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TEST REPORT

Cortex M1 Marine VHF Transceiver

tested to the specification

IEC62238 (2003)

Maritime navigation and radiocommunication equipment and systems – VHF radiotelephone equipment incorporating Class "D" Digital Selective Calling (DSC) – Methods of testing and required test results

for

Vesper Marine Ltd

This Test Report is issued with the authority of:

Andrew Cutler – General Manager

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1. STATEMENT OF COMPLIANCE

The **Cortex M1 Marine VHF Transceiver** complies with IEC 62238 (2003) Clause 8.7 – Adjacent Channel Power.

2. RESULTS SUMMARY

The results of testing that was carried out on March 24th, May 8th and May 28th 2020 are summarised below.

| Clause | Result |
|------------------------------------|---|
| Clause 8.7: Adjacent Channel Power | Complies. M1.0000006B (TUV7) : -70.2 dBc M1.00000069 (TUV5) : -70.8 dBc M1.0000006G (RevD) : -70.0 dBc |

3. INTRODUCTION

This report describes the tests and measurements performed for the purpose of determining compliance with the specification.

The test sample was selected by the client.

This report relates only to the sample tested.

**This report supersedes report no 200309.2 that was issued on June 3rd 2020.
Corrections are on page 4, FCC and IC identifiers of the product have been added to this report.**

Measurement uncertainties with statistical confidence intervals of 95% are shown below test results. Both class A and Class B uncertainties have been accounted for, as well as influence uncertainties where appropriate.

All compliance statements have been made with respect of the specification limit with no reference to the measurement uncertainty.

All testing was carried out as per the standard in the worst-case configuration with no deviations being applied.

4. CLIENT INFORMATION

Company Name Vesper

Physical Address 45 Sale St,
Auckland

Country New Zealand

Contact Mr Dave Kearney

5. DESCRIPTION OF TEST SAMPLE

Brand Name Cortex

Model Number M1

Product VHF Marine Transceiver

Manufacturer Vesper

Manufactured in New Zealand

Serial Number 1.0000006B (TUV7), 1.00000069 (TUV5), 1.0000006G
(Production POD)

Transmitter Power 25 Watts (+44.0 dBm)

Highest frequency 162.025 MHz

Channel tested Channel 16 (156.800 MHz)

Test Voltage 16 Vdc

FCC YJD-VESPM1

IC 9118A-M1

Testing was carried out in the Auckland Laboratory for Adjacent Channel Power.

6. TEST RESULTS

Clause 8.7: Adjacent Channel Power

VHF marine transceiver models were tested for Adjacent Channel Power (ACP) on channel 16 as per IEC 62238.

Testing was carried out using a modulation analyser which has an internal 25 kHz ACP filter that is selected using special functions.

A 30 dB power attenuator was attached at the output of the transceiver to protect the test instruments.

A signal generator was used with the modulation analyser to act as a "receiver" for this test to measure the carrier power of the transmitter frequency in dBc.

With the transmitter unmodulated, the tuning of the modulation analyser was adjusted so that a maximum response is obtained.

This is the 0 dB response point.

The tuning of the "receiver" was then adjusted away from the carrier so that the "receiver" -6 dB response nearest to the transmitter carrier frequency is located at a displacement from the nominal carrier frequency of +/-17 kHz for a 25 kHz channel.

The transmitter was then modulated using the default internal modulation by the client.

The modulation analyser then displays the adjacent channel power directly in dBc.

The test was carried out at upper and lower adjacent channel from the frequency under test.

The measurements have been tabulated as under:

Rated power: 25 Watt (+44 dBm)

Frequency: 156.800 MHz

Modulation: Default internal modulation

Product model: M1.0000006B (TUV7)

| Upper Adjacent channel + 25.0 kHz | | Lower Adjacent channel - 25.0 kHz |
|--------------------------------------|-------|--------------------------------------|
| dBc | -70.2 | -70.5 |
| dBm | -26.2 | -26.5 |

Product model: M1.00000069 (TUV5)

| | Upper Adjacent channel + 25.0 kHz | Lower Adjacent channel - 25.0 kHz |
|------------|--|--|
| dBc | -70.8 | -71.4 |
| dBm | -26.8 | -27.4 |

Product model: M1.0000006G (Production POD)

| | Upper Adjacent channel + 25.0 kHz | Lower Adjacent channel - 25.0 kHz |
|------------|--|--|
| dBc | -70.0 | -71.3 |
| dBm | -26.0 | -27.3 |

Limits: The adjacent channel power shall not exceed a value of 70 dB below the carrier power of the transmitter without any need to be below 0,2 μ W for a 25 kHz channel.

Result: Complies

Measurement Uncertainty: ± 2.0 dB

7. TEST EQUIPMENT USED

| Instrument | Manufacturer | Model | Serial No | Asset Ref |
|---------------------|-----------------|----------|-------------|-----------|
| Modulation Analyzer | Hewlett Packard | HP 8901B | 2608A00782 | E1090 |
| Signal Generator | Rohde & Schwarz | SMHU | 838723/028 | E1493 |
| DC Power Supply | Hewlett Packard | HP6032A | 2743A-02859 | E1069 |

All test equipment was within calibration at the time of testing.

8. ACCREDITATIONS

Testing was carried out in accordance with EMC Technologies NZ Ltd designation as a FCC Accredited Laboratory by International Accreditation New Zealand, designation number: NZ0002 under the APEC TEL MRA, which expires on the 02/12/2022.

The lab is accredited to carry out tests to FCC Part 80, In accordance with ANSI C63.26-2015 and ANSI/TIA-603-D-2010

All measurement equipment has been calibrated in accordance with the terms of the EMC Technologies (NZ) Ltd International Accreditation New Zealand (IANZ) Accreditation to NZS/ISO/IEC 17025.

International Accreditation New Zealand has Mutual Recognition Arrangements for testing and calibration with accreditation bodies in a number of economies. This includes NATA (Australia), UKAS (UK), SANAS (South Africa), NVLAP (USA), A2LA (USA), SWEDAC (Sweden). Further details can be supplied on request.

9. PHOTOGRAPHS





Product in test bench

