

# COMPLIANCE TESTING REPORT

## FCC TITLE 47 PART 15

### SUBPARTS A & C

Client: GE Mining Industrea Mining Technology  
Address: 3 Co-Wyn Close, Fountaindale, NSW 2258, Australia  
Report Number: 0322GEI\_PROD0842-2\_FCC15C  
*[This report supersedes report 0216GEI\_CASIVU\_FCC15C]*  
Date of Testing: 14<sup>th</sup> to 21<sup>st</sup> July 2015  
File Number: GEI150515-A

Equipment Name: CAS IVU  
Equipment Model Number: PROD0842-2  
Equipment Serial Number: Not Supplied  
Equipment FCC ID: YIY-PROD08422  
Equipment Description: Collision Avoidance System with 920MHz V2V Radio

Result: **COMPLIES**

Tested by: Richard Turner



Approved by: Colin Gan



Date of Issue: 22 Mar 2016

**AUSTEST (NSW) FCC REGISTRATION NUMBER 90455**

Results appearing herein relate only to the sample(s) tested.

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Report Revision History:

Date	Report Number	Changes
16 Feb 2016	0216GEI_CASIVU_FCC15C	Original report
22 Mar 2016	0322GEI_PROD0842-2_FCC15C	Separation of report to individual FCC IDs & edits to address TCB queries.

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## 1 TEST SUMMARY

Austest makes no claim regarding the consistency of production versions of the EUT.

The results in this report apply only to the tested EUT described in Section 0 of this report.

FCC Section	Test	Result	Notes
FCC Part 15, Subpart C – Intentional Radiators			
15.203	Antenna Requirement	COMPLIES	
15.205	Restricted Bands of Operation	COMPLIES	
15.207	Conducted Limits	NOT APPLICABLE	(iv)
15.209	Radiated Emission Limits, General Requirements	COMPLIES	
15.215	Additional Provisions to the General Radiated Limitations	COMPLIES	
15.247	Operation within the Bands 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz	COMPLIES	

**Notes** (applicable only if referenced in “Notes” column of above summary table):

- (i) EUT complies (the measurement results were below the applicable limits), but some emissions were within the range of measurement uncertainty of the limits.
- (ii) EUT complies (when modified as described in Section 2 of this report).
- (iii) There were deviations from the applied standard as described in Section 6.2 of this report.
- (iv) EUT is designed to be only powered from a vehicle’s battery supply.

## 2 MODIFICATIONS

No modifications were required to achieve compliance.

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### 3 REFERENCES

FCC Title47 Part 15 current as of July 2015
ANSI C63.10: 2009
KDB Publication 558074 D01 DTS Meas Guidance v03r04

### 4 EQUIPMENT UNDER TEST (EUT) DESCRIPTION

EUT Name:	CAS IVU
EUT Description:	Collision avoidance system with 920MHz V2V radio
EUT Model:	PROD0842-2
EUT Serial Number:	Not Supplied
EUT FCC ID:	YIY-PROD08422 <i>[Please refer to page 6 for details of model differences between variants PROD0842-2 and PROD0847-2]</i>
Manufacturer:	GE Mining Industrea Mining Technology
Power Supply & Rating:	9 to 36VDC
Highest Clock/Operating Frequency:	Highest clock, specified by the client: 800MHz V2V radio operating frequency: 920MHz
Lowest Internal Frequency source	32kHz clock
Transmit Frequency Range:	<ul style="list-style-type: none"> <li>V2V radio: 920MHz (single-frequency transmission) only</li> <li>WiFi: Per RS9110-N-11-03 module specifications</li> </ul>
Transmit Power:	<ul style="list-style-type: none"> <li>V2V radio: 20.5dBm</li> <li>WiFi: Per RS9110-N-11-03 module specifications</li> </ul>
Modulation Technique:	<ul style="list-style-type: none"> <li>V2V radio: 4GFSK</li> <li>WiFi: Per RS9110-N-11-03 module specifications</li> </ul>
Number of Channels:	<ul style="list-style-type: none"> <li>V2V radio: 1</li> <li>WiFi: Per RS9110-N-11-03 module specifications</li> </ul>

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Antenna Specifications:	<ul style="list-style-type: none"><li>• V2V radio: Laird Technologies TRAB9023NP antenna (gain 3dBi)</li><li>• WiFi: Syskim OYH02Ø20-NF</li><li>• GPS: Antenex antenna</li></ul>
-------------------------	--

The equipment under test (EUT) was a collision avoidance system for mining vehicles with external display, 920MHz vehicle to vehicle (V2V) radio, WiFi and GPS functions.

The EUT contained the following radios:

- 920MHz single channel transceiver (SiLabs 4463)
- 2.4GHz WiFi transceiver (Redpine Signals RS9110-N-11-03 – **FCCID: XF6-RS9110N1103**)
- GPS receiver (blox NEO-7N-0-002).

Two variants of EUT were submitted for testing:

- PROD0842-2 without 3G/GSM module
- PROD0847-2 with 3G/GSM module.

Other than removal of the 3G/GSM module and antenna there are no other differences between the variants.

Both EUT variants contained a main processor board, internal rechargeable battery, SD card reader for firmware configuration and LAN port. All housed in a painted metal case.

Both variants use the same external display unit (PROD0839), labelled CAS-DISPLAY-7"-Touch.

The following external antennas were supplied with the EUT:

- 920MHz V2V: Laird Technologies TRAB9023NP antenna with 3dBi gain
- 2.4GHz WiFi: Syskim OYH02Ø20-NF 17cm long omni antenna
- GPS: Antenex antenna

The EUT is normally powered by a vehicle's battery supply, either 12VDC or 24VDC. Without an external DC supply the unit operates in a power down mode, running from the internal battery. Under the power down mode, only the 920MHz transmission is maintained.

This test report covers compliance of the 920MHz V2V radio used in the CAS IVU model PROD0842-2.

**Derived Models:**

No other model variants to be included under the same FCC ID: YIY-PROD08422.

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## 5 EUT TEST SETUP & CONFIGURATION

Refer to the photographs in APPENDIX C – EUT TEST SETUP PHOTOGRAPHS for the EUT test setup and physical configuration.

### PROD0842-2

Connection / Port	Connecting Cable	Source / Load
LAN	10m shielded Ethernet cable	Netgear router
Display	Supplied 5m shielded cable, bundled	Supplied display unit
V2V	Supplied 2m shielded 50Ω coax cable	Laird Technologies TRAB9023NP antenna
WLAN	Supplied 2m shielded 50Ω coax cable	Syskim OYH02Ø20-NF antenna
GPS	Supplied 3m shielded 50Ω coax cable, bundled	Antenex antenna
IVU	Supplied 3m shielded multicore cable	Power leads (x2) to DC supply

### PROD0847-2

Connection / Port	Connecting Cable	Source / Load
LAN	10m shielded Ethernet cable	Netgear router
Display	Supplied 5m shielded cable, bundled	Supplied display unit
V2V	Supplied 2m shielded 50Ω coax cable	Laird Technologies TRAB9023NP antenna
WLAN*	Supplied 2m shielded 50Ω coax cable	Syskim OYH02Ø20-NF antenna
WAN*	Supplied 2m shielded 50Ω coax cable	Laird Technologies TRAB86/17103P antenna
GPS	Supplied 3m shielded 50Ω coax cable, bundled	Antenex antenna
IVU	Supplied 3m shielded multicore cable	Power leads (x2) to DC supply

\*The client advised that PROD0847-2 will only use either WLAN (WiFi) or WAN (cellular) connection not both.

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For both models the case of the EUT was connected to the reference ground, as instructed by the client.

An active Ethernet link was established between the EUT and a Netgear router, placed away from the test area. Also connected to the router was a test PC. The EUT radio functions could be controlled from the test PC following instructions supplied by client.

The EUT was powered by a variable DC supply. Measurements were made with the EUT powered from either 13.8VDC or 28VDC.

### 5.1 EUT Operating Modes

Mode No.	Operating Mode Description
1	Constant transmission at 920MHz (duty cycle 100%). Transmit power set to level 20 using supplied test software.

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## 6 TEST SPECIFICATIONS

### 6.1 Accreditations & Listings

Austest Laboratories has been found to be in compliance with the requirements of Section 2.948 of the FCC Rules and Test Site Criteria (ANSI C63.4-2009) by the FCC Laboratory Division for Certification testing under Parts 15 or 18 of the FCC Rules.

Austest Laboratories (NSW)'s Yarramalong test facilities are listed with the FCC under Registration Number 90455.

Austest Laboratories (NSW)'s Yarramalong test facilities are accredited by A2LA. The tests reported herein have been performed in accordance with its terms of accreditation.

### 6.2 Deviations from Standards and/or Accreditations

None.

### 6.3 Test Facility

Testing was performed in New South Wales at Austest Laboratories (NSW)'s Yarramalong test facilities located at 46 Glenola Farm Lane in Yarramalong Valley, New South Wales, Australia.

Radiated emission testing is performed at an Open Area Test Site (OATS), where some ambient signals may exceed the continuous disturbance limit. The possibility of missing an emission during testing is removed by use of pre-scans, performed in a shielded enclosure, prior to the final OATS measurements.

### 6.4 Measurement Uncertainties

The following uncertainties are for a 95% level of confidence, based on a coverage factor,  $k=2$ .

Test	Measurement Uncertainty
Antenna Port Conducted Emissions	$\pm 2.6\text{dB}$
Radiated Emissions	$\pm 4.7\text{dB}$
Frequency	$\pm 5$ part in $10^{10}$

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## 6.5 Test Equipment

Test Equipment	Brand & Model	Serial No./ID	Cal. Due Date
EMI Receiver	HP 8574B	MEQ72	12 Jun 2016
Test Software	HP85969PC	-	Verified
Spectrum Analyser	HP 8593E	MEQ738	05 Aug 2015
Biconical Array Antenna	Emco EM6912	MEQ297	11 Aug 2015
Log-Periodic Array Antenna	Emco EM6950	MEQ298	10 Aug 2015
DRG Horn Antenna (1 – 18GHz)	AH Systems SAS-571	MEQ107	31 May 2016
Loop Antenna	EM-6876	MEQ225	22 Aug 2015
Pre-Amplifier (30MHz-1GHz)	HP 8447E	MEQ100	01 Jun 2016
Pre-Amplifier (1GHz-25GHz)	RE 218A	MEQ651	15 Aug 2015
Pre-Amplifier (4.5GHz–25GHz)	RE 518A	MEQ650	15 Aug 2015
Attenuator	Omni Spectra 10dB	1022627	27 Sep 2016
Coaxial Cables	Suhner	Various	15 Aug 2015
Multimeter	8060T	MEQ164	19 Sep 2015
Variable DC Power Supply	GWInstek GPS-3030D	-	Verified

All test equipment was checked and performance verified prior to testing.

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## **7 FCC Part 15C, Section 15.203 – ANTENNA REQUIREMENT**

The EUT complies with the requirement of this Section since client has stated that it will only be installed by trained professional installers.

## **8 FCC Part 15C, Section 15.205 – RESTRICTED BANDS OF OPERATION**

The EUT complies with the requirements of this Section since it does not operate within the listed Restricted Bands of Operation. Out of band emissions falling within the Restricted Bands of Operation were found to be below limits specified in section 15.209.

## **9 FCC Part 15C, Section 15.207 - CONDUCTED LIMITS NOT APPLICABLE.**

The EUT is designed to be installed in a vehicle and would not be connected to an AC mains supply.

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## 10 FCC Part 15C, Section 15.209 - RADIATED EMISSION LIMITS, GENERAL REQUIREMENTS

Test Date:	14 and 21 Jul 2015	Temperature:	18-22°C
Test Officer:	Richard Turner	Humidity:	54-68%
Test Location:	Austest Laboratories (NSW)		

### 10.1 EUT Operating Mode

- a. DC supply voltage – 12VDC.
- b. Mode 1 – Constant transmission at 920MHz.

### 10.2 Test Method

- a. Measurements are performed in accordance with ANSI C63.10-2009 and KDB 558074 D01 DTS Meas Guidance v03r04.
- b. Set the measuring receiver BW settings to:
  - i. 9kHz (150kHz to 30MHz) EMI Receiver BW.
  - ii. 120kHz (30MHz to 1GHz) EMI Receiver BW.
  - iii. 1MHz (above 1GHz) RBW, 1MHz or more VBW, using a Spectrum Analyser for Peak measurements.
  - iv. 1MHz (above 1GHz) RBW, 10Hz VBW with linear detection, using a Spectrum Analyser for Average measurements.
- c. Set up the EUT on a non-conductive turntable, 0.8m above the OATS conductive ground plane, and at the indicated test distance away from the measuring antenna.
- d. To maximise emissions, rotate the EUT through 360° and adjust the measuring antenna height between 1m to 4m in the following antenna orientations:
  - i. Loop antenna (9kHz to 30MHz) – Coaxial and coplanar orientations.
  - ii. Biconical and Log-Periodic antennas (30MHz to 1GHz) - Both vertical and horizontal polarizations.
  - iii. Horn antenna (above 1GHz) - Both vertical and horizontal polarizations.
- e. Measure the maximised emission and repeat the above for all measurement frequencies.
- f. Average level measurements were not made where the peak level did not exceed the average limit.
- g. Check linearity of the measuring system, reducing gain when required.

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### 10.3 Sample Calculation Example

The final radiated emission levels were obtained from the measurement equipment software which automatically applied all the stored calibration factors. The calibration / correction factors were applied as follows:

$$E = V + AF + L_{cbl} - G_{pre}$$

Where:

- E = Radiated Electric Field Strength in dB $\mu$ V/m at the specified distance.
- V = EMI Receiver measured signal input voltage in dB $\mu$ V.
- AF = Antenna Factor of the measuring antenna in dB/m.
- L<sub>cbl</sub> = Total cable insertion loss in dB.
- G<sub>pre</sub> = Preamplifier gain in dB.

Frequency (MHz)	Receiver Level, V (dB $\mu$ V)	AF (dB/m)	L <sub>cbl</sub> (dB)	G <sub>pre</sub> (dB)	Corrected Level, E (dB $\mu$ V/m)
100.0	40.0	12.0	2.9	22.5	32.4

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## 10.4 Test Results

Preliminary measurements performed on both models indicated no difference in radiated emission levels. In addition no difference in radiated emissions was found when PROD0847-2 was configured for WLAN operation or 3G/GSM cellular operation. Final measurements were performed on model PROD0847-2 configured for 3G/GSM operation.

Emissions were maximised in level with the EUT mounted vertically on an insulating support, this being a typical orientation. The external V2V antenna was positioned vertically and also mounted on an insulating support.

Radiated emission levels were not affected by DC supply voltage. Final measurements were performed with the EUT connected to a 12VDC supply.

### 10.4.1 Radiated Disturbances: 9kHz to 150kHz at 10m distance

#### **Mode 1 operation**

All spurious emissions were greater than 20dB below the limits specified in section 15.209.

### 10.4.2 Radiated Disturbances: 150kHz to 30MHz at 3m distance

#### **Mode 1 operation**

All spurious emissions were greater than 20dB below the limits specified in section 15.209.

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10.4.3 Radiated Disturbances: 30MHz to 1000MHz at 3m distance

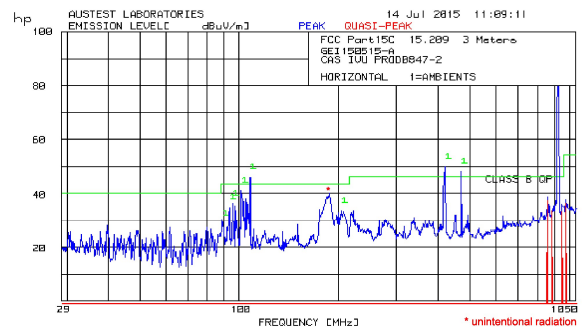
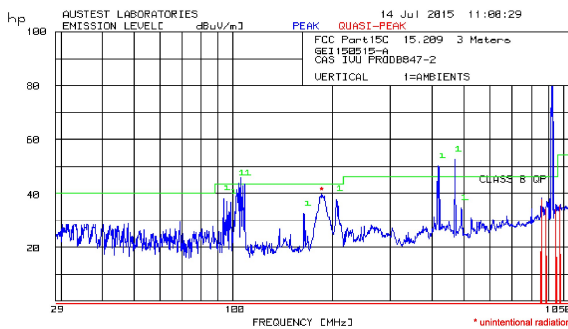
**Mode 1 operation**

The highest measured spurious emissions level was 8.2dB below the 15.209 limit at 860.0MHz.

The highest measured spurious emissions level within a restricted band was 17.5dB below the 15.209 limit at 979.9MHz.

Frequency MHz	Polarisation	Quasi-Peak @ 3m		Limit @ 3m		Below Limit dB
		$\mu\text{V/m}$	$\text{dB}\mu\text{V/m}$	$\mu\text{V/m}$	$\text{dB}\mu\text{V/m}$	
860.0	Vertical	78	37.8	200	46.0	8.2
859.7	Horizontal	74	37.4	200	46.0	8.6
890.0	Vertical	52	34.3	200	46.0	11.7
950.0	Vertical	51	34.1	200	46.0	11.9
889.9	Horizontal	48	33.7	200	46.0	12.3
950.0	Horizontal	47	33.4	200	46.0	12.6
979.9*	Horizontal	67	36.5	500	54.0	17.5
979.9*	Vertical	60	35.6	500	54.0	18.4

\*Emissions within the restricted band 960MHz to 1240MHz.



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10.4.4 Radiated Disturbances: 1000MHz to 6000MHz at 3m distance

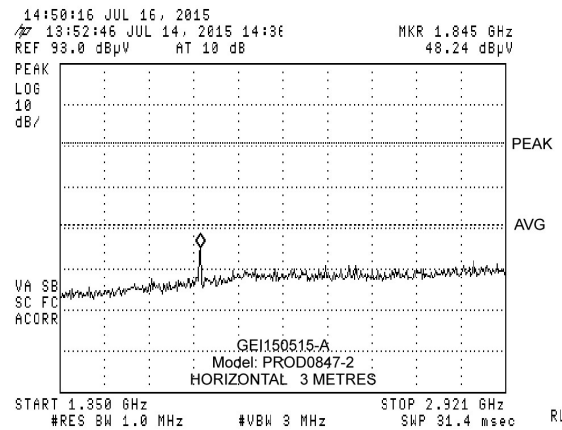
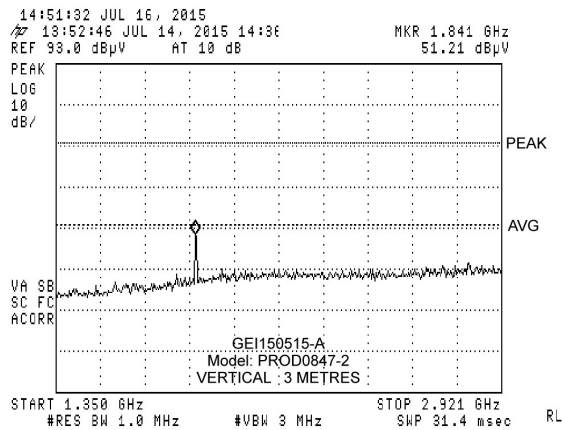
15.209 limit: 500µV/m using average detection. Peak limit set to 20dB above the average limit.

To ensure measurement system linearity, for measurements above 1350MHz a high pass filter (WHKS1350-5SS) was placed at the input to the pre-amplifier. Correction for system loss/gain above 1350MHz reflected the use of this filter.

**Mode 1 operation**

Highest measured spurious emissions as follows:

Frequency MHz	Polarisation	Level dBµV/m		Limit dBµV/m		ΔPk Limit dB	Δ Avg Limit dB
		Peak	Average	Peak	Average		
1839.3	Vertical	51.8	-	74.0	54.0	22.2	-
1840.2	Horizontal	49.6	-	74.0	54.0	24.4	-



**1350MHz to 2900MHz**

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#### 10.4.5 Radiated Disturbances: 60000MHz to 9500MHz at 1m distance

15.209 limit: 500 $\mu$ V/m using average detection at 3 metre distance. Peak limit set to 20dB above the average limit.

Any measured field strength levels performed at a 1 metre distance would be extrapolated to a 3 metre distance using the extrapolation factor of 20dB/decade as specified in section 15.31(f)(1).

#### **Mode 1 operation**

No significant spurious emissions found.

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## **11 FCC Part 15C, Section 15.247 – OPERATION WITHIN THE BANDS 902-928MHz, 2400-2483.5MHz, AND 5725-5850MHz**

### **11.1 6dB Bandwidth - Section 15.247(a)(2)**

Test Date:	20 Jul 2015	Temperature:	21°C
Test Officer:	Richard Turner	Humidity:	68%
Test Location:	Austest Laboratories (NSW)		

#### **11.1.1 EUT Operating Mode**

- a. DC supply voltage – 12VDC.
- b. Mode 1 – Constant transmission at 920MHz.

#### **11.1.2 Test Method**

- a. Measurements are performed in accordance with ANSI C63.10-2009 and KDB 558074 D01 DTS Meas Guidance v03r04 section 8.1.
- b. Connect the EUT antenna port to a spectrum analyser via a low loss RF cable, and attenuator (as necessary).
- c. Set the spectrum analyser RBW to 100kHz RBW, and the VBW to 300kHz.
- d. Mark the peak frequency level and note the -6dB (lower and upper) frequencies.

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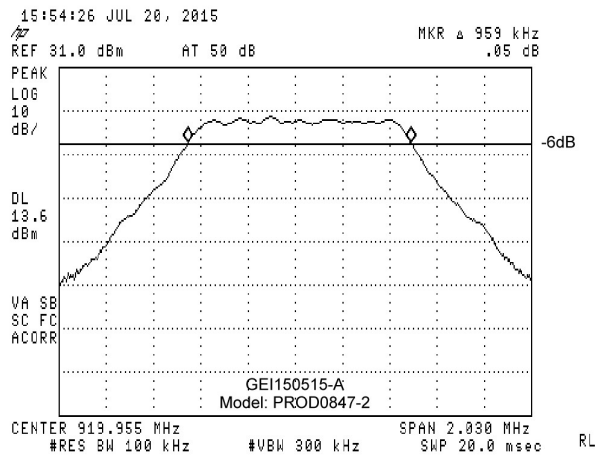
### 11.1.3 Test Results

Measurements were performed on model PROD0847-2.

The same 920MHz V2V radio circuit is installed in model PROD0842-2. It was decided measurement on this model was not necessary.

#### Mode 1 operation

Spectrum analyser RBW: 100kHz  
 Measured 6dB bandwidth: 959kHz  
 Limit: >500kHz  
 EUT COMPLIES



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## 11.2 Peak Conducted Output Power - Section 15.247(b)(3)

Test Date:	20 Jul 2015	Temperature:	21°C
Test Officer:	Richard Turner	Humidity:	68%
Test Location:	Austest Laboratories (NSW)		

### 11.2.1 EUT Operating Mode

- DC supply voltage – 12VDC.
- Mode 1 – Constant transmission at 920MHz

### 11.2.2 Test Method

- Measurements are performed in accordance with ANSI C63.10-2009 and KDB 558074 D01 DTS Meas Guidance v03r04 section 9.1.1.
- Connect the EUT antenna port directly to a spectrum analyser via an attenuator.
- Ensure RBW setting  $\geq$  DTS (6dB) bandwidth.
- Apply amplitude correction to account for cable and attenuator loss.
- Allow the trace to stabilise and position the marker at the peak level (peak search). Record the level and compare to the limit.
- Record the maximum reading.

### 11.2.3 Directional antenna gain

The gain of the supplied TRAB9023NP antenna was specified by the client as 3dBi.

Section 15.247 (b) (4) indicates that the specified limit of 1W for conducted output power is based on the use of an antenna with a directional gain not exceeding 6dBi.

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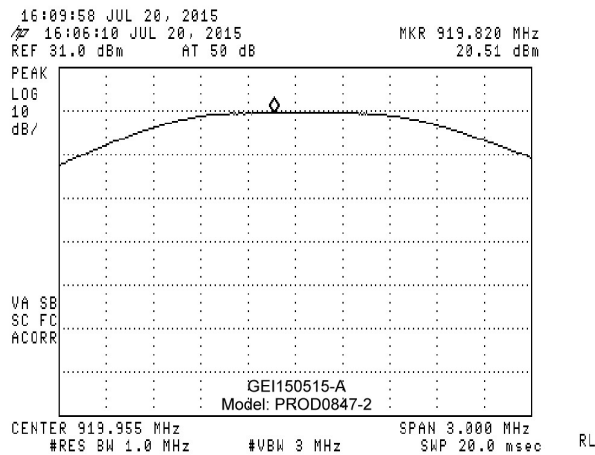


### 11.2.4 Test Results

Measurements were performed on model PROD0847-2.  
 The same 920MHz V2V radio circuit is installed in model PROD0842-2. It was decided measurement on this model was not necessary.

#### Mode 1 operation

Spectrum analyser RBW: 1MHz  
 Measured peak power: 20.5dBm (112mW) at 919.8MHz  
 Limit: 1W  
 $\Delta$  Limit: -9.5dB  
 EUT COMPLIES



### 11.2.5 Transmit Power – Supply Voltage Variation

The EUT is powered from a DC supply provided by a vehicle's battery. The client specified a voltage range 9-36VDC.

Section 15.31 (e) requires transmitted power at the fundamental to be measured with the supply voltage varied between 85% and 115% of the nominal voltage range.

No change in transmit power at the fundamental was observed when the DC supply voltage was varied.

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### 11.3 Out of band emissions – Section 15.247(d)

Test Date:	20 Jul 2015	Temperature:	21°C
Test Officer:	Richard Turner	Humidity:	68%
Test Location:	Austest Laboratories (NSW)		

#### 11.3.1 EUT Operating Mode

- a. DC supply voltage – 12VDC.
- b. Mode 1 – Constant transmission at 920MHz

#### 11.3.2 Test Method

- a. Measurements are performed in accordance with ANSI C63.10-2009 and KDB 558074 D01 DTS Meas Guidance v03r04 section 11.
- b. Connect the EUT antenna port directly to a spectrum analyser via a low loss RF cable, and attenuator (as necessary).
- c. Set the spectrum analyser RBW to 100kHz, and the VBW to 100kHz or more.
- d. Centre the trace on the transmit frequency and record the highest in-band level.
- e. Sweep through the frequency range up to the 10<sup>th</sup> harmonic to locate the highest out of band emissions.
- f. Ensure that any out of band emissions are greater than 20dB below the recorded in band level.
- g. Ensure that any emissions that fall within the restricted bands specified in section 15.205 also meet the radiated emission limits specified in section 15.209.

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### 11.3.3 Test Results

#### Mode 1 operation

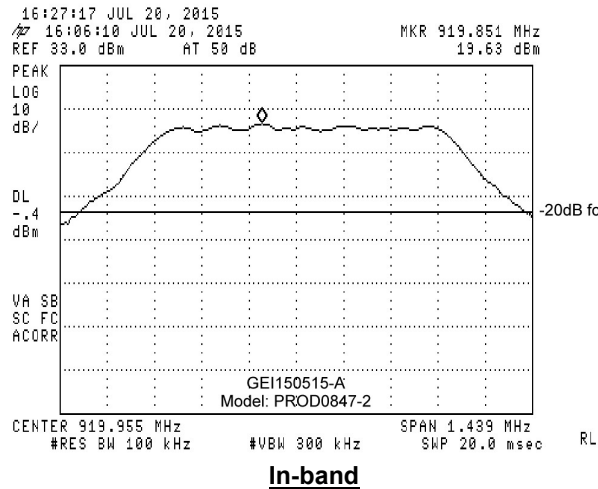
Measurements were performed on model PROD0847-2. The same 920MHz V2V radio circuit is installed in model PROD0842-2. It was decided measurement on this model was not necessary.

Frequency range: 9kHz to 9500MHz  
 Highest in-band level at 919.85MHz, 19.6dBm  
 Spectrum analyser RBW: 100kHz

Measurement of peak conducted output power was used to determine compliance with section 15.247 (b) (3). Therefore the out of band emission limit is 20dB below the in-band level, -0.4dBm.

Highest measured out of band emission level was at 1839.7MHz which was 58.7dB below the highest in band level.

Frequency (MHz)	Peak Level (dBm)	Out of Band Limit (dBm)	Below Limit (dB)
1839.7	-39.1	-0.4	38.7
2759.5	-42.5	-0.4	42.1

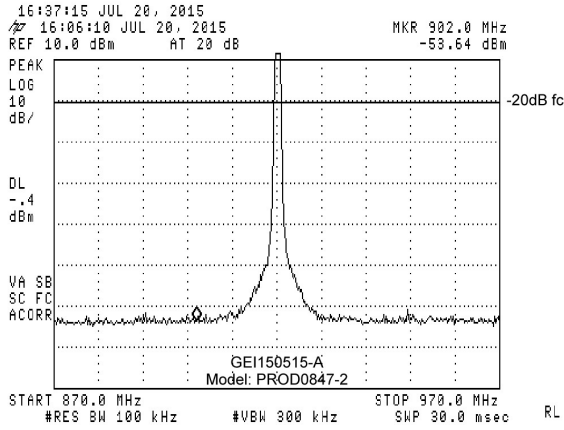


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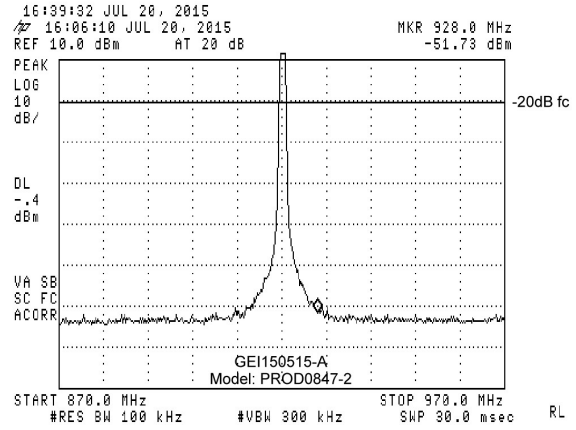
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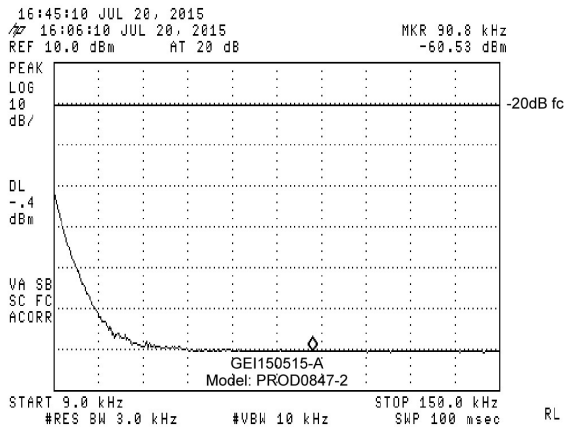




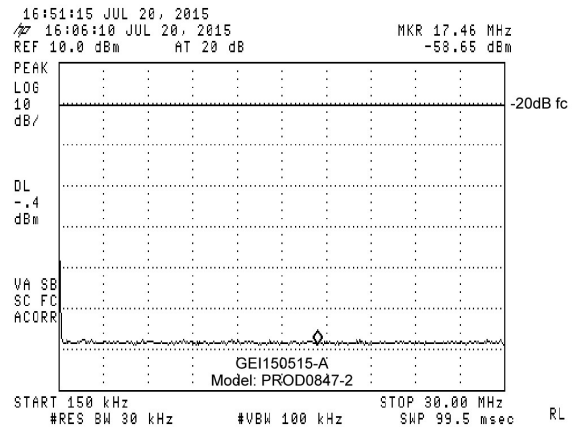
**902MHz**



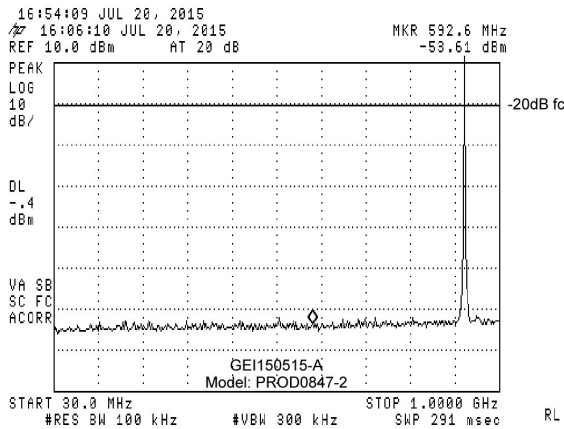
**928MHz**



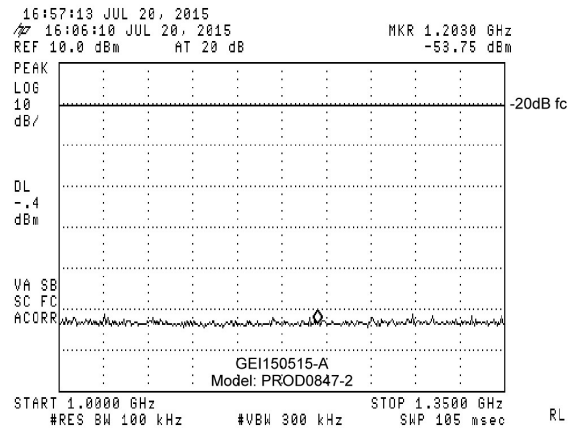
**9kHz to 150kHz**



**150kHz to 30MHz**



**30MHz to 1000MHz**



**1000MHz to 1350MHz**

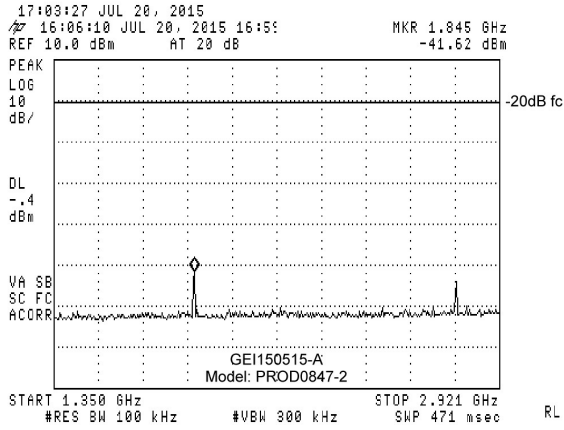
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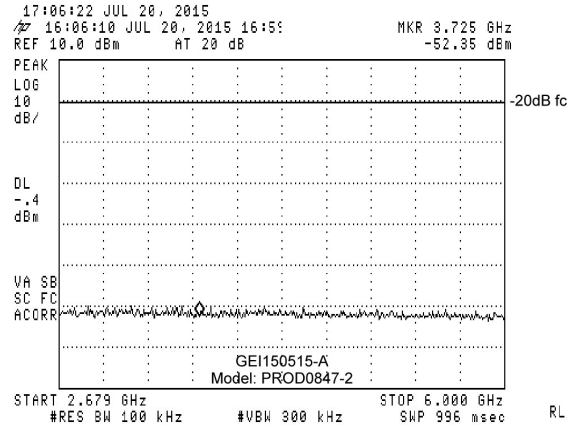
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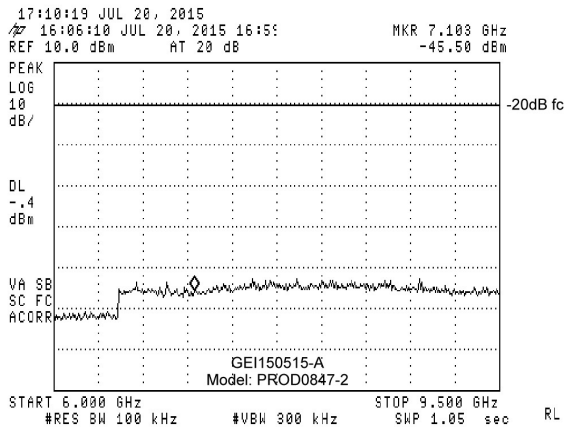




**1350MHz to 2900MHz**



**2600MHz to 6000MHz**



**6000MHz to 9500MHz**

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#### 11.4 Peak Power Spectral Density – Section 15.247(e)

Test Date:	20 Jul 2015	Temperature:	21°C
Test Officer:	Richard Turner	Humidity:	68%
Test Location:	Austest Laboratories (NSW)		

##### 11.4.1 EUT Operating Mode

- a. DC supply voltage – 12VDC.
- b. Mode 1 – Constant transmission at 920MHz

##### 11.4.2 Test Method

- a. Measurements are performed in accordance with ANSI C63.10-2009 and KDB 558074 D01 DTS Meas Guidance v03r04 section 10.2.
- b. Connect the EUT antenna port directly to a spectrum analyser via a low loss RF cable, and attenuator (as necessary).
- c. Set the spectrum analyser RBW to 3kHz, VBW to 10kHz, span 1.5 x 6dB bandwidth.
- d. Record the maximum reading.

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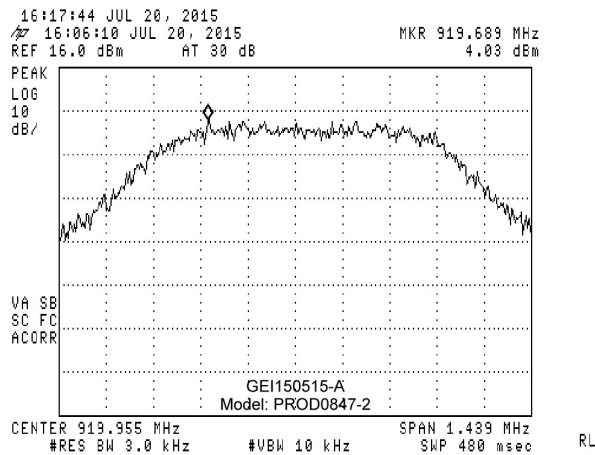


### 11.4.3 Test Results

Measurements were performed on model PROD0847-2.  
 The same 920MHz V2V radio circuit is installed in model PROD0842-2. It was decided measurement on this model was not necessary.

#### Mode 1 – operation

Spectrum analyser: RBW: 3khz  
 Peak spectral density: 4.0dBm at 919.689MHz  
 Limit: 8dBm in any 3kHz band  
 $\Delta$  Limit: -4.0dB  
 EUT COMPLIES



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