

TITLE

2.4GHZ CABLED ON-METAL BALANCE ANTENNA

TABLE OF CONTENTS

1.0 SCOPE

2.0 PRODUCT DESCRIPTION

3.0 APPLICABLE DOCUMENTS

4.0 GENERAL SPECIFICATION

5.0 ANTENNA SPECIFICATION

6.0 MECHANICAL SPECIFICATION

7.0 ENVIRONMENTAL SPECIFICATION

8.0 PACKING

9.0 CHANGE HISTORY

THIS DOCUMENT CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX ELECTRONIC TECHNOLOGIES, LLC AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION									
REVISION DESCRIPTION	REMOVED OBSOLETE PART NUMBERS AS PER PCN#514494			2.4GHZ CABLED ON-METAL BALANCE ANTENNA PRODUCT SPECIFICATION					
CHANGE NO.	770993770993								
REVISED BY	VISHAH2	DATE	2023/11/16	DOC TYPE	DOC TYPE DESCRIPTION		DOC PART	SERIES	
REV APPR BY	GGA	DATE	2023/12/25	PS	PRODUCT SPECIFICATION WORD		001	212498	
INITIAL RELEASE				CUSTOMER		DOCUMENT NUMBER		REVISION	SHEET
INITIAL DRWN	KCHENG06	DATE	2020/04/21	GENERAL MAKRET		2124980150		B2	1 OF 9
INITIAL APPR	XJSONG	DATE	2020/04/21						

2.4GHZ CABLED ON-METAL BALANCE ANTENNA**1.0 SCOPE**

This Product Specification covers the mechanical, electrical and environmental performances specification for 2.4GHz cabled on-metal balance antenna.

2.0 PRODUCT DESCRIPTION**2.1 PRODUCT NAME AND SERIES NUMBER (S)**

Product name: 2.4GHz cabled on-metal balance antenna

Series Number: 212498

2.2 DESCRIPTION

Series 212498 is a slot antenna covering frequency range of 2.4~2.5GHz. A tridimensional FPC ANTENNA with cable and connector extended. Different from other normal antenna on market which require to be mounted on non-metal surface, series 212498 is designed for metal surface application.

2.3 FEATURES

- Antenna Size:20.2x20.2x3.5mm
- Good performance on metal
- Self-adhesive mounted
- Connector options: U.FL & MHF compatible
- Cable OD1.13mm, standard length options (100\150mm)
- Cable and connector can be customized
- RoHS Compliant

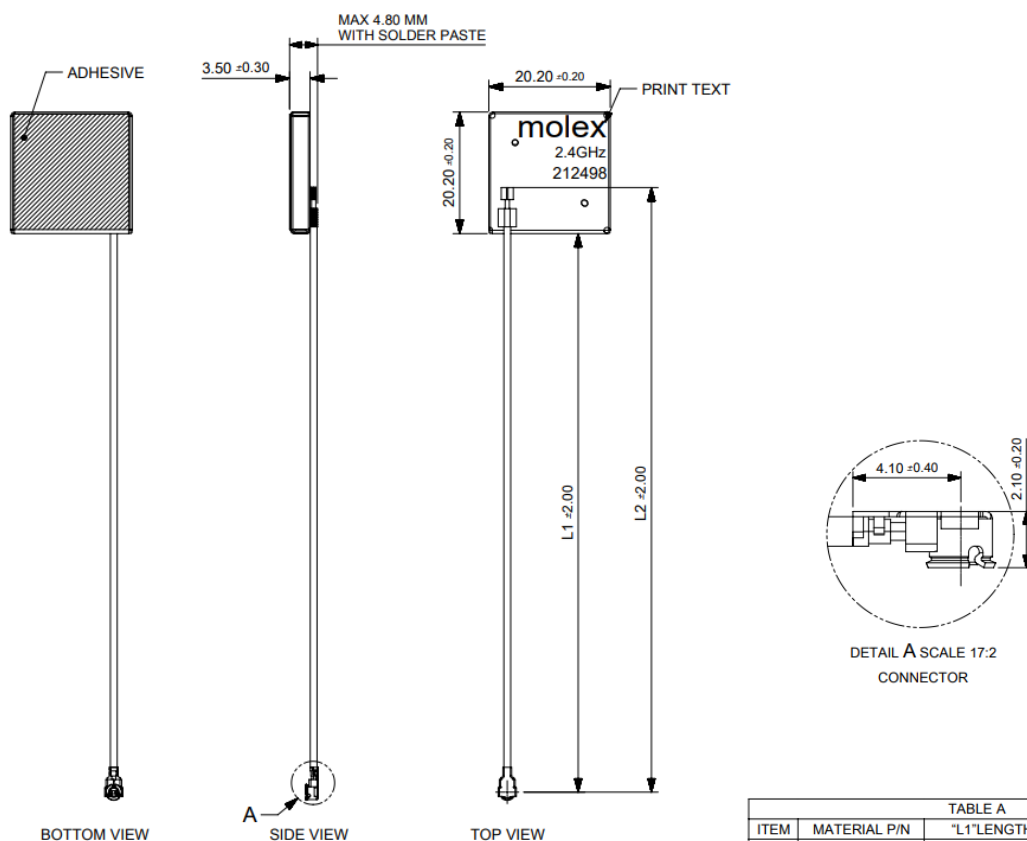


3D VIEW

THIS DOCUMENT CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX ELECTRONIC TECHNOLOGIES, LLC AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION

REVISION DESCRIPTION	REMOVED OBSOLETE PART NUMBERS AS PER PCN#514494			2.4GHZ CABLED ON-METAL BALANCE ANTENNA PRODUCT SPECIFICATION					
CHANGE NO.	770993770993								
REVISED BY	VISHAH2	DATE	2023/11/16	DOC TYPE	DOC TYPE DESCRIPTION		DOC PART	SERIES	
REV APPR BY	GGA	DATE	2023/12/25	PS	PRODUCT SPECIFICATION WORD		001	212498	
INITIAL RELEASE				CUSTOMER		DOCUMENT NUMBER		REVISION	SHEET
INITIAL DRWN	KCHENG06	DATE	2020/04/21	GENERAL MAKRET		2124980150		B2	2 OF 9
INITIAL APPR	XJSONG	DATE	2020/04/21						

2.4 PRODUCT STRUCTURE INFORMATION



NOTES:

1. ANTENNA COLOR:BLACK.
2. CABLE : $\varnothing 1.13\text{mm}$.
3. CONNECTOR MATERIAL:I-PEX MHF I (PLUG GOLD PLATED).
4. ANTENNA ADHESIVE:TESA 68905 (THICKNESS:50um).
5. RELEASE PAPER COLOR:YELLOW.

TABLE A			
ITEM	MATERIAL P/N	"L1"LENGTH	"L2"LENGTH
1	2124980100	92 MM	100 MM
2	2124980150	142 MM	150 MM

Mechanical Structure Information for 212498 Series

THIS DOCUMENT CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX ELECTRONIC TECHNOLOGIES, LLC AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION

REVISION DESCRIPTION	REMOVED OBSOLETE PART NUMBERS AS PER PCN#514494			2.4GHZ CABLED ON-METAL BALANCE ANTENNA PRODUCT SPECIFICATION					
CHANGE NO.	770993770993								
REVISED BY	VISHAH2	DATE	2023/11/16	DOC TYPE	DOC TYPE DESCRIPTION		DOC PART	SERIES	
REV APPR BY	GGA	DATE	2023/12/25	PS	PRODUCT SPECIFICATION WORD		001	212498	
INITIAL RELEASE				CUSTOMER		DOCUMENT NUMBER		REVISION	SHEET
INITIAL DRWN	KCHENG06	DATE	2020/04/21	GENERAL MAKRET		2124980150		B2	3 OF 9
INITIAL APPR	XJSONG	DATE	2020/04/21						

3.0 APPLICABLE DOCUMENTS

DOCUMENT	NUMBER	DESCRIPTION
Sales Drawing (SD)	SD-2124980150	Mechanical Dimension of the product
Application Specification (AS)	AS-2124980150	Antenna Application and surrounding
Packing Drawing (PK)	PK-2124980150	Product packaging specifications

4.0 GENERAL SPECIFICATION

Product name	2.4GHz cabled on-metal balance antenna
Part number	212498 Series
Frequency	2.4GHz-2.485GHz
Polarization	Linear
Operating with matching	-40℃ to 85℃
Storage with matching	-40℃ to 85℃
RF Power	2 Watts
Impedance with matching	50 Ohms
Connector type	U.FL & MHF compatible
User Implementation type	Adhesive TESA 68905
Single weight	1.41g (P/N:2124980100)
	1.56g (P/N:2124980150)
Cable diameter	Ø1.13mm (Black)
Cable length	100mm (P/N:2124980100)
	150mm (P/N:2124980150)

THIS DOCUMENT CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX ELECTRONIC TECHNOLOGIES, LLC AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION

REVISION DESCRIPTION	REMOVED OBSOLETE PART NUMBERS AS PER PCN#514494			2.4GHZ CABLED ON-METAL BALANCE ANTENNA PRODUCT SPECIFICATION					
CHANGE NO.	770993770993								
REVISED BY	VISHAH2	DATE	2023/11/16	DOC TYPE	DOC TYPE DESCRIPTION		DOC PART	SERIES	
REV APPR BY	GGA	DATE	2023/12/25	PS	PRODUCT SPECIFICATION WORD		001	212498	
INITIAL RELEASE				CUSTOMER		DOCUMENT NUMBER		REVISION	SHEET
INITIAL DRWN	KCHENG06	DATE	2020/04/21	GENERAL MAKRET		2124980150		B2	4 OF 9
INITIAL APPR	XJSONG	DATE	2020/04/21						

5.0 ANTENNA SPECIFICATION

All measurements are done of the antenna mounted on the center of reference metal surface which size is 150*100mm with VNA Agilent E5071C and Over-The-Air (OTA) chamber. All measurements in this document are done with the part No.2124980150 with a cable length of 150mm. All tests are based on a plastic plate placed 2.5mm above the antenna.

5.1 ANTENNA PERFORMANCE

5.1.1 ANTENNA PERFORMANCE FOR CABLE LENGTH 100mm

P/N	2124980100
Frequency Range	2.4GHz-2.485GHz
Peak Gain (Max)	3.7 dBi
Total efficiency	>60%
Return Loss	<-6dB

5.1.2 ANTENNA PERFORMANCE FOR CABLE LENGTH 150mm

P/N	2124980150
Frequency Range	2.4GHz-2.485GHz
Peak Gain (Max)	3.6dBi
Total efficiency	>60%
Return Loss	<-6dB

Note that the above antenna performance is measured with the antenna mounted on the center of reference metal surface which size is 150*100mm with VNA Agilent E5071C and Over-The-Air (OTA) chamber. When implement into the system, the frequency resonant might be off-tune due to the loading of surrounding components especially metal plane. This off-tune can be compensated through matching. Although module manufacturers specify a peak gain limit, it is based on free-space conditions. The peak gain will be degraded by 1 to 2dBi in the actual implementation as the radiation pattern will change due to the surround components. As such, during selection of antenna, you can select one with high peak gain to compensate for the loss. Molex can offer assistant to choose the best location and best tuning in-order to meet this peak gain requirement.

THIS DOCUMENT CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX ELECTRONIC TECHNOLOGIES, LLC AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION

REVISION DESCRIPTION	REMOVED OBSOLETE PART NUMBERS AS PER PCN#514494			2.4GHZ CABLED ON-METAL BALANCE ANTENNA PRODUCT SPECIFICATION			
CHANGE NO.	770993770993						
REVISED BY	VISHAH2	DATE	2023/11/16	DOC TYPE	DOC TYPE DESCRIPTION	DOC PART	SERIES
REV APPR BY	GGA	DATE	2023/12/25	PS	PRODUCT SPECIFICATION WORD	001	212498
INITIAL RELEASE				CUSTOMER		DOCUMENT NUMBER	REVISION SHEET
INITIAL DRWN	KCHENG06	DATE	2020/04/21	GENERAL MAKRET	2124980150	B2	5 OF 9
INITIAL APPR	XJSONG	DATE	2020/04/21				

6.0 MECHANICAL SPECIFICATION

DESCRIPTION	TEST CONDITION	TEST RESULT
Pull Test	1. Test Machine: Max intelligent load tester 2. The flexible antenna attached to the plastic plate, the cable pulled to the axial direction.	Pull force >8N
Un-mating force (connector)	Solder the receptacle connector to the test board, then place the board and plug on push-on/pull-off machine, and repeat mating and un-mating 30 cycles at a speed 25±3mm/min. along the mating axis.	Un-mating force : 0.5 kgf min

THIS DOCUMENT CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX ELECTRONIC TECHNOLOGIES, LLC AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION

REVISION DESCRIPTION	REMOVED OBSOLETE PART NUMBERS AS PER PCN#514494			2.4GHZ CABLED ON-METAL BALANCE ANTENNA PRODUCT SPECIFICATION					
CHANGE NO.	770993770993								
REVISED BY	VISHAH2	DATE	2023/11/16	DOC TYPE	DOC TYPE DESCRIPTION		DOC PART	SERIES	
REV APPR BY	GGA	DATE	2023/12/25	PS	PRODUCT SPECIFICATION WORD		001	212498	
INITIAL RELEASE				CUSTOMER		DOCUMENT NUMBER		REVISION	SHEET
INITIAL DRWN	KCHENG06	DATE	2020/04/21	GENERAL MAKRET		2124980150		B2	6 OF 9
INITIAL APPR	XJSONG	DATE	2020/04/21						

7.0 ENVIRONMENTAL SPECIFICATION

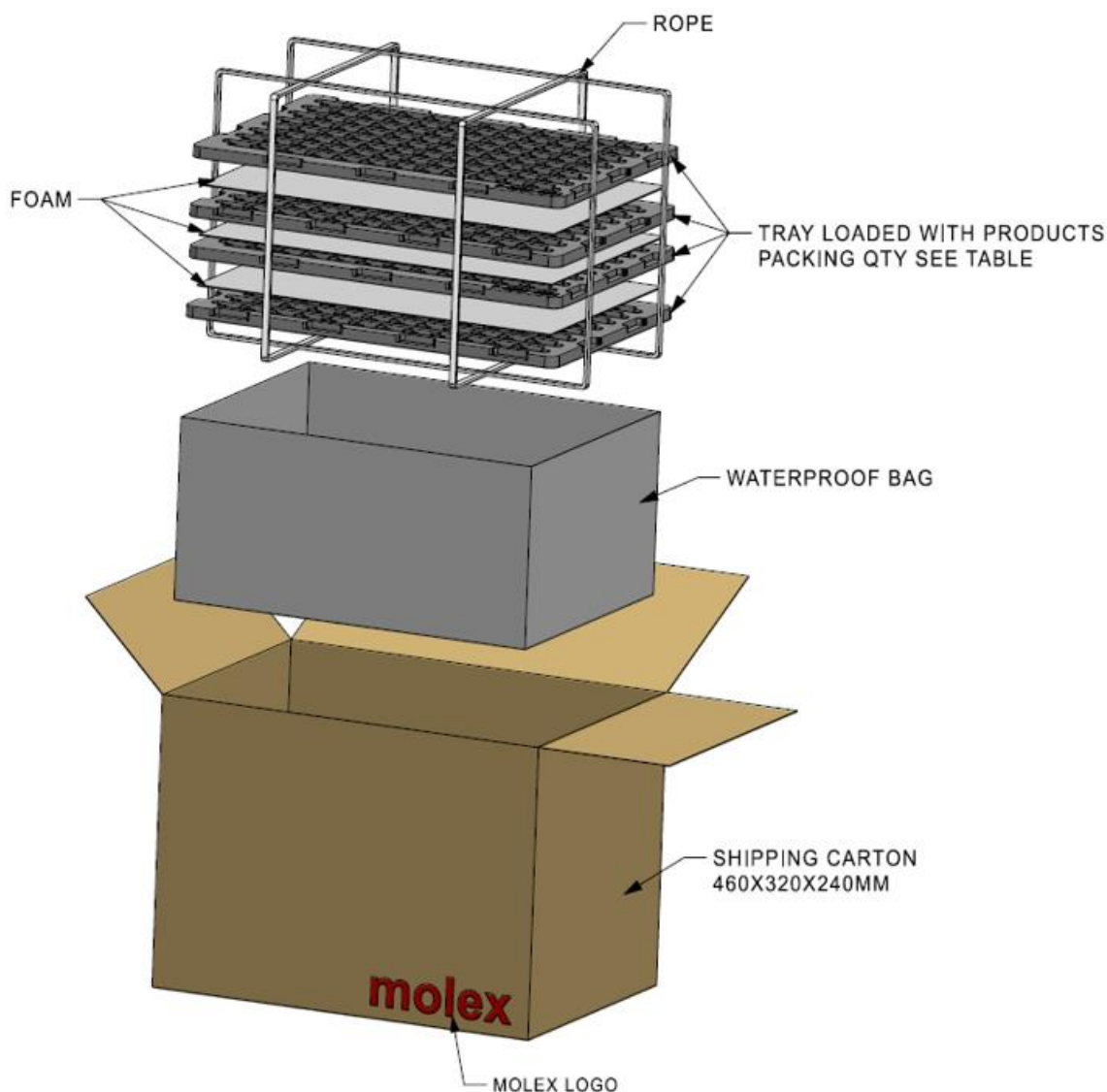
DESCRIPTION	SPECIFICATION
High Temperature	- Temperature: 85°C ($\pm 2^\circ\text{C}$), Time: 240h. - Appearance: No anomalies impairing function. After testing, the function meets the requirements.
Low Temperature	- Temperature: -40°C ($\pm 3^\circ\text{C}$), Time: 240h. - Appearance: No anomalies impairing function. After testing, the function meets the requirements.
High Humidity & High Temperature	- Temperature: 85°C ($\pm 2^\circ\text{C}$), Humidity: 85%, Time: 96h. - Appearance: No anomalies impairing function. After testing, the function meets the requirements.
Salt Spray Test	- NaCl solution Concentration: 5$\pm$1 % Spray time: 48$\pm$4h Ambient temperature: 35$\pm$2 °C . - Appearance: No anomalies impairing function. After testing, the function meets the requirements. - Discoloration accepted.
Temperature Cycling	- The device under test is kept for 30 mins in an environment with a temperature of -40 °C. - Kept for 4 Hours in an environment with a temperature of 85 °C. - Kept for 2 Hours in an environment with a temperature of 125 °C. - The cycle is repeated until a total of 40 cycles have been completed. Hereafter the conditions are stabilized at room temperature. Transfer temperature 8°C per min. - Appearance: No anomalies impairing function. After testing, the function meets the requirements.
Temperature Shock	- The device under test at -40 °C -125 °C by 100 cycles, Dwell of 30 mins, transition time between Dwell 30 secs (~ 61 mins / cycle) and each item should be measured after exposing them in normal temperature and humidity for 24 h. - Appearance: No anomalies impairing function. After testing, the function meets the requirements.

THIS DOCUMENT CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX ELECTRONIC TECHNOLOGIES, LLC AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION

REVISION DESCRIPTION	REMOVED OBSOLETE PART NUMBERS AS PER PCN#514494			2.4GHZ CABLED ON-METAL BALANCE ANTENNA PRODUCT SPECIFICATION					
CHANGE NO.	770993770993								
REVISED BY	VISHAH2	DATE	2023/11/16	DOC TYPE	DOC TYPE DESCRIPTION		DOC PART	SERIES	
REV APPR BY	GGA	DATE	2023/12/25	PS	PRODUCT SPECIFICATION WORD		001	212498	
INITIAL RELEASE				CUSTOMER		DOCUMENT NUMBER		REVISION	SHEET
INITIAL DRWN	KCHENG06	DATE	2020/04/21	GENERAL MAKRET		2124980150		B2	7 OF 9
INITIAL APPR	XJSONG	DATE	2020/04/21						

8.0 PACKING

PRODUCT P/N	PARTS PER TRAY	TOTAL TRAY PER CARTON	TOTAL PARTS PER SHIPPING CARTON
2124980100	96 PCS	15+1	1440 PCS
2124980150	96 PCS	15+1	1440 PCS



NOTES:

1. PUT THE BUNDLED TRAYS INTO WATERPROOF BAGS AND THEN INTO CARTONS.
2. PRODUCTS MUST BE PACKED IN CARTONS AND SEALED UP WITH TAPE.
3. STICK LABEL WITH PART NUMBER AND DATE CODE.
4. STANDARD PACKAGING QUANTITY: SEE TABLE.
5. THIS PACKAGING SPECIFICATION TO BE USED FOR "2.4GHZ ON FULL METAL CABLED ANTENNA."

Packaging information for 212498 Series

THIS DOCUMENT CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX ELECTRONIC TECHNOLOGIES, LLC AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION

REVISION DESCRIPTION	REMOVED OBSOLETE PART NUMBERS AS PER PCN#514494			2.4GHZ CABLED ON-METAL BALANCE ANTENNA PRODUCT SPECIFICATION					
CHANGE NO.	770993770993								
REVISED BY	VISHAH2	DATE	2023/11/16	DOC TYPE	DOC TYPE DESCRIPTION		DOC PART	SERIES	
REV APPR BY	GGA	DATE	2023/12/25	PS	PRODUCT SPECIFICATION WORD		001	212498	
INITIAL RELEASE				CUSTOMER		DOCUMENT NUMBER		REVISION	SHEET
INITIAL DRWN	KCHENG06	DATE	2020/04/21	GENERAL MAKRET		2124980150		B2	8 OF 9
INITIAL APPR	XJSONG	DATE	2020/04/21						

REV	DATE	DESCRIPTION
A	2020/04/20	First Release
B	2020/07/15	Update product name
B1	2023/06/16	Update 7.0 environmental specification information
B2	2023/11/16	REMOVED OBSOLETE PART NUMBERS AS PER PCN#514494

THIS DOCUMENT CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX ELECTRONIC TECHNOLOGIES, LLC AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION

REVISION DESCRIPTION	REMOVED OBSOLETE PART NUMBERS AS PER PCN#514494			2.4GHZ CABLED ON-METAL BALANCE ANTENNA PRODUCT SPECIFICATION					
CHANGE NO.	770993770993								
REVISED BY	VISHAH2	DATE	2023/11/16	DOC TYPE	DOC TYPE DESCRIPTION		DOC PART	SERIES	
REV APPR BY	GGA	DATE	2023/12/25	PS	PRODUCT SPECIFICATION WORD		001	212498	
INITIAL RELEASE				CUSTOMER		DOCUMENT NUMBER		REVISION	SHEET
INITIAL DRWN	KCHENG06	DATE	2020/04/21	GENERAL MAKRET		2124980150		B2	9 OF 9
INITIAL APPR	XJSONG	DATE	2020/04/21						