Schedule of Accreditation

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Keysight Technologies UK Ltd

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Calibration performed by the Organisations at the locations specified below

Locations covered by the organisation and their relevant activities

Laboratory locations:

Location details		Activity	Location code
Address The Calibration House Halesfield 7 Telford Shropshire TF7 4QL	**Local contact** Mr R A Jones	Electrical and Dimensional calibrations	P

Site activities performed away from the locations listed above:

Location details		Activity	Location code
Customers' sites or premises The customers' site or premises must be suitable for the nature of the particular calibrations undertaken and will be the subject of contract review arrangements between the laboratory and the customer	**Local contact** Mr R A Jones	Dimensional	S

DETAIL OF ACCREDITATION

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	Location Code
DC RESISTANCE				P
Specific values	1 Ω	3.9 ppm		
	10 Ω	2.4 ppm		
	100 Ω	1.2 ppm		
	1.0 kΩ	1.3 ppm		
	10 kΩ	1.5 ppm		
	100 kΩ	2.2 ppm		
	1 MΩ	2.2 ppm		
	10 MΩ	6.1 ppm		
Other Values	0 Ω to 0.5 Ω	7.5 ppm + 0.25 μΩ		
	0.5 Ω to 5 Ω	7.4 ppm		
	5 Ω to 50 Ω	5.4 ppm		
	50 Ω to 500 Ω	5.4 ppm		
	500 Ω to 5 kΩ	5.4 ppm		
	5 kΩ to 50 kΩ	5.4 ppm		
	50 kΩ to 500 kΩ	5.4 ppm		
	500 kΩ to 1 MΩ	5.4 ppm		
	1 MΩ to 10 MΩ	7.2 ppm		
	10 MΩ to 100 MΩ	410 ppm		
	100 MΩ to 10 GΩ	0.18 %		
	10 GΩ to 100 GΩ	0.23 %		
	100 GΩ to 1 TΩ	0.45 %		
DC VOLTAGE	0 V to 11 V	2.8 ppm + 0.30 μV		P
	11 V to 110 V	2.8 ppm		
	110 V to 1100 V	3.2 ppm		
	1.0 kV to 70 kV	0.14 %		
DC CURRENT	100 nA to 10 μA	13 ppm + 5.0 pA		P
	10 μA to 2 A	10.0 ppm		
	2 A to 100 A	60 ppm		
	10 A to 100 A	0.08 % + 0.023 A	For the calibration of clamp-on ammeters	
	100 A to 2500 A	0.26 % + 0.60 A		
AC VOLTAGE				P
Generation	1 mV to 3 mV			
	10 Hz to 30 kHz	0.15 %		
	30 kHz to 200 kHz	0.20 %		
	200 kHz to 500 kHz	0.35 %		
	500 kHz to 1.0 MHz	0.75 %		
	3 mV to 10 mV			
	10 Hz to 100 Hz	0.050 %		
	100 Hz to 30 kHz	0.032 %		
	30 kHz to 200 kHz	0.075 %		
	200 kHz to 500 kHz	0.20 %		
	500 kHz to 1.0 MHz	0.50 %		

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	Location Code
AC VOLTAGE (cont'd)				P
Generation (cont'd)	10 mV to 30 mV			
	10 Hz to 100 Hz	0.045 %		
	100 Hz to 30 kHz	0.055 %		
	30 kHz to 200 kHz	0.16 %		
	200 kHz to 500 kHz	0.20 %		
	500 kHz to 1.0 MHz	0.40 %		
	30 mV to 100 mV			
	10 Hz to 100 Hz	0.030 %		
	100 Hz to 30 kHz	0.017 %		
	30 kHz to 200 kHz	0.040 %		
	200 kHz to 500 kHz	0.10 %		
	500 kHz to 1.0 MHz	0.25 %		
	100 mV to 300 mV			
	10 Hz to 30 kHz	0.0060 %		
	30 kHz to 200 kHz	0.020 %		
	200 kHz to 500 kHz	0.048 %		
	500 kHz to 1.0 MHz	0.12 %		
	300 mV to 30 V			
	10 Hz to 30 kHz	0.0050 %		
	30 kHz to 200 kHz	0.010 %		
	200 kHz to 500 kHz	0.040 %		
	500 kHz to 1.0 MHz	0.11 %		
	30 V to 100 V			
	10 Hz to 30 kHz	0.0043 %		
	30 kHz to 200 kHz	0.011 %		
	100 V to 300 V			
	10 Hz to 30 kHz	0.0074 %		
	30 kHz to 200 kHz	0.020 %		
	300 V to 1100 V			
	10 Hz to 30 kHz	0.013 %		
	30 kHz to 200 kHz	0.020 %		
Measurement				
Specific Values	100 mV			
	1 kHz and 30 kHz	0.0050 %		
	60 kHz and 100 kHz	0.010 %		
	500 kHz	0.040 %		
	1 MHz	0.10 %		
	300 mV			
	10 Hz	0.0035 %		
	40 Hz	0.0030 %		
	1 kHz and 30 kHz	0.0035 %		
	50 kHz and 100 kHz	0.010 %		
	500 kHz	0.040 %		
	1 MHz	0.10 %		

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	Location Code
AC VOLTAGE (cont'd)				P
Measurement (cont'd)				
Specific Values (cont'd)	1 V			
	10 Hz	0.0035 %		
	40 Hz, 1 kHz and 30 kHz	0.0030 %		
	60 kHz and 100 kHz	0.010 %		
	500 kHz	0.040 %		
	1 MHz	0.10 %		
	3 V			
	10 Hz	0.0037 %		
	40 Hz, 1 kHz and 30 kHz	0.0030 %		
	50 kHz and 100 kHz	0.010 %		
	500 kHz	0.040 %		
	1 MHz	0.10 %		
	10 V			
	10 Hz	0.0035 %		
	40 Hz	0.0033 %		
	1 kHz and 30 kHz	0.0030 %		
	60 kHz and 100 kHz	0.010 %		
	500 kHz	0.040 %		
	1 MHz	0.10 %		
	30 V			
	10 Hz	0.0035 %		
	40 Hz	0.0037 %		
	1 kHz and 30 kHz	0.0032 %		
	50 kHz and 100 kHz	0.010 %		
	500 kHz	0.040 %		
	1 MHz	0.10 %		
	100 V			
	10 Hz	0.0040 %		
	40 Hz	0.0035 %		
	1 kHz and 30 kHz	0.0032 %		
	60 kHz and 100 kHz	0.010 %		
	300 V			
	45 Hz, 1 kHz, 5 kHz, 10 kHz, 15 kHz and 20 kHz	0.012 %		
	33 kHz, 50 kHz and 100 kHz	0.013 %		
	1000 V			
	45 Hz, 1 kHz, 5 kHz and 10 kHz	0.013 %		
	15 kHz and 20 kHz	0.013 %		
	30 kHz and 33 kHz	0.014 %		
	50 kHz and 100 kHz	0.016 %		

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	Location Code
AC VOLTAGE (cont'd)				P
Measurement (cont'd)				
Other Values	1 mV to 3 mV			
	10 Hz to 100 Hz	0.16 %		
	100 Hz to 30 kHz	0.14 %		
	30 kHz to 200 kHz	0.20 %		
	200 kHz to 500 kHz	0.36 %		
	500 kHz to 1 MHz	0.72 %		
	3 mV to 10 mV			
	10 Hz to 100 Hz	0.050 %		
	100 Hz to 30 kHz	0.035 %		
	30 kHz to 200 kHz	0.080 %		
	200 kHz to 500 kHz	0.21 %		
	500 kHz to 1 MHz	0.50 %		
	10 mV to 30 mV			
	10 Hz to 100 Hz	0.040 %		
	100 Hz to 30 kHz	0.025 %		
	30 kHz to 200 kHz	0.060 %		
	200 kHz to 500 kHz	0.16 %		
	500 kHz to 1 MHz	0.38 %		
	30 mV to 100 mV			
	10 Hz to 100 Hz	0.030 %		
	100 Hz to 30 kHz	0.015 %		
	30 kHz to 200 kHz	0.030 %		
	200 kHz to 500 kHz	0.10 %		
	500 kHz to 1 MHz	0.25 %		
	100 mV to 300 mV			
	10 Hz to 30 kHz	0.0050 %		
	30 kHz to 200 kHz	0.011 %		
	200 kHz to 500 kHz	0.050 %		
	500 kHz to 1 MHz	0.13 %		
	300 mV to 30 V			
	10 Hz to 30 kHz	0.0050 %		
	30 kHz to 200 kHz	0.020 %		
	200 kHz to 500 kHz	0.050 %		
	500 kHz to 1 MHz	0.12 %		
	30 V to 100 V			
	10 Hz to 30 kHz	0.0050 %		
	30 kHz to 200 kHz	0.010 %		
	100 V to 300 V			
	10 Hz to 30 kHz	0.013 %		
	30 kHz to 200 kHz	0.017 %		
	300 V to 1100 V			
	10 Hz to 30 kHz	0.013 %		
	30 kHz to 200 kHz	0.021 %		
	1.0 kV to 30 kV			
	50/60 Hz	0.42 %		

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	Location Code
AC CURRENT	*50 Hz to 60 Hz, 1 kHz* 20 μA to 200 μA	0.016 %		P
	5 kHz 20 μA to 200 μA	0.060 %		
	50 Hz to 1 kHz, 200 μA to 200 mA	0.016%		
	5 kHz 200 μA to 200 mA	0.060%		
	50 Hz to 1 kHz 200 mA to 2A	0.030%		
	50 Hz to 60 Hz, 2 A to 100 A	0.030 %		
	50Hz to 60 Hz 10 A to 100 A 100 A to 2500 A	0.08 % + 0.023 A 0.26 % + 0.60 A	For the calibration of clamp-on ammeters	
AC POWER	*50 Hz to 60 Hz, 400 Hz, 5 kHz* 50 mW to 4 kW 4 kW to 10 kW	0.052 % 0.20 %	At unity power factor. Measurements can be made at power factors of 0.9, 0.5, 0.1 and 0.01 but the quoted uncertainties will be increased.	P
FREQUENCY				P
Specific value	10 MHz	1.0 in 10^{10}		
Other values	0.1 Hz to 1 Hz 1 Hz to 10 Hz 10 Hz to 100 Hz 100 Hz to 10 kHz	5.0 in 10^{4} 5.0 in 10^{5} 5.0 in 10^{6} 5.0 in 10^{7}	Multi-period measurement	
	10 kHz to 100 kHz 100 kHz to 1.0 MHz 1.0 MHz to 10 MHz 10 MHz to 150 MHz 150 MHz to 1 GHz 1 GHz to 20 GHz	1.0 in 10^{6} 1.0 in 10^{7} 1.0 in 10^{8} 1.0 in 10^{9} 1.0 in 10^{9} 3.0 to 10^{10}	Frequency measurement	
PHASE ANGLE	*50 Hz to 10 kHz* 0° to 360°	0.050°		P

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	Location Code
CAPACITANCE				P
Specific values and frequencies	*100 Hz*			
	1 nF	0.012 %		
	10 nF	0.022 %		
	100 nF	0.012 %		
	1 µF	0.012 %		
	1.0 kHz			
	1 pF	0.27 %		
	10 pF	0.045 %		
	100 pF	0.041 %		
	1 nF	0.012 %		
	10 nF	0.012 %		
	100 nF	0.012 %		
	1 µF	0.012 %		
	10 µF	0.016 %		
	100 µF	0.060 %		
	10 kHz			
	1 nF	0.012 %		
	10 nF	0.012 %		
	100 nF	0.012 %		
	1 µF	0.030 %		
	1.0 MHz			
	1 pF	0.24 %		
	10 pF	0.042 %		
	100 pF	0.041 %		
	1 nF	0.048 %		
Other Values and Frequencies	1 nF to 1 µF *100 Hz to 10 kHz*	0.080 %		
INDUCTANCE				P
Specific values and frequencies	*100 Hz*			
	1 mH	0.15 %		
	10 mH	0.15 %		
	100 mH	0.15 %		
	1 H	0.06 %		
	1 kHz			
	1 µH	0.37 %		
	10 µH	0.30 %		
	100 µH	0.030 %		
	1 mH	0.030 %		
	10 mH	0.030 %		
	100 mH	0.030 %		
	1 H	0.030 %		

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	Location Code
INDUCTANCE (cont'd)				P
Specific values and frequencies	*10 kHz*			
	1 μH	0.37 %		
	10 μH	0.30 %		
	100 μH	0.040 %		
	1 mH	0.030 %		
	10 mH	0.040 %		
	100 mH	0.060 %		
	1 H	0.80 %		
	100 Hz to 1 kHz			
	1 H	0.080 %		
	1 kHz to 10 kHz			
	1 H	0.83 %		
Other values, other frequencies				
	1 mH to 100 mH			
	100 Hz to 10 kHz	0.15 %		
ELECTRICAL SIMULATION				
Temperature indicators, calibration by electrical simulation				
Base metal thermocouples	- 270 °C to 0 °C	0.24 °C	excluding cold junction compensation	P
	0 °C to 1370 °C	0.16 °C		
	- 270 °C to 0 °C	0.26 °C	Including cold junction compensation	
	0 °C to 1370 °C	0.20 °C		
Noble metal thermocouples	0 °C to 200 °C	0.51 °C	excluding cold junction compensation	P
	200 °C to 800 °C	0.50 °C		
	800 °C to 1760 °C	1.0 °C		
	0 °C to 200 °C	0.60 °C	Including cold junction compensation	
	200 °C to 800 °C	0.50 °C		
	800 °C to 1760 °C	1.0 °C		
Cold junction compensation	At ambient of 23 °C	0.1 °C		

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	Location Code
RF POWER	*-70 dBm to -36 dBm*		50 ohm systems only	P
	10 MHz to 50 MHz	3.7 %		
	50 MHz to 3 GHz	3.7 %		
	3 GHZ to 6 GHz	3.8 %		
	6 GHZ to 10 GHz	3.8 %		
	10 GHz to 14 GHz	3.9 %		
	14 GHz to 18 GHz	4.2 %		
	-36 dBm to -14 dBm			
	10 MHz to 50 MHz	2.0 %		
	50 MHz to 3 GHz	2.0 %		
	3 GHZ to 6 GHz	2.1 %		
	6 GHZ to 10 GHz	2.2 %		
	10 GHz to 14 GHz	2.4 %		
	14 GHz to 18 GHz	2.8 %		
	-14 dBm to 20 dBm			
	10 MHz to 50 MHz	1.4 %		
	50 MHz to 3 GHz	1.5 %		
	3 GHZ to 6 GHz	1.6 %		
	6 GHZ to 10 GHz	1.8 %		
	10 GHz to 14 GHz	2.0 %		
	14 GHz to 18 GHz	2.5 %		
	50 MHz at 0 dBm	1.0 %		
RF VOLTAGE	200 µV to 10 V		50 ohm systems only	P
	9 kHz to 30 MHz	1.7 %		
	30 MHz to 100 MHz	1.9 %		
	100 MHz to 1 GHz	2.0 %		
	1 GHz to 1.6 GHz	4.1 %		
	1.6 GHz to 2.0 GHz	5.4 %		
AMPLITUDE MODULATION	1 % to 15 %	4.1 %	Applicable for Amplitude Modulation Frequency Modulation Phase Modulation - Carrier frequency range 10 MHz to 1.36 GHz Modulation frequency range 10 Hz to 200 kHz	
	15 % to 30 %	2.3 %		
	30 % to 50 %	2.0 %		
	50 % to 90 %	1.9 %		
FREQUENCY MODULATION	1 kHz to 400 kHz	1.5 %		
PHASE MODULATION	1 radian to 200 radians	1.5 %		

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	Location Code
VOLTAGE REFLECTION COEFFICIENT	100 kHz to 1.3 GHz 0.0 to 0.3 0.3 to 0.6 0.6 to 1.0 >1.3 GHz to 3 GHz 0.0 to 0.3 0.3 to 0.6 0.6 to 1.0 0.045 GHz to 2 GHz 0.0 to 0.3 0.3 to 0.6 0.6 to 1.0 >2 GHz to 18 GHz 0.0 to 0.3 0.3 to 0.6 0.6 to 1.0	 0.011 to 0.012 0.012 to 0.014 0.014 to 0.019 0.011 to 0.015 0.012 to 0.016 0.016 to 0.028 0.011 to 0.012 0.012 to 0.014 0.014 to 0.019 0.011 to 0.016 0.012 to 0.020 0.016 to 0.037	Using HP8753ES Type N connectors only Results and uncertainties may also be quoted in units of Return loss (dB) or VSWR Using HP810C Type N Connectors only Results and uncertainties may also be quoted in units of Return loss (dB) or VSWR	
RF ATTENUATION	100 kHz to 1.3 GHz 0 dB to 30 dB 30 dB to 50 dB 50 dB to 70 dB 70 dB to 80 dB 80 dB to 84 dB >1.3 GHz to 3 GHz 0 dB to 30 dB 30 dB to 50 dB 50 dB to 70 dB 70 dB to 80 dB 80 dB to 84 dB	 0.028 dB to 0.064 dB 0.064 dB to 0.13 dB 0.13 dB to 0.84 dB 0.77 dB to 2.6 dB 2.4 dB to 4.2 dB 0.036 dB to 0.068 dB 0.067 dB to 0.14 dB 0.13 dB to 0.95 dB 0.84 dB to 2.9 dB 2.6 dB to 4.7 dB	Using HP8753ES The uncertainties quoted are for devices fitted with type-N connectors only and which present a near match to the 50 Ω measurement system. Measurement of devices presenting significant mismatch will receive larger uncertainties.	P
RF ATTENUATION	45 MHz to 6 GHz 0 dB to 30 dB 30 dB to 50 dB 50 dB to 70 dB 70 dB to 80 dB 80 dB to 84 dB >6 GHz to 12 GHz 0 dB to 30 dB 30 dB to 50 dB 50 dB to 70 dB 70 dB to 80 dB 80 dB to 84 dB >12 GHz to 18 GHz 0 dB to 30 dB 30 dB to 50 dB 50 dB to 70 dB 70 dB to 80 dB 80 dB to 84 dB	 0.040 dB to 0.069dB 0.069 dB to 0.14 dB 0.12 dB to 0.99 dB 0.64 dB to 3.1 dB 2.0 dB to 4.9 dB 0.043 dB to 0.073 dB 0.072 dB to 0.18 dB 0.15 dB to 1.4 dB 0.99 dB to 4.4 dB 3.1 dB to 6.9 dB 0.056 dB to 0.081 dB 0.081 dB to 0.18 dB 0.18 dB to 1.4 dB 1.4 dB to 4.4 dB 4.4 dB to 6.9 dB	Using HP8510C The uncertainties quoted are for devices fitted with type-N connectors only and which present a near match to the 50 Ω measurement system. Measurement of devices presenting significant mismatch will receive larger uncertainties.	

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	Location Code
DIMENSIONAL			NOTES	
Length	All units of Dimensional measurement in millimetres unless otherwise stated	All Dimensional uncertainties quoted in micrometres unless otherwise stated	1 The uncertainty quoted is for the departure from flatness, straightness, or squareness, ie, the distance separating the two parallel planes which just enclose the surface under consideration.	P
Thread measuring cylinders	As BS 5590:1978			P
	1 to 3 diameter 3 to 5	0.60 0.90		
Plain plug gauges (parallel), cylindrical setting standards and rollers	1 to 3 diameter 3 to 100 100 to 150	0.60 1.0 1.5		P
Length gauges (Flat & Spherical)	25 to 600	1.0 + (5.0 x length in m)		P
Plain ring gauges (parallel)	10 to 25 25 to 50 50 to 100 100 to 150	1.0 1.2 1.7 2.3		P
Angle				P
Squares (see note 1) Blade type	As BS 939:2007 50 to 450	5.0		
Block	As BS 939:2007 50 to 450	5.0		
Angle plates and box angle plates (see note 1)	As BS 5535:1978	Squareness: 4.2 + (1.0 per 100 mm)		P
	50 to 450	Parallelism: 1.0 + (1.0 per 100 mm)		
Form				
Surface plates (see note 1) Granite Cast iron	As BS 817:2008 160 x 100 to 4000 x 6000	1.7 + (0.80 x diagonal in m)		P & S

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	Location Code
DIMENSIONAL (cont'd)				
Measuring machines and instruments				
Micrometer				P
External	As BS 870:2008 0 to 450	Heads: 2.0 between any two points Setting: 1.9 + (7.0 x length in m)		
Internal	As BS 959:2008 0 to 450	Heads: 2.0 between any two points Setting and extension rods: 1.0 + (5.0 x length in m)		
Depth	As BS 6468:2008 0 to 450	Heads: 2.0 between any two points Setting and extension rods: 1.0 + (5.0 x length in m)		
Micrometer heads	As BS 1734:1951 0 to 100	1.2		P
Height setting micrometer	0 to 300	Heads: 2.0 between any two points Stepped column: 2.0 Overall performance: 3.0		P
Riser blocks for above	150 300 600	2.5 3.0 4.0		P
Vernier gauges				
Caliper	As BS 887:2008 0 to 1000	10 + (30 x length in m)		P
Height	As BS 1643:2008 0 to 1000			
Depth	As BS 6365:2008 0 to 600			
Dial gauges and dial test indicators	As BS 907:2008 and BS 2795:1981 0 to 50	1.0		P
Comparators (external)	As BS 1054:1975 250 to 10,000 magnification	1.0 % of range Minimum 0.20		P
Feeler gauges	As BS 957:2008	3.0		P
Steel rules	BS 4372:1968 0 to 1000	10.0 + (15 x length in m)		

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	Location Code
TORQUE Torque Wrenches Torque Drivers	0.15 N m to 1000 N m To BS EN ISO 6789:2003	1.6 % of reading	The uncertainty quoted is for both the application of the calibration torque and the characteristics of the device being calibrated. Calibration results may also be given in units of lbf in and lbf ft.	P
END				