

Product Specification

Number: L-KLS1-4G-F-SMD23*3.5*1.6

Name: 23.0 X 3.5 X 1.6 mm³
SMD Antenna

Customer: _____

Date: 2025-08-18

Customer Signature:



NINGBO KLS ELECTRONIC CO; LTD

Tel : 0086-574-86828566

Fax : 0086-574-86824882

**ADD : NO. 8-1, RONGXIA RD. XIAPU SHANQIAN
INDUSTRIAL ZONE BEILUN NINGBO ZHEJIANG.**

Compi	Check	Review	Approva
Jenny	Jack.C		

Part name	23.0 X 3.5 X 1.6 mm ³ SMD Antenna	Date	2025-08-18
Part number	L-KLS1-4G-F-SMD23*3.5*1.6	Edition	V1
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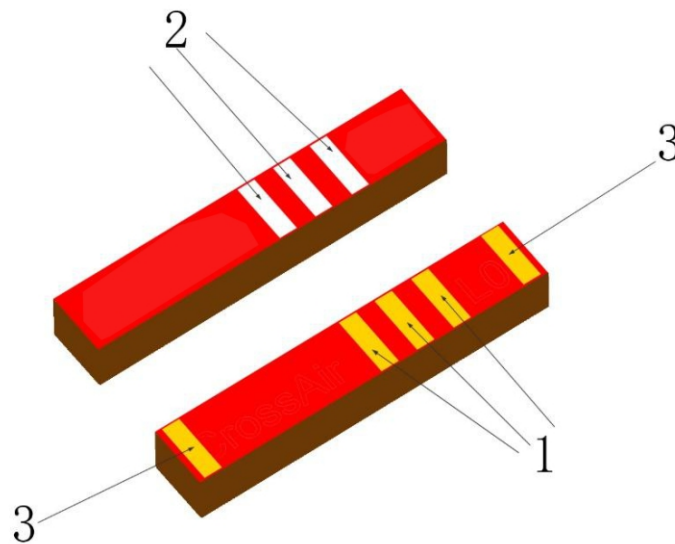
FEATURES

1. Surface Mounted Devices with a small dimension of 23.0 X 3.5 X 1.6 mm³ meet miniaturization trend.
2. Low power loss and high antenna efficiency.
3. High stability in Temperature and Humidity Change.

APPLICATIONS

LTE/4G/3G/2G/GSM/CDMA/NB-IoT band RF applications.

CONSTRUCTION



1、Antenna Feeding

2、Identification Mark

3、Soldering terminal

DIMENSIONS

Figure	Symbol	Dimension(mm)
	L	23.0± 0.2
	w	3.5± 0.1
	T	1.6± 0.1

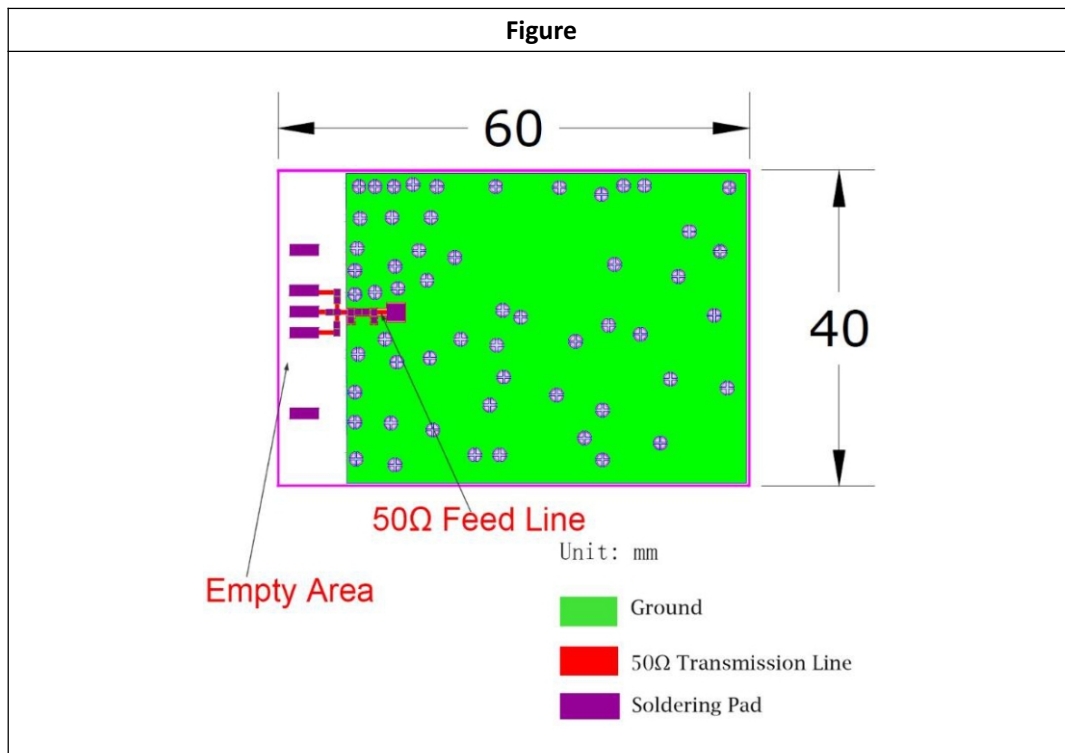
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ELECTRICAL CHARACTERISTICS

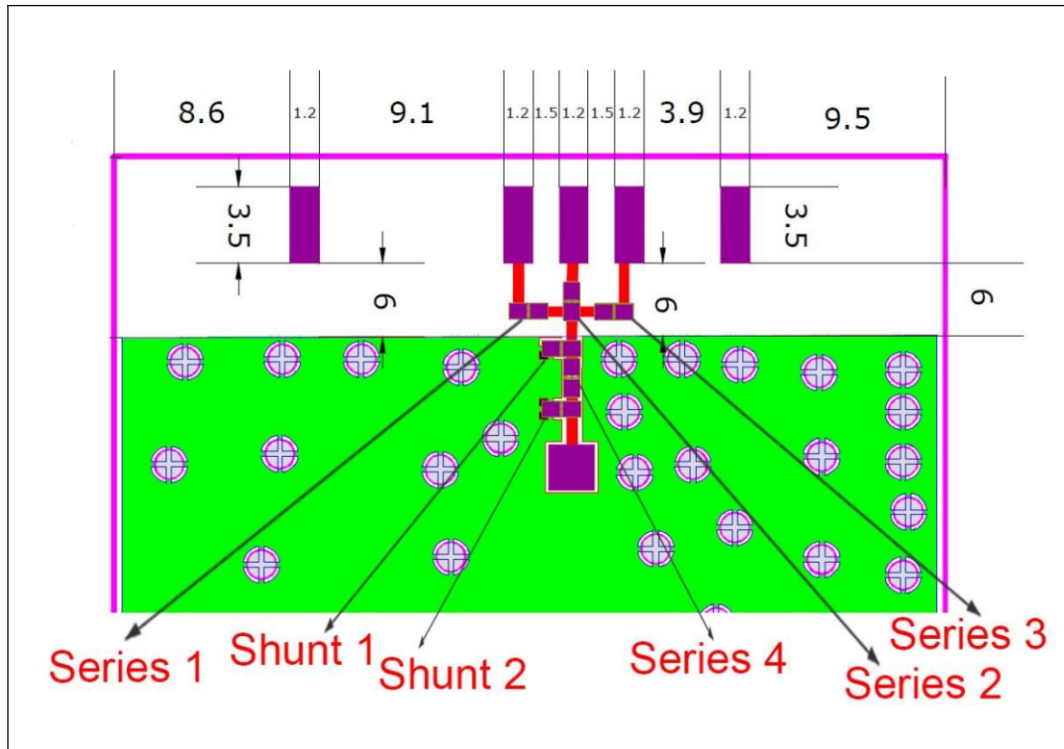
	Specification	
Working Frequency Range	824M-960MHz, 1710M-2700MHz	
Impedance	50Ω	
Gain(dBi)	Low band (700-960MHz)	3.3dBi (Peak)
	Mid band (1710-2170MHz)	2.0dBi (Peak)
	High band (2300-2700Mhz)	2.0dBi (Peak)
VSWR	<3.5	
Operation Temperature	-40°C~+85°C	
Power Capacity	4W	

The working frequency need be adjusted to working band with matching circuit.

SOLDER LAND PATTERN DESIGN

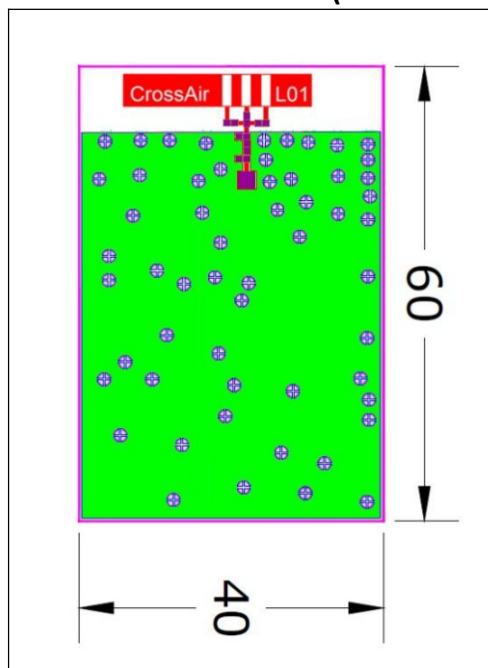


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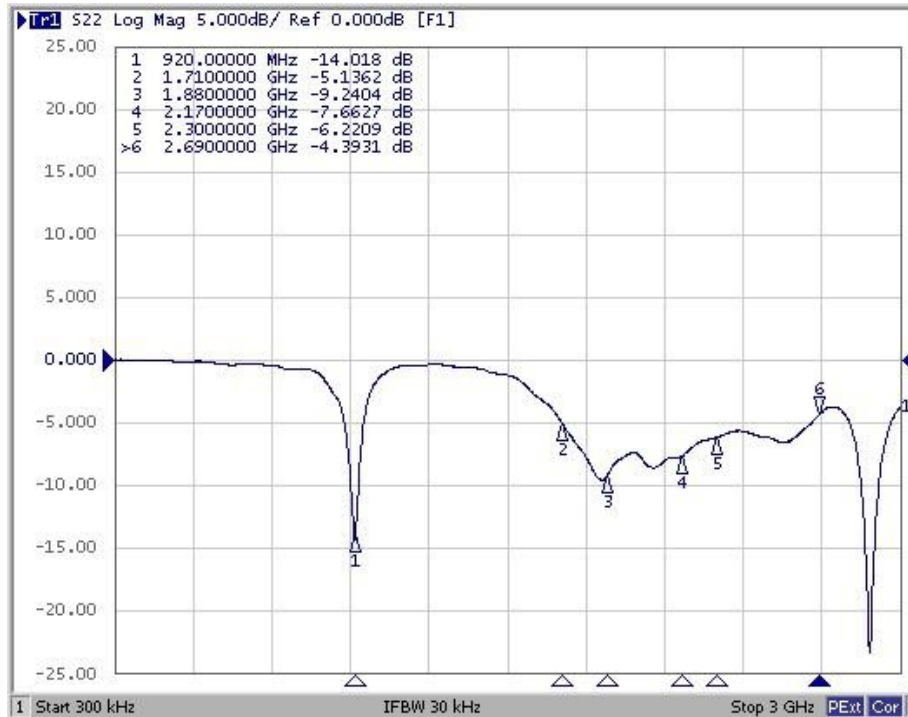
Matching component value	Series 1	22nh
	Series 2	2.2nh
	Series 3	4.3nh
	Shunt 1	18nh
	Series 4	0Ω
	Shunt 2	NC

Antenna on Test Board (Thickness 1.0mm)

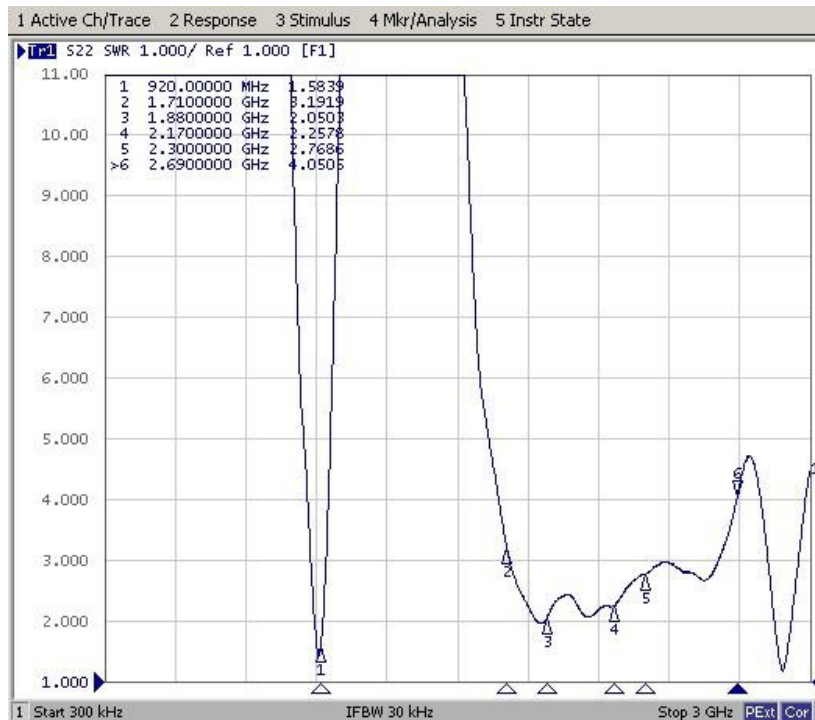


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Antenna S11 on Test Board



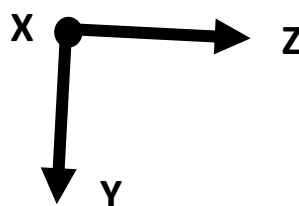
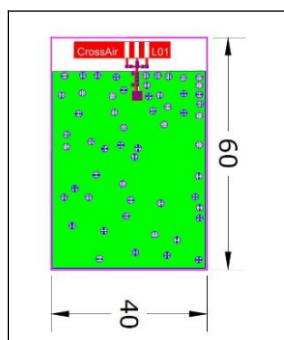
Antenna VSWR on Test Board



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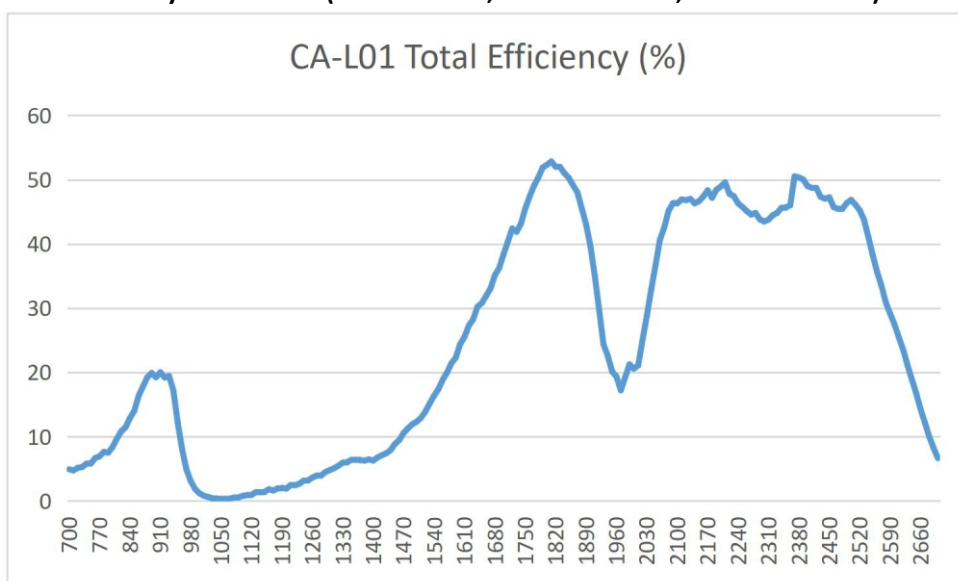
Efficiency and RADIATION PATTERN

Efficiency , Radiation Pattern and Gain were dependent on measurement board design. The specification of L-KLS1-4G-F-SMD23*3.5*1.6 antenna was measured based on the PCB size and installation position as shown in the below figure test board. The test results were tested in ETS 3D Chamber.



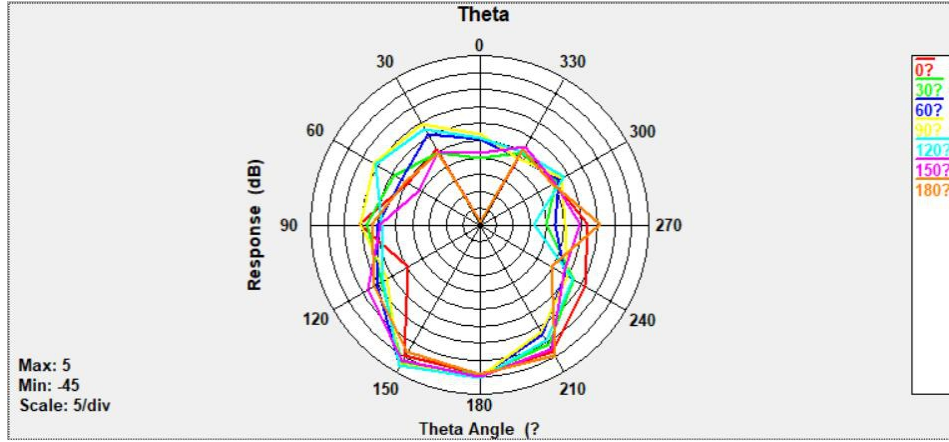
Gain and Efficiency	824M-960MHz	1710M-2170MHz	2300M-2690Mhz
Peak Gain	3.3dBi	2.0dBi	2.0dBi
Average Gain across the band	1.71dBi	0.377dBi	0.39dBi
Gain Range across the band	-0.64dBi ~ 3.3dBi	-3.68dBi ~ 2.0dBi	-3.8dBi ~ 2.0dBi
Peak Efficiency	20.0%	52.8%	50.5%
Average Efficiency across the band	15.8%	40.1%	37.6%
Efficiency Range across the band	8.0% ~ 20.0%	17.2% ~ 52.8%	8.2% ~ 50.5%

Total Efficiency at LTE band (824-960MHz, 1710-2170MHz, 2300-2690MHz).

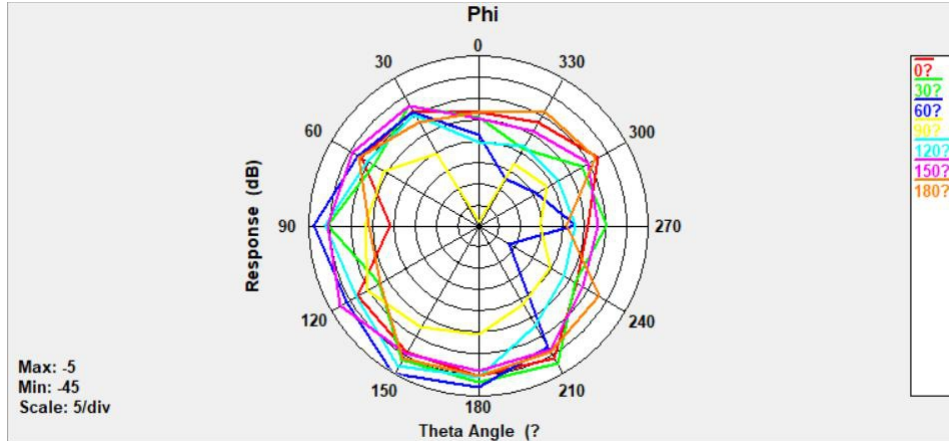


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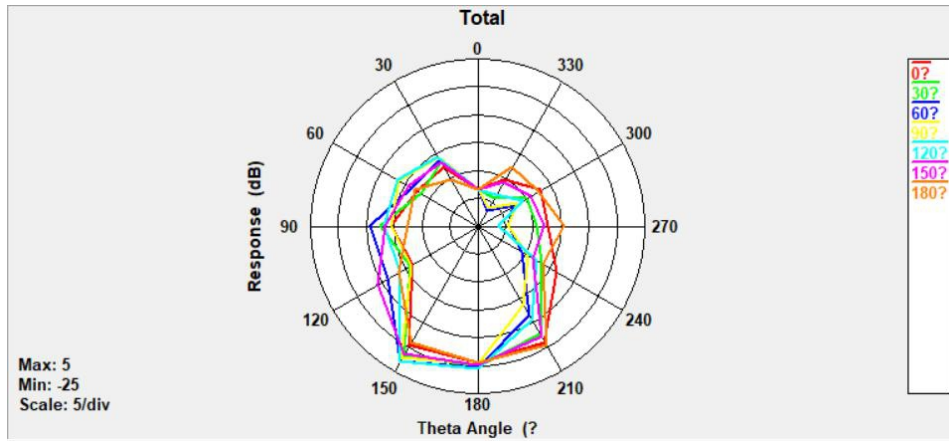
**Theta
@920
MHz**



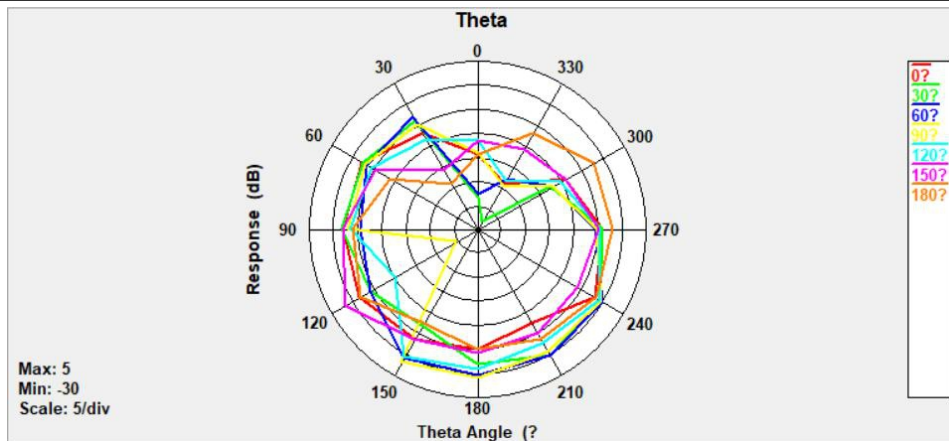
**Phi
@920
MHz**



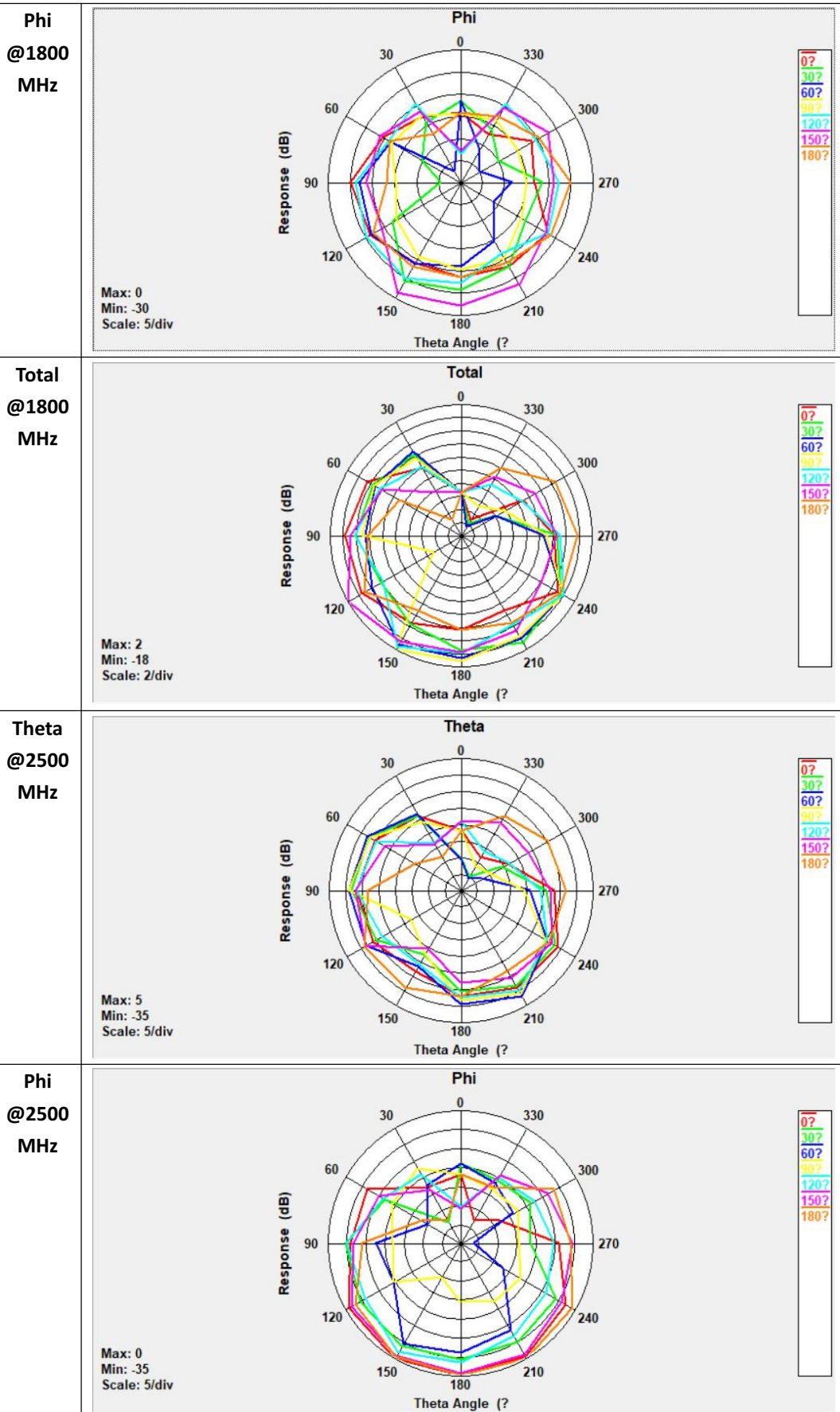
**Total
@920
MHz**



**Theta
@1800
MHz**

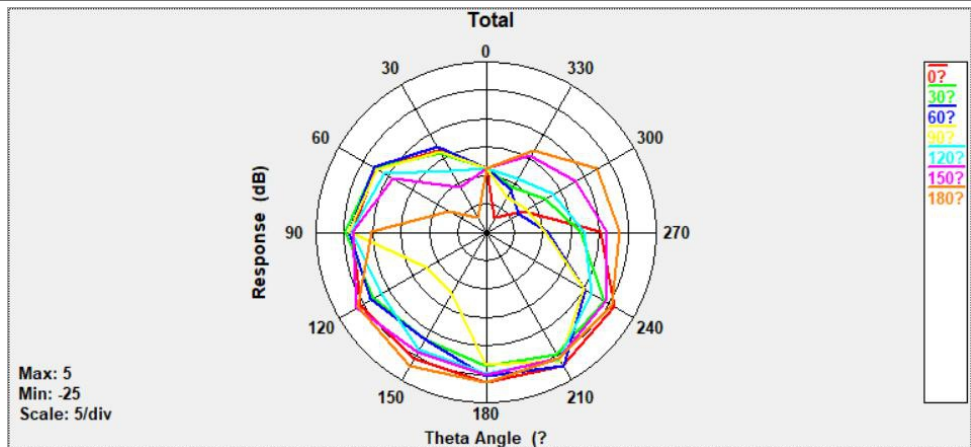


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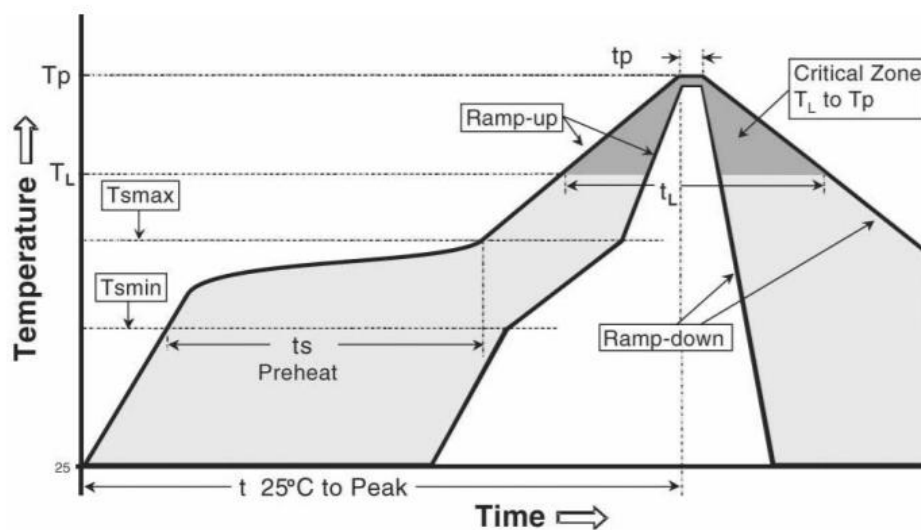
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**Total
@2500
MHz**



SOLDERING CONDITION

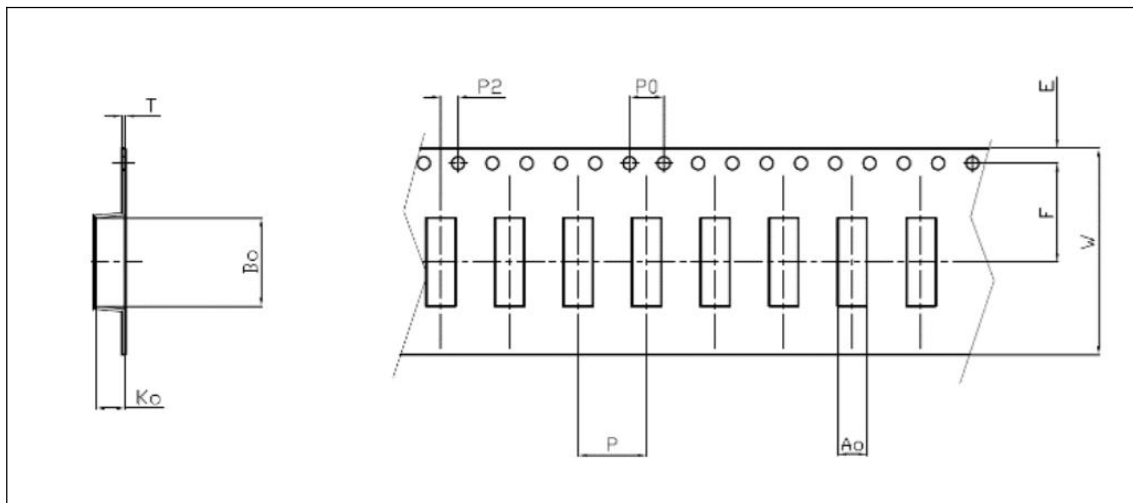
Typical examples of soldering processes that provide reliable joints without any damage is as follows:



Phase	Profile features	Pb-Free assembly (SnAgCu)
RAMP-UP	Avg. Ramp-up Rate (T _{max} to T _p)	3 °C / second (max.)
PREHEAT	- Temperature Min (T _{min}) - Temperature Max (T _{max}) - Time (t _{min} to t _{max})	150 °C 200 °C 60-180 seconds
REFLOW	- Temperature (T _L) - Total Time above T _L (t _L)	217 °C 60-150 seconds
PEAK	- Temperature (T _p) - Time (t _p)	260 °C 20-40 seconds
RAMP-DOWN	Rate	6 °C/second max
Time from 25 °C to Peak Temperature		8 minutes max

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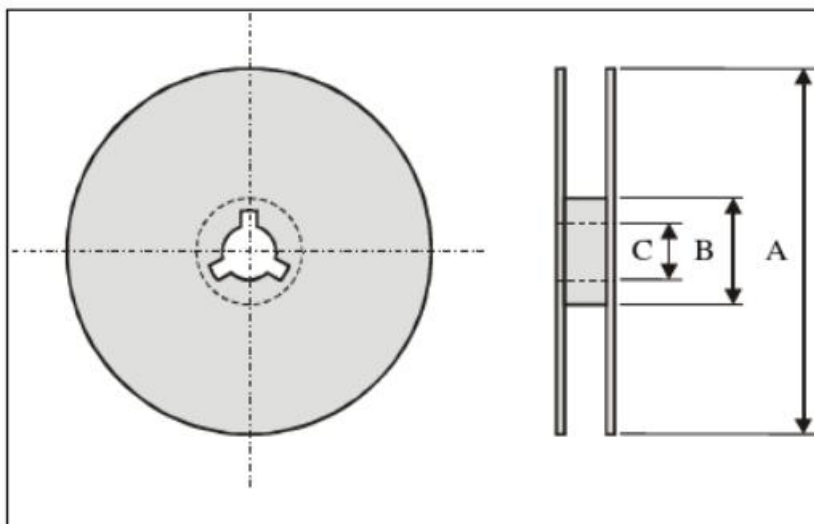
PACKAGING



Plastic Tape specification (unit:mm)

Index	Ao	Bo	Ko	T	W
Dimension (mm)	4.0 ± 0.1	24.0 ± 0.1	1.8 ± 0.1	0.3 ± 0.05	32.0 ± 0.3
Index	E	F	P	P0	P2
Dimension (mm)	1.75 ± 0.1	14.0 ± 0.1	8.0 ± 0.1	4.0 ± 0.1	2.0 ± 0.1

Reel dimensions



Index	A	B	C
Dimension(mm)	330	100	13.5

Typing Quantity: 4000 pieces per reel.

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CAUTION OF HANDLING

Storage environment condition

Products should be storage in the warehouse on the following conditions:

Temperature : -10°C~+40°C

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.