

} pDESKJET3 1
} .PL 11.5"
.UPDATED 8/19/98 moved %on time sss 9/4/98 RESTRICTED bands ss
.OP
.SV DATETESTED,DECEMBER 22, 1998
.SV APPLICANT,DAEWOO PRECISION INDUSTRIES LTD.
.SV FCCID,IT7RK700
.SV CIRDESPG,3
.SV RADPG,3
.SV DCYCPG,
.SV OCCPG,5
.SV TEMPR,60.7 ø F
.SV HUMR, 58%
.SV duration, 31.82 milliseconds
.SV lgpul, 43
.SV lgpultm, .74
.SV stpul, 31
.SV stpultm, .34
.SV tottm, 42.36
.SV %on, 42.4

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TEST EQUIPMENT LIST

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1. Spectrum Analyzer: Hewlett Packard 8566B - Opt 462, w/ preselector 85685A, & Quasi-Peak Adapter HP 85650A, & HP 8449B - OPT H02 Cal. 6/26/98
2. Signal Generator, Hewlett Packard 8640B, cal. 10/1/98
3. Eaton Biconnical Antenna Model 94455-1
20-200 MHz Serial No. 0997 Cal. 5/15/98
4. Electro-Metric Dipole Kit, 20-1000 MHz, Model TDA-30 10/15/98
- 5.

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Electro-Metric Horn 1-18 GHz, Model RGA-180, Cal. 8/15/98
6. Electro-Metric Antennas Model TDS-25-1, TDS-25-2, 5/15/97
7. Electro-Metric Line Impedance Stabilization Network Model

"
No. EM-7821, Serial No. 101; 100KHz-30MHz 50uH. 12/3/97
8. Electro-Metric Line Impedance Stabilization Network Model

"
No. EM-7820, Serial No. 2682; 10KHz-30MHz 50uH. 12/3/97
9. Special low loss cable was used above 1 GHz
10. Tenney Temperature Chamber

TEST PROCEDURE

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GENERAL: This report shall NOT be reproduced except in full without the written approval of TIMCO ENGINEERING, INC.

RADIATION INTERFERENCE: The test procedure used was ANSI STANDARD C63.4-1992 using a HEWLETT PACKARD spectrum analyzer with a prese lector. The bandwidth of the spectrum analyzer was 100 kHz with an appropriate sweep speed. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The resolution bandwidth was 100KHz and the video bandwidth was 300KHz. The ambient temperature of the UUT was &tempr& with a humidity of &humr&.

FORMULA OF CONVERSION FACTORS: The Field Strength at 3m was estab lished by adding the meter reading of the spectrum analyzer (which is set to read in units of dBuV) to the antenna correction factor sup plied by the antenna manufacturer. The antenna correction factors are

stated in terms of dB. The gain of the Preselector was accounted for in the Spectrum Analyzer Meter Reading.

" "

Example:

Freq (MHz)	METER READING + ACF = FS
33	20 dBuV + 10.36 dB = 30.36 dBuV/m @ 3m

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TEST PROCEDURES CONTD.

ANSI STANDARD C63.4-1992 10.1.7 MEASUREMENT PROCEDURES: The UUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m. The UUT was placed in the center of the table. The table used for radiated measurements is capable of continuous rotation. The spectrum was scanned from 30 MHz to 10th harmonic of the fundamental.

Peak readings were taken in three (3) orthogonal planes and the highest readings were converted to average readings based on the duration of "ON" time.

Measurements were made by TIMCO ENGINEERING INC. at the registered open field test site located at 6051 N.W. 19th Lane, Gainesville, Fl 32605.

When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes.

RULES: 2.1033(b)(4) CIRCUIT DESCRIPTION

" "
SEE EXHIBIT 5.

" "

ANTENNA & GROUND:

" "

" "
This unit uses the PCB inductor as the antenna. There is no provision for an external antenna.

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.PL 11.5"
.SV PASSFAIL,DOES
.SV LIMIT,75.62 dBuV/m
.ENTER LIMIT FOR AVERAGE FIELD STRENGTH
.SV LIMIT2,55.62 dBuV/m
.ENTER LIMIT FOR HARMONICS AND SPURIOUS (AFS/10)
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NAME OF TEST: RADIATION INTERFERENCE

RULES PART NO.: 15.231

REQUIREMENTS:

Fundamental Frequency	Field Strength of Fundamental	Field Strength of Harmonics and Spurious Emissions (dBuV/m @ 3m)
MHz	dBuV	
40.66 to 40.70	67.04	47.04
70 to 130	61.94	41.94
130 to 174	61.94 to 71.48	41.94 to 51.48
174 to 260	71.48	51.48
260 to 470	71.48 to 81.94	51.48 to 61.94
470 and above	81.94	61.94

THE LIMIT FOR AVERAGE FIELD STRENGTH dBuV/m FOR THE FUNDAMENTAL FREQUENCY= &LIMIT& dBuV/m. NO FUNDAMENTAL IS ALLOWED IN THE RESTRICTED BANDS.

THE LIMIT FOR AVERAGE FIELD STRENGTH dBuV/m FOR THE HARMONICS AND SPURIOUS FREQUENCIES = &LIMIT2& dBuV/m. SPURIOUS IN THE RESTRICTED BANDS MUST BE LESS THAN 54dBuV/m OR 15.209.

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TEST DATA:

EMISSION FREQ.	METER READING	COAX LOSS	ACF	PEAK	AVERAGE	MARGIN	dB
				FIELD STRNGTH	FIELD STRNGTH		
ANT.	MHz	@ 3m dBuV	dB	dB	dBuV/m	dBuV/m	
.TB #5 #14 #25 #34 #42 #52 #60 #67							
315.09	59.30	1.40	15.16	75.86	68.40	7.22	H
630.18	5.50	1.60	20.76	27.86	20.41	35.21	H
945.27	8.10	2.90	24.26	35.26	27.81	27.81	H
1260.36	7.00	1.00	25.04	33.04	25.59	30.03	H
1575.45R	12.90	1.00	26.30	40.20	32.75	21.25	H
1890.54	25.10	1.01	27.56	53.68	46.22	9.40	H
2205.63R	3.30	1.06	28.51	32.87	25.42	28.58	H
2520.72	1.10	1.11	29.30	31.51	24.06	31.57	H
2835.81R	1.10	1.16	30.09	32.35	24.89	29.11	H
3150.90	1.60	1.20	30.88	33.68	26.23	29.40	H

..Forbidden BAnds emissions must meet the 15.109 level requirements.

..LESS THAN 54.0dBuV/M

..THE FOLLOWING STATEMENT IS REQUIRED IF NO EMISSIONS WER FOUND AT THE ..HIGHER HARMONICS.

..A SEARCH WAS MADE AT ALL OF THE HARMONICS UP TO THE 10th HARMONIC OF .. THE FUNDAMENTAL FREQUENCY AT TA DISTANCE OF ONE METER AND NO ..MEASURABLE EMISSIONS WERE FOUND.

SAMPLE CALCULATION OF LIMIT @ 303 MHz:

$$\begin{aligned}(470 - 260) \text{MHz} &= 210 \text{ MHz} \\ (12500 - 3750) \mu\text{V/m} &= 8750 \mu\text{V/m} \\ 8750 \mu\text{V/m} / 210 \text{MHz} &= 41.67 \mu\text{V/m/MHz} \\ (303 - 260) \text{MHz} &= 43 \text{ MHz}\end{aligned}$$

43 MHz * 41.67 uV/m/MHz = 1791.81 uV/m
(1791.81 + 3750)uV/m = 5541.81 uV/m limit @ 303 MHz
.oj on
The transmitter ceases transmitting when the button is released.

TEST RESULTS: The unit &passfail& meet the FCC requirements.

PERFORMED BY: _____ DATE TESTED: &DATETESTED&

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CALCULATION OF DUTY CYCLE:

.LM 1.0"

The period of the pulse train is determined by observing it on an oscilloscope or a spectrum analyzer with zero(0) frequency span. A plot is then made of the pulse train with a sweep time of 100milliseconds. This sweep determines the duration of the pulse train, which in this case is &duration&. This sweep allows the determination of the number of and type of pulses, i.e. long & short. Plots are then made showing the duration

of each type of pulse and its duration. From the

100millisecond Plot the number of a given type of pulse

is then multiplied by the duration of that type pulse.

This allows the calculation of the amount of time the

UUT is on within 100milliseconds. If the pulse train is

longer than 100milliseconds then this number is multi

plied by 100 to determine the percentage ON TIME. If

the pulse train is less than 100milliseconds the total

on-time is divided by the length of the pulse train and

then multiplied by 100 to determine the percentage ON

TIME. In this case there were &lgpul& pulses

&lgpultm&milliseconds long and &stpul&pulses

&stpultm&milliseconds long for a total of &tottm&milli

seconds on time within either the 100milliseconds or

the pulse train. The average field strength is deter

mined by multiplying the peak field strength by the percent on time. In this case the percentage ON time was &%ON&percent.
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APPLICANT: &APPLICANT&
FCC ID: &FCCID&
NAME OF TEST: Occupied Bandwidth
RULES PART NO.: 15.231(C)
.OJ OFF
REQUIREMENTS: The bandwidth of the emission shall be no wider than .25% of the center frequency for devices operating between 70 and 900 MHz. Bandwidth is determined at the points 20 dB down from the modulated carrier.

315.09 MHz * .0025 = .787725 MHz

.787725 MHz/2 = +/- 393.86

THE GRAPH ON THE FOLLOWING PAGE REPRESENTS THE EMISSIONS TAKEN FOR THE DEVICE.

METHOD OF MEASUREMENT: A small sample of the transmitter output was fed into the spectrum analyzer and the above photo was taken. The vertical scale is set to 10 dB per division: the horizontal scale is set to 100 kHz per division.

TEST RESULTS: The unit meets the FCC requirements.

PERFORMED BY:

DATE: &DATETESTED&

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