TITLE

MOLEX ON-METAL EXTERNAL WI-FI DUAL-BAND ANTENNA

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MOLEX ON-METAL EXTERNAL WI-FI DUAL-BAND ANTENNA

1.0 SCOPE

This Product Specification covers the mechanical, electrical and environmental performances specification for Molex On-Metal External Wi-Fi Dual-Band Antenna.

2.0 PRODUCT DESCRIPTION

2.1 PRODUCT NAME AND SERIES NUMBER (S)

Product name: Molex On-Metal External Wi-Fi Dual-Band Antenna

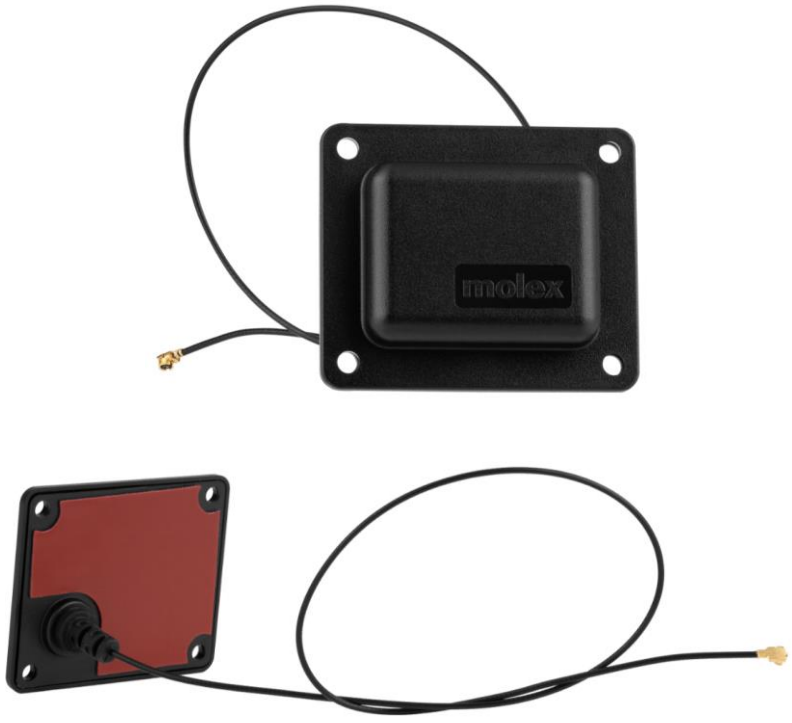
Series Number: 215868 Series

2.2 DESCRIPTION

Series 215868 is an external antenna covering frequency range of 2.4~2.5GHz and 5.15~5.85GHz. Series 215868 is designed for the application of mounting on the metal surface and providing excellent RF performance.

2.3 FEATURES

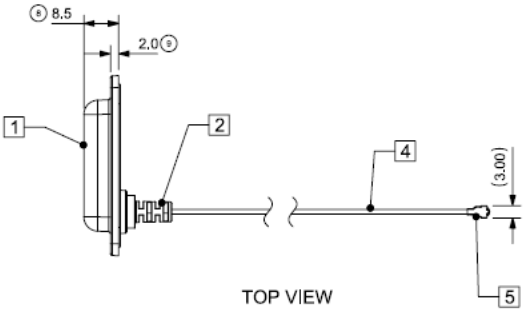
- Antenna Size:44x37x8.5mm
- Good performance on metal
- Self-adhesive mounted
- Connector options: U.FL (MHF compatible)
- Cable and connector can be customized
- IPX7 waterproof



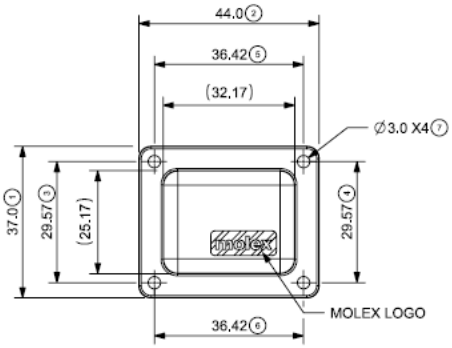
ANTENNA PHOTOGRAPH

2.4 PRODUCT STRUCTURE INFORMATION

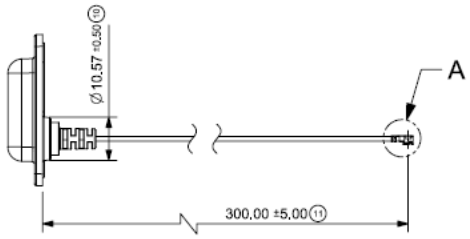
BOM		
ITEM	MATERIAL	DESCRIPTION
1	ANTENNA HOUSING	PC/ABS;COLOR:BLACK
2	SEALING RING	SILICA GEL;COLOR:BLACK
3	ADHESIVE (OPTIONAL)	THICKNESS:0.4MM
4	CABLE	∅1.13MM;COLOR:BLACK
5	CONNECTOR	MHF-I;GOLD PATING



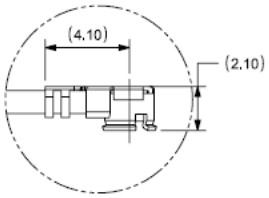
TOP VIEW



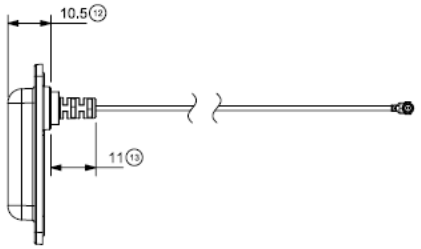
LEFT SIDE VIEW



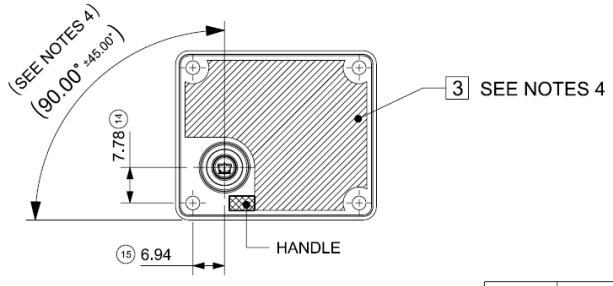
FRONT VIEW



DETAIL A
SCALE 5:1
MHF-I CONNECTOR



BOTTOM VIEW



(COVER CENTER TO HOLE)

RIGHT SIDE VIEW

ITEM	P/N	ADHESIVE
1	2158680001	WITH ADHESIVE
2	2158680011	WITHOUT ADHESIVE

NOTES:
1. MATERIAL:SEE BOM.
2. AFTER RF TEST,PLEASE USE CAP TO PROTECT CONNECTOR.
3. THE CONNECTOR WILL HAVE A ROTATION ANGLE DEVIATION±45˚.
4. IF THE PRODUCT DOES NOT REQUIRE ADHESIVE, CHOOSE MOLEX P/N: 2158680011.

3.0 APPLICABLE DOCUMENTS

DOCUMENT	NUMBER	DESCRIPTION
Sales Drawing (SD)	SD-2158680001	Mechanical Dimension of the product
Application Specification (AS)	AS-2158680001	Antenna Application and surrounding
Packing Drawing (PK)	PK-2158680001	Product packaging specifications

4.0 GENERAL SPECIFICATION

Product name	Molex On-Metal External Wi-Fi Dual-Band Antenna	
Part number	2158680001	2158680011
Frequency	2.4-2.485GHz 5.15-5.85GHz	
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 (T:0.4mm)	Screw fixation
Single weight	7.040g	
Cable diameter	Ø1.13mm (Black)	

5.0 ANTENNA SPECIFICATION

All measurements are done of the antenna mounted on the center of reference metal surface which size is 160mm*112mm with VNA Agilent E5071C and Over-The-Air (OTA) chamber. All measurements in this document are done with the part No.2158680001 with a cable length of 300mm.

5.1 ANTENNA PERFORMANCE

Description	Equipment	Requirement (Cable Length:300mm)	
Frequency Range	VNA E5071C	2.4-2.485GHz	5.15-5.85GHz
Return Loss	VNA E5071C	< -6dB	< -6dB
Peak Gain (Max)	OTA Chamber	1.8dBi	5.5dBi
Average Total Efficiency	OTA Chamber	> 50%	>45%
Polarization	OTA Chamber	Linear	
Input Impedance	VNA E5071C	50 Ohms	

Note that the above antenna performance is measured with the antenna mounted on the center of reference metal surface which size is 160*112mm 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.

6.0 MECHANICAL SPECIFICATION

DESCRIPTION	TEST CONDITION	TEST RESULT
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

7.0 ENVIRONMENTAL SPECIFICATION

DESCRIPTION	SPECIFICATION
Low Temperature Storage	1. Keep test samples in -40±2℃ chamber with 24 hours. 2. No cosmetic problem（No soldering problem；No adhesion problem of glue）
High Temperature Storage	1. Keep test samples in 85±2℃ chamber with 48 hours. 2. No cosmetic problem（No soldering problem；No adhesion problem of glue）
Mechanical Shock	1. Shock accelerated speed: a=500±10% m/S2， 2. Time input: t=6 ms, Test 10 times each in six axis（X,Y,Z,-X,-Y,-Z）Mechanical and Function in spec after test 3. Mechanical and Function in spec after test.
High Humidity Test	1. Test temperature：40±2℃，humidity:95%RH，time: 96Hours. 2. No cosmetic problem（No soldering problem；No adhesion problem of glue）
Salt Mist	1. NACL concentration:5%±1%; Temperature:35±2℃; PH Range:6.5-7.2, Salt fog deposition:1-2ml/(80cm2•h), Time:48h 2. No visible corrosion. 3. Discoloration acceptable
Humidity Test	1. Test temperature：40±2℃，humidity：95%，time：96h 2. No cosmetic problem（No soldering problem；No adhesion problem of glue）

Thermal Cycle	1. Test steps: • Temperature High: +85°C, uncontrolled humidity • Temperature Low: -40°C, uncontrolled humidity • Ramp Rate: 20°C / min. • Dwell Time: 23 minutes at High and Low temperatures Close to 60 min /cycle. Repeat 30cycles. 2. No cosmetic problem（No soldering problem；No adhesion problem of glue）

8.0 CHANGE HISTORY

REV	DATE	DESCRIPTION
A	2020/09/14	First Release
A1	2021/04/28	Add material p/n:2158680011 (Antenna without adhesive)