

# **PCTEST ENGINEERING LABORATORY, INC.**

## **PCTEST Calibration Laboratory**

6660-B Dobbin Road  
Columbia, Maryland 21045  
U.S.A.

Calibration File No.: PCT486C-0801

### **CERTIFICATE OF CALIBRATION**

It is hereby certified that the identified equipment below has been calibrated in PCTEST Calibration Laboratory by qualified personnel following recognized procedures and using transfer standards traceable to US NIST.

EQUIPMENT: Miniature Isotropic RF Probe

MANUFACTURER: IDX Robotics Inc.

SERIAL NO.: PCT486C

Calibration Procedure: IEEE Std. 1528 (Draft 3 - Aug. 2000)

Date of Calibration: 01 August 2001

Calibration Due Date: 01 August 2002

REMARKS: none

Calibrated By: Al Cirwithian

## CALIBRATION RECORD

EQUIPMENT: Miniature Isotropic RF Probe  
MANUFACTURER: IDX Robotics Inc.  
SERIAL NO.: PCT486C

Calibration Procedure: IEEE Std. 1528 (Draft 3 - Aug. 2000)

Date of Calibration: 01 August 2001

Calibration Due Date: 01 August 2002

Environmental Conditions:

Temperature: 25 ±2 °C

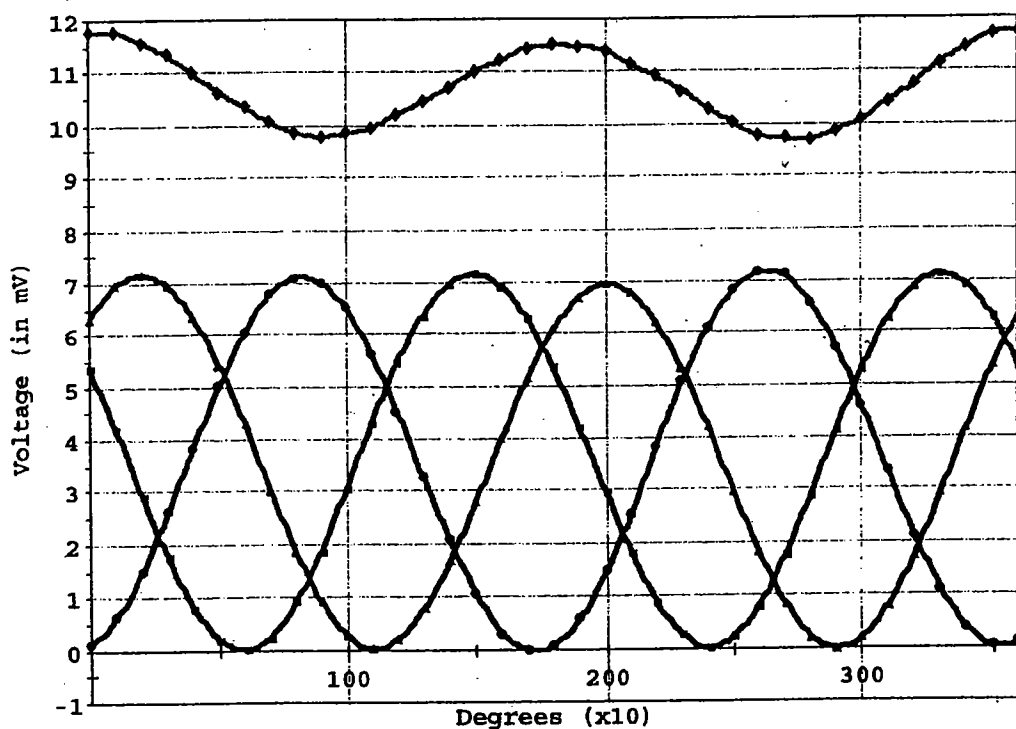
Humidity: 30-60 %

### TEST EQUIPMENT:

1. RF Power Meter - HP 437B
2. RF Power Sensor - HP 8481H
3. Precision Dual-Channel Thermometer - Guildline Model 5150  
S/N: 66145
4. Precision Thermistor Sensor - Guildline 51502
5. Near-Field Broadband Measuring System - IDX
6. Signal Generator - HP 8648D (9kHz-4 GHz)
7. RF Power Amplifier - Amplified Research 5SIG4 (800MHz-  
4.2GHz) 5Watts
8. Dipole Validation Antennas 835MHz - SPEAG
9. Dipole Validation Antennas 1900MHz - SPEAG
10. Network Analyzer HP 8753E
11. TEM Cell - IFI CC-110
12. Directional Coupler - HP 767D

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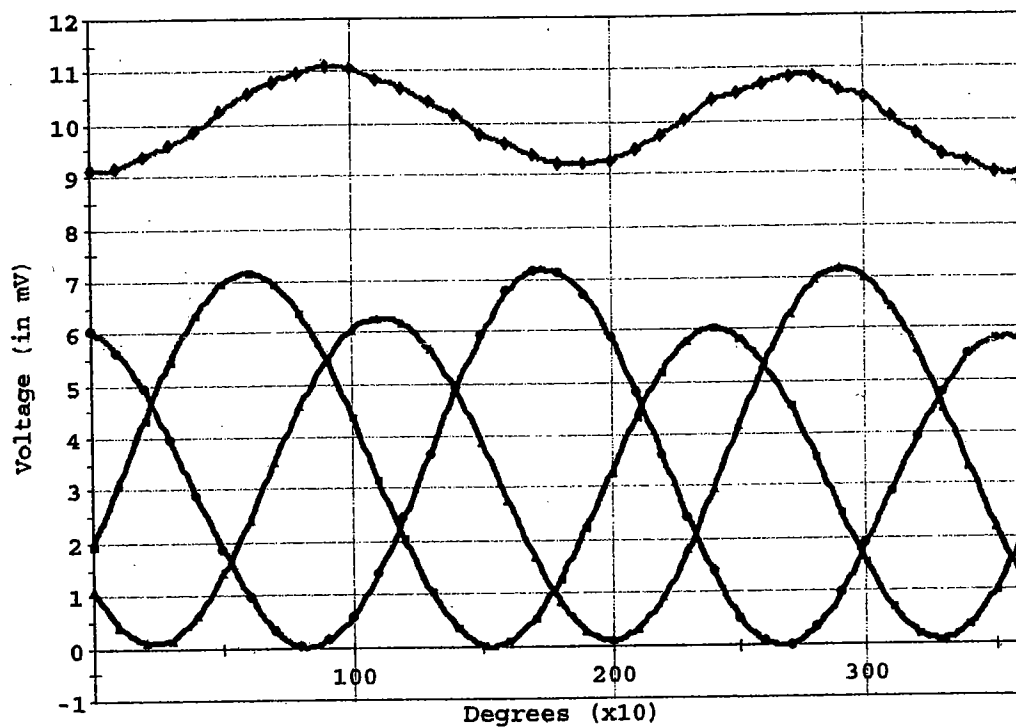
File: 010801 0835 MHz PCT486c.cal  
Date: 01-August 2001 10:37:50 am  
Probe: PCT486C  
Freq: 835  
Comment:  
Amp 1 Setting: 0.239  
Amp 2 Setting: 0.278  
Amp 3 Setting: 0.294



• Ch 0  
▪ Ch 1  
▲ Ch 2  
◆ Sum

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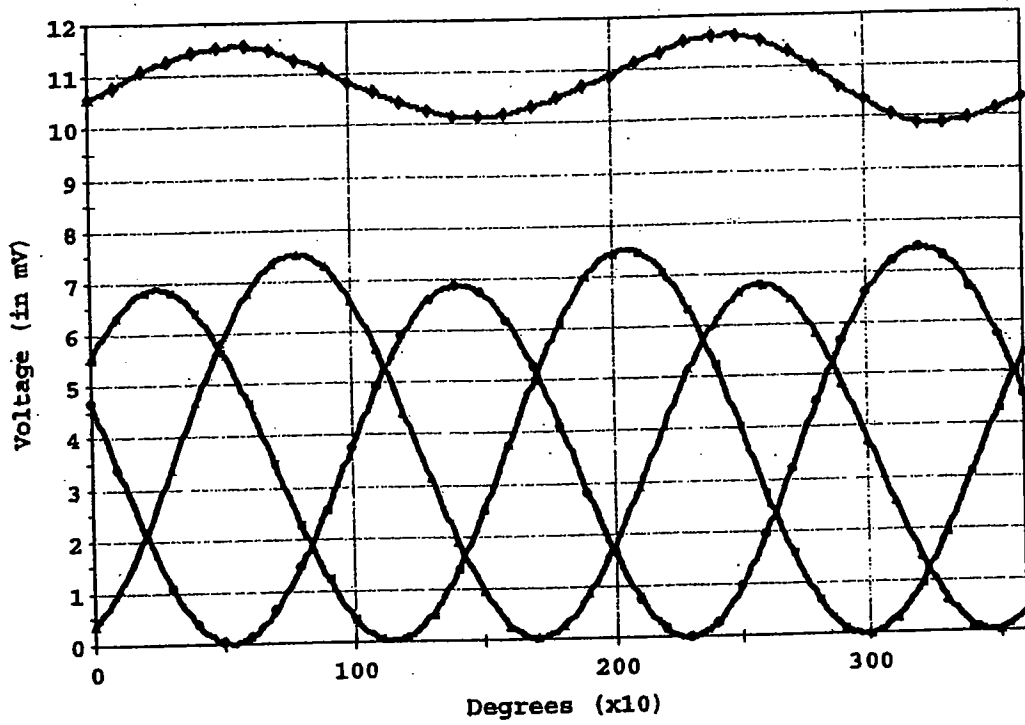
File: 010801 1900 MHz PCT486c.cal  
Date: 01-August 2001 11:07:57 am  
Probe: PCT486C  
Freq: 1900  
Comment:  
Amp 1 Setting: 0.309  
Amp 2 Setting: 0.361  
Amp 3 Setting: 0.421



• Ch 0  
• Ch 1  
• Ch 2  
• Sum

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File: 010801 2450 MHz PCT486c.cal  
Date: 01-August 2001 09:17:10 am  
Probe: PCT486C  
Freq: 2450  
Comment:  
Amp 1 Setting: 0.172  
Amp 2 Setting: 0.187  
Amp 3 Setting: 0.220



• Ch 0  
■ Ch 1  
▲ Ch 2  
◆ Sum

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OFFSET	ANGLE
cm	deg
.20	54.72

Tissue Type	Freq. MHz	Dielectric Constant	Conductivity S/M	Conversion Factor
Brain	835	41.5	0.90	.325
Brain	1900	39.9	1.42	.550
Brain	2450	39.2	1.80	1.004
Muscle	835	56.1	0.95	.423
Muscle	1900	54.2	1.45	.496
Muscle	2450	52.7	1.95	.983

Frequency	Isotropy	dB
835	9.66	.40
1900	9.77	.405
2450	8.06	.336

Calibrated by Ales Date Aug 1, 2001

File : c:/idx3/SYSTEM/SARMEAS3/data/Normal/02011630\_ZOOM.VLT  
Start : 16-Jan-102 06:58:43 pm End : 16-Jan-102 07:13:05 pm

Radio Type : Validation  
Model Number :  
Serial Number : C  
Frequency : 1900 MHz  
Peak Trans. Pwr : 0.250 W  
Start Trans. Pwr : 0.250 W  
Antenna Type : Dipole  
Antenna Posn. : Internal  
Phantom Type : Flat  
Phantom Posn. : E Field  
Scan Type : ZOOM/SAR  
Probe Name : PCTEST  
Field Type : E Field  
Orientation : 0 Degrees

Mixture Type = Muscle  
Mixture Dielectric Constant = 54.200  
Mixture Conductivity = 1.450

Comment :  
1900 MHz Dipole Validation  
SN: C

Robot : PCTEST

Probe Offset = 0.20 cm  
Sensor Factor = 0.0108  
Conversion Factor = 0.496

PCTEST Amplifier Channel Settings : 0.309 0.361 0.421

Max Location : X = 1.500, Y = -1.750, Z = 0.000 (cm) Value = 197.854

Measured Values (volts) =  
2.064E-001 1.318E-001 8.987E-002 6.346E-002 4.708E-002 3.322E-002  
2.407E-002 1.680E-002 1.200E-002 8.758E-003 6.158E-003 4.441E-003  
3.363E-003 2.430E-003 1.916E-003 1.508E-003 1.117E-003 1.130E-003  
1.024E-003 1.204E-003 1.008E-003

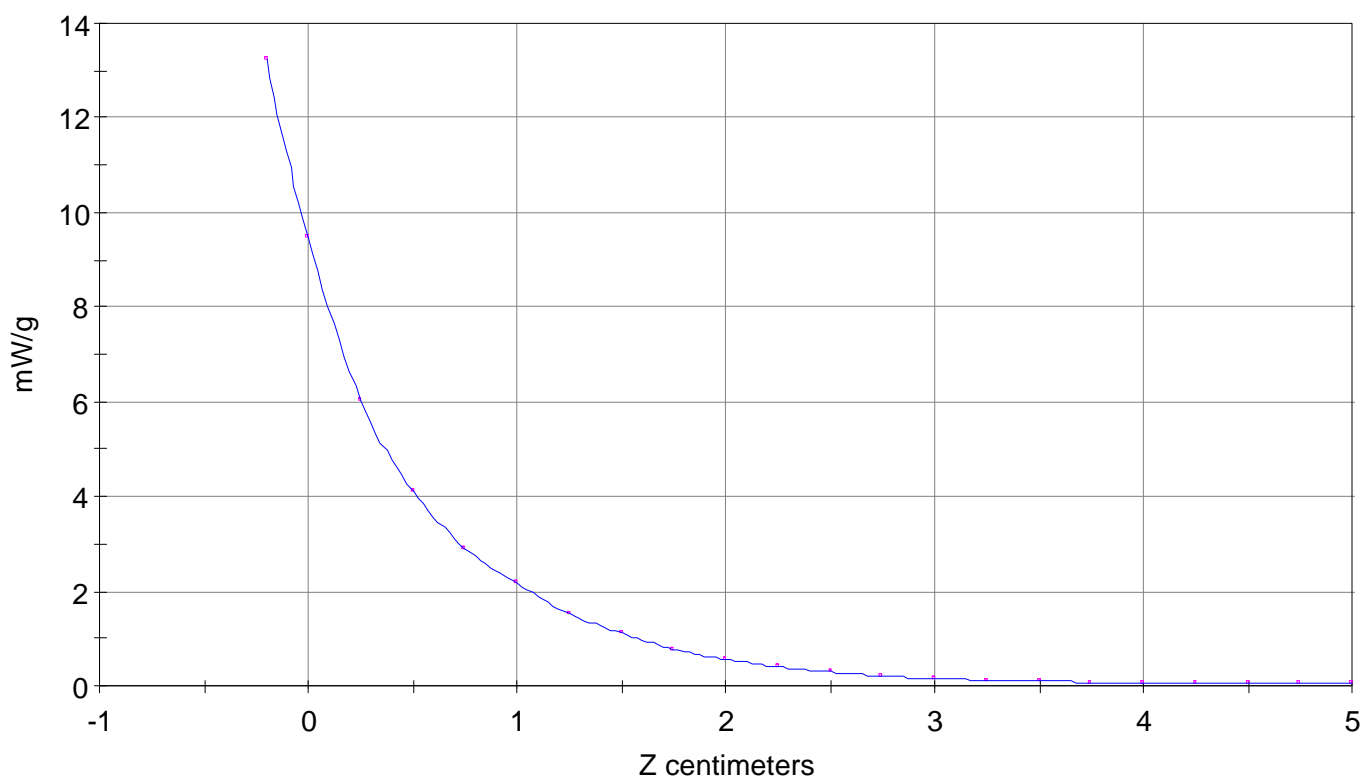
Calc. Voltage @ Surface (Vs) = 0.2880

Voltage @ 1.00 cm (Vt) = 0.0602

Ave. Voltage (Vs+Vt)/2 = 0.1741

Ave. SAR over 1 g (mW/g) = 7.9948

SAR Scan  
File : 02011630\_ZOOM  
Start : 16-Jan-102 06:58:43 pm End : 16-Jan-102 07:13:05 pm  
Validation//C;1900MHz;W;Dipole/Internal;  
Flat/E Field;ZOOM/SAR;PCTEST/E Field/0 DegreesMuscle/54.200/1.450



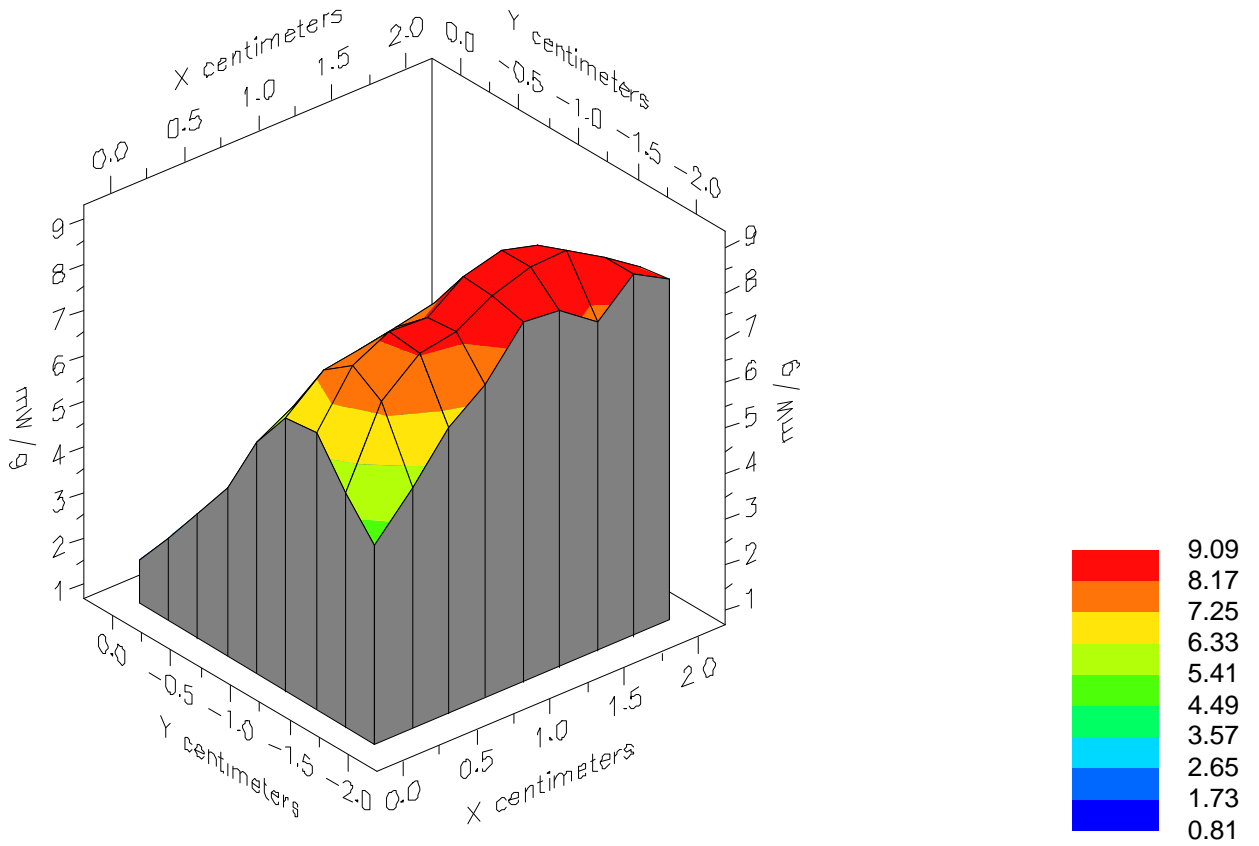


File : 02011630\_ZOOM

Start : 16-Jan-102 06:58:43 pm End : 16-Jan-102 07:13:05 pm

Validation//C;1900MHz;W;Dipole/Internal;

Flat/E Field;ZOOM/SAR;PCTEST/E Field/0 DegreesMuscle/54.200/1.450



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Start : 16-Jan-102 06:58:43 pm End : 16-Jan-102 07:13:05 pm

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Flat/E Field;ZOOM/SAR;PCTEST/E Field/0 DegreesMuscle/54.200/1.450

