
| 33.122 | 16.39 | 1.96 | 0.00 | 18.35 | 35.12 | -16.76 | AVERAGE |
| 33.122 | 27.30 | 1.96 | 0.00 | 29.26 | 45.12 | -15.85 | QP |
| 40.749 | 21.24 | 2.34 | 0.00 | 23.58 | 45.40 | -21.82 | QP |
| 40.749 | 9.11 | 2.34 | 0.00 | 11.45 | 35.40 | -23.95 | AVERAGE |
| 52.859 | 22.02 | 0.77 | 0.00 | 22.79 | 45.85 | -23.05 | QP |
| 52.859 | 10.01 | 0.77 | 0.00 | 10.78 | 35.85 | -25.06 | AVERAGE |
| 88.333 | 13.43 | 0.51 | 0.00 | 13.94 | 37.16 | -23.22 | AVERAGE |
| 88.333 | 24.74 | 0.51 | 0.00 | 25.25 | 47.16 | -21.91 | QP |
| 97.751 | 6.14 | 0.70 | 0.00 | 6.84 | 37.51 | -30.67 | AVERAGE |
| 97.751 | 23.84 | 0.70 | 0.00 | 24.54 | 47.51 | -22.97 | QP |
| 113.533 | 15.03 | 1.51 | 0.00 | 16.54 | 48.10 | -31.56 | QP |
| 113.533 | 2.45 | 1.51 | 0.00 | 3.96 | 38.09 | -34.13 | AVERAGE |

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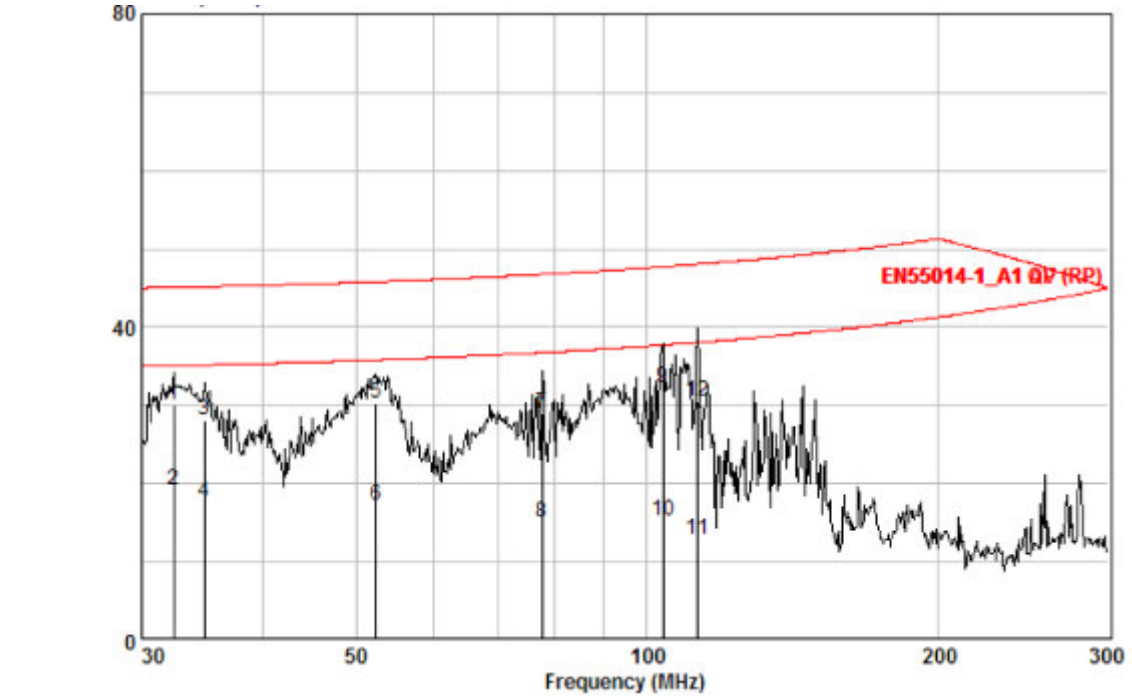
DC OUT:

Peak Scan:




Quasi-peak and Average measurement:

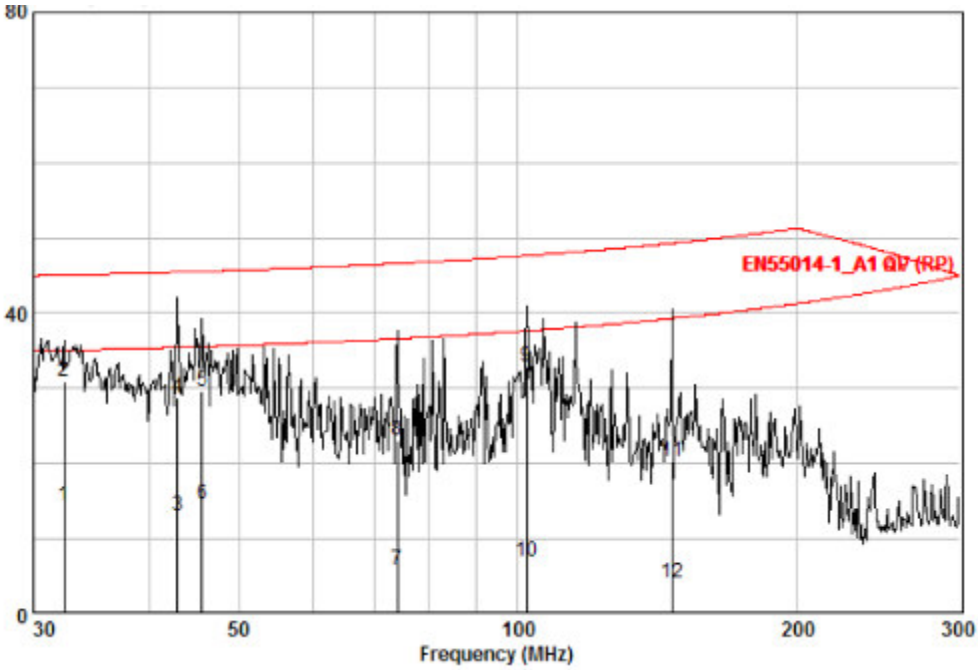
| Freq | Read Level | Trans. | RF Switch Loss | Level | Limit Line | Over Limit | Detector |
|---|---|---|---|---|---|---|---|
| MHz | (dBµV) | dB | dB | (dBpW) | (dBpW) | dB | |
| 32.368 | 28.38 | 1.73 | 0.00 | 30.11 | 45.09 | -14.98 | QP |
| 32.368 | 17.43 | 1.73 | 0.00 | 19.16 | 35.09 | -15.93 | AVERAGE |
| 34.843 | 25.63 | 2.47 | 0.00 | 28.10 | 45.18 | -17.08 | QP |
| 34.843 | 15.25 | 2.47 | 0.00 | 17.72 | 35.18 | -17.46 | AVERAGE |
| 52.375 | 29.46 | 0.79 | 0.00 | 30.25 | 45.83 | -15.58 | QP |
| 52.375 | 16.46 | 0.79 | 0.00 | 17.25 | 35.83 | -18.58 | AVERAGE |
| 77.825 | 28.13 | 0.87 | 0.00 | 29.00 | 46.77 | -17.77 | QP |
| 77.825 | 14.13 | 0.87 | 0.00 | 15.00 | 36.77 | -21.77 | AVERAGE |
| 103.782 | 31.24 | 1.06 | 0.00 | 32.30 | 47.73 | -15.44 | QP |
| 103.782 | 14.14 | 1.06 | 0.00 | 15.20 | 37.73 | -22.54 | AVERAGE |
| 112.751 | 11.26 | 1.51 | 0.00 | 12.77 | 38.06 | -25.29 | AVERAGE |
| 112.751 | 28.93 | 1.51 | 0.00 | 30.44 | 48.07 | -17.63 | QP |

For EN 55014-1

CONTROL IN:

Peak Scan:

Level (dBpW)



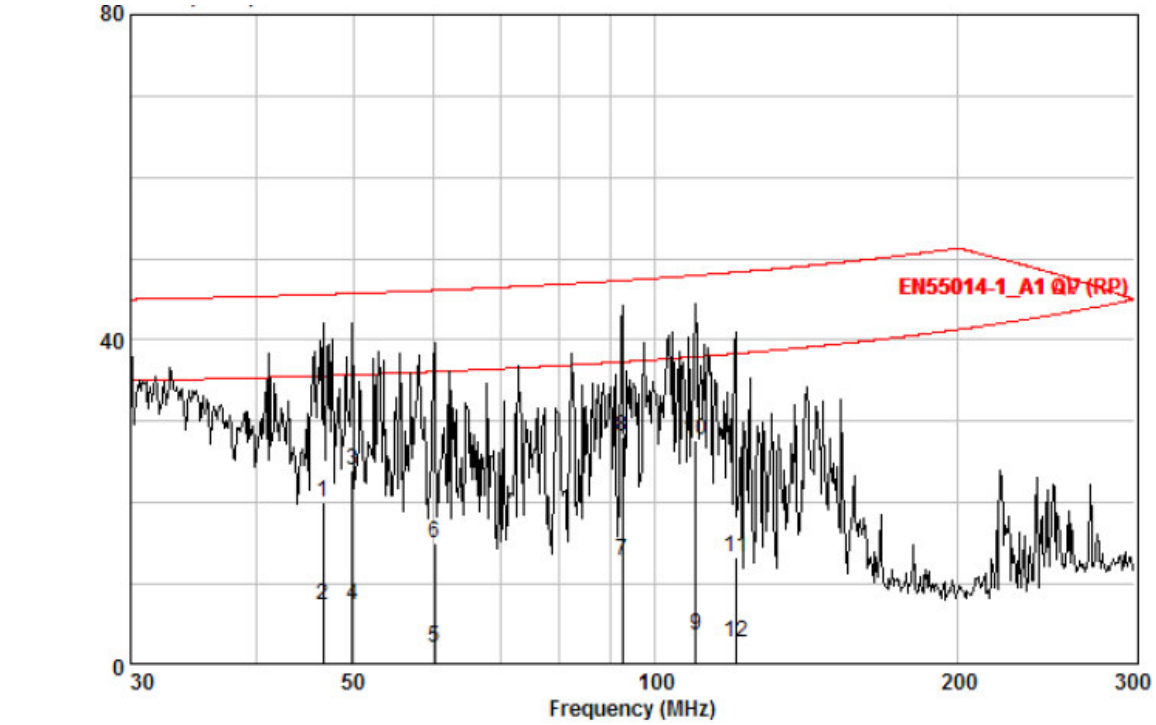

Quasi-peak and Average measurement:

| Freq | Read Level | Trans. | RF Switch Loss | Level | Limit Line | Over Limit | Detector |
|---|---|---|---|---|---|---|---|
| MHz | (dBµV) | dB | dB | (dBpW) | (dBpW) | dB | |
| 32.368 | 12.68 | 1.73 | 0.00 | 14.41 | 35.09 | -20.68 | AVERAGE |
| 32.368 | 29.22 | 1.73 | 0.00 | 30.95 | 45.09 | -14.14 | QP |
| 42.966 | 11.19 | 1.96 | 0.00 | 13.15 | 35.48 | -22.33 | AVERAGE |
| 42.966 | 26.87 | 1.96 | 0.00 | 28.83 | 45.48 | -16.65 | QP |
| 45.616 | 28.14 | 1.53 | 0.00 | 29.67 | 45.58 | -15.91 | QP |
| 45.616 | 13.06 | 1.53 | 0.00 | 14.59 | 35.58 | -20.99 | AVERAGE |
| 74.152 | 4.77 | 1.18 | 0.00 | 5.95 | 36.64 | -30.69 | AVERAGE |
| 74.152 | 21.86 | 1.18 | 0.00 | 23.04 | 46.64 | -23.60 | QP |
| 102.123 | 32.00 | 0.93 | 0.00 | 32.93 | 47.67 | -14.75 | QP |
| 102.123 | 6.05 | 0.93 | 0.00 | 6.98 | 37.67 | -30.69 | AVERAGE |
| 146.596 | 18.71 | 1.61 | 0.00 | 20.32 | 49.32 | -29.00 | QP |
| 146.596 | 2.47 | 1.61 | 0.00 | 4.08 | 39.32 | -35.24 | AVERAGE |

For EN 55014-1

CONTROL OUT:

Peak Scan:




Quasi-peak and Average measurement:

| Freq | Read Level | Trans. | RF Switch Loss | Level | Limit Line | Over Limit | Detector |
|---|---|---|---|---|---|---|---|
| MHz | (dBµV) | dB | dB | (dBpW) | (dBpW) | dB | |
| 46.679 | 18.68 | 1.36 | 0.00 | 20.04 | 45.62 | -25.57 | QP |
| 46.679 | 6.05 | 1.36 | 0.00 | 7.41 | 35.62 | -28.20 | AVERAGE |
| 49.902 | 23.11 | 0.89 | 0.00 | 24.00 | 45.74 | -21.74 | QP |
| 49.902 | 6.58 | 0.89 | 0.00 | 7.47 | 35.74 | -28.27 | AVERAGE |
| 60.273 | 1.68 | 0.58 | 0.00 | 2.26 | 36.12 | -33.86 | AVERAGE |
| 60.273 | 14.36 | 0.58 | 0.00 | 14.94 | 46.12 | -31.18 | QP |
| 92.709 | 12.34 | 0.56 | 0.00 | 12.90 | 37.32 | -24.42 | AVERAGE |
| 92.709 | 27.59 | 0.56 | 0.00 | 28.15 | 47.32 | -19.17 | QP |
| 109.678 | 2.13 | 1.50 | 0.00 | 3.63 | 37.95 | -34.32 | AVERAGE |
| 109.678 | 26.10 | 1.50 | 0.00 | 27.60 | 47.95 | -20.35 | QP |
| 120.260 | 11.79 | 1.51 | 0.00 | 13.30 | 48.34 | -35.04 | QP |
| 120.260 | 1.26 | 1.51 | 0.00 | 2.77 | 38.34 | -35.57 | AVERAGE |