



Spot Check Evaluation

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REVISION HISTORY

VERSION	DESCRIPTION	ISSUED DATE
Rev. 01	Initial issue of report	May 22, 2017



1. Introduction Section

The original model (FCC ID: IHDT56WB4) and the variant model (FCC ID: IHDT56WB2) has identical PCB layout, antenna, SW implementation for Bluetooth/Wi-Fi/NFC/GPS/ GSM/WCDMA/LTE. Based on their similarity, the FCC Part 15C (equipment class: DTS, DSS, DXX) .Part 15E (equipment class: NII) and Part 24, 27 (equipment class: PCS) test data issued test data of IHDT56WB2 references the test data of IHDT56WB4

The original model (FCC ID: IHDT56WB1) and the variant model (FCC ID: IHDT56WB2) has identical PCB layout, antenna, SW implementation for CDMA. Based on their similarity, Part 24, (equipment class: PCS) test data issued test data of IHDT56WB2 references the test data of IHDT56WB1

The applicant takes full responsibility that the test data as referenced in this report represent compliance for this FCC ID (FCC ID: IHDT56WB2).



2. Difference Section

The original model (FCC ID: IHDT56WB4) and the variant model (FCC ID: IHDT56WB2) has identical PCB layout, antenna, SW implementation for Bluetooth/Wi-Fi/NFC/GPS/ GSM/WCDMA/LTE. The details of similarity and difference can be found in the Operating Description.

The original model (FCC ID: IHDT56WB1) and the variant model (FCC ID: IHDT56WB2) has identical PCB layout, antenna, SW implementation for CDMA. The details of similarity and difference can be found in the Operating Description.

Cellular transmitter RF components are different in IHDT56WB2 to support capability for different cellular bands.

The product specification is outlined in the following table:

FCC ID			IHDT56WB4	IHDT56WB1	IHDT56WB2
Wireless Tech	Mode		Frequency (MHz)		
GSM	GSM Voice GPRS (GMSK) EDGE (8PSK)	Multi-Slot Class 12 DTM: No	850/1900	850/1900	850/1900
UMTS	AMR/RCM12.2Kbps HSDPA/HSUPA/DC-HSDPA		B5/B4/B2	B5/B2	B5/B4/B2
CDMA	SO32/SO55/RTAP153.6Kbps/ RETAP 4096Bits		-	BC0/BC1/BC10	BC0/BC1/BC10
LTE (FDD)	QPSK 16QAM 64QAM		B2/B4/B5/B7/B 12/B17/ B25/B26/B30/B 38/B41/ B66	B2/B4/B5/B7/ B12//B13/B17/ B25/B26/B66	B2/B4/B5/B12/ B13/B17/B25/ B26/B41
Wi-Fi	11b/11g/11n(HT20)		2412-2462		
	11a/11n(HT20)/11n(HT40)		5180-5240		
	11ac (VHT20)/11ac (VHT40)		5260-5320		
	11ac (VHT80)		5500-5720		
			5745-5825		
Bluetooth	V5.0		2402-2480 MHz		
NFC	ASK		13.56 MHz		



3. Spot Check Verification Data Section

Summary of the spot check:

Test Item	Mode	IHDT56WB4 Worst Result	IHDT56WB2 Worst Result	Difference (dB)
Average Conducted Power (dBm)	802.11b	18.90	18.87	0.03
	802.11g	18.58	18.56	0.02
	11n HT20	18.62	18.51	0.11
	11ac VHT20	18.58	18.48	0.1
	BT (1Mbps)	14.81	15.43	-0.62
	BT (2Mbps)	9.22	9.62	-0.4
	BT (3Mbps)	9.25	9.72	-0.47
	BT-LE(1Mbps)	9.18	9.48	-0.3
	BT-LE(2Mbps)	9.15	9.41	-0.26
	11a, 5.2GHz	20.99	20.96	0.03
	11n HT20, 5.2GHz	20.98	20.97	0.01
	11n HT40, 5.2GHz	20.42	20.22	0.2
	11ac VHT20, 5.2GHz	20.99	20.97	0.02
	11ac VHT40, 5.2GHz	20.49	20.27	0.22
	11ac VHT80, 5.2GHz	18.40	18.37	0.03
	11a, 5.3GHz	21.17	21.00	0.17
	11n HT20, 5.3GHz	21.19	20.95	0.24
	11n HT40, 5.3GHz	20.27	19.96	0.31
	11ac VHT20, 5.3GHz	21.22	20.88	0.34
	11ac VHT40, 5.3GHz	20.31	19.89	0.42
	11ac VHT80, 5.3GHz	16.97	16.92	0.05
	11a, 5.5GHz	21.34	21.01	0.33
	11n HT20, 5.5GHz	21.29	21.08	0.21
	11n HT40, 5.5GHz	20.58	20.35	0.23
	11ac VHT20, 5.5GHz	21.41	21.05	0.36
	11ac VHT40, 5.5GHz	20.60	20.25	0.35
	11ac VHT80, 5.5GHz	21.14	20.76	0.38
	11a, 5.8GHz	21.07	20.54	0.53
	11n HT20, 5.8GHz	21.06	20.58	0.48
	11n HT40, 5.8GHz	20.50	19.79	0.71
	11ac VHT20, 5.8GHz	21.20	20.67	0.53
	11ac VHT40, 5.8GHz	20.52	19.99	0.53
	11ac VHT80, 5.8GHz	21.21	20.54	0.67
	GSM1900(GPRS)	29.46	29.56	-0.1
	GSM1900(EDGE)	25.17	25.00	0.17
	UMTS B2 (RMC 12.2Kbps)	22.70	22.46	0.24
	UMTS B4 (RMC 12.2Kbps)	22.51	22.37	0.14
	LTE B2 (FDD - QPSK)	23.06	22.81	0.25
	LTE B4 (FDD - QPSK)	22.92	22.84	0.08
	LTE B25 (FDD - QPSK)	22.92	23.01	-0.09
	IMEI of test sample	353311080000163 353311080000700	990007530005260 990007530005609	
	Test date	2017/04/01~2017/04/26	2017/03/31~2017/05/16	
	Mode	IHDT56WB1 Worst Result	IHDT56WB2 Worst Result	Difference (dB)
	CDMA BC1 1XRTT	23.51	23.97	-0.46
	CDMA BC1 1xEV-DO	23.52	23.92	-0.40
	IMEI of test sample	353310080024744	990007530005260	
	Test date	2017/04/18~2017/04/21	2017/04/19~2017/04/21	



FCC Test Report

Test Item	Mode	IHDT56WB4 Worst Result	IHDT56WB2 Worst Result	Difference (dB)
Radiated Spurious Emission (Band Edge. Harmonic) (dBuV/m)	802.11b	53.18	53.40	-0.22
	802.11n-HT20	53.70	52.35	1.35
	BT (3Mbps)	55.60	56.13	-0.53
	BT-LE(1Mbps)	43.15	43.57	-0.42
	BT-LE(2Mbps)	44.33	44.19	0.14
	11n HT40, 5.2GHz	53.31	53.55	-0.24
	11n HT40, 5.3GHz	53.02	50.86	2.16
	11n HT80, 5.5GHz	53.73	53.88	-0.15
	11a, 5.8GHz	44.94	43.03	1.91
	GSM 1900	-52.20	-51.35	0.85
	GSM 1900 (EDGE)	-58.07	-58.22	-0.15
	UMTS B2 (RMC 12.2Kbps)	-48.22	-50.45	-2.23
	LTE B2 (FDD - QPSK)	-37.66	-35.54	2.12
	LTE B4 (FDD - QPSK)	-42.82	-43.49	-0.67
	LTE B25 (FDD - QPSK)	-39.93	-42.09	-2.16
NFC (dBuV/m)	IMEI of test sample	353311080000163 353311080000221	990007530003398 990007530007308 990007530005609	
	Test date	2017/04/08~2017/04/26	2017/04/27~2017/05/13	
	RSE (30MHz to 1G)	34.18	35.37	-1.19
	IMEI of test sample	353311080000163	990007530007308	
	Test date	2017/04/08	2017/04/21	
Test Item	Mode	IHDT56WB1 Worst Result	IHDT56WB2 Worst Result	Difference (dB)
Radiated Spurious Emission (Band Edge. Harmonic) (dBuV/m)	CDMA BC1 1XRTT	-46.85	-48.15	-1.3
	CDMA BC1 1xEV-DO	-48.32	-46.64	1.68
	IMEI of test sample	353310080024686	990007530007308	
	Test date	2017/04/20~2017/04/24	2017/04/19~2017/04/21	

**GSM/WCDMA /CDMA**

Maximum ERP/EIRP (W)	System	Type of Modulation	FCC ID IHDT56WB4	FCC ID IHDT56WB2
	GPRS1900	GMSK	0.9462	0.9683
	GSM1900 EDGE class 8	8PSK	0.3524	0.3388
	WCDMA Band II RMC 12.2Kbps	BPSK	0.1995	0.1888
	WCDMA Band IV RMC 12.2Kbps	BPSK	0.1589	0.1849
	System	Type of Modulation	FCC ID IHDT56WB1	FCC ID IHDT56WB2
	CDMA BC1 1XRTT	QPSK	0.2377	0.2673
	CDMA BC1 1xEV-DO	QPSK	0.2410	0.2642

LTE

Maximum ERP/EIRP (W)	System	Type of Modulation	BW (MHz)	FCC ID IHDT56WB4	FCC ID IHDT56WB2
	LTE B2	QPSK	20	0.2075	0.2046
		16QAM	15	0.1816	0.1766
		64QAM	20	0.1626	0.1671
	LTE B4	QPSK	20	0.2099	0.2061
		16QAM	20	0.1782	0.1734
		64QAM	20	0.1652	0.1652
	LTE B25	QPSK	20	0.1667	0.1702
		16QAM	20	0.1426	0.1422
		64QAM	20	0.1030	0.1030



Conclusion:

Radiated spurious emission test against the variant model for non-cellular part based on the worst-case condition from the original model was performed in this filing to demonstrate the test data from original model remains representative for the variant model.

Based on the spot check test result (power levels measured are within 1dB, and the worst case of RSE spot check verification based on the worst condition from the original model is within 3dB, and are compliance with the limits), the test data from the original model is representative for the variant model.

The unwanted, harmonics, radiated spurious emission is reported peak measurement only due to spurious lower than 20dB than the limit, 74dBuv/m,



4. Reference detail Section

Rule Part	Equipment Class	Wireless Technology	Frequency Band (MHz)	Reference FCC ID	Type Grant/ Permissive Change	Reference Report Title	Reference Application	Reference Report Sections
15C	DTS	Bluetooth – LE Wii-Fi	2400~2483.5	IHDT56WB4	Original Grant	FCC RF Test Report	IHDT56WB2	Part 15C (FR733129B, FR733129C)
	DSS	Bluetooth	2400~2483.5	IHDT56WB4	Original Grant	FCC RF Test Report	IHDT56WB2	Part 15C (FR733129A)
	DXX	NFC	13.56	IHDT56WB4	Original Grant	FCC RF Test Report	IHDT56WB2	Part 15C (FR733129D)
15E	NII	Wi-Fi	5150~5250 5250~5350 5470~5725 5725~5850	IHDT56WB4	Original Grant	FCC RF Test Report	IHDT56WB2	Part 15E (FR733129E, FR733129F, FZ733129)
Part 24.27	PCS	GSM WCDMA	GSM(GPRS)1900 GSM(EDGE)1900 WCDMA B2/B4	IHDT56WB4	Original Grant	FCC RF Test Report	IHDT56WB2	Part 22.24.27 (FG733129-A)
Part 24.27	PCS	LTE	LTE B2/B4/B25	IHDT56WB4	Original Grant	FCC RF Test Report	IHDT56WB2	Part 22.24.27 (FG733129-B)
Part 24	PCS	CDMA	BC1	IHDT56WB1	Original Grant	FCC RF Test Report	IHDT56WB2	Part 22.24.27 (FG733129-02B)

End of this report