

| ULCA 66B |          |             |        |    |           |          |             |        |    |           |              |              |
|----------|----------|-------------|--------|----|-----------|----------|-------------|--------|----|-----------|--------------|--------------|
| Ch.      | PCC      |             |        |    |           | SCC      |             |        |    |           | Power        |              |
|          | BW [MHz] | Freq. [MHz] | Ch.    | RB | RB Offset | BW [MHz] | Freq. [MHz] | Ch.    | RB | RB Offset | (dB m)       | (W)          |
| Low      | 5        | 1 712.5     | 131997 | 25 | 0         | 5        | 1 717.3     | 132045 | 25 | 0         | 20.85        | 0.122        |
|          | 5        | 1 712.8     | 132000 | 25 | 0         | 10       | 1 720.0     | 132072 | 50 | 0         | 20.73        | 0.118        |
|          | 10       | 1 715.0     | 132022 | 50 | 0         | 5        | 1 722.2     | 132094 | 25 | 0         | 20.72        | 0.118        |
|          | 5        | 1 713.0     | 132002 | 25 | 0         | 15       | 1 722.3     | 132095 | 75 | 0         | 20.85        | 0.122        |
|          | 15       | 1 717.5     | 132047 | 75 | 0         | 5        | 1 726.8     | 132140 | 25 | 0         | <b>20.95</b> | <b>0.124</b> |
|          | 10       | 1 715.0     | 132022 | 50 | 0         | 10       | 1 724.9     | 132121 | 50 | 0         | 20.91        | 0.123        |
| Middle   | 5        | 1 752.6     | 132398 | 25 | 0         | 5        | 1 757.4     | 132446 | 25 | 0         | 20.74        | 0.119        |
|          | 5        | 1 750.3     | 132375 | 25 | 0         | 10       | 1 757.5     | 132447 | 50 | 0         | 20.79        | 0.120        |
|          | 10       | 1 752.5     | 132397 | 50 | 0         | 5        | 1 759.7     | 132469 | 25 | 0         | 20.74        | 0.119        |
|          | 5        | 1 748.1     | 132353 | 25 | 0         | 15       | 1 757.4     | 132446 | 75 | 0         | 20.80        | 0.120        |
|          | 15       | 1 752.6     | 132398 | 75 | 0         | 5        | 1 761.9     | 132491 | 25 | 0         | <b>20.87</b> | <b>0.122</b> |
|          | 10       | 1 750.1     | 132373 | 50 | 0         | 10       | 1 760.0     | 132472 | 50 | 0         | 20.86        | 0.122        |
| High     | 5        | 1 772.7     | 132599 | 25 | 0         | 5        | 1 777.5     | 132647 | 25 | 0         | 20.84        | 0.121        |
|          | 5        | 1 767.8     | 132550 | 25 | 0         | 10       | 1 775.0     | 132622 | 50 | 0         | 20.85        | 0.121        |
|          | 10       | 1 770.0     | 132572 | 50 | 0         | 5        | 1 777.2     | 132644 | 25 | 0         | 20.86        | 0.122        |
|          | 5        | 1 763.2     | 132504 | 25 | 0         | 15       | 1 772.5     | 132597 | 75 | 0         | 20.87        | 0.122        |
|          | 15       | 1 767.7     | 132549 | 75 | 0         | 5        | 1 777.0     | 132642 | 25 | 0         | <b>20.93</b> | <b>0.124</b> |
|          | 10       | 1 765.1     | 132523 | 50 | 0         | 10       | 1 775.0     | 132622 | 50 | 0         | 20.90        | 0.123        |

Note;

QPSK Modulation with Full RB

| ULCA 66B |          |             |        |    |           |          |             |        |    |           |              |              |
|----------|----------|-------------|--------|----|-----------|----------|-------------|--------|----|-----------|--------------|--------------|
| Ch.      | PCC      |             |        |    |           | SCC      |             |        |    |           | Power        |              |
|          | BW [MHz] | Freq. [MHz] | Ch.    | RB | RB Offset | BW [MHz] | Freq. [MHz] | Ch.    | RB | RB Offset | (dB m)       | (W)          |
| Low      | 5        | 1 712.5     | 131997 | 25 | 0         | 5        | 1 717.3     | 132045 | 25 | 0         | 19.04        | 0.080        |
|          | 5        | 1 712.8     | 132000 | 25 | 0         | 10       | 1 720.0     | 132072 | 50 | 0         | 19.04        | 0.080        |
|          | 10       | 1 715.0     | 132022 | 50 | 0         | 5        | 1 722.2     | 132094 | 25 | 0         | 19.02        | 0.080        |
|          | 5        | 1 713.0     | 132002 | 25 | 0         | 15       | 1 722.3     | 132095 | 75 | 0         | 19.05        | 0.080        |
|          | 15       | 1 717.5     | 132047 | 75 | 0         | 5        | 1 726.8     | 132140 | 25 | 0         | <b>19.07</b> | <b>0.081</b> |
|          | 10       | 1 715.0     | 132022 | 50 | 0         | 10       | 1 724.9     | 132121 | 50 | 0         | 18.99        | 0.079        |
| Middle   | 5        | 1 752.6     | 132398 | 25 | 0         | 5        | 1 757.4     | 132446 | 25 | 0         | 19.20        | 0.083        |
|          | 5        | 1 750.3     | 132375 | 25 | 0         | 10       | 1 757.5     | 132447 | 50 | 0         | 19.19        | 0.083        |
|          | 10       | 1 752.5     | 132397 | 50 | 0         | 5        | 1 759.7     | 132469 | 25 | 0         | 19.17        | 0.083        |
|          | 5        | 1 748.1     | 132353 | 25 | 0         | 15       | 1 757.4     | 132446 | 75 | 0         | 19.12        | 0.082        |
|          | 15       | 1 752.6     | 132398 | 75 | 0         | 5        | 1 761.9     | 132491 | 25 | 0         | <b>19.20</b> | <b>0.083</b> |
|          | 10       | 1 750.1     | 132373 | 50 | 0         | 10       | 1 760.0     | 132472 | 50 | 0         | 19.13        | 0.082        |
| High     | 5        | 1 772.7     | 132599 | 25 | 0         | 5        | 1 777.5     | 132647 | 25 | 0         | 19.30        | 0.085        |
|          | 5        | 1 767.8     | 132550 | 25 | 0         | 10       | 1 775.0     | 132622 | 50 | 0         | 19.31        | 0.085        |
|          | 10       | 1 770.0     | 132572 | 50 | 0         | 5        | 1 777.2     | 132644 | 25 | 0         | 19.30        | 0.085        |
|          | 5        | 1 763.2     | 132504 | 25 | 0         | 15       | 1 772.5     | 132597 | 75 | 0         | 19.27        | 0.084        |
|          | 15       | 1 767.7     | 132549 | 75 | 0         | 5        | 1 777.0     | 132642 | 25 | 0         | <b>19.34</b> | <b>0.086</b> |
|          | 10       | 1 765.1     | 132523 | 50 | 0         | 10       | 1 775.0     | 132622 | 50 | 0         | 19.26        | 0.084        |

Note;

16QAM Modulation with Full RB

| ULCA 66C |          |             |        |    |           |          |             |        |    |           |              |              |
|----------|----------|-------------|--------|----|-----------|----------|-------------|--------|----|-----------|--------------|--------------|
| Ch.      | PCC      |             |        |    |           | SCC      |             |        |    |           | Power        |              |
|          | BW [MHz] | Freq. [MHz] | Ch.    | RB | RB Offset | BW [MHz] | Freq. [MHz] | Ch.    | RB | RB Offset | (dB m)       | (W)          |
| Low      | 10       | 1 715.3     | 132025 | 1  | 49        | 15       | 1 727.3     | 132145 | 1  | 0         | 22.72        | 0.187        |
|          | 15       | 1 717.5     | 132047 | 1  | 74        | 10       | 1 729.5     | 132167 | 1  | 0         | 22.71        | 0.186        |
|          | 10       | 1 715.5     | 132027 | 1  | 49        | 20       | 1 729.9     | 132171 | 1  | 0         | <b>22.77</b> | <b>0.189</b> |
|          | 20       | 1 720.0     | 132072 | 1  | 99        | 10       | 1 734.4     | 132216 | 1  | 0         | 22.73        | 0.187        |
|          | 15       | 1 717.5     | 132047 | 1  | 74        | 15       | 1 732.5     | 132197 | 1  | 0         | 22.66        | 0.184        |
|          | 15       | 1 717.8     | 132050 | 1  | 74        | 20       | 1 734.9     | 132221 | 1  | 0         | 22.58        | 0.181        |
|          | 20       | 1 720.0     | 132072 | 1  | 99        | 15       | 1 737.1     | 132243 | 1  | 0         | 22.68        | 0.185        |
|          | 20       | 1 720.0     | 132072 | 1  | 99        | 5        | 1 731.7     | 132189 | 1  | 0         | 22.74        | 0.188        |
|          | 5        | 1 713.3     | 132005 | 1  | 24        | 20       | 1 725.0     | 132122 | 1  | 0         | 22.71        | 0.187        |
|          | 20       | 1 720.0     | 132072 | 1  | 99        | 20       | 1 739.8     | 132270 | 1  | 0         | 22.62        | 0.183        |
| Middle   | 10       | 1 747.9     | 132351 | 1  | 49        | 15       | 1 759.9     | 132471 | 1  | 0         | 22.51        | 0.178        |
|          | 15       | 1 750.1     | 132373 | 1  | 74        | 10       | 1 762.1     | 132493 | 1  | 0         | 22.53        | 0.179        |
|          | 10       | 1 745.6     | 132328 | 1  | 49        | 20       | 1 760.0     | 132472 | 1  | 0         | <b>22.75</b> | <b>0.188</b> |
|          | 20       | 1 750.1     | 132373 | 1  | 99        | 10       | 1 764.5     | 132517 | 1  | 0         | 22.50        | 0.178        |
|          | 15       | 1 747.5     | 132347 | 1  | 74        | 15       | 1 762.5     | 132497 | 1  | 0         | 22.74        | 0.188        |
|          | 15       | 1 745.3     | 132325 | 1  | 74        | 20       | 1 762.4     | 132496 | 1  | 0         | 22.71        | 0.187        |
|          | 20       | 1 747.6     | 132348 | 1  | 99        | 15       | 1 764.7     | 132519 | 1  | 0         | 22.71        | 0.187        |
|          | 20       | 1 752.5     | 132397 | 1  | 99        | 5        | 1 764.2     | 132514 | 1  | 0         | 22.63        | 0.183        |
|          | 5        | 1 745.8     | 132330 | 1  | 24        | 20       | 1 757.5     | 132447 | 1  | 0         | 22.69        | 0.186        |
|          | 20       | 1 745.1     | 132323 | 1  | 99        | 20       | 1 764.9     | 132521 | 1  | 0         | 22.50        | 0.178        |
| High     | 10       | 1 760.5     | 132477 | 1  | 49        | 15       | 1 772.5     | 132597 | 1  | 0         | 22.45        | 0.176        |
|          | 15       | 1 762.7     | 132499 | 1  | 74        | 10       | 1 774.7     | 132619 | 1  | 0         | 22.38        | 0.173        |
|          | 10       | 1 755.6     | 132428 | 1  | 49        | 20       | 1 770.0     | 132572 | 1  | 0         | <b>22.65</b> | <b>0.184</b> |
|          | 20       | 1 760.1     | 132473 | 1  | 99        | 10       | 1 774.5     | 132617 | 1  | 0         | 22.55        | 0.180        |
|          | 15       | 1 757.5     | 132447 | 1  | 74        | 15       | 1 772.5     | 132597 | 1  | 0         | 22.44        | 0.175        |
|          | 15       | 1 752.9     | 132401 | 1  | 74        | 20       | 1 770.0     | 132572 | 1  | 0         | 22.43        | 0.175        |
|          | 20       | 1 755.1     | 132423 | 1  | 99        | 15       | 1 772.2     | 132594 | 1  | 0         | 22.22        | 0.167        |
|          | 20       | 1 765.0     | 132522 | 1  | 99        | 5        | 1 776.7     | 132639 | 1  | 0         | 22.65        | 0.184        |
|          | 20       | 1 758.3     | 132455 | 1  | 24        | 20       | 1 770.0     | 132572 | 1  | 0         | 22.72        | 0.187        |
|          | 20       | 1 750.2     | 132374 | 1  | 99        | 20       | 1 770.0     | 132572 | 1  | 0         | 22.59        | 0.181        |

Note;

QPSK Modulation with 1 RB

| ULCA 66C |          |             |        |    |           |          |             |        |    |           |              |              |
|----------|----------|-------------|--------|----|-----------|----------|-------------|--------|----|-----------|--------------|--------------|
| Ch.      | PCC      |             |        |    |           | SCC      |             |        |    |           | Power        |              |
|          | BW [MHz] | Freq. [MHz] | Ch.    | RB | RB Offset | BW [MHz] | Freq. [MHz] | Ch.    | RB | RB Offset | (dB m)       | (W)          |
| Low      | 10       | 1 715.3     | 132025 | 1  | 49        | 15       | 1 727.3     | 132145 | 1  | 0         | 21.63        | 0.146        |
|          | 15       | 1 717.5     | 132047 | 1  | 74        | 10       | 1 729.5     | 132167 | 1  | 0         | 21.26        | 0.134        |
|          | 10       | 1 715.5     | 132027 | 1  | 49        | 20       | 1 729.9     | 132171 | 1  | 0         | <b>21.64</b> | <b>0.146</b> |
|          | 20       | 1 720.0     | 132072 | 1  | 99        | 10       | 1 734.4     | 132216 | 1  | 0         | 21.05        | 0.127        |
|          | 15       | 1 717.5     | 132047 | 1  | 74        | 15       | 1 732.5     | 132197 | 1  | 0         | 21.33        | 0.136        |
|          | 15       | 1 717.8     | 132050 | 1  | 74        | 20       | 1 734.9     | 132221 | 1  | 0         | 21.25        | 0.133        |
|          | 20       | 1 720.0     | 132072 | 1  | 99        | 15       | 1 737.1     | 132243 | 1  | 0         | 21.01        | 0.126        |
|          | 20       | 1 720.0     | 132072 | 1  | 99        | 5        | 1 731.7     | 132189 | 1  | 0         | 21.11        | 0.129        |
|          | 5        | 1 713.3     | 132005 | 1  | 24        | 20       | 1 725.0     | 132122 | 1  | 0         | 21.51        | 0.142        |
|          | 20       | 1 720.0     | 132072 | 1  | 99        | 20       | 1 739.8     | 132270 | 1  | 0         | 21.39        | 0.138        |
| Middle   | 10       | 1 747.9     | 132351 | 1  | 49        | 15       | 1 759.9     | 132471 | 1  | 0         | 21.63        | 0.145        |
|          | 15       | 1 750.1     | 132373 | 1  | 74        | 10       | 1 762.1     | 132493 | 1  | 0         | 21.32        | 0.136        |
|          | 10       | 1 745.6     | 132328 | 1  | 49        | 20       | 1 760.0     | 132472 | 1  | 0         | <b>21.63</b> | <b>0.146</b> |
|          | 20       | 1 750.1     | 132373 | 1  | 99        | 10       | 1 764.5     | 132517 | 1  | 0         | 21.18        | 0.131        |
|          | 15       | 1 747.5     | 132347 | 1  | 74        | 15       | 1 762.5     | 132497 | 1  | 0         | 21.36        | 0.137        |
|          | 15       | 1 745.3     | 132325 | 1  | 74        | 20       | 1 762.4     | 132496 | 1  | 0         | 21.43        | 0.139        |
|          | 20       | 1 747.6     | 132348 | 1  | 99        | 15       | 1 764.7     | 132519 | 1  | 0         | 21.32        | 0.136        |
|          | 20       | 1 752.5     | 132397 | 1  | 99        | 5        | 1 764.2     | 132514 | 1  | 0         | 20.75        | 0.119        |
|          | 5        | 1 745.8     | 132330 | 1  | 24        | 20       | 1 757.5     | 132447 | 1  | 0         | 21.48        | 0.140        |
|          | 20       | 1 745.1     | 132323 | 1  | 99        | 20       | 1 764.9     | 132521 | 1  | 0         | 21.56        | 0.143        |
| High     | 10       | 1 760.5     | 132477 | 1  | 49        | 15       | 1 772.5     | 132597 | 1  | 0         | 20.68        | 0.117        |
|          | 15       | 1 762.7     | 132499 | 1  | 74        | 10       | 1 774.7     | 132619 | 1  | 0         | 20.76        | 0.119        |
|          | 10       | 1 755.6     | 132428 | 1  | 49        | 20       | 1 770.0     | 132572 | 1  | 0         | 21.12        | 0.129        |
|          | 20       | 1 760.1     | 132473 | 1  | 99        | 10       | 1 774.5     | 132617 | 1  | 0         | 20.95        | 0.124        |
|          | 15       | 1 757.5     | 132447 | 1  | 74        | 15       | 1 772.5     | 132597 | 1  | 0         | 20.65        | 0.116        |
|          | 15       | 1 752.9     | 132401 | 1  | 74        | 20       | 1 770.0     | 132572 | 1  | 0         | 21.01        | 0.126        |
|          | 20       | 1 755.1     | 132423 | 1  | 99        | 15       | 1 772.2     | 132594 | 1  | 0         | 20.82        | 0.121        |
|          | 20       | 1 765.0     | 132522 | 1  | 99        | 5        | 1 776.7     | 132639 | 1  | 0         | 21.12        | 0.129        |
|          | 20       | 1 758.3     | 132455 | 1  | 24        | 20       | 1 770.0     | 132572 | 1  | 0         | 20.98        | 0.125        |
|          | 20       | 1 750.2     | 132374 | 1  | 99        | 20       | 1 770.0     | 132572 | 1  | 0         | <b>21.18</b> | <b>0.131</b> |

Note;

16QAM Modulation with 1 RB

| ULCA 66C |          |             |        |     |           |          |             |        |     |           |              |              |
|----------|----------|-------------|--------|-----|-----------|----------|-------------|--------|-----|-----------|--------------|--------------|
| Ch.      | PCC      |             |        |     |           | SCC      |             |        |     |           | Power        |              |
|          | BW [MHz] | Freq. [MHz] | Ch.    | RB  | RB Offset | BW [MHz] | Freq. [MHz] | Ch.    | RB  | RB Offset | (dB m)       | (W)          |
| Low      | 10       | 1 715.3     | 132025 | 50  | 0         | 15       | 1 727.3     | 132145 | 75  | 0         | 21.02        | 0.127        |
|          | 15       | 1 717.5     | 132047 | 75  | 0         | 10       | 1 729.5     | 132167 | 50  | 0         | 21.07        | 0.128        |
|          | 10       | 1 715.5     | 132027 | 50  | 0         | 20       | 1 729.9     | 132171 | 100 | 0         | 21.05        | 0.127        |
|          | 20       | 1 720.0     | 132072 | 100 | 0         | 10       | 1 734.4     | 132216 | 50  | 0         | 20.99        | 0.126        |
|          | 15       | 1 717.5     | 132047 | 75  | 0         | 15       | 1 732.5     | 132197 | 75  | 0         | 20.99        | 0.126        |
|          | 15       | 1 717.8     | 132050 | 75  | 0         | 20       | 1 734.9     | 132221 | 100 | 0         | 20.96        | 0.125        |
|          | 20       | 1 720.0     | 132072 | 100 | 0         | 15       | 1 737.1     | 132243 | 75  | 0         | <b>21.82</b> | <b>0.152</b> |
|          | 20       | 1 720.0     | 132072 | 100 | 0         | 5        | 1 731.7     | 132189 | 25  | 0         | 20.92        | 0.124        |
|          | 5        | 1 713.3     | 132005 | 25  | 0         | 20       | 1 725.0     | 132122 | 100 | 0         | 20.95        | 0.124        |
|          | 20       | 1 720.0     | 132072 | 100 | 0         | 20       | 1 739.8     | 132270 | 100 | 0         | 20.93        | 0.124        |
| Middle   | 10       | 1 747.9     | 132351 | 50  | 0         | 15       | 1 759.9     | 132471 | 75  | 0         | 20.84        | 0.121        |
|          | 15       | 1 750.1     | 132373 | 75  | 0         | 10       | 1 762.1     | 132493 | 50  | 0         | 20.87        | 0.122        |
|          | 10       | 1 745.6     | 132328 | 50  | 0         | 20       | 1 760.0     | 132472 | 100 | 0         | 20.91        | 0.123        |
|          | 20       | 1 750.1     | 132373 | 100 | 0         | 10       | 1 764.5     | 132517 | 50  | 0         | 20.91        | 0.123        |
|          | 15       | 1 747.5     | 132347 | 75  | 0         | 15       | 1 762.5     | 132497 | 75  | 0         | 21.00        | 0.126        |
|          | 15       | 1 745.3     | 132325 | 75  | 0         | 20       | 1 762.4     | 132496 | 100 | 0         | 21.01        | 0.126        |
|          | 20       | 1 747.6     | 132348 | 100 | 0         | 15       | 1 764.7     | 132519 | 75  | 0         | <b>21.12</b> | <b>0.129</b> |
|          | 20       | 1 752.5     | 132397 | 100 | 0         | 5        | 1 764.2     | 132514 | 25  | 0         | 20.83        | 0.121        |
|          | 5        | 1 745.8     | 132330 | 25  | 0         | 20       | 1 757.5     | 132447 | 100 | 0         | 20.89        | 0.123        |
|          | 20       | 1 745.1     | 132323 | 100 | 0         | 20       | 1 764.9     | 132521 | 100 | 0         | 20.80        | 0.120        |
| High     | 10       | 1 760.5     | 132477 | 50  | 0         | 15       | 1 772.5     | 132597 | 75  | 0         | 20.84        | 0.121        |
|          | 15       | 1 762.7     | 132499 | 75  | 0         | 10       | 1 774.7     | 132619 | 50  | 0         | 20.84        | 0.121        |
|          | 10       | 1 755.6     | 132428 | 50  | 0         | 20       | 1 770.0     | 132572 | 100 | 0         | 20.82        | 0.121        |
|          | 20       | 1 760.1     | 132473 | 100 | 0         | 10       | 1 774.5     | 132617 | 50  | 0         | 20.85        | 0.122        |
|          | 15       | 1 757.5     | 132447 | 75  | 0         | 15       | 1 772.5     | 132597 | 75  | 0         | 20.81        | 0.120        |
|          | 15       | 1 752.9     | 132401 | 75  | 0         | 20       | 1 770.0     | 132572 | 100 | 0         | 20.30        | 0.107        |
|          | 20       | 1 755.1     | 132423 | 100 | 0         | 15       | 1 772.2     | 132594 | 75  | 0         | <b>20.94</b> | <b>0.124</b> |
|          | 20       | 1 765.0     | 132522 | 100 | 0         | 5        | 1 776.7     | 132639 | 25  | 0         | 20.82        | 0.121        |
|          | 20       | 1 758.3     | 132455 | 25  | 0         | 20       | 1 770.0     | 132572 | 100 | 0         | 20.94        | 0.124        |
|          | 20       | 1 750.2     | 132374 | 100 | 0         | 20       | 1 770.0     | 132572 | 100 | 0         | 20.84        | 0.121        |

Note;

QPSK Modulation with Full RB

| ULCA 66C |          |             |        |     |           |          |             |        |     |           |              |              |
|----------|----------|-------------|--------|-----|-----------|----------|-------------|--------|-----|-----------|--------------|--------------|
| Ch.      | PCC      |             |        |     |           | SCC      |             |        |     |           | Power        |              |
|          | BW [MHz] | Freq. [MHz] | Ch.    | RB  | RB Offset | BW [MHz] | Freq. [MHz] | Ch.    | RB  | RB Offset | (dB m)       | (W)          |
| Low      | 10       | 1 715.3     | 132025 | 50  | 0         | 15       | 1 727.3     | 132145 | 75  | 0         | 19.33        | 0.086        |
|          | 15       | 1 717.5     | 132047 | 75  | 0         | 10       | 1 729.5     | 132167 | 50  | 0         | 19.36        | 0.086        |
|          | 10       | 1 715.5     | 132027 | 50  | 0         | 20       | 1 729.9     | 132171 | 100 | 0         | 19.36        | 0.086        |
|          | 20       | 1 720.0     | 132072 | 100 | 0         | 10       | 1 734.4     | 132216 | 50  | 0         | 19.27        | 0.084        |
|          | 15       | 1 717.5     | 132047 | 75  | 0         | 15       | 1 732.5     | 132197 | 75  | 0         | 19.47        | 0.088        |
|          | 15       | 1 717.8     | 132050 | 75  | 0         | 20       | 1 734.9     | 132221 | 100 | 0         | 19.40        | 0.087        |
|          | 20       | 1 720.0     | 132072 | 100 | 0         | 15       | 1 737.1     | 132243 | 75  | 0         | <b>19.60</b> | <b>0.091</b> |
|          | 20       | 1 720.0     | 132072 | 100 | 0         | 5        | 1 731.7     | 132189 | 25  | 0         | 19.26        | 0.084        |
|          | 5        | 1 713.3     | 132005 | 25  | 0         | 20       | 1 725.0     | 132122 | 100 | 0         | 19.35        | 0.086        |
|          | 20       | 1 720.0     | 132072 | 100 | 0         | 20       | 1 739.8     | 132270 | 100 | 0         | 19.34        | 0.086        |
| Middle   | 10       | 1 747.9     | 132351 | 50  | 0         | 15       | 1 759.9     | 132471 | 75  | 0         | 19.43        | 0.088        |
|          | 15       | 1 750.1     | 132373 | 75  | 0         | 10       | 1 762.1     | 132493 | 50  | 0         | 19.40        | 0.087        |
|          | 10       | 1 745.6     | 132328 | 50  | 0         | 20       | 1 760.0     | 132472 | 100 | 0         | 19.39        | 0.087        |
|          | 20       | 1 750.1     | 132373 | 100 | 0         | 10       | 1 764.5     | 132517 | 50  | 0         | 19.40        | 0.087        |
|          | 15       | 1 747.5     | 132347 | 75  | 0         | 15       | 1 762.5     | 132497 | 75  | 0         | 19.39        | 0.087        |
|          | 15       | 1 745.3     | 132325 | 75  | 0         | 20       | 1 762.4     | 132496 | 100 | 0         | 19.40        | 0.087        |
|          | 20       | 1 747.6     | 132348 | 100 | 0         | 15       | 1 764.7     | 132519 | 75  | 0         | <b>19.68</b> | <b>0.093</b> |
|          | 20       | 1 752.5     | 132397 | 100 | 0         | 5        | 1 764.2     | 132514 | 25  | 0         | 19.34        | 0.086        |
|          | 5        | 1 745.8     | 132330 | 25  | 0         | 20       | 1 757.5     | 132447 | 100 | 0         | 19.32        | 0.086        |
|          | 20       | 1 745.1     | 132323 | 100 | 0         | 20       | 1 764.9     | 132521 | 100 | 0         | 19.41        | 0.087        |
| High     | 10       | 1 760.5     | 132477 | 50  | 0         | 15       | 1 772.5     | 132597 | 75  | 0         | 19.30        | 0.085        |
|          | 15       | 1 762.7     | 132499 | 75  | 0         | 10       | 1 774.7     | 132619 | 50  | 0         | 19.14        | 0.082        |
|          | 10       | 1 755.6     | 132428 | 50  | 0         | 20       | 1 770.0     | 132572 | 100 | 0         | 19.35        | 0.086        |
|          | 20       | 1 760.1     | 132473 | 100 | 0         | 10       | 1 774.5     | 132617 | 50  | 0         | 19.18        | 0.083        |
|          | 15       | 1 757.5     | 132447 | 75  | 0         | 15       | 1 772.5     | 132597 | 75  | 0         | 19.29        | 0.085        |
|          | 15       | 1 752.9     | 132401 | 75  | 0         | 20       | 1 770.0     | 132572 | 100 | 0         | 19.28        | 0.085        |
|          | 20       | 1 755.1     | 132423 | 100 | 0         | 15       | 1 772.2     | 132594 | 75  | 0         | 19.37        | 0.086        |
|          | 20       | 1 765.0     | 132522 | 100 | 0         | 5        | 1 776.7     | 132639 | 25  | 0         | 19.19        | 0.083        |
|          | 20       | 1 758.3     | 132455 | 25  | 0         | 20       | 1 770.0     | 132572 | 100 | 0         | 19.18        | 0.083        |
|          | 20       | 1 750.2     | 132374 | 100 | 0         | 20       | 1 770.0     | 132572 | 100 | 0         | <b>19.42</b> | <b>0.088</b> |

Note;

16QAM Modulation with Full RB

## 4. Occupied Bandwidth

### 4.1. Limit

CFR 47, Section FCC §2.1049 and IC RSS-Gen Issue 5 6.7.

### 4.2. Test Procedure

#### FCC

The test follows section 5.4.4 of ANSI C63.26-2015.

- a. The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be set wide enough to capture all modulation. products including the emission skirts (typically a span of  $1.5 \times \text{OBW}$  is sufficient).
- b. The nominal IF filter 3 dB bandwidth (RBW) shall be in the range of 1 % to 5 % of the anticipated OBW, and the VBW shall be set  $\geq 3 \times \text{RBW}$ .
- c. Set the reference level of the instrument as required to prevent the signal amplitude from exceeding the maximum spectrum analyzer input mixer level for linear operation. See guidance provided in 4.2.3.
- d. Set the detection mode to peak, and the trace mode to max-hold.
- e. If the instrument does not have a 99 % OBW function, recover the trace data points and sum directly in linear power terms. Place the recovered amplitude data points, beginning at the lowest frequency, in a running sum until 0.5 % of the total is reached. Record that frequency as the lower OBW frequency. Repeat the process until 99.5 % of the total is reached and record that frequency as the upper OBW frequency. The 99 % power OBW can be determined by computing the difference these two frequencies.
- f. The OBW shall be reported and plot(s) of the measuring instrument display shall be provided with the test report. The frequency and amplitude axis and scale shall be clearly labeled. Tabular data can be reported in addition to the plot(s).

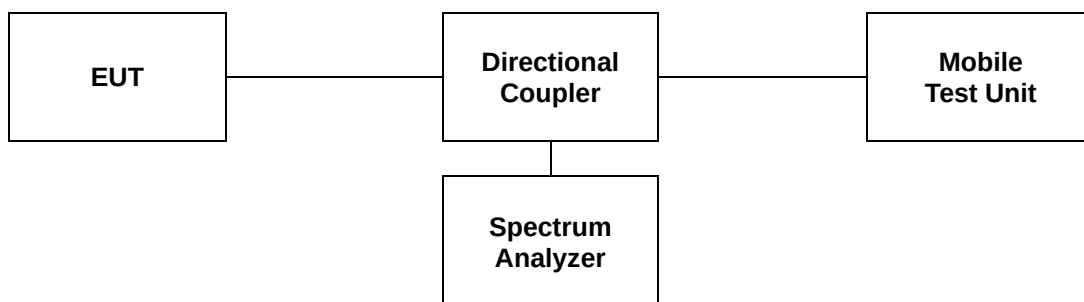
## IC

The following conditions shall be observed for measuring the occupied bandwidth and  $x$  dB bandwidth:

- The transmitter shall be operated at its maximum carrier power measured under normal test conditions.
- The span of the spectrum analyzer shall be set large enough to capture all products of the modulation process, including the emission skirts, around the carrier frequency, but small enough to avoid having other emissions (e.g. on adjacent channels) within the span.
- The detector of the spectrum analyzer shall be set to "Sample". However, a peak, or peak hold, may be used in place of the sampling detector since this usually produces a wider bandwidth than the actual bandwidth (worst-case measurement). Use of a peak hold (or "Max Hold") may be necessary to determine the occupied /  $x$  dB bandwidth if the device is not transmitting continuously.
- The resolution bandwidth (RBW) shall be in the range of 1 % to 5 % of the actual occupied /  $x$  dB bandwidth and the video bandwidth (VBW) shall not be smaller than three times the RBW value. Video averaging is not permitted.

Note: It may be necessary to repeat the measurement a few times until the RBW and VBW are in compliance with the above requirement.

For the 99 % emission bandwidth, the trace data points are recovered and directly summed in linear power level terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached, and that frequency recorded. The process is repeated for the highest frequency data points (starting at the highest frequency, at the right side of the span, and going down in frequency). This frequency is then recorded. The difference between the two recorded frequencies is the occupied bandwidth (or the 99 % emission bandwidth).



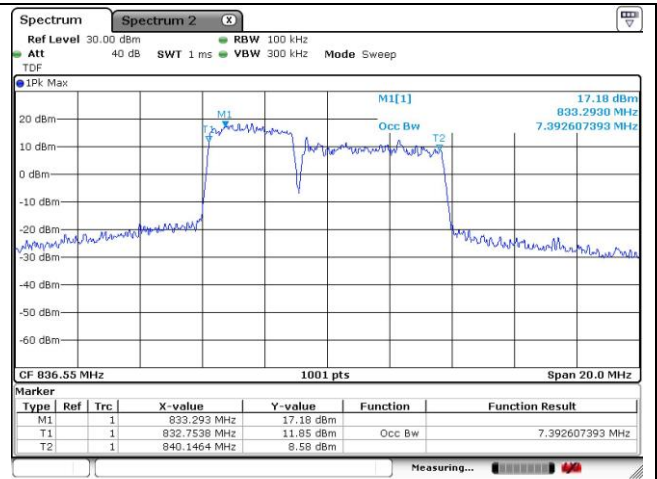
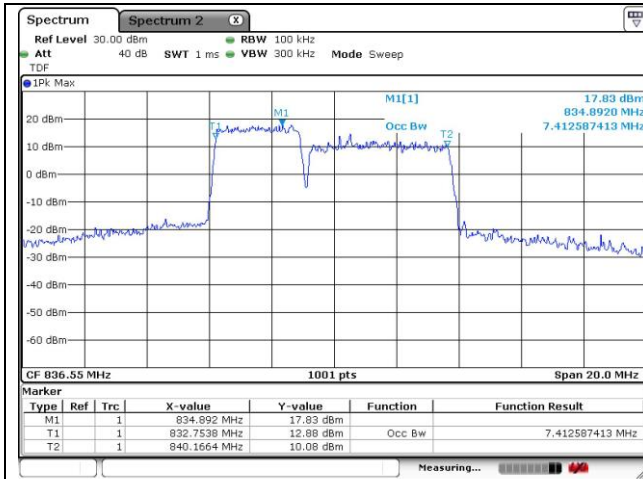
### 4.3 Test Results

Ambient temperature : (23 ± 1) °C  
 Relative humidity : 47 % R.H.

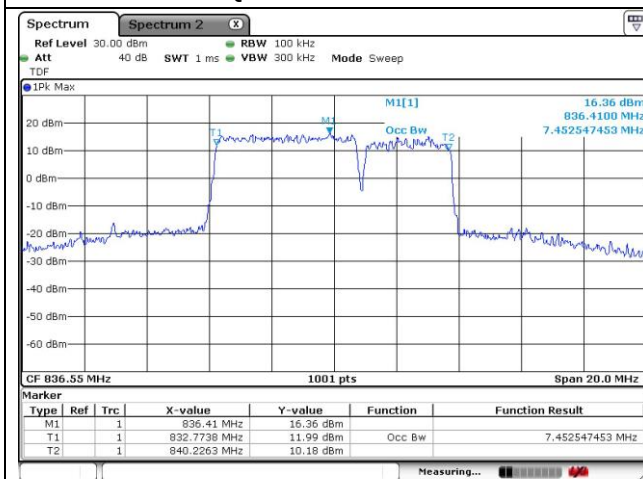
| Band | PCC      |                 |         | SCC      |                 |         | Occupied Bandwidth (MHz) |        |
|------|----------|-----------------|---------|----------|-----------------|---------|--------------------------|--------|
|      | BW (MHz) | Frequency (MHz) | Channel | BW (MHz) | Frequency (MHz) | Channel | QPSK                     | 16QAM  |
| 5B   | 3        | 834.1           | 20501   | 5        | 838.0           | 20540   | 7.413                    | 7.393  |
|      | 5        | 835.0           | 20510   | 3        | 838.9           | 20549   | 7.453                    | 7.453  |
|      | 5        | 831.8           | 20478   | 10       | 839.0           | 20550   | 13.846                   | 13.876 |
|      | 10       | 834.0           | 20500   | 5        | 841.2           | 20572   | 13.966                   | 13.936 |
|      | 10       | 831.6           | 20476   | 10       | 841.5           | 20575   | 18.741                   | 18.701 |
| 7C   | 10       | 2 525.6         | 21006   | 20       | 2 540.0         | 21150   | 28.112                   | 28.052 |
|      | 20       | 2 530.1         | 21051   | 10       | 2 544.5         | 21195   | 28.172                   | 28.112 |
|      | 15       | 2 530.1         | 21051   | 15       | 2 542.1         | 21171   | 28.172                   | 28.232 |
|      | 15       | 2 530.1         | 21051   | 10       | 2 542.1         | 21171   | 23.077                   | 23.077 |
|      | 15       | 2 525.3         | 21003   | 20       | 2 542.4         | 21174   | 32.867                   | 32.937 |
|      | 20       | 2 527.6         | 21026   | 15       | 2 544.7         | 21197   | 32.937                   | 32.797 |
|      | 20       | 2 525.1         | 21001   | 20       | 2 544.9         | 21199   | 37.722                   | 37.642 |
| 66B  | 5        | 1 752.6         | 132398  | 5        | 1 757.4         | 132446  | 9.171                    | 9.251  |
|      | 5        | 1 750.3         | 132375  | 10       | 1 757.5         | 132447  | 13.906                   | 13.876 |
|      | 10       | 1 752.5         | 132397  | 5        | 1 759.7         | 132469  | 13.936                   | 13.876 |
|      | 5        | 1 748.1         | 132353  | 15       | 1 757.4         | 132446  | 18.182                   | 18.182 |
|      | 15       | 1 752.6         | 132398  | 5        | 1 761.9         | 132491  | 18.182                   | 18.182 |
|      | 10       | 1 750.1         | 132373  | 10       | 1 760.0         | 132472  | 18.821                   | 18.741 |
| 66C  | 10       | 1 747.9         | 132351  | 15       | 1 759.9         | 132471  | 23.027                   | 22.977 |
|      | 15       | 1 750.1         | 132373  | 10       | 1 762.1         | 132493  | 23.027                   | 23.027 |
|      | 10       | 1 745.6         | 132328  | 20       | 1 760.0         | 132472  | 28.112                   | 27.932 |
|      | 20       | 1 750.1         | 132373  | 10       | 1 764.5         | 132517  | 28.052                   | 27.932 |
|      | 15       | 1 747.5         | 132347  | 15       | 1 762.5         | 132497  | 28.172                   | 28.172 |
|      | 15       | 1 745.3         | 132325  | 20       | 1 762.4         | 132496  | 32.727                   | 32.727 |
|      | 20       | 1 747.6         | 132348  | 15       | 1 764.7         | 132519  | 32.937                   | 32.727 |
|      | 20       | 1 752.5         | 132397  | 5        | 1 764.2         | 132514  | 22.777                   | 22.777 |
|      | 5        | 1 745.8         | 132330  | 20       | 1 757.5         | 132447  | 22.677                   | 22.677 |
|      | 20       | 1 745.1         | 132323  | 20       | 1 764.9         | 132521  | 37.642                   | 37.562 |

## - Test plots

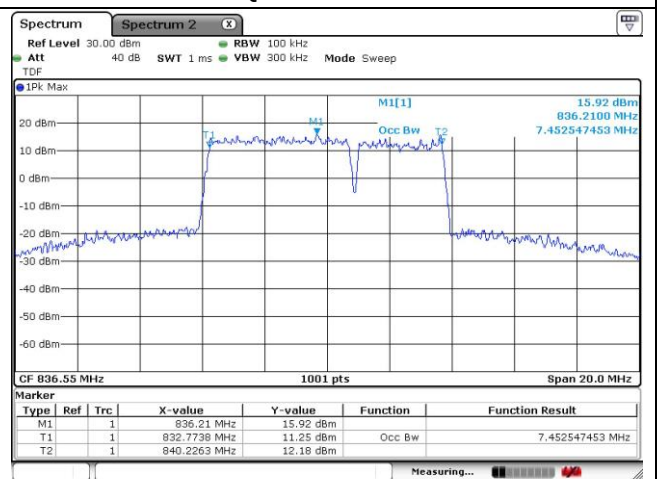
### ULCA 5B



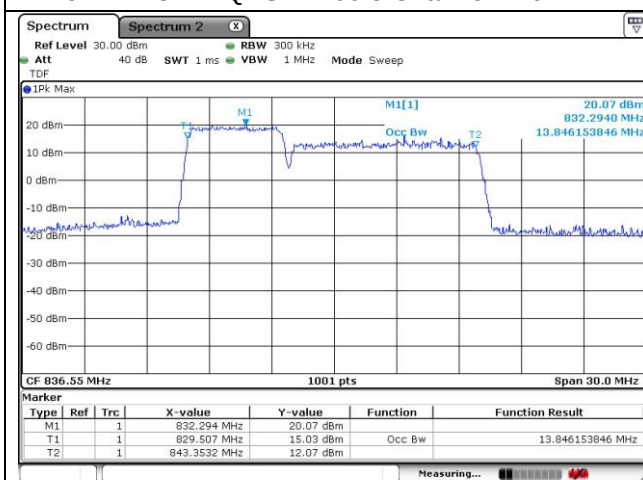
### 3 MHz + 5 MHz QPSK Middle Channel - Full RB



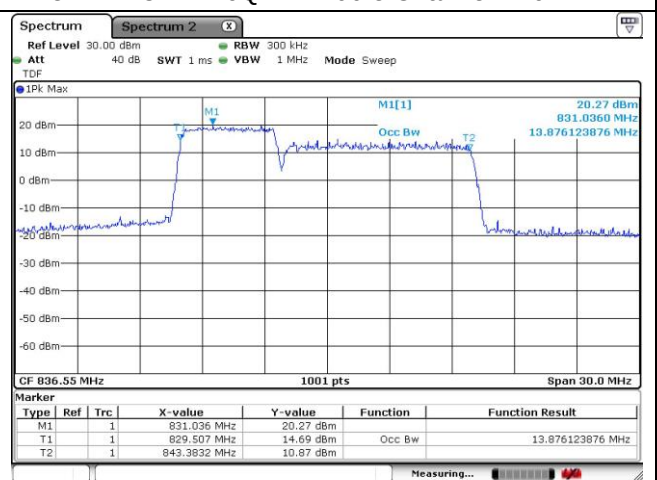
### 3 MHz + 5 MHz 16QAM Middle Channel - Full RB



### 5 MHz + 3 MHz QPSK Middle Channel - Full RB



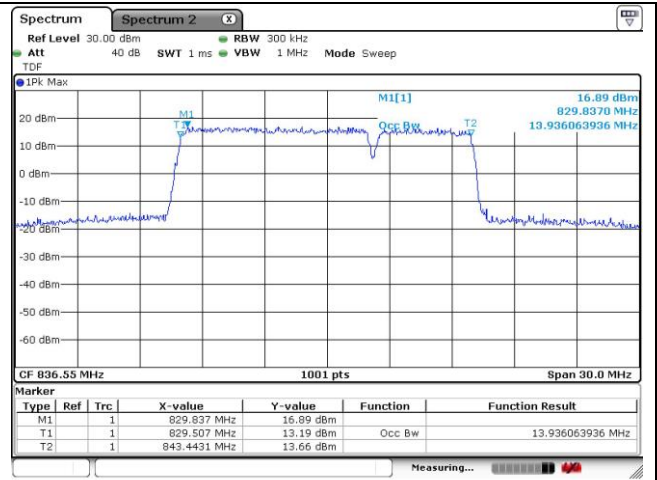
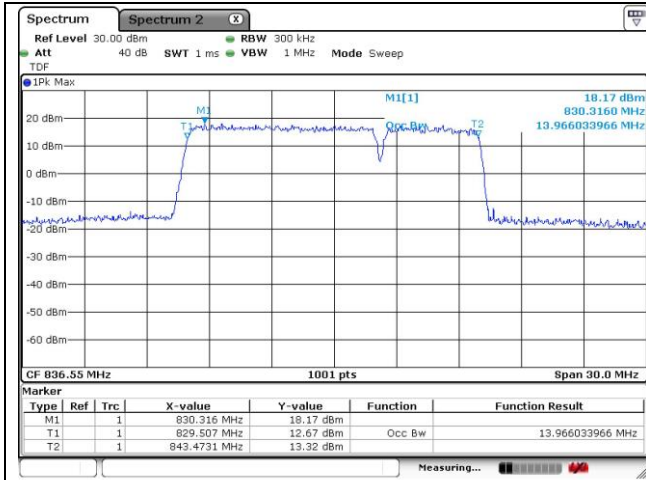
### 5 MHz + 3 MHz 16QAM Middle Channel - Full RB



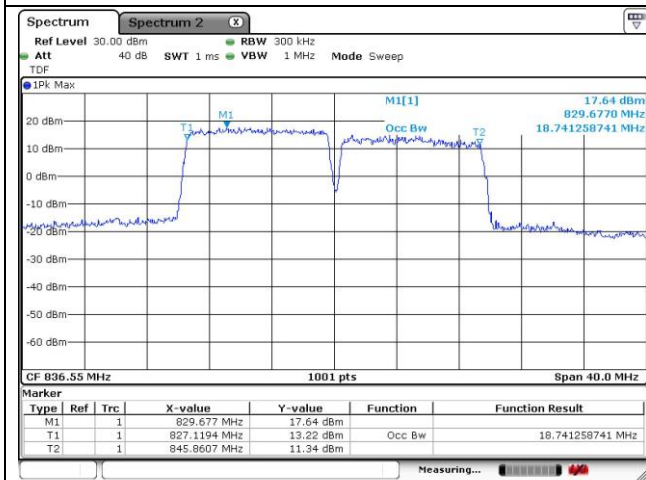
### 5 MHz + 10 MHz QPSK Middle Channel - Full RB

### 5 MHz + 10 MHz 16QAM Middle Channel - Full RB

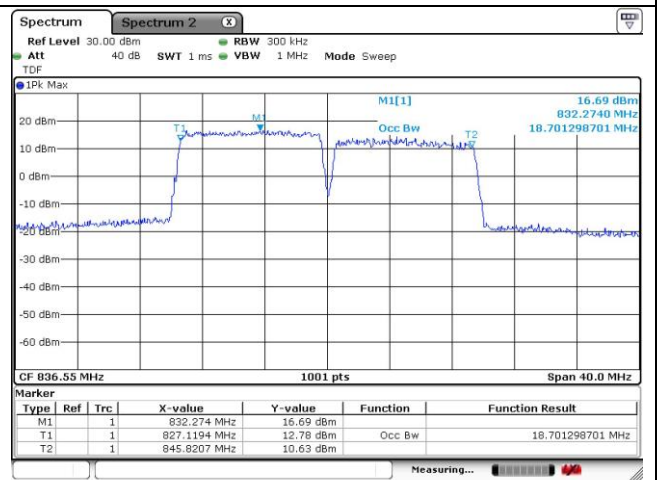
## ULCA 5B



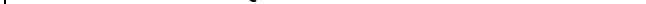
## 10 MHz + 5 MHz QPSK Middle Channel - Full RB



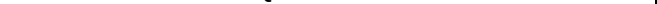
## 10 MHz + 5 MHz 16QAM Middle Channel - Full RB



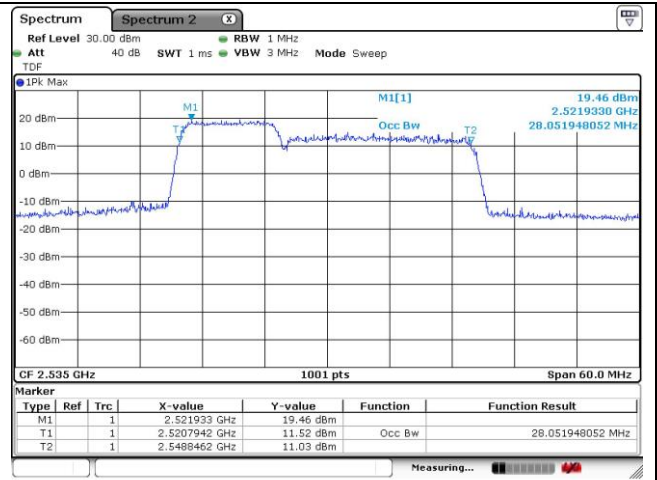
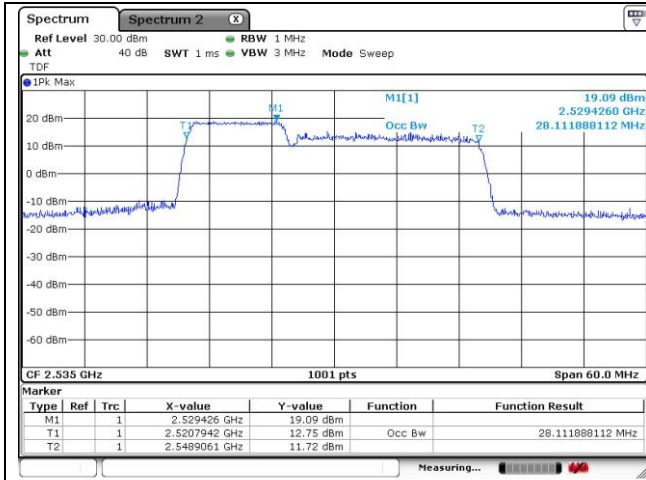
## 10 MHz + 10 MHz QPSK Middle Channel - Full RB



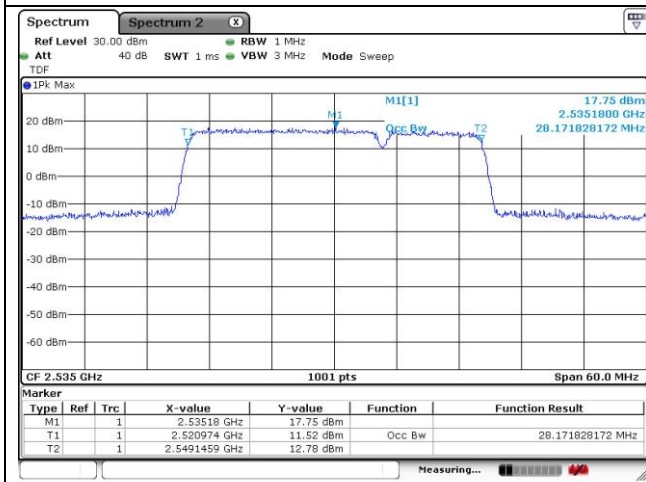
## 10 MHz + 10 MHz 16QAM Middle Channel - Full RB



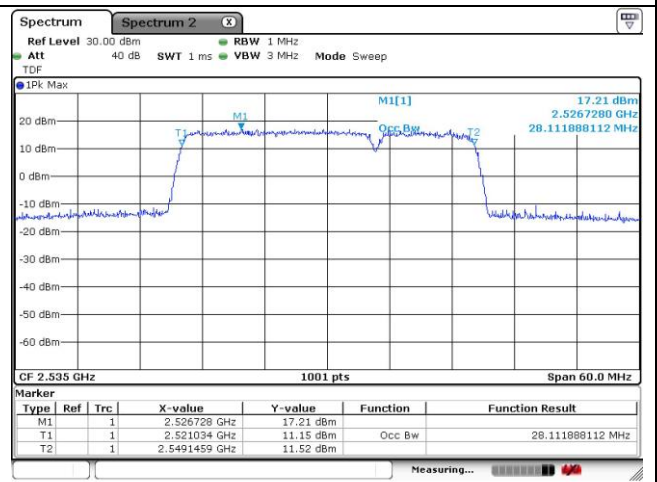
### ULCA 7C



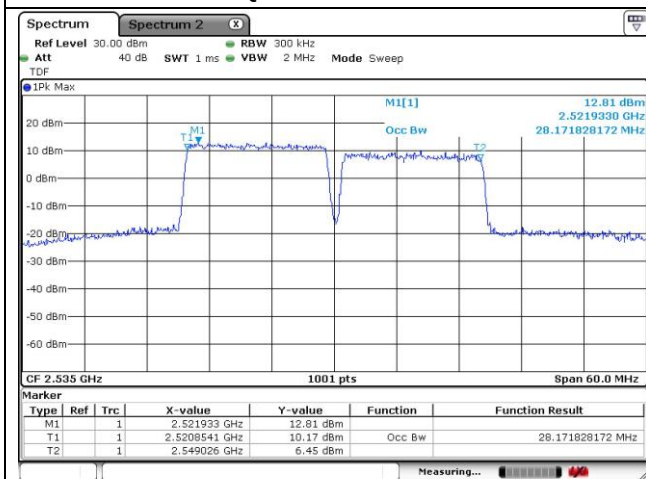
### 10 MHz + 20 MHz QPSK Middle Channel - Full RB



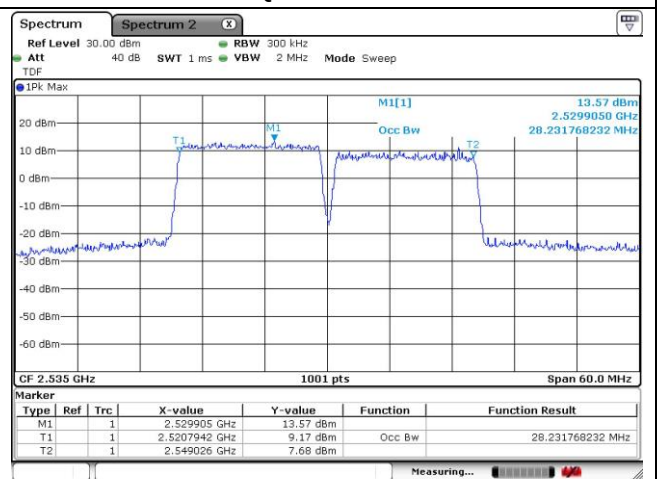
### 10 MHz + 20 MHz 16QAM Middle Channel - Full RB



### 20 MHz + 10 MHz QPSK Middle Channel - Full RB



### 20 MHz + 10 MHz 16QAM Middle Channel - Full RB



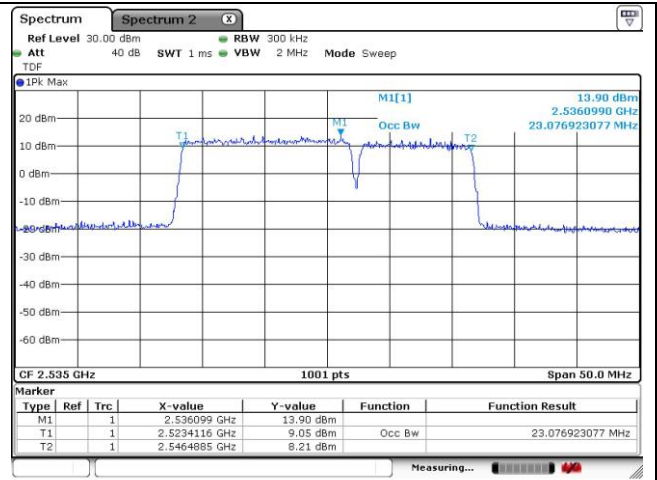
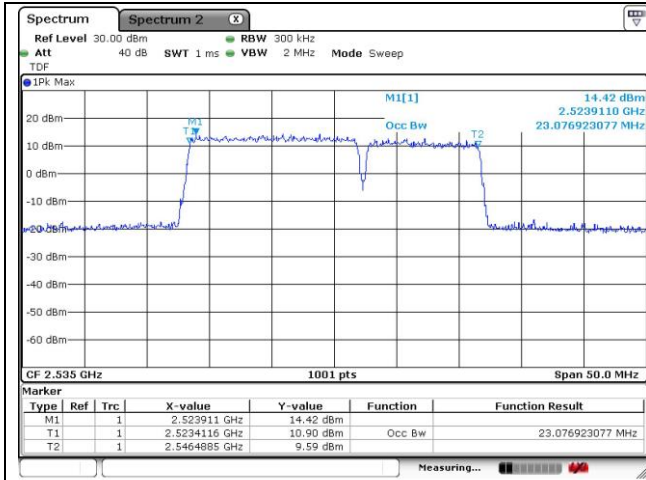
### 15 MHz + 15 MHz QPSK Middle Channel - Full RB



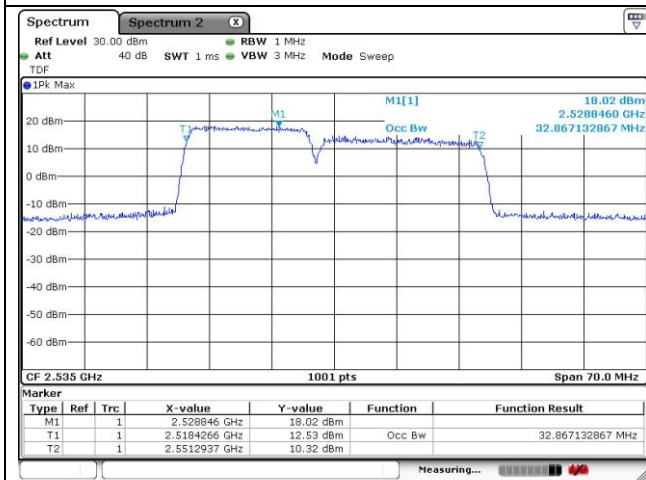
### 15 MHz + 15 MHz 16QAM Middle Channel - Full RB



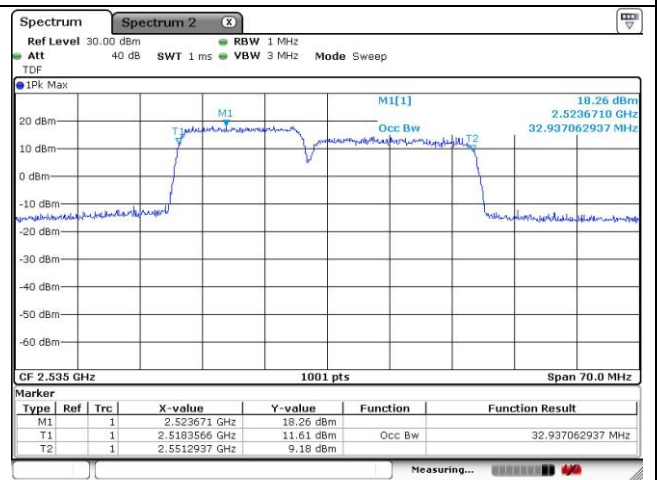
## ULCA 7C



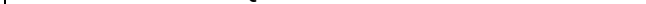
## 15 MHz + 10 MHz QPSK Middle Channel - Full RB



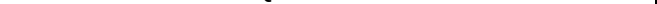
## 15 MHz + 10 MHz 16QAM Middle Channel - Full RB



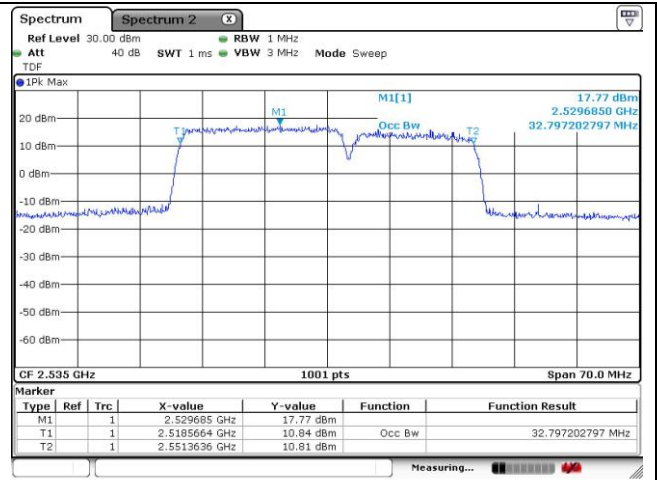
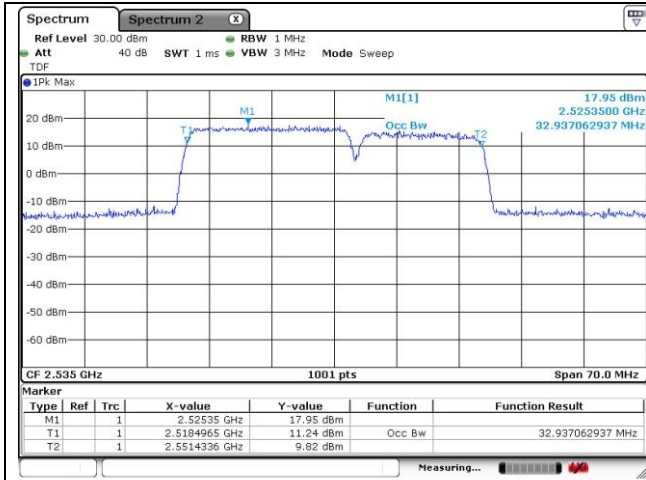
## 15 MHz + 20 MHz QPSK Middle Channel - Full RB



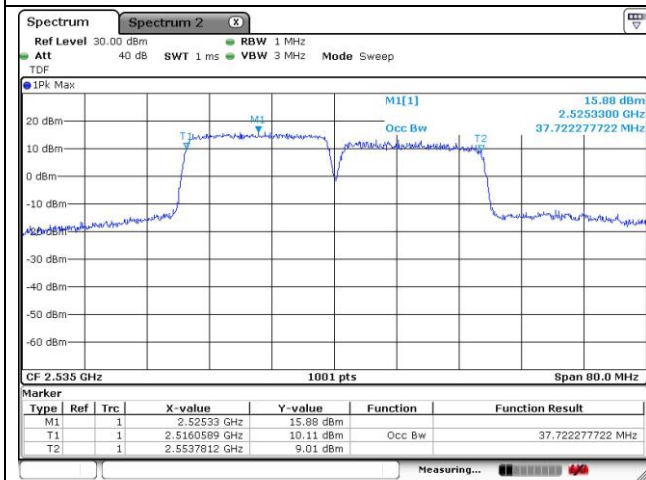
## 15 MHz + 20 MHz 16QAM Middle Channel - Full RB



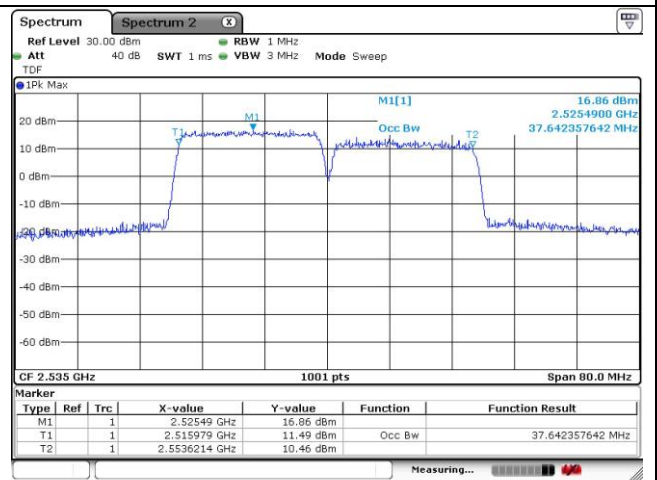
## ULCA 7C



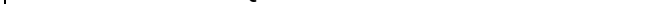
### 20 MHz + 15 MHz QPSK Middle Channel - Full RB



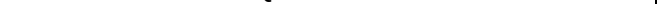
### 20 MHz + 15 MHz 16QAM Middle Channel - Full RB



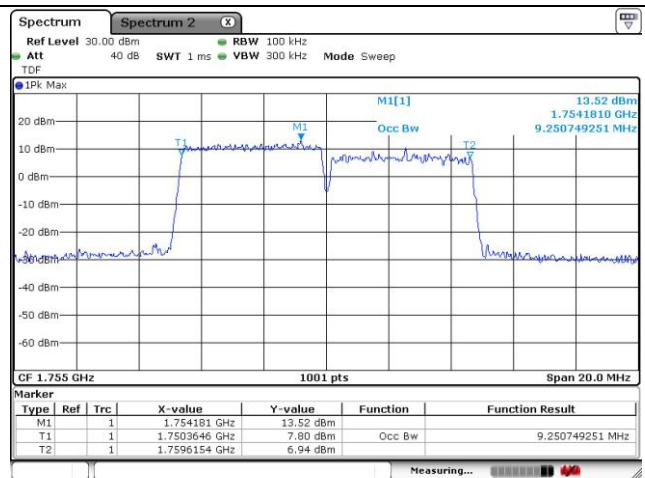
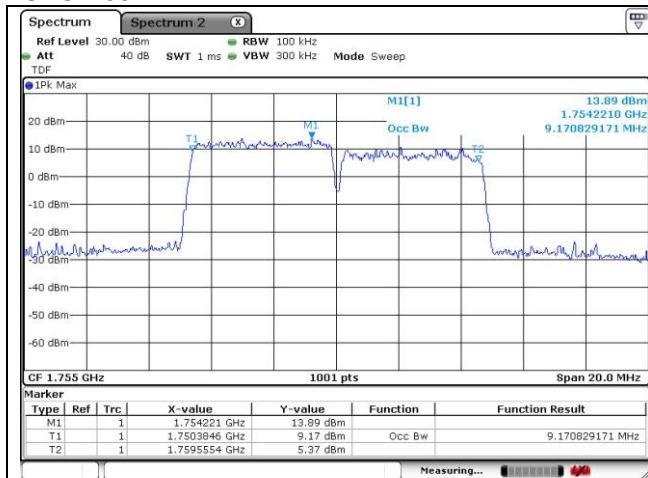
### 20 MHz + 20 MHz QPSK Middle Channel - Full RB



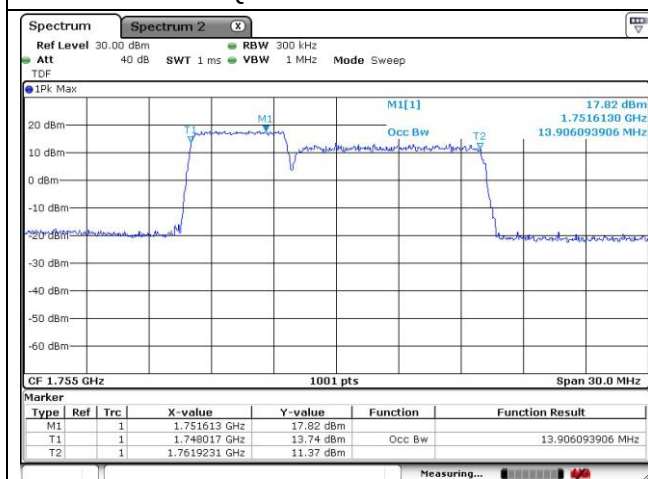
### 20 MHz + 20 MHz 16QAM Middle Channel - Full RB



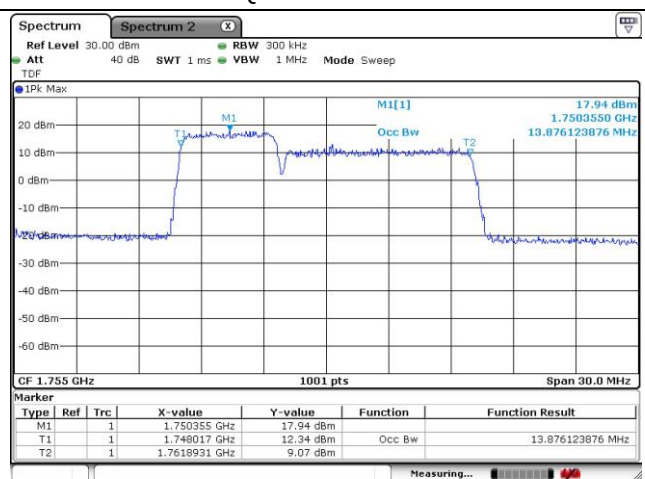
### ULCA 66B



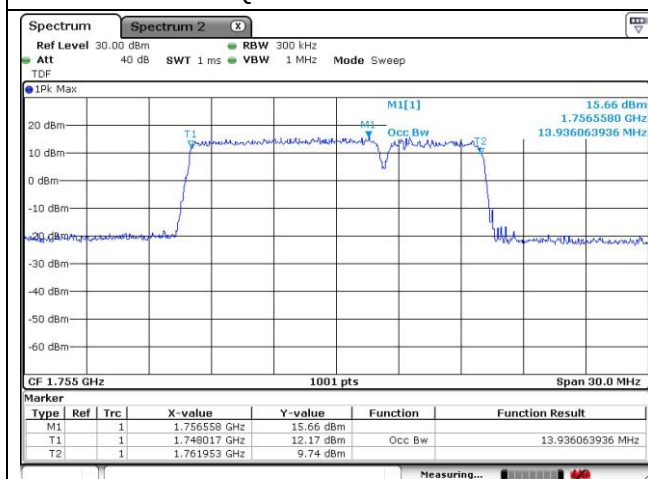
### 5 MHz + 5 MHz QPSK Middle Channel - Full RB



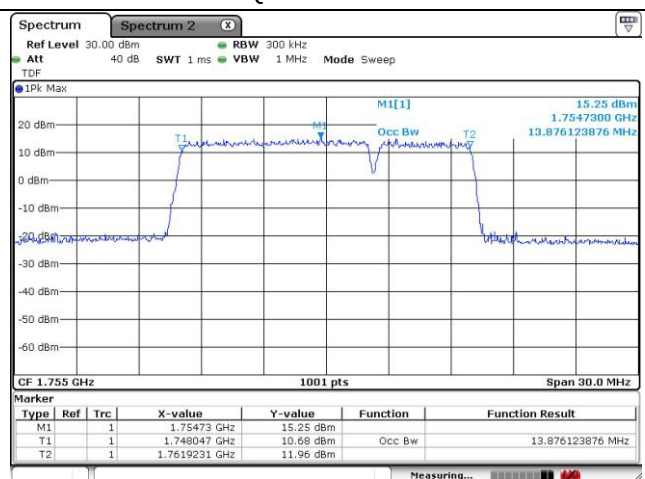
### 5 MHz + 5 MHz 16QAM Middle Channel - Full RB



### 5 MHz + 10 MHz QPSK Middle Channel - Full RB



### 5 MHz + 10 MHz 16QAM Middle Channel - Full RB



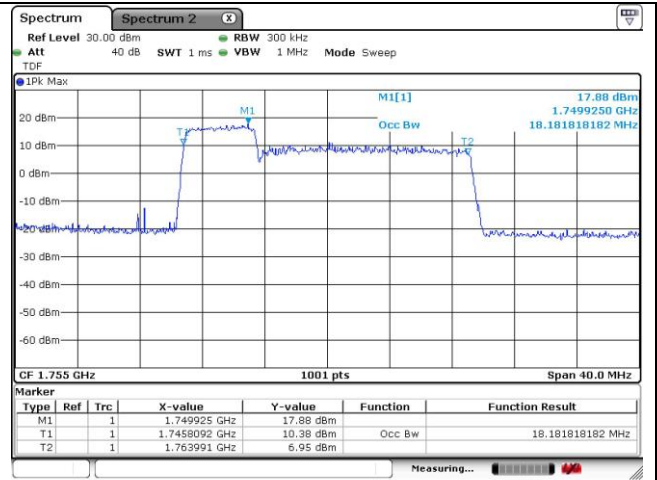
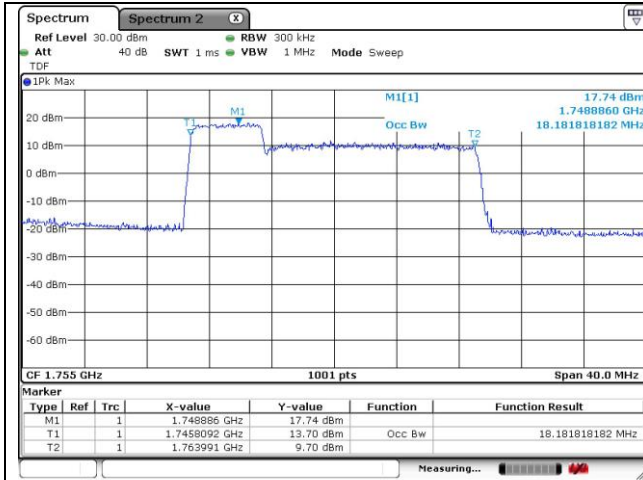
### 10 MHz + 5 MHz QPSK Middle Channel - Full RB



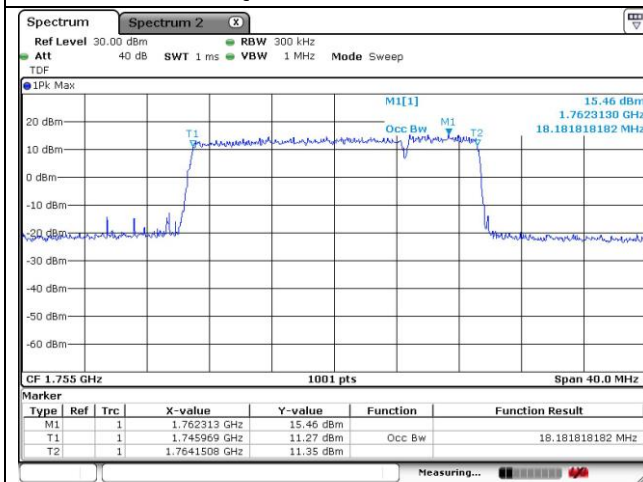
### 10 MHz + 5 MHz 16QAM Middle Channel - Full RB



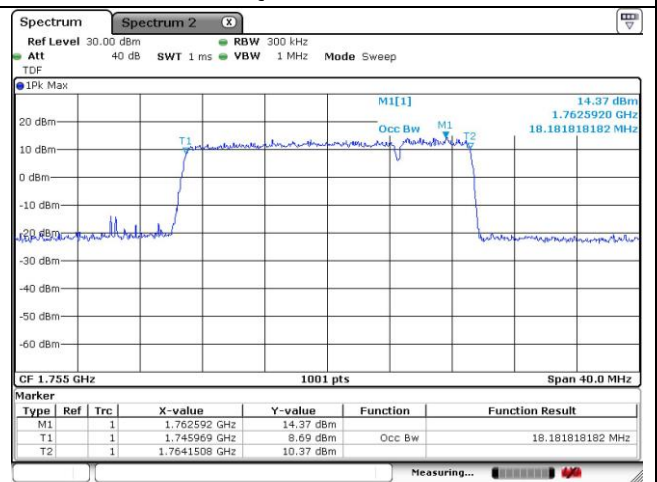
### ULCA 66B



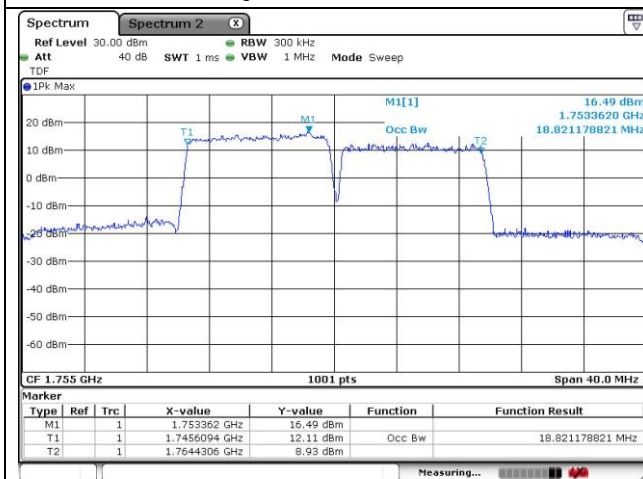
### 5 MHz + 15 MHz QPSK Middle Channel - Full RB



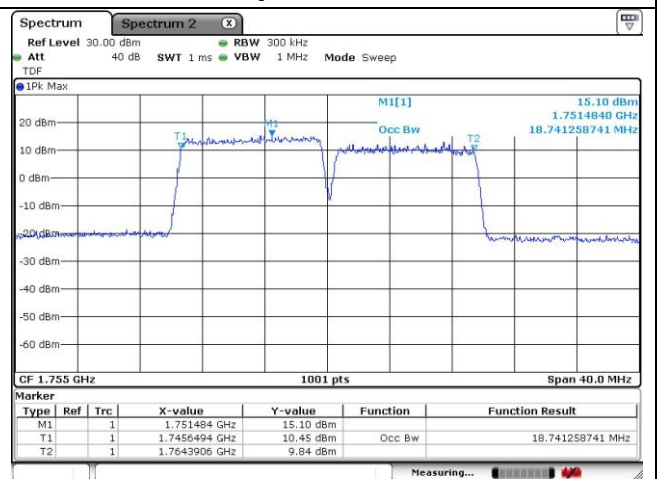
### 5 MHz + 15 MHz 16QAM Middle Channel - Full RB



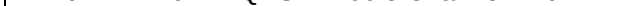
### 15 MHz + 5 MHz QPSK Middle Channel - Full RB



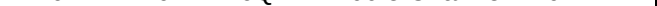
### 15 MHz + 5 MHz 16QAM Middle Channel - Full RB



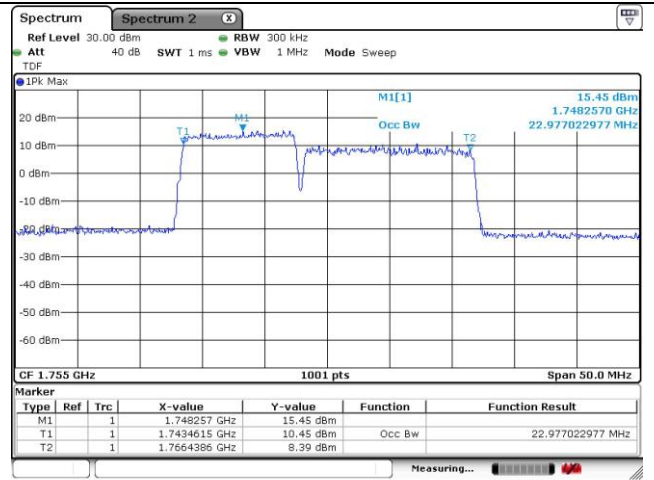
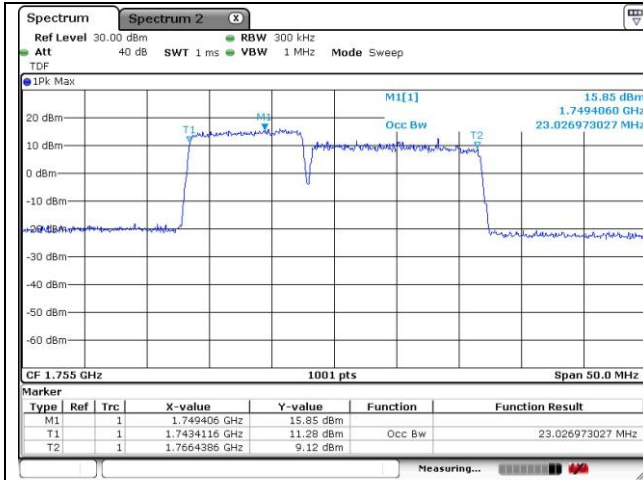
### 10 MHz + 10 MHz QPSK Middle Channel - Full RB



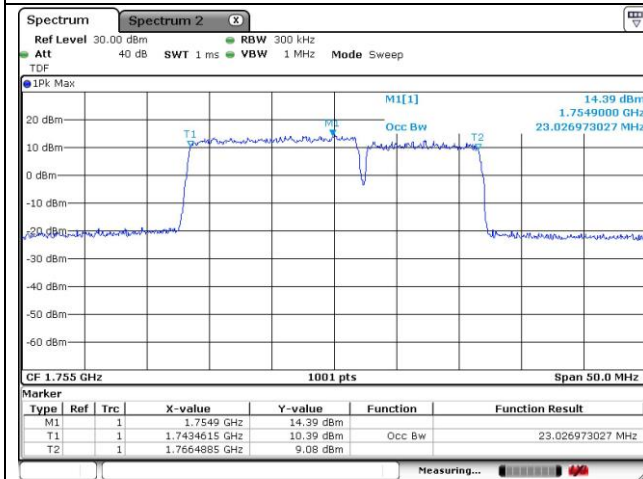
### 10 MHz + 10 MHz 16QAM Middle Channel - Full RB



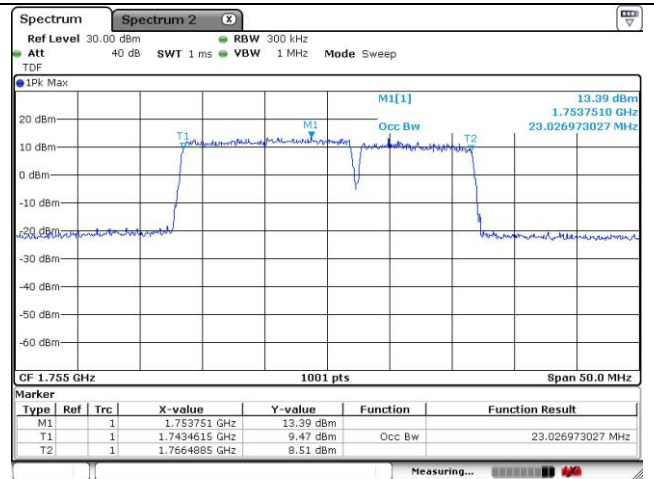
### ULCA 66C



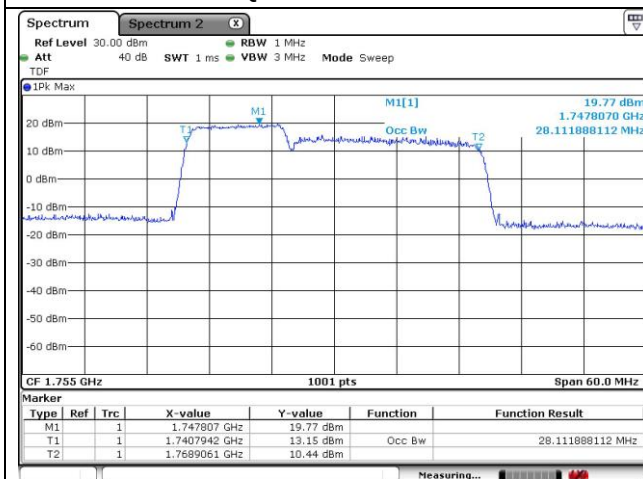
### 10 MHz + 15 MHz QPSK Middle Channel - Full RB



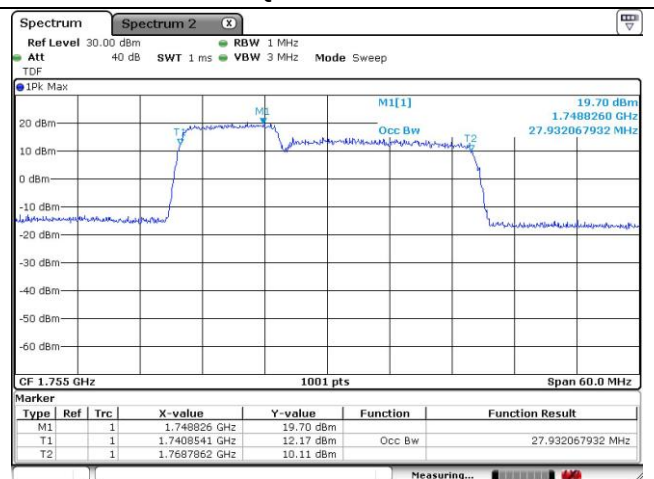
### 10 MHz + 15 MHz 16QAM Middle Channel - Full RB



### 15 MHz + 10 MHz QPSK Middle Channel - Full RB



### 15 MHz + 10 MHz 16QAM Middle Channel - Full RB



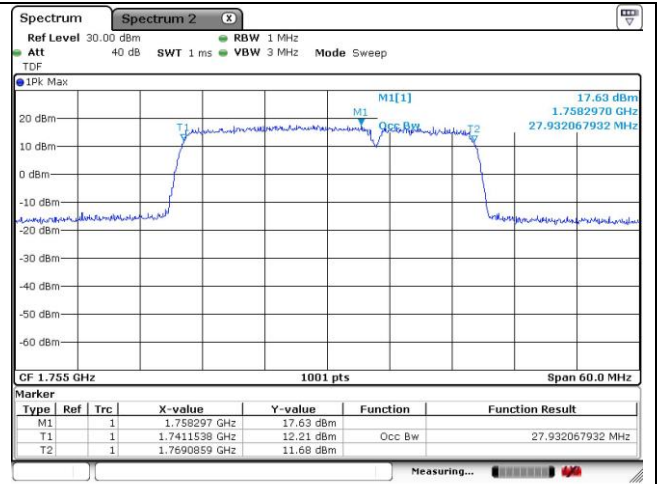
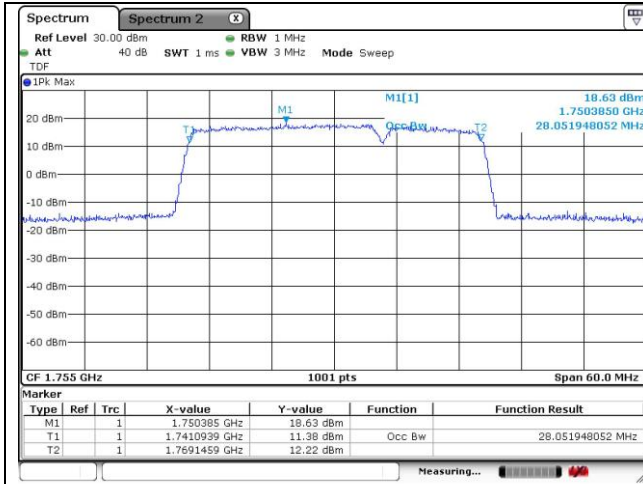
### 10 MHz + 20 MHz QPSK Middle Channel - Full RB



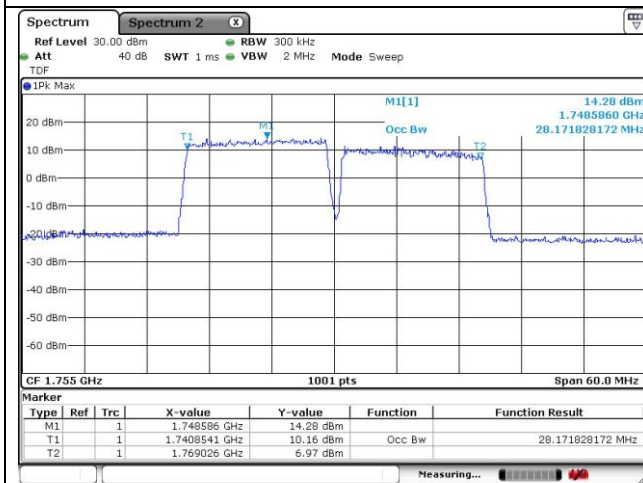
### 10 MHz + 20 MHz 16QAM Middle Channel - Full RB



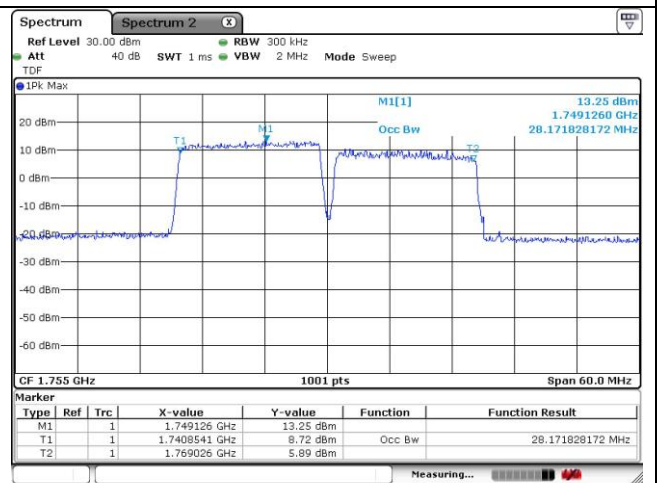
### ULCA 66C



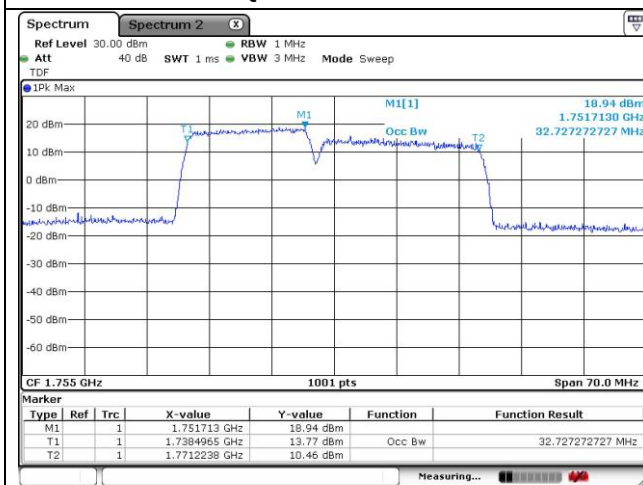
### 20 MHz + 10 MHz QPSK Middle Channel - Full RB



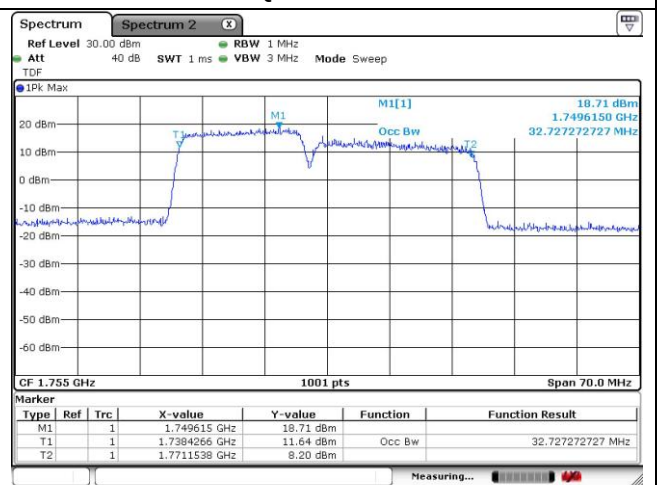
### 20 MHz + 10 MHz 16QAM Middle Channel - Full RB



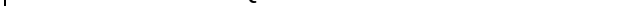
### 15 MHz + 15 MHz QPSK Middle Channel - Full RB



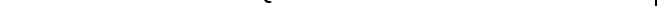
### 15 MHz + 15 MHz 16QAM Middle Channel - Full RB



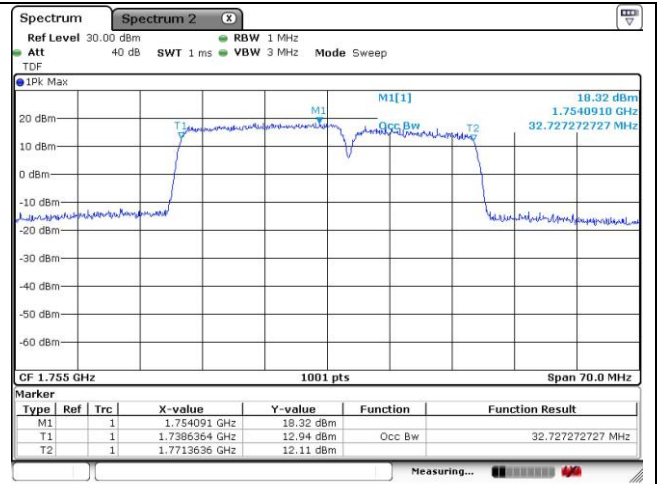
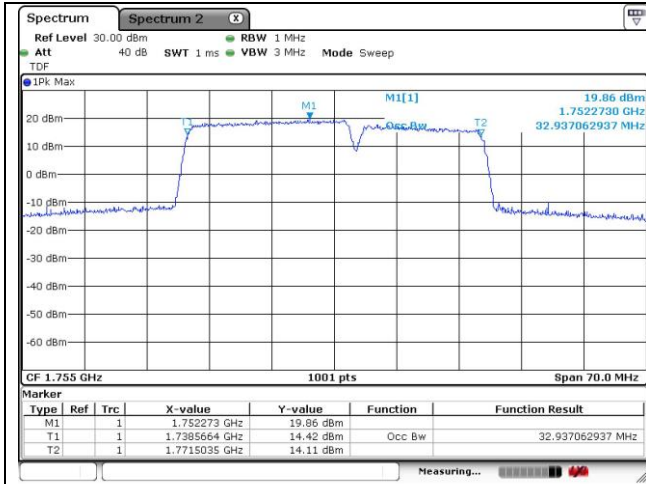
### 15 MHz + 20 MHz QPSK Middle Channel - Full RB



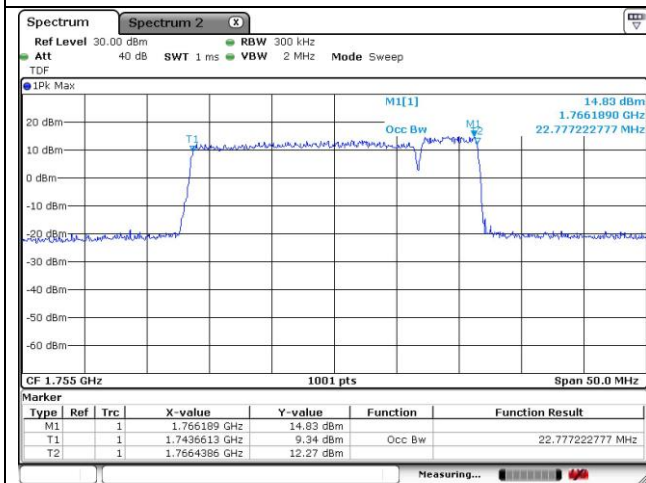
### 15 MHz + 20 MHz 16QAM Middle Channel - Full RB



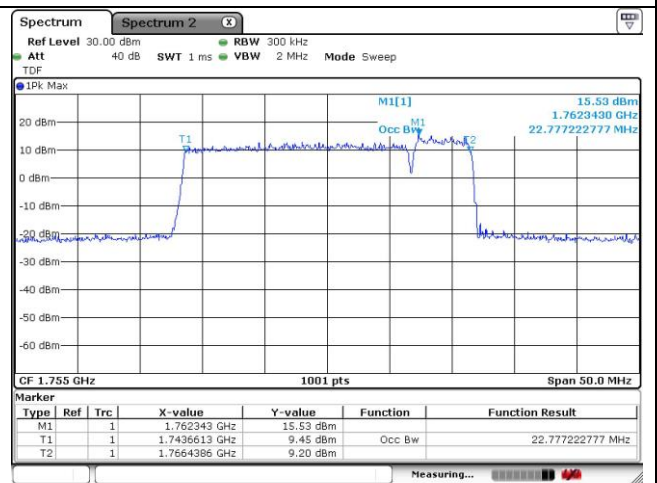
## ULCA 66C



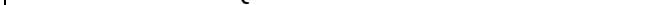
### 20 MHz + 15 MHz QPSK Middle Channel - Full RB



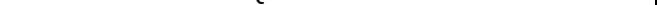
### 20 MHz + 15 MHz 16QAM Middle Channel - Full RB



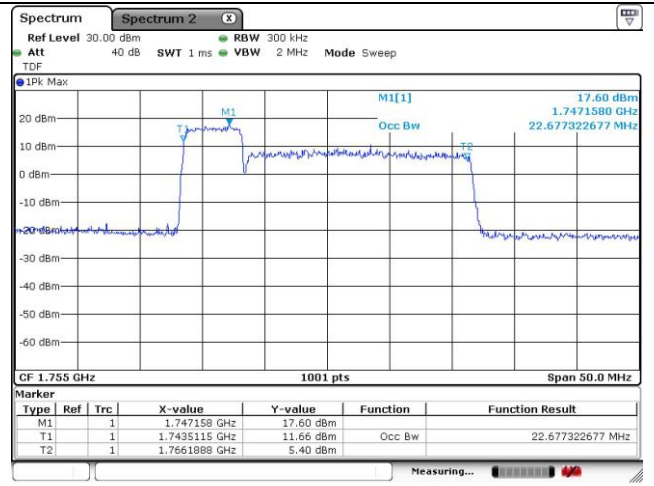
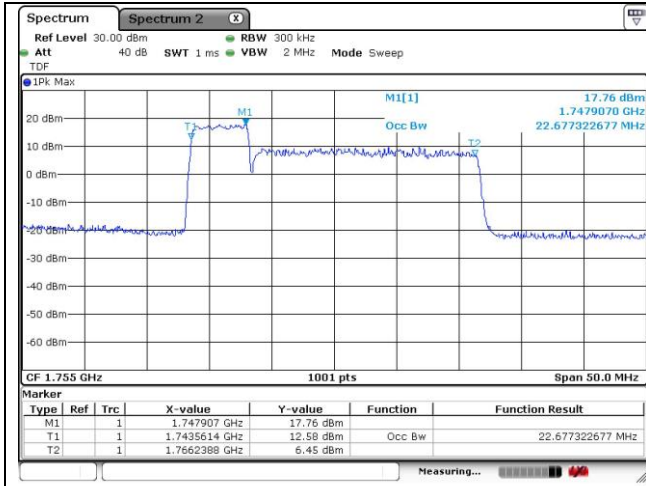
### 20 MHz + 5 MHz QPSK Middle Channel - Full RB



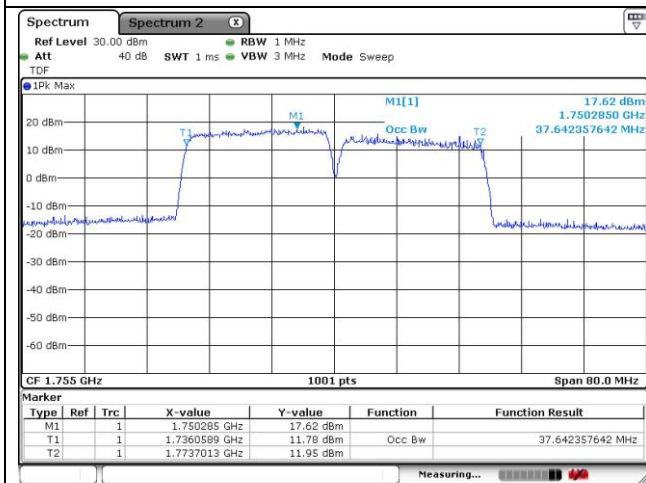
### 20 MHz + 5 MHz 16QAM Middle Channel - Full RB



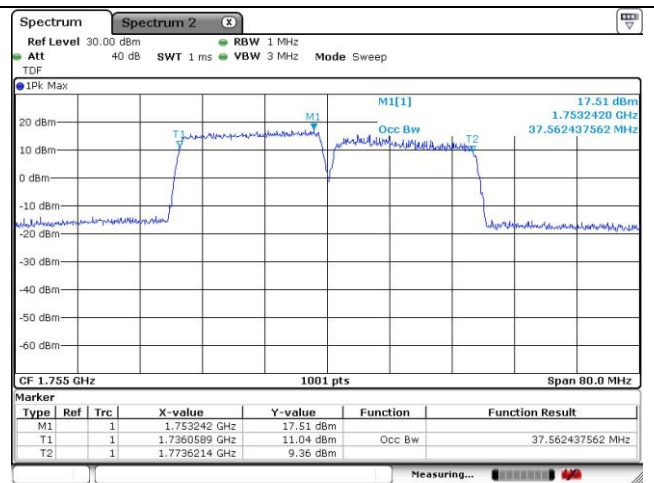
## ULCA 66C



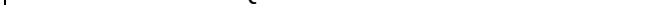
### 5 MHz + 20 MHz QPSK Middle Channel - Full RB



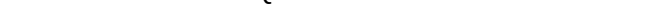
### 5 MHz + 20 MHz 16QAM Middle Channel - Full RB



### 20 MHz + 20 MHz QPSK Middle Channel - Full RB



### 20 MHz + 20 MHz 16QAM Middle Channel - Full RB



## 5. Peak-Average Ratio

### 5.1. Limit

#### FCC

- §22.913(d) Measurement of the ERP of Cellular base transmitters and repeaters must be made using an average power measurement technique. The peak-to-average ratio (PAR) of the transmission must not exceed 13 dB.

- §27.50(d)(5), power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (d)(6) of this section. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

#### IC

- RSS-132 Issue 3

5.4, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time using a signal corresponding to the highest PAPR during periods of continuous transmission.

- RSS-139 Issue 3

6.5, the peak to average power ratio (PAPR) of the equipment shall not exceed 13 dB for more than 0.1 % of the time, using a signal that corresponds to the highest PAPR during periods of continuous transmission.

- RSS-199 Issue 3

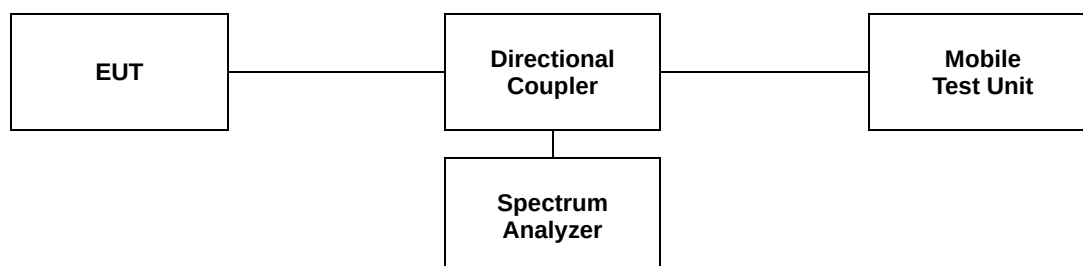
4.4, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time and shall use a signal corresponding to the highest PAPR during periods of continuous transmission.

## 5.2. Test Procedure

The test follows section 5.2.3.4 of ANSI C63.26-2015.

See instrumentation-specific application literature for further guidance regarding use of the CCDF capability. The following guidelines are offered for performing a CCDF measurement.

- a. Set resolution/measurement bandwidth  $\geq$  OBW or specified reference bandwidth.
- b. Set the number of counts to a value that stabilizes the measured CCDF curve.
- c. Set the measurement interval as follows:
  - 1) For continuous transmissions, set to greater of  $[10 \times (\text{number of points in sweep}) \times (\text{transmission symbol period})]$  or 1 ms.
  - 2) For burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize. Set the measurement interval to a time that is less than or equal to the burst duration.
  - 3) If there are several carriers in a single antenna port, the peak power shall be determined for each individual carrier (by disabling the other carriers while measuring the required carrier) and the total peak power calculated from the sum of the individual carrier peak powers.
- d. Record the maximum PAPR level associated with a probability of 0.1 %.
- e. The peak power level is calculated from the sum of the PAPR value from step d) to the measured average power.



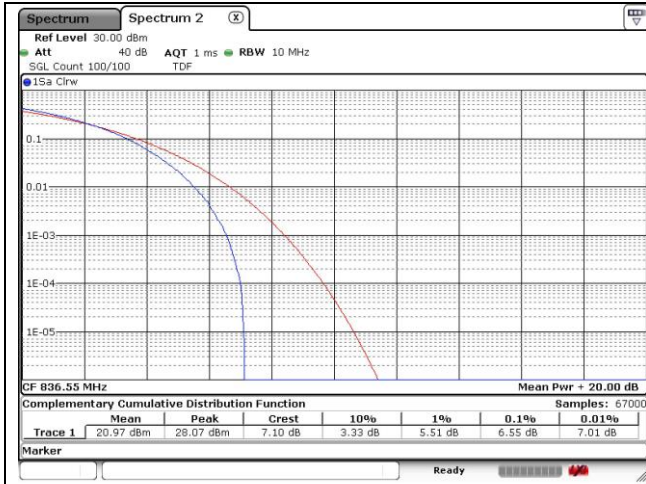
### 5.3 Test Results

Ambient temperature : (23 ± 1) °C  
 Relative humidity : 47 % R.H.

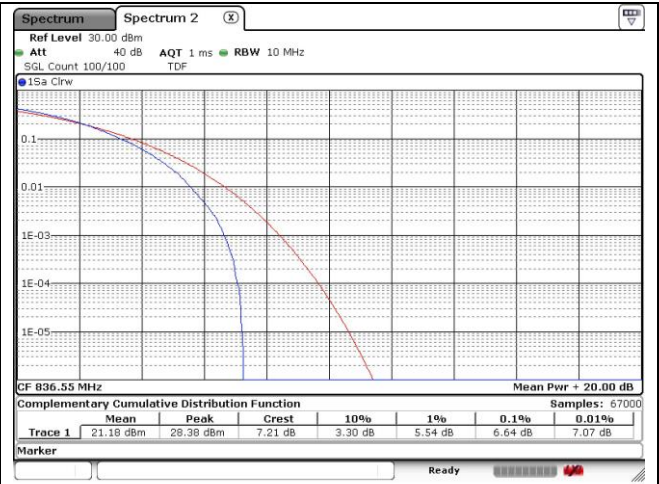
| Band | PCC      |                 |         | SCC      |                 |         | PAR (dB) |
|------|----------|-----------------|---------|----------|-----------------|---------|----------|
|      | BW (MHz) | Frequency (MHz) | Channel | BW (MHz) | Frequency (MHz) | Channel | 64QAM    |
| 5B   | 3        | 834.1           | 20501   | 5        | 838.0           | 20540   | 6.55     |
|      | 5        | 835.0           | 20510   | 3        | 838.9           | 20549   | 6.64     |
|      | 5        | 831.8           | 20478   | 10       | 839.0           | 20550   | 6.72     |
|      | 10       | 834.0           | 20500   | 5        | 841.2           | 20572   | 6.70     |
|      | 10       | 831.6           | 20476   | 10       | 841.5           | 20575   | 6.70     |
| 7C   | 10       | 2 525.6         | 21006   | 20       | 2 540.0         | 21150   | 7.33     |
|      | 20       | 2 530.1         | 21051   | 10       | 2 544.5         | 21195   | 7.33     |
|      | 15       | 2 530.1         | 21051   | 15       | 2 542.1         | 21171   | 7.04     |
|      | 15       | 2 530.1         | 21051   | 10       | 2 542.1         | 21171   | 7.07     |
|      | 15       | 2 525.3         | 21003   | 20       | 2 542.4         | 21174   | 7.13     |
|      | 20       | 2 527.6         | 21026   | 15       | 2 544.7         | 21197   | 7.04     |
|      | 20       | 2 525.1         | 21001   | 20       | 2 544.9         | 21199   | 7.42     |
| 66B  | 5        | 1 752.6         | 132398  | 5        | 1 757.4         | 132446  | 6.90     |
|      | 5        | 1 750.3         | 132375  | 10       | 1 757.5         | 132447  | 7.22     |
|      | 10       | 1 752.5         | 132397  | 5        | 1 759.7         | 132469  | 7.07     |
|      | 5        | 1 748.1         | 132353  | 15       | 1 757.4         | 132446  | 6.87     |
|      | 15       | 1 752.6         | 132398  | 5        | 1 761.9         | 132491  | 6.84     |
|      | 10       | 1 750.1         | 132373  | 10       | 1 760.0         | 132472  | 7.16     |
| 66C  | 10       | 1 747.9         | 132351  | 15       | 1 759.9         | 132471  | 6.99     |
|      | 15       | 1 750.1         | 132373  | 10       | 1 762.1         | 132493  | 6.99     |
|      | 10       | 1 745.6         | 132328  | 20       | 1 760.0         | 132472  | 6.90     |
|      | 20       | 1 750.1         | 132373  | 10       | 1 764.5         | 132517  | 6.81     |
|      | 15       | 1 747.5         | 132347  | 15       | 1 762.5         | 132497  | 7.65     |
|      | 15       | 1 745.3         | 132325  | 20       | 1 762.4         | 132496  | 7.01     |
|      | 20       | 1 747.6         | 132348  | 15       | 1 764.7         | 132519  | 6.96     |
|      | 20       | 1 752.5         | 132397  | 5        | 1 764.2         | 132514  | 6.90     |
|      | 5        | 1 745.8         | 132330  | 20       | 1 757.5         | 132447  | 7.13     |
|      | 20       | 1 745.1         | 132323  | 20       | 1 764.9         | 132521  | 7.51     |

## - Test plots

### ULCA 5B



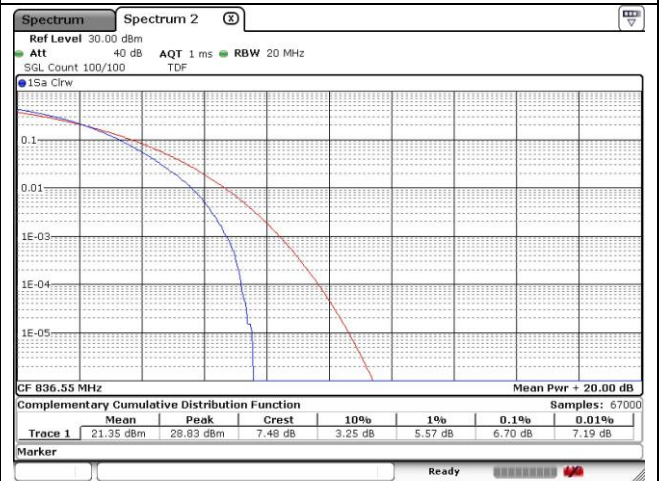
3 MHz + 5 MHz 64QAM Middle Channel - Full RB



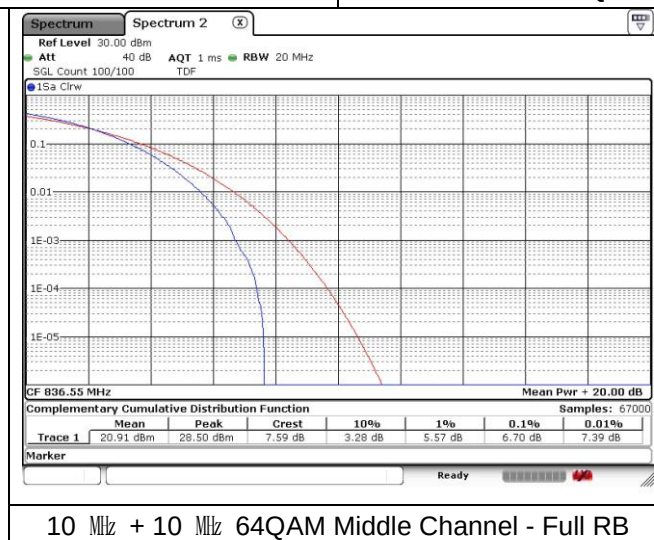
5 MHz + 3 MHz 64QAM Middle Channel - Full RB



5 MHz + 10 MHz 64QAM Middle Channel - Full RB

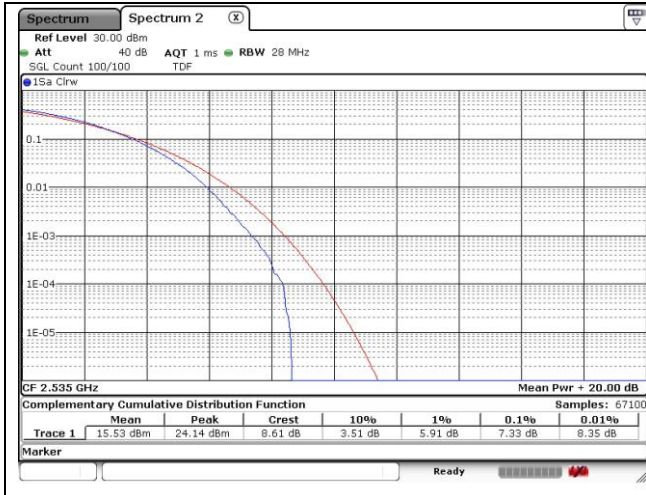


10 MHz + 5 MHz 64QAM Middle Channel - Full RB

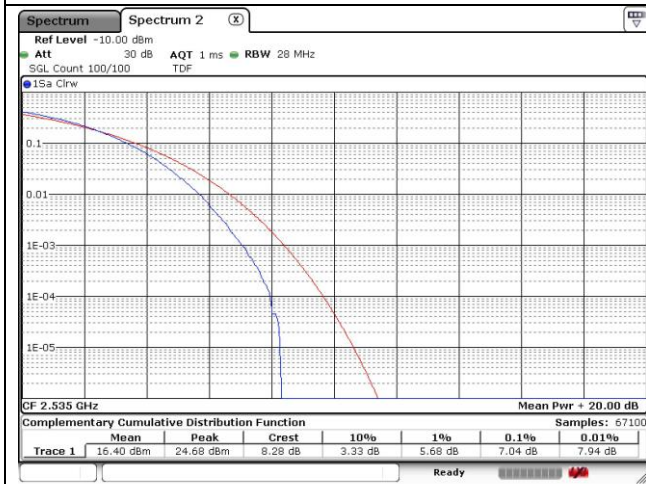


10 MHz + 10 MHz 64QAM Middle Channel - Full RB

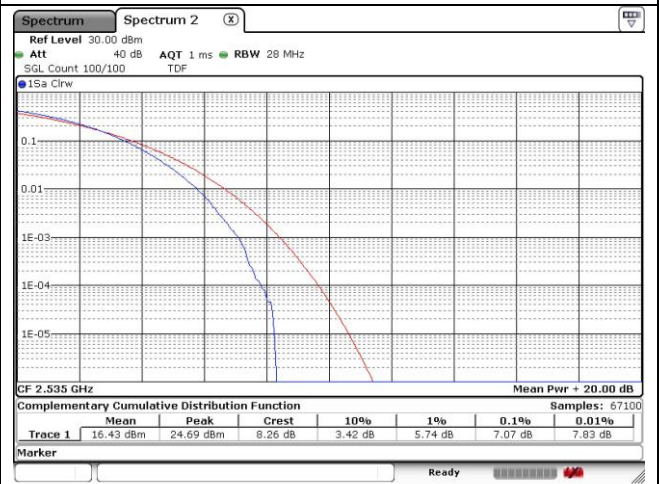
### ULCA 7C



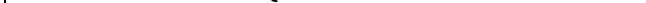
### 10 MHz + 20 MHz 64QAM Middle Channel - Full RB



### 20 MHz + 10 MHz 64QAM Middle Channel - Full RB



### 15 MHz + 15 MHz 64QAM Middle Channel - Full RB



### 15 MHz + 10 MHz 64QAM Middle Channel - Full RB

