TAOGLAS



Datasheet

Magma AL100

Part No:
AL100.301111

Description:

Active L-Band IP67 External Magnetic Mount Antenna with 3m RG-174 SMA(M)

Features:

L-Band Coverage (1525-1560MHz)
High Performance Magnetic Mounting
Cable: 3m of RG-174
Connector: SMA(M)
RoHS & Reach Compliant

Downloaded from Arrow.com.

1.	Introduction	3
2.	Specifications	4
3.	Antenna Characteristics	6
4.	LNA Characteristics	10
5.	Radiation Patterns	12
6.	Mechanical Drawing	16
7.	Packaging	17
	Changelog	18

Taoglas makes no warranties based on the accuracy or completeness of the contents of this document and reserves the right to make changes to specifications and product descriptions at any time without notice. Taoglas reserves all rights to this document and the information contained herein.

Reproduction, use or disclosure to third parties without express permission is strictly prohibited.

Downloaded from Arrow.com.

1. Introduction



The Taoglas Magma AL100 is a high-performance active L-Band, external magnetic mount, SatCom antenna. Engineered with high gain and high efficiency on the L-Band (1525 to 1560MHz), it is used as an additional feed to provide data to correct, or augment, traditional GNSS signals. The L-band is leveraged as a low-cost alternative to traditional RTK services and is perfect for applications where there is limited or no terrestrial cellular connectivity and RTK is not an option.

Typical applications include:

- Fleet Management and Telematics
- Asset Tracking and Navigation
- Precision Agriculture
- Autonomous Robotics

This compact antenna exhibits excellent radiation patterns on L-Bands and with a low noise figure to preserve signal quality helps minimize time to first fix. It also features excellent out-of-band rejection to prevent out-of-band signals from overdriving or damaging its LNAs. The AL100 has been tuned and tested on a 70x70 mm ground plane, working at GPS L-Band center frequency of 1542 MHz, with a 2 stage LNA ensuring good signal strength. It can operate with an input voltage ranging from 1.8 to 5 volts.

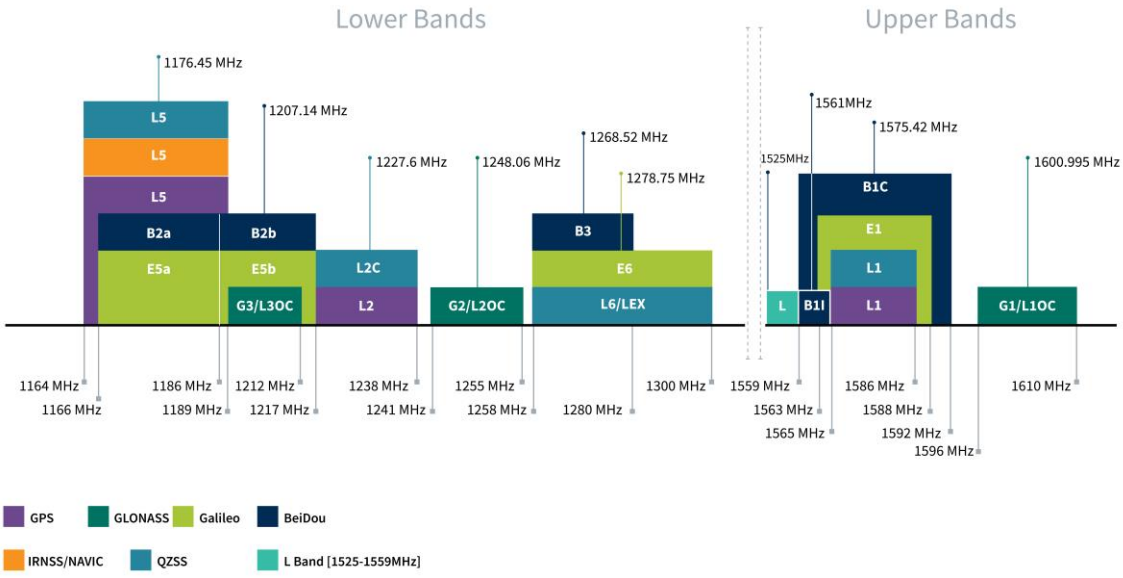
For embedded application, the Taoglas ALPDF254 is an alternative active patch antenna supplied with cable and connector for easy integration into an IoT device.

The cable length and connectors on the AL100 are fully customizable. Contact your regional Taoglas customer support team to request these services or additional support to integrate and test this antenna's performance in your device.

Downloaded from Arrow.com.

2. Specifications

GNSS Frequency Bands					
GPS	L1 1575.42 MHz	L2 1227.6 MHz	L5 1176.45 MHz		
	☐	☐	☐		
GLONASS	G1 1602 MHz	G2 1248 MHz	G3 1207 MHz		
	☐	☐	☐		
Galileo	E1 1575.24 MHz	E5a 1176.45 MHz	E5b 1201.5 MHz	E6 1278.75 MHz	
	☐	☐	☐	☐	
BeiDou	B1C 1575.42 MHz	B1I 1561 MHz	B2a 1176.45 MHz	B2b 1207.14 MHz	B3 1268.52 MHz
	☐	☐	☐	☐	☐
L-Band	L-Band 1542 MHz				
	■				
QZSS (Regional)	L1 1575.42 MHz	L2C 1227.6 MHz	L5 1176.45 MHz	L6 1278.75e6	
	☐	☐	☐	☐	
IRNSS (Regional)	L5 1176.45 MHz				
	☐				
SBAS	L1/E1/B1 1575.42 MHz	L5/B2a/E5a 1176.45 MHz	G1 1602 MHz	G2 1248 MHz	G3 1207 MHz
	☐	☐	☐	☐	☐



GNSS Bands and Constellations

Downloaded from Arrow.com.

GNSS Electrical	
Frequency (MHz)	**L-Band 1525-1559MHz**
Efficiency (%)	62.7
Peak Gain (dBi)	2.95
Average Gain (dB)	-2.03
Axial Ratio at Zenith	3 typ.
Polarization	RHCP
Impedance	50 Ω
Radiation Pattern	Directional

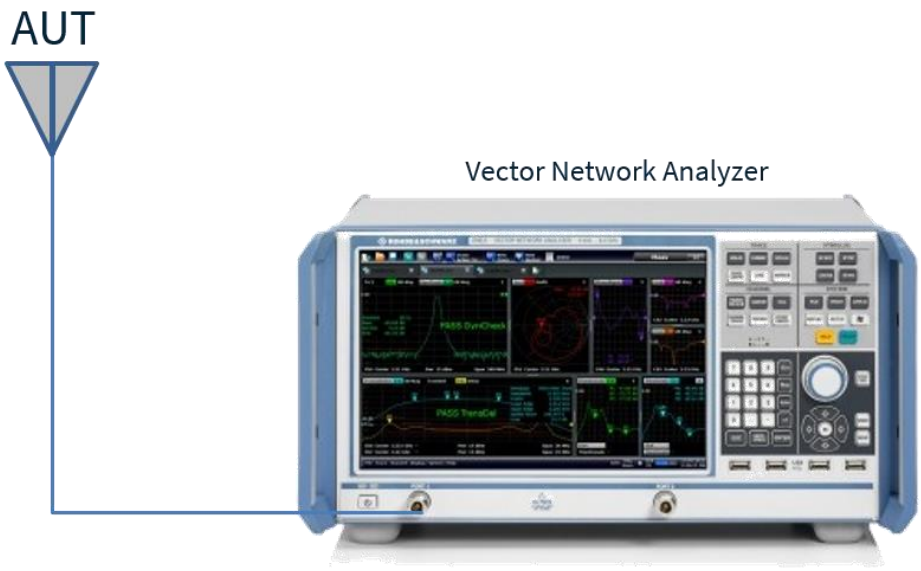
LNA and Filter Electrical Properties	
Frequency (MHz)	**L-Band 1525-1559MHz**
VSWR(max)	2:1
Gain@1.8V (Typ.) (dB)	28.4
Noise@3.0V (Typ.) (dB)	2
Out Band Rejection@1.8V (Typ.) (dB)	>60
Power consumption@1.8V ~5V (mA)	4.9

Mechanical	
Housing Dimensions	49.8*52.4*17.1mm
Housing Material	ABS
Cable	3m RG-174 (fully customizable)
Connector	SMA(M) (fully customizable)
Waterproof	IP67
Weight	98g

Environmental	
Operation Temperature	-40°C ~ +85°C
Storage Temperature	-40°C ~ +90°C
Humidity	Non-condensing 65°C 95% RH

Downloaded from Arrow.com.

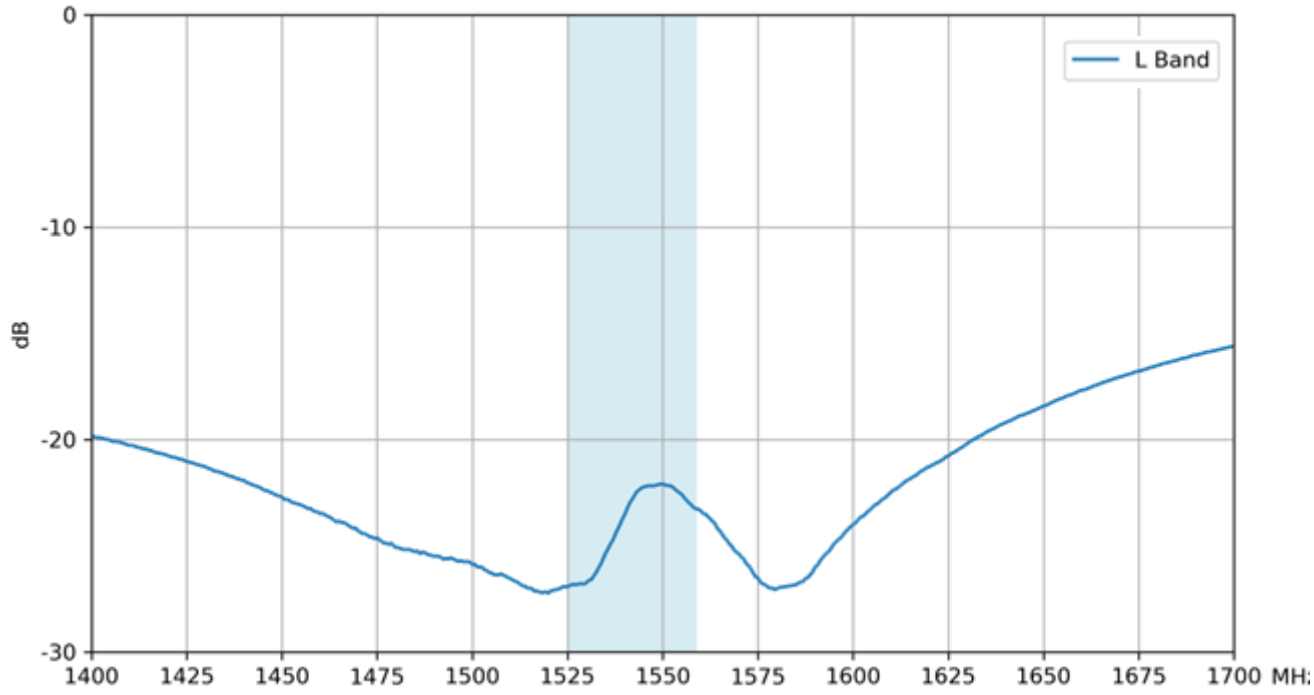
3. Antenna Characteristics



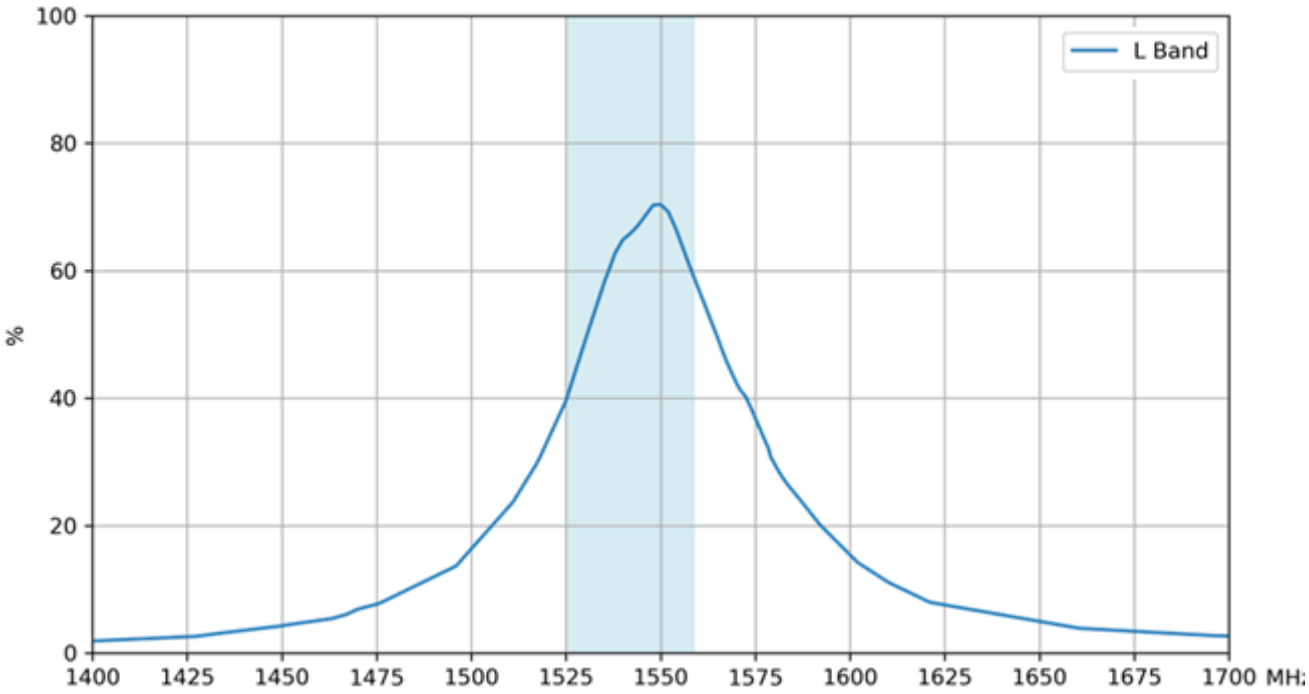


Downloaded from Arrow.com.

3.1 Return Loss

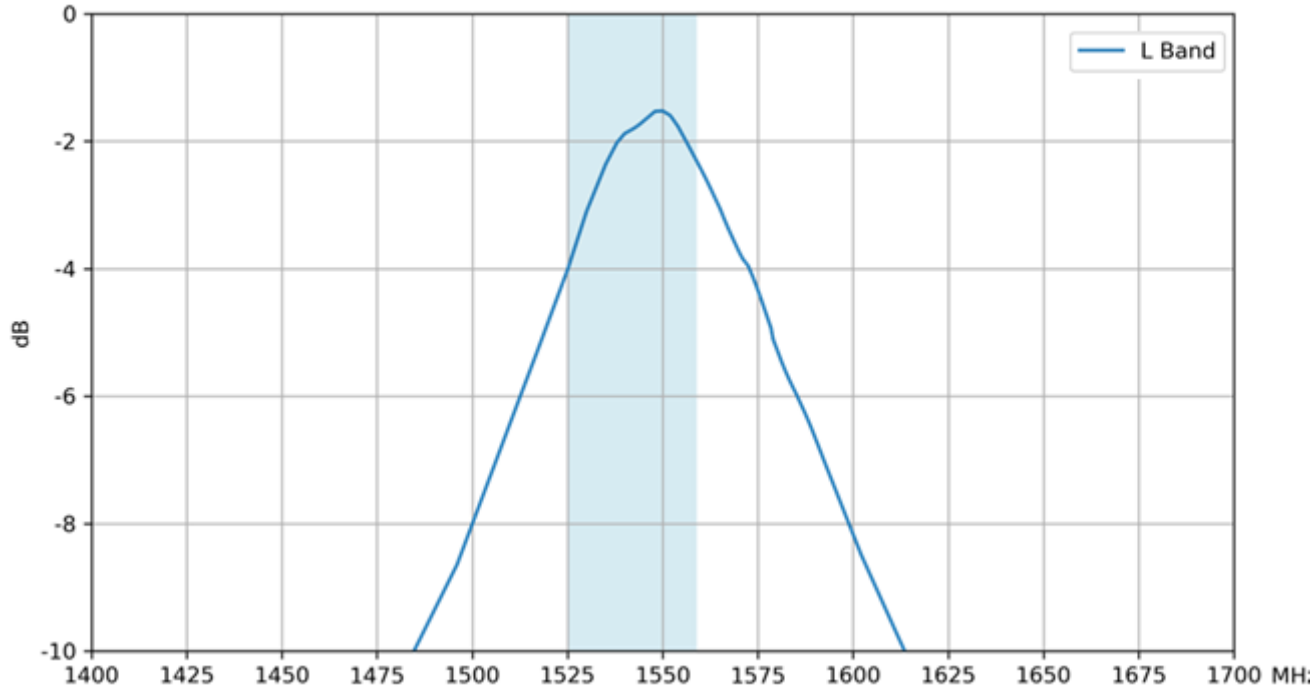


3.2 Efficiency

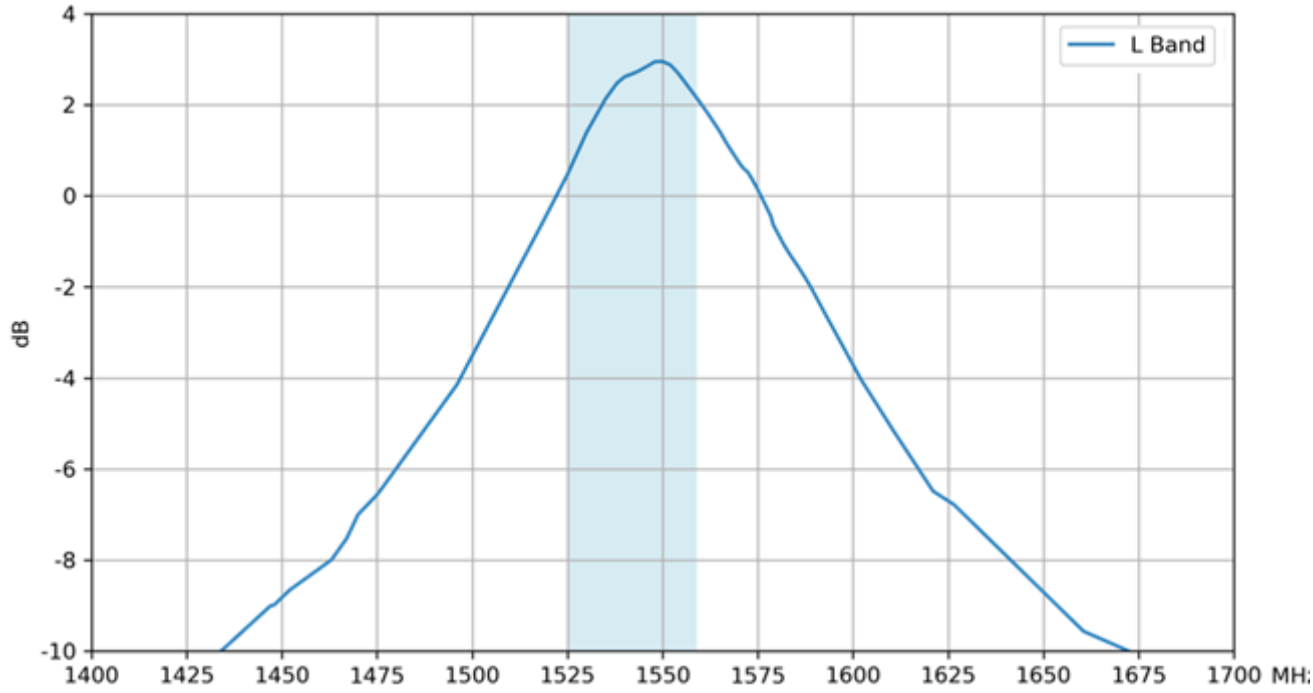


Downloaded from Arrow.com.

3.3 Average Gain

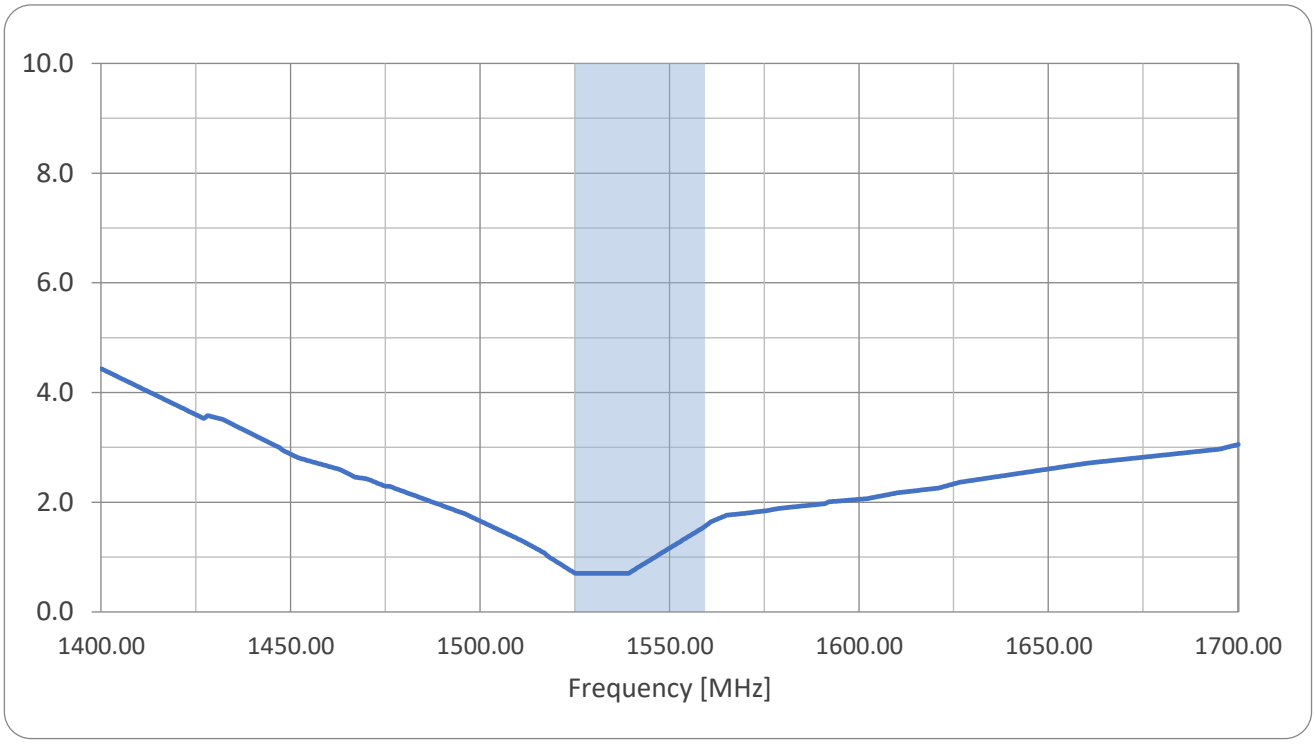


3.4 Peak Gain



Downloaded from Arrow.com.

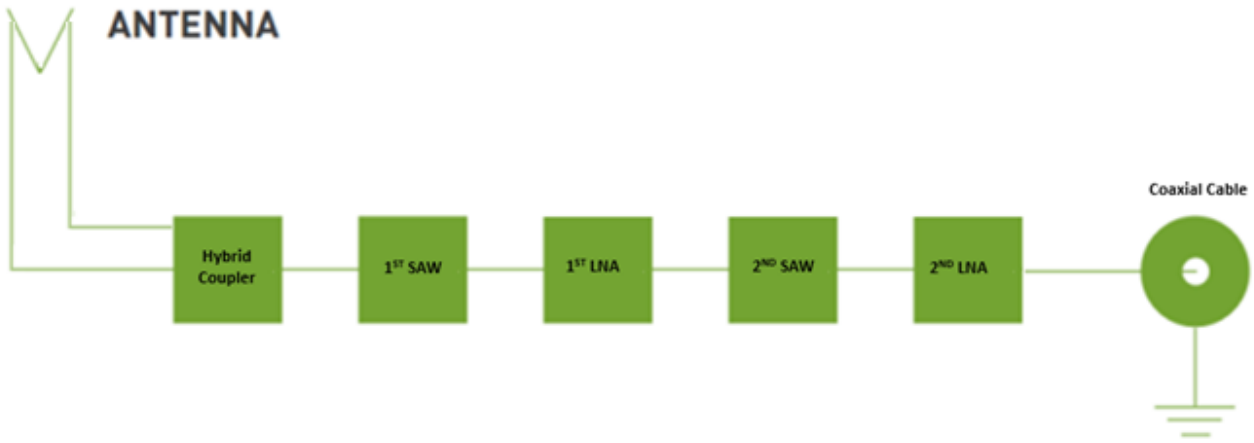
3.5 Axial Ratio XZ



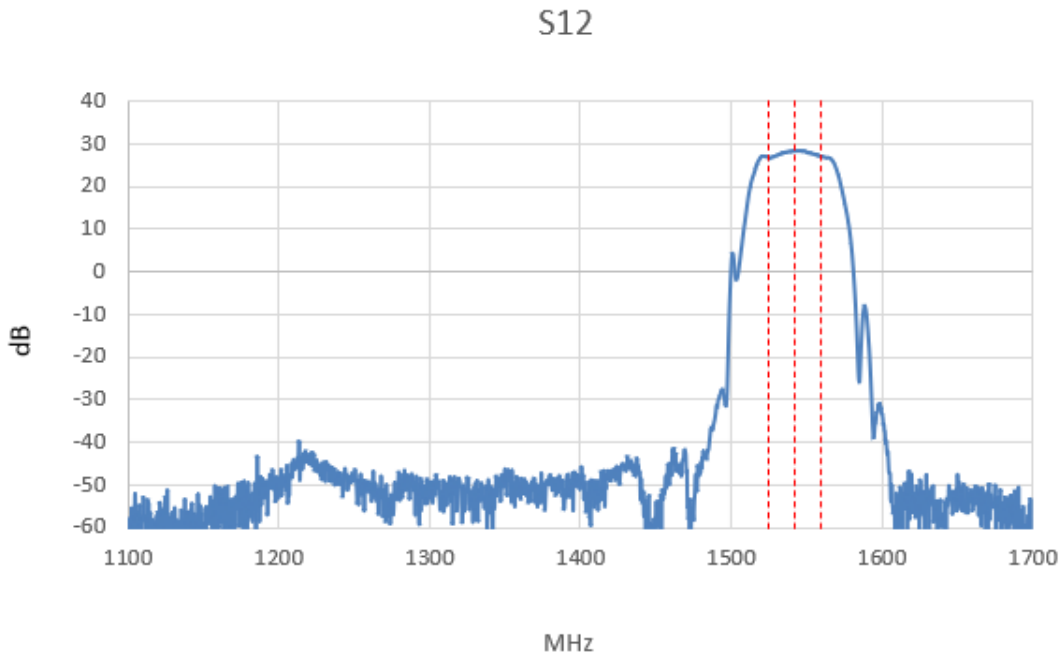
Downloaded from Arrow.com.

4. LNA Characteristics

4.1 LNA Block Diagram (Active Antenna)

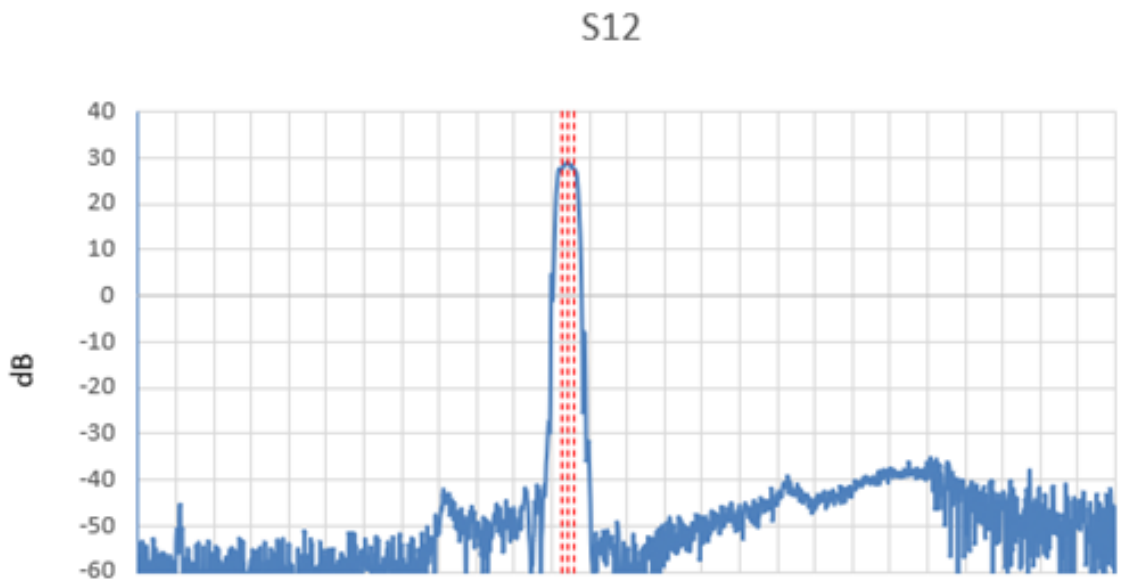


4.2 LNA Gain

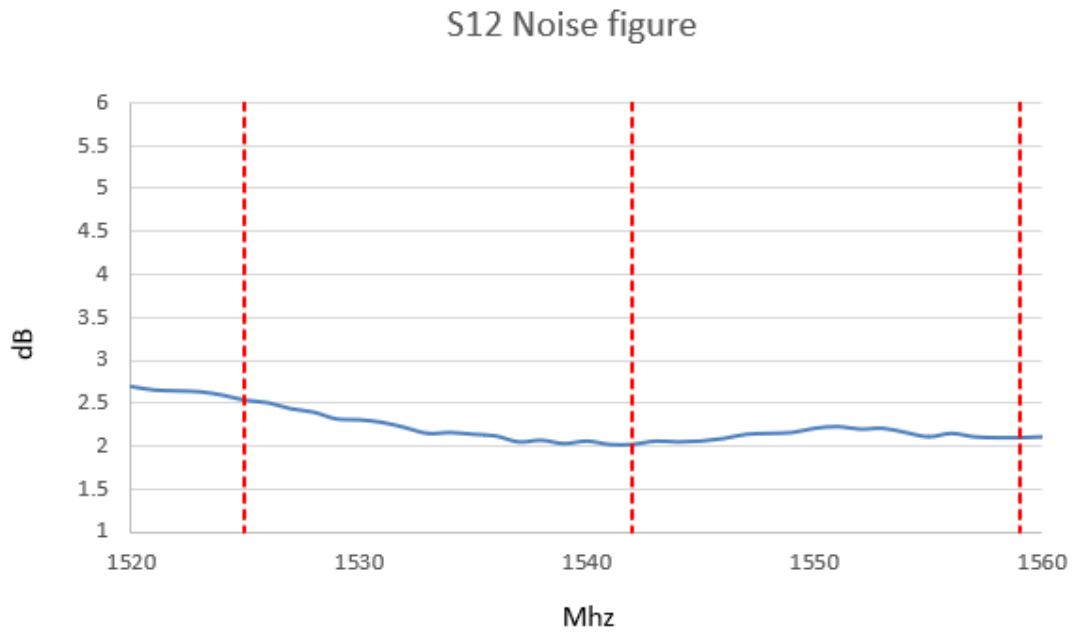


Downloaded from Arrow.com.

4.3 Out Band Rejection



4.4 Noise figure



Downloaded from Arrow.com.

5. Radiation Patterns

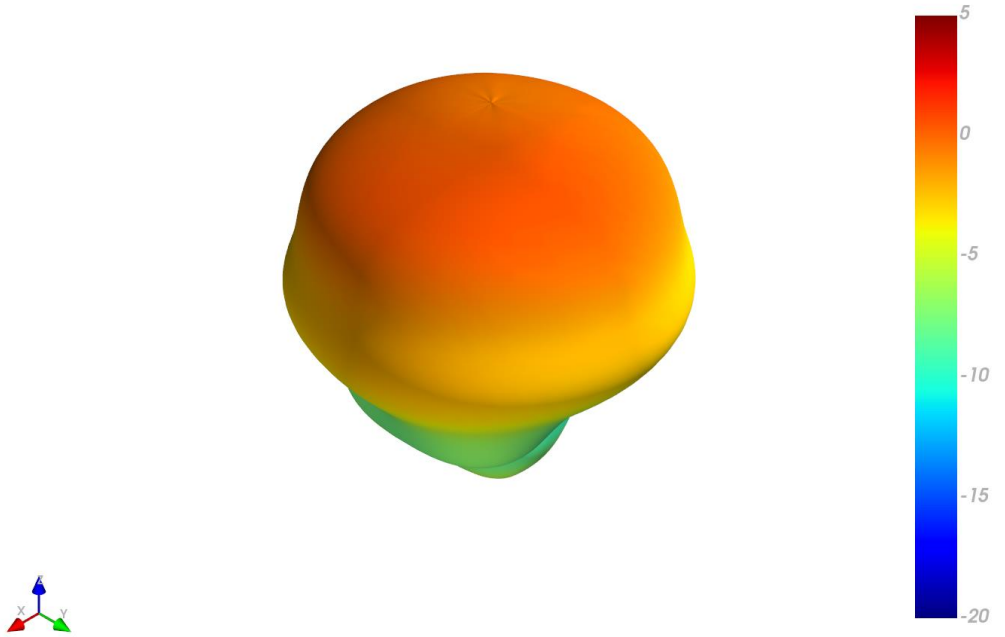
5.1 Test Setup

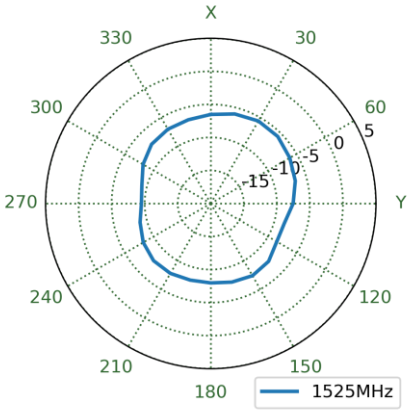
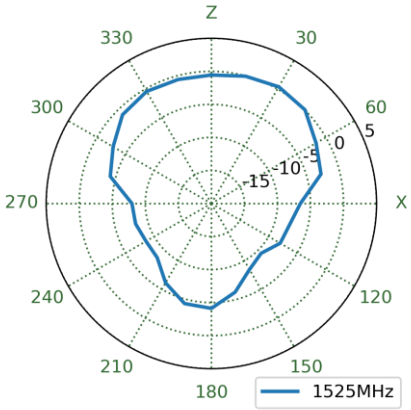
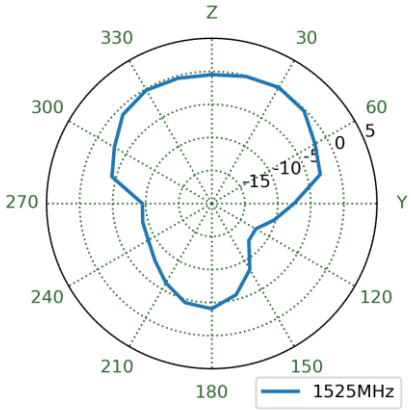


Downloaded from Arrow.com.

5.2 3D and 2D Radiation Patterns

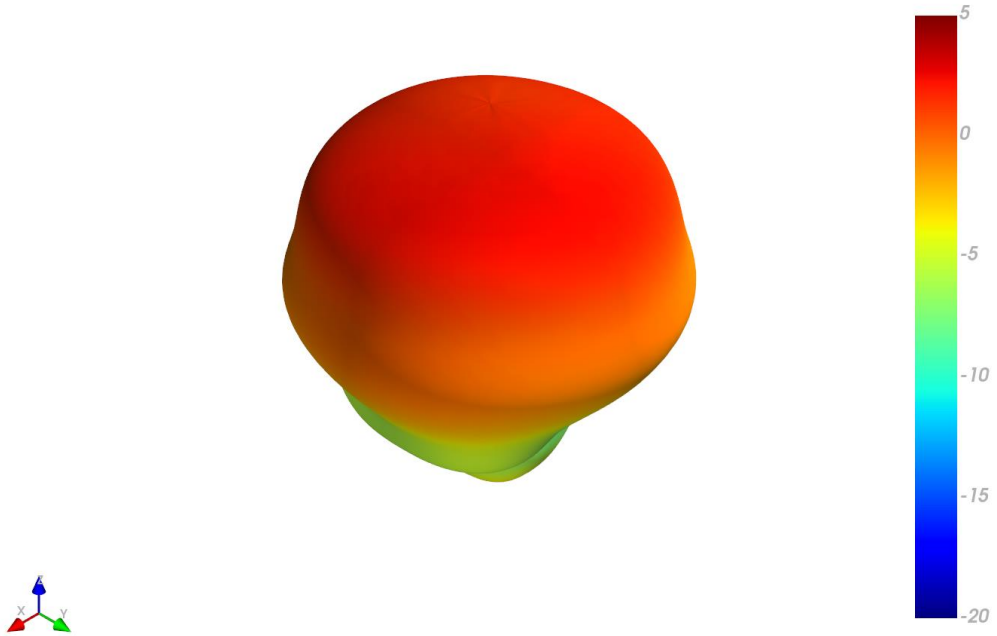
1525 MHz



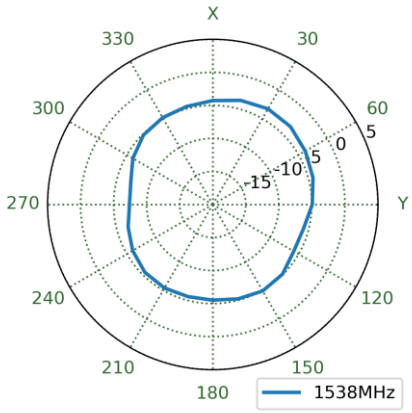
XY Plane	XZ Plane	YZ Plane
		

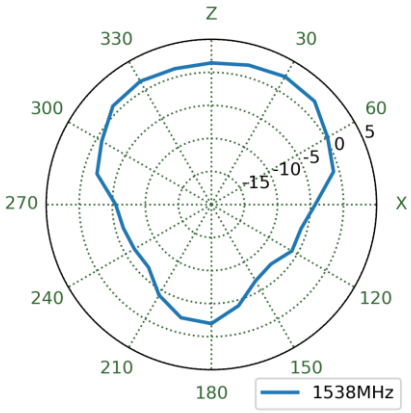
Downloaded from Arrow.com.

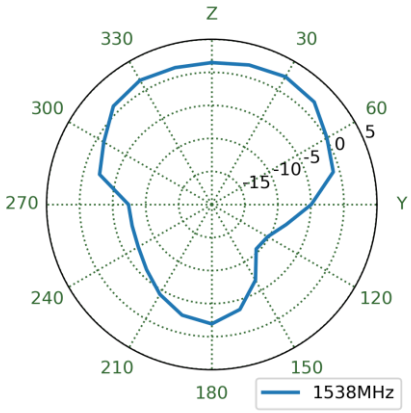
1538 MHz



XY Plane	XZ Plane	YZ Plane

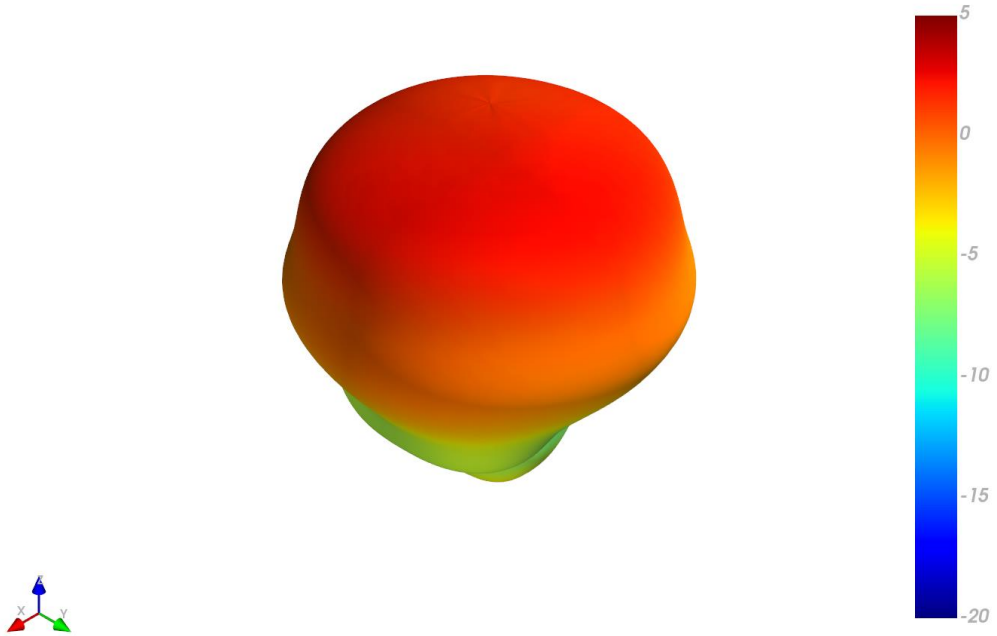




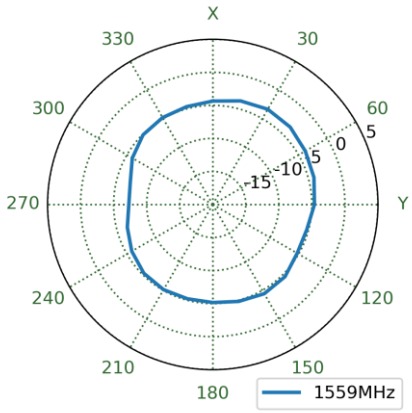


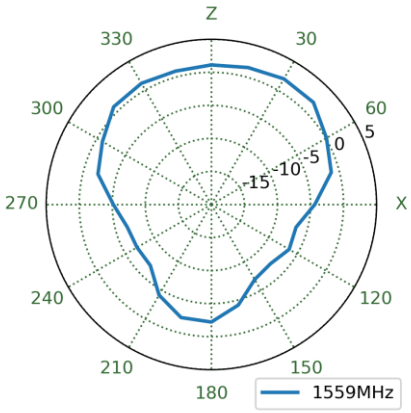
Downloaded from Arrow.com.

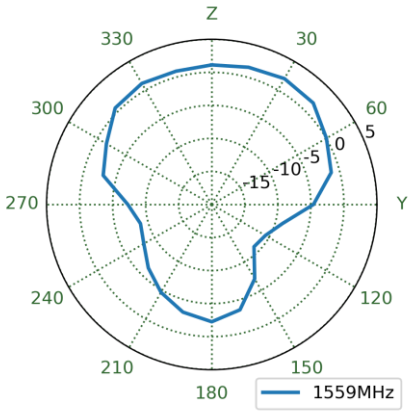
1559 MHz



XY Plane	XZ Plane	YZ Plane



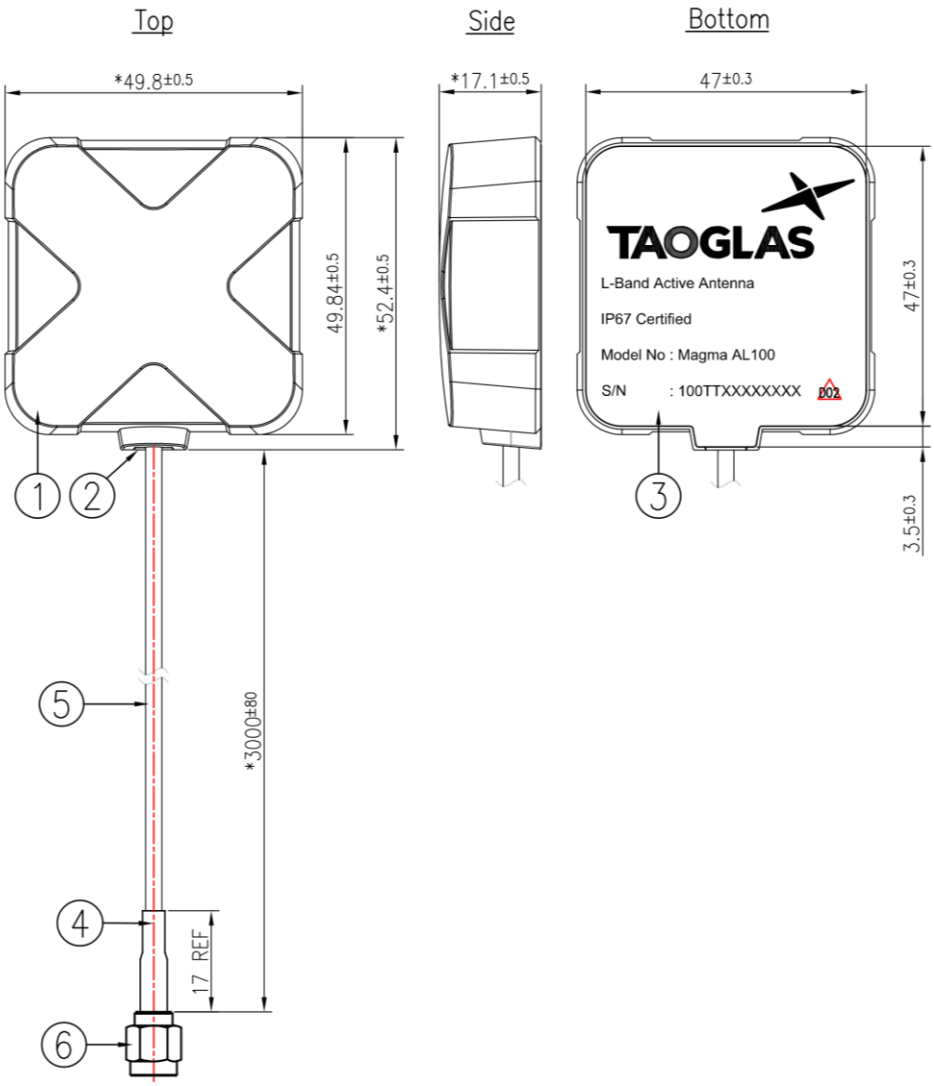




Downloaded from Arrow.com.

6. Mechanical Drawing (Units: mm)

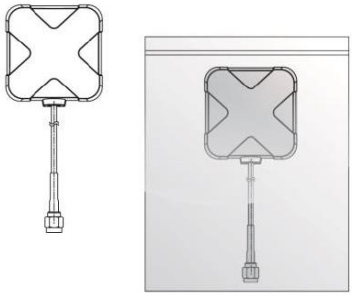
ISO NO.: EDW-23-8-0964
STATE: Release
NOTES:
1. All material must be RoHS compliant.
2. Color Codes: PANTONE Black / Plastics Color Q728-1-1.
3. Finish: Mirror Polish / SPI A-2.
4. Deburring: Less than 0.02mm.
5. No gate, parting line and any other tooling marks on appearance of product.
6. Once product have any crack/break/thread damage or any structural tooling issue, molding supplier need to correct the issue unconditionally.
7. Use this drawing together with the corresponding 3D CAD database file to fully describe the part.
8. The connector orientation has fixed position to the antenna as per drawing.
9. Double Sided Adhesive Area :
10. "*" Critical Dimensions.



	Name	Material	Finish	QTY
1	Housing Top	ABS	Black	1
2	Housing Bottom	ABS	Black	1
3	Sticker Bottom	PET	Silver	1
4	Heat Shrink Tube	PE	Black	1
5	RG174 Coaxial Cable	PVC	Black	1
6	SMA(M)ST	Brass	Au Plated	1

Downloaded from Arrow.com.

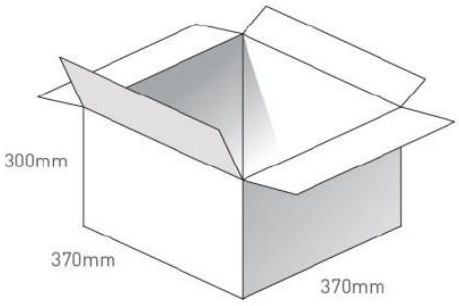
7. Packaging



1 pcs AL100.301111 per PE Bag
SPQ: 10pcs AL100.301111 PE Bag



100pcs AL100.301111 per Carton
Carton Dimensions-370*370*300mm



Downloaded from Arrow.com.

Changelog for the datasheet

SPE-24-8-021– AL100.301111

Revision: A (Original First Release)	
Date:	2024-01-30
Notes:	Initial Release
Author:	Cesar Sousa

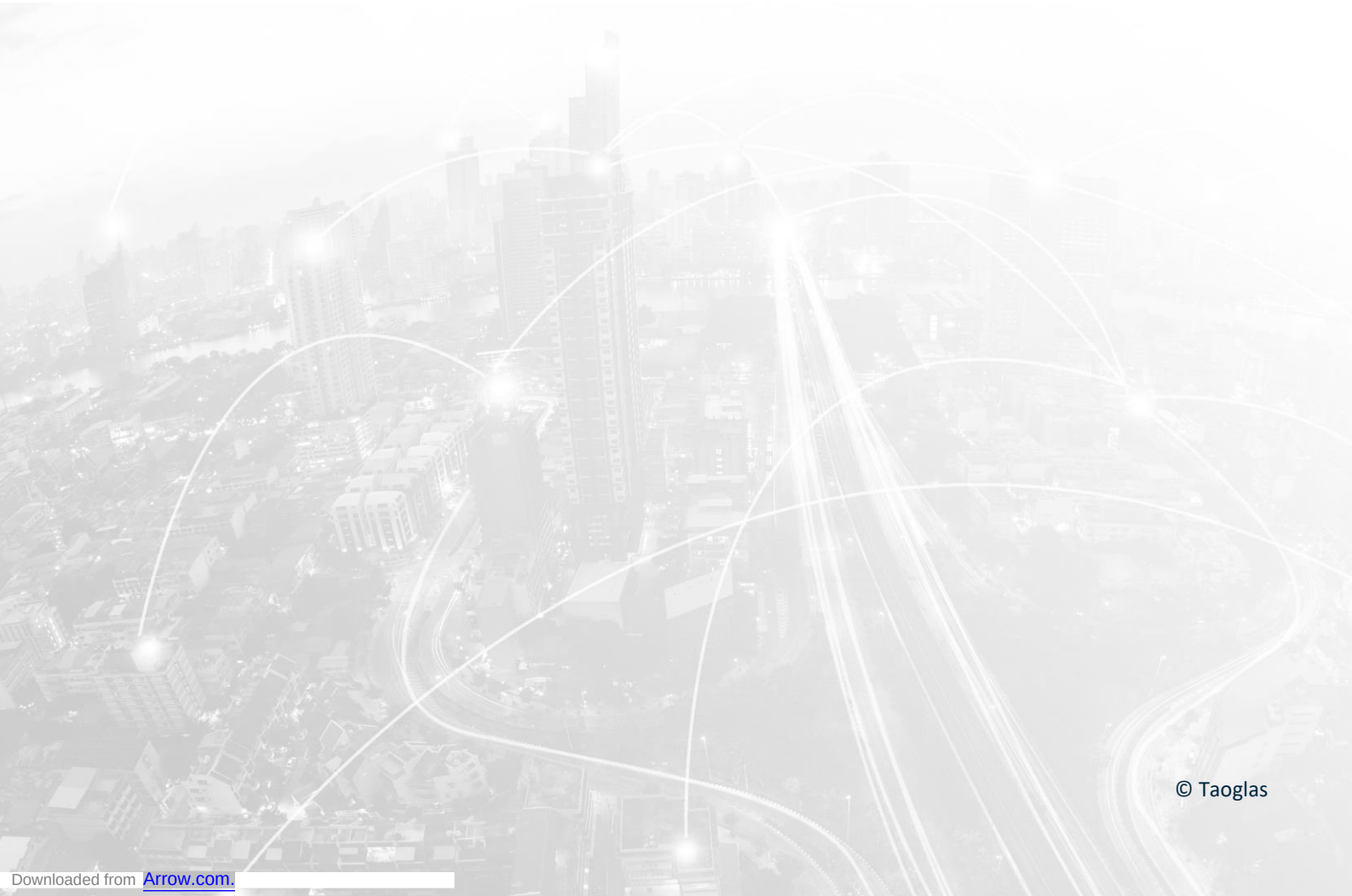
Previous Revisions

Revision:	
Date:	
Changes:	
Changes Made by:	

Downloaded from Arrow.com.

TAOGLAS®

www.taoglas.com



© Taoglas

Downloaded from Arrow.com.