

---

## **REPORT ON**

Limited FCC CFR 47: Parts 2, 15 and 87  
and Industry Canada RSS-GEN and RSS-141 Testing  
of a Park Air Systems Ltd 6525 MDR Transceiver

### **COMMERCIAL-IN-CONFIDENCE**

**FCC ID: C8LB6525MDR**  
**Industry Canada ID: 2137A-B6525MDR**

**Report No OR615642/01 Issue 2**

**July 2007**

---



Product Service





Product Service

Choose certainty. Add value.

COMMERCIAL-IN-CONFIDENCE

TUV Product Service Ltd, Octagon House, Concorde Way, Segensworth North,  
Fareham, Hampshire, United Kingdom, PO15 5RL  
Tel: +44 (0) 1489 558100. Website: [www.tuvps.co.uk](http://www.tuvps.co.uk); [www.babt.com](http://www.babt.com)

**REPORT ON**

Limited FCC CFR 47: Parts 2, 15 and 87 and Industry Canada  
RSS-GEN and RSS-141 Testing of a Park Air Systems Ltd 6525 MDR  
Transceiver

FCC ID: C8LB6525MDR  
Industry Canada ID: 2137A-B6525MDR

Report No OR615642/01 Issue 2

July 2007

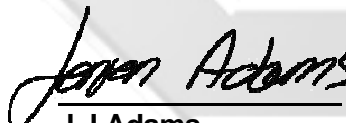
**PREPARED FOR**


Park Air Systems Limited  
Northfields  
Market Deeping  
Peterborough  
PE6 8UE  
England

**PREPARED BY**

  
J Plummer  
Technical Author

**APPROVED BY**

  
J J Adams  
Authorised Signatory

  
M Jenkins  
Authorised Signatory

**DATED**

27<sup>th</sup> July 2007

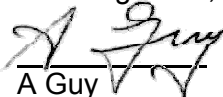
**This report has been up-issued to Issue 2 to correct typographical errors**

---

**ENGINEERING STATEMENT**

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC CFR 47: Parts 2, 15 and 87 and RSS-GEN and RSS-141. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineers;

  
A Guy

  
Z Bailey



Report Number OR615642/01 Issue 2

Page 1 of 23

COMMERCIAL-IN-CONFIDENCE



## CONTENTS

Section		Page No
<b>1</b>	<b>REPORT SUMMARY</b>	
1.1	Status .....	4
1.2	Introduction.....	5
1.3	Brief Summary of Results .....	7
1.4	Product Information .....	8
1.5	Test Conditions .....	9
1.6	Deviations from the Standard .....	9
1.7	Modification Record .....	9
<b>2</b>	<b>TEST DETAILS</b>	
	<b>FCC Part 15 B, Industry Canada RSS-Gen and RSS-141</b>	
2.1	Spurious Radiated Emissions (Enclosure Port).....	11
2.2	Conducted Emissions (AC Power Port).....	14
	<b>FCC Parts 2, 87 and Industry Canada RSS-141 and RSS Gen</b>	
2.3	Radiated Spurious Emissions .....	17
<b>3</b>	<b>TEST EQUIPMENT</b>	
3.1	Test Equipment .....	20
3.2	Measurement Uncertainty .....	21
<b>4</b>	<b>ACCREDITATION, DISCLAIMERS AND COPYRIGHT</b>	
4.1	Accreditation, Disclaimers and Copyright .....	23



Product Service

## **SECTION 1**

### **REPORT SUMMARY**

Limited FCC CFR 47: Parts 2, 15 and 87 and  
Industry Canada RSS-Gen and RSS-141 testing  
of a Park Air Systems Limited 6525 MDR Transceiver



Product Service

**1.1 STATUS**

<b>Equipment Under Test</b>	6525 MDR Transceiver
<b>Objective</b>	To undertake measurements to determine the Equipment Under Test's (EUT's) compliance with the specification.
<b>Name and Address of Client</b>	Park Air Systems Ltd Northfields Market Deeping Peterborough PE6 8UE England
<b>Type</b>	6525 MDR Transceiver
<b>Serial Number(s)</b>	DEV003
<b>Software Version</b>	582V00D06, 583V00D06, 568V00D06, 587V00D08
<b>Test Specification/Issue/Date</b>	FCC CFR 47: Part 2, 2001 FCC CFR 47: Part 15, Subparts B and C, 2006 FCC CFR 47: Part 87, 2005 Industry Canada RSS-Gen: Issue 1, September 2005 Industry Canada RSS-141: Issue 1 Revision 1, February 2004
<b>Test Plan/Issue/Date</b>	TP-M21923-051v0.1 / 3 <sup>rd</sup> October 2006
<b>Number of Items Tested</b>	One
<b>Security Classification of EUT</b>	Commercial-in-Confidence
<b>Incoming Release Date</b>	Declaration of Build Status 7 <sup>th</sup> November 2006
<b>Disposal Reference Number Date</b>	Held pending disposal Not Applicable Not Applicable
<b>Start of Test</b>	10 <sup>th</sup> November 2006
<b>Finish of Test</b>	13 <sup>th</sup> November 2006
<b>Related Documents</b>	ANSI C63.4: 2001 FCC DA 00-705: 2000



Product Service

## 1.2 INTRODUCTION

The information contained within this report is intended to show limited verification of compliance of the Park Air Systems Limited 6525 MDR Transceiver to the requirements of FCC Specification Parts 2, 15 and 87 and Industry Canada RSS-Gen and RSS-141.

Testing has been performed under the following site accreditations

FCC Accreditation  
90987 Octagon House, Fareham Test Laboratory

Industry Canada Accreditation  
IC4270 Octagon House, Fareham Test Laboratory



Product Service

## 1.2 INTRODUCTION

### 1.2.1 Declaration of Build Status

MAIN EUT	
MANUFACTURING DESCRIPTION	VHF Multimode digital radio
MANUFACTURER	Park Air Systems Limited
TYPE	6526 MDR
PART NUMBER	B6525
SERIAL NUMBER	DEV003
HARDWARE VERSION	1
SOFTWARE VERSION	582V00D06, 583V00D06, 568V00D06, 587V00D08
TRANSMITTER OPERATING RANGE	118.000 MHz – 136.975 MHz
RECEIVER OPERATING RANGE	118.000 MHz – 136.975 MHz
COUNTRY OF ORIGIN	UK
INTERMEDIATE FREQUENCIES	21.4 MHz, 450 kHz
ITU DESIGNATION OF EMISSION	6k0A3E, 13k0A2D, 14k0G1D
HIGHEST INTERNALLY GENERATED FREQUENCY	158.375 MHz
OUTPUT POWER (W or dBm)	25W, +44 dBm
FCC ID	C8LB6525MDR
INDUSTRY CANADA ID	2137A-B6525MDR
TECHNICAL DESCRIPTION (a brief description of the intended use and operation)	Ground to air VHF transceiver for operating in both analogue voice and digital data transmissions
BATTERY/POWER SUPPLY	
MANUFACTURING DESCRIPTION	Not Applicable
MANUFACTURER	
VOLTAGE	

Signature

Date

7<sup>th</sup> November 2007

D of B S Serial No

OS615642

TUV Product Service Limited formally certifies that the manufacturer's declaration as reproduced in this report is a true and accurate record of the original received from the applicant.



### 1.3 BRIEF SUMMARY OF RESULTS

A brief summary of the tests carried out is shown below.

FCC CFR 47: Part 15, Subpart B, RSS-Gen, RSS-141

Section	Spec Clause		Test Description	Result	Comments
	FCC	Industry Canada			
2.2	15.107	RSS-Gen, 7.2.2	Conducted Emissions	Pass	
2.1	15.109	RSS-141, 4.5.6.3 RSS-Gen, 6	Spurious Radiated Emissions	Pass	

FCC CFR 47: Parts 2, 87 and RSS-Gen, RSS-141

Section	Spec Clause		Test Description	Result	Comments
	FCC	Industry Canada			
2.3	Part 2.1053, Part 87.139	RSS-141, 6.2, RSS-Gen, 4.7	Radiated Spurious Emissions	Pass	



Product Service

## 1.4 PRODUCT INFORMATION

### 1.4.1 Technical Description

The 6525 MDR is a VHF AM digital ground station operating in the band 118 MHz to 136.975 MHz with 25 kHz / 8.33 kHz channel spacing. The radio will be set to 25 kHz channelling at the factory.

### 1.4.2 Modes of Operation

Modes of operation of the EUT during testing were as follows:

#### Mode 1

AM Mode:

In AM mode the radio provides ground to air communication for the aeronautical mobile service operating in the VHF band. It employs amplitude modulation with 25 kHz channel spacing (6K00A3E) and/or 8.33kHz (5K00A3E) channel spacing.

#### Mode 2

VDL Mode 2 uses Carrier Sense Multiple Access (CSMA) differentially encoded 8-phase shift keying (D8PSK), using a raised cosine filter with  $\alpha=0.6$  (nominal value).

Mode 2 provides a high speed data communication service operating at 31.5 kbit/s with emission designator 14K0G1D.

#### Receive Mode

EUT waiting to receive a signal.

### 1.4.3 Test Configuration

#### Transmitting on the following channels and frequencies:

Bottom Channel:	118.000MHz
Middle Channel:	127.500MHz
Top Channel:	136.975MHz

#### Receiving on the following channel and frequency:

Middle Channel:	127.500MHz
-----------------	------------



Product Service

## **1.5 TEST CONDITIONS**

The EUT was set-up simulating a typical user installation on an Alternative Open Field Test Site or suitable test site under FCC Registration Number: 90987 and Industry Canada Identification Number: IC4270, and tested in accordance with the applicable specification.

For all tests, the Park Air Systems Limited 6525 MDR Transceiver was powered by 120V AC, 60Hz supply.

## **1.6 DEVIATIONS FROM THE STANDARD**

Limited testing, please refer to Section 1.2 for a list of applied tests.

## **1.7 MODIFICATION RECORD**

Not Applicable



Product Service

## **SECTION 2**

### **TEST RESULTS**

Limited FCC CFR 47: Parts 2, 15 and 87 and  
Industry Canada RSS-Gen and RSS-141 testing  
of a Park Air Systems Limited 6525 MDR Transceiver



Product Service

## **2.1 SPURIOUS RADIATED EMISSIONS**

### **2.1.1 Specification Reference**

FCC CFR 47: Part 15 Subpart B, Section 15.109,  
Industry Canada RSS-Gen, 4.8.6 and RSS-141, 4.5.6.3

### **2.1.2 Equipment Under Test**

6525 MDR Transceiver

### **2.1.3 Date of Test**

10<sup>th</sup> November 2007

### **2.1.4 Test Equipment Used**

The major items of test equipment used for the above tests are identified in Section 3.1.

### **2.1.5 Test Procedure**

Test Performed in accordance with ANSI C63.4 and RSS-212.

A preliminary profile of the Spurious Radiated Emissions was obtained by operating the EUT on a remotely controlled turntable within a semi-anechoic chamber. Measurements of emissions from the EUT were obtained with the Measurement Antenna in both Horizontal and Vertical Polarisations. The profiling produced a list of the worst-case emissions together with the EUT azimuth and antenna polarisation.

Using the information from the preliminary profiling of the EUT. The list of emissions was then confirmed or updated under Alternative Open Site conditions. Emission levels were maximised by adjusting the antenna height, antenna polarisation and turntable azimuth.

Emissions identified within the range 30MHz – 1GHz were then formally measured using a CISPR Quasi-Peak detector.

Emissions identified within the range 1GHz – 2GHz were then formally measured using Peak and Average Detectors, as appropriate.

The measurements were performed at a 3m distance unless otherwise stated.



Product Service

## 2.1 SPURIOUS RADIATED EMISSIONS

### 2.1.6 Test Results

Equipment Designation: Unintentional Radiator.

The EUT met the requirements of FCC CFR 47: Part 15 Subpart B, Section 15.109 and Industry Canada RSS-Gen and RSS-141 for Spurious Radiated Emissions (30MHz – 1GHz).

Measurements were made with the EUT in Idle Mode.

Frequency	Polarisation	Height	Azimuth	Field Strength		Limit	
MHz		cm	degree	dBµV/m	µV/m	dBµV/m	µV/m
750.1	Horizontal	116	328	32.6	42.7	46.0	200.0

No other emissions were detected within 20dB of the specification limit.



## 2.1 SPURIOUS RADIATED EMISSIONS

### 2.1.6 Test Results - continued

Equipment Designation: Unintentional Radiator.

The EUT met the requirements of FCC CFR 47: Part 15 Subpart B, Section 15.109 and Industry Canada RSS-Gen and RSS-141 for Spurious Radiated Emissions (1GHz - 2GHz).

Measurements were made with the EUT in Idle Mode.

Frequency	Antenna		Turntable	Peak Field Strength	Peak Limit	Average Field Strength	Average Limit
	Polarisation	Height	Azimuth				
GHz		cm	degree	dBµV/m	dBµV/m	dBµV/m	dBµV/m
1.950*	Vertical	100	000	39.0	89.1	54.0	500.0

No emissions were detected within 20dB of the specification.

\* This measurement is a noise floor measurement only.



Product Service

## **2.2 CONDUCTED EMISSIONS ON POWER PORTS**

### **2.2.1 Specification Reference**

FCC CFR 47: Part 15 Subpart b, Section 15.107  
Industry Canada RSS-Gen, 7.2.2

### **2.2.2 Equipment Under Test**

6525 MDR Transceiver

### **2.2.3 Date of Test**

13<sup>th</sup> November 2006

### **2.2.4 Test Equipment Used**

The major items of test equipment used for the above tests are identified in Section 3.1.

### **2.2.5 Test Procedure**

Test Performed in accordance with ANSI C63.4 and RSS-212.

Conducted Emission Measurements were undertaken within the semi-anechoic chamber. Emissions were measured on the Live and Neutral Lines in turn.

Emissions were formally measured using a Quasi-Peak and Average Detectors, which meet the CISPR requirements. The details of the worst-case emissions for the Live and Neutral Lines are presented in the following tables respectively.

The EUT was supplied from a 120V, 60Hz supply.

The EUT was tested in Idle Mode

### **2.2.6 Test Results**

The EUT met the Class B requirements of FCC CFR 47: Part 15 Subpart C, Section 15.107 and Industry Canada RSS-Gen for Conducted Emissions on the Live and Neutral Lines.

No emissions detected, results shown indicate measurement systems noise floor.

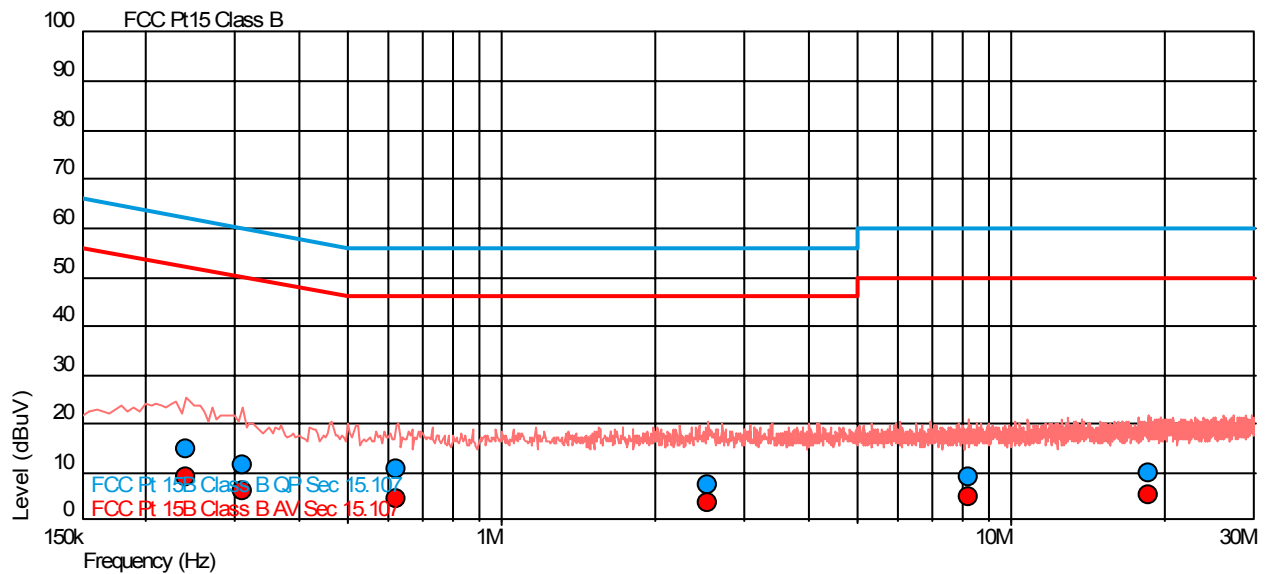


Product Service

## 2.2 CONDUCTED EMISSIONS ON POWER PORTS

### 2.2.6 Test Results

Live Line



#### Final Result

Frequency (MHz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.240	14.7	62.1	-47.4	9.2	52.1	-42.9
0.310	11.5	60.0	-48.5	6.2	50.0	-43.8
0.620	10.6	56.0	-45.4	4.6	46.0	-41.4
2.540	7.6	56.0	-48.4	3.8	46.0	-42.2
8.220	9.0	60.0	-51.0	4.9	50.0	-45.1
18.615	10.0	60.0	-50.0	5.4	50.0	-44.6

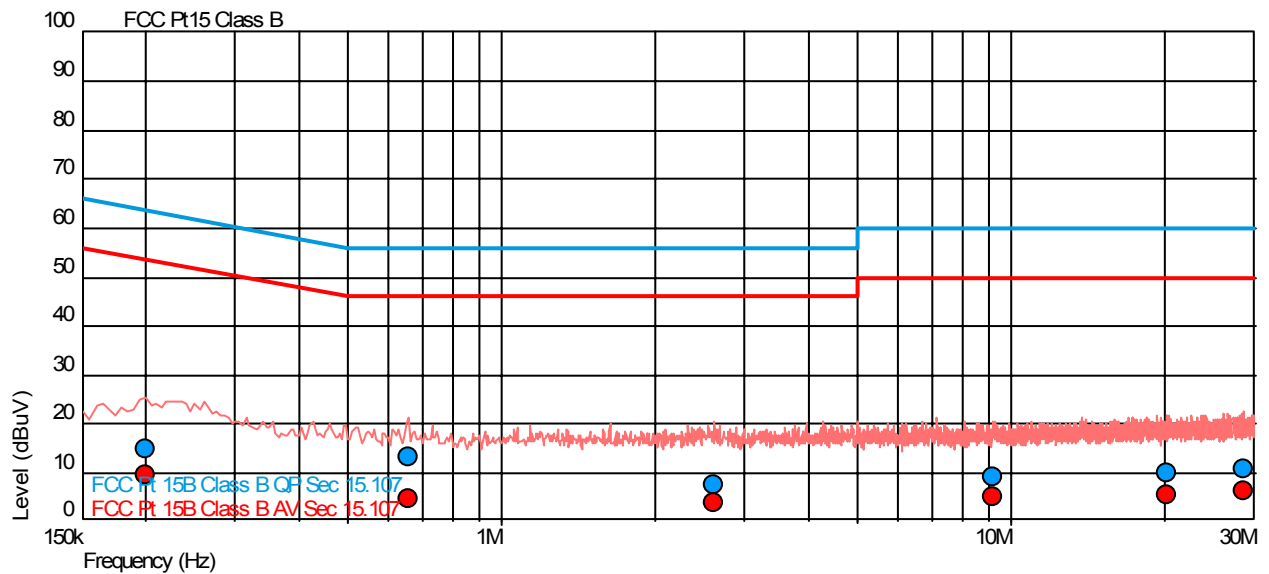


Product Service

## 2.2 CONDUCTED EMISSIONS ON POWER PORTS

### 2.2.6 Test Results

#### Neutral Line



#### Final Result

Frequency (MHz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.200	15.0	63.6	-48.6	9.7	53.6	-43.9
0.655	13.2	56.0	-42.8	4.6	46.0	-41.4
2.600	7.6	56.0	-48.4	3.8	46.0	-42.2
9.225	9.0	60.0	-51.0	4.9	50.0	-45.1
20.130	10.0	60.0	-50.0	5.4	50.0	-44.6
28.420	10.8	60.0	-49.2	6.5	50.0	-43.5



Product Service

## **2.3 RADIATED EMISSIONS**

### **2.3.1 Specification Reference**

FCC Part 2.1053, 87.139 and Industry Canada RSS-GEN 4.7 and RSS-141, 6.2

### **2.3.2 Equipment Under Test**

6525 MDR Transceiver

### **2.3.3 Date of Test**

10<sup>th</sup> November 2007

### **2.3.4 Test Equipment Used**

The major items of test equipment used for the above tests are identified in Section 3.1.

### **2.3.5 Test Procedure**

Test Performed in accordance with 2.1053, 87.139 and RSS-Gen and RSS-141.

The EUT was set up on a remotely controlled turntable within a semi-anechoic Alternative Open Area Test Site [AOATS], powered up and correct operation verified.

Measurements were made over the frequency range 1GHz to 2GHz at a distance of 3m.

A preliminary profile of the EUT's emissions was made, the profiling yielding a list of worst case emission frequencies together with the EUT azimuth and antenna polarisation.

Utilising the data gathered during the preliminary profiling, the emissions detected were maximised by adjusting the antenna height, antenna polarisation and turntable azimuth.

Emission levels were then formally measured with a Peak detector function and the measured levels recorded.

The recorded emission levels were then substituted to give the final ERP level.

The test was performed with the EUT in AM Mode and Mode 2.

### **2.3.6 Test Results**

The EUT met the requirements of FCC CFR 47: Part 2.1053, Part 87.139 and Industry Canada RSS-Gen and RSS-141 for Spurious Radiated Emissions (30MHz – 2GHz).



Product Service

## **2.3 RADIATED EMISSIONS**

### **2.3.6 Test Results**

#### **Test Mode 1**

##### Bottom Channel

No emissions were detected within 50dB of the specification limit.

##### Middle Channel

No emissions were detected within 50dB of the specification limit.

##### Top Channel

No emissions were detected within 50dB of the specification limit.

#### **Test Mode 2**

##### Bottom Channel

No emissions were detected within 45dB of the specification limit.

##### Middle Channel

No emissions were detected within 45dB of the specification limit.

##### Top Channel

No emissions were detected within 45dB of the specification limit.



Product Service

## **SECTION 3**

### **TEST EQUIPMENT**



### 3.1 TEST EQUIPMENT

List of absolute measuring and other principal items of test equipment.

Instrument	Manufacturer	Type No	TE Number	Calibration Due
<b>Section 2.2 EMC - Conducted Emissions</b>				
LISN	Rohde & Schwarz	ESH2-Z5	17	22/02/2007
Test Receiver	Rohde & Schwarz	ESIB40	1006	07/04/2007
Transient Limiter	Hewlett Packard	11947A	1032	13/06/2007
<b>Sections 2.1 and 2.3 EMC - Radiated Emissions</b>				
Spectrum Analyser	Hewlett Packard	8542E	18	09/02/2007
Mast Controller	Inn-Co GmbH	CO 1000	1606	TU
Turntable/Mast Controller	EMCO	2090	1607	TU
Bilog Antenna	Chase	CBL6143	2904	10/11/2007

TU Traceability Unscheduled



Product Service

### 3.2 MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:-

Test Discipline	Frequency / Parameter	MU
Radiated Emissions, Bilog Antenna, AOATS	30MHz to 1GHz Amplitude	5.1dB*
Radiated Emissions, Horn Antenna, AOATS	1GHz to 40GHz Amplitude	6.3dB*
Conducted Emissions, LISN	150kHz to 30MHz Amplitude	3.2dB*

Worst case error for both Time and Frequency measurement 12 parts in  $10^6$ .

\* In accordance with CISPR 16-4



Product Service

## **SECTION 4**

### **ACCREDITATION, DISCLAIMERS AND COPYRIGHT**



Product Service

#### 4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT



This report relates only to the actual item/items tested.

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation.

Results of tests not covered by our UKAS Accreditation Schedule are marked NUA  
(Not UKAS Accredited).

This report must not be reproduced, except in its entirety, without the written permission of  
TUV Product Service Limited

© 2007 TUV Product Service Limited