

Maximum Permissible Exposure Report

1. Product Information

General Description	
EUT :	Smart POS Terminal
Model/Type reference:	P10
Additional Model No.	/
Model Declaration:	/
Hardware Version	V1.00
Software Version	V1.00
Power supply:	DC 3.8V by battery
<p><i>The EUT is Smart POS Terminal. the Smart POS Terminal is intended for WLAN transmission. It is equipped with WiFi2.4G;GSM 850,1900; WCDMA Band II, Band V; LTE 2,5,7,38 41. For more information see the following datasheet</i></p>	
Technical Characteristics	
LTE	
Operation Band:	<input checked="" type="checkbox"/> E-UTRA Band 5(U.S.-Band) <input checked="" type="checkbox"/> E-UTRA Band 7(U.S.-Band) <input checked="" type="checkbox"/> E-UTRA Band 26(U.S.-Band) <input checked="" type="checkbox"/> E-UTRA Band 40(U.S.-Band) <input checked="" type="checkbox"/> E-UTRA Band 41(U.S.-Band)
Modulation Type:	QPSK/16QAM
Release Version:	R10
Power Class:	Class 3
Antenna Description:	FPC Antenna LTE BAND5:1.03dBi;LTE BAND7:-0.92dBi;LTE BAND19:-4.10dBi; LTE BAND26:-4.10dBi;LTE BAND40:-1.34dBi;LTE BAND41:-0.92dBi;
WIFI 2.4G	
Frequency Range:	2412MHz-2462MHz
Type of Modulation:	IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Channel number:	11 channels for 20MHz bandwidth (2412~2462MHz) 7 channels for 40MHz bandwidth (2422~2452MHz)
Channel separation:	5MHz
Antenna Description:	FPC Antenna, -1.69dBi(Max.)
Bluetooth	
Frequency Range	2402MHz~2480MHz
Channel Number	79 channels for Bluetooth V5.0 (DSS) 40 channels for Bluetooth V5.0 (DTS)
Channel Spacing	1MHz for Bluetooth V5.0 (DSS) 2MHz for Bluetooth V5.0 (DTS)
Modulation Type	GFSK, $\pi/4$ -DQPSK, 8-DPSK for Bluetooth V5.0(DSS) GFSK for Bluetooth V5.0 (DTS)
Bluetooth Version	V5.0
Antenna Description	FPC Antenna, -1.69dBi(Max.)
UMTS	
Operation Band:	WCDMA Band V (U.S.-Band)



FrequencyRange:	WCDMA Band V: 826.4~846.6MHz
Modulation Type:	QPSK,16QAM
Release Version	R9
Antenna Description:	FPC Antenna -4.1dBi (max.) For WCDMA Band V
GSM	
Support Band:	<input checked="" type="checkbox"/> GSM 900 (EU-Band) <input checked="" type="checkbox"/> DCS 1800 (EU-Band) <input checked="" type="checkbox"/> GSM 850 (U.S.-Band) <input checked="" type="checkbox"/> PCS 1900 (U.S.-Band)
Release Version:	R99
GPRS Class	Class 12
EGPRS Class	Class 12
Modulation Type:	GMSK for GSM/GPRS; GMSK/8PSK for EGPRS
Antenna Description:	FPC Antenna -4.1dBi (max.) For GSM 850 -2.54dBi (max.) For PCS 1900
GPS function	Support and only RX
NFC	
Operating Frequency	13.56MHz
Modulation Type	ASK
Antenna Description	Internal Antenna, 0 dBi(Max.)

2. Evaluation method and Limit

Evaluation method and Limit

According to KDB447498 D01 General RF Exposure Guidance v06 Section 4.3.1

Standalone SAR test exclusion considerations: “Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Test Exclusion Threshold condition, listed below, is satisfied. These test exclusion conditions are based on source-based time-averaged maximum conducted output power of the RF channel requiring evaluation, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions.²² The minimum test separation distance is determined by the smallest distance from the antenna and radiating structures or outer surface of the device, according to the host form factor, exposure conditions and platform requirements, to any part of the body or extremity of a user or bystander (see 5) of section 4.1). To qualify for SAR test exclusion, the test separation distances applied must be fully explained and justified by the operating configurations and exposure conditions of the transmitter and applicable host platform requirements, typically in the SAR measurement or SAR analysis report, according to the required published RF exposure KDB procedures. When no other RF exposure testing or reporting is required, a statement of justification and compliance must be included in the equipment approval, in lieu of the SAR report, to qualify for the SAR test exclusion. When required, the device specific conditions described in the other published RF exposure KDB procedures must be satisfied before applying these SAR test exclusion provisions; for example, handheld PTT two-way radios, handsets, laptops & tablets etc. “

$$\left[\frac{\text{max. power of channel, including tune-up tolerance, mW}}{\text{min. test separation distance, mm}} \right] \cdot [\sqrt{f \text{ (GHz)}}] \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR, where:}$$

- f (GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison
- 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 below

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm according to f) in section 4.1 is applied to determine SAR test exclusion.

When one of the following test exclusion conditions is satisfied for all combinations of simultaneous transmission configurations, further equipment approval is not required to incorporate transmitter modules in host devices that operate in the mixed mobile and portable host platform exposure conditions. The grantee is responsible for documenting this according to Class I permissive change requirements. Antennas that qualify for standalone SAR test exclusion must apply the estimated standalone SAR to determine simultaneous transmission test exclusion.

a) The $[\sum \text{ of (the highest measured or estimated SAR for each standalone antenna configuration, adjusted for maximum tune-up tolerance) / 1.6 W/kg}] + [\sum \text{ of MPE ratios}]$ is ≤ 1.0 .

b) The SAR to peak location separation ratios of all simultaneously transmitting antenna pairs operating in portable device exposure conditions are all ≤ 0.04 , and the $[\sum \text{ of MPE ratios}]$ is ≤ 1.0 .

3. Refer Evaluation Method

ANSI C95. 1 - 1999: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.

FCC KDB publication 447498 D01 General RF Exposure Guidance v06: Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies.

FCC CFR 47 part1 1. 1310: Radiofrequency radiation exposure limits.

FCC CFR 47 part2 2. 1093: Radiofrequency radiation exposure evaluation: portable devices

4. Antenna Information

EUT can only use antennas certificated as follows provided by manufacturer;

Internal/External Identification	Antenna type and antenna number	Operate frequency band	Maximum antenna gain	Notes
Antenna	FPC antenna	13.553-13.567 MHz	0dBi	NFC Antenna

5. Conducted Power

Mode	Frequency (MHz)	Field Strength(dBuV/m@3m)	EIRP(dBm)	Conducted Output Power(dBm)
ASK	13.56MHz	84.34	-11.15dBm	-11.15dBm

Note: Add the appropriate maximum ground reflection factor to the EIRP (6 dB for frequencies 30 MHz; 4.7 dB for frequencies between 30 MHz and 1000 MHz, inclusive; and 0 dB for frequencies > 1000 MHz).so for NFC: $E(\text{dBuV/m@3m}) = \text{EIRP}(\text{dBm}) - 20 \lg 3(\text{m}) + 104.8 = \text{EIRP}(\text{dBm}) + 95.26$

[NFC]	
Frequency	13.56MHz
Target (dBm)	-11.15dBm
Tolerance ± (dB)	1.0

Test Mode	Channel Frequency (MHz)	Field Strength (dBuV/m@3m)	Max Output Power(mW)	Calculate on Value(Note)	Threshold Value (mW)
NFC	13.56	84.34	0.10	0.003	443

Note:

1. Calculate the SAR test to eliminate thresholds from chapter 2 conditions "3" formula
 2. $\text{Field Strength}(\text{dBuV/m@3m}) = \text{Field Strength}(\text{dBuV/m@30m}) + 40 \cdot \log(30/3)$
 3. $\text{Max Power}(\text{dBm}) = \text{Field Strength of Fundamental}(\text{dBuV/m@3m}) - 95.23$
 4. $\text{Max Power (mW)} = 10^{(\text{Max power (dBm)} / 10)}$
- Since Source-base time average power is below SAR test exclusion power thresholds, the SAR evaluation is not required.

6. Conclusion

The measurement results comply with the FCC Limit per 47 CFR 2.1093 for the uncontrolled RF Exposure and SAR Exclusion Threshold per KDB 447498 v06.