

RF Exposure

Reference test report No:
ULR-TC568819300000027F &
ULR-TC568819300000028F

Seite 1 von 3
Page 1 of 3

1 RF Exposure Report

This report is part of main test report no. ULR-TC568819300000027F & ULR-TC568819300000028F, and only valid when referred with main test reports. This report alone shall not be used to define compliance criteria of the product, the RF exposure measurement results specified are referenced from main test reports.

1.1 RF Exposure Measurement

The limit for Maximum Permissible Exposure (MPE) specified in FCC 1.1310 is followed. The gain of the antennas used in the product is extracted from the Antenna data sheets provided and also the maximum total power input to the antenna is measured. Through the Friis transmission formula and the maximum gain of the antenna, we can calculate the distance, away from the product, where the limit of MPE is reached. Although the Friis Transmission formula is far field assumption, the calculated result of that is an over-prediction for near field power density. It is taken as worst case to specify the safety range.

Note : This product is exempted from RF Exposure Evaluation as per the requirements of sections 2.5.2 of Radio Standard RSS-102 Issue 5. Hence signed declaration of compliance (Annex C) is submitted along with this test report.

1.2 RF Exposure Limit

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environmental impact of the human exposure to radio-frequency (RF) radiation as specified in 1.1307 (b) showed in Table 1.

Table 1: Limits for Maximum Permissible Exposure (MPE) as per FCC

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)
Limits for Occupational / controlled Exposures			
300 - 1500	--	--	F/300
1500 – 100000	--	--	5.0
Limits for General population / Uncontrolled Exposure			
300 - 1500	--	--	F/1500
1500 – 100000	--	--	1.0

F or f = Frequency in MHz

RF Exposure

Reference test report No:
ULR-TC568819300000027F &
ULR-TC568819300000028F

Seite 2 von 3
Page 2 of 3

1.2.1 Friss Formula

Friss Transmission Formula: $P_d = (P_{out} * G) / (4 * \pi * r^2)$

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 the center of radiator in cm

Note :

If we know the maximum gain of the antenna and the total output power to the antenna, through calculation, we will know MPE value at distance 20cm.

1.2.2 EUT Operation condition

EUT was enabled to transmit and receive at lowest, middle and highest channels.

1.2.3 Classification

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user.

Warning statement to the user for keeping at least 20cm or more separation distance from the antenna should be included in the User manual. So, this device is classified as fixed device.

Test Results

Protocol: GSM & WCDMA

Mode	Antenna Gain (dBi)	Antenna gain in linear scale	Channel Frequency (MHz)	Maximum average output power (dBm)	Maximum output power including Tune-up value (mW)	Power Density (mW/cm ²)	FCC Limit (mW/cm ²)
WCDMA Band 2	2.8	1.9055	1852.4	19.45	110.9175	0.04205	1.0000
WCDMA Band 4	2	1.5849	1712.4	18.79	95.2796	0.03004	1.0000
WCDMA Band 5	1	1.2589	836.4	20.57	143.5489	0.03595	0.5644
GSM 850	1	1.2589	824.2	28.58	907.8205	0.22740	0.5494
GSM 1900	2.8	1.9055	1880	24.20	331.1311	0.12550	1.0000

Maximum output power including Tune-up value (dBm) = Maximum output power (dBm) + tune-up (dB)

Note:

1. Manufacturer has declared the tune-up value as ± 1 dB is considered in MPE calculation.
2. Antenna gain details are taken from the antenna data(Part No: TG.09.0113, Penta-band cellular hinged SMA male monopole) sheet.
3. All the maximum output power mentioned are taken from test report no. ULR-TC568819300000027F, measured output power is conducted average power.

RF Exposure

Reference test report No:
ULR-TC568819300000027F &
ULR-TC568819300000028F

Seite 3 von 3
Page 3 of 3

Protocol: Wi-Fi 2.4GHz

Mode	Antenna Gain (dBi)	Antenna gain in linear scale	Channel Frequency (MHz)	Maximum output power (dBm)	Maximum output power including Tune-up value (mW)	Power Density (mW/cm ²)	FCC Limit (mW/cm ²)
802.11g	3	1.99526	2412	18.54	89.94975	0.03570	1

Note:

1. Manufacturer has declared the tune-up value as ± 1 dB is considered in MPE calculation.
2. Antenna gain details are taken from Wi-Fi antenna(Part No: GW.15.2113, 2.4GHz 3dBi terminal mount dipole antenna) data sheet.
3. All the maximum output power mentioned are taken from test report no. ULR-TC568819300000028F, measured output power is conducted power.

Note: The product does not support simultaneous transmission. Conducted output power measured with respect to each protocol with single transmission chain

*****END OF MPE TEST REPORT*****