

Data Sheets for Test Report 127109- OBD ½Wireless Vehicle Interface XXX-WI-916

FOR: EASE Simulation, Inc.
FCC ID No: O8A-WI-916
EUT: OBD ½ Wireless Vehicle Interface
MANUFACTURER: EASE Simulation Inc.
State Route 492, Box 3011
New Milford, PA 18834
John Yuron
570-489-1063
Contact for any questions Bridget A. Keesser
bridget_keesser@instr.com

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Data sheet 2	Conducted emissions data
Data sheet 3	Conducted emissions plotted graph
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WORLD COMPLIANCE CENTER
EMISSION LEVEL [dBuV]

17 JUL 2000 09:24:52

PEAK

100

80

60

40

20

.45

FCC PART 15 CONDUCTED EMISSIONS
EASE DIAGNOSTICS
OBD WIRELESS VEHICLE INTERFACE
ACTIVELY COMMUNICATING
TEST No. 1 LINE @120VAC/60HZ

CLASS B

1

10

30

FREQUENCY [MHz]

18 031

INSTRUMENT SPECIALTIES CO., INC
WORLD COMPLIANCE CENTER
TEST DATA

REPORT No.: 127109 DATE: 17 JULY 2000 TEST No.: 1
TITLE OF TEST: FCC PART 15 CLASS B CONDUCTED EMISSIONS
CUSTOMER: EASE DIAGNOSTICS
EUT DESCRIPTION: OBD WIRELESS VEHICLE INTERFACE
TEST MODE: OPERATIONAL -ACTIVE COMMUNICATION BETWEEN BASE & VEHICLE
SERIAL No.: N/A (BASE UNIT)
FREQUENCY RANGE: 450kHz - 30MHz SENSOR LOCATION: LINE
INPUT POWER: 120VAC/60Hz TEMP: 74.6 f HUM: 58.4 % BAR: 29.94 "
TEST PERFORMED BY: EUGENE P. CLARKE SR.
TEST RESULTS: COMPLIES
TEST CONDITIONS: TABLE TOP ARRANGEMENT, TRANSMIT @ 916.48MHz RECIEVE @ 905.78MHz

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WORLD COMPLIANCE CENTER 17 Jul 2000 09:24:52

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1. CONDUCTED EMISSIONS TEST SETUPS
1.1 FCC PART 15 CLASS B

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EASE DIAGNOSTICS
OBD WIRELESS VEHICLE INTERFACE
ACTIVELY COMMUNICATING
TEST No. 1 LINE @120VAC/60Hz

23 highest Peaks above -50 dB of Limit Line #1
peak criteria = 1 dB

PEAK#	FREQ (MHz)	(dBuV)	DELTA
1	11.67	39.8	-8.2
2	.4812	38.4	-9.6
3	.4693	38.3	-9.7
4	.5082	37.9	-10.1
5	.7867	36.9	-11.1
6	.7079	36.6	-11.4
7	.53	36.2	-11.8
8	.6704	35.7	-12.3
9	.5504	35.6	-12.4
10	.5644	35.3	-12.7
11	.5961	34.7	-13.3
12	.6268	34.7	-13.3
13	.6087	34.6	-13.4
14	.6348	34.5	-13.5
15	.8805	34	-14.0
16	13.69	33.5	-14.5
17	.9299	32.7	-15.3
18	.9417	32.1	-15.9
19	.9657	31.2	-16.8
20	.9779	30.3	-17.7
21	17.76	30.3	-17.7
22	1.016	30	-18.0
23	.9945	29.7	-18.3

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WORLD COMPLIANCE CENTER
EMISSION LEVEL [dBuV]

PEAK

17 JUL 2000 09: 46: 10

100

80

60

40

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.45

FCC PART 15 CONDUCTED EMISSIONS
EASE DIAGNOSTICS
OBD WIRELESS VEHICLE INTERFACE
ACTIVELY COMMUNICATING
TEST No. 2 NEUT @ 120VAC/60HZ

CLASS B

1

10

30

FREQUENCY [MHz]

20931

INSTRUMENT SPECIALTIES CO., INC
WORLD COMPLIANCE CENTER
TEST DATA

REPORT No.: 127109 DATE: 17 JULY 2000 TEST No.: 2
TITLE OF TEST: FCC PART 15 CLASS B CONDUCTED EMISSIONS
CUSTOMER: EASE DIAGNOSTICS
EUT DESCRIPTION: OBD WIRELESS VEHICLE INTERFACE
TEST MODE: OPERATIONAL -ACTIVE COMMUNICATION BETWEEN BASE & VEHICLE
SERIAL No.: N/A (BASE UNIT)
FREQUENCY RANGE: 450kHz - 30MHz SENSOR LOCATION: NEUTRAL
INPUT POWER: 120VAC/60Hz TEMP: 74.6 f HUM: 58.4 % BAR: 29.94 "
TEST PERFORMED BY: EUGENE P. CLARKE SR.
TEST RESULTS: COMPLIES
TEST CONDITIONS: TABLE TOP ARRANGEMENT, TRANSMIT @ 916.48MHz RECIEVE @ 905.78MHz

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WORLD COMPLIANCE CENTER 17 Jul 2000 09:46:10

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1. CONDUCTED EMISSIONS TEST SETUPS
1.1 FCC PART 15 CLASS B

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EASE DIAGNOSTICS
OBD WIRELESS VEHICLE INTERFACE
ACTIVELY COMMUNICATING
TEST No. 2 NEUT @ 120VAC/60Hz

23 highest Peaks above -50 dB of Limit Line #1
peak criteria = 1 dB

PEAK#	FREQ (MHz)	(dBuV)	DELTA
1	11.72	36.8	-11.2
2	11.48	35.7	-12.3
3	.5345	32.5	-15.5
4	11.05	32.1	-15.9
5	.5861	31.7	-16.3
6	.5621	31.6	-16.4
7	.4673	31.5	-16.5
8	.5692	31.4	-16.6
9	11.97	31.4	-16.6
10	.5412	31.3	-16.7
11	.5527	31.3	-16.7
12	.6242	31.2	-16.8
13	.6537	31.2	-16.8
14	.4772	31	-17.0
15	12.22	31	-17.0
16	.6401	30.9	-17.1
17	.5936	30.8	-17.2
18	.6036	30.8	-17.2
19	11.82	30.8	-17.2
20	.5212	30.5	-17.5
21	.4956	30.3	-17.7
22	11.29	30.3	-17.7
23	.4833	30.2	-17.8

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WORLD COMPLIANCE CENTER
EMISSION LEVEL [dBuV]

17 Jul 2000 09:58:20

PEAK

100

80

60

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20

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FCC PART 15 CONDUCTED EMISSIONS
EASE DIAGNOSTICS
OBD WIRELESS VEHICLE INTERFACE
VEHICLE UNIT IN UTILITY MODE
TEST No. 3 LINE @ 120VAC/60Hz

CLASS B

1

10

30

FREQUENCY [MHz]

22 831

INSTRUMENT SPECIALTIES CO., INC
WORLD COMPLIANCE CENTER
TEST DATA

REPORT No.: 127109 DATE: 17 JULY 2000 TEST No.: 3
TITLE OF TEST: FCC PART 15 CLASS B CONDUCTED EMISSIONS
CUSTOMER: EASE DIAGNOSTICS
EUT DESCRIPTION: OBD WIRELESS VEHICLE INTERFACE
TEST MODE: OPERATIONAL - VEHICLE UNIT IN UTILITY MODE
SERIAL No.: N/A (VEHICLE UNIT)
FREQUENCY RANGE: 450kHz - 30MHz SENSOR LOCATION: LINE
INPUT POWER: 120VAC/60Hz TEMP: 74.6 f HUM: 58.4 % BAR: 29.94 "
TEST PERFORMED BY: EUGENE P. CLARKE SR.
TEST RESULTS: COMPLIES
TEST CONDITIONS: TABLE TOP ARRANGEMENT, NO ACTIVE TRANSMISSION IN THIS MODE
BASE UNIT NOT INVOLVED IN THIS PROCESS.

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WORLD COMPLIANCE CENTER 17 Jul 2000 09:58:20

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1. CONDUCTED EMISSIONS TEST SETUPS
1.1 FCC PART 15 CLASS B

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EASE DIAGNOSTICS
OBD WIRELESS VEHICLE INTERFACE
VEHICLE UNIT IN UTILITY MODE
TEST No. 3 LINE @ 120VAC/60Hz

23 highest Peaks above -50 dB of Limit Line #1
peak criteria = 1 dB

PEAK#	FREQ (MHz)	(dBuV)	DELTA
1	.4853	39.4	-8.6
2	12.17	38.3	-9.7
3	.7321	37.9	-10.1
4	.7139	37.8	-10.2
5	.7764	37.6	-10.4
6	.5527	36.5	-11.5
7	.6592	36.2	-11.8
8	.5644	36	-12.0
9	.5716	35.5	-12.5
10	.5788	35.5	-12.5
11	.8551	35.5	-12.5
12	11.72	35.3	-12.7
13	.9068	33.8	-14.2
14	13.63	32.5	-15.5
15	.9861	30.6	-17.4
16	1.037	30.4	-17.6
17	1.003	30.3	-17.7
18	17.76	30.3	-17.7
19	1.072	29.5	-18.5
20	11.92	29.1	-18.9
21	1.095	28.6	-19.4
22	6.143	28.4	-19.6
23	1.147	28.3	-19.7

23 931

WORLD COMPLIANCE CENTER
EMISSION LEVEL [dBuV]

17 Jul 2000 10:07:36

PEAK

100

80

60

40

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1

10

30

FREQUENCY [MHz]

FCC PART 15 CONDUCTED EMISSIONS
EASE DIAGNOSTICS
OBD WIRELESS VEHICLE INTERFACE
VEHICLE UNIT IN UTILITY MODE
TEST No. 4 NEUT @ 120VAC/60Hz

CLASS B

WORLD COMPLIANCE CENTER
EMISSION LEVEL [dBuV]

17 Jul 2000 10:07:36

QUASI-PEAK

100

80

60

40

20

.45

1

10

30

FREQUENCY [MHz]

FCC PART 15 CONDUCTED EMISSIONS
EASE DIAGNOSTICS
OBD WIRELESS VEHICLE INTERFACE
VEHICLE UNIT IN UTILITY MODE
TEST No. 4 NEUT @ 120VAC/60Hz

CLASS B

24831

INSTRUMENT SPECIALTIES CO., INC
WORLD COMPLIANCE CENTER
TEST DATA

REPORT No.: 127109 DATE: 17 JULY 2000 TEST No.: 4
TITLE OF TEST: FCC PART 15 CLASS B CONDUCTED EMISSIONS
CUSTOMER: EASE DIAGNOSTICS
EUT DESCRIPTION: OBD WIRELESS VEHICLE INTERFACE
TEST MODE: OPERATIONAL - VEHICLE UNIT IN UTILITY MODE
SERIAL No.: N/A (VEHICLE UNIT)
FREQUENCY RANGE: 450kHz - 30MHz SENSOR LOCATION: NEUTRAL
INPUT POWER: 120VAC/60Hz TEMP: 74.6 f HUM: 58.4 % BAR: 29.94 "
TEST PERFORMED BY: EUGENE P. CLARKE SR.
TEST RESULTS: COMPLIES
TEST CONDITIONS: TABLE TOP ARRANGEMENT, NO ACTIVE TRANSMISSION IN THIS MODE
BASE UNIT NOT INVOLVED IN THIS PROCESS.

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WORLD COMPLIANCE CENTER	17 Jul 2000	10:07:36
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1. CONDUCTED EMISSIONS TEST SETUPS
1.1 FCC PART 15 CLASS B

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EASE DIAGNOSTICS
OBD WIRELESS VEHICLE INTERFACE
VEHICLE UNIT IN UTILITY MODE
TEST No. 4 NEUT @ 120VAC/60Hz

23 highest Quasi-Peaks above -50 dB of Limit Line #1
peak criteria = 1 dB

PEAK#	FREQ (MHz)	(dBuV)	DELTA
1	11.72	34.7	-13.3
2	11.48	29.3	-18.7
3	11.29	23.2	-24.8
4	11.1	22.4	-25.6
5	11.01	21.5	-26.5
6	10.87	19.5	-28.5
7	10.64	17.6	-30.4
8	10.73	17.5	-30.5
9	13.18	12.1	-35.9

25731

INSTRUMENT SPECIALTIES CO., INC
WORLD COMPLIANCE CENTER
TEST DATA

REPORT No.: 127109 DATE: 17 JULY 2000 TEST No.: 4
TITLE OF TEST: FCC PART 15 CLASS B CONDUCTED EMISSIONS
CUSTOMER: EASE DIAGNOSTICS
EUT DESCRIPTION: OBD WIRELESS VEHICLE INTERFACE
TEST MODE: OPERATIONAL - VEHICLE UNIT IN UTILITY MODE
SERIAL No.: N/A (VEHICLE UNIT)
FREQUENCY RANGE: 450kHz - 30MHz SENSOR LOCATION: NEUTRAL
INPUT POWER: 120VAC/60Hz TEMP: 74.6 f HUM: 58.4 % BAR: 29.94 "
TEST PERFORMED BY: EUGENE P. CLARKE SR.
TEST RESULTS: COMPLIES
TEST CONDITIONS: TABLE TOP ARRANGEMENT, NO ACTIVE TRANSMISSION IN THIS MODE
BASE UNIT NOT INVOLVED IN THIS PROCESS.

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WORLD COMPLIANCE CENTER 17 Jul 2000 10:07:36

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1. CONDUCTED EMISSIONS TEST SETUPS
1.1 FCC PART 15 CLASS B

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EASE DIAGNOSTICS
OBD WIRELESS VEHICLE INTERFACE
VEHICLE UNIT IN UTILITY MODE
TEST No. 4 NEUT @ 120VAC/60Hz

23 highest Peaks above -50 dB of Limit Line #1
peak criteria = 1 dB

PEAK#	FREQ (MHz)	(dBuV)	DELTA
1	11.72	45.6	-2.4
2	11.43	35	-13.0
3	11.57	35	-13.0
4	.5837	32.9	-15.1
5	.5412	32.7	-15.3
6	.4557	32.6	-15.4
7	.5886	32.6	-15.4
8	.5481	32.3	-15.7
9	12.38	32.3	-15.7
10	.5764	32.2	-15.8
11	.6113	32.2	-15.8
12	.6242	32.1	-15.9
13	.6321	32.1	-15.9
14	.6962	32.1	-15.9
15	.5961	32	-16.0
16	12.12	32	-16.0
17	.4654	31.9	-16.1
18	.6537	31.9	-16.1
19	11.82	31.9	-16.1
20	.6455	31.8	-16.2
21	.4752	31.6	-16.4
22	12.02	31.6	-16.4
23	.6592	31.4	-16.6

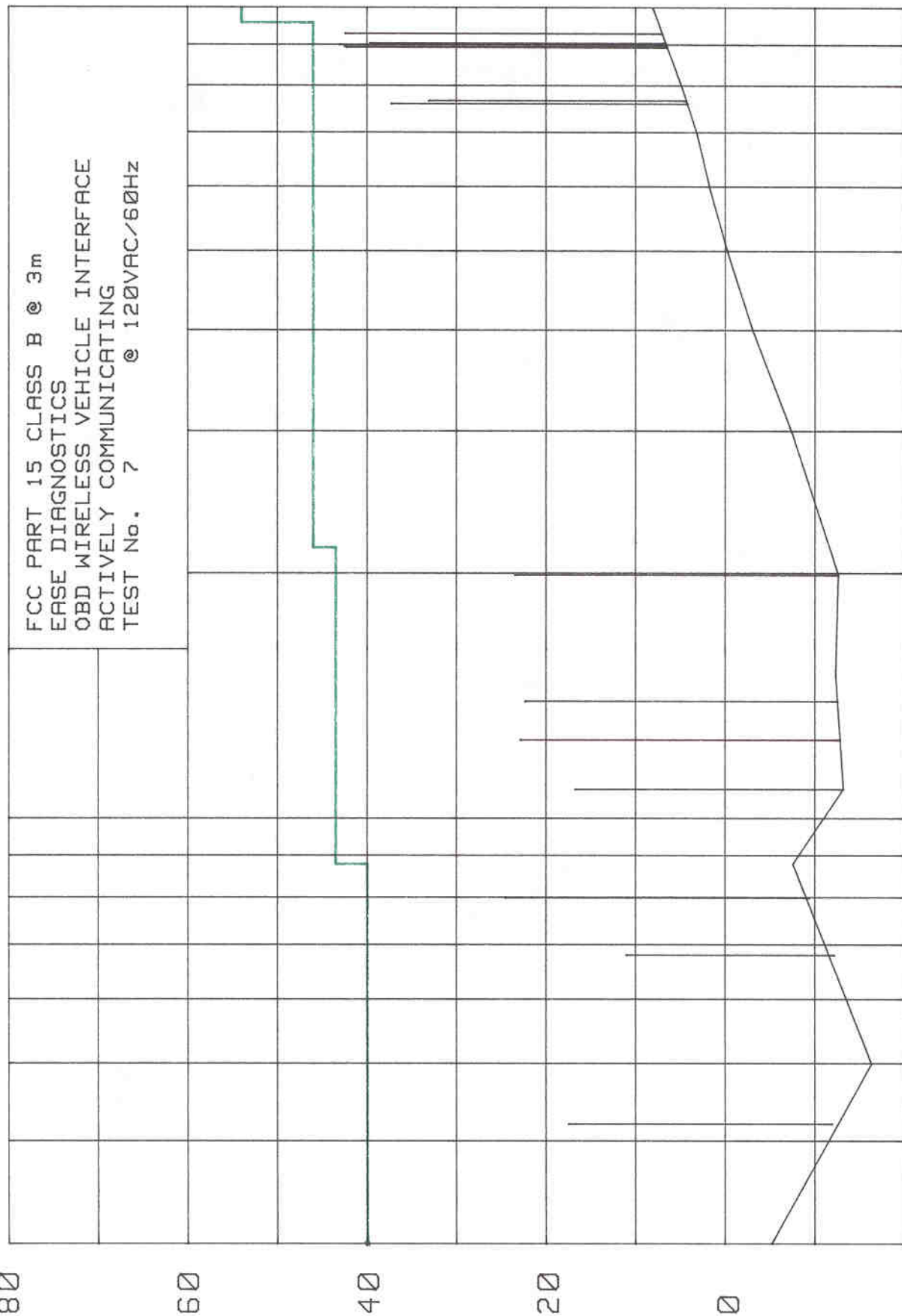
26 731

WORLD COMPLIANCE CENTER

EMISSION LEVEL [dBuV/m]

hp

FCC PART 15 CLASS B @ 3m
EASE DIAGNOSTICS
OBD WIRELESS VEHICLE INTERFACE
ACTIVELY COMMUNICATING
TEST No. 7 @ 120VAC/60Hz



1000

100

30

FREQUENCY [MHz]

FINAL SIGNALS

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INSTRUMENT SPECIALTIES CO., INC
WORLD COMPLIANCE CENTER
TEST DATA

REPORT No.: 127109 DATE: 19 JULY 2000 TEST No.: 7
TITLE OF TEST: FCC PART 15 CLASS B RADIATED EMISSIONS @ 3m
CUSTOMER: EASE DIAGNOSTICS
EUT DESCRIPTION: OBD WIRELESS VEHICLE INTERFACE
TEST MODE: OPERATIONAL - ACTIVE COMMUNICATION BETWEEN BASE & VEHICLE
SERIAL No.: N/A
FREQUENCY RANGE: 30MHz - 1000MHz SENSOR LOCATION/POLARIZATION: WORSE CASE
INPUT POWER: 120VAC/60Hz TEMP: 75.1f HUM: 59.3% BAR: 30.02"
TEST PERFORMED BY: EUGENE P. CLARKE SR.
TEST RESULTS: COMPLIES
TEST CONDITIONS: TABLE TOP ARRANGEMENT
 TRANSMIT @ 916.48MHz, RECEIVE @ 905.78MHz

* INDICATES NOISE FLOOR READING

PRODUCT EMISSIONS

FCC PART 15 CLASS B @ 3m Data File: TEST No. 7 19 Jul 2000 13:51

No	EMISSION	SPEC LIMIT	MEASUREMENTS			POL	SITE		CORR FACTOR	COMMENTS
	FREQUENCY MHz		ABS	dLIM	MODE		HGT	AZM		
			dBuV/m	dB			cm	deg	dB	
1	42.078	39.0	17.5	-21.5	PK	V	100	0	-18.4	*
2	68.030	39.0	11.1	-27.9	PK	V	100	0	-24.5	*
3	79.995	39.0	24.6	-14.4	PK	H	400	180	-23.4	
4	108.900	43.5	16.8	-26.7	PK	V	100	0	-19.5	*
5	125.279	43.5	22.9	-20.6	PK	V	100	270	-18.3	*
6	139.694	43.5	22.4	-21.1	PK	V	100	0	-18.1	*
7	199.795	43.5	23.5	-20.0	PK	H	100	180	-19.9	
8	762.661	46.4	37.3	-9.1	QP	V	150	0	-3.9	
9	769.410	46.4	33.1	-13.3	QP	V	150	0	-3.8	
10	895.062	46.4	42.3	-4.1	QP	V	150	0	-1.6	
11	897.183	46.4	42.5	-3.9	QP	V	150	0	-1.5	
12	902.121	46.4	43.1	-3.3	QP	V	200	0	-1.5	
13	905.772	46.4	39.7	-6.7	QP	V	100	180	-1.4	
14	930.749	46.4	42.4	-4.0	QP	V	110	180	-0.9	

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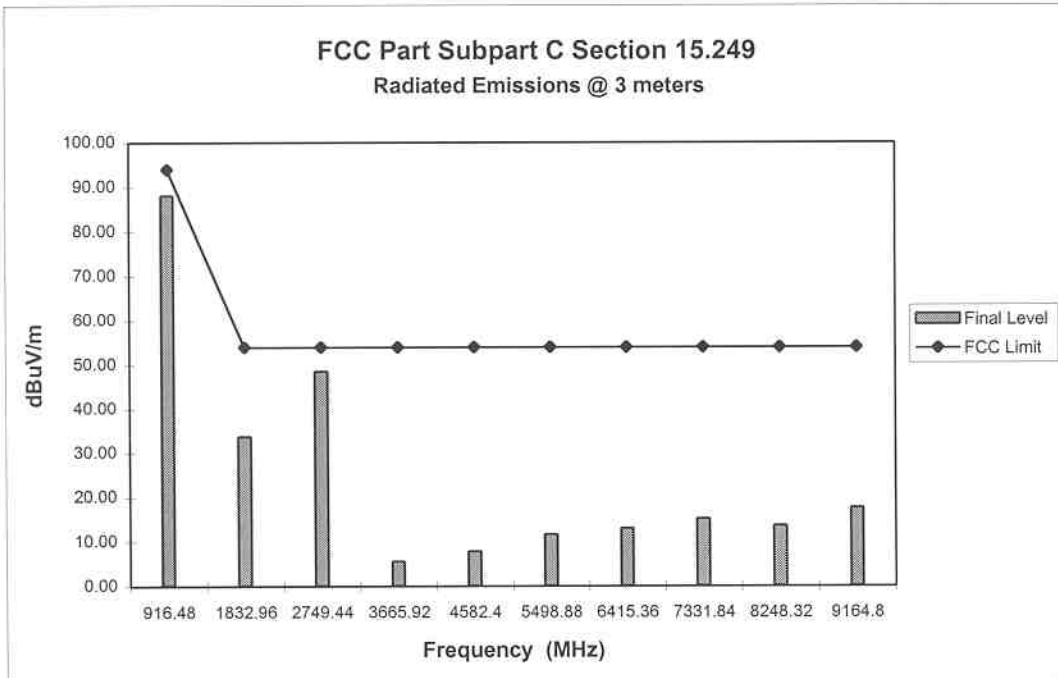
FCC Part 15 Subpart C Section 15.249 **Radiated Emissions @ 3 Meters** **Data Sheet**

Date : 19-Jul-00
Customer Ease Diagnostics
Tech : Eugene P. Clarke Sr.
EUT : OBD Wireless Vehicle Interface

	Frequency (MHz)	Measured Level (dBuV)	Antenna Factor +(dB)	Cable Loss +(dB)	Preamp Gain -(dB)	Final Level (dBuV/m)	Spec Limit (dBuV/m)	Polarity (V/H)	Delta to Limit	Restricted Bands
1	916.48	88.2	23.2	2	25.2	88.20	93.97	Vertical	-5.77	No
2	1832.96	41.17	25.82	3.9	37.1	33.79	53.97	Vertical	-20.18	No
3	2749.44	49.5	30.36	6.4	37.7	48.56	53.97	Vertical	-5.41	Yes
4	3665.92	6.17	30.47	6.40	37.40	5.64	53.97	Vertical	-48.33	Yes
5	4582.4	5.67	33.13	6.40	37.30	7.90	53.97	Vertical	-46.07	Yes
6	5498.88	6.67	34.18	7.70	36.85	11.70	53.97	Horizontal	-42.27	No
7	6415.36	5.67	35.31	10.60	38.50	13.08	53.97	Horizontal	-40.89	No
8	7331.84	7.17	36.48	11.90	40.40	15.15	53.97	Vertical	-38.82	Yes
9	8248.32	4.5	37.56	10.60	39.00	13.66	53.97	Vertical	-40.31	Yes
10	9164.8	8.17	37.65	10.40	38.60	17.62	53.97	Horizontal	-36.35	Yes

Equipment used :

Low loss cables , S/n 329 (3M), S/n 338 (3m), S/n 331 (1m)
 HP8449B Preamp
 EMCO 3155 Antenna S/N: 2845
 HP8566B Spectrum Analyzer



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WORLD COMPLIANCE CENTER
EMISSION LEVEL [dBuV]

17 Jul 2000 09:58:20

PEAK

100

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FCC PART 15 CONDUCTED EMISSIONS
EASE DIAGNOSTICS
OBD WIRELESS VEHICLE INTERFACE
VEHICLE UNIT IN UTILITY MODE
TEST No. 3 LINE @ 120VAC/60Hz

CLASS B

1

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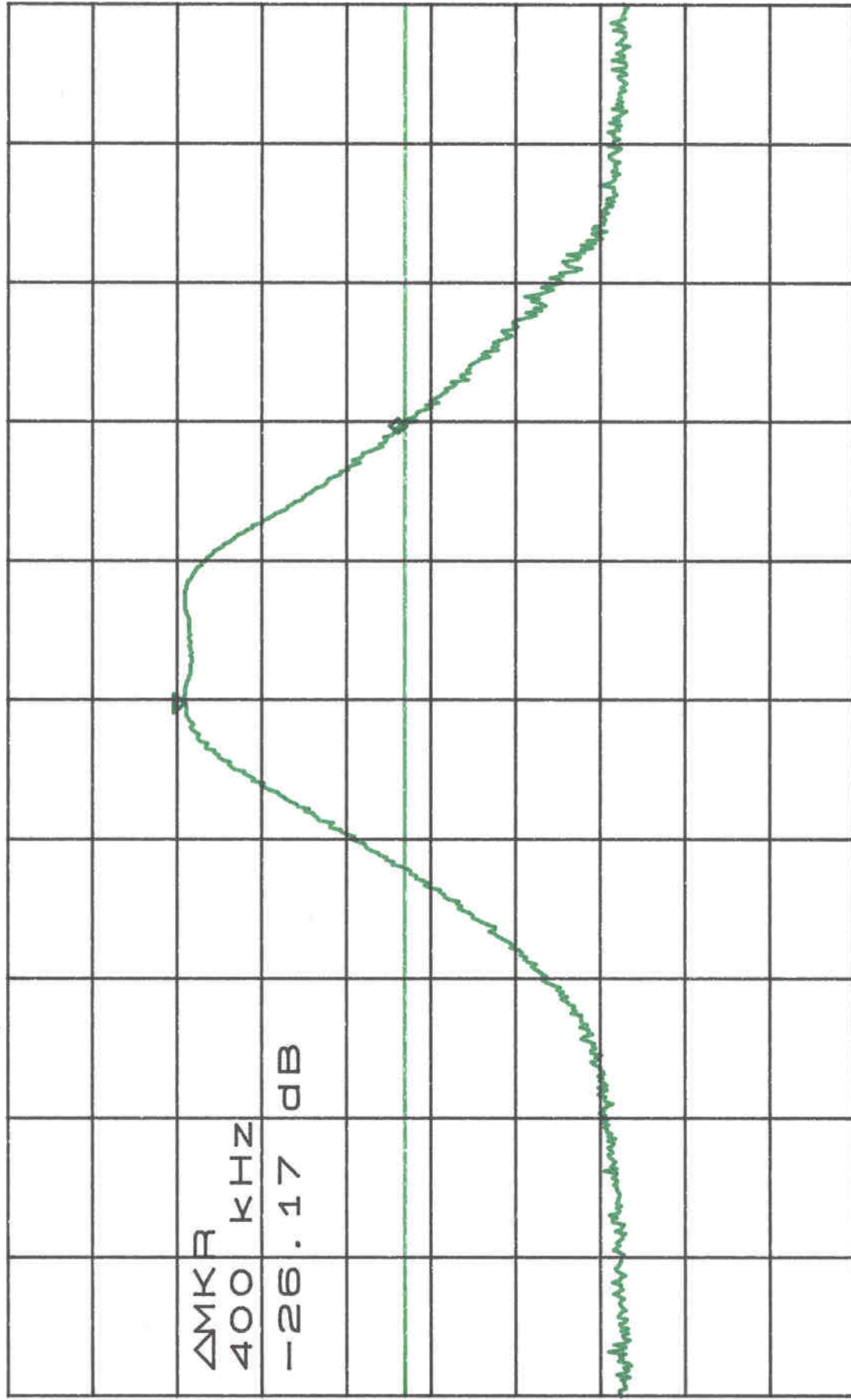
FREQUENCY [MHz]

22 831

ATTEN 20dB

 $\Delta MKR -26.17dB$ RL 117.0dB μV

400KHZ / 10dB / 400KHZ

 ΔMKR
400 KHZ -26.17 dB

31 08 31

CENTER 916.420MHZ

SPAN 2.000MHZ

*RBW 100KHZ

VBW 100KHZ

*SWP 50ms