

Product Specification

產品規格書

Product Description: MRF 2 Plug

Product Number: MRF 2 Series



Test Report No.: TR-MRF-PA0

No.: PS-MRF-PA0



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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
2024/06/07	A3	新增 0.81 線材規格
2025/11/01	A4	變更公司地址及英文名稱

	Prepared by:	XY CHEN 2025/11/01
	Checked by:	/
	Approved by:	Jaisy Kung2025/11/01

HMT Cable Manufacturing Corporation

春源科技(深圳)有限公司

ADD: 301, Building 88, the Fifth Industrial Zone, Mashantou Community, Ma Tian Street, Guangming District, Shenzhen, China

中國深圳市光明區馬田街道馬山頭社區第五工業區 88 棟 301

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

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1. Scope 適用範圍

This specification covers the performance, test and quality requirements for the MRF A13 Plug connector.

本規格適用 MRF A13 Plug connector 的各種性能條件之規範。

2. Product Physical Characteristics 產品特徵

Characteristics	Description
Mating Height 嵌合高度	Cable OD 1.13/0.81 mm: 1.80mm
Housing Material 塑膠材質	High Temperature Plastic
Flammability 可燃性	UL 94-HB
Contact Material 中心端子材質	Copper Alloy / Gold Plating
Ground Contact Material 接地端子材質	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.

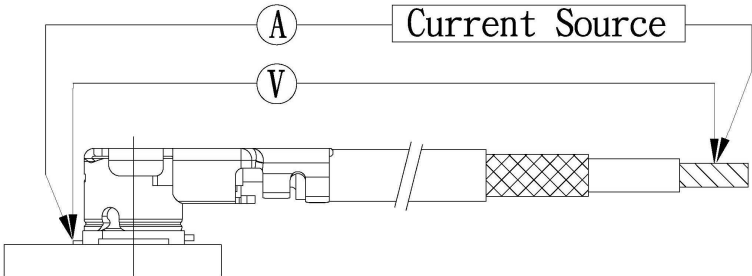
以下檔所標示之產品規格發生衝突時，請依照最新版本為主。如果規格書與圖面發生衝突時，將以圖面為標準。如果規格書與參考檔發生衝突時，則需遵照規格書。

4. Requirements 需求

Nominal Characteristic Impedance: 50 Ω	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.
3GHz to 6GHz: 1.5 Max.	3GHz to 6GHz: 1.5 Max.
Operating Temperature Range: -40°C to +90°C	作業溫度範圍: -40°C to +90°C

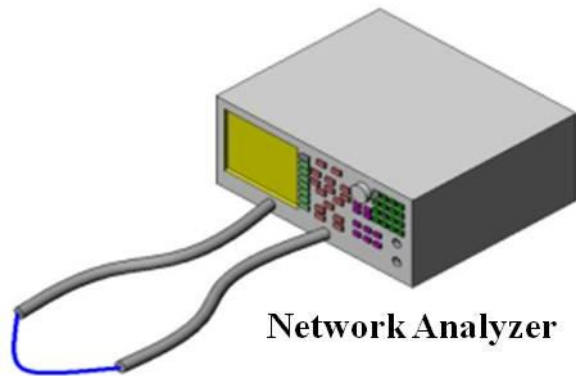
5. Test and Performance Requirement 功能性與測試需求

5.1 Electrical Requirements 電氣性能需求

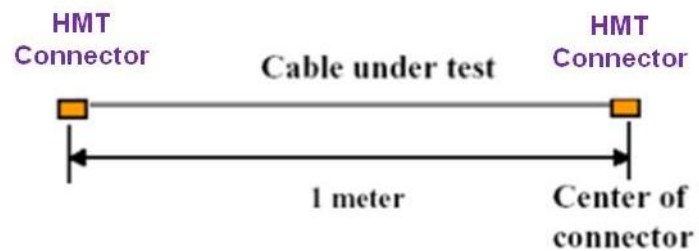
No.	Items 項目	Test Requirement 測試需求	Specifications 規格
1.	Contact Resistance 接觸阻抗	Subject mated contacts assembled in housing to 20mV Max. open circuit at 10mA Max.. Per EIA-364-06B 將端子組裝到塑膠後測試。 測試電壓：20mV Max. 測試電流：10mA Max.	Ground: Initial: 10m Ω Max. Final: 15m Ω Max. Inner: Initial: 20m Ω Max. Final: 25m Ω Max. 接地端子: 初始值: 10m Ω Max. 最終值: 15m Ω Max. 中心端子: 初始值: 20m Ω Max. 最終值: 25m Ω Max.
 <p>Figure 1</p>			
2.	Insulation Resistance 絕緣阻抗	Impressed voltage 100V DC for 1 minute. Test between adjacent circuits of mated connector. Per EIA-364-21C 將公母端子對插使其相連接後測試。 施加直流電壓 100V, 測試 1 分鐘。	Initial: 500M Ω Min. Final: 100M Ω Min. 初始值: 500M Ω 最終值: 100M Ω
3.	Dielectric Withstanding Voltage 耐電壓測試	300V AC for 1 minute. Test between adjacent circuits of mated connector. Current leakage: 0.5mA Max. 將公母端子對插使其相連接後測試。 交流電壓 300V 漏電流設定 0.5mA Max. ,	No creeping discharge or flashover shall occur. 無火花或擊穿現象。

		測試 1 分鐘。	
4.	Insertion Loss 插入損耗	Mate the connector and SMA connector together, then measure the Insertion loss by the network analyzer. 透過 SMA 轉接頭連接網路分析儀測量其插入損耗。	Ø 1.13 mm: DC to 6GHz: -6dB Min. Ø 0.81 mm: DC to 6GHz: -10dB Min.
5.	VSWR 電壓駐波比	Mate the connector and SMA connector together, then measure the VSWR by the network analyzer. Per EIA-364-108 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. 3GHz to 6GHz: 1.5 Max.

【 Test Equipment 】



【 Test Method 】



5.2 Mechanical Requirements 機構性能需求

No.	Items 項目	Test Requirement 測試需求	Specifications 規格
1.	Mating Force 插入力	Soldering the Receptacle connector on the test board and mated the Plug connector, then measure the force. Operation Speed: 25 ± 3 mm / min. 焊接板端連接器在測試板上後嵌合線端連接器，再予以測試。 測試速度：25±3 毫米 / 分鐘。	. 20N Max
2.	Un-Mating Force 拔出力	Soldering the Receptacle connector on the test board and mated the Plug connector, then measure the force. Operation Speed: 25 ± 3 mm / min. 焊接板端連接器在測試板上後嵌合線端連接器，再予以測試。 測試速度：25±3 毫米 / 分鐘。	Initial: 5N Min. After 30 times: 3N Min.
3.	Crimp Strength 拉力	Pull the cable by tensile strength machine, then measure the force of cable as shown in Figure 3 . Operation Speed: 25 ± 3 mm / min. Per EIA-364-13B 使用拉力機測試其線纜拉力如圖 3。 測試速度：25±3 毫米 / 分鐘。	Ø1.13 mm: 15N Min. Ø0.81 mm: 7N Min.

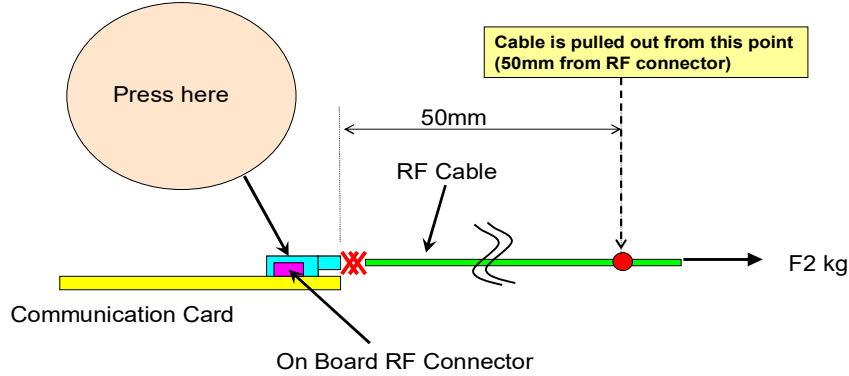
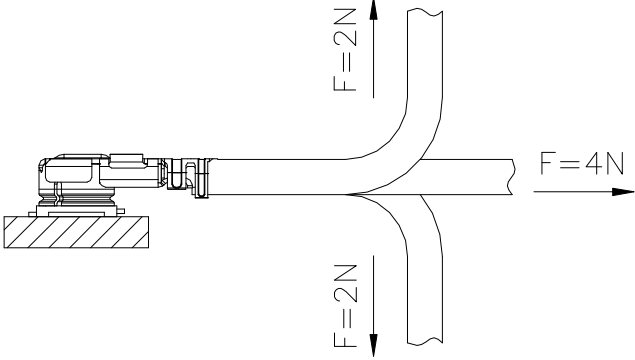


Figure 3

4.	<p>Durability 耐久性測試</p>	<p>Operation Speed: 2~3 Cycles / min. Durability Cycles: 30 Cycles. Per EIA-364-09C 測試速度: 一分鐘 2~3 次循環。 循環次數: 30 次。</p>	<p>No physical damage and meet 5.1.1(Contact Resistance) 5.2.1(Un-Mating Force) 外觀無損壞, 以及滿足以下規格。 5.1.1(接觸阻抗) 5.2.1(拔出力)</p>
5.	<p>Cable Retention Force 線纜保持力</p>	<p>Mated Connectors and apply force on the cable as shown in Figure 5. Direct Current: 100mA Max. 連接器嵌合後並進行測試條件如圖 5 直流電: 10mA Max.</p>	<p>No physical damage. No momentary disconnections of 1 micro-sec/min. And meet 5.1.1(Contact Resistance), 外觀無損壞, 瞬斷時間小於 1 毫 秒, 以及滿足以下規格。 5.1.1(接觸阻抗)</p>
 <p>Figure 5</p>			

<p>6.</p>	<p>Vibration 振動測試</p>	<p>Mated the connector, then Impressed the 100mA DC. Frequency : 10Hz→100Hz→10Hz / approx 15 minutes. Half amplitude, peak value of acceleration: 1.5mm or 59m/s²(6G). Direction: 3 mutually perpendicular directions. Cycle: 5 cycles for each direction. Per EIA-364-28E</p> <p>插入連接器後施加直流電壓 100mA。 測試頻率: 10Hz→100Hz→10Hz / 約 15 分鐘。 振幅: 1.5mm or 59m/s²(6G)。 方向: 3 個互相垂直方向。 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。 5.1.1(接觸阻抗)</p>
<p>7.</p>	<p>Mechanical Shock 機械衝擊測試</p>	<p>Accelerate Velocity: 735m/s²(75G) Waveform: Half-sine shock plus. Duration: 11m sec. Direct Current: 1m A Direction: In ±X, ±Y and ±Z axes. Cycle: 3 cycles for each direction, totally 18 cycles. Per EIA-364-27B</p> <p>速度: 735m/s²(75G)。 波型: 半弦波 測試時間: 11 毫秒 直流電: 1m A 方向: 正負方向之 X, Y 及 Z 軸 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。 5.1.1(接觸阻抗)</p>

5.3 Environmental Requirements 環境需求

No.	Items 項目	Test Requirement 測試需求	Specifications 規格
1.	Thermal Shock 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 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 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>Per EIA-364-17B</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 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: 48 hours</p> <p>Per EIA-364-26B</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: $+35 \pm 2^{\circ}\text{C}$ 鹽水濃度: $5 \pm 1\%$ 測試時間: 48 小時	規格。 5.1.1(接觸阻抗)
5.	Resistance to Cold 耐低溫測試	Mated Connector and apply the following test condition. Temperature: $-40 \pm 2^{\circ}\text{C}$ Duration: 96 hours 連接器嵌合後並進行以下測試條件。 溫度: $-40 \pm 2^{\circ}\text{C}$ 測試時間: 96 小時	No physical damage and meet 5.1.1(Contact Resistance), 外觀無損壞以及滿足以下規格。 5.1.1(接觸阻抗)

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

Test Item 測試項目	Test Group 測試群組										
	A	B	C	D	E	F	G	H	I	J	K
Contact Resistance 接觸阻抗	1,5		1,7		1,3	1,3	1,3	1,5	1,3	1,3	1,3
Insulation Resistance 絕緣阻抗	2,6							2,6			
Dielectric Withstanding Voltage 耐電壓測試	3,7							3,7			
Insertion Loss 插入損耗		2									
VSWR 電壓駐波比		1									
Mating Force 插入力			3,6								
Un-Mating Force 拔出力			2,5								
Crimp Strength 拉力				1							
Durability 耐久性測試			4								
Cable Retention Force 線纜保持力					2						
Vibration 振動測試						2					
Mechanical Shock 機械衝擊測試							2				
Thermal Shock 冷熱衝擊								4			
Humidity 恆溫恆濕測試	4										
Temperature Life 高溫老化測試									2		
Salt Spray 鹽霧測試										2	
Resistance to Cold 耐低溫測試											2
Sample size 樣品數量	5	5	5	5	5	5	5	5	5	5	5