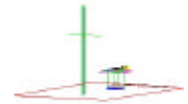
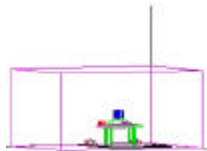


PCTEST ENGINEERING LABORATORY, INC.

6660 – B Dobbin Road · Columbia, MD 21045 · USA

Telephone 410.290.6652 / Fax 410.290.6654

<http://www.pctestlab.com> (email: randy@pctestlab.com)



CERTIFICATE OF COMPLIANCE

MANUFACTURER NAME & ADDRESS:

OLYMPUS MEDICAL SYSTEMS CORP.

2951 Ishikawa-cho, Hachioji-shi

Tokyo, 192-8507 Japan

DATE & LOCATION OF TESTING:

Date(s) of Tests: August 5-8, 2005

Test Report S/N: 0508030558-R2

Test Site: PCTEST Lab, Columbia, MD USA

FCC ID:

S8QEC-1

APPLICANT:

OLYMPUS MEDICAL SYSTEMS CORP.

SUMMARY:

Equipment EUT Type: Olympus Capsule Endoscope System

FCC Rule Part(s): Part 15.209

FCC Classification: Low Power Transmitter

Test Procedure(s): ANSI C63.4-2003

Operating Frequency: 315.0 MHz

The device bearing the FCC Identifier specified above has been shown to comply with the applicable technical standards as indicated in the measurement report and has been tested in accordance with the measurement procedures specified in ANSI C63.4-2003 (See Test Report). These measurements were performed with no deviation from the standards.

I authorize and attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

PCTEST certifies that no party to this application has been denied the FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. 862.





Randy Ortanez
President



TABLE OF CONTENTS

FCC Part 15.209 MEASUREMENT REPORT COVER PAGE	1
1.0 INTRODUCTION.....	2
1.1 EVALUATION PROCEDURE.....	2
1.2 SCOPE.....	2
1.3 PCTEST TEST LOCATION.....	2
2.0 PRODUCT INFORMATION.....	3
2.1 EQUIPMENT DESCRIPTION.....	3
2.2 OPERATION MODE	3
2.3 EMI SUPPRESSION DEVICE(S)	3
3.0 DESCRIPTION OF TEST	4
3.1 CONDUCTED EMISSIONS.....	4
3.2 RADIATED EMISSIONS.....	5
3.3 TISSUE SIMULATING MIXTURE CHARACTERIZATION.....	6
4.0 SAMPLE CALCULATIONS.....	7
4.1 CONDUCTED EMISSION MEASUREMENT SAMPLE CALCULATION	7
4.2 RADIATED EMISSION MEASUREMENT SAMPLE CALCULATION	7
5.0 UNCERTAINTY OF MEASUREMENT	8
5.1 LINE CONDUCTED MEASUREMENT UNCERTAINTY CALCULATIONS	8
5.2 RADIATED EMISSIONS MEASUREMENT UNCERTAINTY CALCULATIONS.....	9
6.0 TEST EQUIPMENT CALIBRATION DATA	10
7.0 ENVIRONMENTAL CONDITIONS.....	11
8.0 CONCLUSION.....	12
ATTACHMENT A. SUMMARY OF TEST RESULTS	
RADIATED TEST DATA	
LINE-CONDUCTED TEST DATA/PLOT(S)	
SUPPORT EQUIPMENT USED	
ATTACHMENT B. FCC ID LABEL & LOCATION	
ATTACHMENT C. TEST SETUP PHOTOGRAPHS	

PCTEST PT. 15.209 REPORT		MEASUREMENT REPORT		Reviewed by: Quality Manager
Filename: 0508030558-R2	Test Dates: August 5-8, 2005	EUT: Olympus Capsule Endoscope System	FCC ID: S8QEC-1	Page i of i

MEASUREMENT REPORT

A. General Information

APPLICANT: OLYMPUS MEDICAL SYSTEMS CORP.
APPLICANT ADDRESS: 2951 Ishikawa-cho, Hachioji-shi
Tokyo, 192-8507 Japan
TEST SITE: PCTEST ENGINEERING LABORATORY, INC.
TEST SITE ADDRESS: 6660-B Dobbin Road, Columbia, MD 21045 USA
FCC RULE PART(S): FCC Part 15.209
FCC ID: S8QEC-1
EUT TYPE: Olympus Capsule Endoscope System
TEST DEVICE S/N: 024
SAMPLE: ☐ Production ☒ Pre-Production ☐ Engineering
FCC CLASSIFICATION: Low Power Transmitter
DATE(S) OF TEST: August 5-8, 2005



A.1 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4-2003. Radiated testing was performed at an antenna to EUT distance of 3 meters.

A.2 Test Facility / NVLAP Accreditation

The conducted and radiated tests were performed at PCTEST Engineering Lab in Columbia, MD 21045 USA.

- PCTEST facility is an FCC registered (PCTEST Reg. No. 90864) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules.
- PCTEST Lab is recognized by U.S. National Institute of Standards & Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP) for compliance with ISO/IEC Guide 17025 and meeting the criteria established in Title 15, Part 285 Code of Federal Regulations. (NVLAP Lab code: 100431-0).
- PCTEST Lab is a recognized U.S. Conformity Assessment Body (CAB) in EMC and R&TTE (n.b. 0982) under the U.S.-EU Mutual Recognition Agreement (MRA).
- PCTEST is an accredited Telecommunication Certification Body (TCB) by the American National Standards Institute (ANSI) meeting the requirements set forth in ISO/IEC Guide 65.
- PCTEST is an Industry Canada Foreign Certification Body (FCB) in all Radio Standards (RSS).

PCTEST PT. 15.209 REPORT		MEASUREMENT REPORT		Reviewed by: Quality Manager
Filename: 0508030558-R2	Test Dates: August 5-8, 2005	EUT: Olympus Capsule Endoscope System	FCC ID: S8QEC-1	Page 1 of 12

1.0 INTRODUCTION

1.1 Evaluation Procedure

The measurement procedure described in the American National Standard for Methods of Measurement of Radio-Noise Emission from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz (ANSI C63.4-2003) was used in determining radiated and conducted emissions emanating from **Olympus Capsule Endoscope System FCC ID: S8QEC-1**.

1.2 Scope

Measurement & determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission.

1.3 PCTEST Test Location

The map at the right shows the location of the PCTEST LABORATORY, its proximity to the FCC Laboratory, the Columbia vicinity area, the Baltimore-Washington Intern't'l (BWI) airport, the city of Baltimore and the Washington, DC area. (see Figure 1.2-1).

These measurement tests were conducted at the PCTEST Engineering Laboratory, Inc. facility in New Concept Business Park, Guilford Industrial Park, Columbia, Maryland. The site address is 6660-B Dobbin Road, Columbia, MD 21045. The test site is one of the highest points in the Columbia area with an elevation of 390 feet above mean sea level. The site coordinates are 39° 11'15" N

latitude and 76° 49'38" W longitude. The facility is 1.5 miles North of the FCC laboratory, and the ambient signal and ambient signal strength are approximately equal to those of the FCC laboratory. There are no FM or TV transmitters within 15 miles of the site. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4 on October 19, 2002.

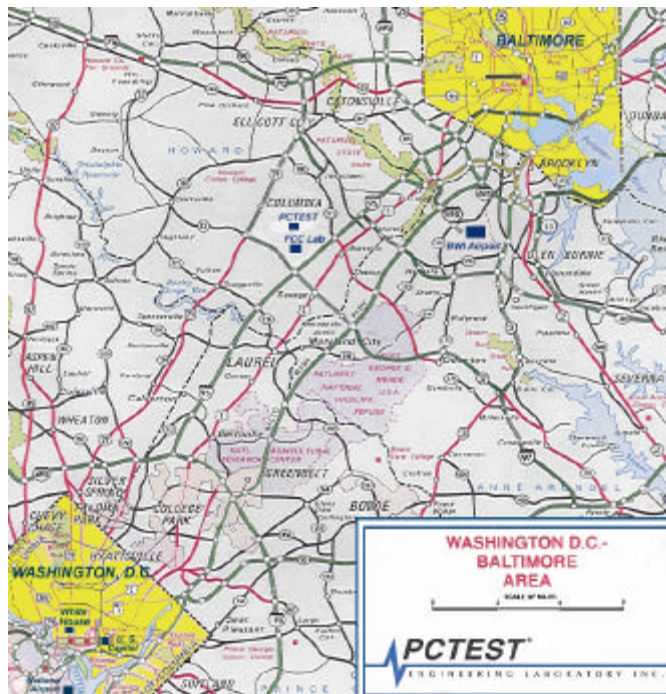




Figure 1.3-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

PCTEST PT. 15.209 REPORT		MEASUREMENT REPORT		Reviewed by: Quality Manager
Filename: 0508030558-R2	Test Dates: August 5-8, 2005	EUT: Olympus Capsule Endoscope System	FCC ID: S8QEC-1	Page 2 of 12

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the OLYMPUS Capsule Endoscope System FCC ID: S8QEC-1.



2.2 Operation Mode

The Olympus Capsule Endoscope System FCC ID: S8QEC-1 was tested stand alone. Please see ATTACHMENT C for more information on the test setup and for test setup photographs.

2.3 EMI Suppression Device(s)

EMI suppression device(s) added and/or modifications made during testing.

- None

PCTEST PT. 15.209 REPORT		MEASUREMENT REPORT		Reviewed by: Quality Manager
Filename: 0508030558-R2	Test Dates: August 5-8, 2005	EUT: Olympus Capsule Endoscope System	FCC ID: S8QEC-1	Page 3 of 12

3.0 DESCRIPTION OF TEST

3.1 Conducted Emissions – N/A

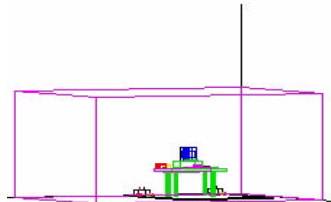


Figure 3.1-1. Shielded Enclosure Line-Conducted Test Facility

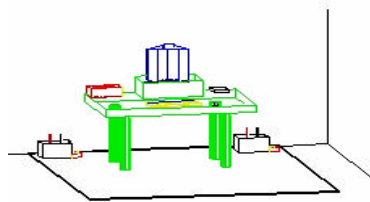


Figure 3.1-2. Line Conducted Emission Test Set-Up

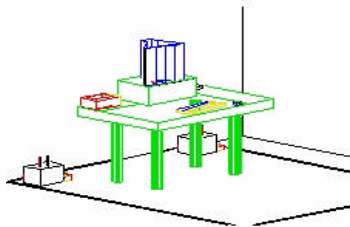


Figure 3.1-3. Wooden Table & Bonded LISNs

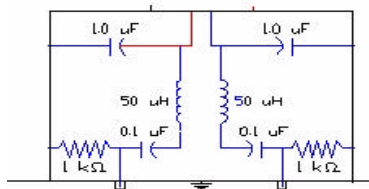




Figure 3.1-4. LISN Schematic Diagram

The line-conducted facility is located inside a 16'x20'x10' shielded enclosure. It is manufactured by Ray Proof Series 81 (see Figure 3.1-1). The shielding effectiveness of the shielded room is in accordance with MIL-Std-285 or NSA 65-5. A 1m x 1.5m wooden table 80cm high is placed 40cm away from the vertical wall and 1.5m away from the sidewall of the shielded room (see Figure 3.1-2). Solar Electronics and EMCO Model 3725/2 (10kHz-30MHz) 50Ω/50μH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room (See Figure 3.1-3). The EUT is powered from the Solar LISN and the support equipment is powered from the EMCO LISN. Power to the LISNs are filtered by a high-current high-insertion loss Ray Proof power line filters (100dB 14Hz-10GHz). The purpose of the filter is to attenuate ambient signal interference and this filter is also bonded to the shielded enclosure. All electrical cables are shielded by braided tinned copper zipper tubing with an inner diameter of ½". If the EUT is a DC-powered device, power will be derived from the source power supply it normally will be powered from and this supply line(s) will be connected to the Solar LISN. The LISN schematic diagram is shown (See Figure 3.1-4). All interconnecting cables more than 1 meter were shortened by non-inductive bundling (serpentine fashion) to a 1-meter length. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the spectrum analyzer to determine the frequency producing the maximum EME from the EUT. The spectrum was scanned from 150kHz to 30Mhz with a 20msec. sweep time. The frequencies producing the maximum level were re-examined using an EMI/Field Intensity Meter and Quasi-Peak adapter. The detector function was set to CISPR quasi-peak mode and average mode. The bandwidth of the receiver was set to 10kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each EME emission. Each emission was maximized by: switching power lines; varying the mode of operation or resolution; clock or data exchange speed; scrolling H patter to the EUT and/or support equipment, and powering the monitor from the floor mounted outlet box and the computer aux AC outlet, if applicable; whichever determined the worst-case emission. Photographs of the worst-case emission can be seen in Attachment H. Each EME reported was calibrated using the HP8640B signal generator.

PCTEST PT. 15.209 REPORT		MEASUREMENT REPORT		Reviewed by: Quality Manager
Filename: 0508030558-R2	Test Dates: August 5-8, 2005	EUT: Olympus Capsule Endoscope System	FCC ID: S8QEC-1	Page 4 of 12

3.2 Radiated Emissions

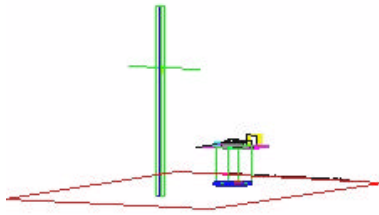


Figure 3.2-1. Meter Test Site

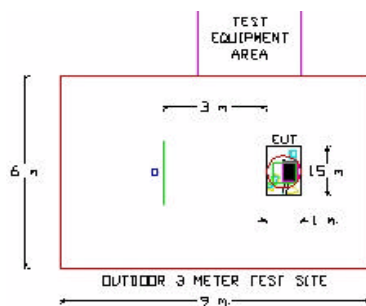


Figure 3.2-2. Dimensions of Outdoor Test Site

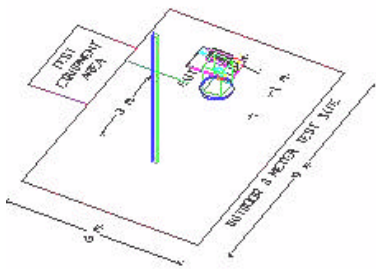


Figure 3.2-3. Turntable and System Setup

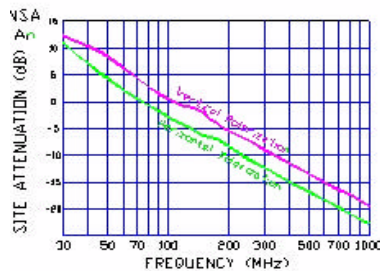


Figure 3.2-4. Normalized Site Attenuation Curves (H&V)

Preliminary measurements were made indoors at 1 meter using broadband antennas, broadband amplifier, and spectrum analyzer to determine the frequency producing the maximum EME. Appropriate precaution was taken to ensure that all EME from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, turntable azimuth with respect to the antenna was noted for each frequency found. The spectrum was scanned from 30 to 200 MHz using biconical antenna and from 200 to 1000 MHz using log-spiral antenna. Above 1 GHz, linearly polarized double ridge horn antennas were used.

Final measurements were made outdoors at 3-meter test range using Roberts™ Dipole antennas or horn antenna (see Figure 3.2-1). The test equipment was placed on a wooden and plastic bench situated on a 1.5 x 2 meter area adjacent to the measurement area (see Figure 3.2-2). Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. Each frequency found during pre-scan measurements was re-examined and investigated using EMI/Field Intensity Meter and Quasi-Peak Adapter. The detector function was set to CISPR quasi-peak mode and the bandwidth of the receiver was set to 100kHz or 1 MHz depending on the frequency or type of signal. Above 1GHz the detector function was set to CISPR average mode (RBW = 1MHz, VBW = 10Hz).

The half-wave dipole antenna was tuned to the frequency found during preliminary radiated measurements. The EUT, support equipment and interconnecting cables were re-configured to the set-up producing the maximum emission for the frequency and were placed on top of a 0.8-meter high non-metallic 1 x 1.5 meter table (see Figure 3.2-3). The EUT, support equipment, and interconnecting cables were re-arranged and manipulated to maximize each EME emission. The turntable containing the system was rotated; the antenna height was varied 1 to 4 meters and stopped at the azimuth or height producing the maximum emission. Each emission was maximized by: varying the mode of operation or resolution; clock or data exchange speed; scrolling H pattern to the EUT and/or support equipment, and powering the monitor from the floor mounted outlet box and the computer aux AC outlet, if applicable; and changing the polarity of the antenna, whichever determined the worst-case emission. Photographs of the worst-case emission can be seen in Appendix G. Each EME reported was calibrated using the HP8640B signal generator. The Theoretical Normalized Site Attenuation Curves for both horizontal and vertical polarization are shown in Figure 3.2-4.

PCTEST PT. 15.209 REPORT	PCTEST Complete Wireless Lab™	MEASUREMENT REPORT	OLYMPUS	Reviewed by: Quality Manager
Filename: 0508030558-R2	Test Dates: August 5-8, 2005	EUT: Olympus Capsule Endoscope System	FCC ID: S8QEC-1	Page 5 of 12



3.3 Tissue Simulating Mixture Characterization

The mixtures consist of a viscous gel using hydroxethylcellulose (HEC) gelling agent and saline solution (see Table 1). Preservation with a bacteriacide is added and visual inspection is made to make sure air bubbles are not trapped during the mixing process. The mixture is calibrated to obtain proper dielectric constant (permittivity) and conductivity of brain or muscle tissue. The mixture characterizations used for the tissue simulating liquids are according to the data by C. Gabriel and G. Hartsgrrove [11].

BRAIN & MUSCLE MIXTURE %	FREQUENCY (Muscle) 300 MHz
WATER	50.6
SUGAR	45.0
SALT	2.3
BACTERIACIDE	0.1
HEC	2.0

$$\sigma = 1$$

$$\varepsilon = 58.7$$

PCTEST PT. 15.209 REPORT		MEASUREMENT REPORT		Reviewed by: Quality Manager
Filename: 0508030558-R2	Test Dates: August 5-8, 2005	EUT: Olympus Capsule Endoscope System	FCC ID: S8QEC-1	Page 6 of 12

4.0 SAMPLE CALCULATIONS

4.1 Conducted Emission Measurement Sample Calculation:

@ 20.3 MHz



$$\begin{aligned}
 \text{Class B limit} &= 250 \mu\text{V} = 47.96 \text{ dB}\mu\text{V} \\
 \text{Reading} &= -67.8 \text{ dBm (calibrated level)} \\
 \text{Convert to dB}\mu\text{V} &= -67.8 + 107 = 39.2 \text{ dB}\mu\text{V} \\
 10^{(39.2/20)} &= 91.2 \mu\text{V} \\
 \\
 \text{Margin} &= 39.2 - 47.96 = -8.76 \\
 &= 8.8 \text{ dB below limit}
 \end{aligned}$$

4.2 Radiated Emission Measurement Sample Calculation:

@ 66.7 MHz

$$\begin{aligned}
 \text{Class B limit} &= 52.14 \text{ dB}\mu\text{V/m @ 3m} . \\
 \text{Reading} &= -90.0 \text{ dBm (calibrated level)} \\
 \text{Convert to dB}\mu\text{V} &= -90.0 + 107 = 17.0 \text{ dB}\mu\text{V} \\
 \text{Antenna Factor + Cable Loss} &= 9.2 \text{ dB/m} \\
 \text{Total} &= 26.2 \text{ dB}\mu\text{V/m} \\
 \\
 \text{Margin} &= 52.14 - 26.2 = 25.94 \\
 &= 3.2 \text{ dB below limit}
 \end{aligned}$$

$$\begin{aligned}
 \text{dBmV} &= 20 \log_{10} (\text{mV/m}) \\
 \text{dBmV} &= \text{dBm} + 107
 \end{aligned}$$

PCTEST PT. 15.209 REPORT		MEASUREMENT REPORT		Reviewed by: Quality Manager
Filename: 0508030558-R2	Test Dates: August 5-8, 2005	EUT: Olympus Capsule Endoscope System	FCC ID: S8QEC-1	Page 7 of 12

5.0 UNCERTAINTY OF MEASUREMENT

5.1 Line Conducted Measurement Uncertainty Calculations



The measurement uncertainties stated were calculated in accordance with the requirements of NIST Technical Note 1297 and NIS 81 (1994).

Table 5.1-1. Line Conducted Measurement Uncertainty Calculations

Contribution (Line Conducted)	Probability Distribution	Uncertainty (± dB)	
		9kHz-150kHz	150-30MHz
Receiver specification	Rectangular	1.5	1.5
LISN coupling specification	Rectangular	1.5	1.5
Cable and input attenuator calibration	Normal (k=2)	0.3	0.5
Mismatch: Receiver VRC $\Gamma_1 = 0.03$ LISN VRC $\Gamma_R = 0.8$ (9kHz) 0.2 (30MHz) Uncertainty limits $20\log(1 \pm \Gamma_1 \Gamma_R)$	U-Shaped	0.2	0.35
System repeatability	Std. deviation	0.2	0.05
Repeatability of EUT		-	-
Combined standard uncertainty	Normal	1.26	1.30
Expanded uncertainty	Normal (k=2)	2.5	2.6

$$\text{Calculations for 150kHz to 30MHz: } u_c(y) = \sqrt{\sum_{i=1}^m u_i^2(y)} = \pm \sqrt{\frac{1.5^2 + 1.5^2}{3} + \left(\frac{0.5}{2}\right)^2 + 0.35} = \pm 1.298\text{dB}$$

$$U = 2U_c(y) = \pm 2.6\text{dB}$$

PCTEST PT. 15.209 REPORT		MEASUREMENT REPORT		Reviewed by: Quality Manager
Filename: 0508030558-R2	Test Dates: August 5-8, 2005	EUT: Olympus Capsule Endoscope System	FCC ID: S8QEC-1	Page 8 of 12

5.2 Radiated Emissions Measurement Uncertainty Calculations



The measurement uncertainties stated were calculated in accordance with the requirements of NIST Technical Note 1297 and NIS 81 (1994).

Table 5.2-1. Radiated Emissions Measurement Uncertainty Calculations

Contribution (Radiated Emissions)	Probability Distribution	Uncertainties (\pm dB)	
		3 m	10 m
Ambient Signals		-	-
Antenna factor calibration	Normal (k=2)	± 1.0	± 1.0
Cable loss calibration	Normal (k=2)	± 0.5	± 0.5
Receiver specification	Rectangular	± 1.5	± 1.5
Antenna directivity	Rectangular	+ 0.5 / - 0	+ 0.5
Antenna factor variation with height	Rectangular	± 2.0	± 0.5
Antenna phase centre variation	Rectangular	0.0	± 0.2
Antenna factor frequency interpolation	Rectangular	± 0.25	± 0.25
Measurement distance variation	Rectangular	± 0.6	± 0.4
Site imperfections	Rectangular	± 2.0	± 2.0
Mismatch: Receiver VRC $\Gamma_1 = 0.2$ Antenna VRC $\Gamma_R = 0.67$ (Bi) 0.3 (Lp) Uncertainty limits $20\log(1 \pm \Gamma_1 \Gamma_R)$	U-Shaped	+ 1.1 - 1.25	± 0.5
System repeatability	Std. Deviation	± 0.5	± 0.5
Repeatability of EUT		-	-
Combined standard uncertainty	Normal	+ 2.19 / - 2.21	+ 1.74 / - 1.72
Expanded uncertainty	Normal (k=2)	+ 4.38 / - 4.42	+ 3.48 / - 3.44

Calculations for 3m-biconical antenna. Coverage factor of k=2 will ensure that the level of confidence will be approximately 95%, therefore:

$$U=2u_c(y) = 2 \times \pm 2.19 = \pm 4.38\text{dB}$$



PCTEST PT. 15.209 REPORT		MEASUREMENT REPORT		Reviewed by: Quality Manager
Filename: 0508030558-R2	Test Dates: August 5-8, 2005	EUT: Olympus Capsule Endoscope System	FCC ID: S8QEC-1	Page 9 of 12

6.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST).

Table 6-1. Annual Test Equipment Calibration Schedule

TYPE	MODEL	CAL. DUE DATE	SERIAL No.
Microwave Spectrum Analyzer	HP 8566 (100Hz-22GHz)	12/05/05	3638A08713
Microwave Spectrum Analyzer	HP 8566 (100Hz-22GHz)	04/17/06	2542A11898
Spectrum Analyzer/Tracking Generator	HP 8591A (9kHz-1.8GHz)	03/24/06	3144A02458
Spectrum Analyzer	HP 8591A (9kHz-1.8GHz)	04/23/06	3108A02053
Spectrum Analyzer	HP 8594A (9kHz-2.9GHz)	11/02/05	3051A00187
Signal Generator	HP 8650B (500Hz-1GHz)	06/02/06	2232A19558
Signal Generator	HP 8640B (500Hz-1GHz)	06/02/06	1851A09816
Signal Generator	Rohde & Schwarz (0.1-1GHz)	09/22/05	894215/012
Ailtech/Eaton Receiver	NM 37/57A-SL (30MHz-1GHz)	04/12/06	0792-03271
Ailtech/Eaton Receiver	NM 37/57A (30MHz-1GHz)	03/11/06	0805-03334
Ailtech/Eaton Receiver	NM 17/27A (0.1-32MHz)	09/17/05	0608-03241
Quasi-Peak Adapter	HP 85650A	08/09/06	2043A00301
Ailtech/Eaton Adapter	CCA-7 CISPR/ANSI QP Adapter	03/11/06	0194-04082
RG58 Coax Test Cable	No.167	03/26/06	n/a
Harmonic/Flicker Test System	HP 6841A (IEC 555-2/3)	11/15/05	3531A00115
Broadband Amplifier	HP 8447D	02/26/06	1145A00470
Broadband Amplifier	HP 8447D	02/26/06	1937A03348
Horn Antenna (2)	EMCO Model 3115 (1-18GHz)	03/15/06	9704-5182, 9205-3874
Horn Antenna	EMCO Model 3116 (18-40GHz)	03/28/06	9203-2178
Biconical Antenna (3)	Eaton 94455-1	01/26/06	1295, 1332, 1277
Loop Antenna	6502	08/10/06	2730
Roberts Dipoles	Compliance Design (1 set) A100	08/11/06	5118
EMCO LISN (3)	3816/2, 3816/2, 3725/2	10/26/05	1077, 1079, 2099
50-ohm Terminator	n/a	n/a	n/a
Microwave Preamp 30dB Gain	HP 83017A (0.5-26.5GHz)	03/26/06	3123A00181
Microwave Cables	MicroCoax (1.0-26.5GHz)	02/26/06	n/a
Spectrum Analyzer	HP 8591A	06/18/06	3034A01395
Modulation Analyzer	HP 8901A	06/26/06	2432A03467
Microwave Survey Meter	Holaday Model 1501 (2.45GHz)	02/21/06	80931
Digital Thermometer	Extech Instruments 421305	03/15/06	426966
Attenuator	4108 (6dB)	3/26/06	
Shielded Screen Room	RF Lindgren Model 26-2/2-0	n/a	6710 (PCT270)
Shielded Semi-Anechoic Chamber	Ray Proof Model S81	04/15/06	R2437 (PCT278)
Environmental Chamber	Associated Systems 1025	08/08/06	PCT285
OATS	n/a	12/31/05	



PCTEST PT. 15.209 REPORT		MEASUREMENT REPORT		Reviewed by: Quality Manager
Filename: 0508030558-R2	Test Dates: August 5-8, 2005	EUT: Olympus Capsule Endoscope System	FCC ID: S8QEC-1	Page 10 of 12

7.0 ENVIRONMENTAL CONDITIONS

The temperature is controlled within range of 15°C to 35°C.



The relative humidity is controlled within range of 10% to 75%.

The atmospheric pressure is controlled within the range 86-106kPa (860-1060mbar).

PCTEST PT. 15.209 REPORT		MEASUREMENT REPORT		Reviewed by: Quality Manager
Filename: 0508030558-R2	Test Dates: August 5-8, 2005	EUT: Olympus Capsule Endoscope System	FCC ID: S8QEC-1	Page 11 of 12

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **OLYMPUS Capsule Endoscope System FCC ID: S8QEC-1** has been verified to comply with §§ 15.209 of the FCC Rules.

PCTEST PT. 15.209 REPORT		MEASUREMENT REPORT		Reviewed by: Quality Manager
Filename: 0508030558-R2	Test Dates: August 5-8, 2005	EUT: Olympus Capsule Endoscope System	FCC ID: S8QEC-1	Page 12 of 12

ATTACHMENT A – TEST PLOTS

ATTACHMENT A – Test Data

Summary of Test Results



Test Date(s): August 5-8, 2005

Test Engineer:



Table A-1. Summary of Test Results

FCC Part 15 Section	Description	Result
15.207	Conducted Emissions	N/A
15.209	Radiated Spurious Emissions	PASS

PCTEST PT. 15.209 REPORT		MEASUREMENT REPORT		Reviewed by: Quality Manager
Filename: 0508030558-R2	Test Dates: August 5-8, 2005	EUT: Olympus Capsule Endoscope System	FCC ID: S8QEC-1	Page A1

ATTACHMENT A – Test Data (Cont.)

Radiated Test Data/Plots

FREQ (MHz)	Level (dBm)	AFCL (dB/m)	POL (H/V)	Height (m)	Azimuth (° angle)	F/S (uV/m)	Margin (dB)
315.45	-88.15	21.16	V	2.7	30	100.05	-6.0
110.8	-89.07	10.67	H	1.4	225	26.97	-14.9
533.2	-94.78	26.78	V	2.5	90	89.18	-7.0
630.9	-96.59	28.69	V	2.2	300	90.21	-6.9
500.11	-101.80	26.10	H	1.5	180	36.78	-14.7
946.35	-112.14	33.25	V	1.3	200	25.46	-17.9

Table A-2. Radiated Measurements at 3-meters

Frequency (MHz)	Field strength (microvolts/meter)	Measure- ment distance (meters)
0.009–0.490	2400/F(kHz)	300
0.490–1.705	24000/F (kHz)	30
1.705–30.0	30	30
30–88	100 **	3
88–216	150 **	3
216–960	200 **	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54–72 MHz, 76–88 MHz, 174–216 MHz or 470–806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§15.231 and 15.241.



NOTES:

1. All modes of operation were investigated and the worst-case emissions are reported.

2. Sample Calculation of limit @ 593kHz

$24000/593 = 40.47 \text{ uV/m}$ or 32.14 dBuV/m @ 30m. Limit at 3m is 52.14 dBuV/m .

- 1 AFCL = Antenna Factor (EMCO Loop) and Cable Loss (30 ft. RG58C/U).
- 2 Measurements using CISPR quasi-peak mode



PCTEST® PT. 15.209 REPORT		MEASUREMENT REPORT		Reviewed by: Quality Manager
Filename: 0508030558-R2	Test Dates: August 5-8, 2005	EUT: Olympus Capsule Endoscope System	FCC ID: S8QEC-1	Page A2

ATTACHMENT A – Test Data (Cont.)

Test Support Equipment Used

1. OLYMPUS Capsule Endoscope System FCC ID: S8QEC-1 (EUT) S/N: 024

Note: See Attachment C – Test Setup Photographs, for actual system test setup.

PCTEST PT. 15.209 REPORT		MEASUREMENT REPORT		Reviewed by: Quality Manager
Filename: 0508030558-R2	Test Dates: August 5-8, 2005	EUT: Olympus Capsule Endoscope System	FCC ID: S8QEC-1	Page A3

ATTACHMENT B – FCC ID LABEL / LOCATION

Labeling on device packaging

For US

The FCC identifier will be placed on the Capsule's packaging. This is because the capsule is too small to have the FCC identifier placed on it, and is always within its packaging or otherwise inside the patient.

For Canada

The IC identifier will be placed on the Capsule's packaging. This is because the capsule is too small to have the IC identifier placed on it, and is always within its packaging or otherwise inside the patient.

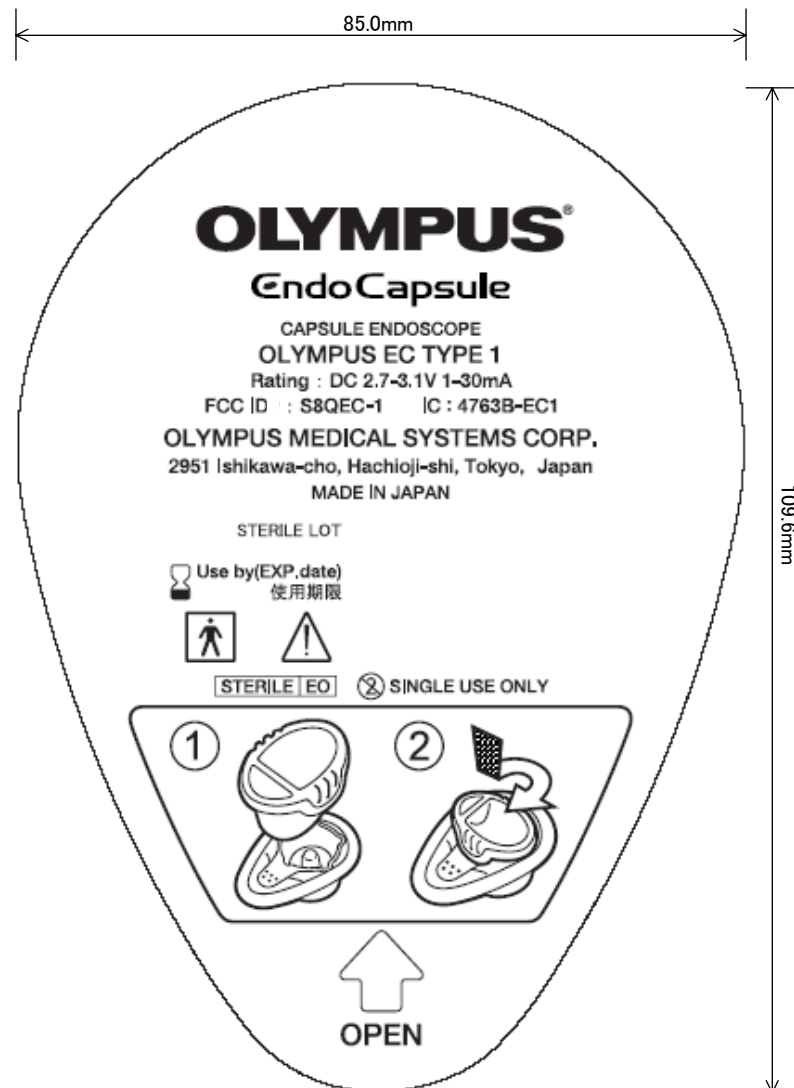


Figure 1. Label for EC TYPE 1

For US

The box package shown in Figure 2 contains 5 Capsules. FCC identifier is placed where Figure 2 indicates "Affix FCC Label ". The detail is shown in the next page (please refer to Figure 3).

For Canada

The box package shown in Figure 2 contains 5 Capsules. IC identifier is placed where Figure 2 indicates "Affix IC Label ". The detail is shown in the next page (please refer to Figure 3).

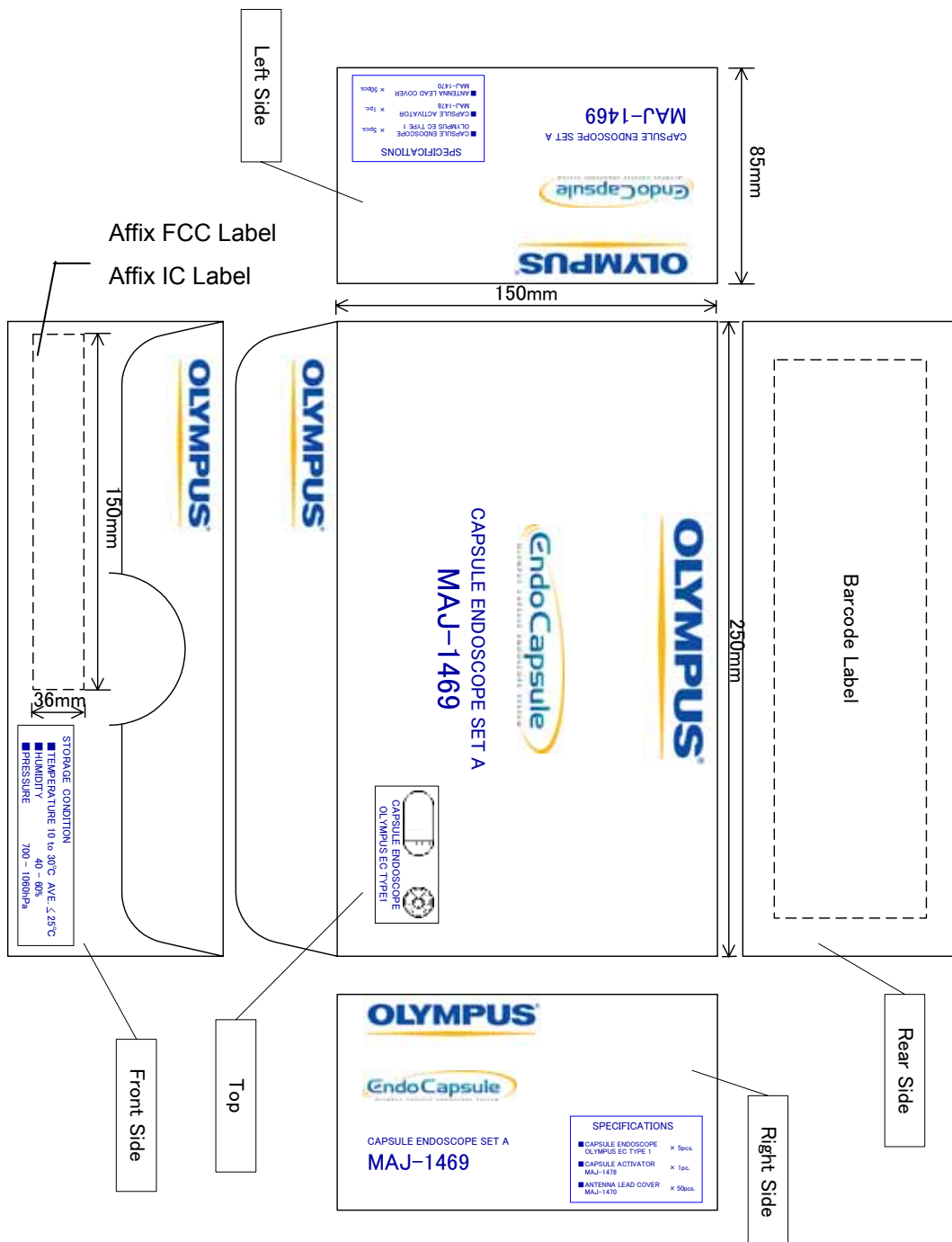


Figure 2. Package appearance of MAJ-1469

For US

Figure 3 is an enlarged view of the part "Affix FCC Label "of Figure 2 in the precedent page.

For Canada

Figure 3 is an enlarged view of the part "Affix IC Label "of Figure 2 in the precedent page.



FCC ID:S8QEC-1

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and

(2) this device must accept any interference received, including interference that may cause undesired operation.

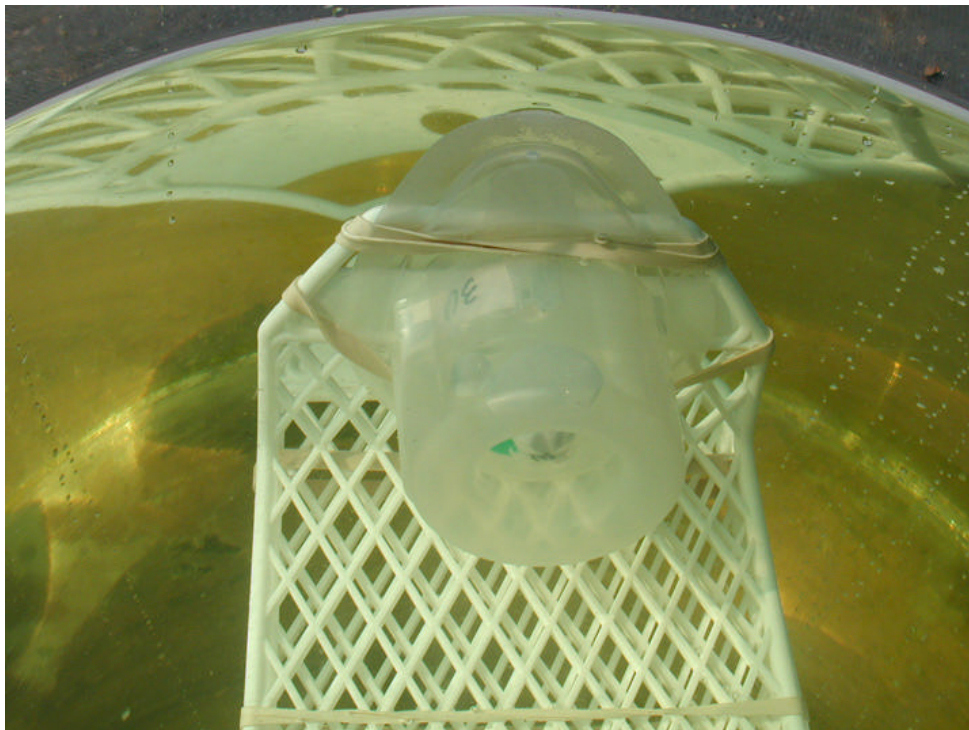
IC:4763B-EC1




AT	BE	CY	CZ	DK	EE	FI	FR	DE	GR
HU	IE	IT	LV	LT	LU	MT	NL	PL	PT
SK	SI	ES	SE	GB	IS	LI	NO	CH	


Figure 3. Particular of label for MAJ-1469

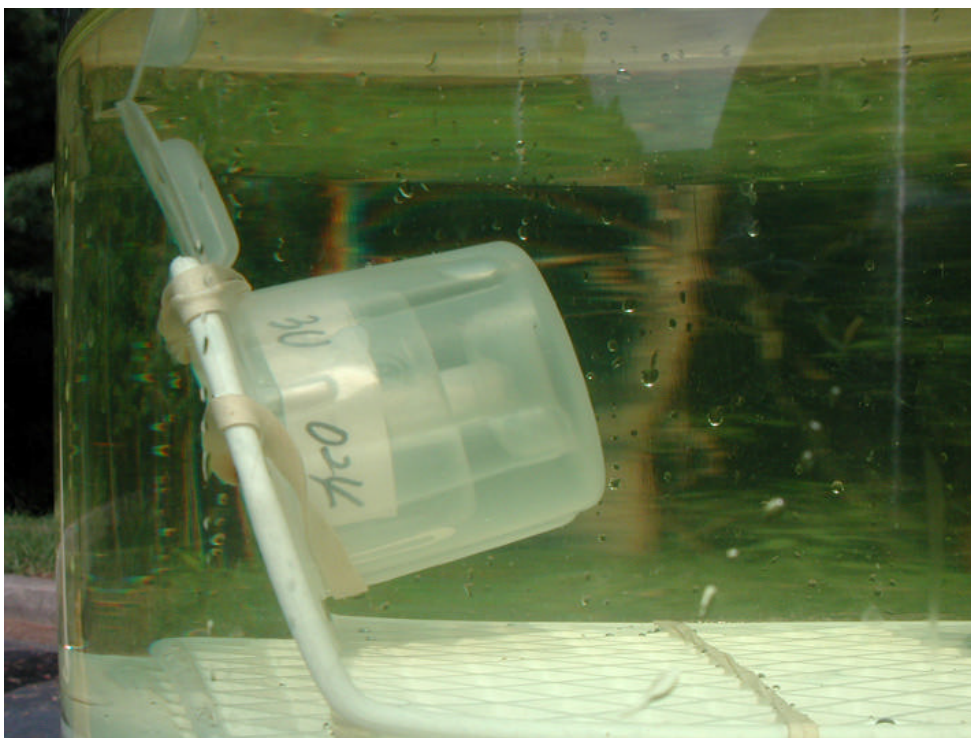
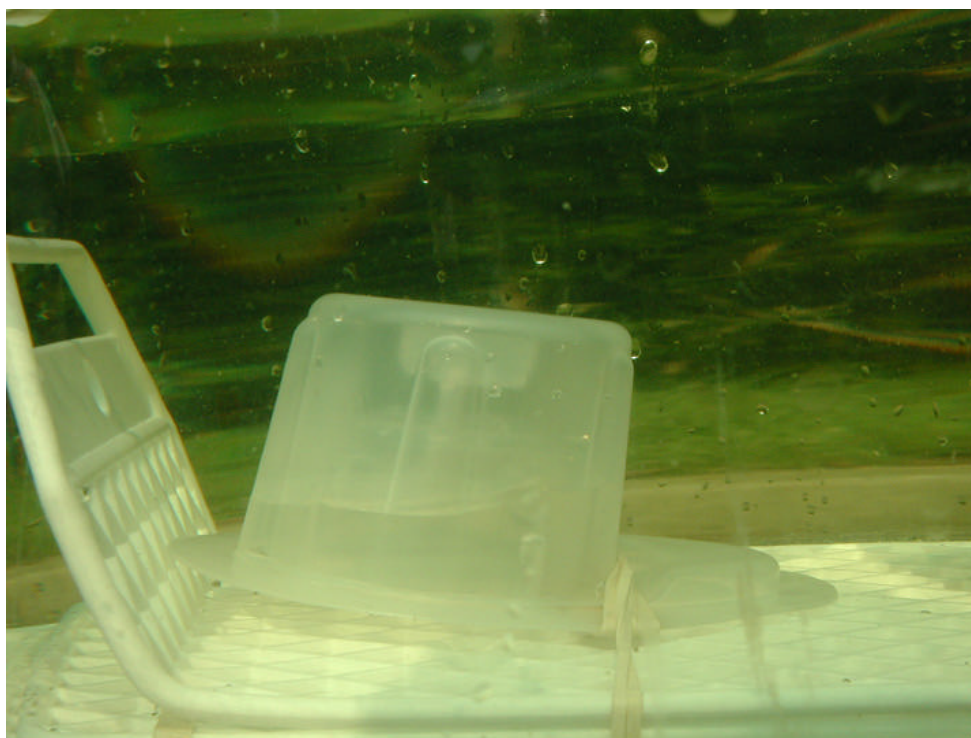
ATTACHMENT C – TEST SETUP PHOTOGRAPHS




	OLYMPUS FCC ID: S8QEC-1	EUT Photographs
© 2005 PCTEST Lab.	Capsule Endoscope System	NVLAP Lab Code: 100431-0



	OLYMPUS FCC ID: S8QEC-1	EUT Photographs
© 2005 PCTEST Lab.	Capsule Endoscope System	NVLAP Lab Code: 100431-0



	OLYMPUS FCC ID: S8QEC-1	EUT Photographs
© 2005 PCTEST Lab.	Capsule Endoscope System	NVLAP Lab Code: 100431-0