
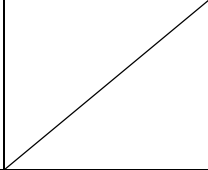



Part No. W5I-B0-07  
(150 mm)  
(주)위니젠

	Check	Check	Approval
위니젠			

	Check	Check	Approval
고객사			

자 료 종 류 /  
작 성 /  
심 사 /  
결 정 /  
등 록 일 자

신흥정밀 귀중

## 사 양 승 인 원

품 명	Internal Antenna
모델명	
업체 P/N	W5I-BO-07

NO.	CODE	DESCRIPTION	REMARK
1		2.4 GHz Internal Antenna	150 mm
2			
3			
4			
5			
6			

상기 품목의 승인을 허락하여 주시기 바랍니다.

2012 년 6 월 15 일

업 체 명 : (주)위니젠

회사주소 : 본사-대전시 유성구 문지동 103-6 한국과학기술원 ICC 진리관 T205

전 화 : 042-863-8640

F A X : 042-863-8641


시흥공장-경기 시흥시 하상동 377-4 씨미트빌 3층

전 화: 031-435-0226

F A X: 031-435-0228

## - 목차 -


1. 승인원 이력 List
2. 규격
3. 기구 도면
4. 측정 기준
  - 4-1 시험 장비
  - 4-2 시험 장비 Setting
  - 4-3 Calibration
5. 시험 절차
  - 5-1 VSWR
  - 5-2 이득 및 방사패턴 측정
6. 측정 Data
  - 6-1 VSWR
  - 6-2 S11
  - 6-3 Radiation Pattern
7. Reliability Test
8. Packaging
9. RoHS Data

	Document No. WAT-1206-EX148I	Rev. No. IR	Model Name W5I-BO-07 (150 mm)
---	---------------------------------	----------------	----------------------------------

## 1. 승인원 이력 List


### 승인원 이력 List

NO	일자	변경전	변경후	사유	Rev
1	2012. 6. 15			최초 발행	IR
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

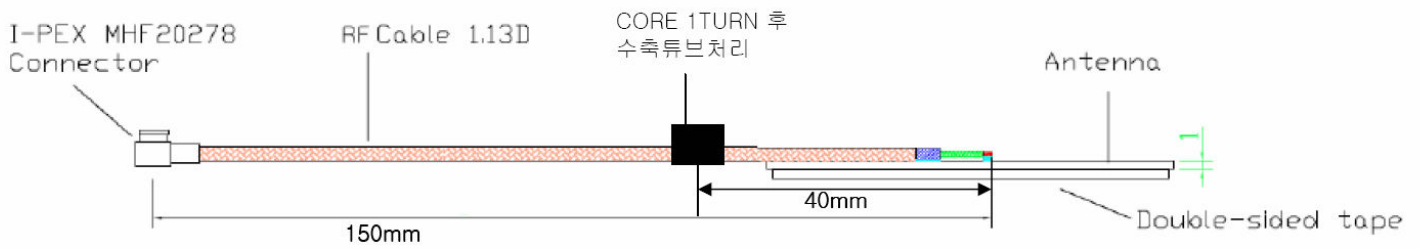
	<b>Document No.</b> WAT-1206-EX148I	<b>Rev. No.</b> IR	<b>Model Name</b> W5I-BO-07 (150 mm)
---	--	-----------------------	---

## 2. 규격


<b>Electrical Specifications</b>	
<b>Frequency Range</b>	2400 ~ 2483.5 MHz
<b>Band Width</b>	83.5 (MHz)
<b>V.S.W.R ( Min )</b>	1.9 :1
<b>Gain Max )</b>	2 ± 1 dBi
<b>Input Impedance</b>	50 (Ω)
<b>Polarization</b>	Linear
<b>Mechanical Specifications</b>	
<b>Antenna Size</b>	48 x 8 x 1 mm
<b>Cable Length</b>	1.13D, 150 mm
<b>Radiator Material</b>	Copper
<b>Operation Temperature</b>	-20 ~ 70 (°C)
<b>Operation Humidity</b>	10 ~ 90 (%)
<b>Option</b>	
<b>Remarks</b>	Data was measured at free space.

	Document No. <b>WAT-1206-EX148I</b>	Rev. No. IR	Model Name <b>W5I-BO-07 (150 mm)</b>
---	--	----------------	---

### 3. 기구 도면



Core 규격: O.D 8mm x I.D 3.4mm x 12mm H

	Document No. WAT-1206-EX148I	Rev. No. IR	Model Name W5I-BO-07 (150 mm)
---	---------------------------------	----------------	----------------------------------

## 4. 측정 기준

### 4-1. 시험 장비


Network Analyzer	HP8753ES
Calibration Kit	HP85033D
High Resistance Meter	HP4277A
Withstanding Voltage Tester	TOS-8750
Adaptor	SMA Type Female ↔ SMA male
Measurement Cable	8120-4779 (Hewlett Packard)

### 4-2. 시험 장비 Setting

Display	Dual Channel : On
	Split Display : On
Menu	Number of Points : 201
	Power : 0 dBm
Measure	Channel 1 : S11
	Channel 2 : S21

### 4-3. Calibration

Calibration- Cal. Kit : 50 Ω  
Calibration menu → Full-2 Port Reflection  
Forward : Open → Short → Load  
Reverse : Open → Short → Load  
Done  
Transmission  
Do Both → FWD + REV  
Done  
Isolation  
Omit Isolation  
Done

	Document No. WAT-1206-EX148I	Rev. No. IR	Model Name W5I-BO-07 (150 mm)
---	---------------------------------	----------------	----------------------------------

## 5. 시험 절차

### 5-1. VSWR

Step 1.

Antenna를 Adaptor 가 포함된 Cable로 Network Analyzer의 Port1에 연결한다.

Step 2.

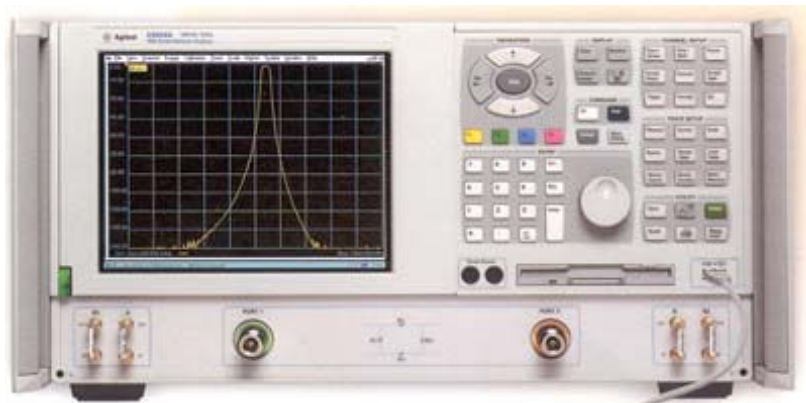
해당 주파수 대역의 Marker Point를 Network Analyzer위에 표시한다.

Step 3.

VSWR 값을 확인한다.

Step 4.

Data를 측정한다.





## 5-2. 이득 및 방사패턴 측정

### Step 1

Chamber와 주파수대역의 시스템을 Calibration과 동시에 Chamber의 제어를 위한 소프트웨어를 확인한다

### Step 2.

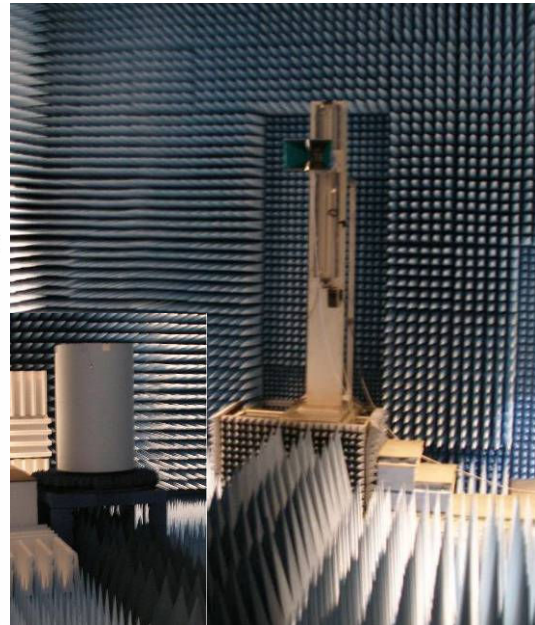
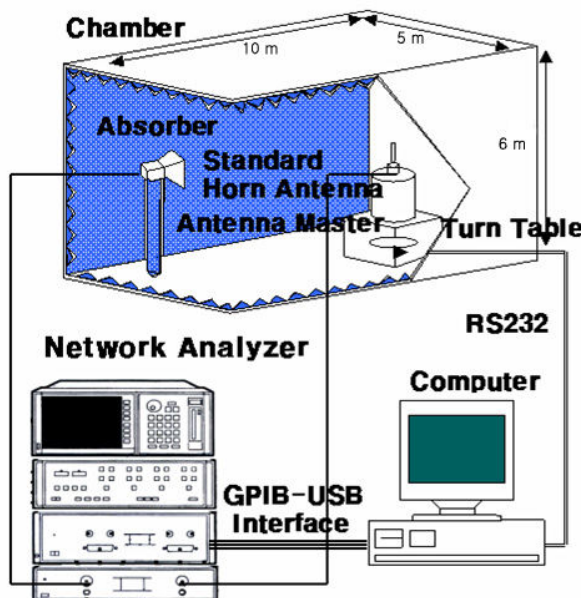
측정할 Antenna를 Chamber 내부의 측정할 위치에 놓는다.

### Step 3.

Chamber의 제어 Program을 작동하여 측정을 시작한다

### Step 4.

Data를 측정한다.





	Document No. WAT-1206-EX148I	Rev. No. IR	Model Name W5I-BO-07 (150 mm)
--	---------------------------------	----------------	----------------------------------

## 6. 측정 Data

모델명	W5I-BO-07 (150 mm)		
회로담당자	곽 원 일		
장 비	(주)위니젠 연구소 Chamber 및 측정 장비 (안테나 단품 측정)		
안테나	2.4 GHz Internal Antenna		
주파수	2400 MHz ~ 2483.5 MHz		

Items	Spec.	Test Result
Frequency	2400 ~ 2483.5 MHz	2400 ~ 2483.5 MHz
VSWR (Min)	< 1.9	1.36
Gain (Max)	2 ± 1 dBi	3.384

### 6-1 VSWR

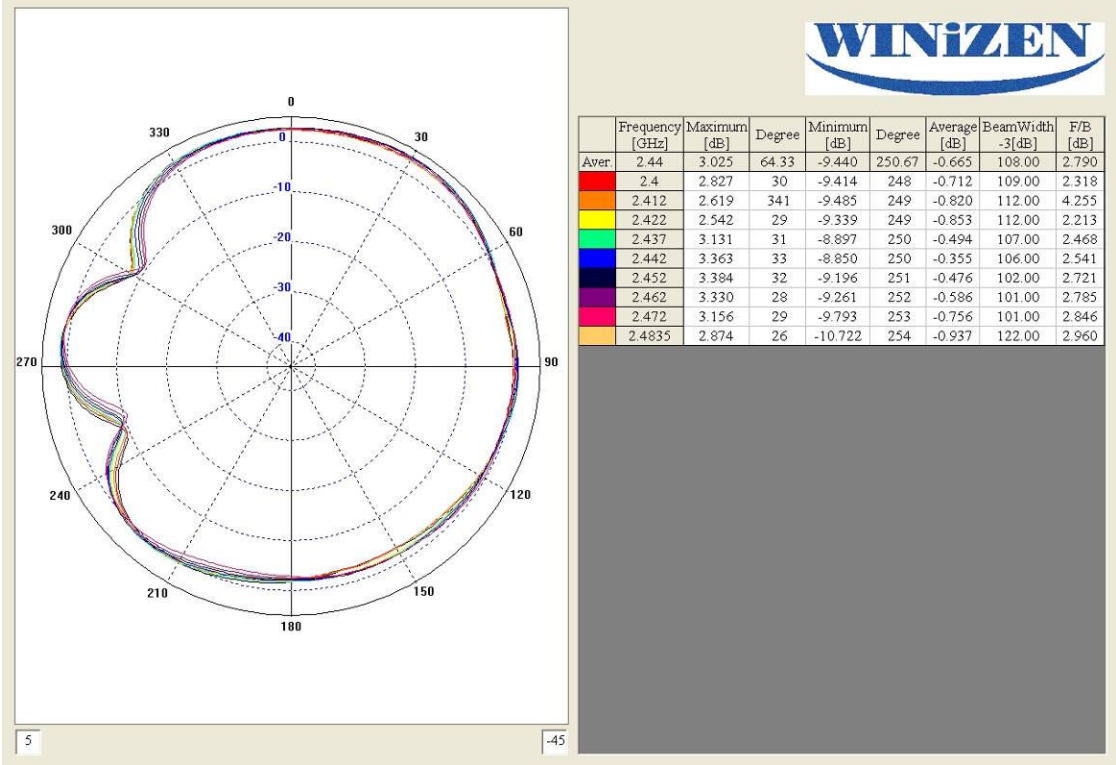


### 6-2 S11

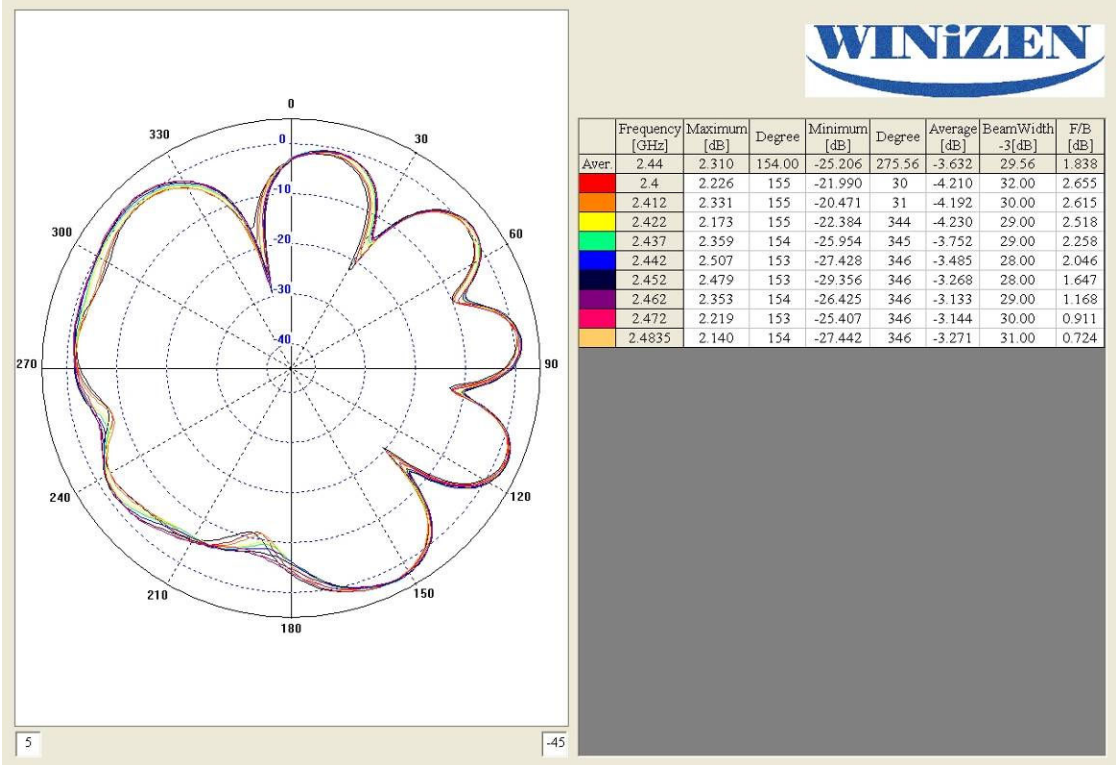



### 6-3 Radiation Pattern

#### a. Azimuth Pattern

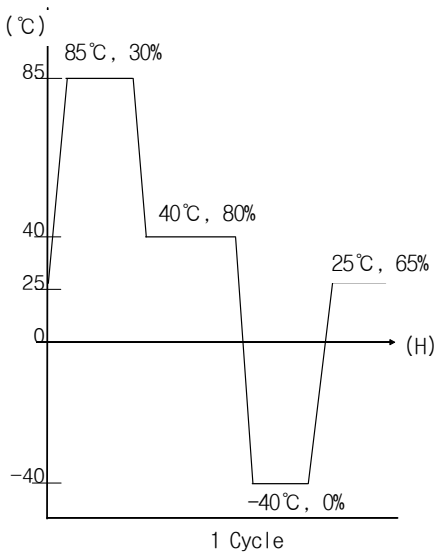
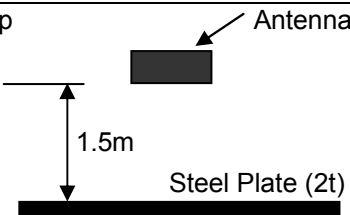


#### b. Elevation Pattern



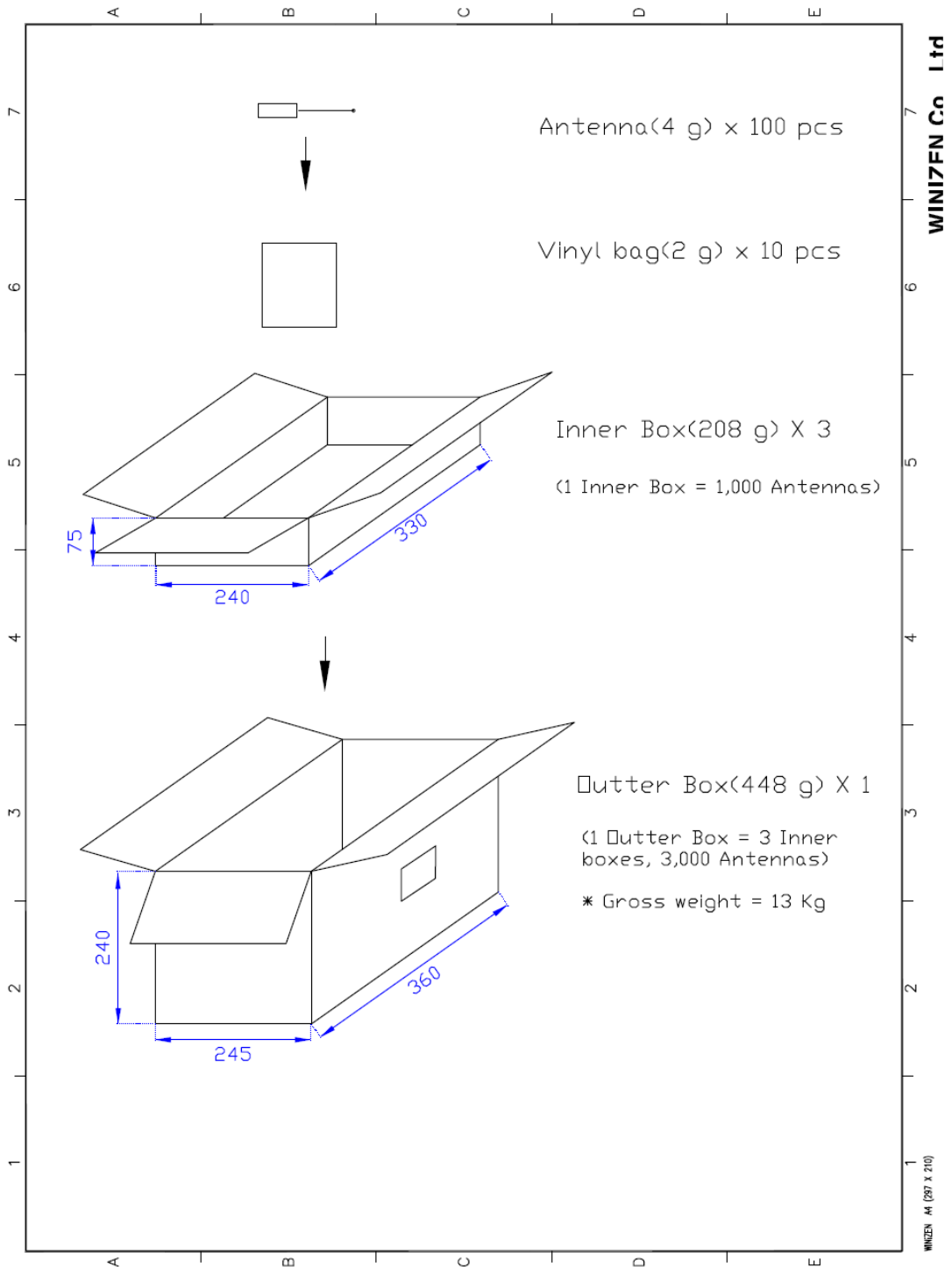
	Document No. <b>WAT-1206-EX148I</b>	Rev. No. IR	Model Name <b>W5I-BO-07 (150 mm)</b>
---	--	----------------	---

## 7. Reliability Test

Item	Specification	Conditions	Test Result
Salt-water Resistance	No change of material characteristic	Temperature of 35°C, Concentration of 5%, Let stand for 48 hours	OK
Humidity Resistance	Changeable range of V.S.WR value $\pm 0.5$ No change of material characteristic	Temperature of 40°C, Humidity of 95%, Let stand for 96 hours	OK
Temperature Test 	Changeable range of V.S.WR value $\pm 0.5$ No change of material characteristic	Increasing from +25°C, 65% to +85°C, 30%; 35min / Keeping on +85°C, 30% for 6hour / Decreasing from +85°C, 30% to +40°C, 80%; 20min / Keeping on +40°C, 80% for 8hour / Decreasing from +40°C, 80% to -40°C, 0%; 60min / Keeping on -40°C, 0% for 4hour / Increasing from -40°C, 0% to 25°C, 65%; 45min / Keeping on 25°C for 3hour / 5Cycle time = 118hour and 20min	OK
Drop 	No disconnection No crack or damage	Drop the antenna at 1.5m height to the steel plate (2t) of ground	OK

	<b>Document No.</b> <b>WAT-1206-EX148I</b>	<b>Rev. No.</b> <b>IR</b>	<b>Model Name</b> <b>W5I-BO-07 (150 mm)</b>
--	---	------------------------------	--

## 8. Packaging



	Document No. WAT-1206-EX148I	Rev. No. IR	Model Name W5I-BO-07 (150 mm)
--	---------------------------------	----------------	----------------------------------

## 9. RoHS Data

Part Name: 2.4 GHz Internal Antenna

Part No. W5I-BO-07

2012.6.15

Chemical constituents				MATERIAL ANALYSIS							
Name of part		Substance	자료첨부 (MSDS/MD)	ANALYSIS RESULT (ppm)						Analysis date	자료첨부 (RoHS성적서)
Break down of the component		Substance Name		Cd	Pb	Hg	Cr+6	PBBs	PBDEs		
Cable	Insulator	PTFE		ND	ND	ND	ND	ND	ND	2011.1.18	
	Conductor	Copper		ND	ND	ND	ND	ND	ND	2011.1.18	
	Jacket	FEP		ND	ND	ND	ND	ND	ND	2011.1.18	
	Shield	Silverplated copper		ND	ND	ND	ND	ND	ND	2011.1.18	
IPEX Connector	Housing (black)	PBT		ND	ND	ND	ND	ND	ND	2010.2.22	
	Contact	Phosphor Bronze Strip		ND	20	ND	ND	ND	ND	2010.2.22	
	Ground contact	Copper		ND	19	ND	ND	ND	ND	2010.2.22	
PCB	FR-4	EPOXY		ND	5	ND	ND	ND	ND	2011.8.22	
Solder		Lead alloy		ND	290	ND	ND	ND	ND	2011.3.10	
TOTAL											