



TEST REPORT NO: RU1076/4876

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FCC ID: OE5S821

**REPORT ON THE CERTIFICATION TESTING OF A  
GROUP 4 TECHNOLOGY Ltd  
S821  
WITH RESPECT TO  
THE FCC RULES CFR 47, PART 15.225  
INTENTIONAL RADIATOR SPECIFICATION  
ON BEHALF OF  
GROUP 4 TECHNOLOGY Ltd**

TEST DATE: 7<sup>th</sup> – 8<sup>th</sup> OCTOBER 2003

TESTED BY: J CHARTERS

APPROVED BY: P GREEN  
EMC PRODUCT  
MANAGER

DATE: 4<sup>th</sup> November 2003

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**Notes:**

- |    |                                                                                                                                                                                                  |           |            |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|------------|
| 1. | Component failure during test                                                                                                                                                                    | YES<br>NO | [ ]<br>[X] |
| 2. | If Yes, details of failure:                                                                                                                                                                      |           |            |
| 3. | The facilities used for the testing of the product contain in this report are FCC Listed.                                                                                                        |           |            |
| 4. | The contents of the attached applicants declarations and other supplied information are not covered by the scope of this laboratory's UKAS or FCC accreditations' and is provided in good faith. |           |            |



## CERTIFICATE OF CONFORMITY & COMPLIANCE

FCC IDENTITY: OE5S821

PURPOSE OF TEST: Certification

TEST SPECIFICATION: FCC RULES CFR 47, Part 15.225

TEST RESULT: Compliant to Specification

EQUIPMENT UNDER TEST: S821

EQUIPMENT SERIAL No: 0331331121

ITU: EMISSION CODE: 12k0A1D

EQUIPMENT TYPE: S821 Tag reader

PRODUCT USE: Access/control

CARRIER EMISSION: 27.6 $\mu$ V/m

ANTENNA TYPE: Integral

ALTERNATIVE ANTENNA: Not applicable

BAND OF OPERATION: 13.553MHz – 13.567MHz

CHANNEL SPACING: N/A wideband

NUMBER OF CHANNELS: 1

FREQUENCY GENERATION: SAW Resonator [ ] Crystal [X] Synthesiser [ ]

MODULATION METHOD: Amplitude [X] Digital [ ] Angle [ ]

POWER SOURCE(s): +12Vdc

TEST DATE(s): 7<sup>th</sup> – 8<sup>th</sup> OCTOBER 2003

ORDER No(s): R00001507

APPLICANT: GROUP 4 TECHNOLOGY Ltd

ADDRESS: Challenge House  
Northway Lane  
Tewkesbury  
Gloucester  
GL19 4QH

TESTED BY: \_\_\_\_\_ J CHARTERS

APPROVED BY: \_\_\_\_\_ P GREEN  
EMC PRODUCT  
MANAGER

## APPLICANT'S SUMMARY

|                                |                                                                |                                 |            |
|--------------------------------|----------------------------------------------------------------|---------------------------------|------------|
| EQUIPMENT UNDER TEST (EUT):    | S821                                                           |                                 |            |
| EQUIPMENT TYPE:                | S821 Tag Reader                                                |                                 |            |
| SERIAL NUMBER OF EUT:          | 0331331121                                                     |                                 |            |
| PURPOSE OF TEST:               | Certification                                                  |                                 |            |
| TEST SPECIFICATION(s):         | FCC RULES CFR 47, Part 15.225                                  |                                 |            |
| TEST RESULT:                   | COMPLIANT                                                      | Yes<br>No                       | [X]<br>[ ] |
| APPLICANT'S CATEGORY:          | MANUFACTURER<br>IMPORTER<br>DISTRIBUTOR<br>TEST HOUSE<br>AGENT | [X]<br>[ ]<br>[ ]<br>[ ]<br>[ ] |            |
| APPLICANT'S ORDER No(s):       | R00001507                                                      |                                 |            |
| APPLICANT'S CONTACT PERSON(s): | Mr E Porter                                                    |                                 |            |
| E-mail address:                | Eric.porter@g4tech.co.uk                                       |                                 |            |
| APPLICANT:                     | GROUP 4 TECHNOLOGY Ltd                                         |                                 |            |
| ADDRESS:                       | Challenge House<br>Tewkesbury<br>Gloucester<br>GL20 8JG        |                                 |            |
| TEL:                           | +44 (0) 1684 850977                                            |                                 |            |
| FAX:                           | +44 (0) 1684 294845                                            |                                 |            |
| MANUFACTURER:                  | GROUP 4 TECHNOLOGY Ltd                                         |                                 |            |
| EUT(s) COUNTRY OF ORIGIN:      | United Kingdom                                                 |                                 |            |
| TEST LABORATORY:               | TRL EMC                                                        |                                 |            |
| UKAS ACCREDITATION No:         | 0728                                                           |                                 |            |
| TEST DATE(s)                   | 7 <sup>th</sup> - 8 <sup>th</sup> OCTOBER 2003                 |                                 |            |
| TEST REPORT No:                | RU1076/4876                                                    |                                 |            |

## EQUIPMENT TEST / EXAMINATIONS REQUIRED

| 1. | TEST/EXAMINATION                         | RULE PART | DETECTOR           | APPLICABILITY |
|----|------------------------------------------|-----------|--------------------|---------------|
|    | Intentional Emission Frequency:          | 15.225    | Quasi Peak         | Yes           |
|    | Intentional Emission Field Strength:     | 15.225    | Quasi Peak         | Yes           |
|    | Intentional Emission Band Occupancy:     | 15.225    | Quasi Peak         | Yes           |
|    | Intentional Emission ERP (mW):           | N/A       | -                  | No            |
|    | Spurious Emissions – Conducted:          | 15.207    | Quasi Peak Average | Yes           |
|    | Spurious Emissions – Radiated <1000MHz:  | 15.209    | Quasi Peak         | Yes           |
|    | Spurious Emissions – Radiated >1000MHz:  | N/A       | -                  | No            |
|    | Maximum Frequency of Search:             | 15.33     | -                  | Yes           |
|    | Antenna Arrangements Integral:           | 15.203    | -                  | Yes           |
|    | Antenna Arrangements External Connector: | 15.204    | -                  | No            |
|    | Restricted Bands                         | 15.205    | -                  | Yes           |
|    | Extrapolation Factor                     | 15.31(f)  | -                  | Yes           |

- |    |                      |                |       |
|----|----------------------|----------------|-------|
| 2. | Product Use:         | Access/control |       |
| 3. | Emission Designator: | 12K0A1D        |       |
| 4. | Duty Cycle:          |                | <100% |
| 5. | Temperatures:        | Ambient (Tnom) | 20°C  |
| 6. | Supply Voltages:     | Vnom           | 12Vdc |
- Note: Vnom voltages are as stated above unless otherwise shown on the test report page
- |    |                     |                |                                     |
|----|---------------------|----------------|-------------------------------------|
| 7. | Equipment Category: | Single channel | <input checked="" type="checkbox"/> |
|    |                     | Two channel    | <input type="checkbox"/>            |
|    |                     | Multi-channel  | <input type="checkbox"/>            |
| 9. | Channel spacing:    | Narrowband     | <input type="checkbox"/>            |
|    |                     | Wideband       | <input checked="" type="checkbox"/> |

## TRANSMITTER TESTS

### TRANSMITTER SPURIOUS EMISSIONS – RADIATED – PART 15.209

Ambient temperature = 20°C(<1GHz) 10m measurements <30MHz [X]  
 Relative humidity = 60% (<1GHz), 3m measurements >30MHz [X]  
 Conditions = Open Area Test Site (OATS) 10m extrapolated from 30m [X]  
 Supply voltage = 12Vdc  
 Channel number = 1

|                  | FREQ.<br>(MHz)                     | MEAS.<br>Rx.<br>(dBµV)       | CABLE<br>LOSS<br>(dB)    | ANT<br>FACT.<br>(dB/m)     | FIELD<br>STRENGTH<br>(dBµV/m) | EXTRAP.<br>FACTOR<br>(dB) | FIELD<br>STRENGTH<br>(µV/m)     | LIMIT<br>(µV/m) |
|------------------|------------------------------------|------------------------------|--------------------------|----------------------------|-------------------------------|---------------------------|---------------------------------|-----------------|
| 1.705MHz - 30MHz | 27.12                              |                              | -                        | -                          | -2.18                         | 19.08                     | 0.78                            | 30              |
| 30MHz - 88MHz    | 32.0<br>66.45                      | 1.8<br>5.4                   | 0.5<br>0.7               | 16.9<br>5.0                | 19.2<br>11.1                  | -                         | 9.12<br>3.6                     | 100             |
| 88MHz - 216MHz   |                                    |                              |                          |                            |                               | -                         |                                 |                 |
| 216MHz - 960MHz  | 217.05<br>230.6<br>244.2<br>257.65 | 35.6<br>34.0<br>11.4<br>26.7 | 1.5<br>1.6<br>1.6<br>1.7 | 8.0<br>9.5<br>11.1<br>12.5 | 45.1<br>45.1<br>24.1<br>40.9  | -                         | 179.9<br>179.9<br>16.0<br>110.9 | 200             |
| 960MHz - 1GHz    |                                    |                              |                          |                            |                               | -                         |                                 |                 |
| 1GHz - 5GHz      |                                    |                              |                          |                            |                               | -                         |                                 |                 |
| Limits           | 1.705MHz to 30MHz                  |                              |                          | 30µV/m @ 30m               |                               |                           |                                 |                 |
|                  | 30MHz to 88MHz                     |                              |                          | 100µV/m @ 3m               |                               |                           |                                 |                 |
|                  | 88MHz to 216MHz                    |                              |                          | 150µV/m @ 3m               |                               |                           |                                 |                 |
|                  | 216MHz to 960MHz                   |                              |                          | 200µV/m @ 3m               |                               |                           |                                 |                 |
|                  | 960MHz to 1GHz                     |                              |                          | 500µV/m @ 3m               |                               |                           |                                 |                 |
|                  | 1GHz to 5GHz                       |                              |                          | 500µV/m @ 3m               |                               |                           |                                 |                 |

See next page for the notes and test methods:

**Notes:**

- 1 Results quoted are extrapolated as indicated
- 2 Emissions were searched to: (x) 1000MHz inclusive, as per Part 15.33a
- 3 Extrapolation factor 9.5dB from 1m to 3m, as per Part 15.31f
- 4 Extrapolation factor 19.08dB from 10m to 30m, as per Part 15.31f
- 5 Measurements >1GHz @ 1m as per Part 15.31f(1)
- 6 Receiver detector >1GHz = CISPR, Quasi-Peak, 120kHz bandwidth
- 7 Receiver detector >1GHz = Peak Hold, 1MHz resolution bandwidth
- 8 New batteries used for battery powered products.
- 9 Emissions 20db's below the limit were not recorded.
- 10 For emission below 30MHz the measuring receiver automatically compensates for the loss due to the antenna factor of the loop antenna. This loss is 20dB's across the measurement range 9kHz to 30MHz.
- 11 For emissions below 30 MHz the cable losses are assumed to be negligible.

**Test Method:**

- 1 As per Radio – Noise Emissions, ANSI C63.4: 1992
- 2 Measuring distances as Notes 1 to 4 above
- 3 EUT 0.8 metre above ground plane
- 4 Emissions maximised by rotation of EUT, on an automatic turntable.  
Raising and lowering the receiver antenna between 1m & 4m(above 30MHz only).  
Horizontal and vertical polarisations, of the receive antenna.  
EUT orientation in three orthogonal planes.  
Maximum results recorded.

The test equipment used for the Transmitter Spurious Emissions – Radiated – Part 15.209 tests is shown overleaf:

| TYPE OF EQUIPMENT                   | MAKER/ SUPPLIER | MODEL No  | SERIAL No    | TRL No | ACTUAL EQUIPMENT USED |
|-------------------------------------|-----------------|-----------|--------------|--------|-----------------------|
| AE, LOOP, Z2, 9kHz - 30MHz          | ROHDE & SCHWARZ | HFH2      | 881058 - 53  | 07     |                       |
| HORN ANTENNA                        | EMCO            | 3115      | 9010-3580    | 138    |                       |
| HORN ANTENNA                        | EMCO            | 3115      | 9010-3581    | 139    |                       |
| SPECTRUM ANALYSER                   | TEKTRONIX       | 2756P     | B010109      | 164    |                       |
| BICONE ANTENNA                      | CHASE           | BBA9106   | N/A          | 193    |                       |
| ANTENNA, LOG PERIODIC 300MHz – 1GHz | CHASE           | UPA6108   | 1061         | 203    |                       |
| RECEIVER                            | ROHDE & SCHWARZ | ESHS20    | 837960/003   | 237    |                       |
| ANTENNA, BICONE 20MHz - 300MHz      | CHASE           | VBA6106A  | 1193         | 251    |                       |
| BILOG ANTENNA                       | CHASE           | CBL6112   | 2098         | 274    |                       |
| RECEIVER                            | ROHDE & SCHWARZ | ESVS10    | 837948/003   | 317    |                       |
| RECEIVER                            | ROHDE & SCHWARZ | ESVS10    | 844594/003   | 352    |                       |
| RECEIVER                            | ROHDE & SCHWARZ | ESHS10    | 844077/019   | 353    |                       |
| V / UHF RECEIVER 20MHz - 1GHz       | ROHDE & SCHWARZ | ESVS 20   | 838804 / 005 | 415    |                       |
| BILOG ANTENNA                       | SCHAFFNER       | CBL6112B  | 2761         | 431    |                       |
| RECEIVER                            | ROHDE & SCHWARZ | ESHS 10   | 830051/001   | UH03   | <b>X</b>              |
| RECEIVER                            | ROHDE & SCHWARZ | ESVS 10   | 825892/003   | UH04   | <b>X</b>              |
| RANGE 1                             | TRL             | 3 METRE   | N/A          | UH06   | <b>X</b>              |
| AE, LOOP, Z2, 9kHz - 30MHz          | ROHDE & SCHWARZ | HFH2      | 881058 - 53  | 07     | <b>X</b>              |
| BILOG ANTENNA                       | CHASE           | CBL6112   | 2129         | UH93   | <b>X</b>              |
| SPECTRUM ANALYSER                   | MARCONI         | 2386/2380 | 152076/004   | UH120  | <b>X</b>              |

## TRANSMITTER TESTS

### TRANSMITTER INTENTIONAL EMISSION – RADIATED – Part 15.225

|                     |   |                            |                           |     |
|---------------------|---|----------------------------|---------------------------|-----|
| Ambient temperature | = | 20°C(<1GHz),               | 3m measurements @ fc      | [X] |
| Relative humidity   | = | 60%(<1GHz),                | 10m measurements @ fc     | [X] |
| Conditions          | = | Open Area Test Site (OATS) | 30m measurements @ fc     | [ ] |
| Supply voltage      | = | 12Vdc                      | 30m extrapolated from 3m  | [X] |
| Channel number      | = | 1                          | 30m extrapolated from 10m | [X] |

| FREQ.<br>(MHz)          | MEASUREMENT<br>DISTANCE<br>Meters | MEASUREMENT Rx.<br>READING<br>(dBμV/m) | EXTRAP.<br>FACTOR<br>(dB) | FIELD<br>STRENGTH<br>(μV/m) |
|-------------------------|-----------------------------------|----------------------------------------|---------------------------|-----------------------------|
| 13.56                   | 3                                 | 59.9                                   | 31.08                     | 27.86                       |
| 13.56                   | 10                                | 47.9                                   | 19.08                     | 27.6                        |
| Limit value @ fc        |                                   | 10,000(μV/m)                           |                           |                             |
| Band occupancy @ -20dBc |                                   | f lower                                | f higher                  |                             |
|                         |                                   | 13.544920MHz                           | 13.580520MHz              |                             |

See spectrum analyser plot – Annex C

#### Notes:

- Results quoted are extrapolated as indicated
- The 3m-10m extrapolation factor is 12.0 calculated from the results above  
Extrapolation factor 10-30m is 19.08dB using the extrapolation factor of 40dB/decade as per 15.331(f)
- Receiver detector @ fc = Quasi Peak 120kHz bandwidth
- When battery powered the EUT was powered with new batteries
- For emission below 30MHz the measuring receiver automatically compensates for the loss due to the antenna factor of the loop antenna. This loss is 20dB's across the measurement range 9kHz to 30MHz.
- For emission below 30 MHz the cable losses are assumed to be negligible.

#### Test Method:

- As per Radio – Noise Emissions, ANSI C63.4: 1992
- Measuring distances 3m & 10m (to produce extrapolation factor)
- EUT 0.8 metre above ground plane
- Emissions maximised by rotation of EUT, on an automatic turntable.  
Raising and lowering the receiver antenna between 1m & 4m.(above 30MHz only)  
Horizontal and vertical polarisations, of the receive antenna.  
EUT orientation in three orthogonal planes.  
Maximum results recorded

The test equipment used for the Transmitter Intentional Emission – Radiated – Part 15.225 tests is shown overleaf:

| TYPE OF EQUIPMENT                   | MAKER/ SUPPLIER | MODEL No  | SERIAL No    | TRL No | ACTUAL EQUIPMENT USED |
|-------------------------------------|-----------------|-----------|--------------|--------|-----------------------|
| AE, LOOP, Z2, 9kHz - 30MHz          | ROHDE & SCHWARZ | HFH2      | 881058 - 53  | 07     |                       |
| HORN ANTENNA                        | EMCO            | 3115      | 9010-3580    | 138    |                       |
| HORN ANTENNA                        | EMCO            | 3115      | 9010-3581    | 139    |                       |
| SPECTRUM ANALYSER                   | TEKTRONIX       | 2756P     | B010109      | 164    |                       |
| BICONE ANTENNA                      | CHASE           | BBA9106   | N/A          | 193    |                       |
| ANTENNA, LOG PERIODIC 300MHz – 1GHz | CHASE           | UPA6108   | 1061         | 203    |                       |
| RECEIVER                            | ROHDE & SCHWARZ | ESHS20    | 837960/003   | 237    |                       |
| ANTENNA, BICONE 20MHz - 300MHz      | CHASE           | VBA6106A  | 1193         | 251    |                       |
| BILOG ANTENNA                       | CHASE           | CBL6112   | 2098         | 274    |                       |
| RECEIVER                            | ROHDE & SCHWARZ | ESVS10    | 837948/003   | 317    |                       |
| RECEIVER                            | ROHDE & SCHWARZ | ESVS10    | 844594/003   | 352    |                       |
| RECEIVER                            | ROHDE & SCHWARZ | ESHS10    | 844077/019   | 353    |                       |
| V / UHF RECEIVER 20MHz - 1GHz       | ROHDE & SCHWARZ | ESVS 20   | 838804 / 005 | 415    |                       |
| BILOG ANTENNA                       | SCHAFFNER       | CBL6112B  | 2761         | 431    |                       |
| RECEIVER                            | ROHDE & SCHWARZ | ESHS 10   | 830051/001   | UH03   | <b>X</b>              |
| RECEIVER                            | ROHDE & SCHWARZ | ESVS 10   | 825892/003   | UH04   |                       |
| RANGE 1                             | TRL             | 3 METRE   | N/A          | UH06   | <b>X</b>              |
| AE, LOOP, Z2, 9kHz - 30MHz          | ROHDE & SCHWARZ | HFH2      | 881058 - 53  | 07     |                       |
| BILOG ANTENNA                       | CHASE           | CBL6112   | 2129         | UH93   |                       |
| SPECTRUM ANALYSER                   | MARCONI         | 2386/2380 | 152076/004   | UH120  | <b>X</b>              |

## TRANSMITTER TESTS

### TRANSMITTER EMISSIONS – FREQUENCY TOLERANCE Part 15.225 (c)

Ambient temperature = 20°C  
Relative humidity = 60%

Fc @ Vnom Tnom = 13.562810MHz

| TEMPERATURE | VOLTAGE | FREQUENCY<br>MHz | DEVIATION<br>kHz | LIMIT<br>kHz |
|-------------|---------|------------------|------------------|--------------|
| -20°C       | 12.0    | 13.562810        | 0                | ±1.356       |
| +50°C       | 12.0    | 13.563320        | -0.51            | ±1.356       |

| TEMPERATURE | VOLTAGE | FREQUENCY<br>MHz | DEVIATION<br>kHz | LIMIT<br>kHz |
|-------------|---------|------------------|------------------|--------------|
| +20°C       | 13.8    | 13.563020        | -0.21            | ±1.356       |
| +20°C       | 10.2    | 13.563220        | -0.41            | ±1.356       |

**Notes:** 1 One hour was allowed for temperature stabilisation.

**Test Method:**

- 1 EUT was placed inside the environmental chamber and temperature adjusted accordingly.
- 2 The DC power was varied from an external dc power supply.
- 3 Frequency was recorded on the spectrum analyzer.

The test equipment used for the Transmitter Frequency Tolerance – Part 15.225 (c) test was:

| TYPE OF EQUIPMENT        | MAKER/<br>SUPPLIER | MODEL No     | SERIAL No  | TRL No | ACTUAL<br>EQUIPMENT<br>USED |
|--------------------------|--------------------|--------------|------------|--------|-----------------------------|
| RECEIVER                 | ROHDE &<br>SCHWARZ | ESHS20       | 837960/003 | 237    |                             |
| LISN / AMN               | ROHDE &<br>SCHWARZ | ESH3-Z5      | 83746/010  | 289    |                             |
| RECEIVER                 | ROHDE &<br>SCHWARZ | ESHS10       | 844077/019 | 353    |                             |
| ENVIRONMENTAL<br>CHAMBER | SHARETREE          | TCC 125-815P | CS 203     | 11     | <b>X</b>                    |
| POWER SUPPLY             | MANSON             | EP603        | 60316619   | UH177  | <b>X</b>                    |
| MULTIMETER               | AVO METER          | M3004        | M3270006   | UH41   | <b>X</b>                    |
| RECEIVER                 | ROHDE &<br>SCHWARZ | ESHS 10      | 830051/001 | UH03   |                             |
| LISN/AMN                 | ROHDE &<br>SCHWARZ | ESH3-Z5      | 863906/018 | UH05   |                             |
| SPECTRUM<br>ANALYSER     | MARCONI            | 2386/2380    | 152076/004 | UH120  | <b>X</b>                    |

## TRANSMITTER TESTS

### TRANSMITTER CONDUCTED EMISSIONS – AC POWER LINE Part 15.207

Ambient temperature = 20°C(<1GHz),  
Relative humidity = 60%(<1GHz),  
Conditions = Power Line Laboratory  
Supply voltage = 110V AC  
Supply Frequency = 60Hz

### SIGNIFICANT EMISSIONS

| FREQUENCY (MHz) | MEASUREMENT RECEIVER READING (dBµV) | DETECTOR   | CONDUCTOR (L or N) | EMISSION (dBµV) |
|-----------------|-------------------------------------|------------|--------------------|-----------------|
| 0.15            | 38.99                               | Quasi Peak | L                  | 66.00           |
| 0.2             | 34.47                               | Quasi Peak | L                  | 63.61           |
| 13.56           | 58.82                               | Quasi Peak | L                  | 60.00           |
| 27.125          | 45.38                               | Average    | L                  | 60.00           |
| 13.56           | 39.83                               | Average    | L                  | 50.00           |

**Notes:**

- 1 See attached plot
- 2 Scans on both Live and Neutral lines were performed . Only worst case emissions are reported

**Test Method:**

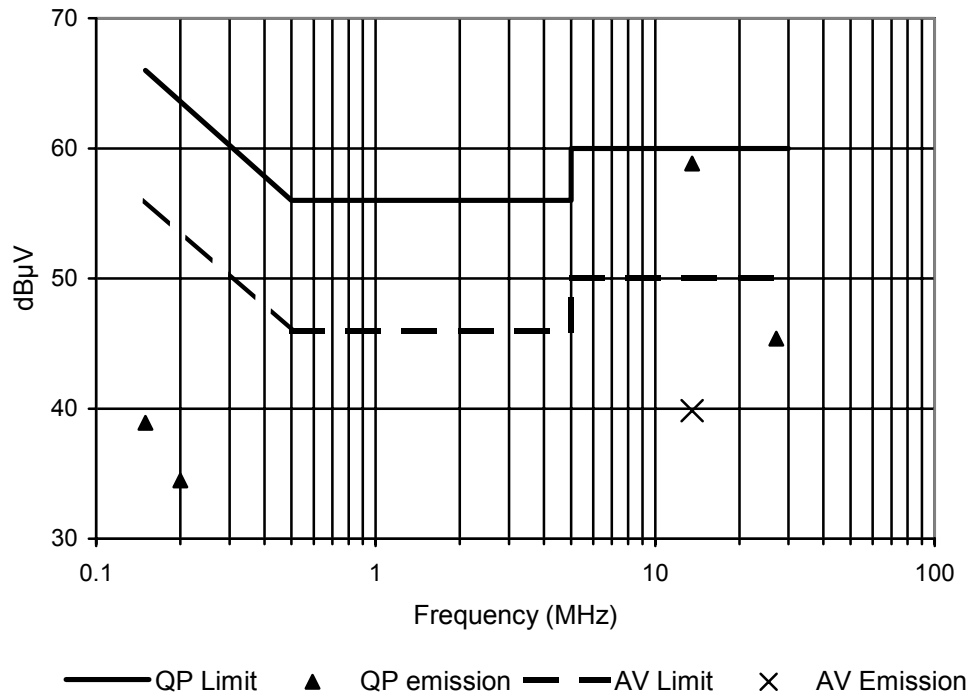
- 1 As per Radio – Noise Emissions, ANSI C63.4: 1992

The test equipment used for the Transmitter Conducted Emissions – AC Power Line Part 15.207 test was:

| TYPE OF EQUIPMENT | MAKER/ SUPPLIER | MODEL No  | SERIAL No  | TRL No | ACTUAL EQUIPMENT USED |
|-------------------|-----------------|-----------|------------|--------|-----------------------|
| RECEIVER          | ROHDE & SCHWARZ | ESHS20    | 837960/003 | 237    |                       |
| LISN / AMN        | ROHDE & SCHWARZ | ESH3-Z5   | 83746/010  | 289    |                       |
| RECEIVER          | ROHDE & SCHWARZ | ESHS10    | 844077/019 | 353    |                       |
| RECEIVER          | ROHDE & SCHWARZ | ESHS 10   | 830051/001 | UH03   | <b>X</b>              |
| LISN/AMN          | ROHDE & SCHWARZ | ESH3-Z5   | 863906/018 | UH05   | <b>X</b>              |
| SPECTRUM ANALYSER | MARCONI         | 2386/2380 | 152076/004 | UH120  |                       |

## POWER LINE CONDUCTION EMISSIONS

Quasi Peak and Average Limit Part 15.207



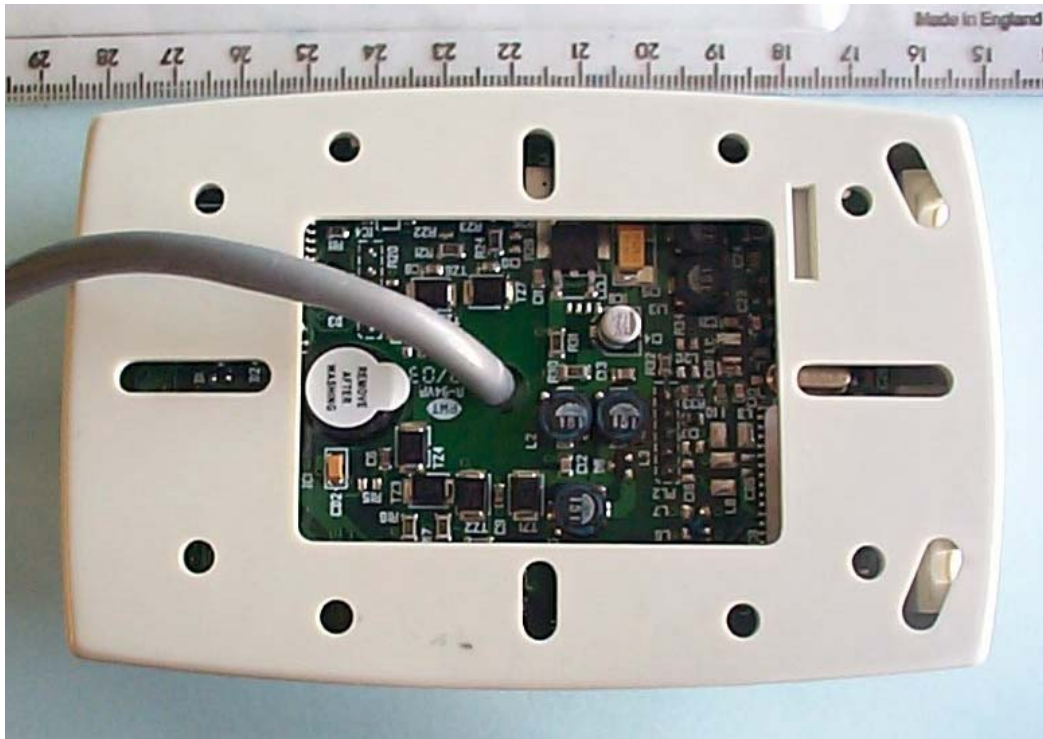
**ANNEX A**  
**PHOTOGRAPHS**

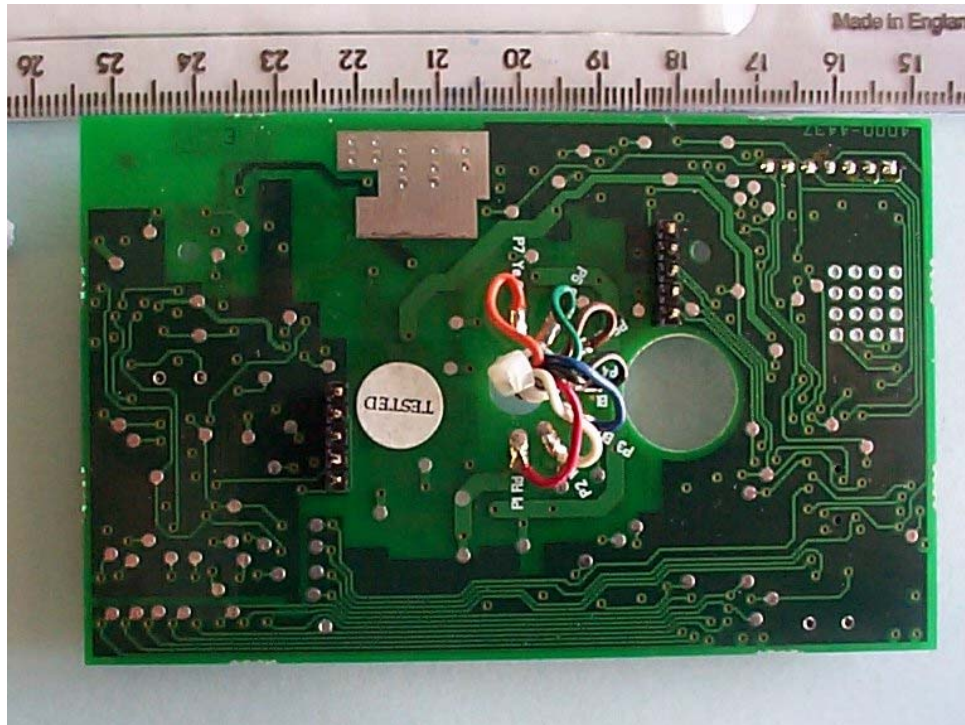


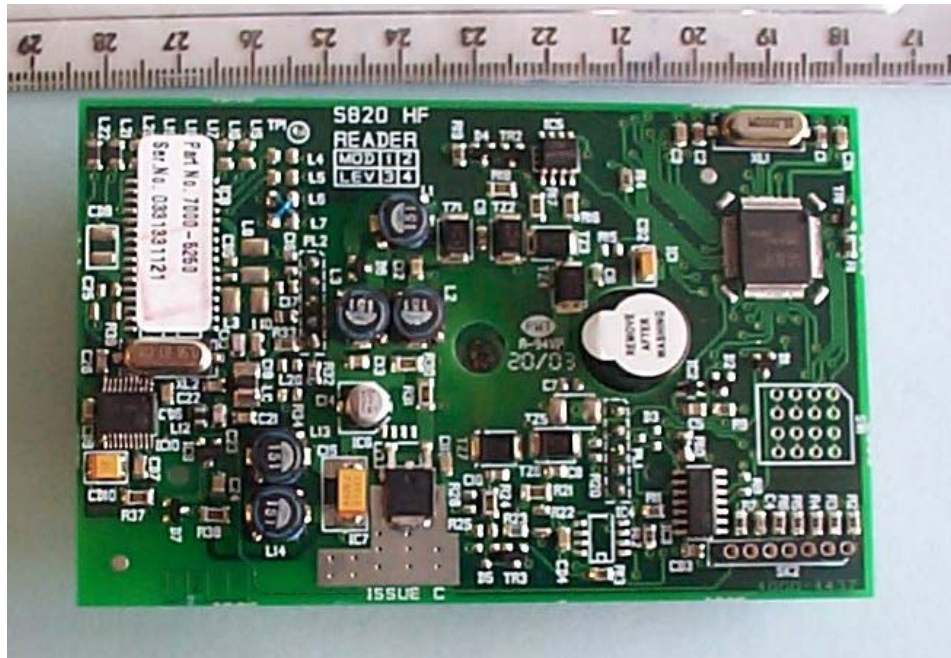


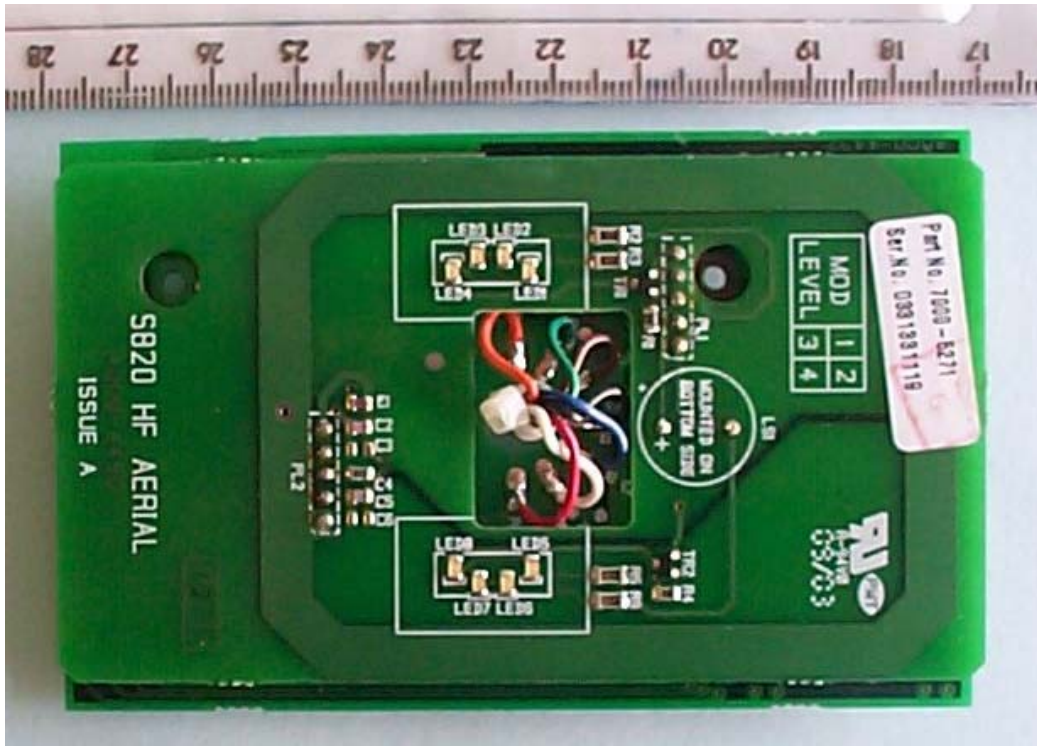
PHOTOGRAPH No. 3

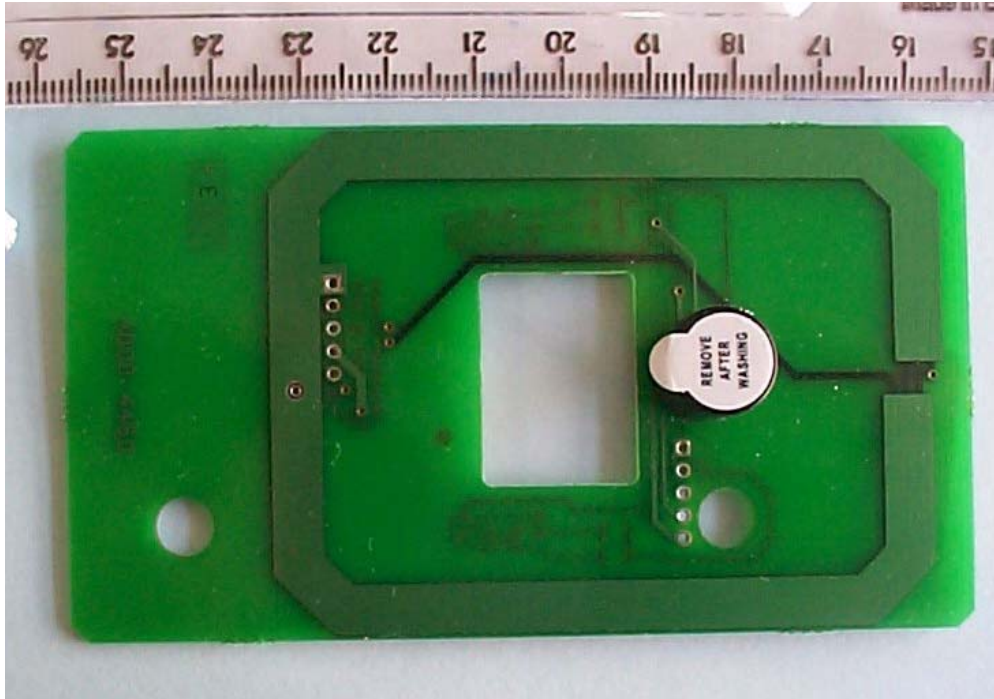
TRANSMITTER REAR VIEW













**ANNEX B**

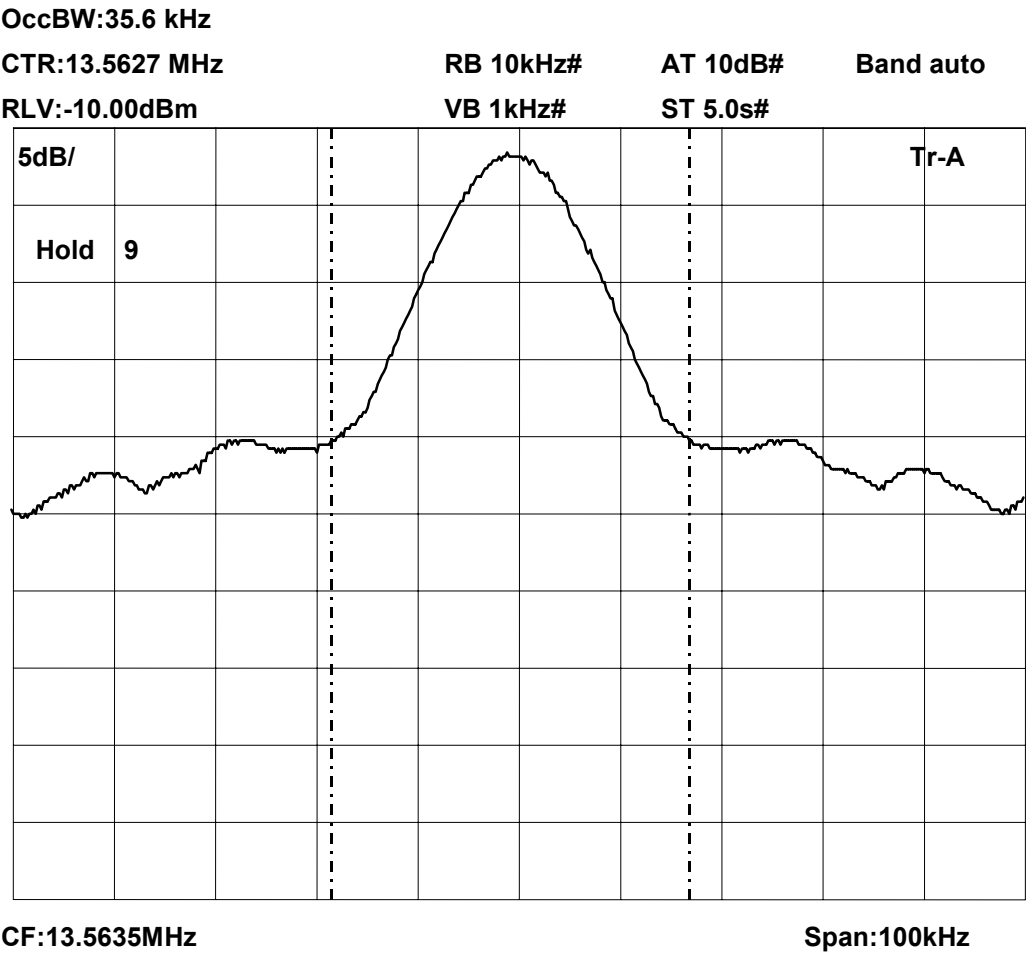
**APPLICANT'S SUBMISSION OF DOCUMENTATION LIST**

## APPLICANT'S SUBMISSION OF DOCUMENTATION LIST

|    |                                            |   |             |     |
|----|--------------------------------------------|---|-------------|-----|
| a. | TCB                                        | - | APPLICATION | [X] |
|    |                                            | - | FEE         | [X] |
| b. | AGENT'S LETTER OF AUTHORISATION            | - |             | [X] |
| c. | MODEL(s) vs IDENTITY                       | - |             | [ ] |
| d. | ALTERNATIVE TRADE NAME DECLARATION(s)      | - |             | [ ] |
| e. | LABELLING                                  | - | PHOTOGRAPHS | [ ] |
|    |                                            | - | DECLARATION | [ ] |
|    |                                            | - | DRAWINGS    | [X] |
| f. | TECHNICAL DESCRIPTION                      | - |             | [X] |
| g. | BLOCK DIAGRAMS                             | - | Tx          | [X] |
|    |                                            | - | Rx          | [ ] |
|    |                                            | - | PSU         | [ ] |
|    |                                            | - | AUX         | [ ] |
| h. | CIRCUIT DIAGRAMS                           | - | Tx          | [X] |
|    |                                            | - | Rx          | [ ] |
|    |                                            | - | PSU         | [ ] |
|    |                                            | - | AUX         | [ ] |
| i. | COMPONENT LOCATION                         | - | Tx          | [X] |
|    |                                            | - | Rx          | [ ] |
|    |                                            | - | PSU         | [ ] |
|    |                                            | - | AUX         | [ ] |
| j. | PCB TRACK LAYOUT                           | - | Tx          | [X] |
|    |                                            | - | Rx          | [ ] |
|    |                                            | - | PSU         | [ ] |
|    |                                            | - | AUX         | [ ] |
| k. | BILL OF MATERIALS                          | - | Tx          | [X] |
|    |                                            | - | Rx          | [ ] |
|    |                                            | - | PSU         | [ ] |
|    |                                            | - | AUX         | [ ] |
| l. | USER INSTALLATION / OPERATING INSTRUCTIONS | - |             | [X] |

**ANNEX C**  
**BANDWIDTH PLOT**

BANDWIDTH PLOT



**ANNEX D**  
**SCAN DATA**

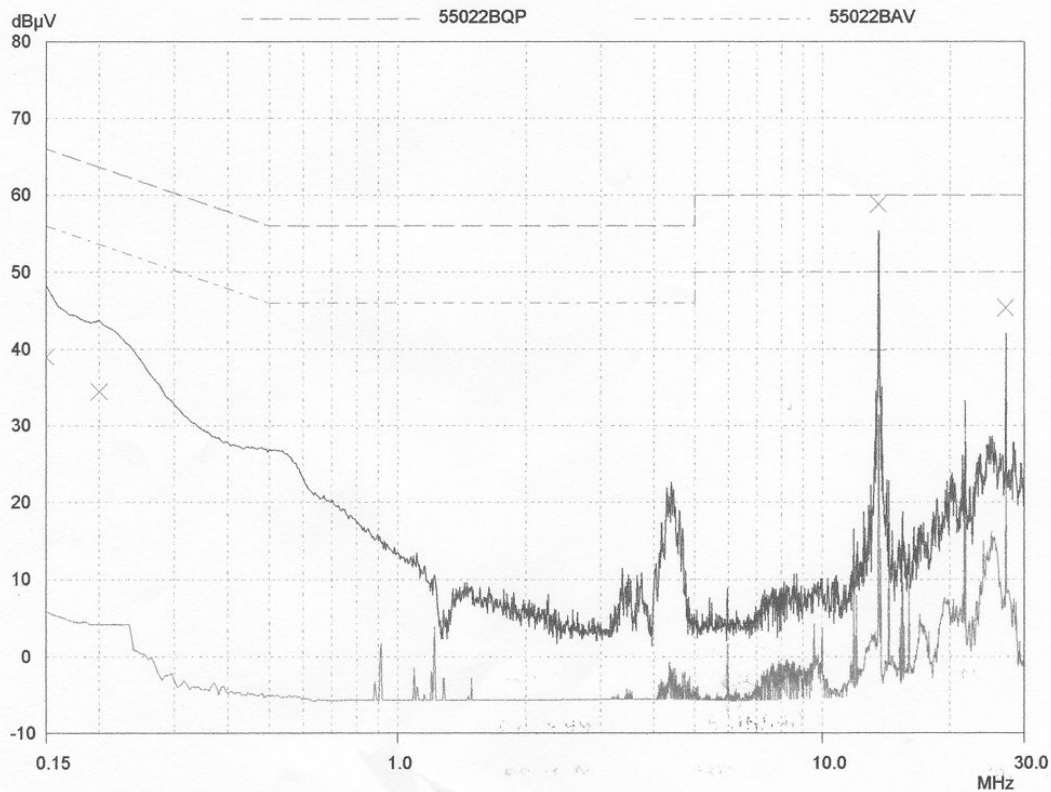
# Powerline Conduction

07 Oct 2003 10:18

## 150kHz - 30MHz

EUT: S821  
 Manuf: Group 4  
 Op Cond: LISN UH5, UH21  
 Operator: J Charters  
 Test Spec: FCC part 15  
 Comment: Live line 110VAC

| Scan Settings      |       | (1 Range)   |             |          | Receiver Settings |       |        |       |  |
|--------------------|-------|-------------|-------------|----------|-------------------|-------|--------|-------|--|
| Frequencies        |       |             |             |          |                   |       |        |       |  |
| Start              | Stop  | Step        | IF BW       | Detector | M-Time            | Atten | Preamp | OpRge |  |
| 150kHz             | 30MHz | 5kHz        | 10kHz       | PK+AV    | 50msec            | Auto  | OFF    | 60dB  |  |
| Transducer         | No.   | Start       | Stop        | Name     |                   |       |        |       |  |
|                    | 1     | 150kHz      | 30MHz       | UH21     |                   |       |        |       |  |
| Final Measurement: |       | Detectors:  | X QP / + AV |          |                   |       |        |       |  |
|                    |       | Meas Time:  | 2sec        |          |                   |       |        |       |  |
|                    |       | Subranges:  | 25          |          |                   |       |        |       |  |
|                    |       | Acc Margin: | 20 dB       |          |                   |       |        |       |  |



## E-Field Radiation

EUT: S821  
Manuf: Group 4  
Op Cond: 3m Indoor Prescan  
Operator: J Charters  
Test Spec: EN55022  
Comment: TX reading tag

| Scan Settings        |         |       |         | (1 Range)   |                   |       |        |       |  | Receiver Settings |  |  |  |
|----------------------|---------|-------|---------|-------------|-------------------|-------|--------|-------|--|-------------------|--|--|--|
| Frequencies          |         |       |         |             |                   |       |        |       |  |                   |  |  |  |
| Start                | Stop    | Step  | IF BW   | Detector    | M-Time            | Atten | Preamp | OpRge |  |                   |  |  |  |
| 30MHz                | 1000MHz | 50kHz | 120kHz  | PK          | 1msec             | Auto  | ON     | 60dB  |  |                   |  |  |  |
| Transducer           | No.     | Start | Stop    | Name        |                   |       |        |       |  |                   |  |  |  |
| 1                    | 15      | 30MHz | 1000MHz | TRLUH72     |                   |       |        |       |  |                   |  |  |  |
|                      | 21      | 30MHz | 1000MHz | CBL6112B    |                   |       |        |       |  |                   |  |  |  |
| Prescan Measurement: |         |       |         | Detector:   | X PK              |       |        |       |  |                   |  |  |  |
|                      |         |       |         | Meas Time:  | see scan settings |       |        |       |  |                   |  |  |  |
|                      |         |       |         | Subranges:  | 50                |       |        |       |  |                   |  |  |  |
|                      |         |       |         | Acc Margin: | 10 dB             |       |        |       |  |                   |  |  |  |

