

FCC RADIO TEST REPORT FCC ID: 2AJMY-KDENTRY

Product: KD ENTRY

Trade Name: KEYDIY

Model Name: KD ENTRY

Serial Model: N/A

Report No.: NTEK-2015NT08278642F1

Prepared for

KEYDIY HK TECH LIMITED

Room1318-19, 13/F, Hollywood Plaza, 610 Nathan Road, Mongkok, Kowloon, Hong Kong

Prepared by

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TEST RESULT CERTIFICATION

Applicant's name:	
Address:	Room1318-19, 13/F, Hollywood Plaza, 610 Nathan Road, Mongkok, Kowloon, Hong Kong
Manufacture's Name:	
Address:	Building #1 East Side, West Shahe Road, Chaguang Industrial Park, Xili Town, NanShan District, Shenzhen City, Zip:518000, China
Product description	
Product name:	KD ENTRY
Model and/or type reference :	KD ENTRY
Serial Model:	N/A
Standards:	FCC Part15.231 01 Oct. 2016
Test procedure	ANSI C63.10-2013
	as been tested by NTEK, and the test results show that the n compliance with the FCC requirements. And it is applicable only n the report.
•	ced except in full, without the written approval of NTEK, this vised by NTEK, personnel only, and shall be noted in the revision o
Date of Test	:
Date (s) of performance of tests	: 27 Aug. 2016 ~ 22 Sep. 2016
Date of Issue	: 22 Sep. 2016
Test Result	Pass
Testing Engine	eer:
	(Allen Liu)
Technical Man	nager: Juson chen
	(Jason)
Authorized Sig	gnatory: Sam. Chew
	(Sam Chen)



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1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15, Subpart C (15.231)					
Standard Section	Test Item	Judgment	Remark		
15.207	Conducted Emission	N/A			
15.203	Antenna Requirement	Pass			
15.231	Radiated Spurious Emission	Pass			
15.231	Occupied Bandwidth	Pass			
15.231	Transmitter Timeout	Pass			

NOTE:

(1) "N/A" denotes test is not applicable in this Test Report.



1.1 TEST FACILITY

NTEK Testing Technology Co., Ltd

Add.: 1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District,

Shenzhen P.R. China.

FCC Registration No.:238937; IC Registration No.:9270A-1

CNAS Registration No.:L5516

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $\mathbf{y} \pm \mathbf{U}$, where expended uncertainty \mathbf{U} is based on a standard uncertainty multiplied by a coverage factor of $\mathbf{k=2}$, providing a level of confidence of approximately 95 % $^{\circ}$

No.	Item	Uncertainty
1	Conducted Emission Test	±1.38dB
2	RF power,conducted	±0.16dB
3	Spurious emissions,conducted	±0.21dB
4	All emissions,radiated(<1G)	±4.68dB
5	All emissions,radiated(>1G)	±4.89dB
6	Temperature	±0.5°C
7	Humidity	±2%



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	KD ENTRY				
Trade Name	KEYDIY				
Model Name	KD ENTRY				
Serial Model	N/A				
Model Difference	N/A				
	The EUT is a KD ENTR	Y			
	Operation Frequency:	315MHz			
Product Description	Modulation Type:	ASK			
·	Number Of Channel	1CH.			
	Antenna Designation:	PCB Antenna			
	Antenna Gain(Peak)	1.0 dBi			
Channel List	Refer to below				
Adapter	N/A				
Battery	DC 12V				
Hardware Version	V1.1				
Software Version	V1.0				

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2

Table for Filed Antenna

Ant	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	N/A	N/A	PCB Antenna	N/A	1.0	Antenna



2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	TX

For Radiated Emission		
Final Test Mode	Description	
Mode 1	TX	

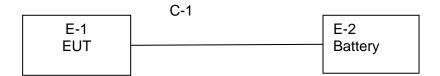
EUT through the mobile phone to control the launch of APP, EUT can not continuous transmission

This APP has Unlock, lock, Panic(used for controlling the horn of car), open the trunk, testing all the keys of the data, only the Panic button function data recorded in the report, because it is the worst mode.



2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiated Spurious Emission Test





2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Brand	Model/Type No.	Series No.	Note
E-1	KD ENTRY	KEYDIY	KD ENTRY	N/A	EUT
E-2	Battery	Tiger	12V60AH	N/A	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	1m	DC Cable

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in <code>[Length_]</code> column.



2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibratio n period
1	Spectrum Analyzer	Agilent	E4407B	MY4510804 0	2016.07.06	2017.07.05	1 year
2	Test Receiver	R&S	ESPI	101318	2016.06.07	2017.06.06	1 year
3	Bilog Antenna	TESEQ	CBL6111D	3916	2016.07.06	2017.07.05	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	620026441 6	2016.06.07	2017.06.06	1 year
5	Spectrum Analyzer	ADVANTEST		150900201	2016.06.07	2017.06.06	1 year
6	Horn Antenna	EM	EM-AH-101 80	2011071402	2016.07.06	2017.07.05	1 year
7	Amplifier	EM	EM-30180	060538	2016.9.22	2017.9.21	1 year
8	Loop Antenna	ARA	PLA-1030/B	1029	2016.06.08	2017.06.07	1 year
9	temporary antenna connector	NTS	R001	N/A	N/A	N/A	N/A
	(Note)						

J	ΛtΔ	1
N	Olc	'n

We will use the temporary antenna connector (soldered on the PCB board) When conducted test And this temporary antenna connector is listed within the instrument list

.



3. ANTENNA REQUIREMENT

3.1 STANDARD REQUIREMENT

15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

3.2 EUT ANTENNA



4. EMC EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)		Standard	
FREQUENCT (MINZ)	Quasi-peak	Average	Quasi-peak	Average	Stariuaru	
0.15 -0.5			66 - 56 *	56 - 46 *	CISPR	
0.50 -5.0			56.00	46.00	CISPR	
5.0 -30.0			60.00	50.00	CISPR	

0.15 -0.5		66 - 56 *	56 - 46 *	LP002.
0.50 -5.0		56.00	46.00	LP002.
5.0 -30.0		60.00	50.00	LP002.

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz



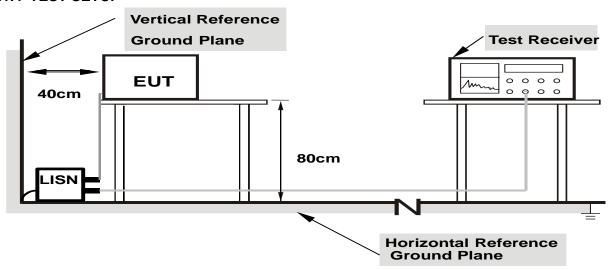
4.1.2 TEST PROCEDURE

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item -EUT Test Photos.

4.1.3 DEVIATION FROM TEST STANDARD

No deviation

4.1.4 TEST SETUP



Note: 1.Support units were connected to second LISN.

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes



4.1.5 TEST RESULT

EUT:	KD ENTRY	Model Name. :	KD ENTRY
Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	1010hPa	Phase :	N/A
Test Voltage :	N/A	Test Mode:	N/A

N/A :means not applicable, Since the EUT's Power supplied from 12V battery.



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 Radiated Emission Limits (FCC 15.209)

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

Note:

- (1) The tighter limit applies at the band edges.
- (2) Emission level (dBuV/m)=20log Emission level (uV/m).

LIMITS OF RADIATED EMISSION MEASUREMENT (FCC 15.231)

Fundamental Frequency (MHz)	Field Strength of fundamental (microvolts/meter)	Field Strength of Unwanted Emissions (microvolts/meter)
40.66 - 40.70	2250.00	225.00
70 - 130	1250.00	125.00
130 - 174	1,250 to 3,750 **	125 to 375 **
174 - 260	3750.00	375.00
260 - 470	3,750 to 12,500 **	375 to 1,250 **
Above 470	12500.00	1250.00

Notes:

(1) ** linear interpolations

[Where F is the frequency in MHz, the formulas for calculating the maximum permitted fundamental field strengths are as follows: for the band 130-174 MHz, uV/m at 3 meters = 56.81818(F) - 6136.3636; for the band 260-470 MHz, uV/m at 3 meters = 41.6667(F) - 7083.3333. The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.]

The limits on the field strength of the spurious emissions in the above table are based on the fundamental frequency of the intentional radiator. Spurious emissions shall be attenuated to the average (or, alternatively, CISPR quasi-peak) limits shown in this table or to the general limits shown in 93 Section 15.209, whichever limit permits a higher field strength.



Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1MHz / 1MHz for Peak

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Receiver Parameter	Setting	
Attenuation	Auto	
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP	
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP	
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP	

4.2.2 TEST PROCEDURE

- a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 m for below 1GHz and 1.5m for above 1GHz the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 0.8 m for below 1GHz and 1.5m for above 1GHz; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For the radiated emission test above 1GHz:
 - Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
- e. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- f. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- g For the actual test configuration, please refer to the related Item –EUT Test Photos. Note:

Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

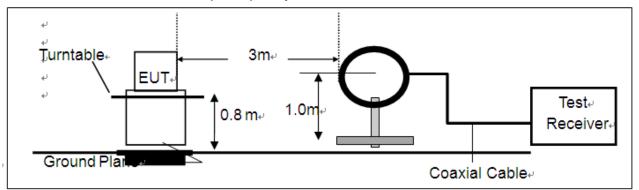
4.2.3 DEVIATION FROM TEST STANDARD

No deviation

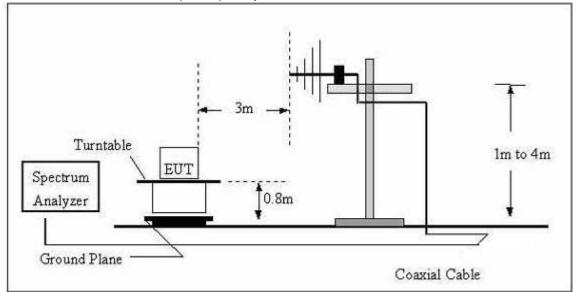


4.2.4 TEST SETUP

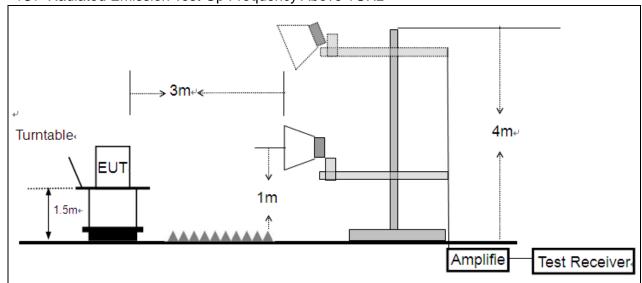
(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



(C) Radiated Emission Test-Up Frequency Above 1GHz





4.2.5 TEST RESULTS (BELOW 30MHz)

EUT:	KD ENTRY	Model Name. :	KD ENTRY
Temperature:	20 ℃	Relative Humidtity:	48%
Pressure :	1010 hPa	Test Voltage :	DC 12.0V
Test Mode :	TX	Polarization :	

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
				Р
				Р

NOTE:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

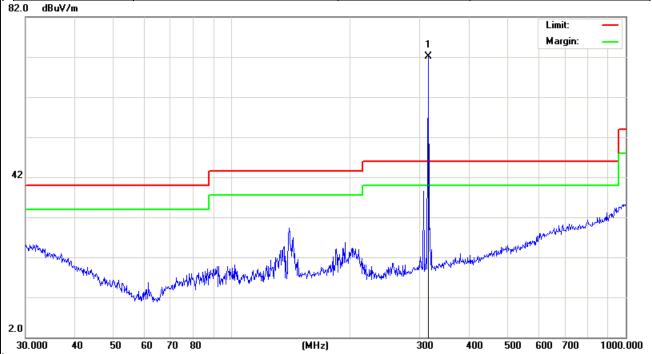
Distance extrapolation factor =40 log (specific distance/test distance)(dB);

Limit line = specific limits(dBuv) + distance extrapolation factor.



4.2.6 TEST RESULTS (BETWEEN 30 - 1000 MHZ)

EUT:	KD ENTRY	Model Name :	KD ENTRY
Temperature:	20 ℃	Relative Humidity:	48%
Pressure:	1010 hPa	Test Voltage :	DC 12.0V
Test Mode :	TX	Polarization :	Vertical

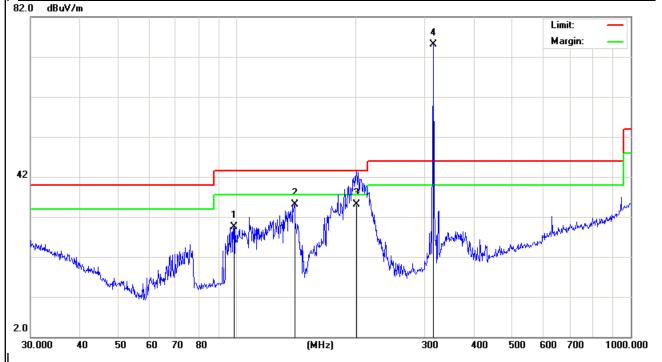


No.	Frequency	Reading	Correct	Result	Limit	Over Limit	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	315.4806	57.63	14.38	72.01	95.62	-23.61	Peak
2	315.4806	-	-	65.64	75.62	-9.98	AVG

Note: The average value of fundamental frequency is:
Average= Peak Value+ 20log(Duty cycle), Final Average= Peak -6.37



EUT:	KD ENTRY	Model Name :	KD ENTRY
Temperature:	20 ℃	Relative Humidity:	48%
Pressure:	1010 hPa	Test Voltage :	DC 12.0V
Test Mode :	TX	Polarization :	Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Over Limit	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	98.4866	18.14	11.41	29.55	43.50	-13.95	QP
2	140.3421	22.92	12.11	35.03	43.50	-8.47	QP
3	201.3930	22.24	12.78	35.02	43.50	-8.48	QP
4	315.4808	60.64	14.38	75.02	95.62	-20.6	Peak
5	315.4808			68.65	75.62	-6.97	AVG

Note: The average value of fundamental frequency is:

Average= Peak Value+ 20log(Duty cycle), Final Average= Peak -6.37



3.4.7 TEST RESULTS (1000-3180 MHZ)

EUT:	KD ENTRY	Model Name :	KD ENTRY
Temperature:	20 ℃	Relative Humidity:	48%
Pressure:	1010 hPa	Test Voltage :	DC 12.0V
Test Mode :	TX	Polarization :	Horizontal

No.	Frequency	Reading	Correct	Dutycycle	Result	Limit	Over Limit	Remark
			Factor	Factor				
	(MHz)	(dBuV/m)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
1	1260.15	50.14	-13.43	-	36.71	75.62	-38.91	Peak
2	1575.331	48.25	-13.12	-	35.13	74.00	-38.87	Peak
3	1890.52	43.82	-11.63	-	32.19	75.62	-43.43	Peak
4	1260.12	-	-	-6.37	30.34	55.62	-25.28	AVG
5	1575.18*	-	-	-6.37	28.76	54.00	-25.24	AVG
6	1890.03	-	-	-6.37	25.82	55.62	-29.80	AVG

EUT:	KD ENTRY	Model Name :	KD ENTRY
Temperature:	20 ℃	Relative Humidity:	48%
Pressure:	1010 hPa	Test Voltage :	DC 12.0V
Test Mode :	TX	Polarization :	Vertical

No.	Frequency	Reading	Correct Factor	Dutycycle Factor	Result	Limit	Over Limit	Remark
	(MHz)	(dBuV/m)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	·
1	1260.39	49.11	-13.32	-	35.79	75.62	-39.83	Peak
2	1575.22	46.4	-13.12	-	33.28	74.00	-40.72	Peak
3	1890.45	43.48	-11.63	-	31.85	75.62	-43.77	Peak
4	1260.12	-	-	-6.37	29.42	55.62	-26.20	AVG
5	1575.18*	-	-	-6.37	26.91	54.00	-27.09	AVG
6	1890.03	-	-	-6.37	25.48	55.62	-30.14	AVG

Note: 1. EUT Pre-scan X/Y/Z orientation, only worst case is presented in the report(Z orientation).

2. *Calculate Average value based on Duty Cycle correction factor:

Duty Cycle=Ton/(Ton+Toff)= $(0.65\text{ms} \times 20+4.75\text{ms} \times 1+1.1 \times 12)/64\text{ms} = 0.48=48\%$

Duty Cycle factor=20lg(Duty Cycle)=20lg(0.48)= -6.37dB

Average=Peak+ Duty Cycle factor

- 2. FCC Limit for Average Measurement = 41.6667(315.00)-7083.3333 = 10996.681164uV/m = 75.62dBuV/m
- 2. Pulse Desensitization Correction Factor

Pulse Width(PW)=64ms

2/PW=2/64ms=0.03kHz

RBW(100kHz) > 2/PW (0.03KHz)

Therefore PDCF is not needed

The "*" means restricted bands



4.2.7 Duty Cycle

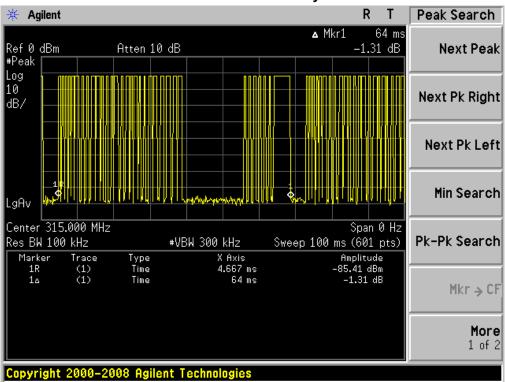
The duty cycle is simply the on time divided by the period:

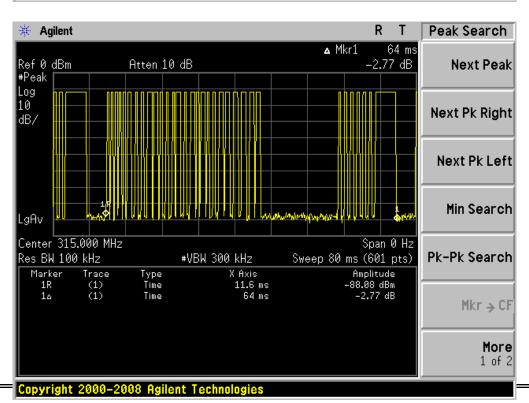
The duration of one cycle = 64ms

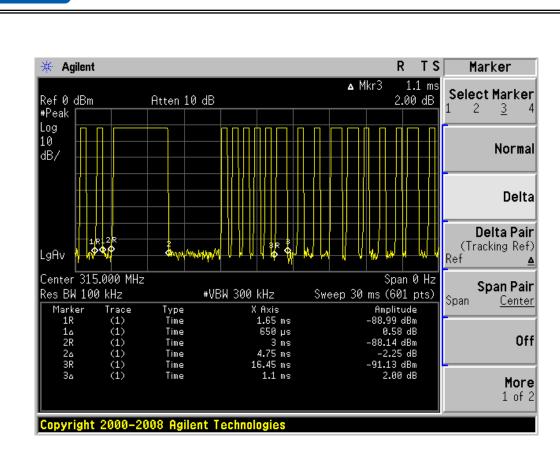
Effective period of the cycle = 0.65ms $\times 20+4.75$ ms $\times 1+1.1\times 12=30.95$ ms

Duty Cycle = 30.95ms/64ms = 0.48

The duration of one cycle









5. BANDWIDTH TEST

5.1 TEST PROCEDURE

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

Limit: 315MHz*0.25%=787.5KHz

5.2 DEVIATION FROM STANDARD

No deviation.

5.3 TEST SETUP

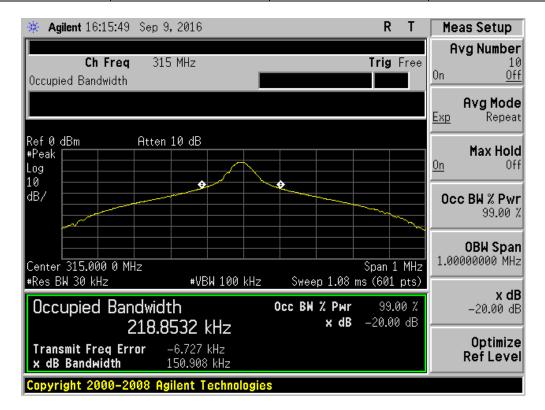
EUT	SPECTRUM
	ANALYZER



5.4 TEST RESULTS

EUT:	KD ENTRY	Model Name :	KD ENTRY
Temperature:	26 ℃	Relative Humidity:	53%
Pressure :	1020 hPa	Test Power :	DC 12.0V
Test Mode :	TX CH 1		

Test Channel	Frequency (MHz)	20 dBc Bandwidth (kHz)	Limit (kHz)
	(IVII 12)	(KITZ)	(KLIZ)
CH01	315	150.908	787.5





6. TRANSMITTER TIMEOUT

6.1 REQUIREMENTS

1 A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

Result: The EUT does not have a automatically activated transmitter .

2 A transmitter activated automatically shall cease transmission within 5 seconds after activation.

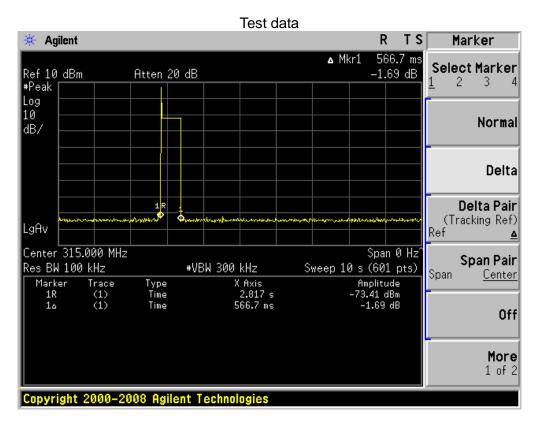
Result: EUT does not automatically launch feature, need to manually control the launch through mobile APP

3 Periodic transmissions at regular predetermined intervals are not permitted. However, polling or supervision transmissions, including data, to determine system integrity of transmitters used in security or safety applications are allowed if the total duration of transmissions does not exceed more than two seconds per hour for each transmitter. There is no limit on the number of individual transmissions, provided the total transmission time does not exceed two seconds per hour

Result: The EUT does not employ periodic transmission.

4 Intentional radiators which are employed for radio control purposes during emergencies involving fire, security, and safety of life, when activated to signal an alarm, may operate during the pendency of the alarm condition.

Result: The section is not applicable to EUT.



THE DURATION OF EACH TRANSMISSION	LIMIT	RESULT
0.5667s	<5s	PASS



7. EUT TEST PHOTO



