

# FCC RF Exposure Report

**FCC ID** : 2ABLK-814G-1  
**Equipment** : GigaHub  
**Model No.** : 814G-1  
**Brand Name** : Calix Inc.  
**Applicant** : Calix Inc.  
**Address** : 1035 N. McDowell Blvd. Petaluma, CA 94954  
**Standard** : 47 CFR FCC Part 2.1091  
**Received Date** : Nov. 30, 2017  
**Tested Date** : Nov. 30, 2017 ~ Feb. 07, 2018

We, International Certification Corp., would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It may be duplicated completely for legal use with the approval of the applicant. It shall not be reproduced except in full without the written approval of our laboratory.

Reviewed by:

  
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Along Chen / Assistant Manager

Approved by:

  
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Gary Chang / Manager



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## Release Record

Report No.	Version	Description	Issued Date
FA7N3003-01	Rev. 01	Initial issue	May 02, 2018

## 1 MPE EVALUATION OF MOBILE DEVICES

Human exposure to RF emissions from mobile devices (47 CFR §2.1091) may be evaluated based on the MPE limits adopted by the FCC for electric and magnetic field strength and/or power density, as appropriate, since exposures are assumed to occur at distances of 20 cm or more from persons.

### 1.1 LIMITS FOR GENERAL POPULATION/UNCONTROLLED EXPOSURE

Frequency Range (MHz)	Power Density (mW /cm <sup>2</sup> )	Averaging Time (minutes)
300~1500	F/1500	30
1500~100000	1.0	30

### 1.2 MPE EVALUATION FORMULA

$$Pd = \frac{Pt}{4 * Pi * R^2}$$

Where

Pd= Power density in mW/cm<sup>2</sup>

Pt= EIRP in mW

Pi= 3.1416

R= Measurement distance

### 1.3 MPE EVALUATION RESULTS

#### MPE Evaluation of Single Transmission

Frequency Range (MHz)	Maximum Conducted Power (dBm)	Rated Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
<b>Non-beamforming mode</b>						
2412~2462 <sup>Note</sup>	27.35	27.50	4.0	20	0.281	1
5180~5240 <sup>Note</sup>	27.11	27.50	4.1	20	0.288	1
5260~5320	23.66	24.00	4.9	20	0.154	1
5500~5700	23.55	24.00	5.2	20	0.165	1
5745~5825 <sup>Note</sup>	29.46	29.50	3.8	20	0.425	1
<b>Beamforming mode</b>						
5180~5240	26.10	26.50	6.86	20	0.431	1
5260~5320	21.98	22.00	7.33	20	0.171	1
5500~5700	22.18	22.50	7.45	20	0.197	1
5745~5825	25.86	26.00	5.96	20	0.312	1

**Note:**

- These 3 frequency bands are certified for original grant.
- For beamforming mode:
  - For 5150~5250 MHz band  
Directional gain =  $10 * \log((10^{3.6/20} + 10^{4.1/20})^2 / 2) = 6.86$  dBi
  - For 5250 ~ 5350 MHz band  
Directional gain =  $10 * \log((10^{3.7/20} + 10^{4.9/20})^2 / 2) = 7.33$  dBi
  - For 5470 ~ 5725MHz band  
Directional gain =  $10 * \log((10^{3.6/20} + 10^{5.2/20})^2 / 2) = 7.45$  dBi
  - For 5745~5850 MHz band  
Directional gain =  $10 * \log((10^{2.0/20} + 10^{3.8/20})^2 / 2) = 5.96$  dBi

#### MPE Evaluation of Simultaneous Transmission

2.4 and 5GHz can transmit at the same time, MPE evaluation is as below formula

$PD1 / \text{Limit}1 + PD2 / \text{Limit} 2 + \dots < 1$ , PD = Power density

**Non-beamforming mode**

MPE Evaluation = Maximum MPE of 2.4GHz + Maximum MPE of 5 GHz =  $0.281 / 1 + 0.425 / 1 = 0.706 < 1$

**Beamforming mode**

MPE Evaluation = Maximum MPE of 2.4GHz + Maximum MPE of 5 GHz =  $0.281 / 1 + 0.431 / 1 = 0.712 < 1$

**Conclusion**

MPE evaluations of single and simultaneous transmission meet the requirement of standard.

## 2 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corp (EMC and Wireless Communication Laboratory), it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan District. Location map can be found on our website <http://www.icertifi.com.tw>.

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