



FCC RF Test Report

APPLICANT : Honeywell International Inc.
Honeywell Safety and Productivity Solutions
EQUIPMENT : Mobile Computer
BRAND NAME : Honeywell
MODEL NAME : CT40P-L1N
FCC ID : HD5-CT40PL1N
STANDARD : 47 CFR Part 2, and 90(S)
CLASSIFICATION : PCS Licensed Transmitter Held to Ear (PCE)

The product was received on Jul. 24, 2020 and completely tested on Aug. 30, 2020. We, Sporton International (Kunshan) Inc., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.26-2015 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International (Kunshan) Inc., the test report shall not be reproduced except in full.

Jason Jia

Reviewed by: Jason Jia / Supervisor

James Huang

Approved by: James Huang / Manager



Sporton International (Kunshan) Inc.

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People's Republic of China



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FW072404	Rev. 01	Initial issue of report	Sep. 03, 2020



1 General Description

1.1 Applicant

Honeywell International Inc.
Honeywell Safety and Productivity Solutions
9680 Old Bailes Rd. Fort Mill, SC 29707 United States

1.2 Manufacturer

Honeywell International Inc.
Honeywell Safety and Productivity Solutions
9680 Old Bailes Rd. Fort Mill, SC 29707 United States

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	Mobile Computer
Brand Name	Honeywell
Model Name	CT40P-L1N
FCC ID	HD5-CT40PL1N
EUT supports Radios application	CDMA/GSM/WCDMA/LTE/NFC/GNSS WLAN 2.4GHz 802.11b/g/n (HT20/HT40) WLAN 5GHz 802.11a/n/ac (HT20/HT40/VHT20/VHT40/VHT80) Bluetooth BR / EDR / LE
HW Version	V2.0
SW Version	OS.03.003-HON.02.001
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Product Specification of Equipment Under Test

Product Specification subjective to this standard	
Tx Frequency	Band 26: 814.7 ~ 823.3 MHz BC10 : 817.9 ~ 823.1 MHz
Rx Frequency	Band 26: 859.7 ~ 868.3 MHz BC10 : 862.9 ~ 868.1 MHz
Bandwidth	Band 26: 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz
Maximum Output Power to Antenna	Band 26 : 22.41 dBm BC10 : 24.76 dBm
Antenna Type	IFA Antenna
Type of Modulation	LTE: QPSK / 16QAM /64QAM CDMA2000 1xRTT: QPSK CDMA2000 1xEV-DO: QPSK/8PSK



1.5 Maximum Conducted Power, Frequency Tolerance and Emission Designator

FCC Rule	System	Type of Modulation	Frequency Tolerance (ppm)	Emission Designator	Maximum Conducted power(W)
Part 90S	CDMA2000 BC10 1xRTT	QPSK	-	-	0.2992

FCC Rule	System	Type of Modulation	BW	Frequency Tolerance (ppm)	Emission Designator	Maximum Conducted power(W)
Part 90S	LTE Band 26	QPSK	1.4 MHz	-	-	0.1742
Part 90S	LTE Band 26	16QAM	1.4 MHz	-	-	0.1521
Part 90S	LTE Band 26	64QAM	1.4 MHz	-	-	0.1250
Part 90S	LTE Band 26	QPSK	3 MHz	-	-	0.1738
Part 90S	LTE Band 26	16QAM	3 MHz	-	-	0.1503
Part 90S	LTE Band 26	64QAM	3 MHz	-	-	0.1225
Part 90S	LTE Band 26	QPSK	5 MHz	-	-	0.1734
Part 90S	LTE Band 26	16QAM	5 MHz	-	-	0.1524
Part 90S	LTE Band 26	64QAM	5 MHz	-	-	0.1236
Part 90S	LTE Band 26	QPSK	10 MHz	-	-	0.1738
Part 90S	LTE Band 26	16QAM	10 MHz	-	-	0.1524
Part 90S	LTE Band 26	64QAM	10 MHz	-	-	0.1222
Part 90S	LTE Band 26	QPSK	15 MHz	-	-	0.1722
Part 90S	LTE Band 26	16QAM	15 MHz	-	-	0.1510
Part 90S	LTE Band 26	64QAM	15 MHz	-	-	0.1239

1.6 Modification of EUT

No modifications are made to the EUT during all test items.

1.7 Testing Site

Sporton International (Kunshan) Inc. is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Test Firm	Sporton International (Kunshan) Inc.		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158 FAX : +86-512-57900958		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	TH01-KS 03CH04-KS	CN1257	314309

1.8 Test Software

Item	Site	Manufacture	Name	Version
1.	03CH04-KS	AUDIX	E3	6.2009-8-24a

1.9 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ 47 CFR Part 2, 90(S)
- ♦ ANSI C63.26-2015
- ♦ FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- ♦ FCC KDB 971168 D02 Misc Rev Approv License Devices v02r01

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.



1.10 Re-use of Measured Data

1.10.1 Introduction Section

This application re-uses data collected on a similar device. The subject device of this application (Model: CT40P-L1N, FCC ID: HD5-CT40PL1N) is electrically identical to the reference device (Model: CT40-L1N, FCC ID: HD5-CT40L1N) for the portions of the circuitry corresponding to the data being re-used, as treated by KDB Publication 484596 D01.

1.10.2 Difference Section

For details concerning the similarity with respect to component placement, mechanical/electrical design etc., please refer to the Product Equality Declaration.

The re-used RF data includes the following bands provided in Appendix C (Sporton RF Report No. FW850409A/FW850409B) for the reference device Model: CT40-L1N, FCC ID: HD5-CT40L1N).

1.10.3 Reference detail Section:

Equipment Class	Reference FCC ID	Report Number	Report Title/Section
PCE (CDMA/LTE)	HD5-CT40L1N	Part90S (Report No. FW850409A/FW850409B)	All sections applicable except conducted power.

1.10.4 Spot Check Verification Data Section

In order to confirm hardware similarity of the subject device with the reference device, spot check measurements were performed on the subject device for the following test items, the test result were consistent with FCC ID: HD5-CT40L1N.

Assertions concerning the similarity of these devices are based on representations by the applicant. The applicant accepts full responsibility for the validity of the similarity claim, and for the determination that verification test data are sufficient to support it.

Test Item	Mode	HD5-CT40L1N Worst Result	HD5-CT40PL1N Worst Result	Difference (dB)
Radiated Spurious Emission (dBuV/m)	Part 90s -LTE 26	-41.99	-46.91	-4.92

2 Test Configuration of Equipment Under Test

2.1 Test Mode

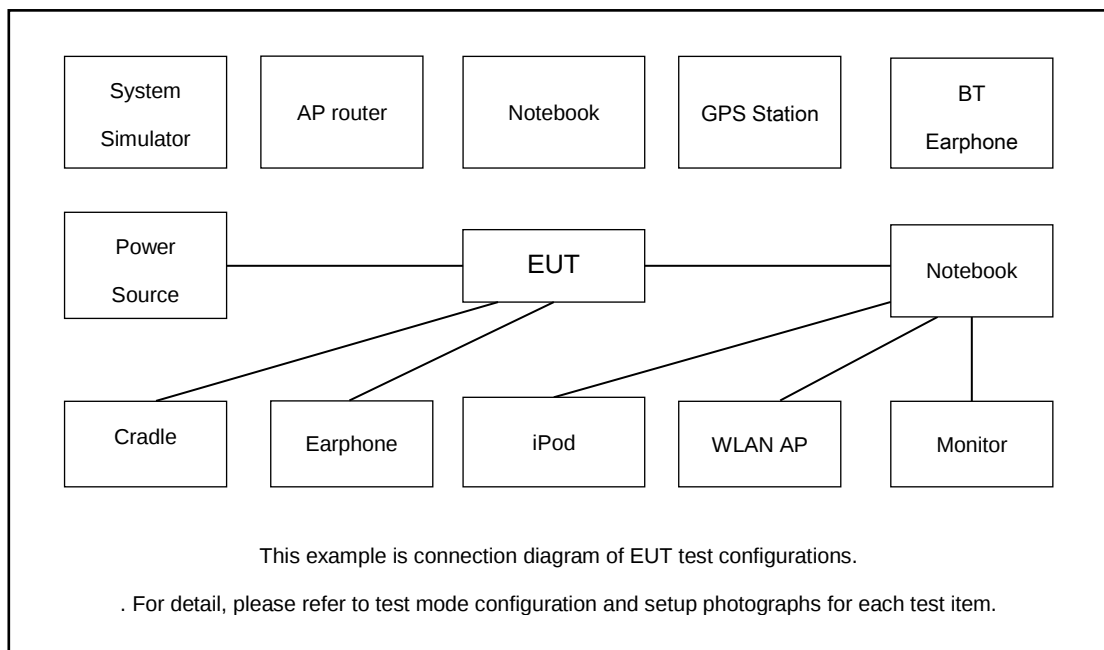
During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission.

Frequency range investigated for radiated emission is 30 MHz to 9000 MHz.

Test Items	Band	Bandwidth (MHz)						Modulation		RB #			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	1	Half	Full	L	M	H
Max. Output Power	26	v	v	v	v	v	-	v	v	v	v	v	v	v	v
Note	1. The mark "v" means that this configuration is chosen for testing 2. The mark "-" means that this bandwidth is not supported. 3. LTE Band26 transmit frequency for part22 rule is 824MHz-849MHz, for part90 rule is 814MHz-824MHz. ERP over 15MHz bandwidth complies the ERP limit line of part22 rule, therefore ERP of the partial frequency spectrum which falls within part 22 also complies.														

Test Modes		
Band	Radiated TCs	Conducted TCs
CDMA2000 BC10	■ 1xRTT Link	■ 1xRTT Link

2.2 Connection Diagram of Test System



2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m

2.4 Frequency List of Low/Middle/High Channels

Frequency List				
Band	Channel/Frequency(MHz)	Lowest	Middle	Highest
CDMA200 BC10	Channel	476	580	684
	Frequency	817.9	820.5	823.1

LTE Band 26 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
15	Channel	26765	-	-
	Frequency	821.5	-	-
10	Channel	-	26740	-
	Frequency	-	819	-
5	Channel	26715	26740	26765
	Frequency	816.5	819	821.5
3	Channel	26705	26740	26775
	Frequency	815.5	819	822.5
1.4	Channel	26697	26740	26783
	Frequency	814.7	819	823.3

3 Test Result

3.1 Conducted Output Power Measurement

3.1.1 Description of the Conducted Output Power Measurement

A system simulator was used to establish communication with the EUT. Its parameters were set to enforce EUT transmitting at the maximum power. The measured power in the radio frequency on the transmitter output terminals shall be reported.

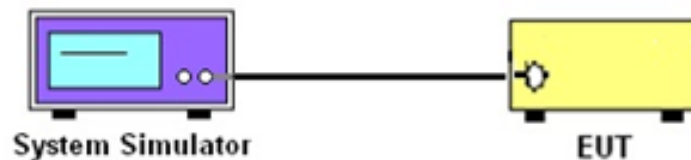
3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.1.3 Test Procedures

1. The transmitter output port was connected to the system simulator.
2. Set EUT at maximum power through the system simulator.
3. Select lowest, middle, and highest channels for each band and different modulation.
4. Measure and record the power level from the system simulator.

3.1.4 Test Setup



3.1.5 Test Result of Conducted Output Power

Please refer to Appendix A.



4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Nov. 02, 2019	Aug. 30, 2020	Nov. 01, 2020	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	-40~+150°C	Oct. 28, 2019	Aug. 30, 2020	Oct. 27, 2020	Conducted (TH01-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55150244	10Hz-44G,MAX 30dB	Apr. 15, 2020	Aug. 03, 2020	Apr. 14, 2021	Radiation (03CH04-KS)
Bilog Antenna	TeseQ	CBL6111D	49922	30MHz-1GHz	Jan. 03, 2020	Aug. 03, 2020	Jan. 02, 2021	Radiation (03CH04-KS)
Horn Antenna	Schwarzbeck	BBHA9120D	1356	1GHz~18GHz	Apr. 20, 2020	Aug. 03, 2020	Apr. 19, 2021	Radiation (03CH04-KS)
SHF-EHF Horn	Com-power	AH-840	101115	18GHz~40GHz	Nov. 10, 2019	Aug. 03, 2020	Nov. 09, 2020	Radiation (03CH04-KS)
Amplifier	SONOMA	310N	187289	9KHz-1GHz	Jan. 03, 2020	Aug. 03, 2020	Jan. 02, 2021	Radiation (03CH04-KS)
Amplifier	MITEQ	EM18G40G GA	060728	18~40GHz	Jan. 08, 2020	Aug. 03, 2020	Jan. 07, 2021	Radiation (03CH04-KS)
high gain Amplifier	MITEQ	AMF-7D-00 101800-30-1	2025788	1Ghz-18Ghz	Jan. 03, 2020	Aug. 03, 2020	Jan. 02, 2021	Radiation (03CH04-KS)
Amplifier	Keysight	83017A	MY57280106	500MHz~26.5GHz	Oct.15, 2019	Aug. 03, 2020	Oct.14, 2020	Radiation (03CH04-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Aug. 03, 2020	NCR	Radiation (03CH04-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Aug. 03, 2020	NCR	Radiation (03CH04-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Aug. 03, 2020	NCR	Radiation (03CH04-KS)

NCR: No Calibration Required



5 Uncertainty of Evaluation

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI 63.26-2015. All the measurement uncertainty value were shown with a coverage $K=2$ to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.3dB
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Uncertainty of Radiated Emission Measurement (1GHz ~ 18GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.8dB
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Appendix A. Test Results of Conducted Test

Conducted Output Power (Average power)

Conducted Power (*Unit: dBm)			
Band	CDMA2000 BC10		
Channel	476	580	684
Frequency	817.9	820.5	823.1
RC1 SO55	24.76	24.57	24.62
RC3 SO55	24.65	24.55	24.62
RC3 SO32 (F+SCH)	24.74	24.45	24.55
RC3 SO32 (+SCH)	24.73	24.43	24.52
RTAP 153.6Kbps	24.75	24.76	24.59
RETAP 4096Bits	24.72	24.45	24.56



LTE Band 26 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
15	1	0	QPSK	22.36	-	-
15	1	37		22.33		
15	1	74		22.30		
15	36	0		21.43		
15	36	20		21.43		
15	36	39		21.46		
15	75	0		21.42		
15	1	0	16-QAM	21.73		
15	1	37		21.79		
15	1	74		21.69		
15	36	0		20.57		
15	36	20		20.55		
15	36	39		20.59		
15	75	0		20.54		
15	1	0	64-QAM	20.76		
15	1	37		20.93		
15	1	74		20.82		
15	36	0		19.67		
15	36	20		19.71		
15	36	39		19.64		
15	75	0		19.64		



LTE Band 26 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
10	1	0	QPSK		22.23	
10	1	25			22.30	
10	1	49			22.40	
10	25	0			21.48	
10	25	12			21.43	
10	25	25			21.43	
10	50	0			21.45	
10	1	0	16-QAM	-	21.74	-
10	1	25			21.83	
10	1	49			21.81	
10	25	0			20.62	
10	25	12			20.57	
10	25	25			20.48	
10	50	0			20.61	
10	1	0	64-QAM		20.75	
10	1	25			20.73	
10	1	49			20.87	
10	25	0			19.60	
10	25	12			19.61	
10	25	25			19.55	
10	50	0			19.61	



LTE Band 26 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	0	QPSK	22.39	22.36	22.33
5	1	12		22.39	22.36	22.36
5	1	24		22.33	22.38	22.29
5	12	0		21.35	21.47	21.41
5	12	7		21.33	21.46	21.39
5	12	13		21.46	21.46	21.29
5	25	0		21.39	21.45	21.30
5	1	0	16-QAM	21.75	21.67	21.67
5	1	12		21.83	21.83	21.44
5	1	24		21.79	21.67	21.69
5	12	0		20.51	20.57	20.50
5	12	7		20.65	20.63	20.57
5	12	13		20.54	20.63	20.46
5	25	0		20.56	20.58	20.52
5	1	0	64-QAM	20.92	20.92	20.77
5	1	12		20.86	20.81	20.67
5	1	24		20.80	20.84	20.83
5	12	0		19.54	19.69	19.48
5	12	7		19.55	19.69	19.56
5	12	13		19.66	19.68	19.46
5	25	0		19.63	19.62	19.45



LTE Band 26 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
3	1	0	QPSK	22.30	22.28	22.34
3	1	8		22.30	22.40	22.37
3	1	14		22.27	22.40	22.27
3	8	0		21.61	21.63	21.53
3	8	4		21.60	21.54	21.56
3	8	7		21.58	21.65	21.57
3	15	0		21.57	21.62	21.50
3	1	0	16-QAM	21.65	21.76	21.77
3	1	8		21.58	21.56	21.67
3	1	14		21.57	21.75	21.65
3	8	0		20.58	20.69	20.50
3	8	4		20.61	20.67	20.65
3	8	7		20.52	20.61	20.46
3	15	0		20.45	20.57	20.46
3	1	0	64-QAM	20.56	20.78	20.64
3	1	8		20.80	20.70	20.65
3	1	14		20.71	20.88	20.63
3	8	0		19.61	19.66	19.50
3	8	4		19.59	19.65	19.55
3	8	7		19.52	19.61	19.44
3	15	0		19.46	19.50	19.45



LTE Band 26 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
1.4	1	0	QPSK	22.24	22.33	22.21
1.4	1	3		22.32	22.28	22.32
1.4	1	5		22.29	22.41	22.17
1.4	3	0		22.31	22.34	22.26
1.4	3	1		22.38	22.40	22.37
1.4	3	3		22.30	22.38	22.30
1.4	6	0	16-QAM	21.31	21.45	21.24
1.4	1	0		21.77	21.73	21.51
1.4	1	3		21.70	21.66	21.60
1.4	1	5		21.51	21.82	21.59
1.4	3	0		21.47	21.52	21.35
1.4	3	1		21.53	21.61	21.42
1.4	3	3		21.40	21.58	21.34
1.4	6	0	64-QAM	20.41	20.58	20.31
1.4	1	0		20.80	20.97	20.84
1.4	1	3		20.95	20.84	20.90
1.4	1	5		20.81	20.89	20.83
1.4	3	0		20.70	20.84	20.58
1.4	3	1		20.79	20.84	20.62
1.4	3	3		20.72	20.81	20.67
1.4	6	0		19.67	19.67	19.49



Appendix C. Reference Report

Please refer to Sporton report number FW850409A/FW850409B which is issued separately.