RADIO FREQUENCY INVESTIGATION LTD

Ewhurst Park
Ramsdell
Basingstoke
Hampshire
England
RG26 5RQ

Switchboard Tel: (+44) 01256 851193
Accounts Tel: (+44) 01256 855490
Sales Tel: (+44) 01256 855400
Fax: (+44) 01256 851192

EXTRACT FROM ORIGINAL TEST REPORT

TEST REPORT FROM RADIO FREQUENCY INVESTIGATION LTD.

Test Of: PAE 3000 Series Radio

To: CAA Ground Aeronautical Transmitting Equipment EMC Test Requirements

Test Report Serial No:
RFI/EMCB1/RP32024A

This Test Report Is Issued Under The Authority Of Brian Watson, Technical Director:	
Tested By:	**Checked By:**
Report Copy No: 02	
Issue Date: 5 June 1996	**Test Dates: 9 April 1996 to 16 April 1996**

This is a true copy of pages extracted from the above test report produced by Radio Frequency Investigation as part of the EMC requirements of the United Kingdom Civil Aviation Authority in order to meet Council directive 89/336/EEC and resulting in Type Examination Certificate 04/7-1

7.2. Test Results For Conducted Emissions On AC Supply

7.2.1. Quasi-Peak Detector Measurements On DC Power Lines - Transmitting at full power (VHF)

7.2.1.1. Plots of the initial scans can be found in Appendix 4.

7.2.1.2. The following table lists frequencies at which emissions were measured using a Quasi-Peak detector:

Frequency (MHz)	Line	Q-P Level (dBµV)	Q-P Limit (dBµV)	Margin (dB)	Result
1.834	-28V	36.0	56.0	20.0	Complied
2.036	-28V	40.5	56.0	15.5	Complied
2.341	-28V	40.6	56.0	15.4	Complied
2.649	-28V	39.4	56.0	16.6	Complied
2.851	-28V	38.1	56.0	17.9	Complied
3.766	-28V	37.0	56.0	19.0	Complied
4.886	-28V	37.0	56.0	19.0	Complied
5.089	-28V	35.4	60.0	24.6	Complied
2.035	+28V	40.2	56.0	15.8	Complied
2.137	+28V	36.2	56.0	19.8	Complied
2.238	+28V	34.4	56.0	21.6	Complied
2.341	+28V	40.2	56.0	15.8	Complied
2.545	+28V	38.9	56.0	17.1	Complied
2.647	+28V	40.8	56.0	15.2	Complied
2.850	+28V	38.3	56.0	17.7	Complied
3.766	+28V	37.6	56.0	18.4	Complied
5.089	+28V	35.1	60.0	24.9	Complied

7.2.2. Average Detector Measurements On DC Power Lines - Transmitting at full power (VHF)

7.2.2.1. Following the initial scans and Quasi-Peak measurements. further measurements were made at the relevant frequencies using an average detector. The measured levels were as follows:

Frequency (MHz)	Line	Av. Level (dBμV)	Av. Limit (dBμV)	Margin (dB)	Result
1.834	-28V	35.6	46.0	10.4	Complied
2.036	-28V	40.4	46.0	5.6	Complied
2.341	-28V	40.4	46.0	5.6	Complied
2.649	-28V	39.2	46.0	16.8	Complied
2.851	-28V	38.1	46.0	7.9	Complied
3.766	-28V	36.9	46.0	9.1	Complied
4.886	-28V	36.4	46.0	9.6	Complied
5.089	-28V	35.4	50.0	14.6	Complied
2.035	+28V	40.1	46.0	5.9	Complied
2.137	+28V	35.6	46.0	10.4	Complied
2.238	+28V	33.9	46.0	12.1	Complied
2.341	+28V	40.1	46.0	5.9	Complied
2.545	+28V	38.8	46.0	7.2	Complied
2.647	+28V	40.7	46.0	5.3	Complied
2.850	+28V	38.2	46 0	7.8	Complied
3.766	+28V	37.4	46 0	8.6	Complied
5.089	+28V	35.0	50.0	15.0	Complied

7.3. Test Results For Conducted Emissions On AC Supply

7.3.1. Quasi-Peak Detector Measurements On AC Power Line - Transmitting full power (VHF)

7.3.1.1. Plots of the initial scans can be found in Appendix 4.

7.3.1.2. The following table lists frequencies at which emissions were measured using a Quasi-Peak detector:

Frequency (MHz)	Line	Q-P Level (dBμV)	Q-P Limit (dBμV)	Margin (dB)	Result
0.172	Live	25.1	64.9	39.8	Complied
12.000	Live	42.0	60.0	18.0	Complied
14.003	Live	35.8	60.0	24.2	Complied
18.002	Live	34.1	60.0	25.9	Complied
20.002	Live	42.1	60.0	17.9	Complied
24.002	Live	46.9	60.0	13.1	Complied
12.001	Neutral	42.0	60.0	18.0	Complied
14.003	Neutral	35.5	60.0	24.5	Complied
18.002	Neutral	33.6	60.0	26.4	Complied
19.999	Neutral	41.7	60.0	18.3	Complied
22.005	Neutral	27.1	60.0	32.9	Complied
24.002	Neutral	45.9	60.0	14.1	Complied

7.3.2. Average Detector Measurements On Live And Neutral Lines- Transmitting full power (VHF)

7.3.2.1. Following the initial scans and Quasi-Peak measurements, further measurements were made at the relevant frequencies using an average detector. The measured levels were as follows:

Frequency (MHz)	Line	Av. Level (dBμV)	Av. Limit (dBμV)	Margin (dB)	Result
0.172	Live	18.2	54.9	36.7	Complied
12.000	Live	40.8	50.0	9.2	Complied
14.003	Live	33.7	50.0	16.3	Complied
18.002	Live	27.8	50.0	22.2	Complied
20.002	Live	40.1	50.0	9.9	Complied
24.002	Live	44.9	50.0	5.1	Complied
12.001	Neutral	40.6	50.0	9.4	Complied
14.003	Neutral	33.3	50.0	16.7	Complied
18.002	Neutral	27.8	50.0	22.2	Complied
19.999	Neutral	39.8	50.0	10.2	Complied
22.005	Neutral	26.5	50.0	23.5	Complied
24.002	Neutral	43.9	50.0	6.1	Complied

Appendix 2. Measurement Methods

A2.1. AC Mains Conducted Emissions

A2.1.1. AC mains conducted emissions measurements were performed in accordance with the standard, against appropriate limits for each detector function.

A2.1.2. The test was performed in a shielded enclosure with the equipment arranged as detailed in the standard on a wooden bench using the floor of the screened enclosure as the ground reference plane.

A2.1.3. Initial measurements in the form of swept scans covering the entire measurement band were performed in order to identify frequencies on which the EUT was generating interference. In order to minimise the time taken for these swept measurements, a Peak detector was used in conjunction with the appropriate detector IF measuring bandwidths (see table below). Repetitive scans were performed to allow for emissions with low repetition rates, and the duty cycle of the EUT. The test configuration was the same for the initial scans as for the final measurements.

A2.1.4. During the swept measurements (and also during subsequent final measurements on single frequencies) any signals found to be between the limit and a level 6 dB below it were further maximised by changing the configuration of the EUT, e.g. re-routing cables to peripherals and moving peripherals with respect to the EUT.

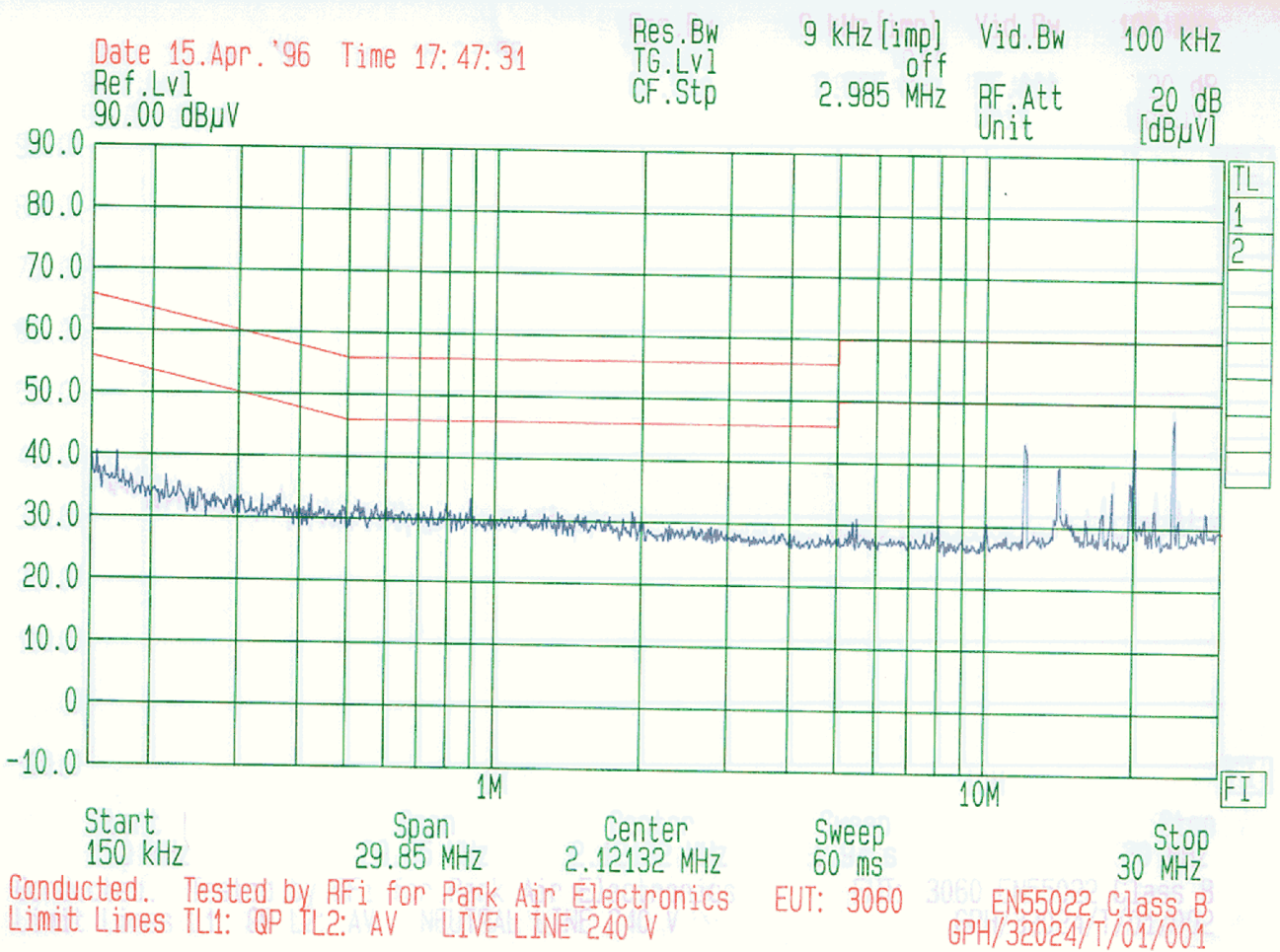
A2.1.5. Following the initial scans, a graph was produced giving an overview of the emissions from the EUT plotted against the appropriate specification limit. A tolerance line was set 6 dB below the specification limit and levels above the tolerance line were re-tested (at individual frequencies) using the appropriate detector function.

Appendix 4. Graphical Test Results

This appendix contains the following graphs.

Graph Reference Number	Title
GPH\32024\T\01\001	Scan of conducted emissions: AC live line, transmit mode
GPH\32024\T\01\002	Scan of conducted emissions: AC neutral line. transmit mode
GPH\32024\T\01\003	Scan of conducted emissions: +28V line transmi mode
GPH\32024\T\01\004	Scan of conducted emissions: -28V line transmit mode
GPH\32024\T\01\006	Scan of radiated electric field: both polarisations (30 to 200 MHz). Transmit Mode VHF
GPH\32024\T\01\007	Scan of radiated electric field: both polarisations (30 to 200 MHz). Recieve Mode VHF
GPH\32024\T\01\008	Scan of radiated electric field: non-polarised (200 to 1000 MHz) Recieve Mode VHF
GPH\32024\T\01\009	Scan of radiated electric field: non-polarised (200 to 1000 MHz) Transmit Mode VHF
GPH\32024\T\01\010	Scan of radiated electric field: non-polarised (200 to 1000 MHz) Receive Mode UHF
GPH\32024\T\01\011	Scan of radiated electric field: non-polarised (200 to 1000 MHz) Transmit Mode UHF
GPH\32024\T\01\012	Scan of radiated electric field: both polarisations (30 to 200 MHz). Transmit Mode UHF
GPH\32024\T\01\013	Scan of radiated electric field: both polarisations (30 to 200 MHz). Recieve Mode UHF

These pages are not included in the total number of pages for this report.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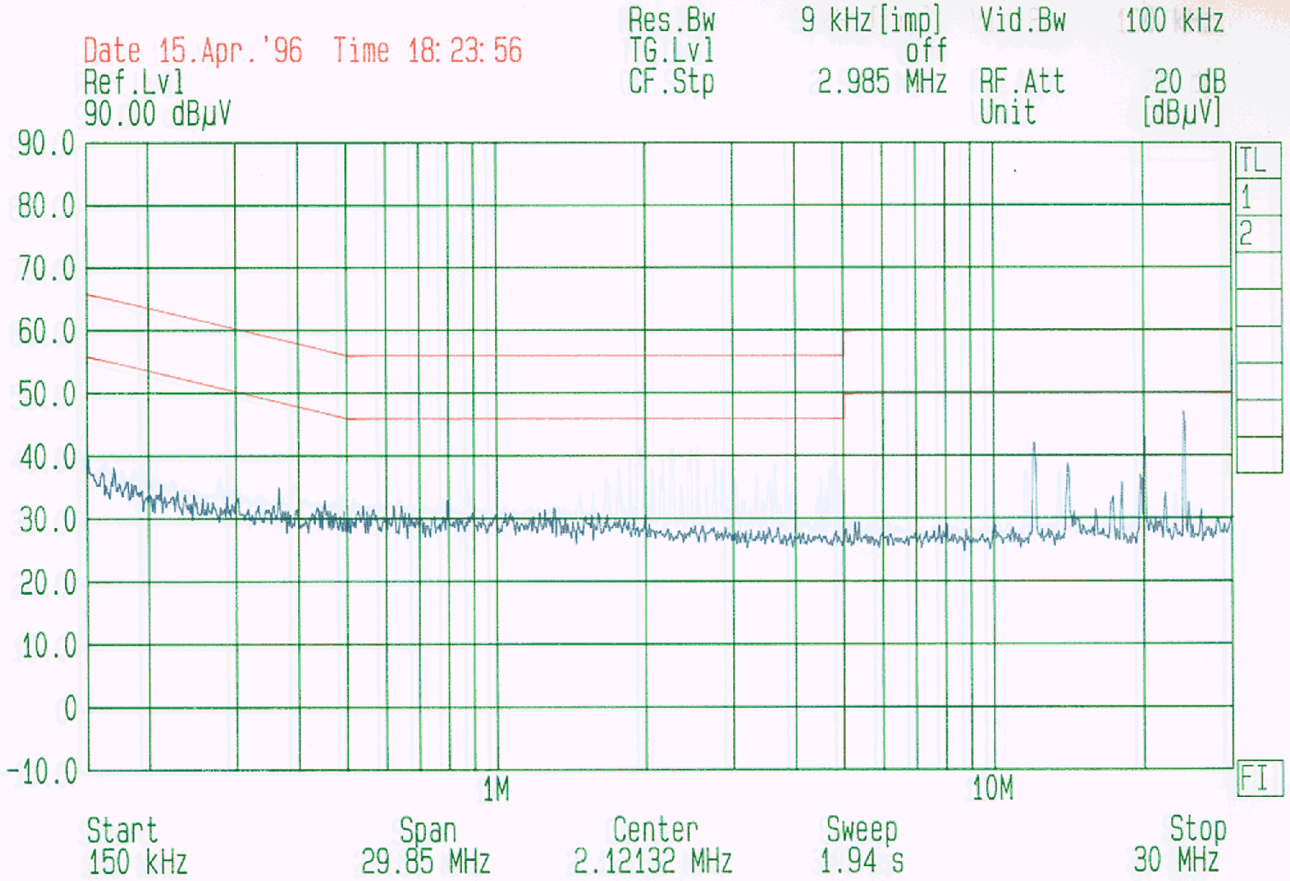
TG.Lvl off
CF.Stp 2.985 MHz
Vid.Bw 100 kHz
RF.Att 20 dB
Unit [dBµV]
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0
-10.0
1M
10M
TL
1
2
FI
Start 150 kHz
Span 29.85 MHz
Center 2.12132 MHz
Sweep 60 ms
Stop 30 MHz
Conducted. Tested by RFi for Park Air Electronics
Limit Lines TL1: QP TL2: AV LIVE LINE 240 V
EUT: 3060
EN55022 Class B
GPH/32024/T/01/001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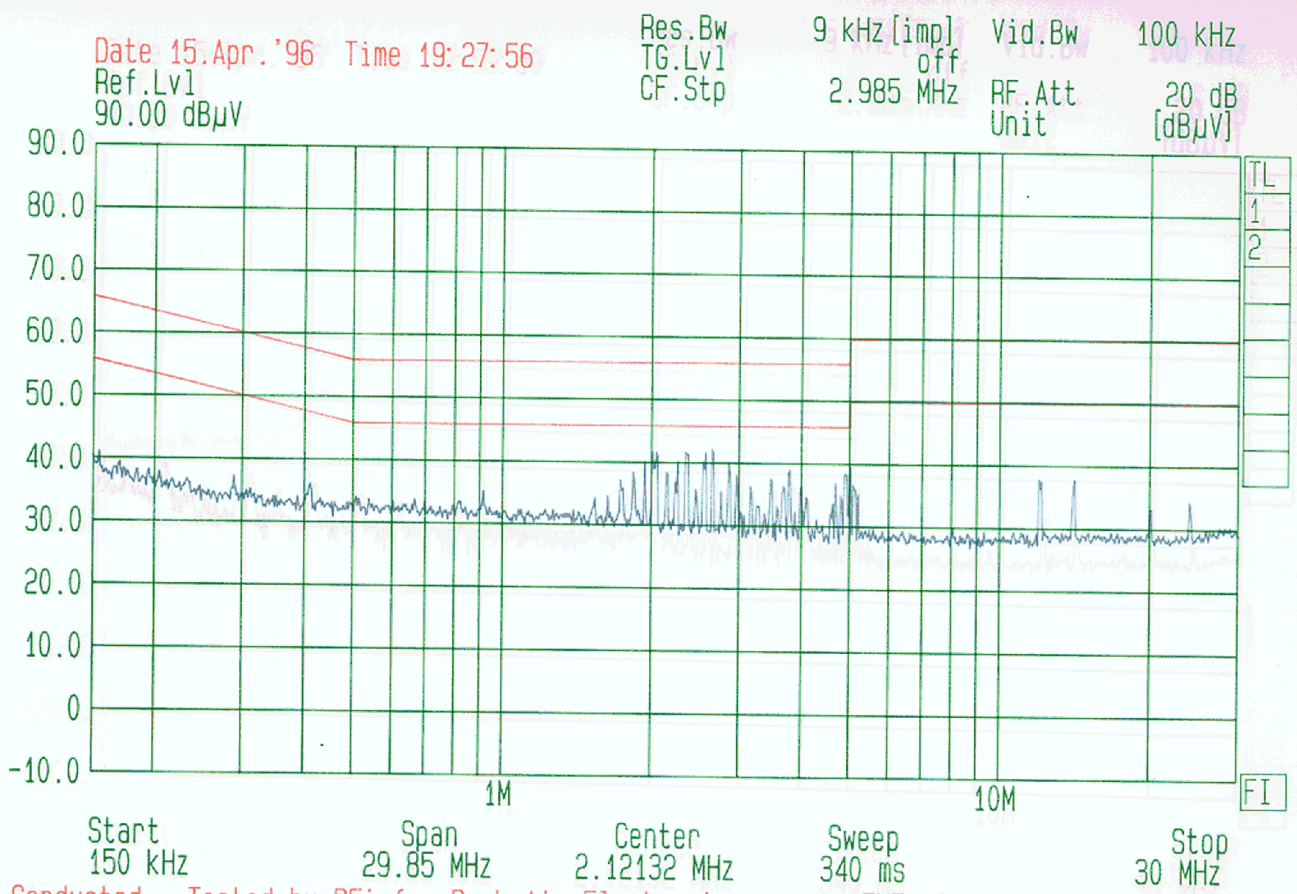
90.00 dBµV
Res.Bw 9 kHz [imp]
TG.Lvl off
CF.Stp 2.985 MHz
Vid.Bw 100 kHz
RF.Att 20 dB
Unit [dBµV]
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0
-10.0
1M
10M
TL
1
2
FI
Start 150 kHz
Span 29.85 MHz
Center 2.12132 MHz
Sweep 1.94 s
Stop 30 MHz
Conducted. Tested by RFi for Park Air Electronics
Limit Lines L1: QP L2: AV NEUTRAL LINE 240 V
EUT: 3060 EN55022 Class B
GPH/32024/T/01/002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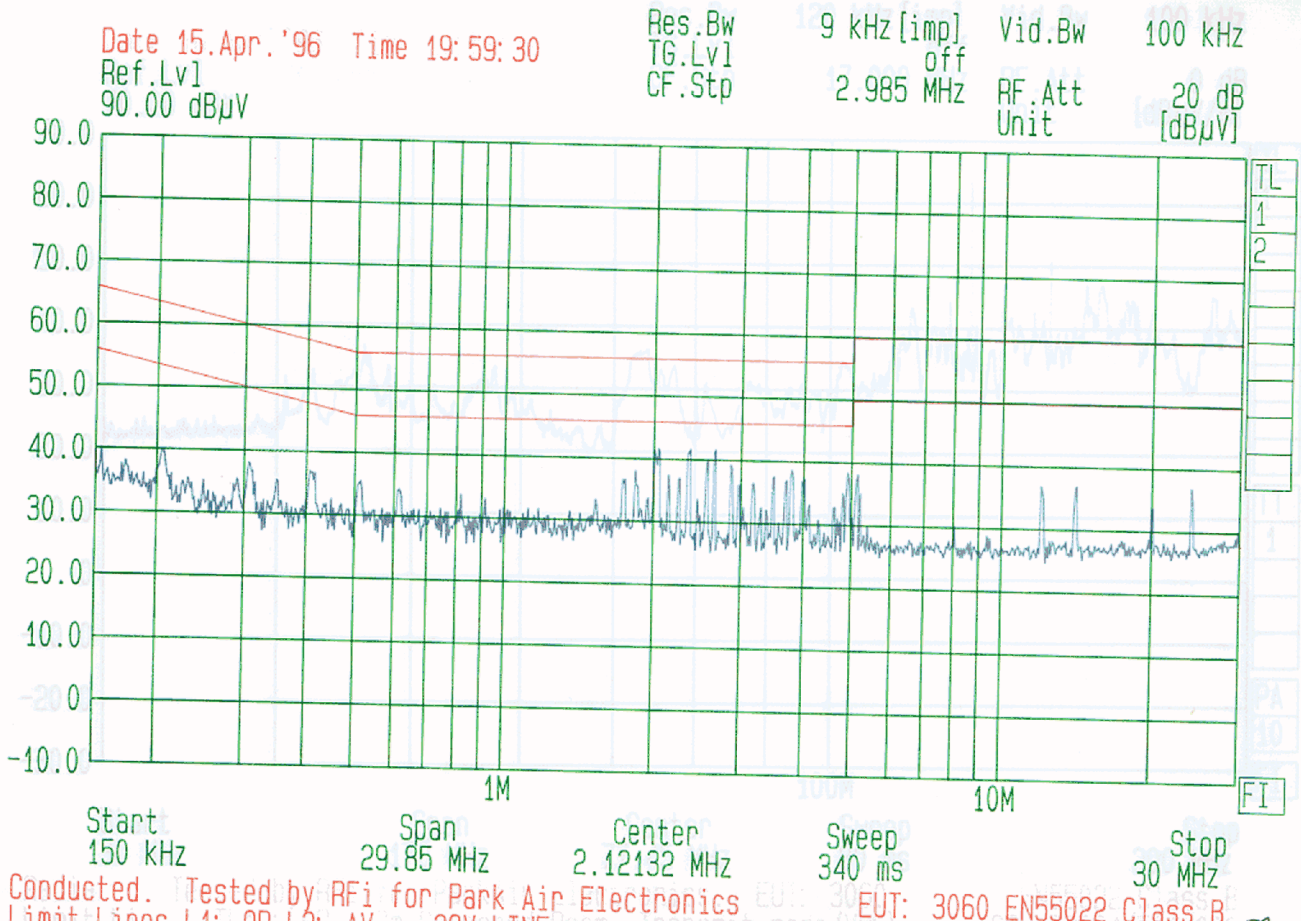
Ref.Lvl
90.00 dBµV
Res.Bw 9 kHz [imp]
TG.Lvl off
CF.Stp 2.985 MHz
Vid.Bw 100 kHz
RF.Att 20 dB
Unit [dBµV]
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0
-10.0
1M
10M
TL
1
2
FI
Start 150 kHz
Span 29.85 MHz
Center 2.12132 MHz
Sweep 340 ms
Stop 30 MHz
Conducted. Tested by RFi for Park Air Electronics
Limit Lines L1: QP L2: AV +28V LINE
EUT: 3060 EN55022 Class B
GPH/32024/T/01/003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TG.Lvl off
CF.Stp 2.985 MHz
Vid.Bw 100 kHz
RF.Att 20 dB
Unit [dBµV]
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80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0
-10.0
1M
10M
TL
1
2
FI
Start 150 kHz
Span 29.85 MHz
Center 2.12132 MHz
Sweep 340 ms
Stop 30 MHz
Conducted. Tested by RFi for Park Air Electronics
Limit Lines L1: QP L2: AV -28V LINE
EUT: 3060 EN55022 Class B
GPH/32024/T/01/0004