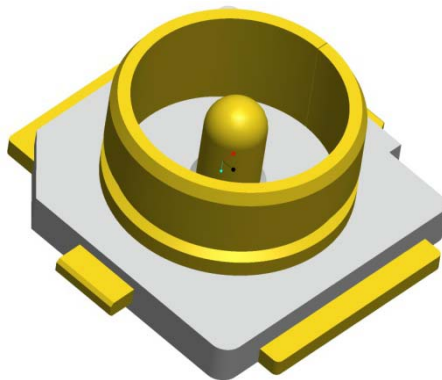


# Product Specification

## 產品規格書

Product Description : MRF1 Receptacle  
Product Number : MRF1 Series



Test Report No. : TR-MRF-R10

---

No.:PS-MRF-R10



This document contains proprietary information which is the property of **Harumoto Corporation** and is strictly confidential and shall not be disclosed to others in whole or in part, reproduced, copied, or used as basic for design, manufacturing or sale of apparatus without the written permission of **Harumoto Corporation**

**Revision History.**

**Date : 2015/04/17**

**Doc. Version: A2**

| Date       | Version | Change Description |
|------------|---------|--------------------|
| 2011/07/11 | A0      | New Release        |
| 2013/05/14 | A1      | 變更規格書格式            |
| 2015/04/17 | A2      | 變更公司地址             |
|            |         |                    |
|            |         |                    |
|            |         |                    |
|            |         |                    |

|                                                                                     |               |                   |
|-------------------------------------------------------------------------------------|---------------|-------------------|
|  | Prepared by : | Shiran 2015/04/17 |
|                                                                                     | Checked by :  | /                 |
|                                                                                     | Approved by : | Lvyigen2015/04/17 |

**Harumoto Technology (ShenZhen) Co., Ltd**

**春源科技(深圳)有限公司**

**ADD : No.4 The Sixth Industrial Park Mashantou Village, Gongming Town,  
Guangming New Zone, Shenzhen.**

**廣東省深圳市光明新區公明街道馬山頭第六工業區 4 號**

**TEL : +86-755-27710581    FAX : +86-755-27710196**

# Table of Contents

---

|                                                     |    |
|-----------------------------------------------------|----|
| 1. Scope 適用範圍 .....                                 | 4  |
| 2. Product Physical Characteristics 產品型號與特徵 .....   | 4  |
| 3. Applicable and Specification 應用規格 .....          | 4  |
| 4. Requirements 需求 .....                            | 4  |
| 5. Test and Performance Requirement 功能性與測試需求 .....  | 5  |
| 5.1 Electrical Requirements 電氣性能需求 .....            | 5  |
| 5.2 Mechanical Requirements 機構性能需求 .....            | 7  |
| 5.3 Environmental Requirements 環境需求 .....           | 8  |
| 6. Test Sequence and Sample Quantity 測試順序與樣品數 ..... | 10 |

## 1. Scope 適用範圍

This specification covers the performance, test and quality requirements for the MRF1 Receptacle connector.

本規格適用 MRF1 Receptacle connector 的各種性能條件之規範。

## 2. Product Physical Characteristics 產品特徵

| Characteristics                      | Description                 |
|--------------------------------------|-----------------------------|
| Receptacle Physical Outline 外觀尺寸     | 3 x 3 x 1.25 mm             |
| Receptacle OD 外部直徑                   | 2.0mm                       |
| Housing Material 塑膠材質                | High Temperature Plastic    |
| Flammability 可燃性                     | UL 94-V0                    |
| Contact Material 中心端子材質              | Copper Alloy / Gold Plating |
| Ground Contact Material 接地面材質        | Copper Alloy / Gold Plating |
| RoHs Compliant / Halogen Free 無鉛無鹵要求 | Must be Compliant           |

## 3. Applicable and Specification 應用規格

Follow **EIA-364** specification.

The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the latest edition of the document applies. In the event of conflict between the requirements of this specification and the product drawing, the product drawing shall take precedence. In the event of conflict between the requirement of this specification and the referenced document, this specification shall take precedence.

以下文件所標示之產品規格發生衝突時，請依照最新版本為主。如果規格書與圖面發生衝突時，將以圖面為標準。如果規格書與參考文件發生衝突時，則需遵照規格書。

## 4. Requirements 需求

Nominal Characteristic Impedance : 50Ω

特性阻抗：50Ω

Voltage Rating : 60V AC

額定電壓：60V AC

Current Rating : 1A Max.

額定電流：1A Max.

Applicable Frequency : DC to 6GHz

應用頻率：DC to 6GHz

VSWR :

電壓駐波比：

DC to 3GHz : 1.3 Max.

DC to 3GHz : 1.3 Max.

3 to 6GHz : 1.4 Max.

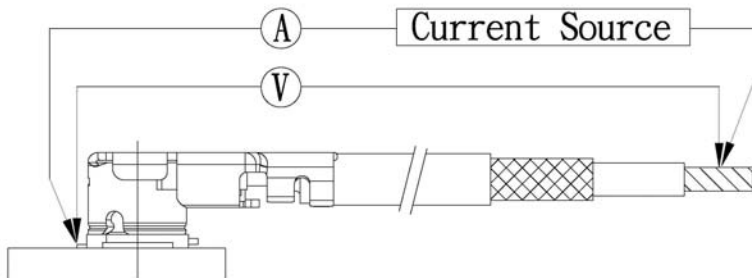
3 to 6GHz : 1.4 Max.

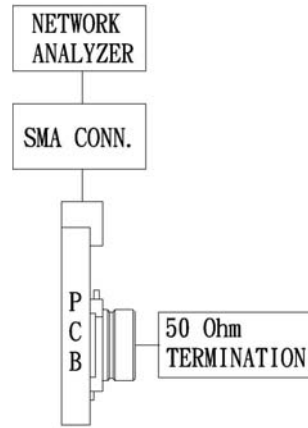
Operating Temperature Range : -40°C to +90°C

作業溫度範圍：-40°C to +90°C

## 5. Test and Performance Requirement 功能性與測試需求

### 5.1 Electrical Requirements 電氣性能需求

| No. | Items<br>項目                                 | Test Requirement<br>測試需求                                                                                                                                                                            | Specifications<br>規格                                                                                                                                                                                                                       |
|-----|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.  | Contact Resistance<br>接觸阻抗                  | <p>Subject mated contacts assembled in housing to 20mV Max. open circuit at 10mA Max..</p> <p>Per <b>EIA-364-06B</b></p> <p>將端子組裝到塑膠後測試。</p> <p>測試電壓：20mV Max.</p> <p>測試電流：10mA Max.</p>            | <p>Ground：</p> <p>Initial：10mΩ Max.</p> <p>Final：15mΩ Max.</p> <p>Inner：</p> <p>Initial：20mΩ Max.</p> <p>Final：25mΩ Max.</p> <p>接地端子：</p> <p>初始值：10mΩ Max.</p> <p>最終值：15mΩ Max.</p> <p>中心端子：</p> <p>初始值：20mΩ Max.</p> <p>最終值：25mΩ Max.</p> |
|     |                                             |  <p style="text-align: center;"><b>Figure 1</b></p>                                                             |                                                                                                                                                                                                                                            |
| 2.  | Insulation Resistance<br>絕緣阻抗               | <p>Impressed voltage 100V DC for 1 minute.</p> <p>Test between adjacent circuits of mated connector.</p> <p>Per <b>EIA-364-21C</b></p> <p>將公母端子對插使其相連接後測試。</p> <p>施加直流電壓 100V, 測試 1 分鐘。</p>         | <p>Initial：500MΩ Min.</p> <p>Final：100MΩ Min.</p> <p>初始值：500MΩ Min.</p> <p>最終值：100MΩ Min.</p>                                                                                                                                              |
| 3.  | Dielectric<br>Withstanding Voltage<br>耐電壓測試 | <p>200V AC for 1 minute.</p> <p>Test between adjacent circuits of mated connector.</p> <p>Current leakage：0.5mA Max.</p> <p>將公母端子對插使其相連接後測試。</p> <p>交流電壓 200V 漏電流設定 0.5mA Max.，</p> <p>測試 1 分鐘。</p> | <p>No creeping discharge or flashover shall occur.</p> <p>無火花或擊穿現象。</p>                                                                                                                                                                    |

|    |               |                                                                                                                                                                                                                                                                                                                                                                                      |                                                   |
|----|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|
| 4. | VSWR<br>電壓駐波比 | Mate the connector and SMA connector together, then measure the VSWR by the network analyzer.<br><br>Per EIA-364-108<br><br>透過 SMA 轉接頭連接網路分析儀測量其電壓駐波比。                                                                                                                                                                                                                               | DC to 3GHz : 1.3 Max.<br><br>3 to 6GHz : 1.4 Max. |
|    |               | <div data-bbox="821 555 1129 981" data-label="Diagram">  <pre> graph TD     NA[NETWORK ANALYZER] --- SC[SMA CONN.]     SC --- C1[ ]     C1 --- P[P]     C1 --- C[C]     C1 --- B[B]     B --- T[50 Ohm TERMINATION]             </pre> </div> <p data-bbox="842 1014 970 1052"><b>Figure 2</b></p> |                                                   |

## 5.2 Mechanical Requirements 機構性能需求

| No. | Items<br>項目                | Test Requirement<br>測試需求                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Specifications<br>規格                                                                                                                       |
|-----|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| 1.  | Durability<br>耐久性測試        | <p>Operation Speed : 2~3 cycles / min.</p> <p>Durability Cycles : 30 Cycles.</p> <p><b>Per EIA-364-09C</b></p> <p>測試速度：一分鐘 2~3 次循環。</p> <p>循環次數：30 次。</p>                                                                                                                                                                                                                                                                                                                                        | <p>No physical damage and meet 5.1.1(Contact Resistance)</p> <p>外觀無損壞，以及滿足以下規格。</p> <p>5.1.1(接觸阻抗)</p>                                     |
| 2.  | Vibration<br>振動測試          | <p>Mated the connector, then Impressed the 100mA DC.</p> <p>Frequency : 10Hz→100Hz→10Hz / approx 20 minutes.</p> <p>Half amplitude, peak value of acceleration : 1.5mm or 59m/s<sup>2</sup>(6G).</p> <p>Direction : 3 mutually perpendicular directions.</p> <p>Cycle : 5 cycles for each direction.</p> <p><b>Per EIA-364-28E</b></p> <p>插入連接器後施加直流電壓 100mA。</p> <p>測試頻率：10Hz→100Hz→10Hz / 約 20 分鐘。</p> <p>振幅：1.5mm or 59m/s<sup>2</sup>(6G)。</p> <p>方向：3 個互相垂直方向。</p> <p>循環次數：5 次，總共 15 次。</p> | <p>No momentary disconnections of 1 micro-sec/min. And meet 5.1.1(Contact Resistance),</p> <p>瞬斷時間小於 1 毫秒，以及滿足以下規格。</p> <p>5.1.1(接觸阻抗)</p> |
| 3.  | Mechanical Shock<br>機械衝擊測試 | <p>Accelerate Velocity : 735m/s<sup>2</sup>(75G)</p> <p>Waveform : Half-sine shock plus.</p> <p>Duration : 11m sec.</p> <p>Direct Current : 1m A</p> <p>Direction : In ±X, ±Y and ±Z axes.</p> <p>Cycle : 3 cycles for each direction, totally 18 cycles.</p> <p><b>Per EIA-364-27B</b></p> <p>速度：735m/s<sup>2</sup>(75G)。</p> <p>波型：半弦波</p> <p>持續時間：11 毫秒</p> <p>直流電：1m A</p> <p>方向：正負方向之 X, Y 及 Z 軸</p> <p>循環次數：每一方向重覆 3 次，總共 18 次</p>                                                         | <p>No momentary disconnections of 1 micro-sec/min. And meet 5.1.1(Contact Resistance),</p> <p>瞬斷時間小於 1 毫秒，以及滿足以下規格。</p> <p>5.1.1(接觸阻抗)</p> |

### 5.3 Environmental Requirements 環境需求

| No. | Items<br>項目                | Test Requirement<br>測試需求                                                                                                                                                                                                                                                                                                              | Specifications<br>規格                                                                                                                                                                                                                     |
|-----|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.  | Thermal Shock<br>冷熱衝擊      | <p>Mated Connector and apply the following test condition.</p> <p>Temperature :</p> <p>a) -40°C(30 minutes), +25°C(5 minutes)</p> <p>b) +90°C(30 minutes), +25°C(5 minutes)</p> <p>Cycle : 5 cycles</p> <p>連接器嵌合後並進行以下測試條件。</p> <p>溫度 :</p> <p>c) -40°C(30 分鐘), +25°C(5 分鐘)</p> <p>d) +90°C(30 分鐘), +25°C(5 分鐘)</p> <p>循環次數 : 5 次</p> | <p>No physical damage and meet</p> <p>5.1.1(Contact Resistance),</p> <p>5.1.2(Insulation Resistance),</p> <p>5.1.3(Dielectric Withstanding Voltage).</p> <p>外觀無損壞以及滿足以下規格。</p> <p>5.1.1(接觸阻抗)</p> <p>5.1.2(絕緣阻抗)</p> <p>5.1.3(耐電壓測試)</p> |
| 2.  | Humidity<br>恆溫恆濕測試         | <p>Mated Connector and apply the following test condition.</p> <p>Temperature : +40±2°C</p> <p>Humidity : 90~95% RH</p> <p>Duration : 96 Hours</p> <p>連接器嵌合後並進行以下測試條件。</p> <p>溫度 : +40±2°C</p> <p>濕度 : 90~95% RH</p> <p>測試時間 : 96 小時</p>                                                                                              | <p>No physical damage and meet</p> <p>5.1.1(Contact Resistance),</p> <p>5.1.2(Insulation Resistance),</p> <p>5.1.3(Dielectric Withstanding Voltage).</p> <p>外觀無損壞以及滿足以下規格。</p> <p>5.1.1(接觸阻抗)</p> <p>5.1.2(絕緣阻抗)</p> <p>5.1.3(耐電壓測試)</p> |
| 3.  | Temperature Life<br>高溫老化測試 | <p>Mated Connector and apply the following test condition.</p> <p>Temperature : +90°C</p> <p>Duration : 96 Hours</p> <p><b>Per EIA-364-17B</b></p> <p>連接器嵌合後並進行以下測試條件。</p> <p>溫度 : +90°C</p> <p>測試時間 : 96 小時</p>                                                                                                                      | <p>No physical damage and meet</p> <p>5.1.1(Contact Resistance),</p> <p>外觀無損壞以及滿足以下規格。</p> <p>5.1.1(接觸阻抗)</p>                                                                                                                            |
| 4.  | Salt Spray<br>鹽霧測試         | <p>Mated Connector and apply the following test condition.</p> <p>Temperature : +35 ± 2°C</p> <p>Salt water density : 5 ± 1%</p> <p>Duration : 24 hours</p> <p><b>Per EIA-364-26B</b></p> <p>連接器嵌合後並進行以下測試條件。</p>                                                                                                                     | <p>No physical damage and detrimental corrosion. Meet</p> <p>5.1.1(Contact Resistance),</p> <p>外觀無損壞與氧化，以及滿足以下</p>                                                                                                                       |

|    |                                    |                                                                                                                                                                |                                                                                             |
|----|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
|    |                                    | 溫度：+35 ± 2°C<br>鹽水濃度：5 ± 1%<br>測試時間：24 小時                                                                                                                      | 規格。<br>5.1.1(接觸阻抗)                                                                          |
| 5. | Resistance to Cold<br>耐低溫測試        | Mated Connector and apply the following test condition.<br>Temperature : -40 ± 2°C<br>Duration : 96 hours<br>連接器嵌合後並進行以下測試條件。<br>溫度：-40 ± 2°C<br>測試時間：96 小時    | No physical damage and meet 5.1.1(Contact Resistance),<br><br>外觀無損壞以及滿足以下規格。<br>5.1.1(接觸阻抗) |
| 6. | Solder Ability<br>焊接附著性            | Dip the solder pin of the connector in solder bath.<br>Temperature : +245 ± 5°C<br>Duration : 5 ± 0.5 sec.<br>將連接器焊接部位放入錫槽內浸錫。<br>溫度：245 ± 5°C<br>時間：5 ± 0.5 秒 | Dipped surface shall be wet with solder : 95% Min.<br><br>浸錫區域必須大於 95%。                     |
| 7. | Soldering Heat Resistance<br>焊接耐熱性 | Lead free reflow up to 260°C peak for 10 sec.<br>需滿足無鉛回流爐最高溫 260°C 10 秒鐘。                                                                                      | No physical damage.<br>外觀無損壞。                                                               |

Figure 3

## 6. Test Sequence and Sample Size 測試順序與樣品數

| Test Item<br>測試項目                        | Test Group 測試群組 |   |     |     |     |     |     |     |     |   |   |
|------------------------------------------|-----------------|---|-----|-----|-----|-----|-----|-----|-----|---|---|
|                                          | A               | B | C   | D   | E   | F   | G   | H   | I   | J | K |
| Contact Resistance<br>接觸阻抗               | 1,5             |   | 1,3 | 1,3 | 1,3 | 1,5 | 1,3 | 1,3 | 1,3 |   |   |
| Insulation Resistance<br>絕緣阻抗            | 2,6             |   |     |     |     | 2,6 |     |     |     |   |   |
| Dielectric Withstanding Voltage<br>耐電壓測試 | 3,7             |   |     |     |     | 3,7 |     |     |     |   |   |
| VSWR<br>電壓駐波比                            |                 | 1 |     |     |     |     |     |     |     |   |   |
| Durability<br>耐久性測試                      |                 |   | 2   |     |     |     |     |     |     |   |   |
| Vibration<br>振動測試                        |                 |   |     | 2   |     |     |     |     |     |   |   |
| Mechanical Shock<br>機械衝擊測試               |                 |   |     |     | 2   |     |     |     |     |   |   |
| Thermal Shock<br>冷熱衝擊                    |                 |   |     |     |     | 4   |     |     |     |   |   |
| Humidity<br>恆溫恆濕測試                       | 4               |   |     |     |     |     |     |     |     |   |   |
| Temperature Life<br>高溫老化測試               |                 |   |     |     |     |     | 2   |     |     |   |   |
| Salt Spray<br>鹽霧測試                       |                 |   |     |     |     |     |     | 2   |     |   |   |
| Resistance to Cold<br>耐低溫測試              |                 |   |     |     |     |     |     |     | 2   |   |   |
| Solder Ability<br>焊接附著性                  |                 |   |     |     |     |     |     |     |     | 1 |   |
| Soldering Heat Resistance<br>焊接耐熱性       |                 |   |     |     |     |     |     |     |     |   | 1 |
| Sample size<br>樣品數量                      | 5               | 5 | 5   | 5   | 5   | 5   | 5   | 5   | 5   | 5 | 5 |