

RF Exposure Evaluation Declaration

Product Name : PDS5-US
Model No. : PDS5-US
FCC ID: QIPPDS5-US
IC: 7830A-PDS5US

Applicant : Gemalto M2M GmbH.
Address : Siemensdamm 50 Berlin 13629 Germany

Date of Receipt : 01-30-2015
Issued Date : 02-06-2015
Report No. : UL05420150130FCC/IC039-2
Report Version : V1.0

The test results relate only to the samples tested.
The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.
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Address : Siemensdamm 50 Berlin 13629 Germany
Manufacturer : Gemalto M2M GmbH.
Address : Siemensdamm 50 Berlin 13629 Germany
Model No. : PDS5-US
EUT Voltage : Extreme Low:3.3V, Nominal:3.8V, Extreme High:4.5V
Brand Name : N/A
Applicable Standard : FCC's Rules (47 C.F.R. § 1.1310 and 2.1091)
Industry Canada RSS-102, Issue 4
Test Result : Complied
Performed Location : Unilab (Shanghai) Co.,Ltd.
FCC 2.948 register number is 714465
IC register number is 11025A-1
No.1350, Lianxi Road, Pudong New District, Shangha, China
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Documented By :



(Technical Engineer: Andy Wei)

Reviewed By :



(Senior Engineer: Forest Cao)

Approved By :



(Supervisor: Eva Wang)

1. EUT Description

Product Name:	PDS5-US
Model Name:	PDS5-US
Hardware Version:	B2.1
Software Version:	03.001
RF Exposure Environment:	Uncontrolled
GSM/ EDGE	
Support Band:	GSM850/PCS1900
EGPRS/GPRS Class:	12
Tx Frequency Range:	GSM 850: 824.2MHz to 848.8MHz PCS 1900: 1850.2MHz to 1909.8MHz
Rx Frequency Range:	GSM 850: 869.2MHz to 893.8MHz PCS 1900: 1930.2MHz to 1989.8MHz
Type of modulation:	GMSK for GSM/GPRS 8PSK for EDGE
Antenna Type:	Connector
Antenna Peak Gain:	GSM 850:2.15dBi PCS 1900: 2.15dBi
WCDMA	
Support Band:	WCDMA Band II
Tx Frequency Range:	WCDMA Band II : 1850MHz ~1910MHz
Rx Frequency Range:	WCDMA Band II : 1930MHz ~1990MHz
Type of modulation:	WCDMA(UMTS): QPSK
Antenna Type:	Connector
Antenna Peak Gain:	WCDMA Band II : 2.15dBi
Support Band:	WCDMA Band V
Tx Frequency Range:	WCDMA Band V: 824MHz ~849MHz
Rx Frequency Range:	WCDMA Band V: 869MHz ~894MHz
Type of modulation:	WCDMA(UMTS): QPSK
Antenna Type:	Connector
Antenna Peak Gain:	WCDMA Band V: 2.15dBi

2. RF Exposure Evaluation

2.1 Limits

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range(MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time (Minutes)
(A)Limits for Occupation/Control Exposures				
300-1500	--	--	F/300	6
1500-100,000	--	--	5	6
(B)Limits for General Occupation/UnControlled Exposures				
300-1500	--	--	F/1500	6
1500-100,000	--	--	1	30

F= Frequency in MHz

Friis Formula

Friis transmission formula: $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2)$

Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

P_d is the limit of MPE, 1 mW/cm². If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

2.2. Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

The temperature and related humidity: 22°C and 45% RH.

2.3.Test Result of RF Exposure Evaluation

This device is evaluated by mobile device with general population/uncontrolled exposure condition
For this device, the calculation is using the most conservative values, and the results are as follows:

Test Mode	Antenna Gain (dBi)	Maximum Output Power (dBm)	Average Power (dBm)	Average EIRP (mW)	Calculated RF Exposure at d = 20cm (mW/cm2)	MPE Limit (mW/cm2)
GSM 850	2.15	34	27.15	518.8	0.10	0.55
PCS 1900	2.15	31	24.15	260.0	0.05	1.00
The averaged power calculated method are shown as below: Averaged power=Maximum burst averaged power(1 Tx Slot)-9dB Duty cycle =12.5% Average EIRP Power=Average Power+Antenna Gain						

Test Mode	Antenna Gain (dBi)	Maximum Output Power (dBm)	Maximum Output Power (mW)	Calculated RF Exposure at d = 20cm (mW/cm2)	MPE Limit (mW/cm2)
WCDMA 850	2.15	25	518.8	0.10	0.55
WCDMA 1900	2.15	25	518.8	0.10	1.00
Duty cycle =100%					

Test Mode	ERP (dBm)	EIRP (dBm)	Peak EIRP (mW)	Average EIRP (mW)	Calculated RF Exposure at d = 20cm (mW/cm2)	MPE Limit (mW/cm2)
GSM 850	32.70	34.85	3054.92	384.59	0.17	0.55
PCS 1900	-----	29.65	922.57	116.14	0.04	1.00
The frame-averaged power calculated method are shown as below: Average EIRP=Peak EIRP-9dB Duty cycle =12.5%						

Test Mode	ERP (dBm)	EIRP (dBm)	Peak EIRP (mW)	Calculated RF Exposure at d = 20cm (mW/cm2)	MPE Limit (mW/cm2)
WCDMA 850	24.05	26.20	416.87	0.08	0.55
WCDMA 1900	-----	24.18	261.82	0.05	1.00
Duty cycle =100%					

This device can pass RF exposure limit.