


Laboratory Accreditation Programmes

Schedule to
CERTIFICATE OF ACCREDITATION

Laboratory	EMC Technologies (NZ) Ltd	
Address	47 Mackelvie Street, Grey Lynn, Auckland, 1021	
Telephone	09 360-0862	
URL	www.emctech.com.au	
Authorised Representative	Mr Andrew Cutler General Manager	
Client No.	2218	
Programme	Electrical Testing Laboratory	
Accreditation Number	424	
Initial Accreditation Date	24 June 1991	
Conformance Standard	ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories	
Testing Services Summary	3.41	Radiocommunications Equipment
	3.42	Electromagnetic Compatibility Testing
Signatories	Mr Andrew Cutler	3.41, 3.42

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3.41 Radiocommunications Equipment

- (a) Receiving equipment
- (b) Transmitting equipment

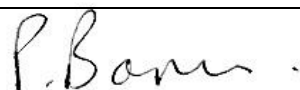
The following tests on analogue AM and FM, VHF and UHF transmitters and receivers in accordance with In-house methods and the methods specified below. Measurements are made over the ranges given.

- i) Transmitter power
- ii) Frequency stability
- iii) Case radiation
- iv) Spurious emissions
- v) Effective radiated power
- vi) Frequency deviation
- vii) Adjacent channel power
- viii) Intermodulation attenuation
- ix) Co-channel rejection
- x) Adjacent channel selectivity
- xi) Intermodulation response
- xii) Blocking
- xiii) Modulation distortion
- xiv) Transmitter transient performance
- xv) Emission masks

Methods

ANSI C63.10-2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
ANSI C63.26-2016	Standard for Compliance Testing of Transmitters Used in Licensed Radio Services
ANSI/TIA-603-D	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
AS/NZS 4268	Radio equipment and systems – Short range devices – Limits and methods of measurement
AS/NZS 4295	VHF/UHF Analogue Speech Equipment
AS/NZS 4415	VHF Maritime Mobile Equipment
AS/NZS 4365	UHF Citizen Band radio and Personal Radio Service
AS/NZS 4768.1	Digital radio equipment operating in land mobile and fixed services bands in the frequency range 29.7 MHz to 1 GHz - Radiofrequency requirements
AS/NZS 4769.1	Radiocommunications equipment used in the paging service - Angle modulated equipment
ETSI EN	Electromagnetic compatibility and Radio spectrum Matters (ERM)

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- ETSI EN 300 086-1 Land Mobile Service; Radio equipment with an internal or external RF connector intended primarily for analogue speech; Part 1: Technical characteristics and methods of measurement
- ETSI EN 300 113-1 Land mobile service; Radio equipment intended for the transmission of data (and/or speech) using constant or non-constant envelope modulation and having an antenna connector; Part 1: Technical characteristics and methods of measurement
- ETSI EN 300 220-1 Short Range Devices (SRD); Radio equipment to be used in the 25 MHz to 1 000 MHz frequency range with power levels ranging up to 500 mW; Part 1: Technical characteristics and test methods
- ETSI EN 300 330 Short Range Devices (SRD); Technical characteristics and test methods for radio equipment in the frequency range 9 kHz to 25 MHz and inductive loop systems in the frequency range 9 kHz to 30 MHz
- ETSI EN 300 440-1 Short Range Devices (SRD); Radio equipment to be used in the 1 GHz to 40 GHz frequency range; Part 1: Technical characteristics and test methods
- FCC 47 CFR Parts; 22, 87, 90, 95, 97 & 101
- FCC MP-5 FCC Methods of Measurement of Radio Noise Emissions from Industrial, Scientific and Medical Equipment
- RSS-GEN General Requirements for Compliance of Radio Apparatus
- RSS 102 Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)
- RSS 119 Land Mobile and Fixed Ratio Transmitters and Receivers - 27.41 to 960 MHz
- RSS 210 Licence-Exempt Radio Apparatus: Category I Equipment
- RSS 247 Digital Transmission Systems (DTSS), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices

Measurement Capabilities

Power (conducted and radiated)
 1 nW to 1000 watts below 1 GHz
 1 nW to 30 watts 1 GHz to 26 GHz

Frequency reference 1 part in 10⁹

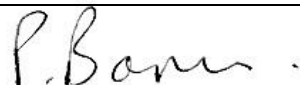
Frequency modulation deviation
 10 Hz in 10 kHz
 Temperature – 30 °C to + 60 °C

3.42 Electromagnetic Compatibility Testing

Determination of radio interference and immunity characteristics of industrial, scientific and medical radio frequency equipment, sound and television receivers, household appliances and similar apparatus, fluorescent lamps and luminaires and information technology equipment.

(a) Radiated emissions

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Radiated Electric Field Emissions (incl. Low power tx & case radiation)

25 MHz to 40 GHz	ANSI C63.4-2014
EUT test volume limit 50 cm ³	
3 m and 10 m measurement distances	IEC, AS/NZS CISPR 11
AC mains single and 3 phase supply up to 16 amps	IEC, AS/NZS CISPR 12
	IEC, AS/NZS CISPR 13
	IEC, AS/NZS CISPR 14
	IEC, AS/NZS CISPR 16-1
	IEC, AS/NZS CISPR 16-2
	IEC, AS/NZS CISPR 32
	AS/NZS 3200.1.2
	AS/NZS 4268
	EN 55011
	EN 55032
	EN 60945, clauses 4.5.1, 9, 10 only
	EN / IEC 60601-1-2
	EN / IEC 61000-6-3
	EN / IEC 61000-6-4
	EN 300 086
	EN 300 220-1
	EN 301 489-1 / EN 301 489-3
	EN 301 489-1 / EN 301 489-4
	EN 301 489-1 / EN 301 489-5
	ICES-001
	ICES-003

Radiated Magnetic Field Emissions (including Van Veen Loop measurements)

9 kHz to 30 MHz	IEC, AS/NZS CISPR 11
	IEC, AS/NZS CISPR 15
	AS/NZS 3200.1.2
	EN 55011
	EN 55015
	EN / IEC 60601-1-2
	EN 60945, clauses 4.5.1, 9, 10 only
	EN 300 330
	ICES-001

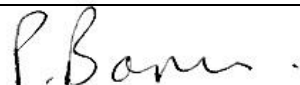
Note: All radiated emission measurements are carried out at the laboratory's open area test site (OATS).

(b) Radiated immunity

Radiated Electromagnetic Immunity Testing

27 MHz to 2800 MHz	IEC, AS/NZS CISPR 14-2
1 V/m, 3 V/m, 10 V/m	IEC, AS/NZS CISPR 24

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Radiated field area 0.5 m x 0.5 m maximum	AS/NZS 3200.1.2 EN 55024 IEC AS/NZS 60335.1 clause 19.11.4.2 EN 60601-1-2/ IEC 60601-1-2 EN 60945, clauses 4.5.1, 9, 10 only IEC / EN 61000-4-3 EN 61547 EN 301 489-1/ EN 301 489-3 EN 301 489-1/ EN 301 489-4 EN 301 489-1/ EN 301 489-5
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Power frequency magnetic immunity	EN/IEC 61000-4-8
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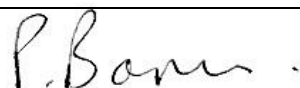
(c) Conducted emissions

AC/DC power port conducted emissions Telecom port conducted emissions

9 kHz to 30 MHz Single phase up to 240 Vac and 32 amps	ANSI C63.4-2014 ISO, AS/NZS CISPR 11 ISO, AS/NZS CISPR 13 ISO, AS/NZS CISPR 14 ISO, AS/NZS CISPR 15 ISO, AS/NZS CISPR 16-1 ISO, AS/NZS CISPR 16-2 ISO, AS/NZS CISPR 32 AS/NZS 3200.1.2 EN 55011 EN 55014 EN 55015 EN 55032 EN / IEC 60601-1-2 EN 60945, clauses 4.5.1, 9, 10 only EN 301 489-1/ EN 301 489-3 EN 301 489-1/ EN 301 489-4 EN 301 489-1/ EN 301 489-5 IEC 61000-6-3 IEC 61000-6-4 ICES-001 ICES-003
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Disturbance Power Measurements 30 MHz to 300 MHz	IEC, AS/NZS CISPR 13 IEC, AS/NZS CISPR 14-1 IEC, AS/NZS CISPR 32 EN 55014-1 EN 55032 ICES-003
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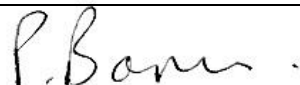
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Local Oscillator Voltage Measurements 30 MHz to 2150 MHz	IEC, AS/NZS CISPR 13 IEC, AS/NZS CISPR 32 EN 55032 ICES-003
Video RF Output Measurements 20 MHz to 2150 MHz	IEC, AS/NZS CISPR 13 IEC, AS/NZS CISPR 32 EN 55032 ICES-003
Discontinuous Noise Measurements 0.15 MHz to 30 MHz	IEC, AS/NZS CISPR 14 EN 55014 IEC 61000-6-3 IEC 61000-6-4
Harmonic current emissions DC to 40 th harmonic 240 Vac, up to 16 A per phase	EN IEC 61000-3-2
Voltage changes, fluctuations and flicker 240 Vac, up to 16 A per phase	EN IEC 61000-3-3
(d) Conducted immunity	
Electrostatic Discharge Up to 15 kV air discharge	IEC, AS/NZS CISPR 14-2 IEC, AS/NZS CISPR 24 AS/NZS 3200.1.2 EN 55014-2 EN 55024 IEC AS/NZS 60335.1 clause 19.11.4.1 EN / IEC 60601-1-2 EN 60945, clauses 4.5.1, 9, 10 only IEC 61000-4-2 EN 301 489-1 / EN 301 489-3 EN 301 489 1 / EN 304 489-4 EN 301 489 1 / EN 304 489-5
Up to 8kV contact discharge	As above plus EN 61547
Electrical Fast Transients AC mains up to 240 V single phase, 16 amps Power port and IO, single and control port available	IEC, AS/NZS CISPR 14-2 IEC, AS/NZS CISPR 24 AS/ NZS 3200.1.2 EN 55014-2 EN 55024

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Voltage 200 V to 4000 V +ve & -ve
 tBURST 0.1 mS to 20 mS
 fBURST (0.1 to 2.5, 5, 100) kHz > 2kV

IEC AS/NZS 60335.1 clause 19.11.4.3
 EN 60601-1-2/ IEC 60601-1-2
 EN 60945, clauses 4.5.1, 9, 10 only
 IEC 61000-4-4
 EN 61547
 EN 301 489-1 / EN 301 489-3
 EN 301 489-1 / EN 301 489-4
 EN 301 489-1 / EN 301 489-5

Surges
 0.5 kV to 2.0 kV (line to line)
 0.5 kV to 4.0 kV (line to ground)

IEC, AS/NZS CISPR 14-2
 IEC, AS/NZS CISPR 24
 AS/NZS 3200.1.2
 EN 55014-2
 EN 55024
 IEC AS/NZS 60335.1 clause 19.11.4.4
 EN / IEC 60601-1-2
 EN 60945, clauses 4.5.1, 9, 10 only
 IEC 61000-4-5
 EN 61547
 EN 301 489-1/ EN 301 489-3
 EN 301 489-1/ EN 301 489-4
 EN 301 489-1/ EN 301 489-5

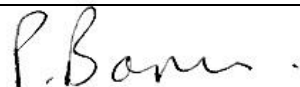
Voltage dips and short interruptions
 DC Current Max 24 A
 AC Voltage Max 280 Vrms

IEC, AS/NZS CISPR 14-2
 IEC, AS/NZS CISPR 24
 EN 55014-2
 EN 55024
 IEC AS/NZS 60335.1 clause 19.11.4.6
 EN 60601-1-2/IEC 60601-1-2
 EN 60945, clauses 4.5.1, 9, 10 only
 IEC 61000-4-11
 EN 61547
 EN 301 489-1/ EN 301 489-3
 EN 301 489-1/ EN 301 489-4
 EN 301 489-1/ EN 301 489-5

Radio frequency injected currents
 1 V, 3 V, 10 V

IEC, AS/NZS CISPR 14-2
 IEC, AS/NZS CISPR 24
 EN 55014-2
 EN 55024
 IEC AS/NZS 60335.1 clause 19.11.4.5
 EN / IEC 60601-1-2
 EN 60945, clauses 4.5.1, 9, 10 only
 IEC 61000-4-6
 EN 301 489-1/ EN 301 489-3
 EN 301 489-1/ EN 301 489-4

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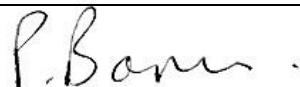
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Harmonics and interharmonics	EN 301 489-1/ EN 301 489-5 IEC AS/NZS 60335.1 clause 19.11.4.7 IEC/EN 61000-4-13
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