

APPROVAL SHEET

AMANT Series – 3216(1206) – RoHS Compliance

MULTILAYER CERAMIC ANTENNA

Halogens Free Product

2400 ~ 2500 MHz Working Frequency

**Automotive
Qualified to AEC-Q200**

P/N: AMANT3216120A5T

*Contents in this sheet are subject to change without prior notice.

FEATURES

1. Surface Mounted Devices with a small dimension of $3.2 \times 1.6 \times 1.2 \text{ mm}^3$ meet future miniaturization trend.
2. LTCC process
3. High stability in Temperature / Humidity Change

APPLICATIONS

1. 2400 ~ 2500 MHz Working Frequency
2. Bluetooth, Wireless, HomeRF

CONSTRUCTION

Top view



PIN	Connection
1	Feeding
2	Identification Mark
3	Soldering terminal

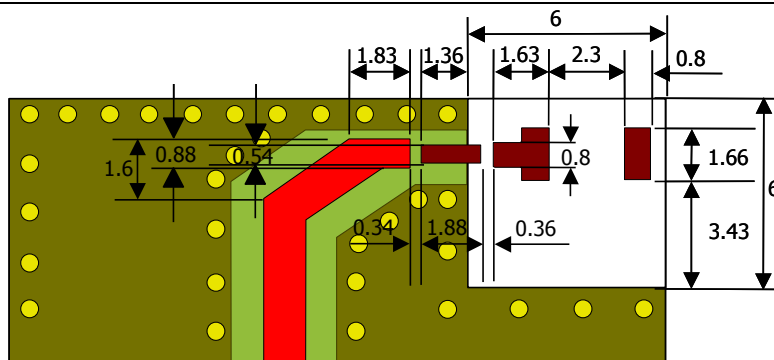
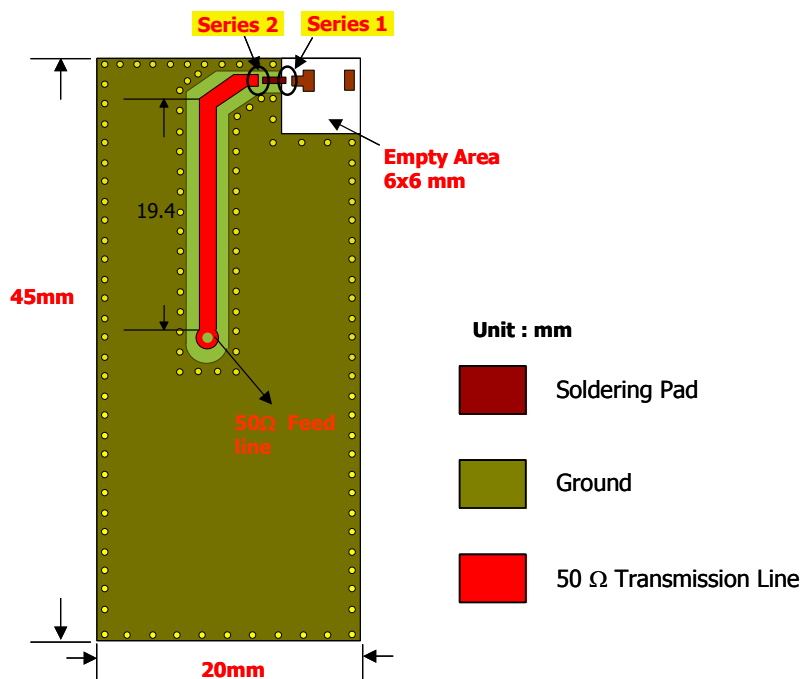
DIMENSIONS

Figure	Symbol	Dimension (mm)
	L	3.20 ± 0.20
	W	1.60 ± 0.10
	T	1.20 ± 0.10
	A	0.25 ± 0.15

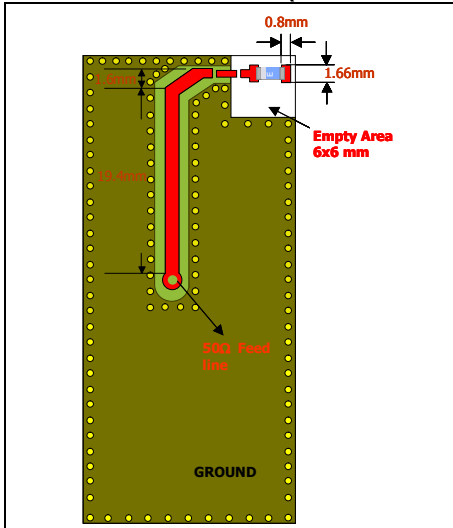
ELECTRICAL CHARACTERISTICS

AMANT3216120A5T		Specification
Working Frequency Range		2400 ~ 2500 MHz
Fc (GHz)		2.9
Gain (dBi)		2 (Typical)
VSWR		2 max.
Matching component value	Series 1	6.8nH
	Series 2	-
Power Capacity		3 W max.
Maximum Input Power		5 Watts for 5 minutes
Polarization		Linear
Azimuth Beamwidth		Omni-directional
Moisture sensitivity levels		MSL is LEVEL 1 (Refer to : IPC/JEDEC J-STD-020)
HBM ESD		Pass 1KV on all pins (Base on AEC-Q200-002)
MM ESD		Pass 200V (Base on EIA/JESD22-A115)
Operating & Storage Condition (Component)		
Operation Temperature Range: -55℃ ~ +125℃		
Storage Temperature Range: -55℃ ~ +125℃		
Storage Condition before Soldering (Included packaging material)		
Storage Temperature Range: +5 ~ +40℃		
Humidity: 30 to 70% relative humidity		

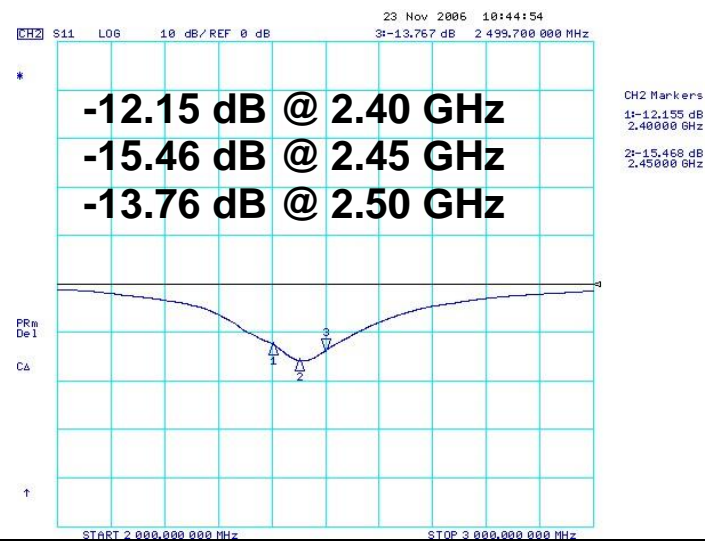
* This frequency must be adjusted to 2.45GHz with matching circuit.

SOLDER LAND PATTERN DESIGN**Figure**

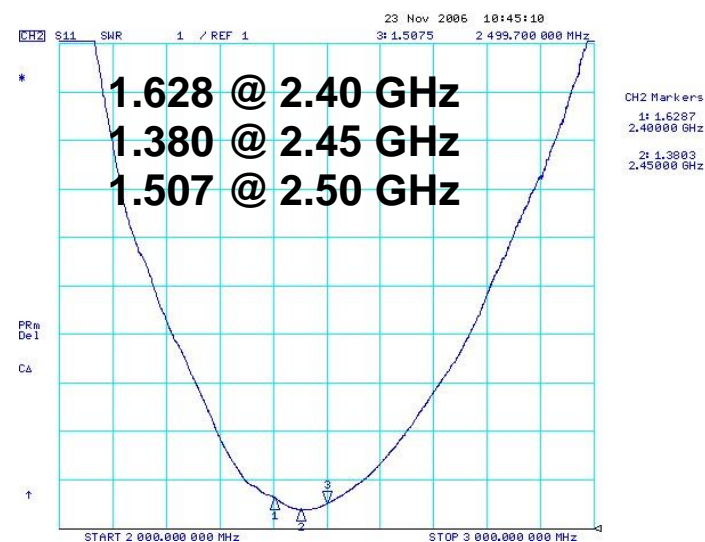
Antenna on Test Board (Thickness 1.2mm)



Antenna S11 on Test Board

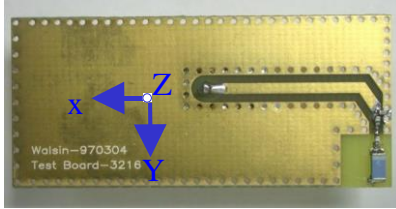


Antenna VSWR on Test Board



RADIATION PATTERN

Radiation Pattern and Gain were dependent on measurement board design. The specification of AMANT3216120A5T antenna was measured based on the PCB size and installation position as shown in the below figure Test Board



	Vertical	Horizontal
Y - Z Plane Average Gain= 0.948 dBi	<p>Peak Gain = 2.93dBi Average Gain = 0.60dBi</p>	<p>Peak Gain= -5.60dBi Average Gain=-10.19dBi</p>
X - Z Plane Average Gain= -2.147 dBi	<p>Peak Gain= -4.98 dBi Average Gain= -9.68dBi</p>	<p>Peak Gain= 1.61 dBi Average Gain= -2.99 dBi</p>
X - Y Plane Average Gain= -2.810 dBi	<p>Peak Gain= -3.79 dBi Average Gain= -8.89dBi</p>	<p>Peak Gain= 0.77 dBi Average Gain= -4.04 dBi</p>

RELIABILITY TEST

TEST	PROCEDURE / TEST METHOD	REQUIREMENT
Resistance to soldering heat (R.S.H) MIL-STD-202 method 210	Un-mounted chips completely immersed for 10±1second in a SAC solder bath at 270°C±5°C	No mechanical damage. Electrical specification shall satisfy the descriptions in electrical characteristics under the operational temperature range within -55 ~ 125°C. Loss of metallization on the edges of each electrode shall not exceed 25
Solderability J-STD-002	* Condition A Un-mounted chips 4hrs / 155°C*dry then completely immersed for 5±0.5 sec in solder bath at 235±5°C. * Condition B Un-mounted chips steam 8 hrs then completely immersed for 10±1 sec. in solder bath at 260+0/-5°C..	All terminations shall exhibit a continuous solder coating free from defects from a minimum of 95% of the critical surface area of any individual termination.
Temperature cycling JESD22 method JA-104	1000 cycles, -55°C ~ +125°C, dwell time 30min	No mechanical damage. Electrical specification shall satisfy the descriptions in electrical characteristics under the operational temperature range within -55 ~ 125°C.
Humidity MIL-STD-202 method 103	1000+48/-0 hours; 85°C, 85% RH	No mechanical damage. Electrical specification shall satisfy the descriptions in electrical characteristics under the operational temperature range within -55 ~ 125°C.
High Temperature Exposure MIL-STD-202 method 108	1000+48/-0 hours; without load in a temperature chamber controlled 125±3°C	No mechanical damage. Electrical specification shall satisfy the descriptions in electrical characteristics under the operational temperature range within -55 ~ 125°C.
Mechanical Shock MIL-STD-202 method 213	1/2 Sine Pulse / 100g Peak / Velocity 12.3ft/sec	No mechanical damage. Electrical specification shall satisfy the descriptions in electrical characteristics under the operational temperature range within -55 ~ 125°C.
Board Flex AEC-Q200-005	RF component mounted on a 90mm glass epoxy resin PCB(FR4), bending once 2mm for 60sec	No mechanical damage. Electrical specification shall satisfy the descriptions in electrical characteristics under the operational temperature range within -55 ~ 125°C.
Adhesive Strength of Termination AEC-Q200-006	*Pressurizing force : 5N (LGA terminal series) for 60 sec ; 5N (≤ 0603) for 60 sec ; 10N (> 0603) for 60 sec.	No remarkable damage or removal of the termination.
Vibration MIL-STD-202 method 204	Test 5g's for 20min., 12 cycles each of 3 orientations	No mechanical damage. Electrical specification shall satisfy the descriptions in electrical characteristics under the operational temperature range within -55 ~ 125°C.
ESD AEC-Q200-002	Test contact 1.0KV (0.5KV for 1005 only)	No mechanical damage. Electrical specification shall satisfy the descriptions in electrical characteristics under the operational temperature range within -55 ~ 125°C.

SOLDERING CONDITION

Typical examples of soldering processes that provide reliable joints without any damage are given in Fig 2
 This product could sustain by reflow process three times, and the temperature below 260°C.

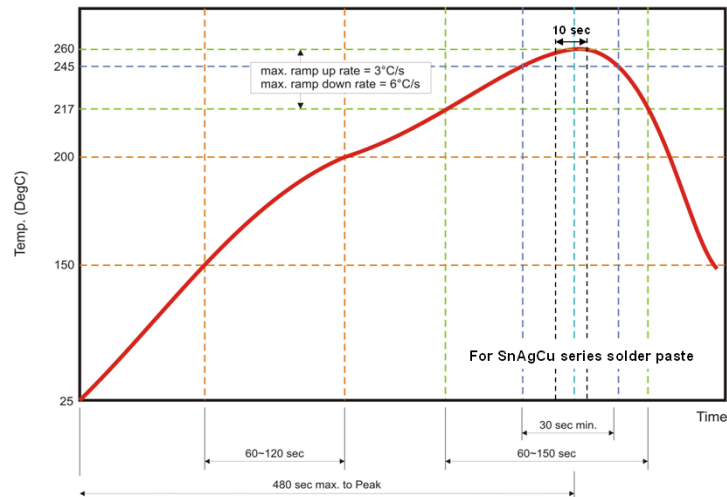


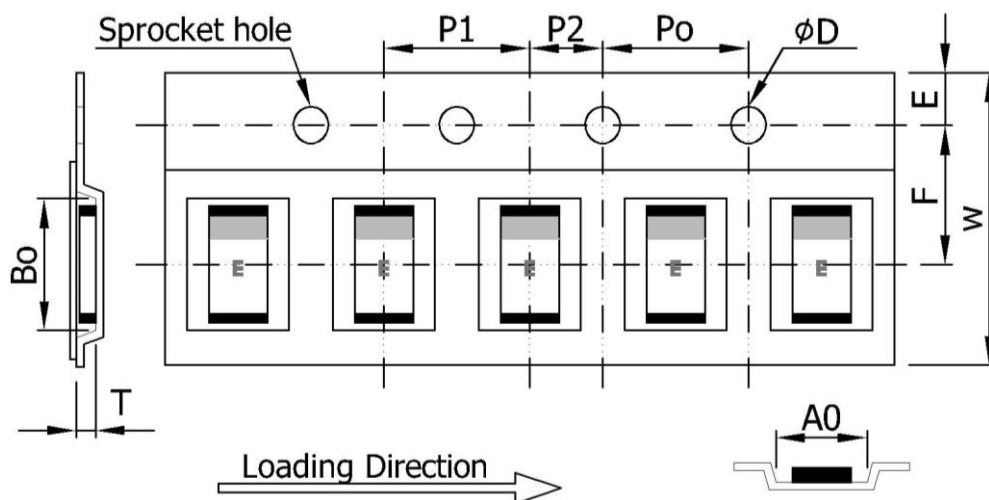
Fig 2. Infrared soldering profile

ORDERING CODE

AM	ANT	321612	0	A	5	T
Walsin Automotive device	Product code ANT : Antenna	Dimension code Per 2 digits of Length, Width, Thickness : e.g. : 321612 = Length 32, Width 16, Thickness 12	Unit of dimension 0 : 0.1 mm 1 : 1.0 mm	Application A : 2.4GHz ISM Band	Specification Design Code	Packing T : 7" Reeled

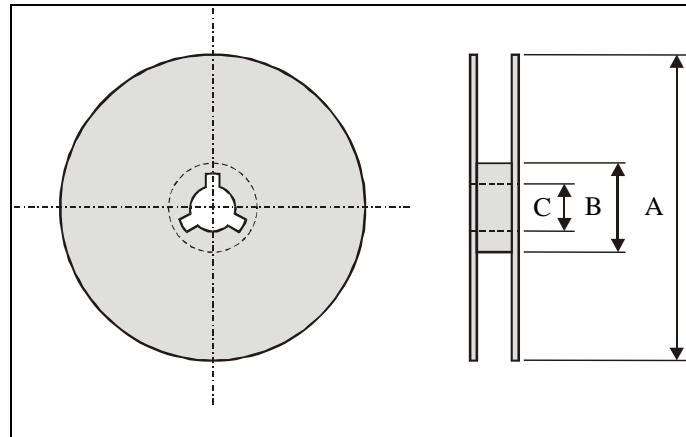
Minimum Ordering Quantity: 2000 pcs per reel.

PACKAGING



Plastic Tape specifications (unit : mm)

Index	Ao	Bo	ΦD	T	W
Dimension (mm)	1.81 ± 0.10	3.42 ± 0.10	1.55 ± 0.05	1.26 ± 0.10	8.00 ± 0.10
Index	E	F	Po	P1	P2
Dimension (mm)	1.75 ± 0.10	3.50 ± 0.05	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.10

Reel dimensions

Index	A	B	C
Dimension (mm)	Φ178	Φ60.0	Φ13.5

Typing Quantity: 2000 pieces per 7" reel

CAUTION OF HANDLING**Limitation of Applications**

Please contact us before using our products for the applications listed below which require especially high reliability for the prevention of defects, which might directly cause damage to the third party's life, body or property.

- (1) Aircraft equipment
- (2) Aerospace equipment
- (3) Undersea equipment
- (4) Medical equipment
- (5) Disaster prevention / crime prevention equipment
- (6) Traffic signal equipment
- (7) Transportation equipment (vehicles, trains, ships, etc.)
- (8) Applications of similar complexity and /or reliability requirements to the applications listed in the above.

Storage condition

- (1) Products should be used in 6 months from the day of WALSIN outgoing inspection, which can be confirmed.
- (2) Storage environment condition.
 - Products should be storage in the warehouse on the following conditions.
 - Temperature : +5 to +40℃
 - Humidity : 30 to 70% relative humidity
 - Don't keep products in corrosive gases such as sulfur. Chlorine gas or acid or it may cause oxidization of electrode, resulting in poor solderability.
 - Products should be storage on the palette for the prevention of the influence from humidity, dust and so on.
 - Products should be storage in the warehouse without heat shock, vibration, direct sunlight and so on.
 - Products should be storage under the airtight packaged condition.