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**RF exposure analysis for the equipment TL2803GRE, TL2803GE, 3G2080RE, 3G2080E (FCC ID: F5316TL2803GRE; IC: 160A-TL2803GRE)**

The devices TL2803GRE, TL2803GE, 3G2080RE and 3G2080E (FCC ID: F5316TL2803GRE; IC: 160A-TL2803GRE) are cellular alarm communicator device integrating a module 2G/3G (Telit UE910-NAR). This device is to be used only for fixed and mobile applications.

The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all the persons and must not be co-located or operating in conjunction with any other antenna or transmitter except as under the conditions described KDB 447498 D01 General RF Exposure Guidance.

**MPE exposure limits**

The table below is excerpted from Table 1B of 47 CFR 1.1310 titled Limits for Maximum Permissible Exposure (MPE), Limits for General Population/Uncontrolled Exposure:

| Frequency Range (MHz) | Power density (mW/cm <sup>2</sup> ) | Averaging time (minutes) |
|-----------------------|-------------------------------------|--------------------------|
| 300 – 1500            | f (MHz) /1500                       | 30                       |
| 1500 – 100.000        | 1,0                                 | 30                       |

The table below is excerpted from RSS-102, Issue 5, 4, titled “Table 4: RF Field Strength Limits for Devices Used by the General Public (Uncontrolled Environment)”:

| Frequency Range (MHz) | Power density (W/m <sup>2</sup> ) | Averaging time (minutes) |
|-----------------------|-----------------------------------|--------------------------|
| 300-6000              | $0.02619 f^{0.6834}$              | 6                        |

**EIRP/ERP limits**

For 850 MHz frequency band and according to FCC §22.913 the maximum ERP of the device is 7 W (equivalent to 11,48 W EIRP) while IC SRSP-503 defines an EIRP limit of 11,5 W.

For 1900 MHz frequency band and according to FCC §24.232 and IC SRSP-510, the maximum EIRP of the device should be lower than 2 W.

Using the equation  $S = \frac{PG}{4\pi R^2}$  to calculate the exposure to electromagnetic fields

where: S = power density (in appropriate units, e.g. mW/cm<sup>2</sup>)  
P = power input to the antenna (in appropriate units, e.g., mW)  
G = power gain of the antenna in the direction of interest relative to an isotropic radiator  
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

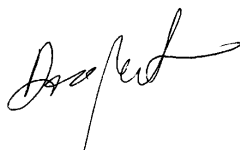
compliance with FCC/IC MPE and EIRP limits is demonstrated following the calculations shown in the following page.

| Frequency Band | Mode       | Frequency Range (MHz) | Reference frequency (Lowest freq.) (MHz) | Maximum conducted output power (per tune-up) (dBm) | Maximum number of TX slots | Duty cycle (%) | FCC MPE limit (mW/cm <sup>2</sup> ) | IC MPE limit (mW/cm <sup>2</sup> ) | FCC EIRP limit per §22.913 and §24.232 (W) | IC EIRP limit per SRSP-503, SRSP-510, SRSP-513 and SRSP-518 (W) | Evaluation distance for compliance with MPE limits (cm) | Antenna gain to meet FCC MPE limit (dBi) | Antenna gain to meet IC MPE limit (dBi) | Antenna gain to meet FCC EIRP limit (dBi) | Antenna gain to meet IC EIRP limit (dBi) | Maximum antenna gain to meet all the limits (dBi) | Maximum antenna gain to meet all the limits per frequency band (dBi) |
|----------------|------------|-----------------------|------------------------------------------|----------------------------------------------------|----------------------------|----------------|-------------------------------------|------------------------------------|--------------------------------------------|-----------------------------------------------------------------|---------------------------------------------------------|------------------------------------------|-----------------------------------------|-------------------------------------------|------------------------------------------|---------------------------------------------------|----------------------------------------------------------------------|
| GSM 850        | GPRS/EDGE  | 824.2 - 848.8         | 824,2                                    | 33,50                                              | 1                          | 25,0%          | 0,54947                             | 0,25760                            | 11,48                                      | 11,50                                                           | 20                                                      | 6,93                                     | 3,64                                    | 7,09                                      | 7,10                                     | 3,64                                              | Maximum antenna gain for 850 MHz frequency band:                     |
| FDD V          | WCDMA/HSPA | 826,4 - 846,6         | 826,4                                    | 24,00                                              | N/A                        | 100%           | 0,55093                             | 0,25807                            | 11,48                                      | 11,50                                                           | 20                                                      | 10,42                                    | 7,13                                    | 16,59                                     | 16,60                                    | 7,13                                              | 3,64 dBi                                                             |
| PCS 1900       | GPRS/EDGE  | 1850.2 - 1909.8       | 1850,2                                   | 30,50                                              | 1                          | 25,0%          | 1,00000                             | 0,44766                            | 2,00                                       | 2,00                                                            | 20                                                      | 12,53                                    | 9,04                                    | 2,51                                      | 2,51                                     | 2,51                                              | Maximum antenna gain for 1900 MHz frequency band:                    |
| FDD II         | WCDMA/HSPA | 1852.4 - 1907.6       | 1852,4                                   | 24,00                                              | N/A                        | 100%           | 1,00000                             | 0,44803                            | 2,00                                       | 2,00                                                            | 20                                                      | 13,01                                    | 9,52                                    | 9,01                                      | 9,01                                     | 9,01                                              | 2,51 dBi                                                             |

With this antenna gain figures the maximum RF exposure can be found the table below:

| Frequency Band | Mode       | Frequency Range (MHz) | Maximum conducted output power (per tune-up) (dBm) | Maximum number of TX slots | Duty cycle (%) | Antenna gain (dBi) | Evaluation distance for compliance with MPE limits (cm) | $S = \frac{PG}{4\pi R^2}$<br>(mW/cm <sup>2</sup> ) | MPE limit (FCC/IC worst case)<br>(mW/cm <sup>2</sup> ) |
|----------------|------------|-----------------------|----------------------------------------------------|----------------------------|----------------|--------------------|---------------------------------------------------------|----------------------------------------------------|--------------------------------------------------------|
| GSM 850        | GPRS/EDGE  | 824.2 - 848.8         | 33,50                                              | 1                          | 25,0%          | 3,64               | 20                                                      | 0,25744                                            | 0,25760                                                |
| FDD V          | WCDMA/HSPA | 826,4 - 846,6         | 24,00                                              | N/A                        | 100%           | 3,64               | 20                                                      | 0,11554                                            | 0,25807                                                |
| PCS 1900       | GPRS/EDGE  | 1850.2 - 1909.8       | 30,50                                              | 1                          | 25,0%          | 2,51               | 20                                                      | 0,09946                                            | 0,44766                                                |
| FDD II         | WCDMA/HSPA | 1852.4 - 1907.6       | 24,00                                              | N/A                        | 100%           | 2,51               | 20                                                      | 0,08907                                            | 0,44803                                                |

Yours sincerely,



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