

# MPE Calculation

Model Name : **SP94**

FCC ID : **2ALP8SP94**

Device Category : **Portable device**

Separation distance : **31.2 mm**

## KDB 447498 - 3.4.1 a)

For 100 MHz to 6 GHz and test separation distances  $\leq 50$  mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$  for 1-g SAR, and  $\leq 7.5$  for 10-g extremity SAR, where

- $f(\text{GHz})$  is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

| Modulation    | Frequency (MHz) | Min. Test separation distance | Measured Maximum Average power | Tune-up tolerance | Max. Power with tune-up tolerance |       | Standalone SAR Test exclusion thresholds for 100MHz to 6GHz at test separation distance $\leq 50$ mm | Limit | Result |
|---------------|-----------------|-------------------------------|--------------------------------|-------------------|-----------------------------------|-------|------------------------------------------------------------------------------------------------------|-------|--------|
|               |                 | (mm)                          | (dBm)                          | (dB)              | (dBm)                             | (mW)  |                                                                                                      |       |        |
| GFSK          | 2402            | 32.30                         | 14.47                          | $\pm 0.50$        | 14.97                             | 31.41 | 1.5069                                                                                               | 3.00  | PASS   |
|               | 2441            |                               | 16.43                          |                   | 16.93                             | 49.32 | 2.3855                                                                                               | 3.00  | PASS   |
|               | 2480            |                               | 16.07                          |                   | 16.57                             | 45.39 | 2.2132                                                                                               | 3.00  | PASS   |
| $\pi/4$ DQPSK | 2402            | 32.30                         | 9.59                           | $\pm 0.50$        | 10.09                             | 10.21 | 0.4899                                                                                               | 3.00  | PASS   |
|               | 2441            |                               | 13.41                          |                   | 13.91                             | 24.60 | 1.1901                                                                                               | 3.00  | PASS   |
|               | 2480            |                               | 12.90                          |                   | 13.40                             | 21.88 | 1.0667                                                                                               | 3.00  | PASS   |
| 8DPSK         | 2402            | 32.30                         | 10.70                          | $\pm 0.50$        | 11.20                             | 13.18 | 0.6325                                                                                               | 3.00  | PASS   |
|               | 2441            |                               | 14.51                          |                   | 15.01                             | 31.70 | 1.5331                                                                                               | 3.00  | PASS   |
|               | 2480            |                               | 13.94                          |                   | 14.44                             | 27.80 | 1.3553                                                                                               | 3.00  | PASS   |
| BT LE         | 2402            | 32.30                         | 2.18                           | $\pm 0.50$        | 2.68                              | 1.85  | 0.0889                                                                                               | 3.00  | PASS   |
|               | 2442            |                               | 6.78                           |                   | 7.28                              | 5.35  | 0.2586                                                                                               | 3.00  | PASS   |
|               | 2480            |                               | 6.66                           |                   | 7.16                              | 5.20  | 0.2535                                                                                               | 3.00  | PASS   |
| MESH          | 2410            | 31.20                         | 10.25                          | $\pm 0.50$        | 10.75                             | 11.89 | 0.5914                                                                                               | 3.00  | PASS   |
|               | 2445            |                               | 10.02                          |                   | 10.52                             | 11.27 | 0.5649                                                                                               | 3.00  | PASS   |
|               | 2475            |                               | 9.14                           |                   | 9.64                              | 9.20  | 0.4641                                                                                               | 3.00  | PASS   |

## KDB 447498 - 3.4.2 b)

When an antenna qualifies for the standalone SAR test exclusion of 4.3.1 and also transmits simultaneously with other antennas, the standalone SAR value must be estimated according to the following to determine the simultaneous transmission SAR test exclusion criteria:36

1)  $[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})/x}] \text{ W/kg}$ , for test separation distances  $\leq 50$  mm;

where  $x = 7.5$  for 1-g SAR and  $x = 18.75$  for 10-g SAR.

| Modulation | Frequency (MHz) | Min. Test separation distance | Max. Power with tune-up tolerance |       | Simultaneous transmission SAR Test exclusion thresholds for 100MHz to 6GHz at test separation distance $\leq 50$ mm ( $x=7.5$ ) | Limit | Result |
|------------|-----------------|-------------------------------|-----------------------------------|-------|---------------------------------------------------------------------------------------------------------------------------------|-------|--------|
|            |                 | (mm)                          | (dBm)                             | (mW)  |                                                                                                                                 |       |        |
| Bluetooth  | 2441            | 32.30                         | 16.93                             | 49.32 | 0.3969                                                                                                                          | 0.40  | PASS   |
| MESH       | 2410            | 31.20                         | 10.75                             | 11.89 |                                                                                                                                 |       |        |