

CERTIFICATE OF ACCREDITATION



EMC Technologies (NZ) Ltd		Client Number 2218	
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Telephone 09 360-0862		www.emctech.com.au	
Authorised Representative Mr Andrew Cutler General Manager			
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			
Laboratory Services Summary			
3.41	Radiocommunications Equipment		
3.42	Electromagnetic Compatibility Testing		
Approved 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-E	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

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AS/NZS EN 301 025	VHF radiotelephone equipment for general communications and associated equipment for Class 'D' Digital Selective Calling (DSG) - Excluding Clause 10 Receiver for DSG decoder tests
AS/NZS EN 301 178	Portable Very High Frequency (VHF) radiotelephone equipment for the maritime mobile service operating in the VHF bands (for non-GMDSS applications only); Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU – Excluding Clause 7 Environmental tests
ETSI EN ETSI EN 300 086-1	Electromagnetic compatibility and Radio spectrum Matters (ERM) 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 300 224	Land Mobile Service; Radio equipment for use in a Paging Service operating within the frequency range 25 MHz - 470 MHz; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU
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
ETSI EN 300 698	Radio telephone transmitters and receivers for the maritime mobile service operating in the VHF bands used on inland waterways; Harmonised Standard for access to radio spectrum and for features for emergency services (excluding Clause 7.4 and 7.5 of Environmental tests and Clause B ATIS tests)
ETSI EN 301 025	VHF radiotelephone equipment for general communications and associated equipment for Class 'D' Digital Selective Calling (DSG) – Excluding Clause 7 Environmental tests and Clause 10 Receiver for DSG decoder tests
ETSI EN 301 178	Portable Very High Frequency (VHF) radiotelephone equipment for the maritime mobile service operating in the VHF bands (for non-GMDSS applications only); Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU – Excluding Clause 7 Environmental tests
FCC 47 CFR FCC MP-5	Parts; 22, 80, 87, 90, 95, 97 & 101 FCC Methods of Measurement of Radio Noise Emissions from Industrial, Scientific and Medical Equipment
RSS-GEN	General Requirements for Compliance of Radio Apparatus

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RSS-102 (RF Exp) Radio Frequency (RF) Exposure Compliance of Radiocommunication (≥10 MHz)
 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

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 IEC, AS/NZS CISPR 12
AC mains single and 3 phase supply up to 16 amps	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

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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
 1 V/m, 3 V/m, 10 V/m
 Radiated field area 0.5 m x 0.5 m
 maximum

IEC, AS/NZS CISPR 14-2
 IEC, AS/NZS CISPR 24
 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

Power frequency magnetic immunity

EN/IEC 61000-4-8

(c) Conducted emissions

AC/DC power port conducted emissions Telecom port conducted emissions

9 kHz to 30 MHz

ANSI C63.4-2014

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Single phase up to 240 Vac
 and 32 amps

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

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

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

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	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 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 CISPR 14-2 IEC, AS/NZS CISPR 24 AS/ NZS 3200.1.2 EN 55014-2 EN 55024 IEC AS/NZS 60335.1 clause 19.11.4.3 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

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

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