

Advanced  
Compliance Laboratory

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## ELECTROMAGNETIC EMISSION COMPLIANCE REPORT

of

### FULL FUNCTION RADIO CONTROL

MODEL: 800  
FCC ID: QKX800

*May 27, 2004*

This report concerns (check one): Original grant ☒ Class II change ☐  
Equipment type: LOW POWER TRANSMITTER

Deferred grant requested per 47 CF 0.457(d)(1)(ii)? yes ☐ no ☒  
If yes, defer until: \_\_\_\_\_ (date)  
Company agrees to notify the Commission by \_\_\_\_\_ (date)  
of the intended date of announcement of the product so that the grant can be  
issued on that date.

Transition Rules Request per 15.37? yes ☐ no ☒  
If no, assumed Part 15, Subpart B for unintentional radiators - the new 47 CFR  
[10-1-90 Edition] provision.

Report prepared for: Golden Technology Electronic Toys Co., Ltd.  
Report prepared by: Advanced Compliance Laboratory, Inc.  
Report number: 0048-040329-01



The test result in this report IS supported and covered by the NVLAP accreditation

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# 1. GENERAL INFORMATION

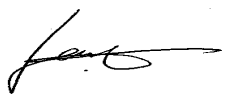
## 1.1 Verification of Compliance

EUT: Full Function Radio Control  
 Model: 800  
 Applicant: GOLDEN TECHNOLOGY ELECTRONIC TOYS CO., LTD.  
 CHENSENG ROAD, PUMEI DISTRICT  
 CHENGHAI CITY, GUANGDONG, CHINA  
 Test Type: FCC Part 15C CERTIFICATION  
 Result: PASS  
 Tested by: ADVANCED COMPLIANCE LAB  
 Test Date: May 27, 2004  
 Report Number: 0048-040329-01

The above equipment was tested by Advanced Compliance Laboratory for compliance with the requirement set forth in the FCC rules and regulations Part 15 subpart C. This said equipment in the configuration described in the report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

The estimated uncertainty of the test result is given as following. The method of uncertainty calculation is provided in Advanced Compliance Lab. Doc. No. 0048-01-01.

	Prob. Dist.	Uncertainty(dB)	Uncertainty(dB)	Uncertainty(dB)
		30-1000MHz	1-6.5GHz	Conducted
Combined Std. Uncertainty $u_c$	norm.	$\pm 2.36$	$\pm 2.99$	$\pm 1.83$



Wei Li  
 Lab Manager  
 Advanced Compliance Lab

Date: May 27, 2004

## **1.2 Equipment Modifications**

N/A

### 1.3 Product Information

#### System Configuration

ITEM	DESCRIPTION	FCC ID	CABLE
Product	TRANSMITTER(1)	QKX800	
Housing	PLASTICS		
Power Supply	DC9V Adapter 120V/60Hz		
Operation Freq.	27.1MHz		
Device Type	Periodic Operation		
Receiver	FCC Part 15 : 800(RX)		

(1) EUT submitted for grant.

### 1.4 Test Methodology

Radiated tests were performed according to the procedures in ANSI C63.4-1992 at an antenna to EUT distance of 3 meters.

### 1.5 Test Facility

The open area test site and conducted measurement facility used to collect the radiated and conducted data are located at Somerset, New Jersey. This site has been accepted by FCC to perform measurements under Part 15 or 18 in a letter dated May 19, 1997 (Refer to: 31040/PRV 1300F2). The NVLAP Lab code for accreditation of FCC EMC Test Method is: 200101-0.

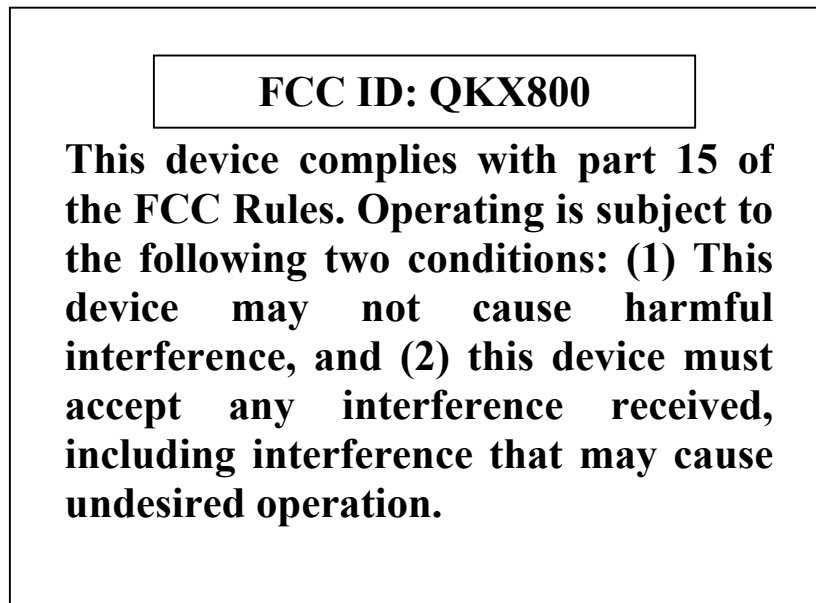
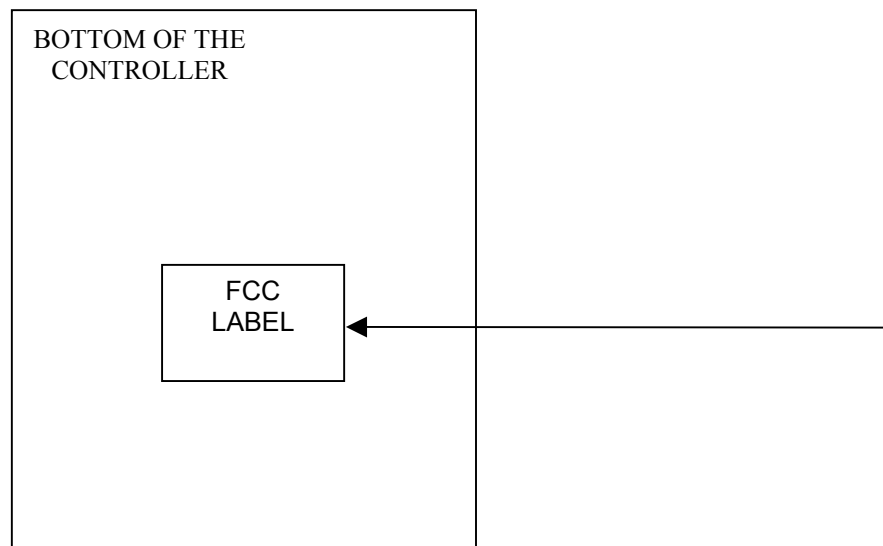
### 1.6 Test Equipment

Manufacture	Model	Serial No.	Description	Last Cal dd/mm/y	Cal Due dd/mm/y
Hewlett-Packard	HP8546A	3625A00341	EMI Receiver	23/10/03	23/10/04
EMCO	3104C	9307-4396	20-300MHz Biconical Antenna	12/02/04	12/02/05
EMCO	3146	9008-2860	200-1000MHz Log-Periodic Antenna	09/02/04	09/02/05
Fischer Custom	LISN-2	900-4-0008	Line Impedance Stabilization Networks	03/07/03	03/07/04
Fischer Custom	LISN-2	900-4-0009	Line Impedance Stabilization Networks	03/07/03	03/07/04
EMCO	6502	2665	10KHz-30MHz Active Loop Antenna	27/02/04	27/02/05
EMCO	3115	4945	Double Ridge Guide Horn Antenna	15/09/03	15/09/04

All Test Equipment Used are Calibrated Traceable to NIST Standards.

### **1.7 Statement for the Document Use**

This report shall not be reproduced except in full, without the written approval of the laboratory. And this report must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government.

**2. PRODUCT LABELING****Figure 2.1 FCC ID Label****Figure 2.2 Location of the Label**



### **3. SYSTEM TEST CONFIGURATION**

#### **3.1 Justification**

The system was configured for testing in a typical fashion (as a customer would normally use it). And its antenna was permanently attached to the EUT with maximum length, 12 inches.

This manually operated transmitter will deactivate immediately when the control button is released.

Testing was performed as EUT was operated at frequency channel 27.145MHz continuously.

#### **3.2 Special Accessories**

N/A.

#### **3.3 Configuration of Tested System**

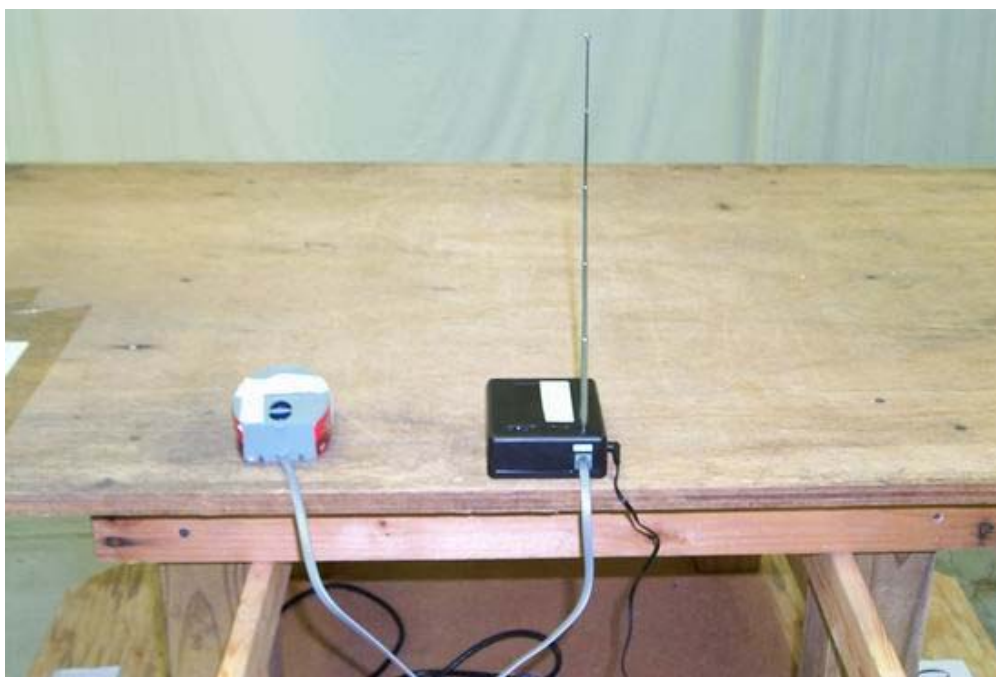
Figure 3.1 and Figure 3.5 illustrate this system, which is tested standing along.



**Figure 3.1 Cable Interlink Configuration**



**Figure 3.2 Radiated Front**



**Figure 3.3 Radiated Rear**

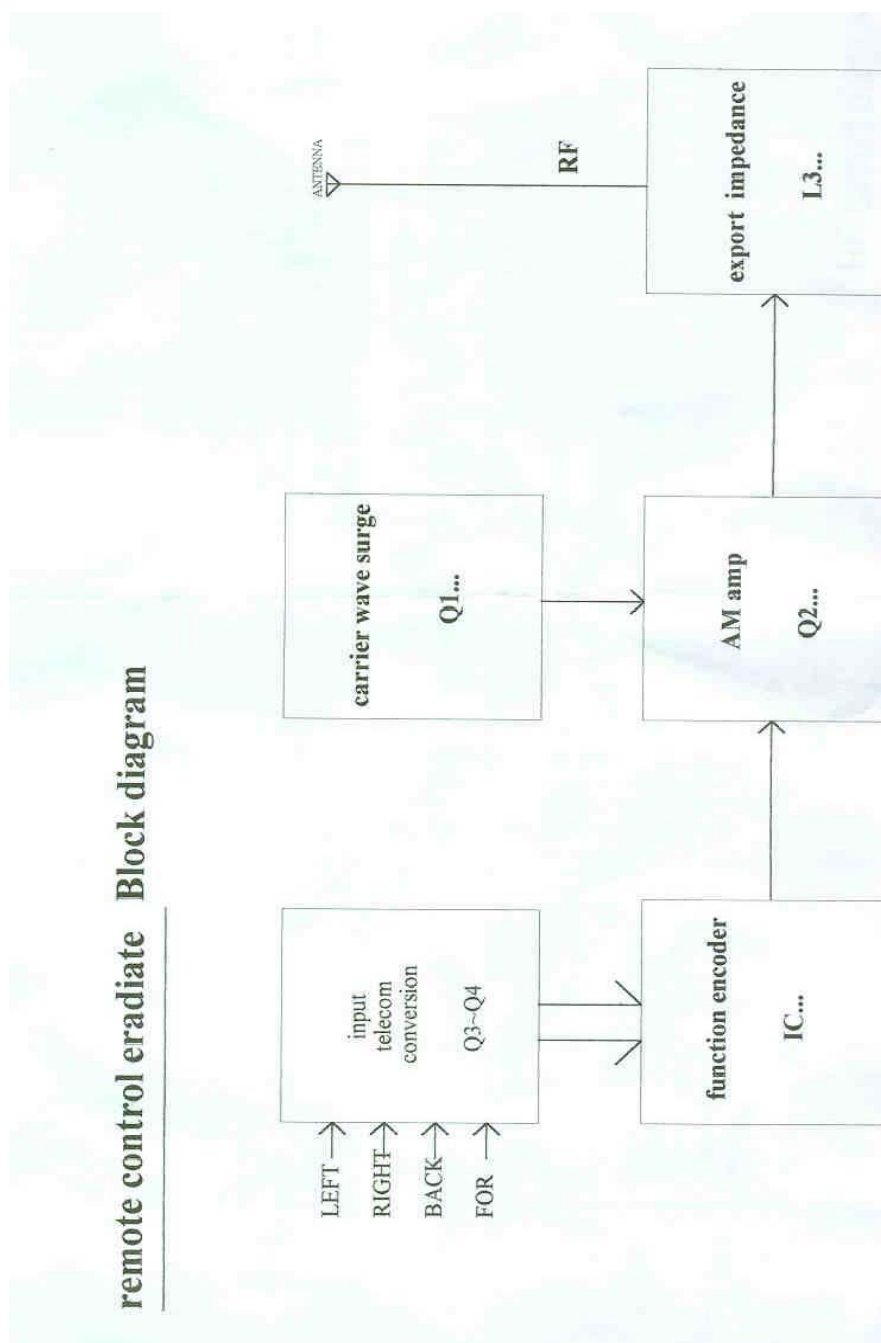


**Figure 3.4 Conducted Front**



**Figure 3.5 Conducted Rear**

## 4. SYSTEM BLOCK DIAGRAM



**Figure 4.1 System BLOCK DIAGRAM**

## 5. CONDUCTED EMISSION DATA

### 5.1 Test Methods and Conditions

The EUT was under normal operational mode during the conducted emission test. EMI Receiver was scanned from 150KHz to 30MHz with maximum hold mode for maximum emission. Recorded data was sent to the plotter to generate output in linear format. At the input of the spectrum analyzer, a HP transient limiter is inserted for protective purpose. This limiter has a 10 dB attenuation in the range of 150KHz to 30MHz. That factor was automatically compensated by the receiver, so the readings are the corrected readings. The reference of the plot is the CISPR 22 Class B limit in Figure 5.1 through Figure 5.2.

Conducted Emission Technical Requirements				
Frequency Range	Class A		Class B	
	Quasi-Peak dBuV	Average dBuV	Quasi-Peak DBuV	Average dBuV
150kHz-0.5MHz	79 (8912uV)	66 (1995uV)	66-56	56-46
0.5MHz-30MHz	73 (4467uV)	60 (1000uV)	---	---
0.5MHz- 5MHz	---	---	56	46
5MHz-30MHz	---	---	60	50

Emissions that have peak values close to the specification limit (if any) are also measured in the quasi-peak mode to determine compliance.

### 5.2 Test Data

Figure 5.1 through Figure 5.2 show the neutral and line conducted emissions for the standard operation mode. Fundamental emission at 27.1MHz is also recorded.

Six Highest Data for AC Line Conducted Emissions						
Frequency (MHz)	0.178	0.189	0.252	0.309	0.426	0.650
Peak Reading (uV)	53.6	85.0	76.8	72.1	52.5	61.9

Test Personnel:

Tester Signature: 

Date: May 27, 2004

Typed/Printed Name: Edward Lee

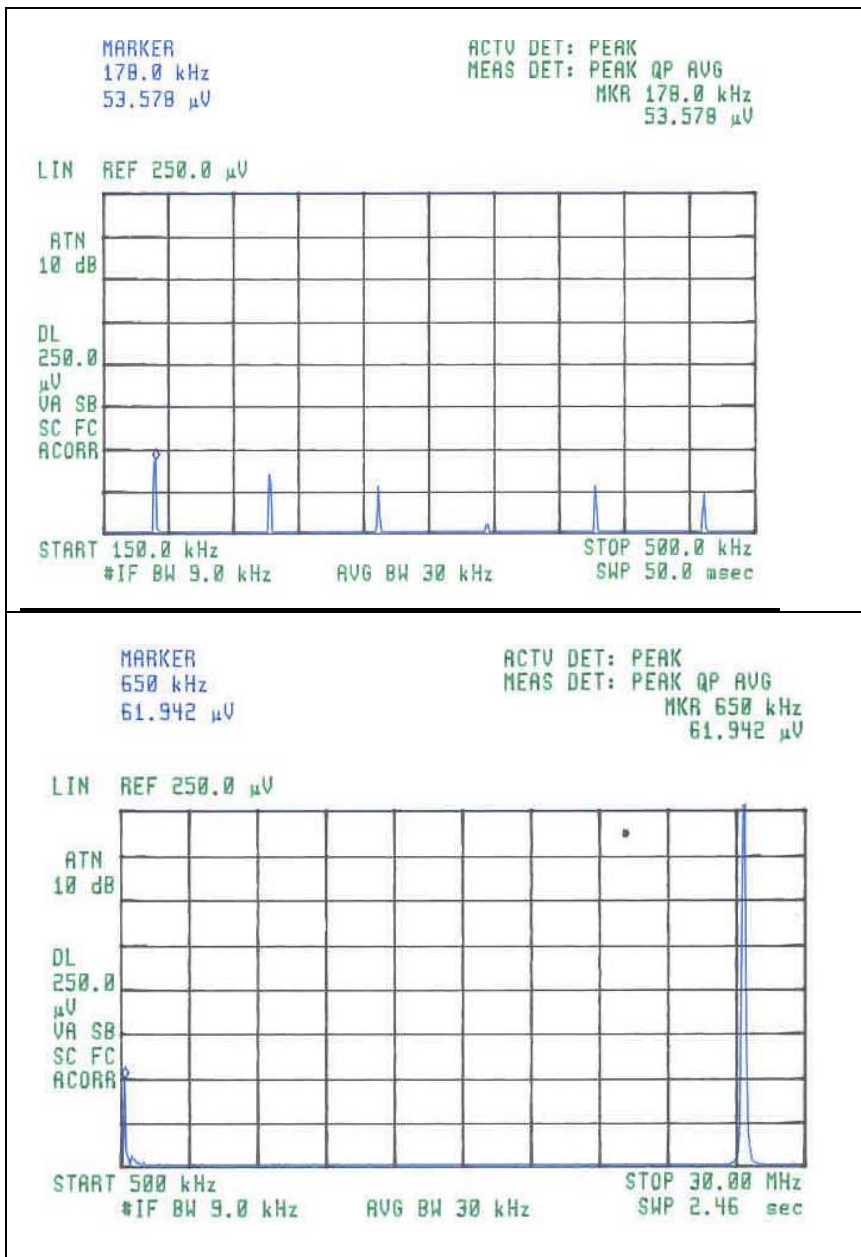


Figure 5.1 Line Conducted

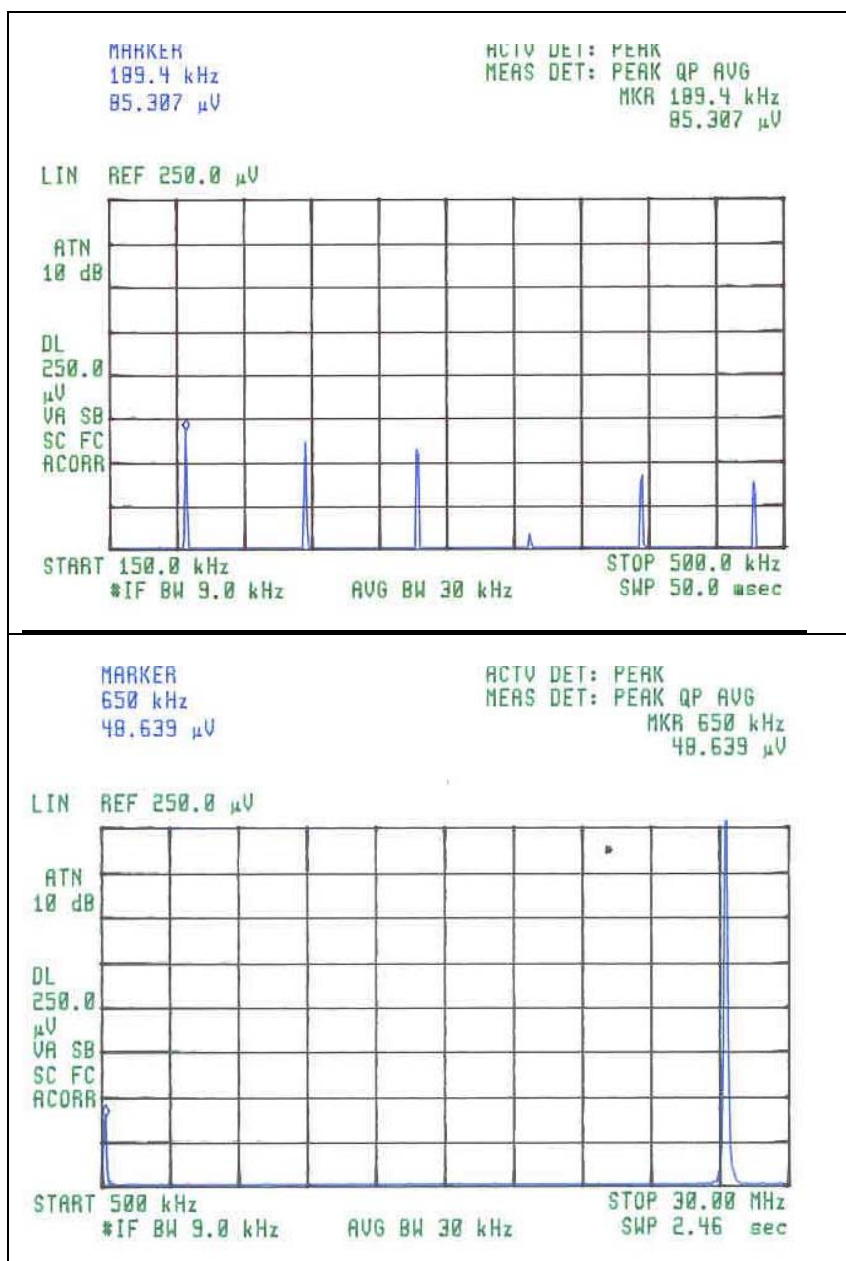


Figure 5.2 Neutral Conducted



## 6. RADIATED EMISSION DATA

### 6.1 Field Strength Calculation

The corrected field strength is automatically calculated by EMI Receiver using following:

$$FS = RA + AF + CF + AG$$

where FS: Corrected Field Strength in dB $\mu$ V/m

RA: Amplitude of EMI Receiver before correction in dB $\mu$ V

AF: Antenna Factor in dB/m

CF: Cable Attenuation Factor in dB

AG: Built-in Preamplifier Gain in dB (Stored in receiver as part of the calibration data)

### 6.2 Test Methods and Conditions

The initial step in collecting radiated data is a EMI Receiver scan of the measurement range below 30MHz using peak detector and 9KHz IF bandwidth / 30KHz video bandwidth. For the range 30MHz - 1GHz 120KHz, IF bandwidth / 30KHz video bandwidth are used. Both bandwidths are 1MHz for above 1GHz measurement. The highest radiated emissions below 25GHz are recorded.

### 6.3 Test Data

The following data lists the significant emission frequencies, polarity and position, peak reading of the EMI Receiver, calculated average reading if any, the FCC limit, and the difference between the reading and the limit. Explanation of the correction and calculation are given in section 5.1.

Test Personnel:

Tester Signature:



Typed/Printed Name: Edward Lee

Date: May 27, 2004

## Radiated Test Data

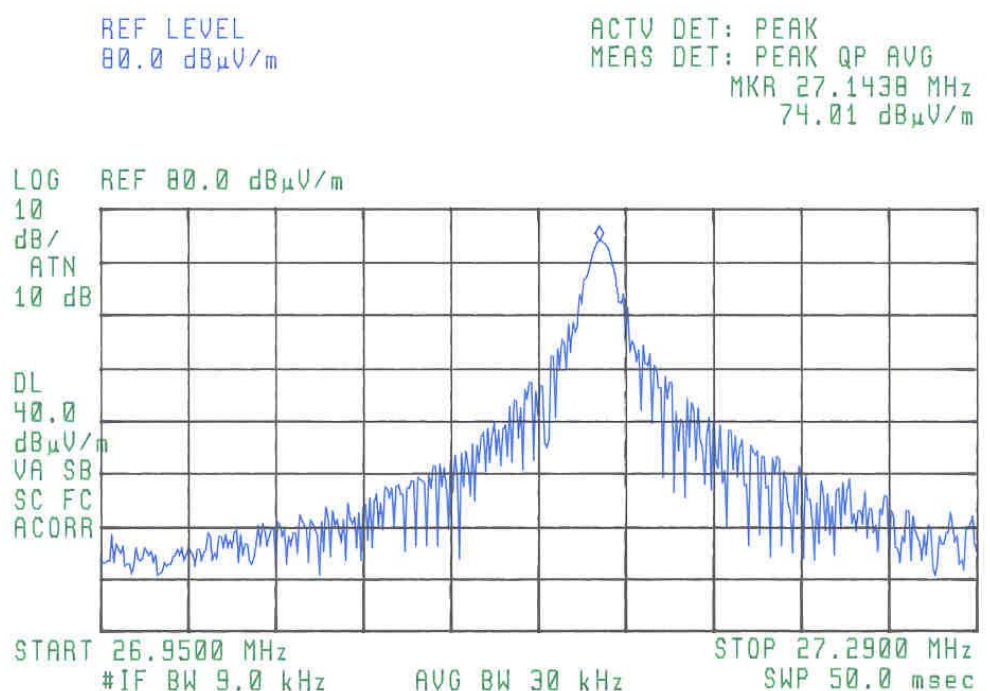
### Radiated Test Data (CH-27.145MHz)

Frequency (MHz)	Polarity [H or V], Position (X,Y,Z)	Height (m)	Azimuth (Degree)	Peak Reading (dB $\mu$ V/m)	FCC 3m Limit (dB $\mu$ V/m)	Difference from limit (dB)
27.1	H	2.6	10	67.7	80	-12.3
54.3	H	1.9	10	38.0*	40	-2
81.4	H	2.2	0	37.2	40	-2.8
27.4	V	1.3	0	74.0	80	-6
54.3	V	1.4	0	36.8*	40	-3.2

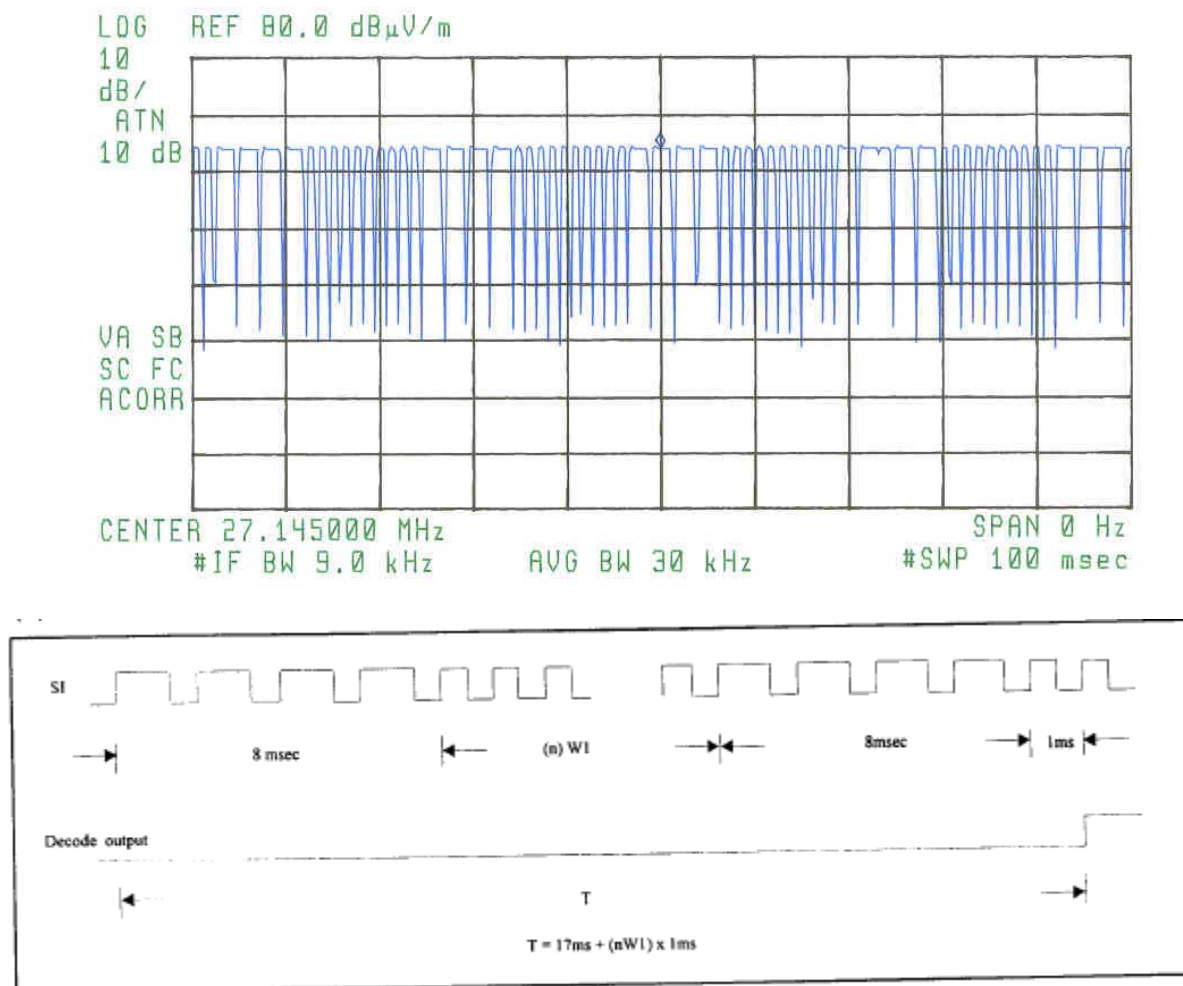
(1) The limit for emissions within the 26.96-27.28MHz band is 10,000 $\mu$ V(80dB). Sec. 15.227. The limit for other emissions is defined in Sec. 15.209.

(2) If each peak reading is less than the FCC average limit, it'll be not necessary to show the calculated average reading based on the pulse train characteristics.

\*-----quasi-peak reading.



**Figure 6.1 Bandwidth Plot**



**Figure 6.2 Pulse Train Plot: n=10**

## **7. PHOTOS OF TESTED EUT**

The following photos show the inside details of the EUT.