

	<b>Reliability Test Report</b>	Document No.	CQA-RD-2043-01
		Total Page	9
		Confidential level	N/A

# Reliability Test Report

## (MG210)

Revision	Date	Change History
0	2020. 10. 22	Write the initial document
1	2021. 02. 26	Change part numbers

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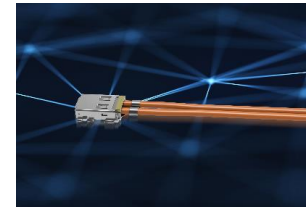
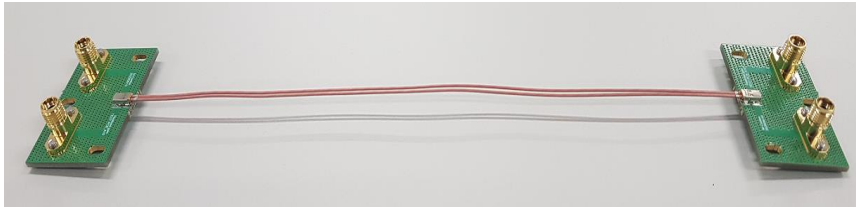
Series Name	MG210	Revision	1
Description	<ul style="list-style-type: none"> <li>● Receptacle</li> <li>● Plug cable assembly</li> </ul>	Date	2021-02-26
Part Number	<ul style="list-style-type: none"> <li>● MG210RE02</li> <li>● MGC10216</li> </ul>	Prepared by	BJ. Lim

## 1. Product Specification

### 1-1. Summary

This document is reliability testing result of MG210 produced in Sensorview.

### 1-2. Product Structure (Picture, Drawing)



### 1-3. Mechanical

No	Item	Description
1	Connector Material	Housing : Zn(Au-Plated) Signal Pin : BeCu(Au-Plated) Insulator : LCP Shell : STS(Ni-Plated)
2	Cable Material	Conductor : Silver Plated Copper Insulator : LDPFA Outer Conductor : Tin Plated Copper Wire Copper Polyester Tape
3	Receptacle Material	Housing : Zn(Ni-Plated) Shell : STS(Ni-Plated)

### 1-4. Electrical

No	Item	Unit	Spec. Value
1	Impedance	$\Omega$	50 $\pm$ 2
2	VSWR	-	Max 1.5 : 1 @ 10GHz
3	Insertion Loss (L=200mm)	dB	Min -1.7 @ 10GHz
4	Crosstalk (Isolation)	dB	Max -40 @ 10GHz

## 2. Reliability Test Specification

### 2-1. Electrical Performance

Test Item	Acceptance Criteria	Procedure
Function Examination	1. No disconnection or short 2. Max 1.5 : 1 @ 10GHz 3. Min -1.7 @ 10GHz 4. Max -40 @ 10GHz	1. DC Current, Resistance 2. VNA (S11) VSWR 3. VNA 2 Port Test (S21) Insertion Loss 4. VNA Crosstalk
Low Level Contact Resistance	1. Micro ohm meter measuring - Signal(Inner) Contact : 40mΩ Max. - Ground(Out) Contact : 40mΩ Max.	EIA-364-23 1. Test Equipment : Milliohm Meter 2. Test Method : ~6V DC, Current 10mA
Insulation Resistance	1. Connector insulation resistance after test. - Initial : 500MΩ Min	EIA-364-21 1. Test Equipment : Insulation Resistance Tester 2. Test Method : 200V DC / 60 sec
Withstanding Voltage	1. Insulation should not show breakdown or flashover. 2. Satisfy the electrical characteristics.	EIA-364-20 1. Test Equipment : Withstanding Voltage Tester 2. Test Method : 100V AC / 60 sec / 0.5mA

### 2-2. Mechanical Performance

Mating & Un-mating Force	1. Mating & Un-mating Force after test. - Mating : 30N•m Max. - Un-mating : 5N•m Min.	EIA-364-13 1. Test Equipment : Universal Testing Machine 2. Test Method : Receptacle(Connector) & Plug Cable Mating & Un-mating. - Speed : 25±3mm/min - Measure : After 20 times
Durability	1. Mating & Un-mating Force after test. - Mating : 30N•m Max. - Un-mating : 5N•m Min.	EIA-364-09 1. Test Equipment : Universal Testing Machine 2. Test Method : Receptacle(Connector) & Plug Cable Mating & Un-mating. - Speed : 25±3mm/min - Measure : After 30 times Min
Cable Retention Force	1. No disconnection (0.1s Max) 2. No mechanical deformation or damage.	1. Test Equipment : Push-Pull Gauge Power Supply 2. Test Method : 100mA DC power supply at insertion state. - Measure : at 0degree 10N•m

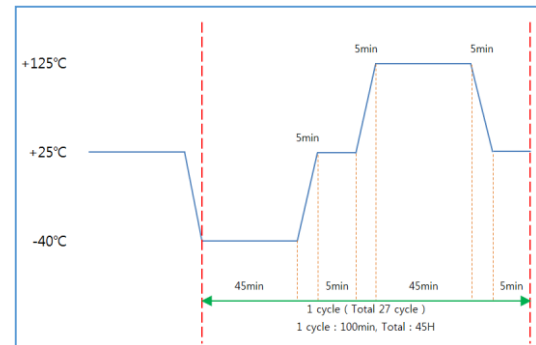
## 2-3. Environmental Performance

Thermal Shock

1. Satisfy the electrical characteristics.
2. No mechanical deformation or damage.

UL 83 & UL 12771.

1. Test Equipment : Thermal Shock Chamber
2. Test Method : -40°C ~ +125°C
  - 1 cycle : -40°C (45 min) → 25 °C (5 min) → 125°C (45 min) → 25°C (5min)
  - Total 27cycles (45hours)
  - Measure : After leaving at room temperature for 1hour

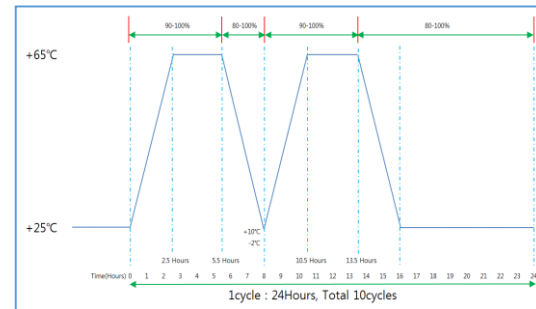


Moisture Resistance

1. Satisfy the electrical characteristics.
2. No mechanical deformation or damage.

MIL-STD-202G Method 10

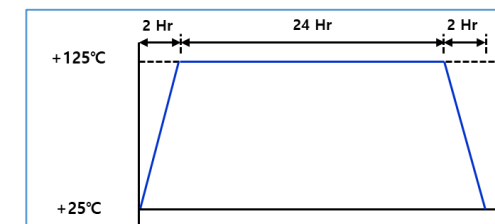
1. Test Equipment : Temperature & Humidity Chamber
2. Test Method : +25°C ~ +65°C / 80% ~ 100% RH
  - Total 10 cycles (1 cycle : 24 hours)
  - Measure : After removing moisture and leaving it at room temperature for 1 hour.



High Temperature

1. Satisfy the electrical characteristics.
2. No mechanical deformation or damage.

1. Test Equipment : Temperature & Humidity Chamber
2. Test Method : +125 °C, 24 hours
  - Measure : After leaving at room temperature for 1 hour



Low Temperature	<ol style="list-style-type: none"> <li>Satisfy the electrical characteristics.</li> <li>No mechanical deformation or damage.</li> </ol>	<ol style="list-style-type: none"> <li>Test Equipment : Temperature &amp; Humidity Chamber</li> <li>Test Method : -40 °C, 24 hours <ul style="list-style-type: none"> <li>- Measure : After leaving at room temperature for 1 hour</li> </ul> </li> </ol>
Vibration	<ol style="list-style-type: none"> <li>No disconnection (0.1s Max)</li> <li>No mechanical deformation or damage.</li> </ol>	<p>EIA-364-28</p> <ol style="list-style-type: none"> <li>Test Equipment : Vibration Testing Machine, Power Supply</li> <li>Test Method : 100mA DC power supply at insertion state. <ul style="list-style-type: none"> <li>- Frequency : 10-50-10Hz/min</li> <li>- Amplitude, acceleration : 0.76 ~ 1.52mm/S<sup>2</sup> (6G)</li> <li>- Test Time : 2 hours for each X, Y, Z axis (Total 6 hours)</li> </ul> </li> </ol>
Salt Spray (Corrosion)	<ol style="list-style-type: none"> <li>No corrosion, red rust, defect</li> </ol>	<ol style="list-style-type: none"> <li>Test Equipment : Salt Spray Chamber</li> <li>Test Method : <ul style="list-style-type: none"> <li>- Salinity : NaCl 5% Spray</li> <li>- Chamber Temperature : 35°C</li> <li>- Test Time : 72 Hours</li> <li>- Remove all salt water with water, dry it for 12 hours and check.</li> </ul> </li> </ol>

### 3. Reliability Test Result

Test Item	Acceptance Criteria	Result Data	Pass / Fail																
Low Level Contact Resistance	<ul style="list-style-type: none"> <li>- Signal(Inner) Contact : 40mΩ Max.</li> <li>- Ground(Out) Contact : 40mΩ Max.</li> </ul>	<p>Sample : #1~#10 (Unit : mΩ)</p> <table border="1"> <thead> <tr> <th>Index</th> <th>Port1 Signal Contact</th> <th>Port2 Signal Contact</th> <th>Ground Contact</th> </tr> </thead> <tbody> <tr> <td>Max</td> <td>28.5</td> <td>27.3</td> <td>13.9</td> </tr> <tr> <td>Min</td> <td>21.2</td> <td>21.2</td> <td>10.4</td> </tr> <tr> <td>Avg</td> <td>25.8</td> <td>24.7</td> <td>12.4</td> </tr> </tbody> </table>	Index	Port1 Signal Contact	Port2 Signal Contact	Ground Contact	Max	28.5	27.3	13.9	Min	21.2	21.2	10.4	Avg	25.8	24.7	12.4	Pass
Index	Port1 Signal Contact	Port2 Signal Contact	Ground Contact																
Max	28.5	27.3	13.9																
Min	21.2	21.2	10.4																
Avg	25.8	24.7	12.4																
Insulation Resistance	<ol style="list-style-type: none"> <li>Min 500MΩ</li> </ol>	<p>Sample : #1~#10 (Unit : MΩ)</p> <table border="1"> <thead> <tr> <th>Index</th> <th>After Test</th> </tr> </thead> <tbody> <tr> <td>Max</td> <td>9999</td> </tr> <tr> <td>Min</td> <td>9999</td> </tr> <tr> <td>Avg</td> <td>9999</td> </tr> <tr> <td colspan="2" style="text-align: center;">9999MΩ = ∞</td> </tr> </tbody> </table>	Index	After Test	Max	9999	Min	9999	Avg	9999	9999MΩ = ∞		Pass						
Index	After Test																		
Max	9999																		
Min	9999																		
Avg	9999																		
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Withstanding Voltage	1. No breakdown or flashover. 2. VSWR : Max 1.5:1@10GHz 3. I/L : Min -1.7@10GHz 4. C/T : Max -40@10GHz	Sample : #1~#10 (Unit : dB) <table border="1" data-bbox="746 365 1272 860"> <thead> <tr> <th rowspan="2">Index</th> <th colspan="2">After test</th> </tr> <tr> <th>Port1 VSWR (S11)</th> <th>Port2 VSWR (S11)</th> </tr> <tr> <th rowspan="2">Max</th> <td>1.40</td> <td>1.38</td> </tr> <tr> <td>-1.37</td> <td>-1.36</td> </tr> <tr> <th rowspan="2">Min</th> <td>1.23</td> <td>1.29</td> </tr> <tr> <td>-1.46</td> <td>-1.46</td> </tr> <tr> <th rowspan="2">Avg</th> <td>1.33</td> <td>1.33</td> </tr> <tr> <td>-1.41</td> <td>-1.42</td> </tr> </thead></table>	Index	After test		Port1 VSWR (S11)	Port2 VSWR (S11)	Max	1.40	1.38	-1.37	-1.36	Min	1.23	1.29	-1.46	-1.46	Avg	1.33	1.33	-1.41	-1.42	Pass
Index	After test																						
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Min	1.23	1.29																					
	-1.46	-1.46																					
Avg	1.33	1.33																					
	-1.41	-1.42																					
Mating & Un-mating Force	1. Mating : Max 30N•m. 2. Un-mating : Min 5N•m.	Sample : #1~#10 (Unit : N•m) <table border="1" data-bbox="746 947 1272 1137"> <thead> <tr> <th rowspan="2">Item</th> <th colspan="2">After 20 times</th> </tr> <tr> <th>Mating</th> <th>Un-mating</th> </tr> </thead> <tbody> <tr> <td>Max</td> <td>26.2</td> <td>27.3</td> </tr> <tr> <td>Min</td> <td>18.5</td> <td>16.9</td> </tr> <tr> <td>Avg</td> <td>25.7</td> <td>21.2</td> </tr> </tbody> </table>	Item	After 20 times		Mating	Un-mating	Max	26.2	27.3	Min	18.5	16.9	Avg	25.7	21.2	Pass						
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Cable Retention Force	1. No mechanical deformation or damage. 2. No disconnection (Max 0.1s)	Sample : #1~#5 (Unit : N•m) <table border="1" data-bbox="746 1512 1272 1919"> <thead> <tr> <th>Sample</th> <th>After Test</th> </tr> </thead> <tbody> <tr> <td>#1 (Cable 1, 2)</td> <td>No damage &amp; No disconnection</td> </tr> <tr> <td>#2 (Cable 1, 2)</td> <td>No damage &amp; No disconnection</td> </tr> <tr> <td>#3 (Cable 1, 2)</td> <td>No damage &amp; No disconnection</td> </tr> <tr> <td>#4 (Cable 1, 2)</td> <td>No damage &amp; No disconnection</td> </tr> <tr> <td>#5 (Cable 1, 2)</td> <td>No damage &amp; No disconnection</td> </tr> </tbody> </table>	Sample	After Test	#1 (Cable 1, 2)	No damage & No disconnection	#2 (Cable 1, 2)	No damage & No disconnection	#3 (Cable 1, 2)	No damage & No disconnection	#4 (Cable 1, 2)	No damage & No disconnection	#5 (Cable 1, 2)	No damage & No disconnection	Pass								
Sample	After Test																						
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Thermal Shock	1. No mechanical deformation or damage. 2. VSWR : Max 1.5:1@10GHz 3. I/L : Min -1.7@10GHz 4. C/T : Max -40@10GHz	Sample : #1~#10 (Unit : dB) <table border="1" data-bbox="746 362 1272 860"> <thead> <tr> <th rowspan="4">Index</th> <th colspan="2">After test</th> </tr> <tr> <th>Port1 VSWR (S11)</th> <th>Port2 VSWR (S11)</th> </tr> <tr> <th>Port1 I/L (S21, dB)</th> <th>Port2 I/L (S21, dB)</th> </tr> <tr> <th colspan="2">Crosstalk (dB)</th> </tr> </thead> <tbody> <tr> <td rowspan="3">Max</td> <td>1.34</td> <td>1.33</td> </tr> <tr> <td>-1.40</td> <td>-1.38</td> </tr> <tr> <td colspan="2">-45.08</td> </tr> <tr> <td rowspan="3">Min</td> <td>1.26</td> <td>1.28</td> </tr> <tr> <td>-1.62</td> <td>-1.47</td> </tr> <tr> <td colspan="2">-48.34</td> </tr> <tr> <td rowspan="3">Avg</td> <td>1.31</td> <td>1.31</td> </tr> <tr> <td>-1.46</td> <td>-1.45</td> </tr> <tr> <td colspan="2">-46.61</td> </tr> </tbody> </table>	Index	After test		Port1 VSWR (S11)	Port2 VSWR (S11)	Port1 I/L (S21, dB)	Port2 I/L (S21, dB)	Crosstalk (dB)		Max	1.34	1.33	-1.40	-1.38	-45.08		Min	1.26	1.28	-1.62	-1.47	-48.34		Avg	1.31	1.31	-1.46	-1.45	-46.61		Pass
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High Temperature	1. No mechanical deformation or damage. 2. VSWR : Max 1.5:1@10GHz 3. I/L : Min -1.7@10GHz 4. C/T : Max -40@10GHz	Sample : #1~#10 (Unit : dB) <table border="1" data-bbox="746 1527 1272 2018"> <thead> <tr> <th rowspan="4">Index</th> <th colspan="2">After test</th> </tr> <tr> <th>Port1 VSWR (S11)</th> <th>Port2 VSWR (S11)</th> </tr> <tr> <th>Port1 I/L (S21, dB)</th> <th>Port2 I/L (S21, dB)</th> </tr> <tr> <th colspan="2">Crosstalk (dB)</th> </tr> </thead> <tbody> <tr> <td rowspan="3">Max</td> <td>1.40</td> <td>1.36</td> </tr> <tr> <td>-1.32</td> <td>-1.38</td> </tr> <tr> <td colspan="2">-45.22</td> </tr> <tr> <td rowspan="3">Min</td> <td>1.31</td> <td>1.29</td> </tr> <tr> <td>-1.48</td> <td>-1.46</td> </tr> <tr> <td colspan="2">-48.03</td> </tr> <tr> <td rowspan="3">Avg</td> <td>1.34</td> <td>1.32</td> </tr> <tr> <td>-1.41</td> <td>-1.41</td> </tr> <tr> <td colspan="2">-46.47</td> </tr> </tbody> </table>	Index	After test		Port1 VSWR (S11)	Port2 VSWR (S11)	Port1 I/L (S21, dB)	Port2 I/L (S21, dB)	Crosstalk (dB)		Max	1.40	1.36	-1.32	-1.38	-45.22		Min	1.31	1.29	-1.48	-1.46	-48.03		Avg	1.34	1.32	-1.41	-1.41	-46.47		Pass
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Low Temperature	1. No mechanical deformation or damage. 2. VSWR : Max 1.5:1@10GHz 3. I/L : Min -1.7@10GHz 4. C/T : Max -40@10GHz	Sample : #1~#10 (Unit : dB) <table border="1" data-bbox="746 365 1270 860"> <thead> <tr> <th rowspan="2">Index</th> <th colspan="2">After test</th> </tr> <tr> <th>Port1 VSWR (S11)</th> <th>Port2 VSWR (S11)</th> </tr> </thead> <tbody> <tr> <td rowspan="3">Max</td> <td>1.41</td> <td>1.38</td> </tr> <tr> <td>-1.35</td> <td>-1.37</td> </tr> <tr> <td colspan="2" style="text-align: center;">-45.14</td> </tr> <tr> <td rowspan="3">Min</td> <td>1.30</td> <td>1.30</td> </tr> <tr> <td>-1.47</td> <td>-1.45</td> </tr> <tr> <td colspan="2" style="text-align: center;">-49.86</td> </tr> <tr> <td rowspan="3">Avg</td> <td>1.34</td> <td>1.33</td> </tr> <tr> <td>-1.41</td> <td>-1.41</td> </tr> <tr> <td colspan="2" style="text-align: center;">-47.26</td> </tr> </tbody> </table>	Index	After test		Port1 VSWR (S11)	Port2 VSWR (S11)	Max	1.41	1.38	-1.35	-1.37	-45.14		Min	1.30	1.30	-1.47	-1.45	-49.86		Avg	1.34	1.33	-1.41	-1.41	-47.26		Pass
Index	After test																												
	Port1 VSWR (S11)	Port2 VSWR (S11)																											
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Vibration	1. No mechanical deformation or damage. 2. No disconnection (Max 0.1s)	Sample : #1~#2 <table border="1" data-bbox="746 947 1270 1135"> <thead> <tr> <th>Sample</th> <th>After Test</th> </tr> </thead> <tbody> <tr> <td>#1 (Cable1, 2)</td> <td>No damage &amp; No disconnection</td> </tr> <tr> <td>#2 (Cable1, 2)</td> <td>No damage &amp; No disconnection</td> </tr> </tbody> </table>	Sample	After Test	#1 (Cable1, 2)	No damage & No disconnection	#2 (Cable1, 2)	No damage & No disconnection																					
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Salt Spray (Corrosion)	1. No corrosion, red rust, defect	Sample : #1~#10 <table border="1" data-bbox="746 1232 1270 1420"> <thead> <tr> <th>Sample</th> <th>After Test</th> </tr> </thead> <tbody> <tr> <td>Receptacle #1~#10</td> <td>No corrosion, red rust, defect</td> </tr> <tr> <td>Plug Cable #1~#10</td> <td>No corrosion, red rust, defect</td> </tr> </tbody> </table>	Sample	After Test	Receptacle #1~#10	No corrosion, red rust, defect	Plug Cable #1~#10	No corrosion, red rust, defect																					
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