

National Accreditation Board for Testing and Calibration Laboratories

Department of Science & Technology, India

CERTIFICATE OF ACCREDITATION

TEKTRONIX (INDIA) PVT. LTD.

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2005

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

St. Marks Road, Bangalore

in the discipline of

ELECTRO-TECHNICAL CALIBRATION

Certificate Number

C-0830

Issue Date

19/07/2012



Valid Until 18/07/2014

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the additional requirements of NABL.

Signed for and on behalf of NABL

Avijit Das

Convenor

Director

Chairman



Department of Science & Technology, India

SCOPE OF ACCREDITATION

Laboratory

Tektronix (India) Pvt. Ltd., St. Marks Road, Bangalore

Accreditation Standard

ISO/IEC 17025: 2005

Field

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Pag

0.048% to 0.75%

Page 1 of 4

Quantity Measured / Instru	ment Range/ Frequency	* Calibration Measurement Capability (±)	Remarks
ATTAN			
AT LAB			
SOURCE			
1. DC VOLTAGE	10 mV to 100 mV	52 ppm to 15 ppm	Using Fluke5720A
i. De vollage	100 mV to 1V	15 ppm to 7 ppm	Calibrator by Direct
	1V to 10 V	7 ppm to 4 ppm	Method
	10 V to 100 V	4 ppm to 6 ppm	
	100 V to 1000 V	6 ppm to 8 ppm	
		15	
2. AC VOLTAGE	40 Hz to 1 kHz		
	2 mV to 19 mV	0.24 % to 0.035 %	Using Calibrator
	19 mV to 100 mV	0.035 % to 0.02 %	Fluke 5720A Calibrato
	100 mV to 100 V	0.02 % to 0.011 %	by Direct Method
	100 V to 1000 V	0.011 % to 0.009 %	
	1 kHz to 20 kHz		
	1.9 mV to 19 mV	0.25 % to 0.035 %	
100	19 mV to 100 mV	0.035 % to 0.018 %	
	100 mV to 1V	0.018 % to 0.006 %	
	1V to 100 V	0.006 % to 0.008 %	
	20 kHz to 100 kHz		
	19 mV to 100 mV	0.018 % to 0.02 %	
	100 mV to 1V	0.02 % to 0.011 %	
	1V to 100 V	0.011% to 0.022 %	
B. DC CURRENT	190 μA to 1.9 mA	85 ppm to 50 ppm	Using Calibrator
	1.9 mA to 190 mA	50 ppm to 60 ppm	Fluke 5720A, 5725
	190 mA to 1.9A	60 ppm to 165 ppm	by Direct Method
	1.9 A to 10A	165 ppm to 480 ppm	

10 A to 500 A

4.

Using Calibrator Fluke

5500 A with Current Coil by Direct Method



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Page

2 of 4

Quantity Measured / Instrument		Range/ Frequency	* Calibration Measurement Capability (±)	Remarks
	/ /	2221	700	H .
4.	AC CURRENT	40 Hz to 1 kHz		
	. /~/	19 μA to 190 mA	0.19 % to 0.02 %	Using Calibrator
		190 mA to 1.9 A	0.02 % to 0.035 %	Fluke 5720A, 5725
		1.9 A to 10 A	0.035 % to 0.06 %	by Direct Method
		1 kHz to 5 kHz		
		19 μA to 190 mA	0.19% to 0.04%	
		190 mA to 1.9A	0.04% to 0.06%	
		1.9A to 10A	0.06% to 0.12%	
		50Hz		
		10 A to 100 A	0.12% to 0.4%	 Using Calibrator Fluke
		100 A to 500 A	0.4% to 1.8%	5500 A with Current Coi by Direct Method
		5 kHz to 10 kHz		
		190 μA to 190 mA	0.17%	Using Calibrator Fluke
	\ A\	190 mA to 1.9 A	0.17 to 0.07%	5720 A, 5725
		VAL.		by Direct Method
5.	RESISTANCE	1Ω to 10 Ω	120 ppm to 30 ppm	Using Calibrator
-		10Ω to $100 k\Omega$	30 ppm to 15 ppm	Fluke 5720A
		100 kΩ to 1MΩ	15 ppm to 30 ppm	by Direct Method
		$1 \text{ M}\Omega$ to $100 \text{ M}\Omega$	30 ppm to 140 ppm	
6.	CAPACITANCE	1kHz		
	/	1 nF to 10 nF	1.75% to 0.45%	Using Calibrator
		10 nF to 100 nF	0.45% to 0.65%	Fluke 5500A
		100 nF to 1μF	0.65 % to 0.45%	by Direct Method
		1 μF to 100 μF	0.45% to 0.65%	
		100 μF to 0.8 mF	0.65% to 1.25%	



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Page

3 of 4

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		3/41		
7.	OSCILLOSCOPE (I) AMPLITUDE (DC SIGNAL)	1 mV to 100 mV 100 mV to 50 V	2.0 % to 0.04% 0.04% to 0.02%	Using Oscilloscope Calibrator Fluke 9500B by Direct Method
	(II) BAND WIDTH	50 kHz and 10 MHz (Ref.) 50 kHz to 8 GHz 8 GHz to 18 GHz	0.4 dB to 0.5 dB	Using Calibrator Fluke 9500B Power Meter E 4418 B with Sensor H -18
	(III) TIME MARKER	1 nS to 20 mS 20 mS to 5 S	7 ppm to 10 ppm 10 ppm to 120 ppm	Using Calibrator Fluke 9500 B by Direct Method
8.	RF POWER	10 MHz to 18 GHz -60 dBm to 10 dBm (1nW to 10mW)	4.6 to 5%	Using Signal Generator Anritsu MG 3694 C & Agilent Power Meter with Sensor E 4418 B/ E 9304A-H18 by Direct Method
9.	RF ATTENUATION	10 MHz to 18 GHz 1 dB to 60 dB	0.4 dB to 0.6dB	Using Signal Generator Anritsu MG 3694 C & Agilent Power Meter with Sensor E 4418 B/ E 9304A-H18 by Ratio Method
10.	VSWR	10 MHz to 18 GHz 1 to 2	0.1 to 0.3	Using 500hm Open and Short circuit termination.



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4 of 4

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11. FREQUENCY	100 Hz to 10 MHz 10 MHz to 20 GHz	10 ppm to 0.35 ppm 0.35 ppm to 0.25 ppm	Using Agilent 53151 A Microwave Frequency Counter and Signal Generator Anritsu MG 3694 C & Fluke 5500 A By Direct Method
MEASURE			
12. DC VOLTAGE	10mV to 1V 1V to 1000 V	45 ppm to 60 ppm 60 ppm to 8 ppm	Using 8½ DMM Agilent 3458A by Comparison Method
13. AC VOLTAGE	1 kHz 100 mV to 1V 1V to 10V 10 V to 100 V 100 V to 700 V	0.014% to 0.011% 0.011% 0.011 % to 0.03% 0.03% to 0.05%	Using 8½ DMM Agilent 3458A by Comparison Method
14. DC CURRENT	100µA to 1mA 1mA to 100 mA 100 mA to 1A	40 ppm to 30 ppm 30 ppm to 50 ppm 50 ppm to 144 ppm	Using 8½ DMM Agilent 3458A by Comparison Method
15. AC CURRENT	1 kHz 100 μA to1 mA 1 mA to 100 mA 100 mA to 1A	100 to 60 ppm 60 ppm 60 ppm to 150ppm	Using 8½ DMM Agilent 3458A by Comparison Method
16. RESISTANCE	1Ω to 10 Ω 10 Ω to 100 kΩ 100 kΩ to 10 MΩ	90 ppm to 20 ppm 20 ppm to 13 ppm 13 ppm to 75 ppm	Using 8½ DMM Agilent 3458A by Comparison Method

^{*} Measurement Capability is expressed as an uncertainty (±) at a confidence probability of 95%