



財團法人全國認證基金會
Taiwan Accreditation Foundation

Certificate of Accreditation

(Certificate No: L3431-251229)

This is to certify that

Alltestek Co., LTD
Calibration Laboratory

No.145, Sec.1, Sanmin Rd., Zhongli Dist., Taoyuan City, Taiwan

is accredited in respect of laboratory

Accreditation Criteria : ISO/IEC 17025: 2017; CNS 17025: 2018

Accreditation Number : 3431

Originally Accredited : December 01, 2017

Effective Period : December 01, 2023 to November 30, 2026

Accredited Scope : Calibration Field, see described in the Appendix



Scan to verify

Yi-Ling Chen

Yi-Ling Chen
President, Taiwan Accreditation Foundation
December 29, 2025

Accreditation Number : 3431

Laboratory Head : LIAO, Chun-Pin

Electricity

calibration items	working standard brand /model	calibration method document name /no.	measurand level or range				measurement conditions /independent variable explanation	smallest uncertainty	
			minimum value	units	maximum value	units		value	units
KF1001 DC Voltage Source DC Voltage Meter	Agilent/3458A FLUKE/5720A	In-house method: DC Voltage Calibration Procedure (Report No.: ECL-SCP-01)	100	mV	100	mV	DC Voltage Source	17	$\mu\text{V/V}$
			1	V	1	V	DC Voltage Source	10	$\mu\text{V/V}$
			10	V	10	V	DC Voltage Source	10	$\mu\text{V/V}$
			100	V	100	V	DC Voltage Source	12	$\mu\text{V/V}$
			1000	V	1000	V	DC Voltage Source	14	$\mu\text{V/V}$
			100	mV	100	mV	DC Voltage Meter	16	$\mu\text{V/V}$
			1	V	1	V	DC Voltage Meter	7	$\mu\text{V/V}$
			10	V	10	V	DC Voltage Meter	5	$\mu\text{V/V}$
			100	V	100	V	DC Voltage Meter	7	$\mu\text{V/V}$
			1000	V	1000	V	DC Voltage Meter	10	$\mu\text{V/V}$
Approval Signatory: LIANG, Sung-Chun									
KF1002 DC Current Source DC Current Meter	Agilent/3458A FLUKE/5720A	In-house method: DC Current Calibration Procedure (Report No.: ECL-SCP-02)	100	μA	100	μA	DC Current Source	48	$\mu\text{A/A}$
			1	mA	1	mA	DC Current Source	45	$\mu\text{A/A}$
			10	mA	10	mA	DC Current Source	45	$\mu\text{A/A}$
			100	mA	100	mA	DC Current Source	60	$\mu\text{A/A}$
			1	A	1	A	DC Current Source	0.15	mA/A
			100	μA	100	μA	DC Current Meter	0.12	mA/A
			1	mA	1	mA	DC Current Meter	55	$\mu\text{A/A}$
			10	mA	10	mA	DC Current Meter	52	$\mu\text{A/A}$
			100	mA	100	mA	DC Current Meter	65	$\mu\text{A/A}$
			1	A	1	A	DC Current Meter	0.11	mA/A
Approval Signatory: LIANG, Sung-Chun									



calibration items	working standard brand /model	calibration method document name /no.	measurand level or range				measurement conditions /independent variable explanation	smallest uncertainty	
			minimum value	units	maximum value	units		value	units
KF1011 AC Voltage Source AC Voltage Meter	Agilent/3458A FLUKE/5720A	In-house method: AC Voltage Calibration Procedure (Report No.: ECL-SCP-03)	100	mV	100	mV	AC Voltage Source @ freq.: 60 Hz	0.18	mV/V
			1	V	1	V	AC Voltage Source @ freq.: 60 Hz	0.17	mV/V
			10	V	10	V	AC Voltage Source @ freq.: 60 Hz	0.17	mV/V
			100	V	100	V	AC Voltage Source @ freq.: 60 Hz	0.29	mV/V
			100	mV	100	mV	AC Voltage Source @ freq.: 1 kHz	0.23	mV/V
			1	V	1	V	AC Voltage Source @ freq.: 1 kHz	0.23	mV/V
			10	V	10	V	AC Voltage Source @ freq.: 1 kHz	0.23	mV/V
			100	V	100	V	AC Voltage Source @ freq.: 1 kHz	0.29	mV/V
			100	mV	100	mV	AC Voltage Meter @ freq.: 60 Hz	0.18	mV/V
			1	V	1	V	AC Voltage Meter @ freq.: 60 Hz	67	μV/V
			10	V	10	V	AC Voltage Meter @ freq.: 60 Hz	64	μV/V
			100	V	100	V	AC Voltage Meter @ freq.: 60 Hz	84	μV/V
			100	mV	100	mV	AC Voltage Meter @ freq.: 1 kHz	0.18	mV/V
			1	V	1	V	AC Voltage Meter @ freq.: 1 kHz	68	μV/V
			10	V	10	V	AC Voltage Meter @ freq.: 1 kHz	64	μV/V
100	V	100	V	AC Voltage Meter @ freq.: 1 kHz	84	μV/V			
Approval Signatory: LIANG, Sung-Chun									
KF1012 AC Current Source AC Current Meter	Agilent/3458A FLUKE/5720A	In-house method: AC Current Calibration Procedure (Report No.: ECL-SCP-05)	100	μA	100	μA	AC Current Source @ freq.: 60 Hz	1.8	mA/A
			1	mA	1	mA	AC Current Source @ freq.: 60 Hz	0.96	mA/A
			10	mA	10	mA	AC Current Source @ freq.: 60 Hz	0.94	mA/A
			100	mA	100	mA	AC Current Source @ freq.: 60 Hz	0.94	mA/A
			1	A	1	A	AC Current Source @ freq.: 60 Hz	1.2	mA/A
			100	μA	100	μA	AC Current Source @ freq.: 1 kHz	1.1	mA/A
			1	mA	1	mA	AC Current Source @ freq.: 1 kHz	0.60	mA/A
			10	mA	10	mA	AC Current Source @ freq.: 1 kHz	0.60	mA/A
			100	mA	100	mA	AC Current Source @ freq.: 1 kHz	0.60	mA/A
			1	A	1	A	AC Current Source @ freq.: 1 kHz	1.4	mA/A
			100	μA	100	μA	AC Current Meter @ freq.: 60 Hz	1.4	mA/A
			1	mA	1	mA	AC Current Meter @ freq.: 60 Hz	0.25	mA/A
			10	mA	10	mA	AC Current Meter @ freq.: 60 Hz	0.20	mA/A



calibration items	working standard brand /model	calibration method document name /no.	measurand level or range				measurement conditions /independent variable explanation	smallest uncertainty	
			minimum value	units	maximum value	units		value	units
KF1012 AC Current Source AC Current Meter	Agilent/3458A FLUKE/5720A	In-house method: AC Current Calibration Procedure (Report No.: ECL-SCP-05)	100	mA	100	mA	AC Current Meter @ freq.: 60 Hz	0.19	mA/A
			1	A	1	A	AC Current Meter @ freq.: 60 Hz	0.35	mA/A
			100	μ A	100	μ A	AC Current Meter @ freq.: 1 kHz	0.26	mA/A
			1	mA	1	mA	AC Current Meter @ freq.: 1 kHz	0.20	mA/A
			10	mA	10	mA	AC Current Meter @ freq.: 1 kHz	0.20	mA/A
			100	mA	100	mA	AC Current Meter @ freq.: 1 kHz	0.19	mA/A
Approval Signatory: LIANG, Sung-Chun									
KF3001 DC Resistance Source DC Resistance Meter	Agilent/3458A FLUKE/5720A	In-house method: DC Resistance Calibration Procedure (Report No.: ECL-SCP-04)	1	Ω	1	Ω	DC Resistance Source	67	$\mu\Omega/\Omega$
			10	Ω	10	Ω	DC Resistance Source	29	$\mu\Omega/\Omega$
			100	Ω	100	Ω	DC Resistance Source	26	$\mu\Omega/\Omega$
			1	k Ω	1	k Ω	DC Resistance Source	17	$\mu\Omega/\Omega$
			10	k Ω	10	k Ω	DC Resistance Source	17	$\mu\Omega/\Omega$
			100	k Ω	100	k Ω	DC Resistance Source	17	$\mu\Omega/\Omega$
			1	M Ω	1	M Ω	DC Resistance Source	32	$\mu\Omega/\Omega$
			10	M Ω	10	M Ω	DC Resistance Source	84	$\mu\Omega/\Omega$
			1	Ω	1	Ω	DC Resistance Meter	0.12	m Ω/Ω
			10	Ω	10	Ω	DC Resistance Meter	27	$\mu\Omega/\Omega$
			100	Ω	100	Ω	DC Resistance Meter	12	$\mu\Omega/\Omega$
			1	k Ω	1	k Ω	DC Resistance Meter	10	$\mu\Omega/\Omega$
			10	k Ω	10	k Ω	DC Resistance Meter	10	$\mu\Omega/\Omega$
			100	k Ω	100	k Ω	DC Resistance Meter	13	$\mu\Omega/\Omega$
			1	M Ω	1	M Ω	DC Resistance Meter	31	$\mu\Omega/\Omega$
			10	M Ω	10	M Ω	DC Resistance Meter	53	$\mu\Omega/\Omega$
Approval Signatory: LIANG, Sung-Chun									



calibration items	working standard brand /model	calibration method document name /no.	measurand level or range				measurement conditions /independent variable explanation	smallest uncertainty	
			minimum value	units	maximum value	units		value	units
KF4001 Oscilloscope (Sampling Oscilloscope) Tektronix 8000 Series and 80E00 Modules /CSA8000 /TDS8000_B /TDS8200 /DSA8200 /DSA8300 /80E04 /80E08_B /80E10	Signal Generator Keysight/N5172B Multimeter Keithley/2000 LCR Meter Keysight/U1733C Arbitrary Function Generator Tektronix /AFG3252 Microwave Broadband 50 Ω Load (Terminator) Keysight /85052D-902C Microwave Broadband 50 Ω Air Line Keysight /85053B-60005 Sampling Oscilloscope (Time Domain Reflectometer) Tektronix /CSA8000 Sampling Module Tektronix/80E04	In-house method: Digital Sampling Oscilloscope Calibration Procedure (Report No.: DSO-SCP-01)	1000	ps	1000	ps	Time Period Readout (Short-Term Optimized Mode) (Frequency 1 GHz/Horizontal position 19 ns)	0.25	ps
			1000	ps	1000	ps	Time Period Readout (Short-Term Optimized Mode) (Frequency 1 GHz/Horizontal position 100 ns)	0.25	ps
			1000	ps	1000	ps	Time Period Readout (Short-Term Optimized Mode) (Frequency 1 GHz/Horizontal position 1 us)	0.25	ps
			1000	ps	1000	ps	Time Period Readout (Internal 10 MHz Reference Mode) (Frequency 1 GHz/Horizontal position 19 ns)	0.25	ps
			1000	ps	1000	ps	Time Period Readout (Internal 10 MHz Reference Mode) (Frequency 1 GHz/Horizontal position 100 ns)	0.25	ps
			1000	ps	1000	ps	Time Period Readout (Internal 10 MHz Reference Mode) (Frequency 1 GHz/Horizontal position 1 us)	0.25	ps
			0	ps	<1.4	ps	External Trigger Jitter Readout (Short-Term Optimized Mode) (Frequency 2.5 GHz/Horizontal Position 19 ns)	0.12	ps
			1.4	ps	<2.2	ps	External Trigger Jitter Readout (Short-Term Optimized Mode) (Frequency 2.5 GHz/Horizontal Position 100 ns)	0.12	ps
			2.2	ps	≤11.2	ps	External Trigger Jitter Readout (Short-Term Optimized Mode) (Frequency 2.5 GHz/Horizontal Position 1 us)	0.12	ps
			0	ps	2.5	ps	External Trigger Jitter Readout (Internal 10 MHz Reference Mode) (Frequency 2.5 GHz/Horizontal Position 19 ns)	0.12	ps



calibration items	working standard brand /model	calibration method document name /no.	measurand level or range				measurement conditions /independent variable explanation	smallest uncertainty	
			minimum value	units	maximum value	units		value	units
KF4001 Oscilloscope (Sampling Oscilloscope) Tektronix 8000 Series and 80E00 Modules /CSA8000 /TDS8000_B /TDS8200 /DSA8200 /DSA8300 /80E04 /80E08_B /80E10	Signal Generator Keysight/N5172B Multimeter Keithley/2000 LCR Meter Keysight/U1733C Arbitrary Function Generator Tektronix /AFG3252 Microwave Broadband 50 Ω Load (Terminator) Keysight /85052D-902C Microwave Broadband 50 Ω Air Line Keysight /85053B-60005 Sampling Oscilloscope (Time Domain Reflectometer) Tektronix /CSA8000 Sampling Module Tektronix/80E04	In-house method: Digital Sampling Oscilloscope Calibration Procedure (Report No.: DSO-SCP-01)	0	ps	2.5	ps	External Trigger Jitter Readout (Internal 10 MHz Reference Mode) (Frequency 2.5 GHz/Horizontal Position 100 ns)	0.12	ps
			0	ps	2.5	ps	External Trigger Jitter Readout (Internal 10 MHz Reference Mode) (Frequency 2.5 GHz/Horizontal Position 1 us)	0.12	ps
			0	ps	1.5	ps	External Pre-scaled Trigger Jitter Readout (Short-Term Optimized Mode) (Frequency 2.5 GHz/Horizontal Position 19 ns)	0.12	ps
			0	ps	2.5	ps	External Pre-scaled Trigger Jitter Readout (Internal 10 MHz Reference Mode) (Frequency 2.5 GHz/Horizontal Position 19 ns)	0.12	ps
			1000	mV	1000	mV	DC Calibration Output/Front Out	0.16	mV
			0	mV	0	mV	DC Calibration Output/Front Out	0.13	mV
			-1000	mV	-1000	mV	DC Calibration Output/Front Out	0.16	mV
			0	mV	0	mV	Base Level Readout	0.18	mV
			50.0	Ω	50.0	Ω	Input Impedance Readout	0.16	Ω
			-1550	mV	-1550	mV	DC Voltage Measurement	7.6	mV



calibration items	working standard brand /model	calibration method document name /no.	measurand level or range				measurement conditions /independent variable explanation	smallest uncertainty	
			minimum value	units	maximum value	units		value	units
KF4001 Oscilloscope (Sampling Oscilloscope) Tektronix 8000 Series and 80E00 Modules /CSA8000 /TDS8000_B /TDS8200 /DSA8200 /DSA8300 /80E04 /80E08_B /80E10	Signal Generator Keysight/N5172B Digital Sampling Multimeter Keithley/2000 Calibration Procedure (Report No.: DSO-SCP-01)	In-house method: Digital Sampling Oscilloscope Calibration Procedure (Report No.: DSO-SCP-01)	-1350	mV	-1350	mV	DC Voltage Measurement	7.4	mV
			-1100	mV	-1100	mV	DC Voltage Measurement	7.3	mV
			-850	mV	-850	mV	DC Voltage Measurement	7.1	mV
			-650	mV	-650	mV	DC Voltage Measurement	7.0	mV
			-450	mV	-450	mV	DC Voltage Measurement	7.0	mV
			-250	mV	-250	mV	DC Voltage Measurement	6.9	mV
			0	mV	0	mV	DC Voltage Measurement	6.9	mV
			250	mV	250	mV	DC Voltage Measurement	6.9	mV
			450	mV	450	mV	DC Voltage Measurement	7.0	mV
			650	mV	650	mV	DC Voltage Measurement	7.0	mV
			850	mV	850	mV	DC Voltage Measurement	7.1	mV
			1100	mV	1100	mV	DC Voltage Measurement	7.3	mV
			1350	mV	1350	mV	DC Voltage Measurement	7.4	mV
			1550	mV	1550	mV	DC Voltage Measurement	7.6	mV
			-450	mV	-450	mV	DC Voltage Measurement/-450mV	7.0	mV
			-350	mV	-350	mV	DC Voltage Measurement/-350 mV	7.0	mV
			-250	mV	-250	mV	DC Voltage Measurement/-250 mV	6.9	mV
			-150	mV	-150	mV	DC Voltage Measurement/-150 mV	6.9	mV
			-50	mV	-50	mV	DC Voltage Measurement/-50 mV	6.9	mV
			50	mV	50	mV	DC Voltage Measurement/50 mV	6.9	mV
			150	mV	150	mV	DC Voltage Measurement/150 mV	6.9	mV
			250	mV	250	mV	DC Voltage Measurement/250 mV	6.9	mV
			350	mV	350	mV	DC Voltage Measurement/350 mV	7.0	mV
450	mV	450	mV	DC Voltage Measurement/450 mV	7.0	mV			
0.0	mV	0	mV	Random Noise	0.35	mV			
25	ps	35	ps	Reflected Rise Time (Positive Polarity)	1.7	ps			
25	ps	35	ps	Reflected Rise Time (Negative Polarity)	1.7	ps			



calibration items	working standard brand /model	calibration method document name /no.	measurand level or range				measurement conditions /independent variable explanation	smallest uncertainty	
			minimum value	units	maximum value	units		value	units
KF4001 Oscilloscope (Sampling Oscilloscope) Tektronix 8000 Series and 80E00 Modules /CSA8000 /TDS8000_B /TDS8200 /DSA8200 /DSA8300 /80E04 /80E08_B /80E10	Signal Generator Keysight/N5172B Digital Sampling Multimeter Keithley/2000 LCR Meter Keysight/U1733C Arbitrary Function Generator Tektronix /AFG3252 Microwave Broadband 50 Ω Load (Terminator) Keysight /85052D-902C Microwave Broadband 50 Ω Air Line Keysight /85053B-60005 Sampling Oscilloscope (Time Domain Reflectometer) Tektronix /CSA8000 Sampling Module Tektronix/80E04	In-house method: Digital Sampling Oscilloscope Calibration Procedure (Report No.: DSO-SCP-01)	-3.0	%	3.0	%	Step Response Aberration (Positive Polarity -10 ns~200 ps)	0.068	%
			-3.0	%	3.0	%	Step Response Aberration (Positive Polarity -250 ps~20 ps)	0.068	%
			-3.0	%	3.0	%	Step Response Aberration (Positive Polarity 400 ps~5 ns)	0.068	%
			-1.0	%	1.0	%	Step Response Aberration (Positive Polarity 5 ns~90 ns)	0.023	%
			-3.0	%	3.0	%	Step Response Aberration (Negative Polarity -10ns~200 ps)	0.068	%
			-3.0	%	3.0	%	Step Response Aberration (Negative Polarity -250ps~20 ps)	0.068	%
			-3.0	%	3.0	%	Step Response Aberration (Negative Polarity 400ps~5 ns)	0.068	%
			-1.0	%	1.0	%	Step Response Aberration (Negative Polarity 5ns~90 ns)	0.023	%
Approval Signatory: HSU, Ming-Lu									



calibration items	working standard	calibration method	measurand level or range				measurement conditions /independent variable	smallest uncertainty	
	brand /model	document name /no.	minimum value	units	maximum value	units	explanation	value	units
KF4008 Spectrum Analyzer (On-site calibration included)	rubidium Freq standard /Fluke/910R Counter /Agilent/53132A signal Generator /Keysight/E8247C power meter/sensor /Agilent/E4418B /Keysight/N8487A /E9304A/H18 spectrum analyzer /Agilent E4446A	In-house method: spectrum analyzer calibration procedure (Document No.: SPA-SCP-01)	10	MHz	10	MHz	spectrum base freq. accuracy	1.2×10 ⁻⁸	
			250	kHz	500	kHz	central freq. reading value (bandwidth 1 MHz)	9.4×10 ⁻⁹	
			500	kHz	1	MHz	central freq. reading value (bandwidth 1 MHz)	7.9×10 ⁻⁹	
			1	MHz	10	MHz	central freq. reading value (bandwidth 1 MHz)	6.1×10 ⁻⁹	
			10	MHz	40	GHz	central freq. reading value (bandwidth 1 MHz)	5.3×10 ⁻⁹	
			-30	dBm	10	dBm	voltage level (freq. response @ 0.25~500 MHz)	0.15	dB
			-30	dBm	10	dBm	voltage level (freq. response @ 0.5~40 GHz)	0.20	dB
Approval Signatory: HSU, Ming-Lu									
KF4012 Arbitrary function generator (on-site calibration included)	Digital multimeter /HP/Agilent 3458A Counter /HP/Agilent 53132A Power meter/sensor /Agilent E4418B /E9304A Digital oscilloscope /Tektronix DPO7254C Spectrum analyzer /Agilent E4446A	In-house method: arbitrary function generator calibration procedure (document no.: AFG-SCP-01)	0.02	V	0.2	V	Voltage (amplitude) /1 kHz	0.09	%
			0.2	V	2.5	V	Voltage (amplitude) /1 kHz	0.07	%
			2.5	V	10	V	Voltage (amplitude) /1 kHz	0.08	%
			1	mV	100	mV	Voltage (DC Bias)	0.12	%
			0.1	V	1	V	Voltage (DC Bias)	0.08	%
			1	V	10	V	Voltage (DC Bias)	0.08	%
			1	kHz	240	MHz	Frequency	2.5×10 ⁻⁸	
			-20	dBm	10	dBm	Sine wave flatness/ (0.1~240) MHz, Reference 100 kHz	0.19	dB



calibration items	working standard	calibration method	measurand level or range				measurement conditions /independent variable	smallest uncertainty	
	brand /model	document name /no.	minimum value	units	maximum value	units	explanation	value	units
KF4012 Arbitrary function generator (on-site calibration included)	Digital multimeter /HP/Agilent 3458A Counter /HP/Agilent 53132A Power meter/sensor /Agilent E4418B /E9304A Digital oscilloscope /Tektronix DPO7254C Spectrum analyzer /Agilent E4446A	In-house method: arbitrary function generator calibration procedure (document no.: AFG-SCP-01)	10	dBm	18	dBm	Sine wave flatness/ (0.1~240) MHz, Reference 100 kHz	0.19	dB
			10	dBm	18	dBm	Sine wave flatness/ (100~240) MHz, Reference 100 kHz	0.38	dB
			1	MHz	240	MHz	Spurious signal level	0.90	dB
			1	kHz	20	kHz	Total Harmonic Distortion	0.07	%
			2.5	ns	2.5	ns	Rise Time (SQ10 MHz)	0.11	ns
			5	ns	5	ns	Rise Time (SQ10 MHz)	0.28	ns
			13	ns	13	ns	Rise Time (SQ10 MHz)	0.53	ns
Approval Signatory: HSU, Ming-Lu									

Electromagnetics

calibration items	working standard	calibration method	measurand level or range				measurement conditions /independent variable	smallest uncertainty	
	brand /model	document name /no.	minimum value	units	maximum value	units	explanation	value	units
KG1001 Microwave power meter	HP 8478B Keysight 11683	In-house method: PMC-SAP-01	1	mW	1	mW	Power Reference: Frequency 50 MHz	1.2	%
			-25 (3.16)	dBm (μ W)	20 (100)	dBm (mW)	Power Range	0.32	%
Approval Signatory: LIANG, Sung-Chun; HSU, Ming-Lu									



calibration items	working standard	calibration method	measurand level or range				measurement conditions /independent variable	smallest uncertainty	
	brand /model	document name /no.	minimum value	units	maximum value	units	explanation	value	units
KG1001 Microwave power sensor	HP 8478B Keysight N432A Agilent 11667A	In-house method: PSC-SCP-01	0.8		1		Power 1 mW Frequency 10 MHz to 50 MHz	3.4	%
			0.8		1		Power 1 mW Frequency 50 MHz to 2 GHz	3.4	%
			0.8		1		Power 1 mW Frequency >2 GHz to 12 GHz	3.6	%
			0.8		1		Power 1 mW Frequency >12 GHz to 13 GHz	3.8	%
			0.8		1		Power 1 mW Frequency >13 GHz to 14 GHz	4.0	%
			0.8		1		Power 1 mW Frequency >14 GHz to 16 GHz	3.8	%
			0.8		1		Power 1 mW Frequency >16 GHz to 17 GHz	3.6	%
			0.8		1		Power 1 mW Frequency >17 GHz to 18 GHz	4.6	%
Approval Signatory: LIANG, Sung-Chun; HSU, Ming-Lu									
KG1002 Short circuit, Opener, Terminator, Mismatch, Attenuator, microwave components	Keysight /85055-60003 Keysight /85055-60004	In-house method: SPC-SCP-01	0.00		<0.10		Reflection coefficient Type N @ 10 MHz to 500 MHz	0.0064	
			0.10		<0.20		Reflection coefficient Type N @ 10 MHz to 500 MHz	0.0074	
			0.20		<0.30		Reflection coefficient Type N @ 10 MHz to 500 MHz	0.0083	
			0.30		<0.40		Reflection coefficient Type N @ 10 MHz to 500 MHz	0.0093	
			0.40		<0.50		Reflection coefficient Type N @ 10 MHz to 500 MHz	0.011	
			0.50		<0.60		Reflection coefficient Type N @ 10 MHz to 500 MHz	0.012	
			0.60		<0.70		Reflection coefficient Type N @ 10 MHz to 500 MHz	0.014	



calibration items	working standard	calibration method	measurand level or range				measurement conditions /independent variable	smallest uncertainty	
	brand /model	document name /no.	minimum value	units	maximum value	units	explanation	value	units
KG1002 Short circuit, Opener, Terminator, Mismatch, Attenuator, microwave components	Keysight /85055-60003 Keysight /85055-60004	In-house method: SPC-SCP-01	0.70		<0.80		Reflection coefficient Type N @ 10 MHz to 500 MHz	0.015	
			0.80		<0.90		Reflection coefficient Type N @ 10 MHz to 500 MHz	0.017	
			0.90		<1.00		Reflection coefficient Type N @ 10 MHz to 500 MHz	0.019	
			1.00		1.00		Reflection coefficient Type N @ 10 MHz to 500 MHz	0.020	
			0.00		<0.10		Reflection coefficient Type N @ >500 M Hz to 2 GHz	0.0064	
			0.10		<0.20		Reflection coefficient Type N @ >500 M Hz to 2 GHz	0.0074	
			0.20		<0.30		Reflection coefficient Type N @ >500 M Hz to 2 GHz	0.0083	
			0.30		<0.40		Reflection coefficient Type N @ 500 M Hz to 2 GHz	0.0093	
			0.40		<0.50		Reflection coefficient Type N @ >500 M Hz to 2 GHz	0.011	
			0.50		<0.60		Reflection coefficient Type N @ >500 M Hz to 2 GHz	0.012	
			0.60		<0.70		Reflection coefficient Type N @ >500 M Hz to 2 GHz	0.014	
			0.70		<0.80		Reflection coefficient Type N @ >500 M Hz to 2 GHz	0.015	
			0.80		<0.90		Reflection coefficient Type N @ >500 M Hz to 2 GHz	0.017	
			0.90		<1.00		Reflection coefficient Type N @ >500 M Hz to 2 GHz	0.019	
			1.00		1.00		Reflection coefficient Type N @ >500 M Hz to 2 GHz	0.020	
0.00		<0.10		Reflection coefficient Type N @ >2 GHz to 8 GHz	0.013				



calibration items	working standard	calibration method	measurand level or range				measurement conditions /independent variable	smallest uncertainty	
	brand /model	document name /no.	minimum value	units	maximum value	units	explanation	value	units
KG1002 Short circuit, Opener, Terminator, Mismatch, Attenuator, microwave components	Keysight /85055-60003 Keysight /85055-60004	In-house method: SPC-SCP-01	0.10		<0.20		Reflection coefficient Type N @ >2 GHz to 8 GHz	0.014	
			0.20		<0.30		Reflection coefficient Type N @ >2 GHz to 8 GHz	0.015	
			0.30		<0.40		Reflection coefficient Type N @ >2 GHz to 8 GHz	0.017	
			0.40		<0.50		Reflection coefficient Type N @ >2 GHz to 8 GHz	0.019	
			0.50		<0.60		Reflection coefficient Type N @ >2 GHz to 8 GHz	0.021	
			0.60		<0.70		Reflection coefficient Type N @ >2 GHz to 8 GHz	0.024	
			0.70		<0.80		Reflection coefficient Type N @ >2 GHz to 8 GHz	0.028	
			0.80		<0.90		Reflection coefficient Type N @ >2 GHz to 8 GHz	0.032	
			0.90		<1.00		Reflection coefficient Type N @ >2 GHz to 8 GHz	0.036	
			1.00		1.00		Reflection coefficient Type N @ >2 GHz to 8 GHz	0.037	
			0.00		<0.10		Reflection coefficient Type N @ >8 GHz to 18 GHz	0.013	
			0.10		<0.20		Reflection coefficient Type N @ >8 GHz to 18 GHz	0.015	
			0.20		<0.30		Reflection coefficient Type N @ >8 GHz to 18 GHz	0.017	
			0.30		<0.40		Reflection coefficient Type N @ >8 GHz to 18 GHz	0.019	
			0.40		<0.50		Reflection coefficient Type N @ >8 GHz to 18 GHz	0.023	
			0.50		<0.60		Reflection coefficient Type N @ >8 GHz to 18 GHz	0.027	



calibration items	working standard brand /model	calibration method document name /no.	measurand level or range				measurement conditions /independent variable explanation	smallest uncertainty	
			minimum value	units	maximum value	units		value	units
KG1002 Short circuit, Opener, Terminator, Mismatcher, Attenuator, microwave components	Keysight /85055-60003 Keysight /85055-60004	In-house method: SPC-SCP-01	0.60		<0.70		Reflection coefficient Type N @ >8 GHz to 18 GHz	0.031	
			0.70		<0.80		Reflection coefficient Type N @ >8 GHz to 18 GHz	0.037	
			0.80		<0.90		Reflection coefficient Type N @ >8 GHz to 18 GHz	0.043	
			0.90		<1.00		Reflection coefficient Type N @ >8 GHz to 18 GHz	0.050	
			1.00		1.00		Reflection coefficient Type N @ >8 GHz to 18 GHz	0.052	
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KG1002 Short circuit, Opener, Terminator, Mismatcher, Attenuator, microwave components	Keysight /85055-60003 Keysight /85055-60004	In-house method: SPC-SCP-01	>-10	dB	0	dB	Transmission coefficient Type N @ 10 MHz to 500 MHz	0.063	dB
			>-20	dB	-10	dB	Transmission coefficient Type N @ 10 MHz to 500 MHz	0.071	dB
			>-30	dB	-20	dB	Transmission coefficient Type N @ 10 MHz to 500 MHz	0.086	dB
			>-40	dB	-30	dB	Transmission coefficient Type N @ 10 MHz to 500 MHz	0.10	dB
			>-50	dB	-40	dB	Transmission coefficient Type N @ 10 MHz to 500 MHz	0.12	dB
			>-60	dB	-50	dB	Transmission coefficient Type N @ 10 MHz to 500 MHz	0.14	dB
			-60	dB	-60	dB	Transmission coefficient Type N @ 10 MHz to 500 MHz	0.19	dB
			>-10	dB	0	dB	Transmission coefficient Type N @ >500 MHz to 2 GHz	0.062	dB
			>-20	dB	-10	dB	Transmission coefficient Type N @ >500 MHz to 2 GHz	0.070	dB
			>-30	dB	-20	dB	Transmission coefficient Type N @ >500 MHz to 2 GHz	0.086	dB



calibration items	working standard brand /model	calibration method document name /no.	measurand level or range				measurement conditions /independent variable explanation	smallest uncertainty	
			minimum value	units	maximum value	units		value	units
KG1002 Short circuit, Opener, Terminator, Mismatch, Attenuator, microwave components	Keysight /85055-60003 Keysight /85055-60004	In-house method: SPC-SCP-01	>-40	dB	-30	dB	Transmission coefficient Type N @ >500 M Hz to 2 GHz	0.10	dB
			>-50	dB	-40	dB	Transmission coefficient Type N @ >500 M Hz to 2 GHz	0.11	dB
			>-60	dB	-50	dB	Transmission coefficient Type N @ >500 M Hz to 2 GHz	0.14	dB
			-60	dB	-60	dB	Transmission coefficient Type N @ >500 M Hz to 2 GHz	0.19	dB
			>-10	dB	0	dB	Transmission coefficient Type N @ >2 GHz to 8 GHz	0.13	dB
			>-20	dB	-10	dB	Transmission coefficient Type N @ >2 GHz to 8 GHz	0.13	dB
			>-30	dB	-20	dB	Transmission coefficient Type N @ >2 GHz to 8 GHz	0.14	dB
			>-40	dB	-30	dB	Transmission coefficient Type N @ >2 GHz to 8 GHz	0.15	dB
			>-50	dB	-40	dB	Transmission coefficient Type N @ >2 GHz to 8 GHz	0.16	dB
			>-60	dB	-50	dB	Transmission coefficient Type N @ >2 GHz to 8 GHz	0.19	dB
			-60	dB	-60	dB	Transmission coefficient Type N @ >2 GHz to 8 GHz	0.25	dB
			>-10	dB	0	dB	Transmission coefficient Type N @ >8 GHz to 18 GHz	0.23	dB
			>-20	dB	-10	dB	Transmission coefficient Type N @ >8 GHz to 18 GHz	0.23	dB
			>-30	dB	-20	dB	Transmission coefficient Type N @ >8 GHz to 18 GHz	0.24	dB
			>-40	dB	-30	dB	Transmission coefficient Type N @ >8 GHz to 18 GHz	0.26	dB
			>-50	dB	-40	dB	Transmission coefficient Type N @ >8 GHz to 18 GHz	0.27	dB



calibration items	working standard	calibration method	measurand level or range				measurement conditions /independent variable	smallest uncertainty	
	brand /model	document name /no.	minimum value	units	maximum value	units	explanation	value	units
KG1002 Short circuit, Opener, Terminator, Mismatch, Attenuator, microwave components	Keysight /85055-60003 Keysight /85055-60004	In-house method: SPC-SCP-01	>-60	dB	-50	dB	Transmission coefficient Type N @ >8 GHz to 18 GHz	0.29	dB
			-60	dB	-60	dB	Transmission coefficient Type N @ >8 GHz to 18 GHz	0.36	dB
Approval Signatory: LIANG, Sung-Chun; HSU, Ming-Lu									

Time And Frequency

calibration items	working standard	calibration method	measurand level or range				measurement conditions /independent variable	smallest uncertainty	
	brand /model	document name /no.	minimum value	units	maximum value	units	explanation	value	units
KJ0200 1. Various types of signal generator 2. Various frequency counters	1. Controlled Frequency Standards /FLUKE 910R 2. Universal Counter /Agilent 53132A	In-house method: Time and frequency calibration procedures (Document No.: TFC-SCP-01)	10	MHz	10	MHz		1.5×10 ⁻⁸	
Approval Signatory: LIANG, Sung-Chun									

Note: Smallest uncertainty represents an expanded uncertainty using a coverage factor approximately 95 % level of confidence.
(Null Below)

