

LC Filter



Used for filtering specific frequency, LC filter may be divided into three classes (low pass filter, band pass filter, high pass filter). Now, we produce low pass and band pass filters in Busan factory. LC filter is fabricated with high permittivity multi-layer ceramic, and all conductors embedded in ceramic are silver. It is a small size and high performance filter with low insertion loss in the passband together with good out-of-passband characteristics. It is applicable to codeless phones, wireless LAN and Bluetooth applications.

General Features

- Small size (1210 to 0603)
- Internal shielding incorporated
- Excellent spurious characteristics
- Relatively easy control of attenuation poles
- High allowable input power(500mW)

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Applications

- Suitable for a variety of application in the GHz frequency range
 → US-PCS, DCS1800, W-Lan, Bluetooth, CLP etc.

Part Numbering

LC B 21 B 2450 Q 1
 ① ② ③ ④ ⑤ ⑥ ⑦

① ABBREVIATION OF LC FILTER

"LC" MEANS THE MULTI-LAYER CHIP LC FILTER OF SAMSUNG ELECTRO-MECHANICS CO., LTD

② TYPE OF FILTER

CODE	DESCRIPTION OF CODE
B	Band Pass Filter
H	High Pass Filter
L	Low Pass Filter
X	Balance Filter (Band Pass Filter + BALUN)



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③ DIMENSION

CODE	DIMENSION (L×W)
10	1.6×0.8
21	2.0×1.25
22	2.5×2.0
23	2.5×3.2
31	3.2×1.6
32	3.2×2.5

④ MATERIAL

CODE	DESCRIPTION OF CODE
B	Material for RF Filter
M	
T	

⑤ CENTER FREQUENCY

CODE	DESCRIPTION OF CODE
2450	Nominal center frequency is identified by 4 digits (unit:MHz)

⑥ SERIAL NO.

CODE	DESCRIPTION OF CODE
A,B,C,...Q.	A single capital letter expresses the series name for individual specification.

⑦ DESIGN ORDER

CODE	DESCRIPTION OF CODE
1,2,3,...	A figure expresses identification of the series design type.

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CARACTERISTIC LINE UP

● BAND PASS FILTER

Application	Part Number	Pass Band [MHz]	IL [dB] max	VSWR [dB] min	Attenuation [dB] Min (at MHz)				
11b/g	LCB32B2450A2	2400~2500	1.8	2.0	48 (902~928)	50 (1500~1550)	12 (2150~2200)	30 (2f0)	
	LCB32B2450A3	2400~2500	1.8	2.0	48 (902~928)	50 (1500~1550)	12 (2150~2200)	30 (2f0)	
	LCB22M2450B1	2400~2500	1.2	2.0	50 (1200)	30 (2f0)			
	LCB22B2450L1	2400~2500	2.2	2.0	40 (2100)	30 (2f0)			
	LCB22B2450S1	2400~2500	2.5	2.0	20 (1700~1900)	20 (2700)	30 (2f0)	15 (3f0)	
	LCB21B2450Q1	2400~2500	1.8	2.0	30 (1300)	10 (2000)	10 (3000)	20 (3600)	35 (2f0)
	LCB21B2450Q3	2400~2500	1.8	2.0	30 (1300)	10 (2000)	8 (3000)	15 (3600)	30 (2f0)
	LCB21B2450T1	2400~2500	1.8	2.0	14 (1900)	20 (5000)			
	LCB10C2450K1	2400~2500	2.2	2.0	25 (880~960)	13 (1710~1990)	16 (2f0)	20 (3f0)	
11a	LCB21M5425A1	4900~5950	1.8	2.2	30 (3900~4000)	15 (2f0)			
	LCB21M5425B1	4900~5950	1.5	2.2	30 (2f0)				
5.8GHz CLP	LCB22B1917A1	1907~1927	1.9	2.0	37.5 (956~961)	32.5 (2868~2883)	32.5 (3824~3844)	32.5 (4780~4805)	32.5 (5736~5766)
	LCB21B3822A1	3816~3828	1.5	2.0	32 (1912~1922)	32 (5736~5766)	32 (7638~7688)	32 (9560~9610)	
	LCB21M5743A1	5735~5751	1.3	2.0	38 (1912~1922)	25 (3819~3844)	27 (7638~7688)	27 (9560~9610)	
	LCB21M4884A2	4822~4947	2.5	2.0	30 (1607~1649)	30 (3214~3298)	28 (6429~6596)		
	LCB22D5787A1	5725~5850	2.5	2.2	47 (1908~1950)	35 (4821~4947)	18 (6628~6753)	30 (9642~9893)	30 (11450~11700)

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● LOW PASS FILTER

Application	Part Number	Pass Band [MHz]	IL [dB] max	VSWR [dB] min	Attenuation [dB] Min (at MHz)		
					35 (2f0)	25 (3f0)	25 (4f0)
11b/g	LCL10T2450A1	2400~2500	0.45	1.5	35 (2f0)	25 (3f0)	
	LCL21T2450B1	2400~2500	0.5	1.5	27 (2f0)	25 (3f0)	25 (4f0)
11a	LCL21D5250A1	5150~5350	0.7	2.0	24 (2f0)	19 (3f0)	
5.8GHz CLP	LCL21D5787A1	5725~5850	0.7	2.0	30 (2f0)	20 (3f0)	
	LCL10D5425U1	4900~5950	0.7	1.7	20 (9800)	30 (11900)	20 (17850) reference

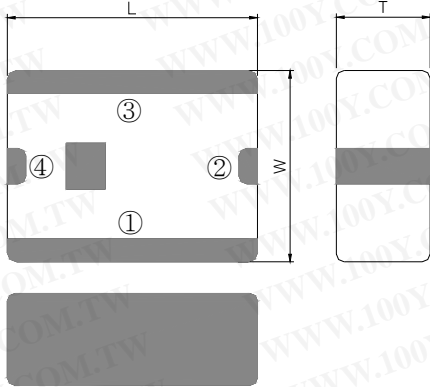
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● BALANCE FILTER (BAND PASS FILTER + BALUN)

Part Number	Pass Band [MHz]	IL [dB] max	RL [dB] min	Amplitude Imbalance [dB]	Phase Imbalance [deg]	Balance Z [Ω]	Attenuation [dB] Min (at MHz)			Note
							30 (2f0)	30 (3f0)	30 (2f0)	
LCX22B2450W1	2400~2500	2.0	10	1.0	180±10	100	30 (2f0)	30 (3f0)		No DC Feed
LCX22B2450N1	2400~2500	2.0	10	1.0	180±10	100	35 (880~960)	30 (1710~1910)	30 (2f0)	DC Feed
LCX22B2450N5	2400~2500	2.0	10	1.0	180±10	50	35 (880~960)	30 (1710~1910)	30 (2f0)	DC Feed
LCX21H2450X2	2400~2500	3.0	10	1.0	180±10	100	50 (880~960)	30 (1710~1910)	30 (2f0)	DC Feed Small size

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● LCB32B2450A2

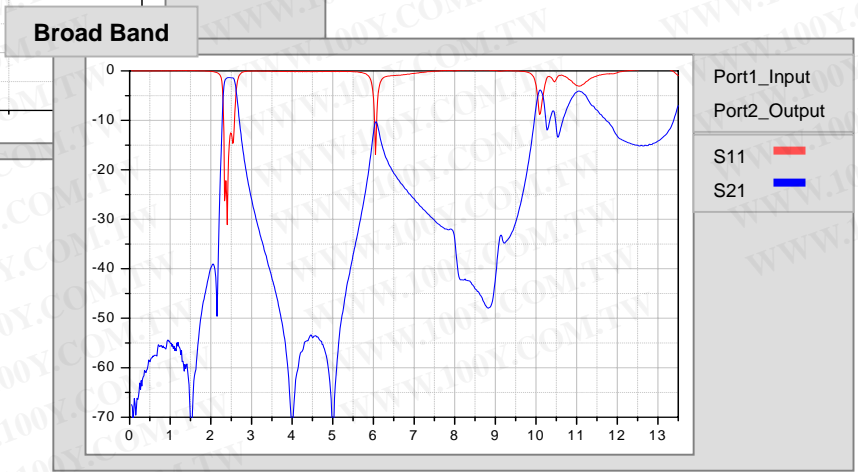
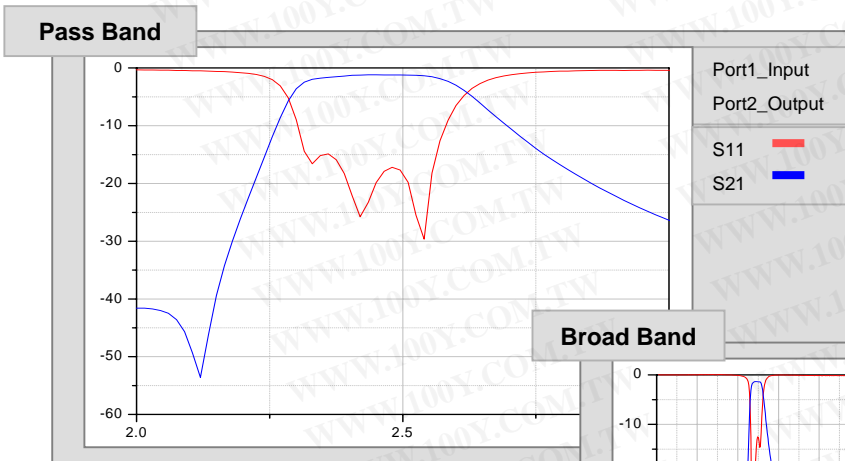


Dimension (mm)	
L	3.20 ± 0.30
W	2.50 ± 0.30
T	1.50 ± 0.10

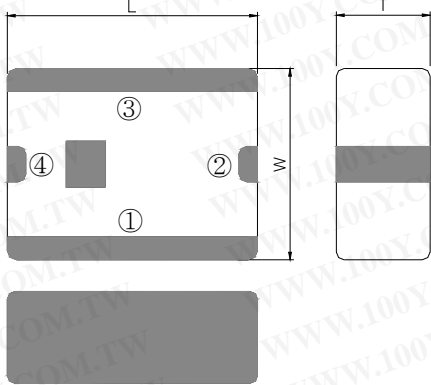
Terminal	
Input	④
Output	②
GND	①③

Parameter	Frequency	SPEC.	Unit
Pass Band	2400~2500		
Insertion Loss	2400~2500	1.8	dB max
VSWR	2400~2500	2.0	Max
Attenuation	902~928	48	dB min
	1500~1550	50	dB min
	2150~2200	12	dB min
	4800~5000	30	dB min

LC filter



● LCB32B2450A3

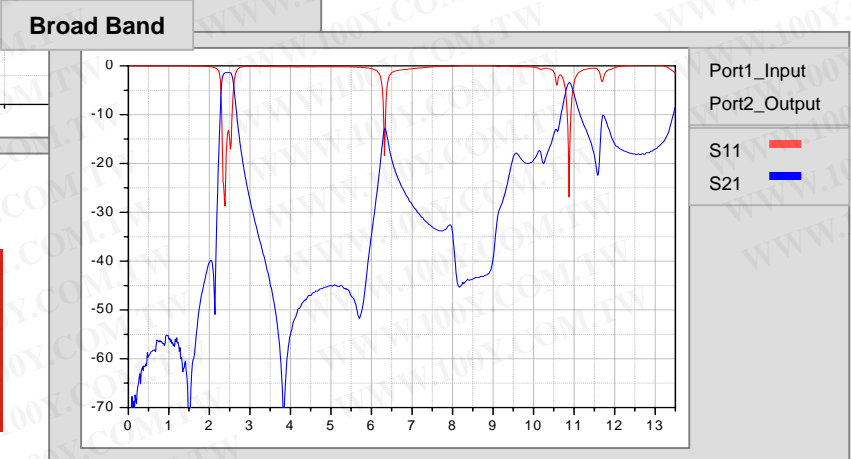
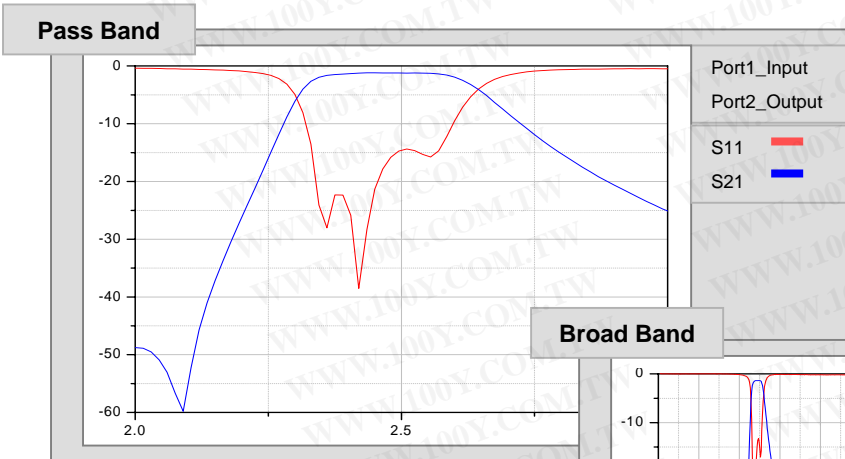


Dimension (mm)	
L	3.20 ± 0.30
W	2.50 ± 0.30
T	1.25 ± 0.10

Terminal	
Input	④
Output	②
GND	①③

Parameter	Frequency	SPEC.	Unit
Pass Band	2400~2500		
Insertion Loss	2400~2500	1.8	dB max
VSWR	2400~2500	2.0	Max
Attenuation	902~928	48	dB min
	1500~1550	50	dB min
	2150~2200	12	dB min
	4800~5000	30	dB min

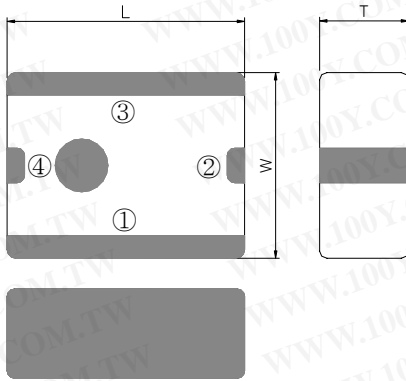
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● LCB22M2450B1

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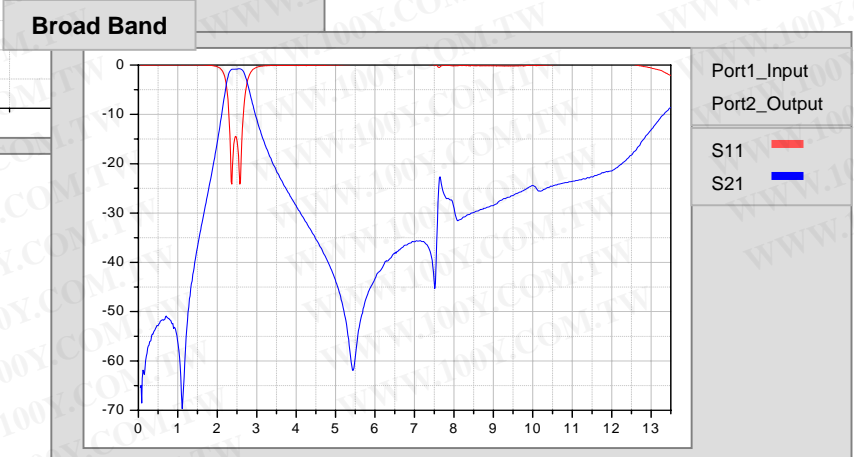
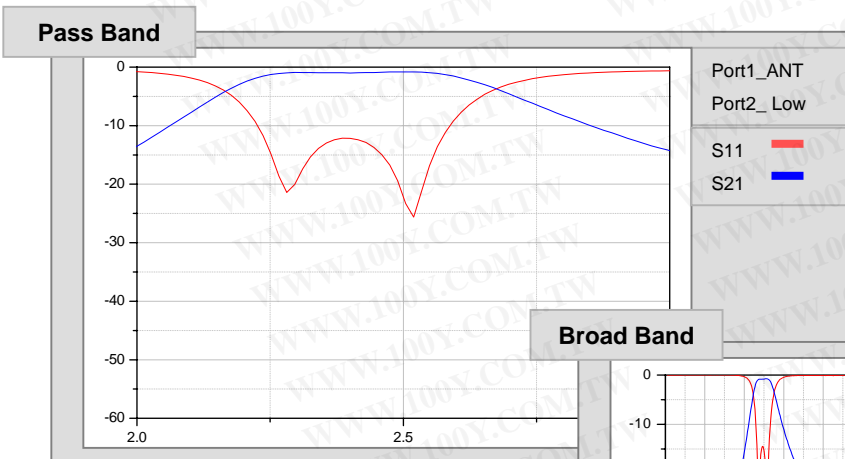


Dimension (mm)	
L	2.50 ± 0.20
W	2.00 ± 0.20
T	1.00 ± 0.10

Terminal	
Input	④
Output	②
GND	①③

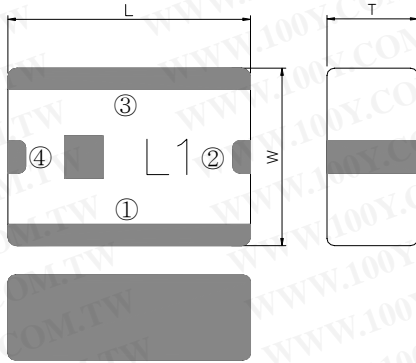
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Pass Band	2400~2500		
Insertion Loss	2400~2500	1.2	dB max
VSWR	2400~2500	2.0	Max
Attenuation	1200	50	dB min
	4800~5000	30	dB min

LC filter



● LCB22B2450L1

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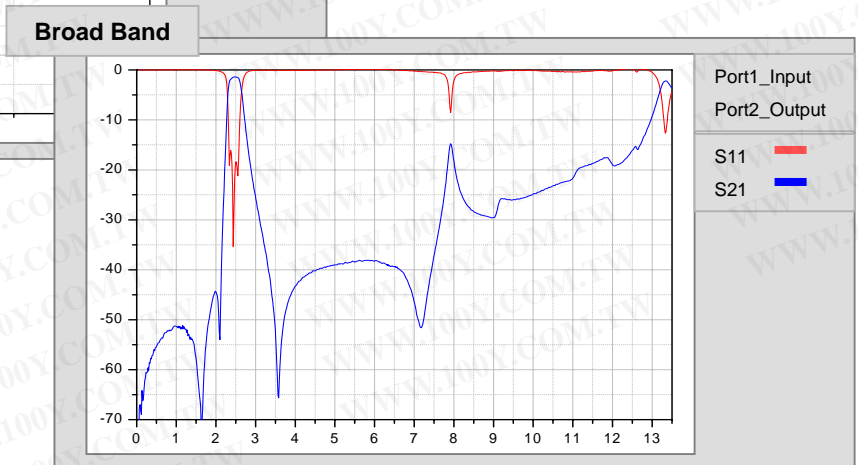
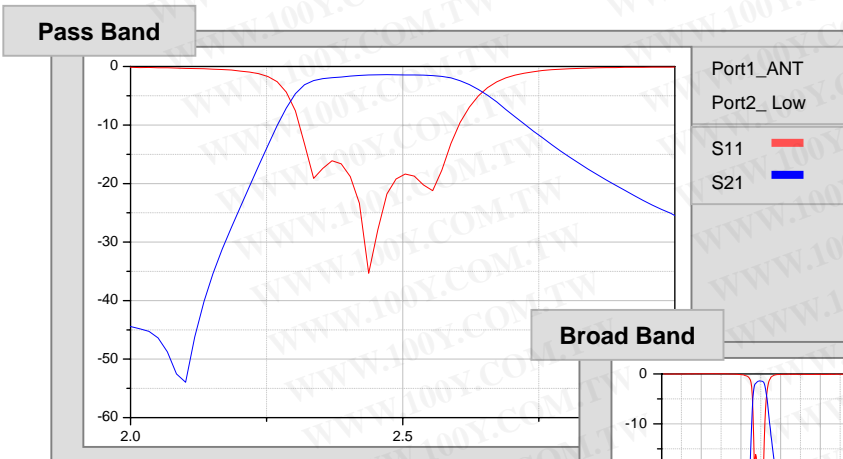


Dimension (mm)	
L	2.50 ± 0.20
W	2.00 ± 0.20
T	1.00 ± 0.10

Terminal	
Input	④
Output	②
GND	①③

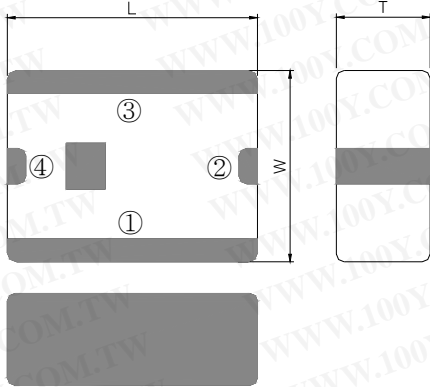
Parameter	Frequency	SPEC.	Unit
Pass Band	2400~2500		
Insertion Loss	2400~2500	2.2	dB max
VSWR	2400~2500	2.0	Max
Attenuation	2100	40	dB min
	4800~5000	30	dB min

LC filter



● LCB22B2450S1

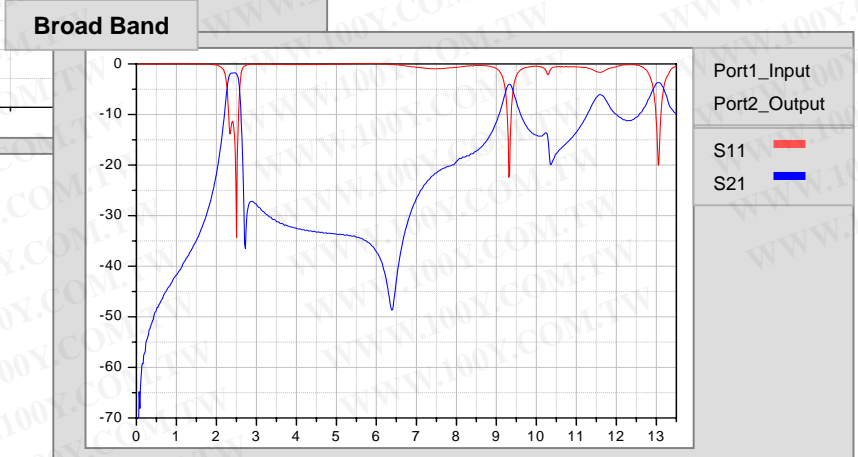
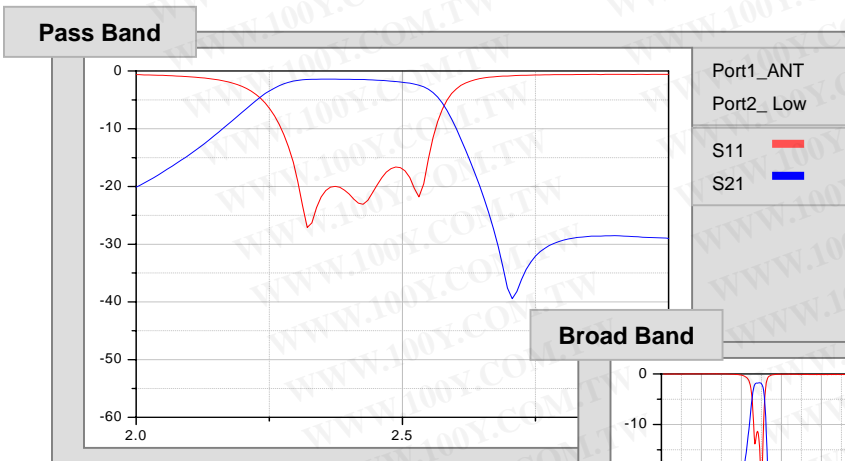
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Dimension (mm)	
L	2.50 ± 0.20
W	2.00 ± 0.20
T	1.00 ± 0.10

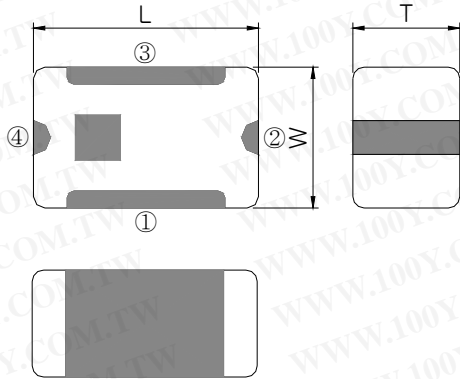
Terminal	
Input	④
Output	②
GND	①③

Parameter	Frequency	SPEC.	Unit
Pass Band	2400~2500		
Insertion Loss	2400~2500	2.5	dB max
VSWR	2400~2500	2.0	Max
Attenuation	1700~1900	20	dB min
	2700	20	dB min
	4800~5000	30	dB min
	7200~7500	15	dB min



LC filter

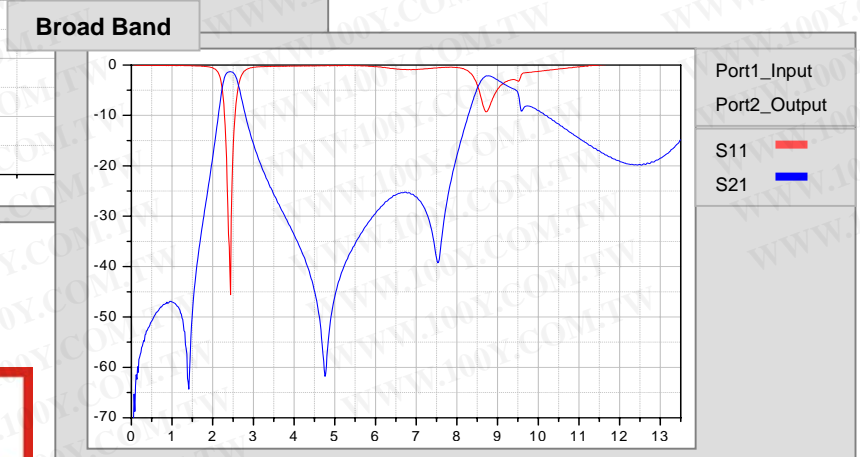
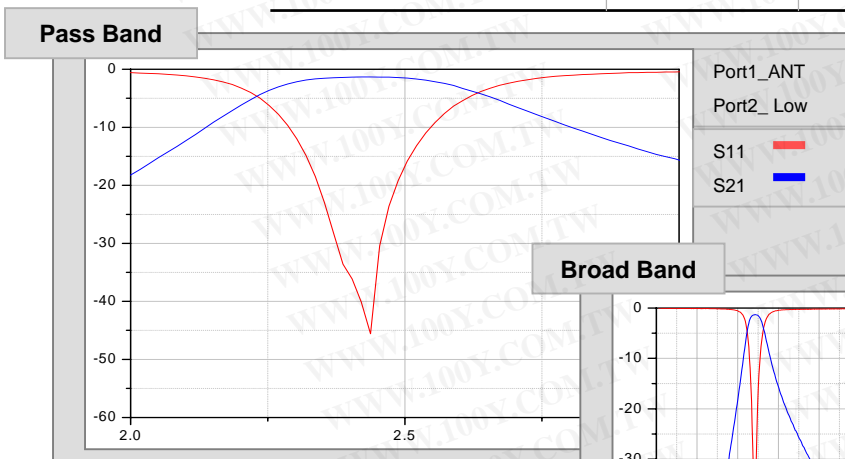
● LCB21B2450Q1



Dimension (mm)	
L	2.00 ± 0.15
W	1.25 ± 0.10
T	0.95 ± 0.10

Terminal	
Input	④
Output	②
GND	①③

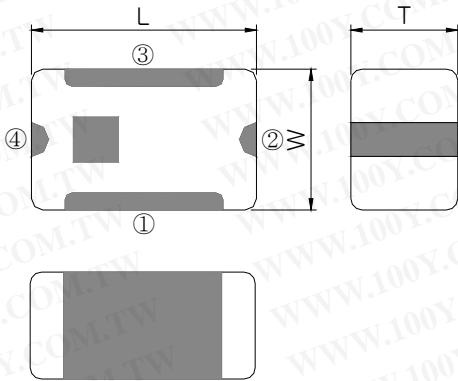
Parameter	Frequency	SPEC.	Unit
Pass Band	2400~2500		
Insertion Loss	2400~2500	1.8	dB max
VSWR	2400~2500	2.0	Max
Attenuation	1300	30	dB min
	2000	10	dB min
	3000	10	dB min
	3600	20	dB min
	4800~5000	35	dB min
	5000~7500	15	dB min



LC filter

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● LCB21B2450Q3

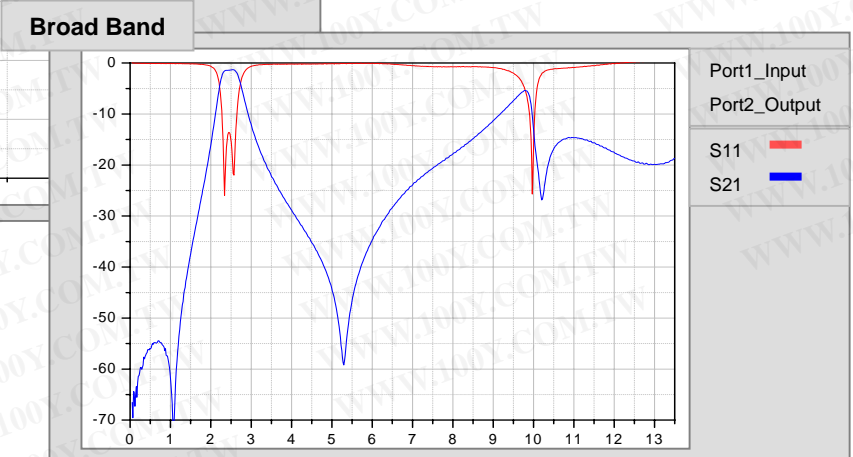
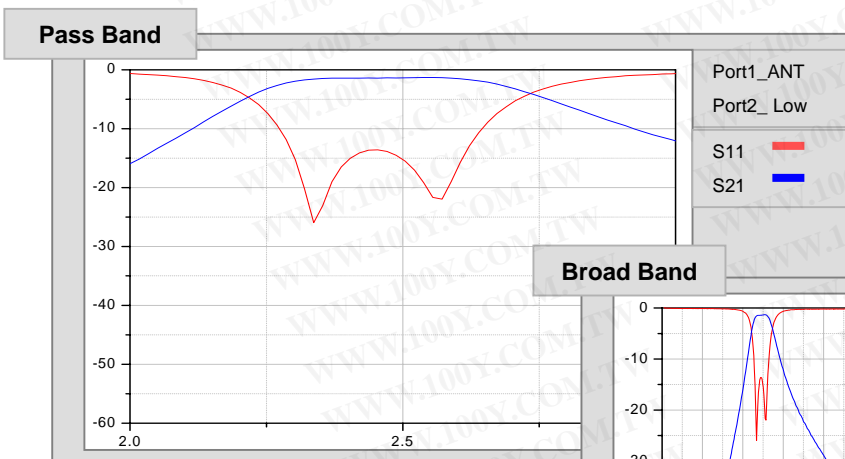


Dimension (mm)	
L	2.00 ± 0.15
W	1.25 ± 0.10
T	0.75 max

Terminal	
Input	④
Output	②
GND	①③

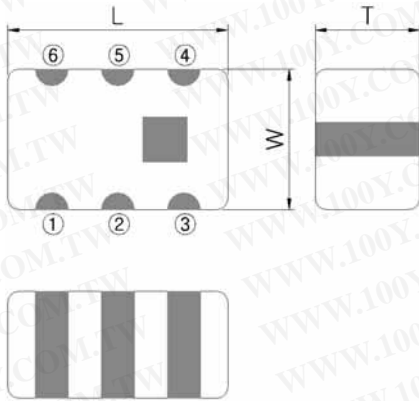
Parameter	Frequency	SPEC.	Unit
Pass Band	2400~2500		
Insertion Loss	2400~2500	1.8	dB max
VSWR	2400~2500	2.0	Max
Attenuation	1300	30	dB min
	2000	10	dB min
	3000	8	dB min
	3600	15	dB min
	4800~5000	30	dB min

LC filter



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● LCB21B2450T1

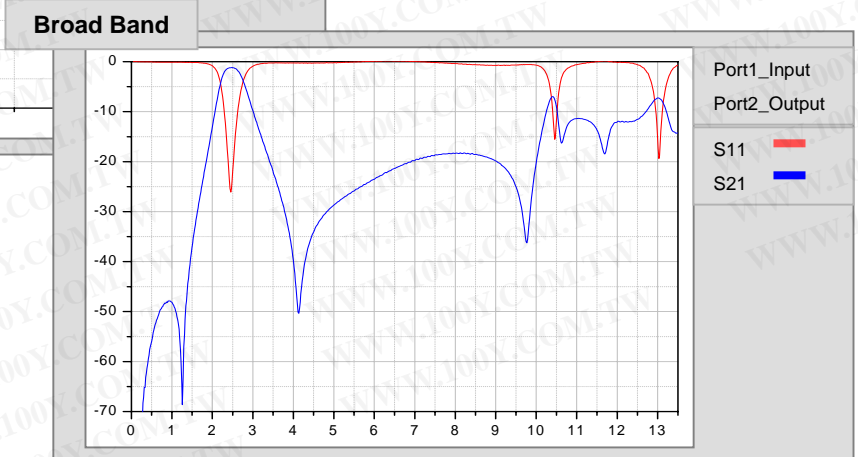
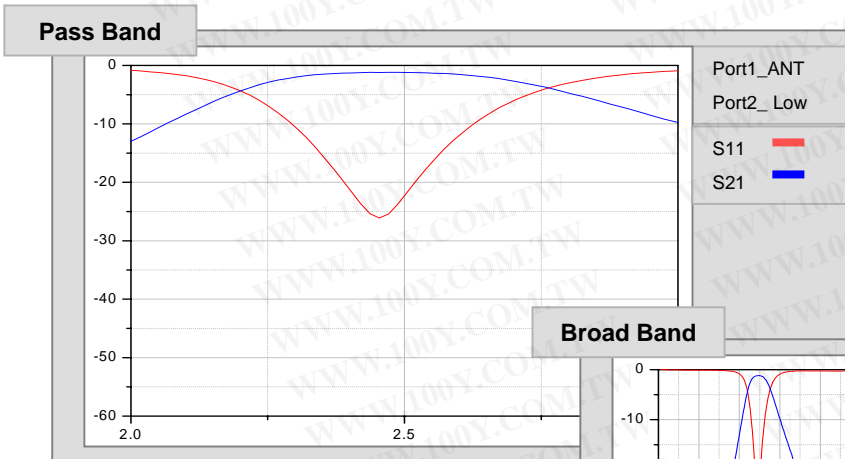


Dimension (mm)	
L	2.00 ± 0.15
W	1.25 ± 0.10
T	0.95 ± 0.10

Terminal	
Input	⑥
Output	④
GND	① ② ③ ⑤

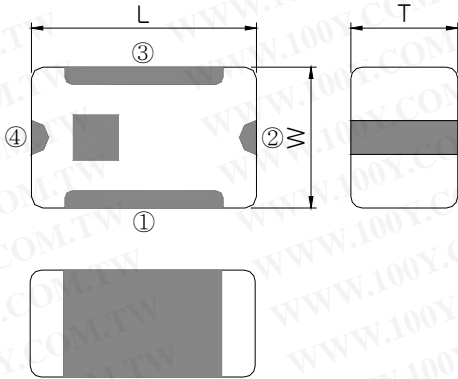
Parameter	Frequency	SPEC.	Unit
Pass Band	2400~2500		
Insertion Loss	2400~2500	1.8	dB max
VSWR	2400~2500	2.0	Max
Attenuation	1900	14	dB min
	5000	20	dB min

LC filter



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● LCB10C2450K1

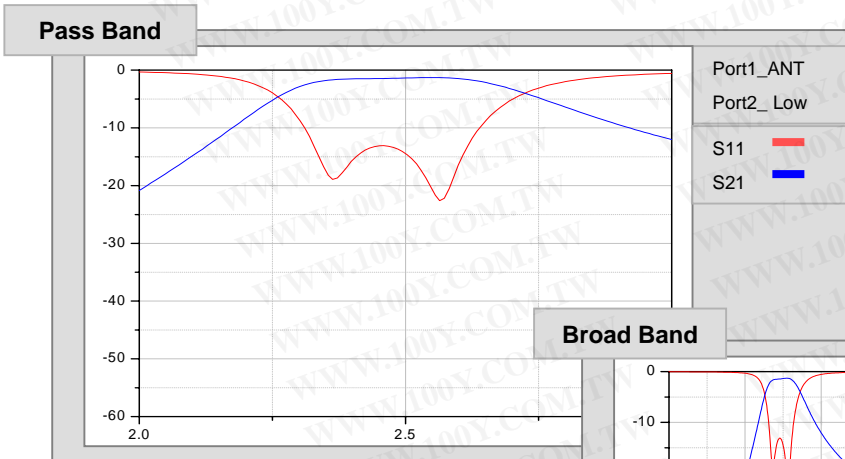


Dimension (mm)	
L	1.60 ± 0.15
W	0.80 ± 0.15
T	0.60 ± 0.10

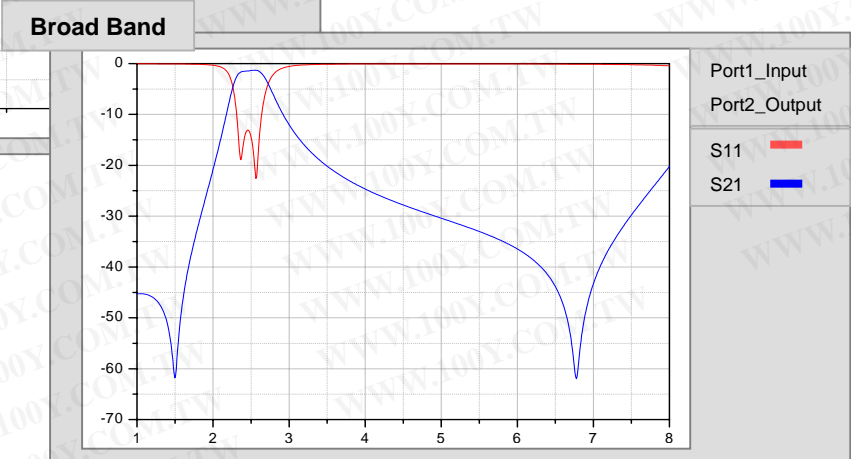
Terminal	
Input	④
Output	②
GND	①③

Parameter	Frequency	SPEC.	Unit
Pass Band	2400~2500		
Insertion Loss	2400~2500	2.2	dB max
VSWR	2400~2500	2.0	Max
Attenuation	880~960	25	dB min
	1710~1990	13	dB min
	4800~5000	16	dB min
	7200~7500	20	dB min

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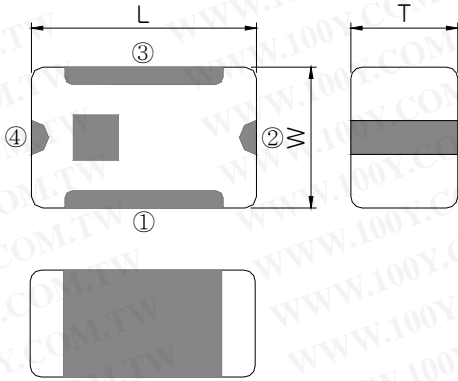


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● LCB21M5425A1

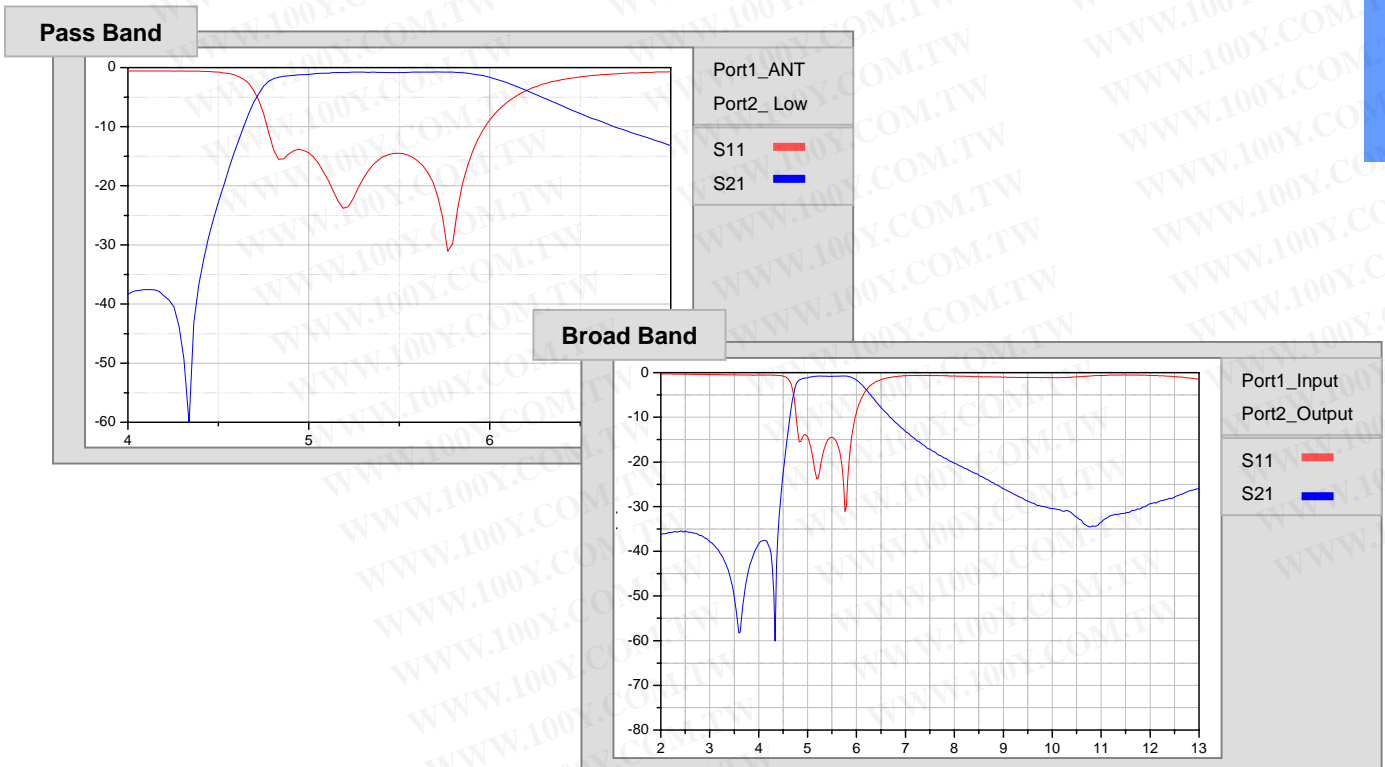


Dimension (mm)	
L	2.00 ± 0.15
W	1.25 ± 0.10
T	0.95 ± 0.10

Terminal	
Input	④
Output	②
GND	①③

Parameter	Frequency	SPEC.	Unit
Pass Band	4900~5950		
Insertion Loss	4900~5950	1.8	dB max
VSWR	4900~5950	2.2	Max
Attenuation	3900~4000	30	dB min
	9800~11900	15	dB min

LC filter

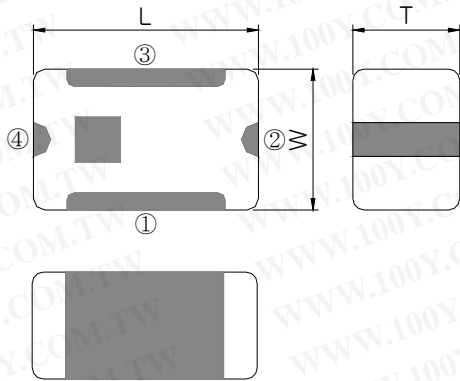


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● LCB21M5425B1

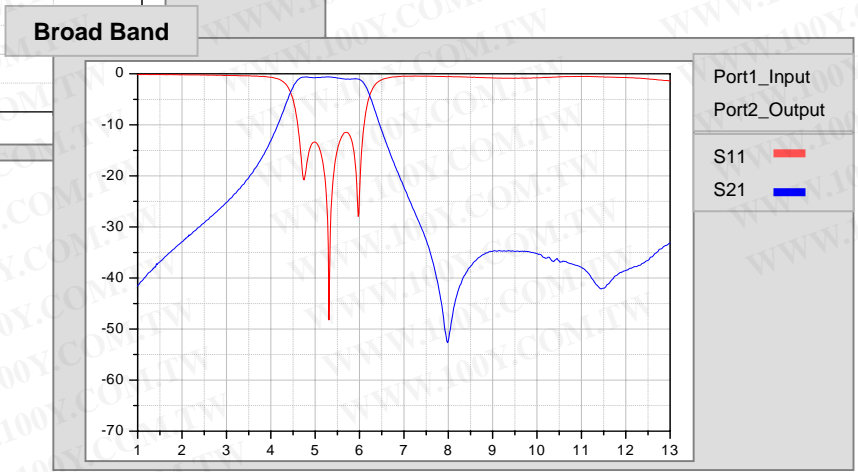
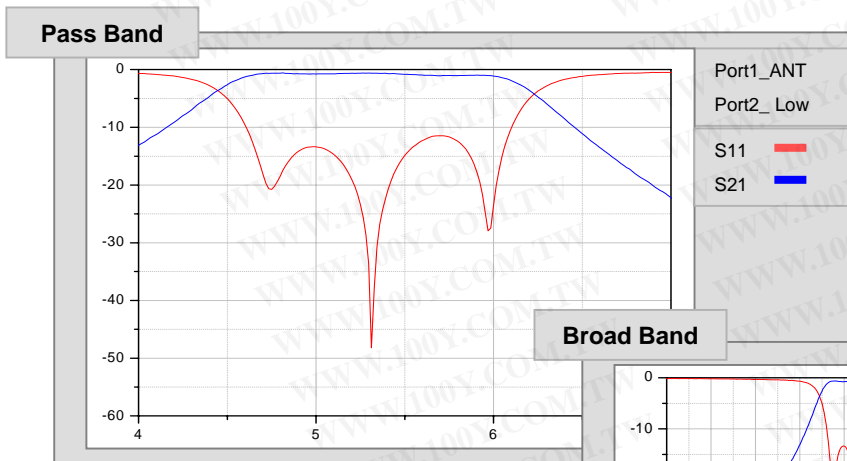


Dimension (mm)	
L	2.00 ± 0.15
W	1.25 ± 0.10
T	0.95 ± 0.10

Terminal	
Input	④
Output	②
GND	①③

Parameter	Frequency	SPEC.	Unit
Pass Band	4900~5950		
Insertion Loss	4900~5950	1.5	dB max
VSWR	4900~5950	2.2	Max
Attenuation	9600~11900	30	dB min

LC filter

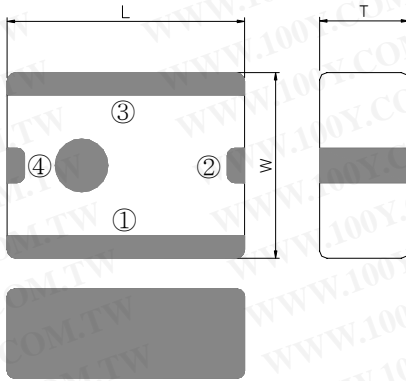


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● LCB22B1917A1

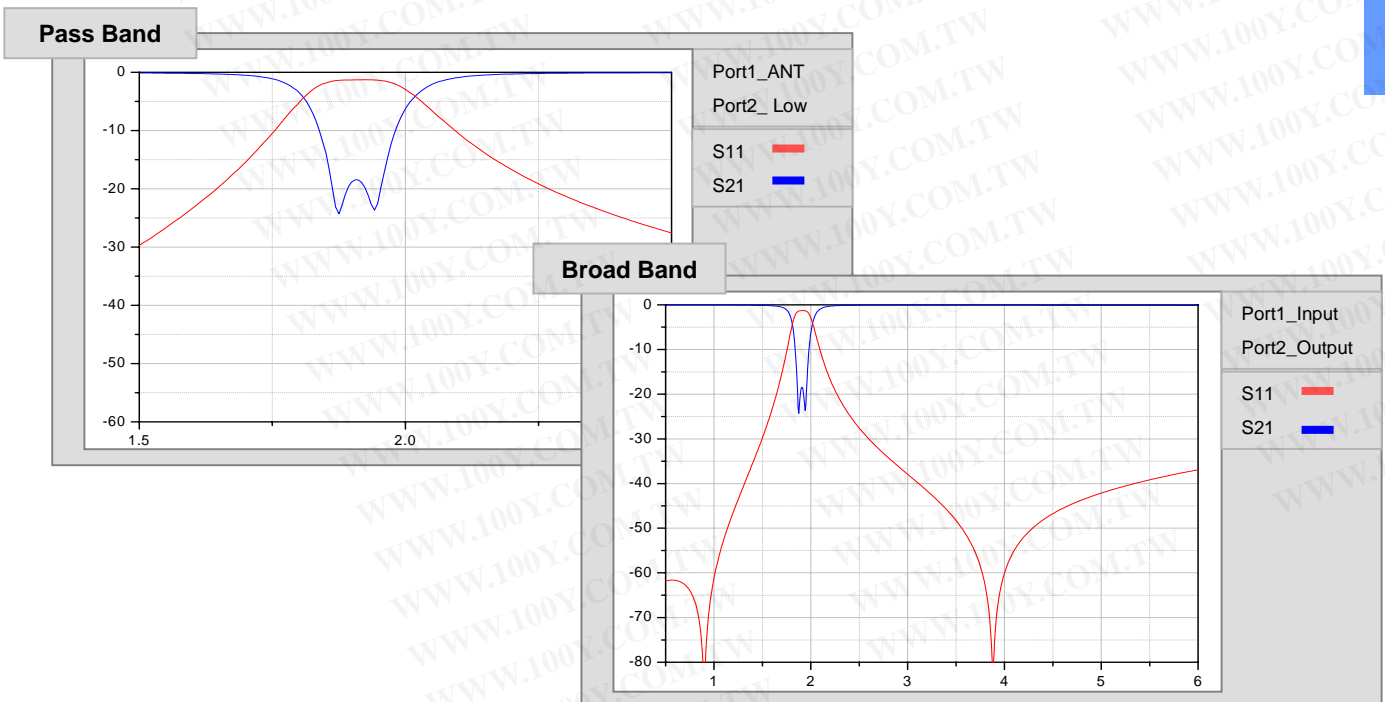


Dimension (mm)	
L	2.50 ± 0.20
W	2.00 ± 0.20
T	1.00 ± 0.10

Terminal	
Input	④
Output	②
GND	①③

Parameter	Frequency	SPEC.	Unit
Pass Band	1907~1927		
Insertion Loss	1907~1927	1.9	dB max
VSWR	1907~1927	2.0	Max
Attenuation	956~961	37.5	dB min
	2868~2883	32.5	dB min
	3824~3844	32.5	dB min
	4780~4805	32.5	dB min
	5736~5766	32.5	dB min

LC filter

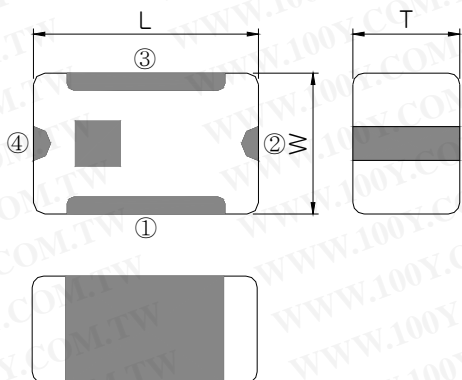


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● LCB21B3822A1

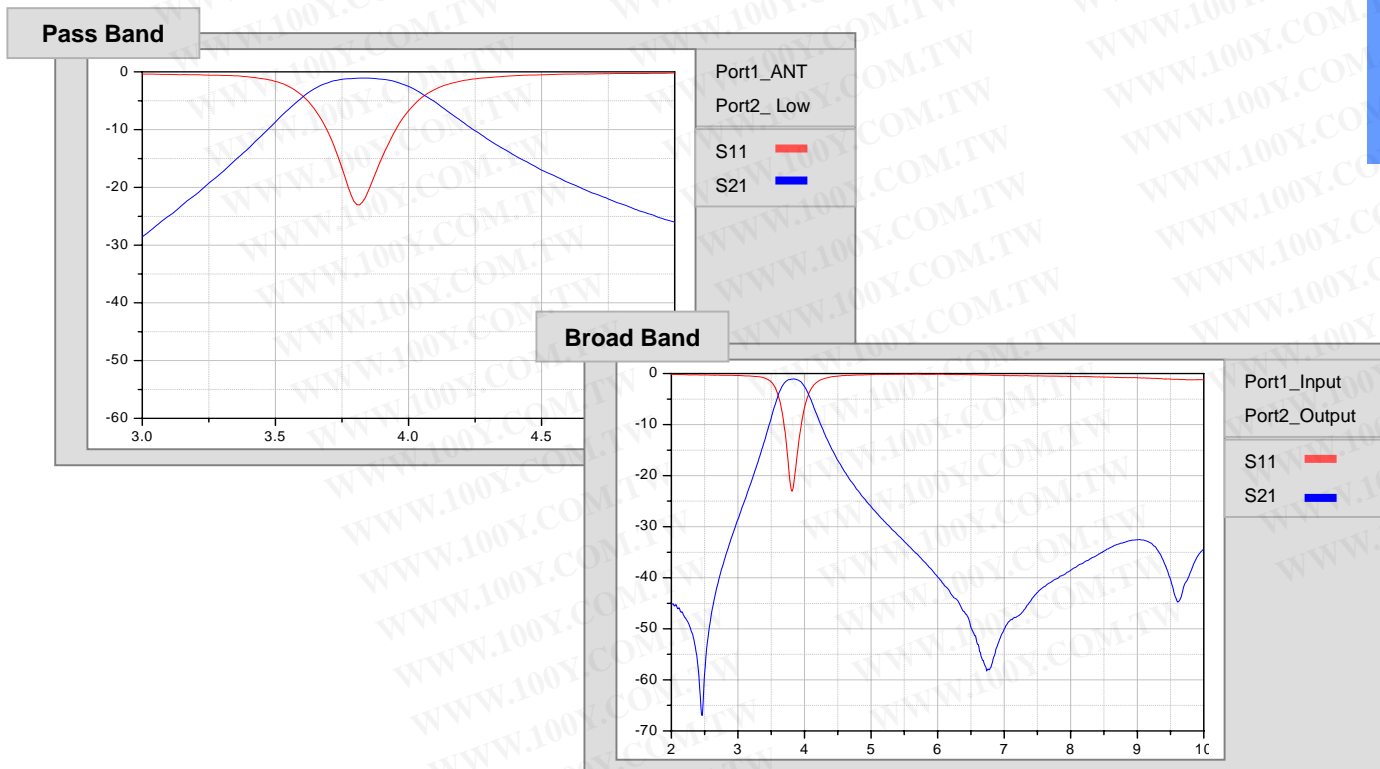


Dimension (mm)	
L	2.00 ± 0.15
W	1.25 ± 0.10
T	0.95 ± 0.10

Terminal	
Input	④
Output	②
GND	①③

Parameter	Frequency	SPEC.	Unit
Pass Band	3816~3828		
Insertion Loss	3816~3828	1.5	dB max
VSWR	3816~3828	2.0	Max
Attenuation	1912~1922	32	dB min
	5736~5766	32	dB min
	7638~7688	32	dB min
	9560~9610	32	dB min

LC filter

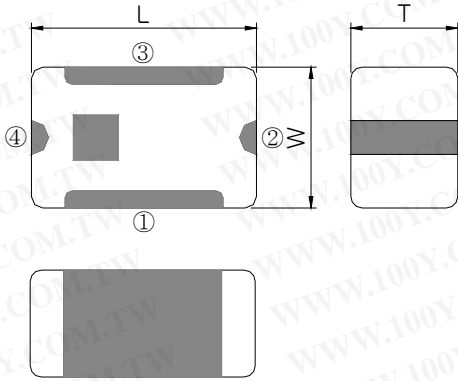


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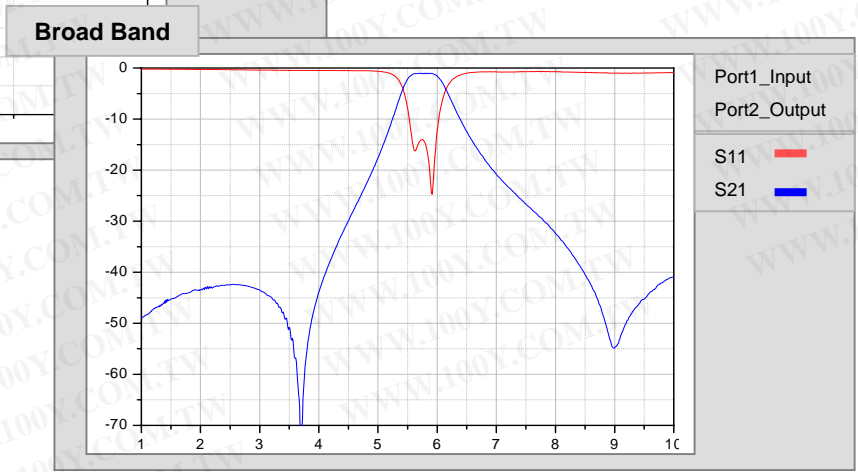
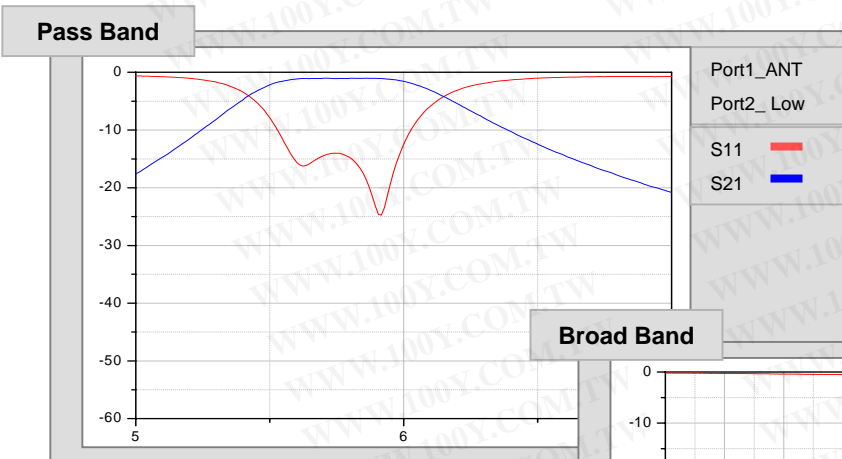
● LCB21M5743A1



Dimension (mm)	
L	2.00 ± 0.15
W	1.25 ± 0.10
T	0.95 ± 0.10

Terminal	
Input	④
Output	②
GND	①③

Parameter	Frequency	SPEC.	Unit
Pass Band	5735~5751		
Insertion Loss	5735~5751	1.3	dB max
VSWR	5735~5751	2.0	Max
Attenuation	1912~1922	38	dB min
	3819~3844	25	dB min
	7638~7688	27	dB min
	9560~9610	27	dB min



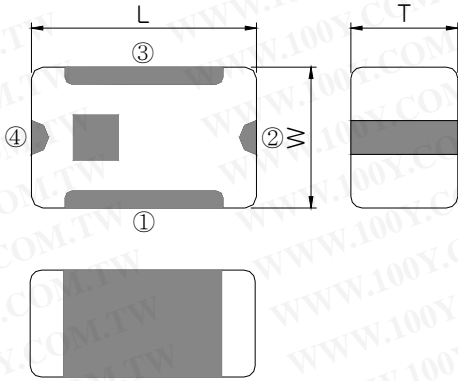
LC filter

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● LCB21M4884A2

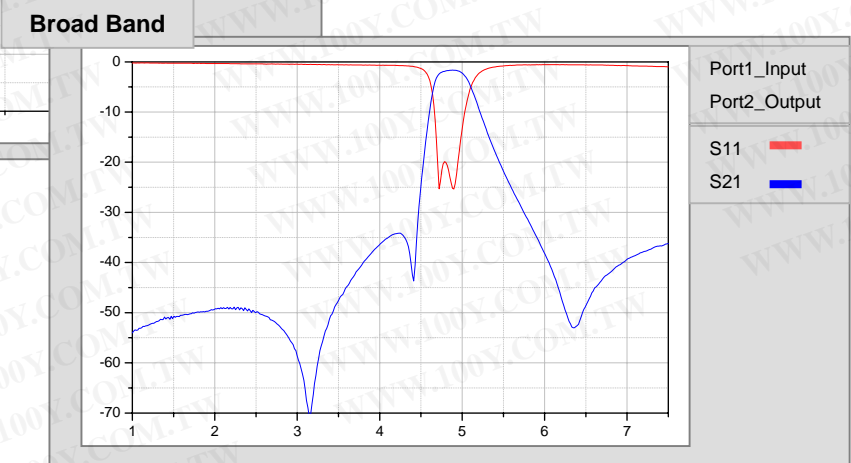
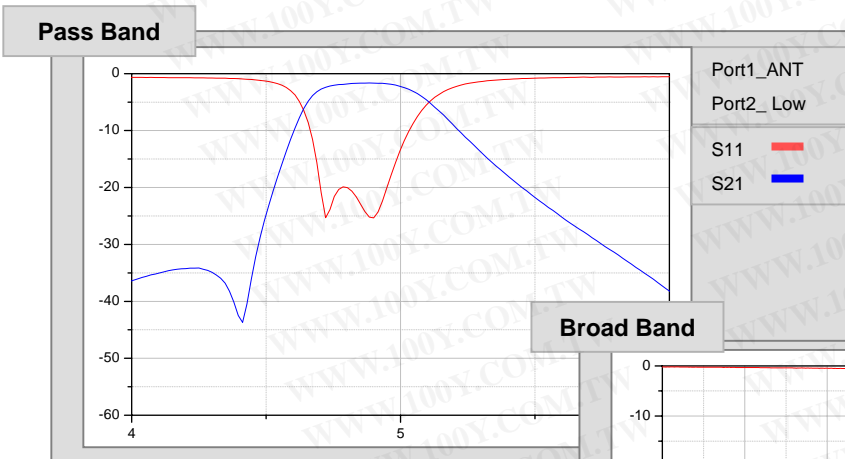


Dimension (mm)	
L	2.00 ± 0.15
W	1.25 ± 0.10
T	0.95 ± 0.10

Terminal	
Input	④
Output	②
GND	①③

Parameter	Frequency	SPEC.	Unit
Pass Band	4822~4947		
Insertion Loss	4822~4947	2.5	dB max
VSWR	4822~4947	2.0	Max
Attenuation	1607~1649	30	dB min
	3214~3298	30	dB min
	6429~6596	28	dB min

LC filter

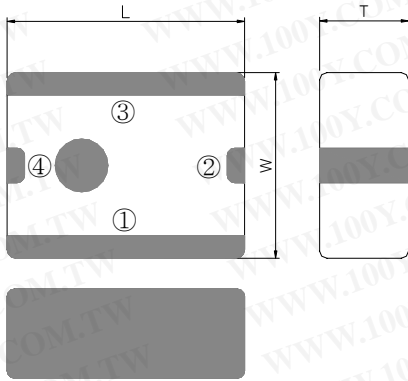


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● LCB22D5787A1

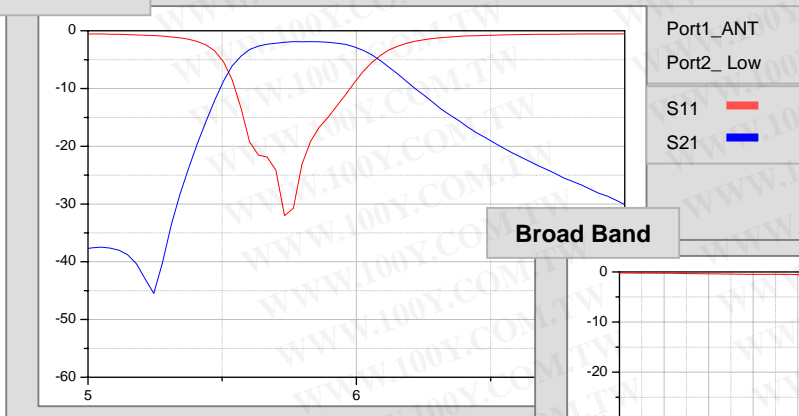


Dimension (mm)	
L	2.50 ± 0.20
W	2.00 ± 0.20
T	1.0 max

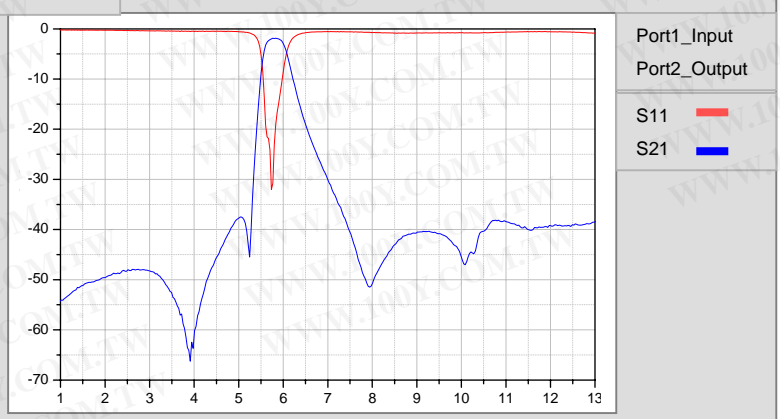
Terminal	
Input	④
Output	②
GND	①③

Parameter	Frequency	SPEC.	Unit
Pass Band	5725~5850		
Insertion Loss	5725~5850	2.5	dB max
VSWR	5725~5850	2.2	Max
Attenuation	902~928	50	dB min
	1908~1950	47	dB min
	3816~3900	35	dB min
	4821~4947	35	dB min
	6628~6753	18	dB min
	9642~9893	30	dB min
	11450~11700	30	dB min

Pass Band



Broad Band

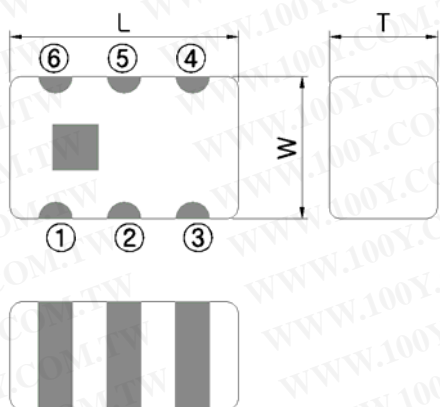


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● LCL10T2450A1

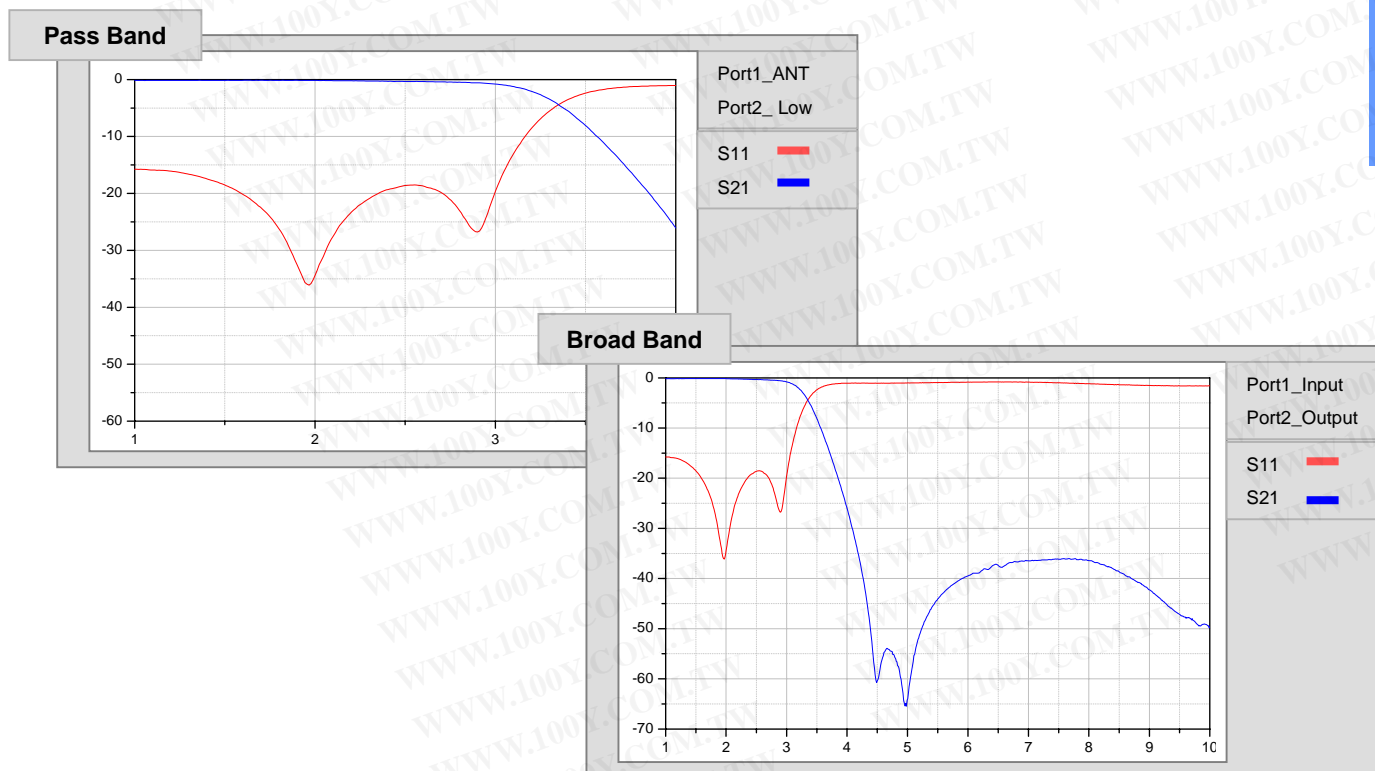


Dimension (mm)	
L	1.60 ± 0.10
W	0.80 ± 0.10
T	0.60 ± 0.10

Terminal	
Input	②
Output	⑤
GND	①③④⑥

Parameter	Frequency	SPEC.	Unit
Pass Band	2400~2500		
Insertion Loss	2400~2500	0.45	dB max
VSWR	2400~2500	1.5	Max
Attenuation	4800~5000	35	dB min
	7200~7500	25	dB min

LC filter

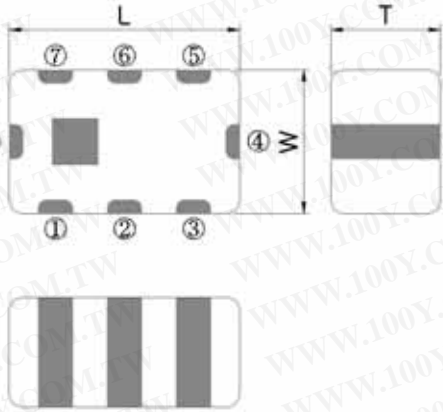


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● LCL21T2450B1

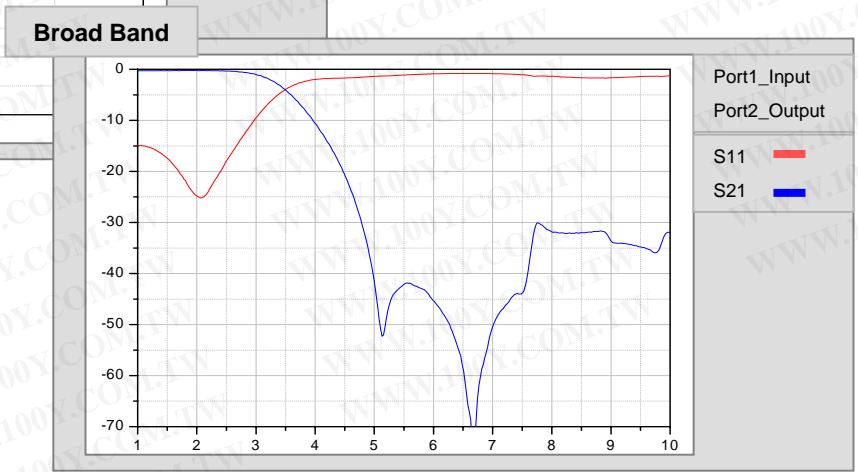
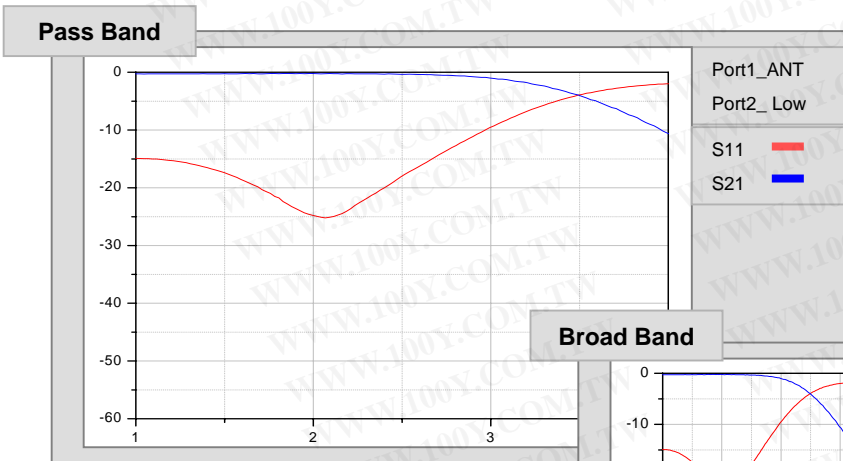


Dimension (mm)	
L	2.00 ± 0.15
W	1.25 ± 0.15
T	0.95 ± 0.10

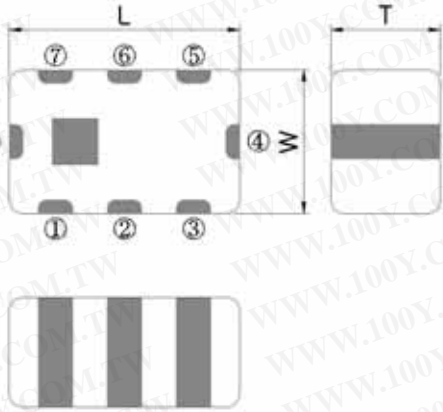
Terminal	
Input	⑧
Output	④
N.C	② ⑥
GND	① ③ ⑤ ⑦

Parameter	Frequency	SPEC.	Unit
Pass Band	2400~2500		
Insertion Loss	2400~2500	0.5	dB max
VSWR	2400~2500	1.5	Max
Attenuation	4800~5000	27	dB min
	7200~7500	25	dB min
	9600~10000	25	dB min

LC filter



● LCL21D5250A1

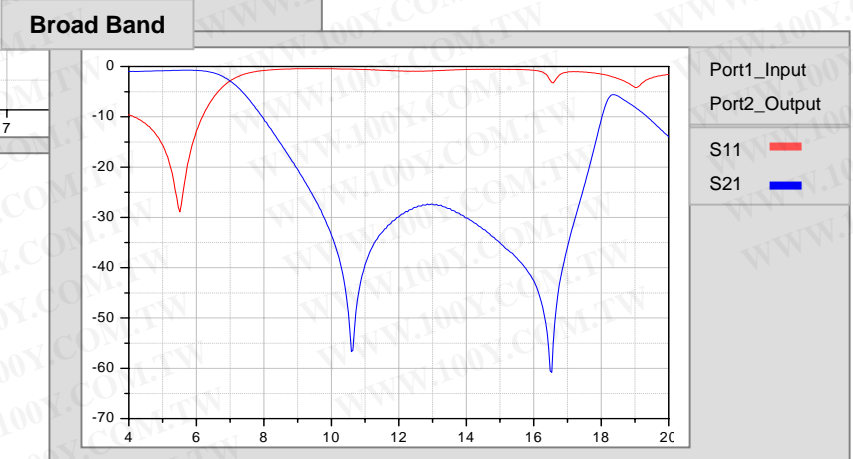
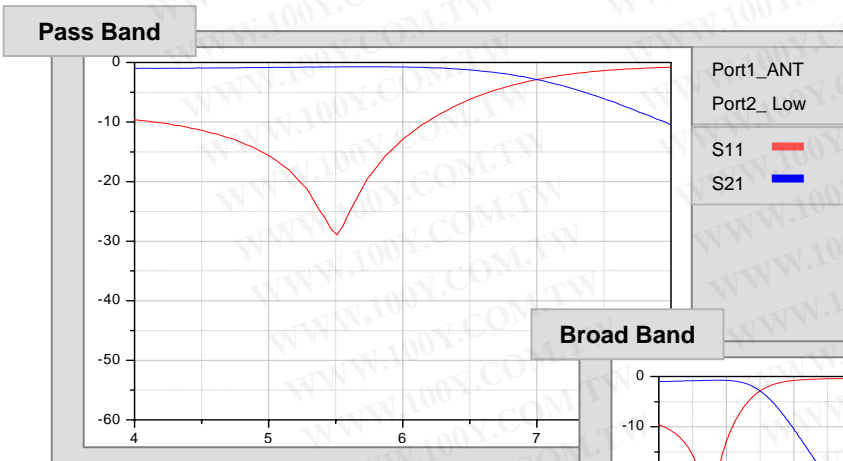


Dimension (mm)	
L	2.00 ± 0.15
W	1.25 ± 0.15
T	0.95 ± 0.10

Terminal	
Input	⑧
Output	④
N.C	②⑥
GND	①③⑤⑦

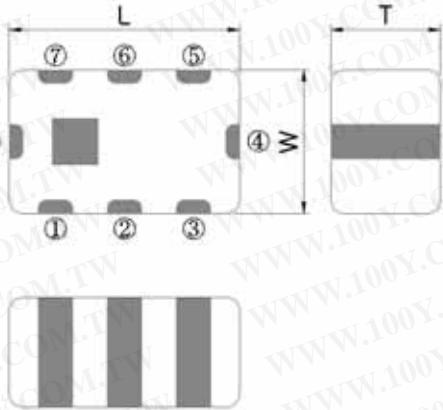
Parameter	Frequency	SPEC.	Unit
Pass Band	5150~5350		
Insertion Loss	5150~5350	0.7	dB max
VSWR	5150~5350	2.0	Max
Attenuation	10300~10700	24	dB min
	15450~16050	19 (reference)	dB min

LC filter



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● LCL21D5787A1

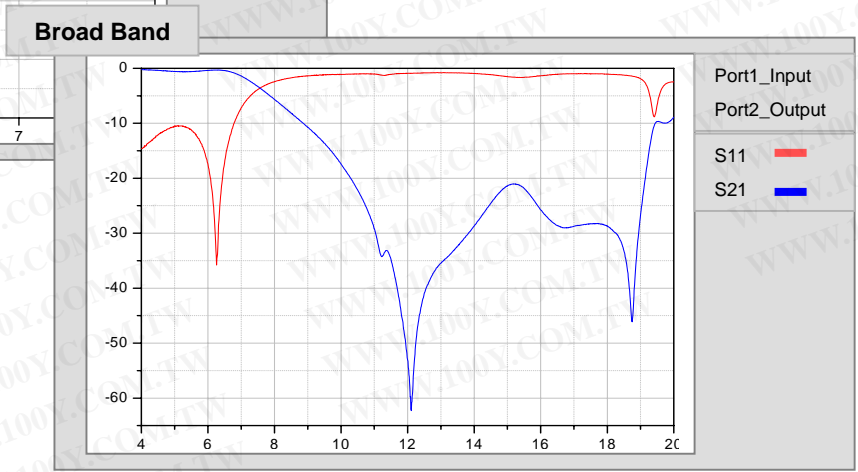
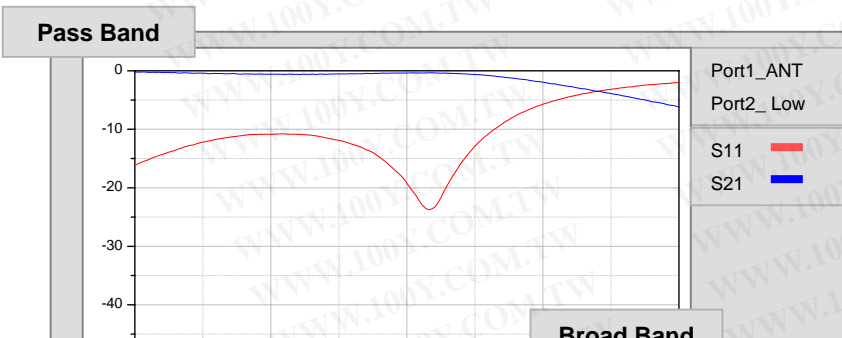


Dimension (mm)	
L	2.00 ± 0.15
W	1.25 ± 0.15
T	0.95 ± 0.10

Terminal	
Input	⑧
Output	④
N.C	②⑥
GND	①③⑤⑦

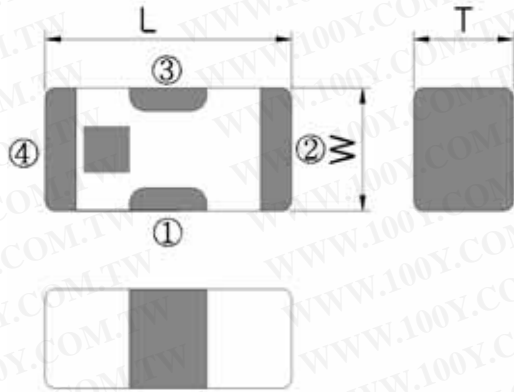
Parameter	Frequency	SPEC.	Unit
Pass Band	5725~5850		
Insertion Loss	5725~5850	0.7	dB max
VSWR	5725~5850	2.0	Max
Attenuation	11450~11700	30	dB min
	17175~17550	20 (reference)	dB min

LC filter



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● LCL10D5425U1

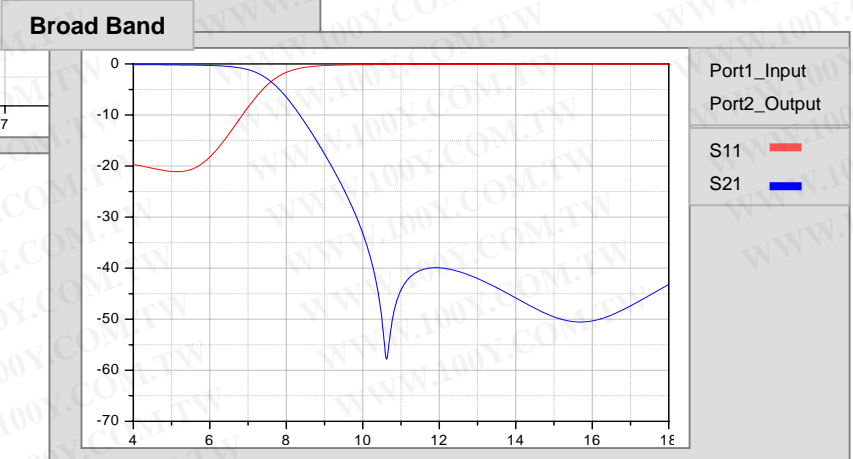
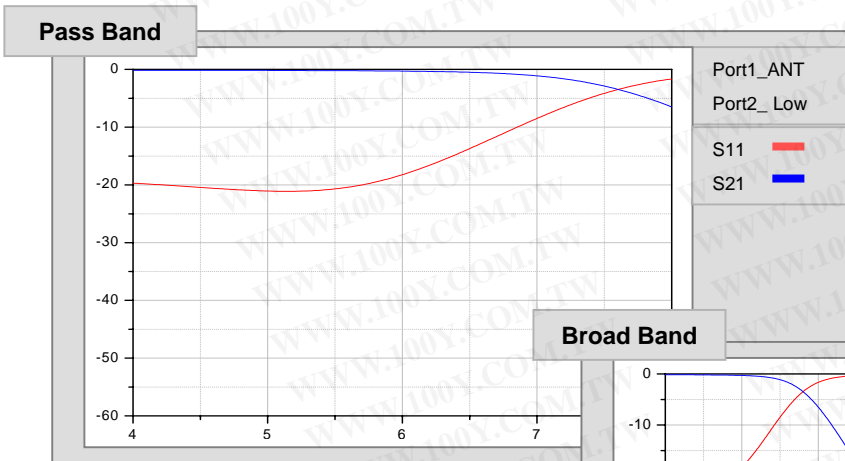


Dimension (mm)	
L	1.60 ± 0.10
W	0.80 ± 0.10
T	0.60 ± 0.10

Terminal	
Input	④
Output	②
GND	①③

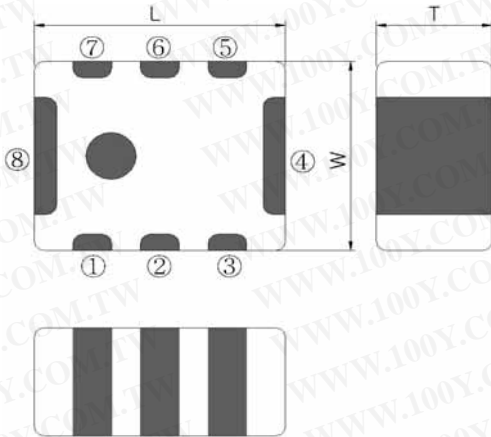
Parameter	Frequency	SPEC.	Unit
Pass Band	4900~5950		
Insertion Loss	4900~5950	0.7	dB max
VSWR	4900~5950	1.7	Max
Attenuation	9800	20	dB min
	11900	30	dB min
	17850	20(reference)	dB min

LC filter



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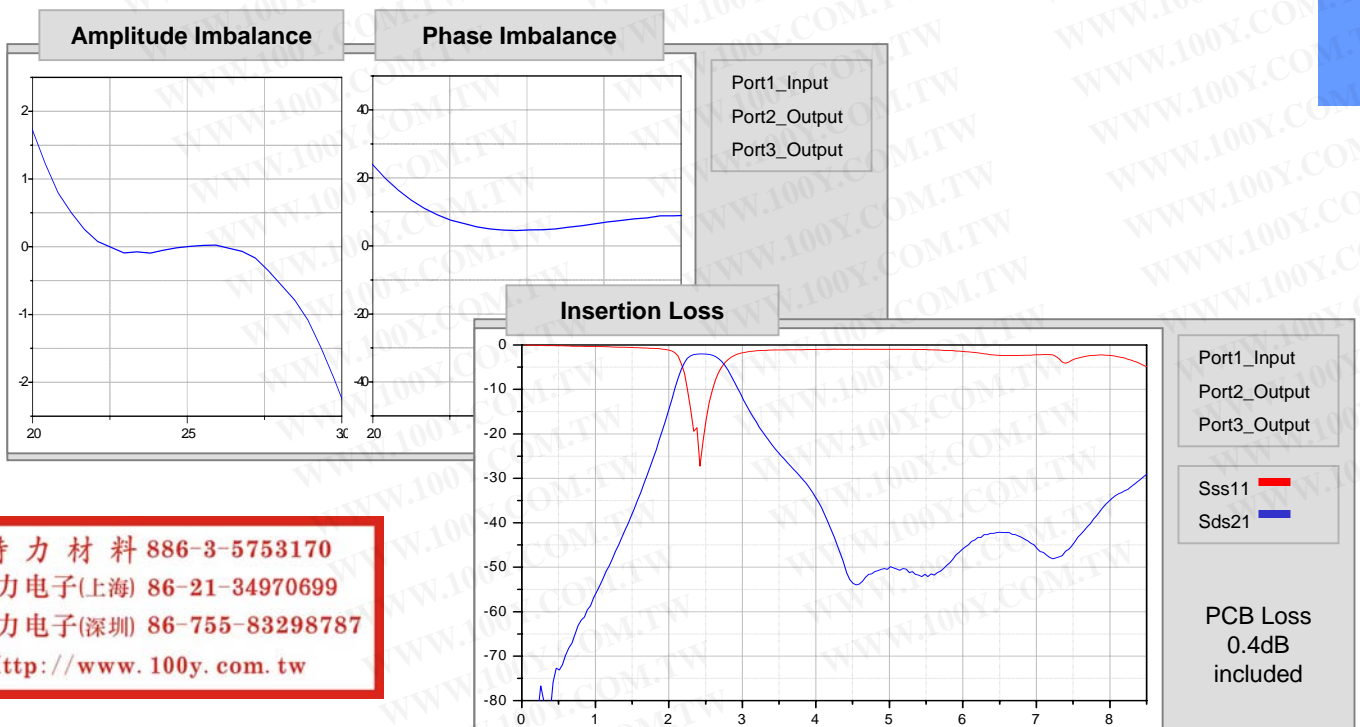
● LCX22B2450W1



Dimension (mm)	
L	2.50 ± 0.20
W	2.00 +0.3/-0.2
T	1.20 ± 0.15

Terminal	
Input	②
Output	⑤ ⑦
N.C	① ③ ⑥
GND	④ ⑧

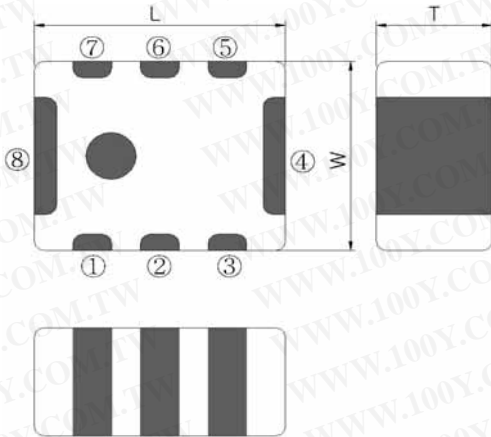
Parameter	Frequency	SPEC.	Unit
Pass Band	2400~2500		
Insertion Loss	2400~2500	2.0	dB max
Return Loss	2400~2500	10	dB min
Attenuation	4800~5000	30	dB min
	7200~7500	30	dB min
Phase Imbalance	2400~2500	180 ± 10	deg
Amplitude Imbalance	2400~2500	1.0	dB max
Unbalance Impedance		50	Ω
Balance Impedance		100	Ω



LC filter

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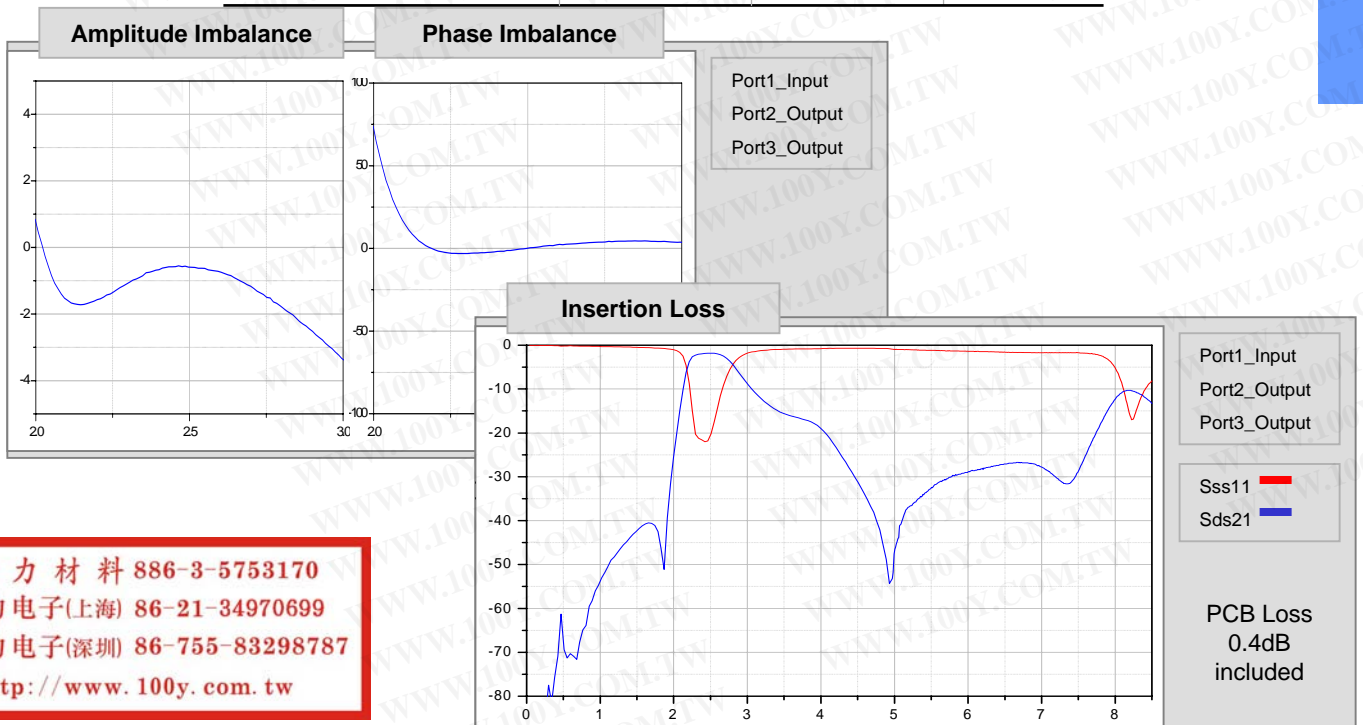
● LCX22B2450N1



Dimension (mm)	
L	2.50 ± 0.20
W	2.00 +0.3/-0.2
T	1.20 ± 0.15

Terminal	
Input	②
Output	⑤⑦
DC	③
N/C	①⑥
GND	④⑧

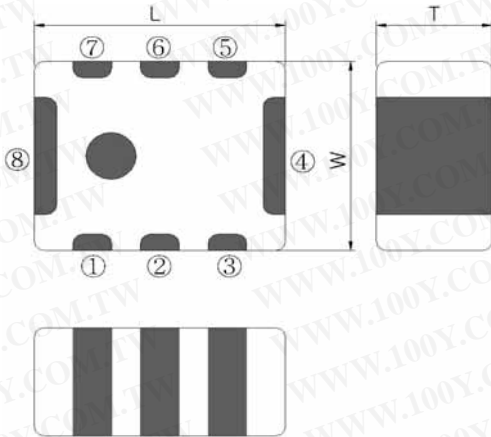
Parameter	Frequency	SPEC.	Unit
Pass Band	2400~2500		
Insertion Loss	2400~2500	2.0	dB max
Return Loss	2400~2500	10	dB min
Attenuation	880~960	35	dB min
	1710~1910	30	dB min
	4800~5000	30	dB min
Phase Imbalance	2400~2500	180 ± 10	deg
Amplitude Imbalance	2400~2500	1.0	dB max
Unbalance Impedance		50	Ω
Balance Impedance		100	Ω



LC filter

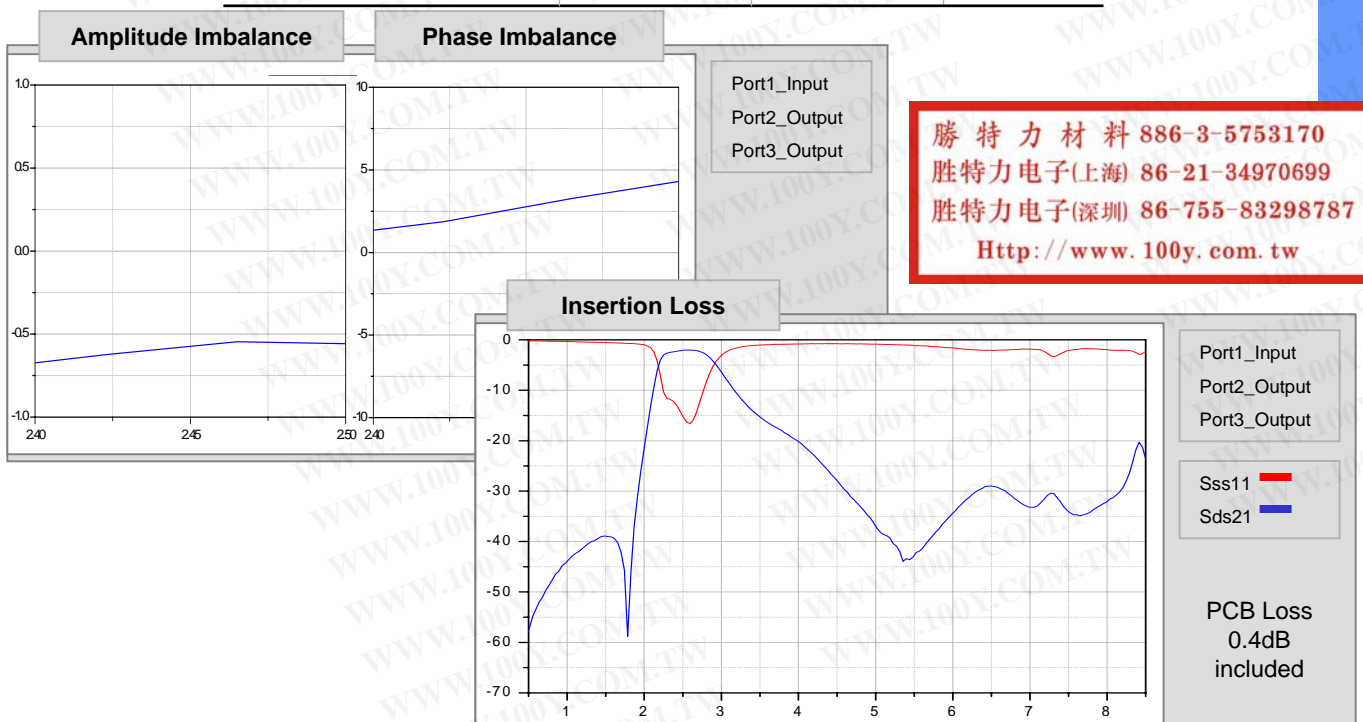
勝特力材料 886-3-5753170
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● LCX22B2450N5



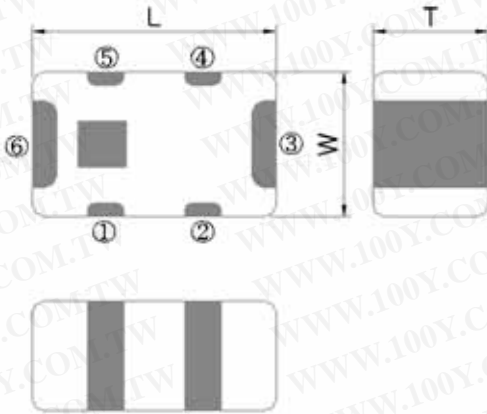
Dimension (mm)	
L	2.50 ± 0.20
W	2.00 +0.3/-0.2
T	1.20 ± 0.15
Terminal	
Input	②
Output	⑤⑦
DC	③
N/C	①⑥
GND	④⑧

Parameter	Frequency	SPEC.	Unit
Pass Band	2400~2500		
Insertion Loss	2400~2500	2.0	dB max
Return Loss	2400~2500	10	dB min
Attenuation	880~960	35	dB min
	1710~1910	30	dB min
	4800~5000	30	dB min
Phase Imbalance	2400~2500	180 ± 10	deg
Amplitude Imbalance	2400~2500	1.0	dB max
Unbalance Impedance		50	Ω
Balance Impedance		50	Ω



LC filter

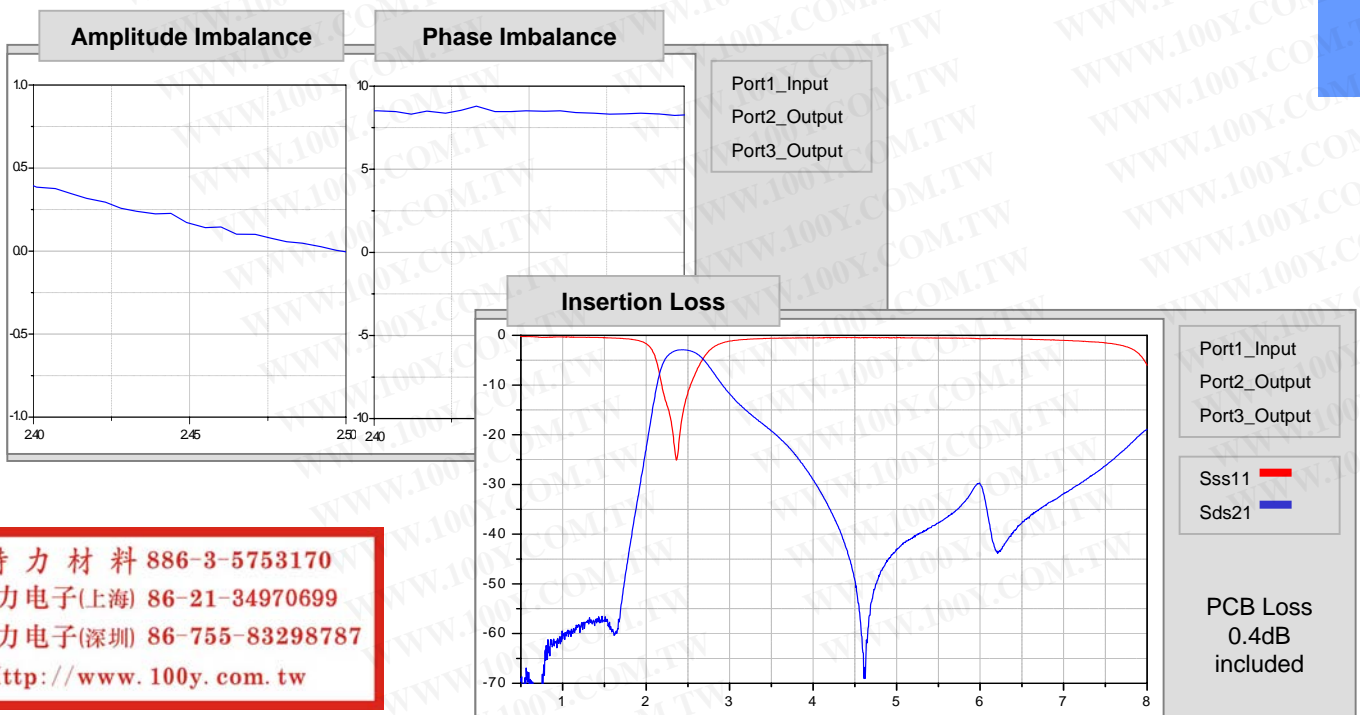
● LCX21H2450X2



Dimension (mm)	
L	2.00 ± 0.15
W	1.25 ± 0.15
T	0.75max

Terminal	
Input	①
Output	④ ⑤
N/C or DC	②
GND	③ ⑥

Parameter	Frequency	SPEC.	Unit
Pass Band	2400~2500		
Insertion Loss	2400~2500	3.0	dB max
Return Loss	2400~2500	10	dB min
Attenuation	880~960	50	dB min
	1710~1910	30	dB min
	4800~5000	30	dB min
Phase Imbalance	2400~2500	180 ± 10	deg
Amplitude Imbalance	2400~2500	1.0	dB max
Unbalance Impedance		50	Ω
Balance Impedance		100	Ω

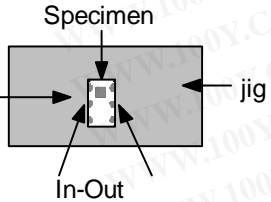


LC filter

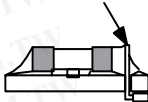
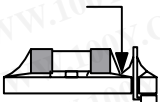
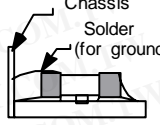
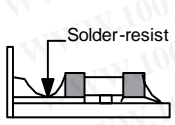
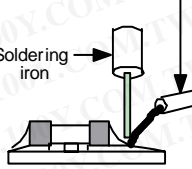
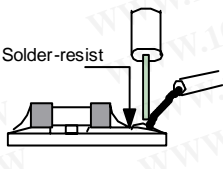
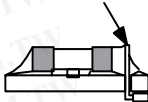
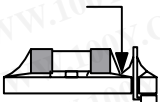
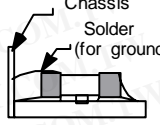
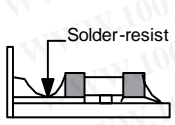
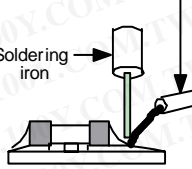
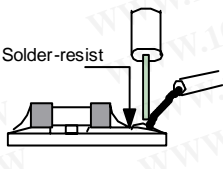
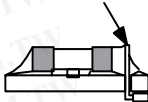
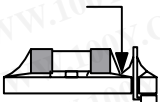
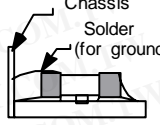
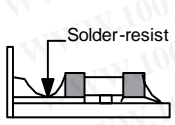
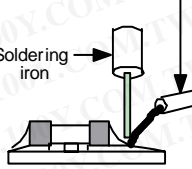
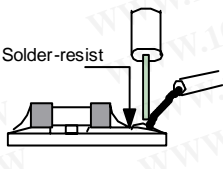
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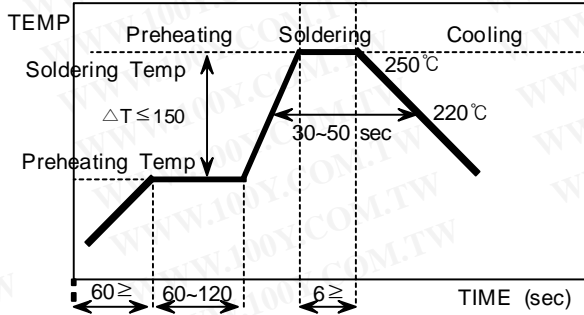
RELIABILITY TEST CONDITION

ITEM	Specified Value	Test Methods & Remarks
1. Operating Temperature Range	-40 to +85℃	<div style="border: 2px solid red; padding: 5px; text-align: center;"> <p>勝特力材料 886-3-5753170 勝特力电子(上海) 86-21-34970699 勝特力电子(深圳) 86-755-83298787 Http://www.100y.com.tw</p> </div>
2. Storage Temperature Range	+15 to +35℃	
3. Thermal Shock (Temperature Cycle Test)	Satisfy Electrical Characteristics.	Repeat 32 cycles under the following conditions. -40℃ for 30 min → +85℃ for 30 min. (Transition time : 5~8 min)
4. Humidity Resistance Test	Satisfy Electrical Characteristics.	Precondition at +25℃ for 1 hour. Let stand at temperature +70±3℃, 90~95% relative humidity for 240 hours. Finally allow to dry at room ambient for 4 hours before taking final measurements.
5. High Temperature Test	Satisfy Electrical Characteristics.	Solder the sample on PCB. Exposure at 125±3℃ for 500 hours. 1-2 hours exposure at room temperature and humidity, prior to measurement.
6. Low Temperature Test	Satisfy Electrical Characteristics.	Solder the sample on PCB. Exposure at -50 ±3℃ for 500 hours. 1-2 hours exposure at room temperature and humidity, prior to measurement.
7. Temperature Characteristics	Satisfy Electrical Characteristics.	Solder the sample on PCB. Exposure at Each Temperature -40℃, -20℃, 0℃, 25℃, 50℃, 85℃ for 30 minutes.

ITEM	Specified Value	Test Methods & Remarks
8. Solderability of Termination	75% of the termination is to be soldered evenly and continuously.	After preheated at 125~150°C for 1~2min. and being dipped in flux 3~5 seconds, the specimen shall be immersed in solder at 230 ±5°C for 3 ± 1 seconds.
9. Resistance to Soldering Heat (Dipping)	Satisfy Electrical Characteristics. No apparent damage.	Immerse the chip in the eutectic solder solution of 260±5°C for 5±0.5s (flow soldering batch) after preheating for 60 ±3 second at 120 to 150°C. Then set it for 2 to 24h at room temperature and measure.
10. Resistance to Soldering Heat (Reflow)	Satisfy Electrical Characteristics. No apparent damage.	Preheat Temperature : 150±10°C Preheat Period : 60sec. MIN. Peak Temperature : 230±5°C Peak Temp. Period : 10 sec. Specimens are soldered twice with the above condition. then kept in room condition for 24 hours before measurements.
11. Board Adhesion (Push strength)	9.8N Minimum	Solder specimens onto test jig shown below. Apply pushing force at 0.5mm/Sec until electrode pads are peeled off or ceramic broken. 
12. Mechanical Shock.	Satisfy Electrical Characteristics. No apparent damage.	Subject samples to three one-half sine shock pulse (3000 g's for 0.3 milliseconds) in each direction (for six total) along each of the three mutually perpendicular axes for a total of 18 shocks.
13. Vibration Test	Satisfy Electrical Characteristics. No apparent damage.	Solder the sample on PCB. Vibrate as apply 20~2000Hz, 186m/s ² (19G) acceleration, 1.5mm amplitude for 2 hours in each of three (X,Y,Z) axis (total 6 hours).
14. Appearance	No failure to cause any problems in actual application.	

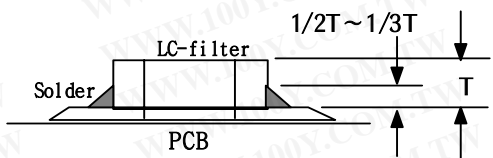
APPLICATION MANUAL

STAGES	PRECAUTIONS	TECHNICAL CONSIDERATIONS												
<p>1. Circuit Design</p>	<p>► Verification of operating environment, electrical rating and Performance.</p> <p>1. A malfunction in medical equipment, spacecraft, nuclear reactors, etc. may cause serious harm to human life or have severe social ramifications. As such, any LC filters to be used in such equipment may require higher safety and/or reliability considerations and should be clearly differentiated from components used in general purpose applications.</p>	<div style="border: 2px solid red; padding: 5px; text-align: center;"> <p>勝特力材料 886-3-5753170 勝特力电子(上海) 86-21-34970699 勝特力电子(深圳) 86-755-83298787 Http://www.100y.com.tw</p> </div>												
<p>2. PCB Design</p>	<p>► Pattern configurations (Design of Land-patterns)</p> <p>1. When LC-filters are mounted on a PCB, the amount of solder used (size of fillet) can directly affect LC-filters performance. Therefore, the following items must be carefully considered in the design of solder land patterns:</p> <p>(1)The amount of solder applied can affect the ability of chips to withstand mechanical stresses which may lead to breaking or cracking. Therefore, when designing land-patterns it is necessary to consider the appropriate size and configuration of the solder pads which in turn determines the amount of solder necessary to form the fillets.</p> <p>(2)When more than one part is jointly soldered onto the same land or pad, the pad must be designed so that each component's soldering point is separated by solder-resist.</p>	<p>Excess solder can affect the ability of chips to withstand mechanical stresses. Therefore, please take proper precautions when designing land-patterns.</p> <p>(1) Examples of good and bad solder application</p> <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th data-bbox="810 1144 932 1240"></th> <th data-bbox="932 1144 1163 1240">Not recommended</th> <th data-bbox="1163 1144 1401 1240">Recommended</th> </tr> </thead> <tbody> <tr> <td data-bbox="810 1240 932 1391">Mixed mounting of SMD and leaded components</td> <td data-bbox="932 1240 1163 1391">  </td> <td data-bbox="1163 1240 1401 1391">  </td> </tr> <tr> <td data-bbox="810 1391 932 1547">Component placement close to the chassis</td> <td data-bbox="932 1391 1163 1547">  </td> <td data-bbox="1163 1391 1401 1547">  </td> </tr> <tr> <td data-bbox="810 1547 932 1771">Hand-Soldering of leaded components near mounted components</td> <td data-bbox="932 1547 1163 1771">  </td> <td data-bbox="1163 1547 1401 1771">  </td> </tr> </tbody> </table>		Not recommended	Recommended	Mixed mounting of SMD and leaded components			Component placement close to the chassis			Hand-Soldering of leaded components near mounted components		
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STAGES	PRECAUTIONS	TECHNICAL CONSIDERATIONS
<p>3. Soldering</p>	<p>► Selection of Flux</p> <p>1. Since flux may have a significant effect on the performance of LC-filters, it is necessary to verify the following conditions prior to use;</p> <p>(1) Flux used should be with less than or equal to 0.1wt%(Chlorine conversion method) of halogenated content. Flux having a strong acidity content should not be applied.</p> <p>(2) When soldering LC-filters on the board, the amount of flux applied should be controlled at the optimum level.</p> <p>(3) When using water-soluble flux, special care should be taken to properly clean the boards.</p> <p>► Soldering</p> <p>Temperature, time, amount of solder, etc. are specified in accordance with the following recommended conditions.</p>	<p>1-1. When too much halogenated substance (Chlorine etc.) content is used to activate the flux, or highly acidic flux is used, an excessive amount of residue after soldering may lead to corrosion of the terminal electrodes or degradation of insulation resistance on the surface of the LC-filter.</p> <p>1-2. Flux is used to increase solderability in flow soldering, but if too much is applied, a large amount of flux gas may be emitted and may detrimentally affect solderability. To minimize the amount of flux applied, it is recommended to use a flux-bubbling system.</p> <p>1-3. Since the residue of water-soluble flux is easily dissolved by water content in the air, the residue on the surface of LC-filter in high humidity conditions may cause a degradation of insulation resistance and therefore affect the reliability of the components. The Cleaning methods and the capability of the machines used should also be considered carefully when selecting water soluble flux.</p> <p>1-1. Preheating when soldering</p> <p>Heating : Chip LC-filter components should be preheated to within 100 to 130 °C of the soldering.</p> <p>Cooling : The temperature difference between the components and cleaning process should not be greater than 100 °C. Chip LC-filters are susceptible to thermal shock when exposed to rapid or concentrated heating or rapid cooling. Therefore, the soldering process must be conducted with a great care so as to prevent malfunction of the components due to excessive thermal shock.</p> <p>Recommended conditions for soldering [Reflow soldering] Temperature Profile</p>  <p>The graph shows a temperature profile with three main phases: Preheating, Soldering, and Cooling. The Preheating phase starts at a temperature below 150°C and rises to a plateau at 150°C, with a time duration of at least 60 seconds. The Soldering phase is a horizontal line at 250°C, with a time duration of 30-50 seconds. The Cooling phase starts at 250°C and drops to 220°C. The maximum temperature change during preheating is ΔT ≤ 150°C. The time for the preheating ramp is 60-120 seconds, and the time for the cooling ramp is at least 6 seconds.</p>

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LC filter

STAGES	PRECAUTIONS	TECHNICAL CONSIDERATIONS						
3. Soldering		<p>Caution</p> <ol style="list-style-type: none"> The ideal condition is to have solder mass (fillet) controlled to 1/2 to 1/3 of the thickness of the LC-filter, as shown below:  <ol style="list-style-type: none"> Because excessive dwell times can detrimentally affect solderability, soldering duration should be kept as close to recommended times as possible. 						
4. Cleaning	<p>► Cleaning conditions</p> <ol style="list-style-type: none"> When cleaning the PC board after the LC-filters are all mounted, select the appropriate cleaning solution according to the type of flux used and purpose of the cleaning(e.g. to remove soldering flux or other materials from the production process.) Cleaning conditions should be determined after verifying, through a test run, that the cleaning process does not affect the LC-filter's characteristics. 	<ol style="list-style-type: none"> The use of inappropriate solutions can cause foreign substances such as flux residue to adhere to the LC-filter, resulting in a degradation of the LC-filter's electrical properties (especially insulation resistance). Inappropriate cleaning conditions (insufficient or excessive cleaning) may detrimentally affect the performance of the LC-filters. <p>(1) Excessive cleaning</p> <p>In the case of ultrasonic cleaning, too much power output can cause excessive vibration of the PC board which may lead to the cracking of the LC-filter or the soldered portion, or decrease the terminal electrodes' strength.</p> <p>Thus the following conditions should be carefully checked;</p> <table border="0"> <tr> <td>Ultrasonic output</td> <td>Below 20 w/l</td> </tr> <tr> <td>Ultrasonic frequency</td> <td>Below 40 kHz</td> </tr> <tr> <td>Ultrasonic washing period</td> <td>5 min. or less</td> </tr> </table>	Ultrasonic output	Below 20 w/l	Ultrasonic frequency	Below 40 kHz	Ultrasonic washing period	5 min. or less
Ultrasonic output	Below 20 w/l							
Ultrasonic frequency	Below 40 kHz							
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5. Post cleaning processes	<p>► Application of resin coatings, molding, etc. to the PCB and components.</p> <ol style="list-style-type: none"> With some type of resins a decomposition gas or chemical reaction vapor may remain inside the resin during the hardening period or while left under normal storage conditions resulting in the deterioration of the LC-filter's performance. When a resin's hardening temperature is higher than the LC-filter's operating temperature, the stresses generated by the excess heat may lead to LC-filter damage or destruction. Stress caused by a resin's temperature generated expansion and contraction may damage LC-filters. <p>The use of such resins, molding materials etc. is not recommended.</p>	<div style="border: 2px solid red; padding: 5px; text-align: center;"> <p>勝特力材料 886-3-5753170 勝特力电子(上海) 86-21-34970699 勝特力电子(深圳) 86-755-83298787 Http://www.100y.com.tw</p> </div>						



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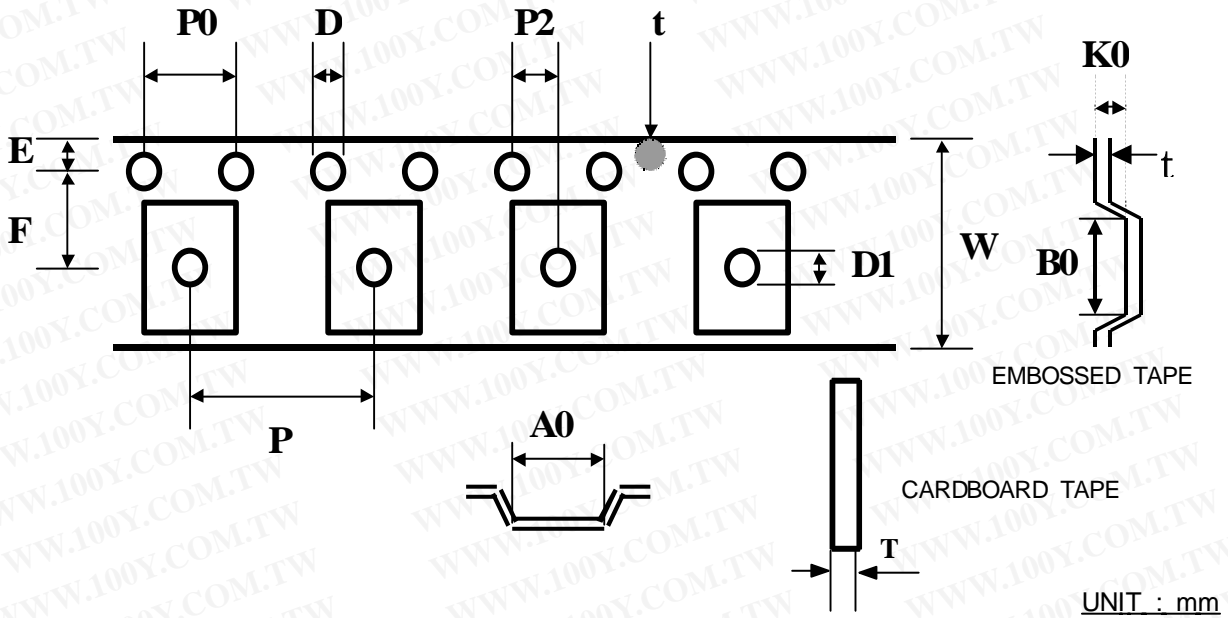
STAGES	PRECAUTIONS	TECHNICAL CONSIDERATIONS
6. Storage conditions	<p>► Storage</p> <p>1. To maintain the solderability of terminal electrodes and to keep the packaging material in good condition, care must be taken to control temperature and humidity in the storage area. Humidity should especially be kept as low as possible.</p> <p>Recommended conditions Ambient temperature Below 40°C Humidity Below 70% RH</p> <p>The ambient temperature must be kept below 30°C. Even under ideal storage conditions LC-filter electrode solderability decreases as time passes, so LC-filters should be used within 6 months from the time of delivery.</p> <p>※ The packaging material should be kept where no chlorine or sulfur exists in the air.</p>	<p>1. If the parts are stocked in a high temperature and humidity environment, problems such as reduced solderability caused by oxidation of terminal electrodes and deterioration of taping/packaging materials may take place. For this reason, components should be used within 6 months from the time of delivery. If exceeding the above period, please check solderability before using the LC-filters.</p>

LC filter

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PACKAGING

● CARRIER TAPE SPECIFICATION



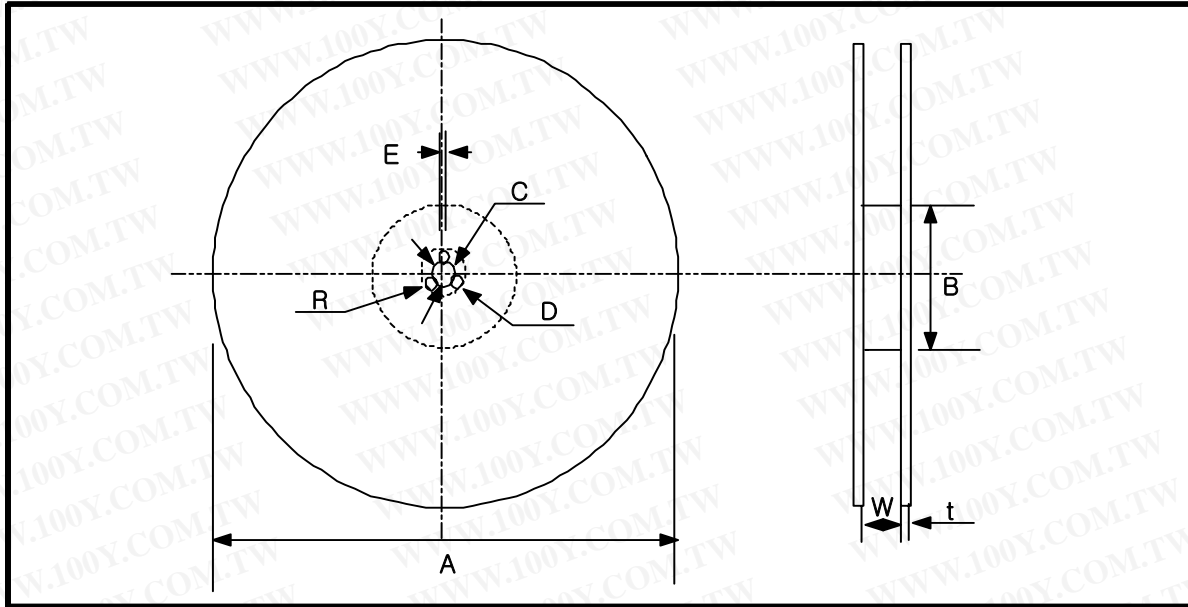
TYPE	TAPE MATERIAL	A0	B0	T	K0	P2
10	CARDBOARD TAPE	1.10±0.2	1.90±0.2	0.75±0.1	-	2.0±0.05
21	EMBOSSED TAPE	1.45±0.1	2.25±0.1	-	1.1±0.1	

TYPE	W	P	E	F	D	D1	P0
10	8.0±0.3	4.0±0.1	1.75±0.1	3.5±0.05	Φ1.5±0.1	-	4.0±0.1
21						1.0±0.25	

● QUANTITY

TYPE	THICKNESS OF BODY[MM]	STANDARD QUANTITY[PCS]
10	0.65	4000
21	0.95	3000

● REEL DIMENSION



unit : mm

A	B	C	D	E	W	T	R
$\phi 178 \pm 2$	$\phi 60 \pm 5.0$	$\phi 13 \pm 0.5$	$\phi 21 \pm 0.8$	2 ± 0.5	10.0 ± 1.5	0.8 ± 0.2	1.0

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NOTICE

● Report before change

If it is required to change the specifications, materials or manufacturing methods of this specified LC Filters, we shall inform on written statement with its quality and reliability data before changes may occur.

● Packaging

Package includes label with below item and outgoing inspection data on customer's request.

- Part No.& Lot No.
- Quantity
- Name and logo of manufacturer

● Restriction of environmental destructive material

LC Filters specified on this specification do not use any of under stated materials.

Cd, Hg, As, Br and its chemical composite, PCB and asbestos.

PBBS

PBBOs

PBDO

PBDE

PBB

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● Usage of destructive materials to ozonosphere

LC Filters specified on this specification do not use any of under stated ODS materials on its manufacturing stages.

Freon

Haron

1-1-1 TCE

CCI4

HCFC