



A Test Lab Techno Corp.

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MPE Report

Test Report No.	: 1208FS11-01
Applicant	: HON HAI Precision IND. CO., LTD.
Manufacturer	: HON HAI Precision IND. CO., LTD.
Product Type	: PCI-E Embedded Module
Trade Name	: N/A
Model Number	: TangoP1001
Dates of Received	: Jul. 17, 2012
Dates of Test	: Aug. 03, 2012
Dates of Issued	: Aug. 22, 2012
Test Specification	: 47 CFR § 2.1091 47 CFR §1.1310 ANSI / IEEE Std.C95.1-1992
Location of Test Lab.	: Chang-an Lab.

1. The test operations have to be performed with cautious behavior, the test results are as attached.
2. The test results are under chamber environment of A Test Lab Techno Corp. A Test Lab Techno Corp. does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples.
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Approved By : Yung-Tan Tsai Tested By : Bill Hu
(Yung Tan Tsai) (Bill Hu)



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1. Description of Equipment under Test (EUT)

Applicant	HON HAI Precision IND. CO., LTD.
Applicant Address	5F-1,5 Hsin-An Road Hsinchu, Science-Based Industrial Park Taiwan, R.O.C
Manufacturer	HON HAI Precision IND. CO., LTD.
Manufacturer Address	5F-1,5 Hsin-An Road Hsinchu, Science-Based Industrial Park Taiwan, R.O.C
Product Type	PCI-E Embedded Module
Trade Name	N/A
Model Number	TangoP1001
FCC ID	MCLT77Z29500
Hardware Version	Rev.F
Software Version	P1001.3.03_0.1
Frequency Range	824.2 - 848.8 MHz GPRS/EGPRS 850 1850.2 - 1909.8 MHz GPRS/EGPRS 1900 1852.4 - 1907.6 MHz WCDMA(RMC 12.2K)/HSDPA/HSUPA Band II 826.4 - 846.6 MHz WCDMA(RMC 12.2K)/HSDPA/HSUPA Band V 1710 - 1755 MHz LTE Band 4 704 - 716 MHz LTE Band 17
Transmit Power (conducted power)	GPRS/EGPRS 850: 1.778 W / 32.50 dBm GPRS/EGPRS 1900: 0.871 W / 29.40 dBm WCDMA(RMC 12.2K)/HSDPA/HSUPA Band II: 0.230 W / 23.62 dBm WCDMA(RMC 12.2K)/HSDPA/HSUPA Band V: 0.225 W / 23.53 dBm LTE Band 4: 0.201 W / 23.03 dBm LTE Band 17: 0.208 W / 23.18 dBm
Antenna for test	Tel Cab, T-AT314
Antenna Specification	GSM 850: 2.14 dBi PCS 1900: 2.14 dBi WCDMA Band II: 2.14 dBi WCDMA Band V: 2.14 dBi LTE Band 4: 2.14 dBi LTE Band 17: 2.14 dBi
Antenna Designation	External Antenna
Temperature Range	-30 ~ +70°C

The above equipment was tested by A Test Lab Techno Corp. For compliance with the requirements set forth in 47 CFR § 2.1091 & 47 CFR § 1.1310. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties



2. Human Exposure Assessment

Due to the design and installation of this product, it is not possible to conduct SAR evaluation. This is because client either manufactures or supplies the antenna(s) that will be used in the installation of this product. Therefore, this product will be evaluated as a mobile device per 47 CFR §1.1310 titled "Radiofrequency radiation exposure limits", generally referred to as MPE limits.

In 47 CFR § 2.1091, paragraph (b) defines a mobile device as "a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 cm is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. " This product is intended to be installed into a vehicle such that the unit is physically secured at one location. In the installation guide supplied with the product,

Client has made the following statement: "IMPORTANT: To meet the FCC's RF Exposure Guidelines, the antenna should be installed so there is at least 20 cm of separation between the body of the user and nearby persons and the antenna". Based on the installation of the transceiver and the antenna, the transmitters radiating structure is more than 20 cm from the user. Thus, this product is a "mobile device" as defined in section § 2.1091 paragraph (b).

Exposure evaluation

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = \frac{PG}{4\pi R^2}$$

Where

S: power density

P: power input to the antenna

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.



3. RF Output Power

Band	Date Rate	CH	Frequency (MHz)	Conducted power Avg.-Burst (dBm)	Worst Case
GPRS850	4Down1Up Duty factor 1/8	128	824.2	32.40	<input type="checkbox"/>
		190	836.6	32.50	<input checked="" type="checkbox"/>
		251	848.8	32.40	<input type="checkbox"/>
	3Down2Up Duty factor 2/8	128	824.2	30.50	<input type="checkbox"/>
		190	836.6	30.10	<input type="checkbox"/>
		251	848.8	29.80	<input type="checkbox"/>
	2Down3Up Duty factor 3/8	128	824.2	28.60	<input type="checkbox"/>
		190	836.6	28.40	<input type="checkbox"/>
		251	848.8	28.00	<input type="checkbox"/>
	1Down4Up Duty factor 4/8	128	824.2	27.40	<input type="checkbox"/>
		190	836.6	27.10	<input type="checkbox"/>
		251	848.8	26.90	<input type="checkbox"/>
EGPRS850	4Down1Up Duty factor 1/8	128	824.2	27.40	<input type="checkbox"/>
		190	836.6	27.50	<input checked="" type="checkbox"/>
		251	848.8	27.30	<input type="checkbox"/>
	3Down2Up Duty factor 2/8	128	824.2	25.40	<input type="checkbox"/>
		190	836.6	25.20	<input type="checkbox"/>
		251	848.8	25.10	<input type="checkbox"/>
	2Down3Up Duty factor 3/8	128	824.2	23.40	<input type="checkbox"/>
		190	836.6	23.20	<input type="checkbox"/>
		251	848.8	23.40	<input type="checkbox"/>
	1Down4Up Duty factor 4/8	128	824.2	22.30	<input type="checkbox"/>
		190	836.6	22.10	<input type="checkbox"/>
		251	848.8	22.00	<input type="checkbox"/>



Band	Date Rate	CH	Frequency (MHz)	Conducted power Avg.-Burst (dBm)	Worst Case
GPRS1900	4Down1Up Duty factor 1/8	512	1850.2	29.40	■
		661	1880.0	29.30	<input type="checkbox"/>
		810	1909.8	29.20	<input type="checkbox"/>
	3Down2Up Duty factor 2/8	512	1850.2	27.20	<input type="checkbox"/>
		661	1880.0	27.10	<input type="checkbox"/>
		810	1909.8	27.00	<input type="checkbox"/>
	2Down3Up Duty factor 3/8	512	1850.2	25.50	<input type="checkbox"/>
		661	1880.0	25.40	<input type="checkbox"/>
		810	1909.8	25.30	<input type="checkbox"/>
	1Down4Up Duty factor 4/8	512	1850.2	24.30	<input type="checkbox"/>
		661	1880.0	24.20	<input type="checkbox"/>
		810	1909.8	24.10	<input type="checkbox"/>
EGPRS1900	4Down1Up Duty factor 1/8	512	1850.2	26.50	■
		661	1880.0	26.40	<input type="checkbox"/>
		810	1909.8	26.30	<input type="checkbox"/>
	3Down2Up Duty factor 2/8	512	1850.2	24.40	<input type="checkbox"/>
		661	1880.0	24.30	<input type="checkbox"/>
		810	1909.8	24.20	<input type="checkbox"/>
	2Down3Up Duty factor 3/8	512	1850.2	22.50	<input type="checkbox"/>
		661	1880.0	22.40	<input type="checkbox"/>
		810	1909.8	22.30	<input type="checkbox"/>
	1Down4Up Duty factor 4/8	512	1850.2	21.30	<input type="checkbox"/>
		661	1880.0	21.20	<input type="checkbox"/>
		810	1909.8	21.10	<input type="checkbox"/>



Band	Date Rate	CH	Frequency (MHz)	Conducted power Time-Avg. (dBm)	Worst Case
WCDMA Band II	---	9262	1852.4	23.58	<input type="checkbox"/>
		9400	1880.0	23.59	<input type="checkbox"/>
		9538	1907.6	23.62	<input checked="" type="checkbox"/>
HSDPA Band II	1	9262	1852.4	23.37	<input type="checkbox"/>
		9400	1880.0	23.40	<input type="checkbox"/>
		9538	1907.6	23.44	<input type="checkbox"/>
	2	9262	1852.4	23.35	<input type="checkbox"/>
		9400	1880.0	23.39	<input type="checkbox"/>
		9538	1907.6	23.43	<input type="checkbox"/>
	3	9262	1852.4	22.86	<input type="checkbox"/>
		9400	1880.0	22.91	<input type="checkbox"/>
		9538	1907.6	22.94	<input type="checkbox"/>
	4	9262	1852.4	22.85	<input type="checkbox"/>
		9400	1880.0	22.89	<input type="checkbox"/>
		9538	1907.6	22.95	<input type="checkbox"/>
HSUPA Band II	1	9262	1852.4	21.33	<input type="checkbox"/>
		9400	1880.0	21.36	<input type="checkbox"/>
		9538	1907.6	21.43	<input type="checkbox"/>
	2	9262	1852.4	19.30	<input type="checkbox"/>
		9400	1880.0	19.35	<input type="checkbox"/>
		9538	1907.6	19.43	<input type="checkbox"/>
	3	9262	1852.4	20.30	<input type="checkbox"/>
		9400	1880.0	20.35	<input type="checkbox"/>
		9538	1907.6	20.44	<input type="checkbox"/>
	4	9262	1852.4	19.31	<input type="checkbox"/>
		9400	1880.0	19.35	<input type="checkbox"/>
		9538	1907.6	19.44	<input type="checkbox"/>
	5	9262	1852.4	21.30	<input type="checkbox"/>
		9400	1880.0	21.35	<input type="checkbox"/>
		9538	1907.6	21.42	<input type="checkbox"/>



Band	Date Rate	CH	Frequency (MHz)	Conducted power Time-Avg. (dBm)	Worst Case
WCDMA Band V	---	4132	826.4	23.53	<input checked="" type="checkbox"/>
		4183	836.6	23.48	<input type="checkbox"/>
		4233	846.6	23.22	<input type="checkbox"/>
HSDPA Band V	1	4132	826.4	23.37	<input type="checkbox"/>
		4183	836.6	23.29	<input type="checkbox"/>
		4233	846.6	23.02	<input type="checkbox"/>
	2	4132	826.4	23.36	<input type="checkbox"/>
		4183	836.6	23.28	<input type="checkbox"/>
		4233	846.6	23.01	<input type="checkbox"/>
	3	4132	826.4	22.89	<input type="checkbox"/>
		4183	836.6	22.80	<input type="checkbox"/>
		4233	846.6	22.52	<input type="checkbox"/>
	4	4132	826.4	22.90	<input type="checkbox"/>
		4183	836.6	22.80	<input type="checkbox"/>
		4233	846.6	22.54	<input type="checkbox"/>
HSUPA Band V	1	4132	826.4	21.31	<input type="checkbox"/>
		4183	836.6	21.05	<input type="checkbox"/>
		4233	846.6	20.55	<input type="checkbox"/>
	2	4132	826.4	19.32	<input type="checkbox"/>
		4183	836.6	19.04	<input type="checkbox"/>
		4233	846.6	18.53	<input type="checkbox"/>
	3	4132	826.4	20.35	<input type="checkbox"/>
		4183	836.6	20.07	<input type="checkbox"/>
		4233	846.6	19.55	<input type="checkbox"/>
	4	4132	826.4	19.32	<input type="checkbox"/>
		4183	836.6	19.03	<input type="checkbox"/>
		4233	846.6	18.52	<input type="checkbox"/>
	5	4132	826.4	21.28	<input type="checkbox"/>
		4183	836.6	21.00	<input type="checkbox"/>
		4233	846.6	20.49	<input type="checkbox"/>



Band	Channel Bandwidth	Modulation	CH	Frequency (MHz)	RB Configuration		Conducted power Time-Avg. (dBm)	Worst Case	
					Size	Offset			
LTE Band 4	5MHz	QPSK	19975	1712.5	1	0	21.63	<input type="checkbox"/>	
					1	24	21.37	<input type="checkbox"/>	
					12	6	21.57	<input type="checkbox"/>	
					25	0	21.51	<input type="checkbox"/>	
			20175	1732.5	1	0	23.03	<input checked="" type="checkbox"/>	
					1	24	23.01	<input type="checkbox"/>	
					12	6	22.53	<input type="checkbox"/>	
					25	0	22.51	<input type="checkbox"/>	
			20375	1752.5	1	0	21.51	<input type="checkbox"/>	
					1	24	21.47	<input type="checkbox"/>	
					12	6	21.54	<input type="checkbox"/>	
					25	0	21.48	<input type="checkbox"/>	
		16QAM	19975	1712.5	1	0	22.01	<input type="checkbox"/>	
					1	24	21.71	<input type="checkbox"/>	
					12	6	21.64	<input type="checkbox"/>	
					25	0	21.52	<input type="checkbox"/>	
			20175	1732.5	1	0	22.62	<input type="checkbox"/>	
					1	24	22.54	<input type="checkbox"/>	
					12	6	21.67	<input type="checkbox"/>	
					25	0	21.53	<input type="checkbox"/>	
			20375	1752.5	1	0	21.66	<input type="checkbox"/>	
					1	24	21.52	<input type="checkbox"/>	
					12	6	21.53	<input type="checkbox"/>	
					25	0	21.43	<input type="checkbox"/>	
	10MHz	QPSK	20000	1715.0	1	0	21.34	<input type="checkbox"/>	
					1	49	21.33	<input type="checkbox"/>	
					25	12	21.85	<input type="checkbox"/>	
					50	0	21.68	<input type="checkbox"/>	
			20175	1732.5	1	0	22.71	<input type="checkbox"/>	
					1	49	22.48	<input type="checkbox"/>	
					25	12	22.69	<input type="checkbox"/>	
					50	0	22.44	<input type="checkbox"/>	
			20350	1750.0	1	0	21.94	<input type="checkbox"/>	
					1	49	21.62	<input type="checkbox"/>	
					25	12	21.96	<input type="checkbox"/>	
					50	0	21.75	<input type="checkbox"/>	
			16QAM	20000	1715.0	1	0	21.83	<input type="checkbox"/>
						1	49	21.62	<input type="checkbox"/>
						25	12	21.77	<input type="checkbox"/>
						50	0	21.62	<input type="checkbox"/>
				20175	1732.5	1	0	21.67	<input type="checkbox"/>
						1	49	21.79	<input type="checkbox"/>
						25	12	21.73	<input type="checkbox"/>
						50	0	21.51	<input type="checkbox"/>
				20350	1750.0	1	0	21.67	<input type="checkbox"/>
						1	49	21.52	<input type="checkbox"/>
						25	12	21.65	<input type="checkbox"/>
						50	0	21.62	<input type="checkbox"/>



Band	Channel Bandwidth	Modulation	CH	Frequency (MHz)	RB Configuration		Conducted power Time-Avg. (dBm)	Worst Case
					Size	Offset		
LTE Band 17	5MHz	QPSK	23755	706.5	1	0	22.10	<input type="checkbox"/>
					1	24	22.63	<input type="checkbox"/>
					12	6	21.93	<input type="checkbox"/>
					25	0	21.86	<input type="checkbox"/>
			23790	710.0	1	0	22.46	<input type="checkbox"/>
					1	24	22.92	<input type="checkbox"/>
					12	6	22.41	<input type="checkbox"/>
					25	0	22.16	<input type="checkbox"/>
			23825	713.5	1	0	23.18	<input checked="" type="checkbox"/>
					1	24	21.83	<input type="checkbox"/>
					12	6	22.37	<input type="checkbox"/>
					25	0	22.19	<input type="checkbox"/>
		16QAM	23755	706.5	1	0	21.69	<input type="checkbox"/>
					1	24	22.06	<input type="checkbox"/>
					12	6	21.47	<input type="checkbox"/>
					25	0	20.90	<input type="checkbox"/>
			23790	710.0	1	0	22.02	<input type="checkbox"/>
					1	24	22.19	<input type="checkbox"/>
					12	6	21.54	<input type="checkbox"/>
					25	0	21.25	<input type="checkbox"/>
			23825	713.5	1	0	22.51	<input type="checkbox"/>
					1	24	21.35	<input type="checkbox"/>
					12	6	21.47	<input type="checkbox"/>
					25	0	21.19	<input type="checkbox"/>
	10MHz	QPSK	23780	709.0	1	0	21.84	<input type="checkbox"/>
					1	49	22.65	<input type="checkbox"/>
					25	12	22.62	<input type="checkbox"/>
					50	0	22.41	<input type="checkbox"/>
			23790	710.0	1	0	21.84	<input type="checkbox"/>
					1	49	21.74	<input type="checkbox"/>
					25	12	22.38	<input type="checkbox"/>
					50	0	22.00	<input type="checkbox"/>
			23800	711.0	1	0	21.35	<input type="checkbox"/>
					1	49	21.23	<input type="checkbox"/>
					25	12	22.44	<input type="checkbox"/>
					50	0	21.99	<input type="checkbox"/>
		16QAM	23780	709.0	1	0	21.35	<input type="checkbox"/>
					1	49	21.78	<input type="checkbox"/>
					25	12	21.76	<input type="checkbox"/>
					50	0	21.48	<input type="checkbox"/>
			23790	710.0	1	0	21.14	<input type="checkbox"/>
					1	49	21.04	<input type="checkbox"/>
					25	12	21.57	<input type="checkbox"/>
					50	0	21.18	<input type="checkbox"/>
			23800	711.0	1	0	21.28	<input type="checkbox"/>
					1	49	20.92	<input type="checkbox"/>
					25	12	21.47	<input type="checkbox"/>
					50	0	20.94	<input type="checkbox"/>



4. Test Result

Band	Data Rate or Sub-Test	Frequency (MHz)	Limit (mw)	Distance (cm) [R]	Power (dBm) [P]	ANT Gain (dBi) [G]	[P]+ [G] (W) [TP]	Power Density [S]	Min. distance (cm)
GPRS 850	4Down1Up	824.2	0.549	20	32.40	2.14	2.844	0.043	20cm
		836.6	0.558	20	32.50	2.14	2.911	0.044	20cm
		848.8	0.566	20	32.40	2.14	2.844	0.043	20cm
EGPRS 850	4Down1Up	824.2	0.549	20	27.40	2.14	0.899	0.014	20cm
		836.6	0.558	20	27.50	2.14	0.920	0.014	20cm
		848.8	0.566	20	27.30	2.14	0.879	0.013	20cm
GPRS 1900	4Down1Up	1850.2	1.000	20	29.40	2.14	1.426	0.022	20cm
		1880.0	1.000	20	29.30	2.14	1.393	0.021	20cm
		1909.8	1.000	20	29.20	2.14	1.361	0.021	20cm
EGPRS 1900	4Down1Up	1850.2	1.000	20	26.50	2.14	0.731	0.011	20cm
		1880.0	1.000	20	26.40	2.14	0.714	0.011	20cm
		1909.8	1.000	20	26.30	2.14	0.698	0.011	20cm
WCDMA Band II	-----	1852.4	1.000	20	23.58	2.14	0.373	0.045	20cm
		1880.0	1.000	20	23.59	2.14	0.374	0.045	20cm
		1909.7	1.000	20	23.62	2.14	0.377	0.046	20cm
HSDPA Band II	1	1852.4	1.000	20	23.37	2.14	0.356	0.043	20cm
		1880.0	1.000	20	23.40	2.14	0.358	0.043	20cm
		1909.7	1.000	20	23.44	2.14	0.361	0.044	20cm
HSUPA Band II	1	1852.4	1.000	20	21.33	2.14	0.222	0.027	20cm
		1880.0	1.000	20	21.36	2.14	0.224	0.027	20cm
		1909.7	1.000	20	21.43	2.14	0.228	0.028	20cm
WCDMA Band V	-----	826.4	0.551	20	23.53	2.14	0.369	0.045	20cm
		836.4	0.558	20	23.48	2.14	0.365	0.044	20cm
		846.6	0.564	20	23.22	2.14	0.344	0.042	20cm
HSDPA Band V	1	826.4	0.551	20	23.37	2.14	0.356	0.043	20cm
		836.4	0.558	20	23.29	2.14	0.349	0.042	20cm
		846.6	0.564	20	23.02	2.14	0.328	0.040	20cm
HSUPA Band V	1	826.4	0.551	20	21.31	2.14	0.221	0.027	20cm
		836.4	0.558	20	21.05	2.14	0.208	0.025	20cm
		846.6	0.564	20	20.55	2.14	0.186	0.023	20cm



Band	Channel Bandwidth	Modulation	Frequency (MHz)	Limit (mw)	Distance (cm) [R]	Power (dBm) [P]	ANT Gain (dBi) [G]	[P]+ [G] (W) [TP]	Power Density [S]	Min. distance (cm)
LTE Band 4	5 MHz	QPSK	1712.5	1.000	20	21.63	2.14	0.238	0.029	20cm
			1732.5	1.000	20	23.03	2.14	0.329	0.040	20cm
			1752.5	1.000	20	21.51	2.14	0.232	0.028	20cm
		16QAM	1712.5	1.000	20	22.01	2.14	0.260	0.031	20cm
			1732.5	1.000	20	22.62	2.14	0.299	0.036	20cm
			1752.5	1.000	20	21.66	2.14	0.240	0.029	20cm
	10 MHz	QPSK	1715.0	1.000	20	21.34	2.14	0.223	0.027	20cm
			1732.5	1.000	20	22.71	2.14	0.305	0.037	20cm
			1750.0	1.000	20	21.94	2.14	0.256	0.031	20cm
		16QAM	1715.0	1.000	20	21.83	2.14	0.249	0.030	20cm
			1732.5	1.000	20	21.67	2.14	0.240	0.029	20cm
			1750.0	1.000	20	21.67	2.14	0.240	0.029	20cm
LTE Band 17	5 MHz	QPSK	706.5	0.471	20	22.10	2.14	0.265	0.032	20cm
			710.0	0.473	20	22.46	2.14	0.288	0.035	20cm
			713.5	0.476	20	23.18	2.14	0.340	0.041	20cm
		16QAM	706.5	0.471	20	21.69	2.14	0.242	0.029	20cm
			710.0	0.473	20	22.02	2.14	0.261	0.032	20cm
			713.5	0.476	20	22.51	2.14	0.292	0.035	20cm
	10 MHz	QPSK	709.0	0.473	20	22.65	2.14	0.301	0.037	20cm
			710.0	0.473	20	21.74	2.14	0.244	0.030	20cm
			711.0	0.474	20	21.23	2.14	0.217	0.026	20cm
		16QAM	709.0	0.473	20	21.78	2.14	0.247	0.030	20cm
			710.0	0.473	20	21.04	2.14	0.208	0.025	20cm
			711.0	0.474	20	20.92	2.14	0.202	0.025	20cm