

# MPE/RF EXPOSURE REPORT



Evaluation of: Alereon Inc.–Camouflage (AL5955),  
Commander (AL5930) and Combat (AL5934)

To: FCC CFR 47 Part 1.1310

Report Serial No.: ALER01-U2 MPE Rev A

This report supersedes: NONE

Applicant: Alereon Inc.  
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Austin, TX 78750  
USA

Product Function: UWB Module with Parallel/Serial USB  
interface

Issue Date: 12<sup>th</sup> December 2018

## **This Report is Issued Under the Authority of:**

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## MAXIMUM PERMISSABLE EXPOSURE

### Calculations for Maximum Permissible Exposure Levels

Power Density =  $P_d$  ( $\text{mW}/\text{cm}^2$ ) =  $\text{EIRP}/(4*\pi*d^2)$

$\text{EIRP} = P * G$

$P$  = Peak output power (mW)

$G$  = Antenna numeric gain (numeric)

$d$  = Separation distance (cm)

Numeric Gain =  $10^{(G(\text{dBi})/10)}$

The calculations in the table below use the highest conducted power values specified for the EUT. These calculations represent worst case in terms of the exposure levels. As the 3 units use the same RF Chipset with the same antenna, the MPE values are the same for each unit tested. Only one MPE value is reported.

Maximum Permissible Exposure

| Freq. Band (MHz) | Ant Gain (dBi) | Numeric Gain (numeric) | Peak Output Power (dBm) | Peak Output Power (mW) | Calculated Power Density ( $\text{mW}/\text{cm}^2$ ) @ 20cm | Power Density Limit ( $\text{mW}/\text{cm}^2$ ) | Min Calculated safe distance for Limit (cm) |
|------------------|----------------|------------------------|-------------------------|------------------------|-------------------------------------------------------------|-------------------------------------------------|---------------------------------------------|
| 3168.0 – 8976.0  | 0.2            | 1.05                   | -41.5                   | 7.05E-05               | 1.47E-08                                                    | 1.0                                             | 0.00                                        |

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### **Specification - Maximum Permissible Exposure Limits**

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

| Frequency range (MHz)                                          | Electric field strength (V/m) | Magnetic field strength (A/m) | Power density (mW/cm <sup>2</sup> ) | Averaging time (minutes) |
|----------------------------------------------------------------|-------------------------------|-------------------------------|-------------------------------------|--------------------------|
| <b>(A) Limits for Occupational/Controlled Exposure</b>         |                               |                               |                                     |                          |
| 0.3-3.0                                                        | 614                           | 1.63                          | *100                                | 6                        |
| 3.0-30                                                         | 1842/f                        | 4.89/f                        | *900/f <sup>2</sup>                 | 6                        |
| 30-300                                                         | 61.4                          | 0.163                         | 1.0                                 | 6                        |
| 300-1,500                                                      | --                            | --                            | f/300                               | 6                        |
| 1,500-100,000                                                  | --                            | --                            | 5                                   | 6                        |
| <b>(B) Limits for General Population/Uncontrolled Exposure</b> |                               |                               |                                     |                          |
| 0.3-1.34                                                       | 614                           | 1.63                          | *100                                | 30                       |
| 1.34-30                                                        | 824/f                         | 2.19/f                        | *180/f <sup>2</sup>                 | 30                       |
| 30-300                                                         | 27.5                          | 0.073                         | 0.2                                 | 30                       |
| 300-1,500                                                      | --                            | --                            | f/1500                              | 30                       |
| 1,500-100,000                                                  | --                            | --                            | 1.0                                 | 30                       |

f = frequency in MHz \* = Plane-wave equivalent power density

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