Intertek Testing Services
ETL Testing Laboratories

IDT Technology Limited

Application
For
Class II Permissive Change
(FCC ID: NMTTHR128-01)

Transmitter

WO# 9801016
CKL/at
April 17, 1998

FCC ID : NMTTHR128-01

Intertek Testing Services Hong Kong Ltd.
2/F, Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong.
Telephone (852) 2746 8600 Fax (852) 2785 5487

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LIST OF EXHIBITS

MEASUREMENT/TECHNICAL REPORT

IDT Technology Limited - MODEL: Thermo Sensor THN128
FCC ID: NMTTHR128-01

April 17, 1998

This report concerns (check one:) Original Grant____ Class II Change__X____

Equipment Type: Low Power Transmitter (example: computer, printer, modem, etc.)

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? Yes___ No_X__

If yes, defer until: _____
date

Company Name 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_X__

If no, assumed Part 15, Subpart C for intentional radiator - the new 47 CFR [10-1-96 Edition] provision.

Report prepared by:

C. K. Lam
Intertek Testing Services
2/F., Garment Center,
576, Castle Peak Road,
HONG KONG
Phone: 852-2746-8211
Fax: 852-2785-5487

Table of Contents

List of Figures

EXHIBIT 1

GENERAL DESCRIPTION

1.0 General Description

1.1 Product Description

The equipment under test (EUT) is a transmitter portion of a wireless thermometer system operating at 433.92 MHz which is controlled by a crystal. The EUT is powered by two AAA size batteries. There are two control switches (°C/°F and channel) and one reset button inside the housing. During normal use, one receiver can be used associated with three transmitters so as to record the temperature from three different location. Also the EUT transmits temperature signal every 30 seconds and the duration of each transmission is less than 1 seconds. The internal circuitry, wiring connections and software protocol of the model THN128 are the same as the model THR128 (FCC ID: NMTTHR128-01) which was granted previously except it has no LCD display.
The following page lists the technical description of the EUT.

1.2 Related Submittal(s) Grants

This is a single application for certification of a transmitter. The FCC ID of the receiver associated with this transmitter is NMTEMR899-01.

Integrated Display Technology Ltd.
顯 威 科 技 有 限 公 司

Technical descriptions of THN128

THN128 is a remote thermo-sensor. It converts analogue temperature signal into digital signal and transmits via RF channel. It composes a controller part and a transmitter part. The transmitter is basically a Colipittis oscillator, where C1, C2 and X1 are used to determinate the resonant frequency that is 433.92MHz. Transistor Q1 whose fT is greater than 6GHz, provides a good frequency response to the circuit. There is a LC filtering circuitry, L1 and C3, that is used to suppress harmonies of the oscillator. An inductor, L3, is employed to match the impedance of the antenna, L4.

Kam Yee Street, Hunghom, Kowloon, Hong Kong. Tel: 2764 7873 Fax: 2765 6629 Cable: IDTRAYMOND Telex: 46567 IDTHK HX

1.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (1992). All measurements were performed in Open Area Test Sites. Preliminary scans were performed in the Open Area Test Sites only to determine worst case modes. For each scan, the procedure for maximizing emissions in Appendices D and E were followed. All Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application.

1.4 Test Facility

The open area test site and conducted measurement facility used to collect the emission data is located at Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong. This test facility and site measurement data have been fully placed on file with the FCC.

EXHIBIT 2

SYSTEM TEST CONFIGURATION

2.0 System Test Configuration

2.1 Justification

The equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). The EUT was mounted to a cardboard box, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes.

The EUT was powered from new two AAA size batteries.

For maximizing emissions, the EUT was rotated through 360°, the antenna height was varied from 1 meter to 4 meters above the ground plane, and the antenna polarization was changed. This step by step procedure for maximizing emissions led to the data reported in Exhibit 3.0.

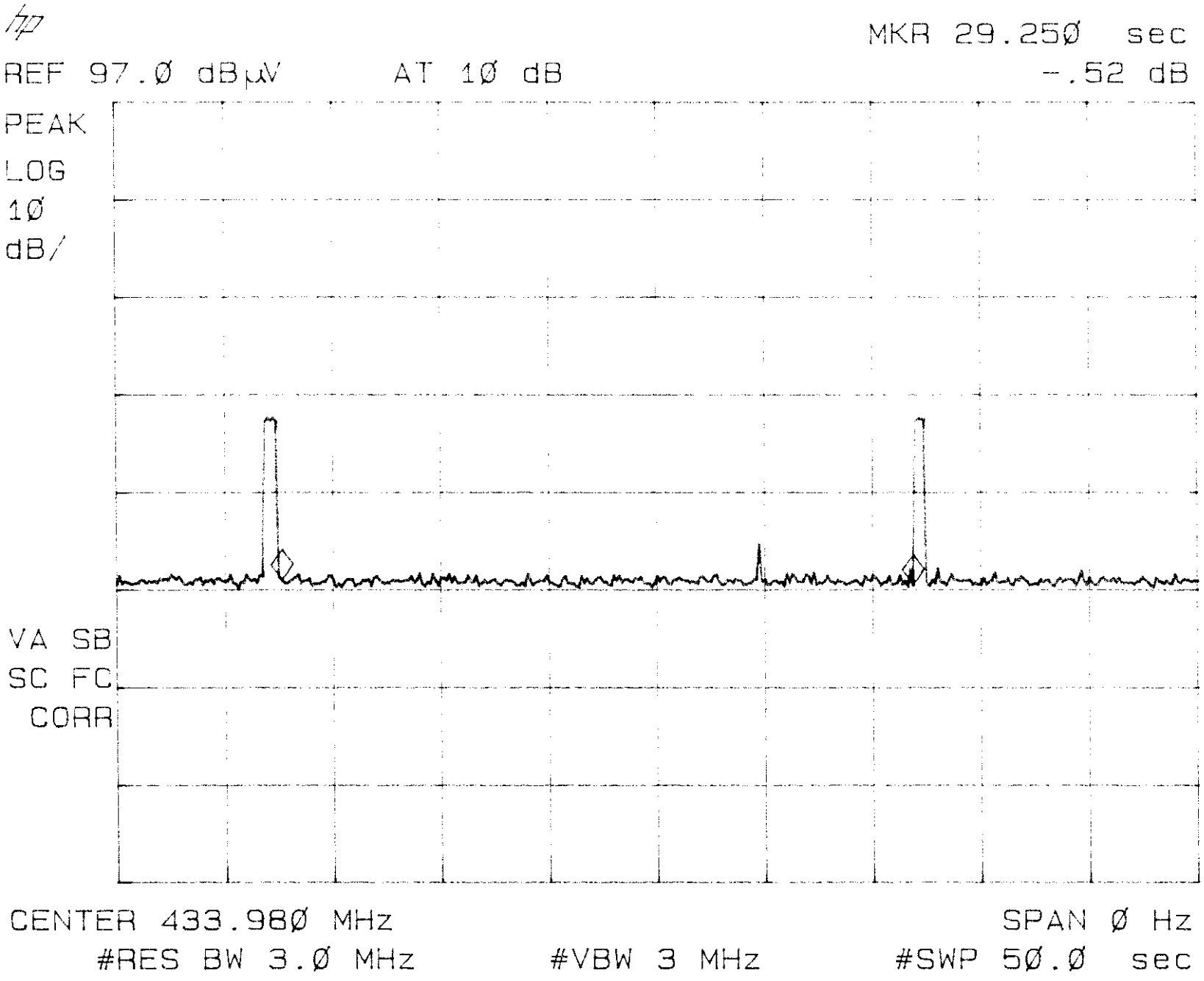
The following two plots show the transmission period is 750ms and the slient period is 29.250 second which is 39 times of the transmission period. The EUT meet the automatically limiting operation.

2.2 EUT Exercising Software

There was no special software to exercise the device. Once the button is powered up, the unit transmits the typical signal. For simplicity of testing, the unit was wired to transmit continuously.

2.3 Special Accessories

There are no special accessories necessary for compliance of this product.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SC FC
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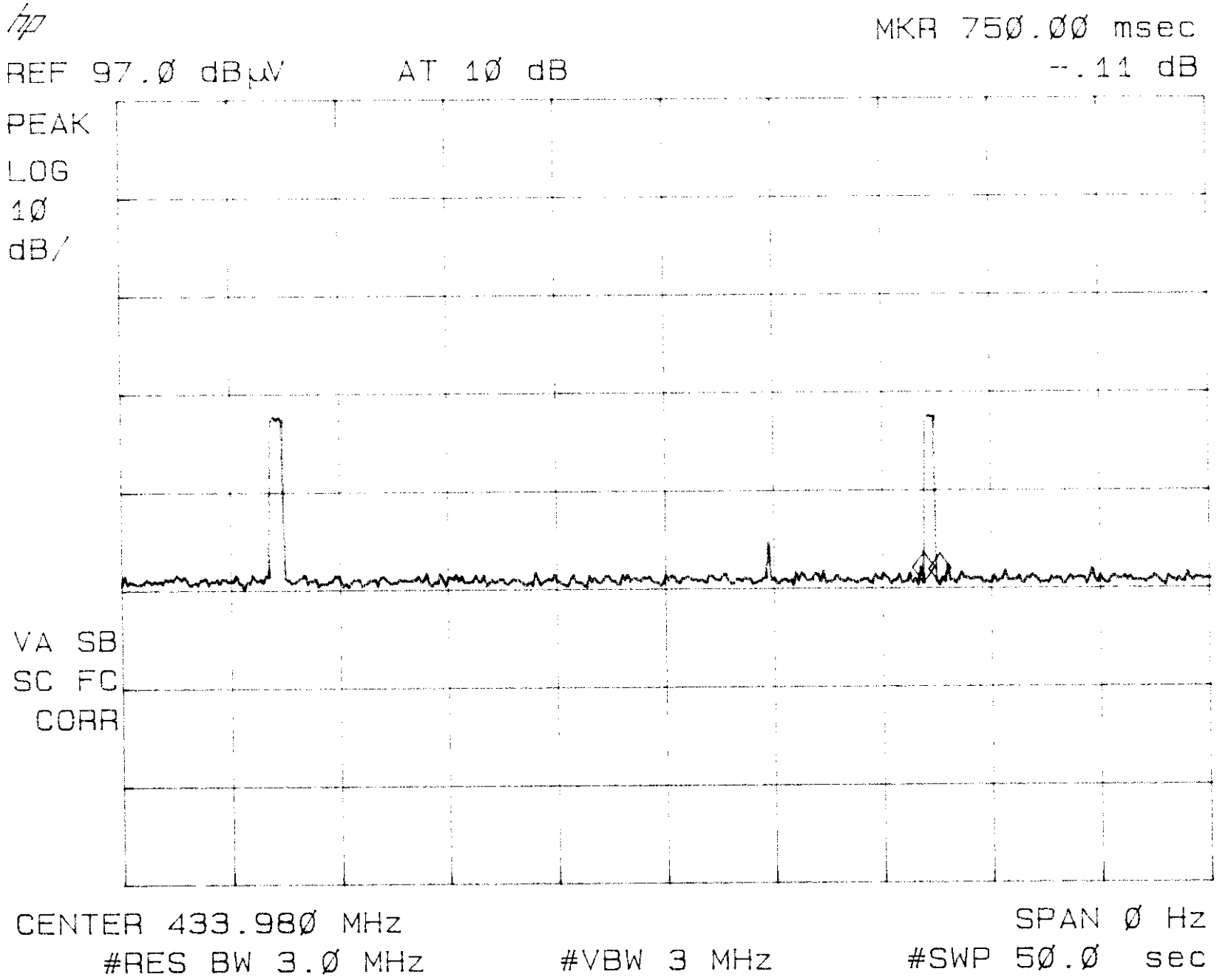
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VA SB
SC FC
CORR
CENTER 433.98Ø MHz
SPAN Ø Hz
#RES BW 3.Ø MHz
#VBW 3 MHz
#SWP 5Ø.Ø sec

2.4 Equipment Modification

Any modifications installed previous to testing by IDT Technology Limited will be incorporated in each production model sold/leased in the United States.

No modifications were installed by Intertek Testing Services.

2.5 Support Equipment List and Description

This product was tested in a standalone configuration.

All the items listed under section 2.0 of this report are

Confirmed by:

C. K. Lam
Assistant Manager
Intertek Testing Services
Agent for IDT Technology Limtied

_____Signature

_____Date

EXHIBIT 3

EMISSION RESULTS

3.0 Emission Results

Data is included worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included.

3.1 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

FS = RA + AF + CF - AG + PD + AV

where FS = Field Strength in dBμV/m
RA = Receiver Amplitude (including preamplifier) in dBμV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB
PD = Pulse Desensitization in dB
AV = Average Factor in -dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

FS = RA + AF + CF - AG + PD + AV

3.1 Field Strength Calculation (cont)

Example

Assume a receiver reading of 62.0 dBμV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0 dB, and the resultant average factor was -10 dB. The net field strength for comparison to the appropriate emission limit is 32 dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 62.0 dBμV
AF = 7.4 dB
CF = 1.6 dB
AG = 29.0 dB
PD = 0 dB

AV = -10 dB

FS = 62 + 7.4 + 1.6 - 29 + 0 + (-10) = 32 dBμV/m

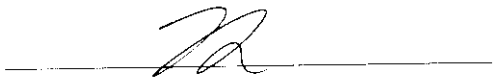
Level in mV/m = Common Antilogarithm [(32 dBμV/m)/20] = 39.8 μV/m

3.3 Radiated Emission Data

The data on the following page lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Judgement: Passed by 5.2 dB

TEST PERSONNEL:



Signature

Ken C. C. Lam, Compliance Engineer
Typed/Printed Name

April 17, 1998
Date

Company: IDT Technology Limited
Model: Thermo Sensor THN128

Date of Test: March 21, 1998

Table 1

Radiated Emissions

Polarity	Frequency (MHz)	Reading (dBμV)	Antenna Factor (dB)	Pre-Amp Gain (dB)	Average Factor (-dB)	Net at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
H	433.980	60.2	25.0	16	5.9	63.3	72.9	-9.6
H	867.960	38.6	31.0	16	5.9	47.7	52.9	-5.2
H	*1301.94	52.0	26.5	34	5.9	38.6	54.0	-15.4
H	1735.920	50.0	26.5	34	5.9	36.6	52.9	-16.3
H	2169.900	49.4	29.1	34	5.9	38.6	52.9	-14.3

Notes: 1. Peak Detector Data unless otherwise stated.

2. All measurements were made at 3 meter. Harmonic emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna and average detector are used for the emission over 1000MHz.

*Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak detector data for frequencies below 1000 MHz and average detector data for frequencies over 1000 MHz.

Test Engineer: Ken C. C. Lam