



Spot Check Evaluation

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REVISION HISTORY

VERSION	DESCRIPTION	ISSUED DATE
Rev. 01	Initial issue of report	Mar. 16, 2018



1. Introduction Section

The original model (FCC ID: IHDT56XE2) and the variant model (FCC ID: IHDT56XE4) has identical PCB layout, antenna, SW implementation for Bluetooth/Wi-Fi/GPS/NFC. Based on their similarity, the FCC Part 15C (equipment class: DTS, DSS, DXX) and Part 15E (equipment class: NII) test data issued test data of IHDT56XE4 references the test data of IHDT56XE2

The original model (FCC ID: IHDT56XE1) and the variant model (FCC ID: IHDT56XE4) has identical PCB layout, antenna, SW implementation for GSM/WCDMA/LTE. Based on their similarity, the FCC Part 22, 24, 27 (equipment class: PCE) test data issued test data of IHDT56XE4 references the test data of IHDT56XE1

The original model (FCC ID: IHDT56XE2) and the variant model (FCC ID: IHDT56XE4) has identical PCB layout, antenna, SW implementation for WCDMA/LTE. Based on their similarity, the FCC Part 22, 24 (equipment class: PCE) test data issued test data of IHDT56XE4 references the test data of IHDT56XE2

The applicant takes full responsibility that the test data as referenced in this report represent compliance for this FCC ID (FCC ID: IHDT56XE4).



2. Difference Section

The original model (FCC ID: IHDT56XE2) and the variant model (FCC ID: IHDT56XE4) has identical PCB layout, antenna, SW implementation for Bluetooth/Wi-Fi/NFC/GPS. The details of similarity and difference can be found in the Operating Description.

The original model (FCC ID: IHDT56XE1) and the variant model (FCC ID: IHDT56XE4) has identical PCB layout, antenna, SW implementation for GSM/WCDMA/LTE. Based on their similarity, the FCC Part 22, 24, 27 (equipment class: PCE) test data issued test data of IHDT56XE4 references the test data of IHDT56XE1

The original model (FCC ID: IHDT56XE2) and the variant model (FCC ID: IHDT56XE4) has identical PCB layout, antenna, SW implementation for WCDMA/LTE. Based on their similarity, the FCC Part 22, 24 (equipment class: PCE) test data issued test data of IHDT56XE4 references the test data of IHDT56XE2

Cellular transmitter RF components are different in IHDT56XE4, to support capability for different cellular bands.



The product specification is outlined in the following table:

FCC ID			IHDT56XE1	IHDT56XE2	IHDT56XE4
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/B4/B2	B5/B4/B2
LTE (FDD)	QPSK 16QAM 64QAM		B2/B4/B5/B7/B12/ B13/B14//B17/B2 5/B26/B30/B38/ B41/B66/B71	B2/B4/B5/B7/B13/ B66	B2/B4/B5/B7/B12/ B17/B66
CDMA	RC1/RC3		BC0/BC1/BC10	BC0/BC1	-
Wi-Fi	11b/11g/11n(HT20)		2412-2462		
	11a/11n(HT20)/11n(HT40)/		5180-5240		
	11ac(VHT20)/		5260-5320		
	11ac(VHT40)/		5500-5700		
	11ac(VHT80)		5745-5825 *5600-5650 notched		
Bluetooth	V5.0 LE		2402-2480 MHz		
NFC	ASK		13.56MHz		



3. Spot Check Verification Data Section

Summary of the spot check:

Test Item	Mode	IHDT56XE2 Worst Result	IHDT56XE4 Worst Result	Difference (dB)
Average Conducted Power (dBm)	802.11b	18.97	18.99	-0.02
	802.11g	16.97	16.94	0.03
	11n HT20	16.88	16.95	-0.07
	BT (1Mbps)	12.26	11.94	0.32
	BT (2Mbps)	9.79	9.25	0.54
	BT (3Mbps)	9.81	9.31	0.5
	BT-LE 1Mbps	12.15	12.03	0.12
	BT-LE 2Mbps	12.35	11.94	0.41
	11a, 5.2GHz	16.95	16.84	0.11
	11n HT20, 5.2GHz	16.80	16.99	-0.19
	11n HT40, 5.2GHz	15.85	15.98	-0.13
	11ac VHT20, 5.2GHz	15.97	15.93	0.04
	11ac VHT40, 5.2GHz	14.74	14.98	-0.24
	11ac VHT80, 5.2GHz	14.60	14.69	-0.09
	11a, 5.3GHz	16.88	16.89	-0.01
	11n HT20, 5.3GHz	16.81	16.99	-0.18
	11n HT40, 5.3GHz	15.79	15.95	-0.16
	11ac VHT20, 5.3GHz	15.91	15.96	-0.05
	11ac VHT40, 5.3GHz	14.59	14.99	-0.40
	11ac VHT80, 5.3GHz	14.56	14.61	-0.05
	11a, 5.5GHz	16.71	16.99	-0.28
	11n HT20, 5.5GHz	16.66	16.94	-0.28
	11n HT40, 5.5GHz	15.88	15.97	-0.09
	11ac VHT20, 5.5GHz	15.88	15.95	-0.07
	11ac VHT40, 5.5GHz	14.80	14.99	-0.19
	11ac VHT80, 5.5GHz	14.84	14.99	-0.15
	11a, 5.8GHz	16.96	16.99	-0.03
	11n HT20, 5.8GHz	16.93	16.97	-0.04
	11n HT40, 5.8GHz	15.96	15.87	0.09
	11ac VHT20, 5.8GHz	15.90	15.94	-0.04
	11ac VHT40, 5.8GHz	14.89	14.98	-0.09
	11ac VHT80, 5.8GHz	14.93	14.72	0.21
	UMTS B2 (RMC 12.2Kbps)	22.66	22.67	-0.01
	UMTS B5 (RMC 12.2Kbps)	22.50	22.59	-0.09
	LTE B2 (FDD - QPSK)	23.50	22.94	0.56
	LTE B5 (FDD - QPSK)	22.93	22.38	0.55
	IMEI of test sample	351885090004200 351885090004549	354102090009834 354102090009842 354102090009370 354102090009388	
	Test date	2018/01/18~2018/03/03	2018/01/18~2018/03/12	
	Mode	IHDT56XE1 Worst Result	IHDT56XE4 Worst Result	Difference (dB)
	GSM(GPRS) 1900	29.73	29.37	0.36
	EDGE 1900	25.48	25.52	-0.04-
	UMTS B4 (RMC 12.2Kbps)	22.74	22.70	0.04
	LTE B4 (FDD - QPSK)	22.84	22.59	0.25
	LTE B7 (FDD - QPSK)	22.83	22.30	0.53
	LTE B12 (FDD - QPSK)	22.78	22.37	0.41
	LTE B17 (FDD - QPSK)	22.73	22.33	0.40
	LTE B66 (FDD - QPSK)	22.93	22.71	0.22
	IMEI of test sample	351886090013043	354102090013794 354102090013802	
	Test date	2018/01/18~2018/03/02	2018/01/18~2018/03/07	



Test Item	Mode	IHDT56XE2 Worst Result	IHDT56XE4 Worst Result	Difference (dB)
Radiated Spurious Emission (Band Edge. Harmonic) (dBuV/m)	802.11b	42.45	41.95	0.5
	802.11gn(20)	49.86	50.04	-0.18
	BT	56.4	54.63	1.77
	BT-LE	47.26	46.79	0.47
	11a, 5.2GHz	40.69	40.99	-0.3
	11n HT40, 5.3GHz	50.67	49.21	1.46
	11n HT20, 5.5GHz	44.83	46.39	-1.56
	11n HT40, 5.8GHz	54.76	55.20	-0.44
	UMTS B4 (RMC 12.2Kbps)	-42.22	-42.36	-0.14
	LTE B4 (FDD - QPSK)	-37.93	-35.06	2.87
	LTE B12 (FDD - QPSK)	-35.66	-36.52	-0.86
	LTE B17 (FDD - QPSK)	-51.21	-53.02	-1.81
	LTE B66 (FDD - QPSK)	-40.91	-38.59	2.32
	IMEI of test sample	351885090010702 351885090010710	354102090018132 354102090018140 354102090013794 354102090013802	
	Test date	2018/01/18~2018/03/03	2018/01/18~2018/03/12	
NFC (dBuV/m)	RSE (30MHz to1GHz)	36.68	37.51	-0.83
	IMEI of test sample	351885090010710	354102090013836 354102090013844	
	Test date	2018/01/18~2018/03/02	2018/01/18~2018/02/08	

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	IHDT56XE2	Original Grant	FCC RF Test Report	IHDT56XE4	Part 15C (FR811821-02B, FR811821-02C)
	DSS	Bluetooth	2400~2483.5	IHDT56XE2	Original Grant	FCC RF Test Report	IHDT56XE4	Part 15C (FR811821-02A)
	DXX	NFC	13.56	IHDT56XE2	Original Grant	FCC RF Test Report	IHDT56XE4	Part 15C (FR811821-02D)
15E	NII	Wi-Fi	5150~5250 5250~5350 5470~5725 5725~5850	IHDT56XE2	Original Grant	FCC RF Test Report	IHDT56XE4	Part 15E (FR811821-02E, FR811821-02F)
Part 22.24.27	PCE	WCDMA	WCDMA B2/B5	IHDT56XE2	Original Grant	FCC RF Test Report	IHDT56XE4	Part 22.24.27 (FG811821-02A)
		LTE	LTE B2/B5	IHDT56XE2	Original Grant	FCC RF Test Report	IHDT56XE4	Part 22.24.27 (FG811821-02B)
		GSM/WCDMA	GSM 1900 (EDGE)1900 WCDMA B4	IHDT56XE1	Original Grant	FCC RF Test Report	IHDT56XE4	Part 22.24.27 (FG811821A)
		LTE	LTE B4/B7/B12/B17/B66	IHDT56XE1	Original Grant	FCC RF Test Report	IHDT56XE4	Part 22.24.27 (FG811821B)

End of this report