

ACAL-0924-137D

SCOPE OF ACCREDITATION

ANALYTICAL TESTING AND CALIBRATION (ATC) LABORATORY INTEGRATED MICRO-ELECTRONICS INC. (IMI) #103 Trade Avenue corner Technology Avenue Laguna, Technopark Special Export Processing Zone, Biñan, Laguna

Calibration

Calibration				
Classification of Scopes	Measured quantities/ instrument	Range to be calibrated	Calibration and Measurement Capability (CMC)*	Standard Method/ Reference Standard
Engineering Metrology Equipment				
Internal/External Micrometer	Analog & Digital Micrometer	0 to 300 mm	0.0060 mm	JIS B 7502:2016 WI CCL 00 010
Electronic indicators, dial gauges & test indicators	Dial test indicators	0 to 1 mm	1.8 um	JIS B 7533:2015 WI CCL 07 007
	Dial gauges	0 to 10 mm	2.0 um	JIS B 7503:2017 WI CCL 99 007
Electronic & Vernier calipers	Vernier and Digital caliper	0 to 200 mm	10 um	JIS B 7507:2016 WI CCL 99 011
Electronic & Vernier height & Depth gauges	Height gauges	0 to 300 mm	6.0 um	JIS B 7517:2018 WI CCL 05 002
Feeler Gauge	Feeler Gauges	Up to 3 mm	0.001 mm	JIS B 7524:2008 WI CCL 04 003
Steel rules & measuring tapes	Steel rules	0 to 150 mm	0.009 mm	WI CCL 05 005 JIS B 7516:2005
Dimensional Precision Instruments				
Precision projection apparatus	Profile projector			On-site Calibration WI CCL 05 004
	X-axis	0 to 150 mm	0.0010 mm	
	Y-axis	0 to 150 mm	0.0010 mm	
Weighing Devices				
Precision Laboratory Balances	Precision and Analytical Balance	Up to 1000 g	0.00010 g	Euramet cg-18 ver. 4.0 (In-house developed method) WI CCL 17 008 (on-site/in-house calibration)
Industrial Balances	Analog and Digital Weighing Scales	Up to 160 kg	0.010 g	
Pressure and vacuum measuring devices and pressure gauge tester				
Pressure gauges	Pressure gauges	Up to 100 psi	1.0 psi	WI CCL 16 002 (on-site calibration)
		>100 psi to 200 psi	1.2 psi	

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		>200 psi to 10000 psi	4.0 psi	
Vacuum gauges	Vacuum gauges	0 inHg to -25 inHg 0 mmHg to -690 mmHg	0.086 inHg 1.2 mmHg	WI-CCL-19-001 (on-site calibration) In-house developed method
Pressure Transducers/ Transmitters	Pressure Transducers/ Transmitters	Up to 100 psi >100 psi to 200 psi >200 psi to 10000 psi	1.0 psi 1.2 psi 4.0 psi	WI CCL 16 002 (on-site calibration) In-house developed method
Pressure recorder	Pressure recorder	Up to 100 psi >100 psi to 200 psi >200 psi to 10000 psi	1.0 psi 1.2 psi 4.0 psi	WI CCL 16 002 (on-site calibration) In-house developed method
Pressure calibrators	Analog test gauges	Up to 100 psi >100 psi to 200 psi >200 psi to 10000 psi	1.0 psi 1.2 psi 4.0 psi	WI CCL 16 002 (on-site calibration) In-house developed method
Force measuring devices				
Force gauges	Force gauge	Up to 160 kgf	0.10% of load	WI CCL 17 001
Other devices	Push pull gauge	Up to 160 kgf	0.10% of load	In-house developed method
	Gram Gauge	Up to 250g	0.20 g	WI CCL 99 005 (on-site/in-house calibration) In-house developed method
Indicating and Recording Instruments				
D.C. voltmeters	DC Voltmeter (Up to 6.5 digits)	0 to 100 mV 0 to 1 V 0 to 10 V 0 to 100 V 0 to 1000 V	0.0030 mV 0.000010 V 0.00010 V 0.0020 V 0.020 V	EURAMET cg-15 v3.0 WI CCL 05 008 In-house developed method
A.C. Voltmeters	A.C. Voltmeters (from 50 Hz to 20kHz)	1 mV to 45 mV 50 mV to 450 mV 300 mV to 4.5 V 5 V to 45 V	0.0030 mV 0.013 mV 0.00014 V 0.002 V	EURAMET cg-15 v3.0 WI CCL 05 008 In-house developed method

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D.C. Ammeters	D.C. Ammeters	50 V to 1000 V	0.002 V	EURAMET cg-15 v3.0 WI CCL 05 008 In-house developed method
		0 to 330 μ A	0.070 μ A	
		0 to 3.3 mA	0.38 μ A	
		0 to 33 mA	2.3 mA	
		0 to 330 mA	3.5 mA	
		0 to 1.1 A	0.00024 A	
		0 to 3 A	0.00080 A	
A.C. Ammeters	A.C. Ammeters (from 50 Hz to 1kHz)	0 to 20 A	0.0055 A	EURAMET cg-15 v3.0 WI CCL 05 008 In-house developed method
		0 to 500 μ A	0.38 μ A	
		0 to 5000 μ A	2.3 μ A	
		0 to 50 mA	0.035 mA	
		0 to 400 mA	0.24 mA	
Wattmeter	DC Wattmeter	0 to 10 A	0.0055 A	WI CCL 17 007 In-house developed method
		up to 330 W	0.05 % of reading	
		up to 3 kW	0.08 % of reading	
	AC Wattmeter, 60 Hz, pf = 1	up to 20.9 kW	0.07 % of reading	
		up to 9 W	0.09 % of reading	
		up to 33 W	0.06 % of reading	
		up to 90 W	0.09 % of reading	
		up to 330 W	0.06 % of reading	
		up to 900 W	0.08 % of reading	
		up to 2.2 kW	0.07 % of reading	
		up to 4.6 kW	0.09 % of reading	
		up to 20.9 kW	0.08 % of reading	
Ohmmeters	Ohmmeters	0 to 500 Ω	0.032 Ω	EURAMET cg-15 v3.0 In-house developed method WI CCL 05 008
		0 to 5 k Ω	0.0003 k Ω	
		0 to 50 k Ω	0.003 k Ω	
		0 to 500 k Ω	0.21 k Ω	
		0 to 180 M Ω	0.0012 M Ω	
LCR Meters	LCR Meters - Resistance	0 to 200 Ω	0.0057 Ω	In-house developed method WI CCL 05 009
		0 to 500 k Ω	0.00057 k Ω	
		0 to 200 M Ω	0.00057 M Ω	
	LCR Meters - Capacitance	0 to 500 pF	0.77 pF	
		0 to 500 nF	0.0019 nF	
		0 to 2000 μ F	0.00086 μ F	



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Other instruments Digital Multimeter up to 6 ½ digits Analog Multimeter	LCR Meters - Inductance	0 to 500 mH	0.003 mH	
		0 to 20 H	0.003 H	
	@ DC voltage	up to 200 mV	7.5 ppm of reading	WI CCL 05 008 (in-house/on-site calibration) In-house developed method
		up to 2.2 V	5 ppm of reading	
		up to 22 V	3.5 ppm of reading	
		up to 220 V	5 ppm of reading	
		up to 1100 V	6.5 ppm of reading	
	@ AC voltage	up to 22 mV, 40 to 20 kHz	100 ppm of reading	WI CCL 05 008 In-house developed method
		up to 200 mV, 40 to 20 kHz	70 ppm of reading	
		up to 22 V, 40 to 20 kHz	48 ppm of reading	
		up to 220 V, 40 to 20 kHz	65 ppm of reading	
		up to 1100 V, 50 to 1 kHz	80 ppm of reading	
	@ DC Current	up to 220 µA	40 ppm of reading	WI CCL 05 008 In-house developed method
		up to 22 mA	35 ppm of reading	
		up to 220 mA	45 ppm of reading	
		up to 2.2 A	80 ppm of reading	
		up to 3 A	294 ppm of reading	
		up to 11A	388 ppm of reading	
		up to 20.5 A	775 ppm of reading	
	@ AC Current	up to 220 mA 40 to 1 kHz	120 ppm of reading	WI CCL 05 008 In-house developed method
		up to 2.2 A 20 to 1 kHz	300 ppm of reading	
		up to 3 A 45 to 1 kHz	0.050 % of reading	



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		up to 11A 45 to 100 kHz	0.050 % of reading	
		up to 20.5 A 45 to 100 kHz	0.050 % of reading	
	@ Resistance	0 to 500 Ω	0.032 Ω	WI CCL 05 008 In-house developed method
		0 to 5 kΩ	0.00030 kΩ	
		0 to 50 kΩ	0.003 kΩ	
		0 to 500 kΩ	0.21 kΩ	
		0 to 100 MΩ	0.0012 MΩ	
		0 Ω	40 μΩ	
		up to 1.9 Ω	95 ppm of reading	
		up to 19 Ω	23 ppm of reading	
		up to 190 Ω	10 ppm of reading	
		up to 19 kΩ	6.5 ppm of reading	
		up to 190 kΩ	8.5 ppm of reading	
		up to 1 MΩ	13 ppm of reading	
		up to 1.9 MΩ	18 ppm of reading	
		up to 10 MΩ	40 ppm of reading	
		up to 19 MΩ	47 ppm of reading	
		up to 100 MΩ	100 ppm of reading	
		up to 110 MΩ	387 ppm of reading	
		up to 330 MΩ	0.23 % of reading	
up to 1100 MΩ	15 % of reading			
Clamp meter	Clamp meter	up to 1000 A, AC/DC	0.5% of reading	WI CCL 17 003 (in-house/on-site calibration)
		DC, up to 1000A	0.28% of reading	
		AC, up to 1000A 45~65 Hz		
		AC, up to 1000A 65~440 Hz	0.79% of reading	
Frequency and time measuring instruments and standards				
Frequency meter	Frequency meter	Up to 1.19 MHz	0.0025% of reading	In-house developed method (WI CCL 05 008)
		Up to 15 MHz	50 ppm of reading	



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Time interval meter	Timer/Stopwatch	Up to 550 minutes	0.0064 s	In-house developed method (WI CCL 17 004) onsite calibration
Frequency standard	Frequency standard/source	10 Hz to 1 MHz	10 ppm of reading	In-house developed method (WI CCL 17 002)
Waveform Measuring Instruments				
Other Characteristics	Oscilloscope			
	Vertical Deflection	0 to 200 mV	0.045 mV	WI CCL 05 011 (in-house/on-site calibration)
		0 to 20 V	0.0020 V	
		0 to 40 V	0.0040 V	
	Horizontal Deflection	0 to 500 ns	2.3 ns	WI CCL 05 011 (in-house/on-site calibration)
		0 to 50 μs	0.022 μs	
		0 to 500 μs	0.022 μs	
		0 to 800 μs	0.046 μs	
		0 to 20 ms	0.002 ms	
		0 to 50 ms	0.022 ms	
0 to 400 ms		0.022 ms		
Power Supplies				
DC Power Supplies	DC Power Supplies	up to 200 mV	5.5 ppm of reading	WI CCL 07 005 (in-house/on-site calibration) In-house developed method
		up to 20 V	3.7 ppm of reading	
		up to 200 V	5.7 ppm of reading	
		up to 1000 V	6.0 ppm of reading	
		up to 2 mA	14 ppm of reading	
		up to 20 mA	16 ppm of reading	
		up to 200 mA	52 ppm of reading	
		up to 2 A	193 ppm of reading	
		up to 20 A	420 ppm of reading	
High voltage equipment				
Direct voltage tests	DC high voltage tester	Up to 20 KV	2.0 % of reading	WI CCL 14 002 (on-site calibration)
		Up to 35 KV	1.0 % of reading	
		Up to 40 KV	2.0 % of reading	

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Alternating voltage tests	AC high voltage tester	Up to 28 KV	5.0 % of reading	In-house developed method
Calibration of Ancillary Temperature Measuring Instruments				
Digital thermometer	Digital thermometer - Thermocouple type	-200 °C to 1767 °C	0.60 °C	WI-CCL-17-006 (on-site calibration) In-house developed method
Resistance bridge	Digital thermometer RTD Type	-200 °C to 800 °C	0.10 °C	
Indicators, recorders and controllers	Indicators, recorders and controllers Thermocouple Input Type	-200 °C to 1767 °C	0.60 °C	
	RTD Input type	-200 °C to 800 °C	0.10 °C	
Testing of temperature-controlled enclosures				
Ovens, furnaces and baths	Ovens, furnaces and baths	20 °C to 300 °C	0.7 °C	WI CCL 99 006 (on-site calibration) In-house developed method
Incubators	Incubators	20 °C to 50 °C	0.7 °C	WI CCL 99 006 (on-site calibration) In-house developed method
Autoclaves and sterilizing ovens	Autoclaves and sterilizing ovens	20 °C to 300 °C	0.7 °C	WI CCL 23 001 (on-site calibration) In-house developed method
Industrial Freezers	Industrial Freezers and Refrigerators	-80 °C to 20 °C	0.7 °C	WI CCL 99 006 (on-site calibration) In-house developed method
Hygrometer				
Calibration of Humidity Measuring Devices	Thermohygrometer/ Thermohygrograph	20 °C to 40 °C 33% RH to 96%RH	0.21 °C 1.0 % RH	WI CCL 00 001 (in-house calibration) In-house developed method
Humidity Chamber	Environmental Chamber (Chamber's Humidity Sensor)	10%RH to 95%RH	1.0 % RH	WI CCL 13 003 (on-site calibration) In-house developed method



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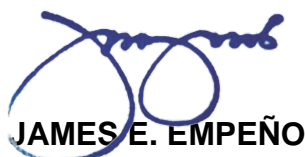
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Torque Measuring Device				
Torque wrenches/ Drivers	Torque wrenches/ Drivers	0 to 10 Nm	0.0058 Nm	WI CCL 23 002 (on-site) In-house developed method
		up to 20 Nm	0.0058 Nm	
		up to 100 Nm	0.26 Nm	
Torque Analyzer/ meter	Torque Analyzer/ meter	0 to 10 Nm	0.0011 Nm	
		>10 Nm and including 20 Nm	0.013 Nm	
		>20 Nm and including 30 Nm	0.016 Nm	

* CMC expressed as an expanded uncertainty having a specific coverage probability of approximately 95%.



JAMES E. EMPEÑO

Director IV
Philippine Accreditation Bureau



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