

SPECIFICATION

WOUND CHIP INDUCTORS

LEM2520 TYPE

	Specifications	
	LEM2520 TYPE	(1 / 10)

1. Range of application

This specification sheet applies to type LEM2520 small squareshaped chip coils.

2. Ordering code

Example : LEM 2520 T 100 J
 (1) (2) (3) (4) (5)

- (1) Type
- (2) External dimensions
- (3) Packing style (T: Taping)
- (4) Inductance
- (5) Inductance tolerance

3. Standard measuring method

Inductance	: LCR meter	(HP 4285A+42851A or equivalent)
Q	: LCR meter	(HP 4285A+42851A or equivalent)
Self-resonance frequency	: Network Analyzer	(Anritsu MS620J or equivalent)
DC resistance	: DC Ohmmeter	(A&D AD5812 or equivalent)

Standard test conditions

Unless otherwise specified, temperature is 20 ± 15 °C and the humidity is 65 ± 20 %.

Should any doubt arise about the test results, further test shall be conducted at a temperature of 20 ± 2 °C and a humidity of 65 ± 5 %.

Inductance and Q are in accordance with our standard measurement figures.

4. Operating temperature range

-40 °C to +85 °C

5. Electrical characteristics

Refer to table 1 and 3.

6. External dimensions and structural diagram

Refer to Table 2.

7. Mechanical characteristics

Refer to Table 3.

8. Environment test performance standards

Refer to Table 3.

9. Taping method

Refer to Table 4.

10. Packing form

Refer to Table 5.

11. Reflow profile chart

Refer to Table 6.

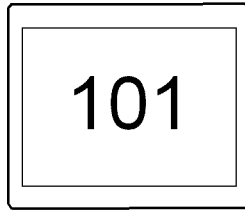
		Table 1						
		ELECTRICAL CHARACTERISTICS					(2 / 10)	
Item	Inductance [μ H]	Tolerance [%]	Q min	S.R.Freq. [MHz] min	D.C. Resistance [Ω] max	Rated Current [mA] max	Measuring Frequency [MHz]	
LEM2520TR12K	0.12	± 10	30	600	0.37	520	25.2	
LEM2520TR15K	0.15	± 10	30	550	0.42	480	25.2	
LEM2520TR18K	0.18	± 10	30	500	0.46	460	25.2	
LEM2520TR22K	0.22	± 10	30	450	0.52	430	25.2	
LEM2520TR27K	0.27	± 10	30	425	0.56	420	25.2	
LEM2520TR33K	0.33	± 10	30	400	0.60	400	25.2	
LEM2520TR39K	0.39	± 10	30	375	0.65	375	25.2	
LEM2520TR47K	0.47	± 10	30	350	0.68	350	25.2	
LEM2520TR56K	0.56	± 10	30	300	0.75	325	25.2	
LEM2520TR68K	0.68	± 10	30	270	0.85	300	25.2	
LEM2520TR82K	0.82	± 10	30	250	1.00	260	25.2	
LEM2520T1R0J	1.0	± 5	30	220	1.10	245	7.96	
LEM2520T1R2J	1.2	± 5	30	180	1.20	230	7.96	
LEM2520T1R5J	1.5	± 5	30	135	1.30	220	7.96	
LEM2520T1R8J	1.8	± 5	30	100	1.45	210	7.96	
LEM2520T2R2J	2.2	± 5	30	75	1.55	200	7.96	
LEM2520T2R7J	2.7	± 5	30	55	1.70	195	7.96	
LEM2520T3R3J	3.3	± 5	30	48	1.90	185	7.96	
LEM2520T3R9J	3.9	± 5	30	43	2.10	180	7.96	
LEM2520T4R7J	4.7	± 5	30	40	2.30	175	7.96	
LEM2520T5R6J	5.6	± 5	25	36	2.50	170	7.96	
LEM2520T6R8J	6.8	± 5	25	33	2.70	165	7.96	
LEM2520T8R2J	8.2	± 5	25	30	3.05	160	7.96	
LEM2520T100J	10	± 5	25	27	3.50	155	2.52	
LEM2520T120J	12	± 5	25	23	3.80	150	2.52	
LEM2520T150J	15	± 5	25	20	4.40	140	2.52	
LEM2520T180J	18	± 5	25	18	4.80	130	2.52	
LEM2520T220J	22	± 5	25	17	5.50	125	2.52	
LEM2520T270J	27	± 5	25	16	6.30	115	2.52	
LEM2520T330J	33	± 5	25	15	7.10	110	2.52	
LEM2520T390J	39	± 5	20	14	9.50	90	2.52	
LEM2520T470J	47	± 5	20	13	11.10	80	2.52	
LEM2520T560J	56	± 5	20	12	12.10	75	2.52	
LEM2520T680J	68	± 5	20	11	16.60	70	2.52	
LEM2520T820J	82	± 5	20	10	19.00	65	2.52	
LEM2520T101J	100	± 5	15	9	21.00	60	0.796	

Table 2

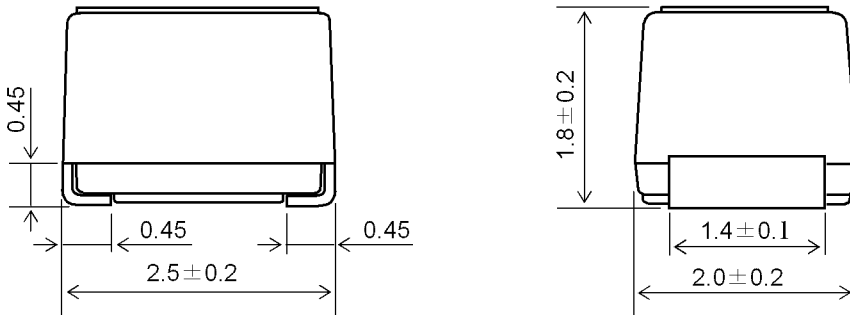
EXTERNAL DIMENSIONS AND
STRUCTURAL DIAGRAM

(3 / 10)

1. External dimensions



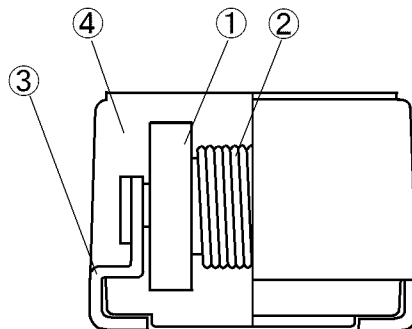
Printing example
101J : "101" (100 μH)



Unit [mm]

※ Remark: Dimension without tolerance is reference value.

2. Structural diagram



- | | |
|----------------------|---|
| ① Core | Ferrite core |
| ② Coil material | Polyurethane-copper wire |
| ③ External electrode | Solder coating (Lead plating composition : Sn
Joint solder : Sn / Ag / Cu) |
| ④ Over-coating resin | Thermosetting resin |

Table 3		(4 / 10)
STANDARDS		

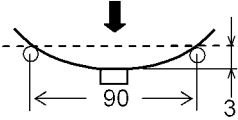
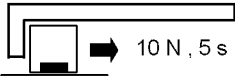
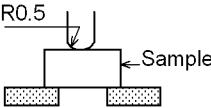
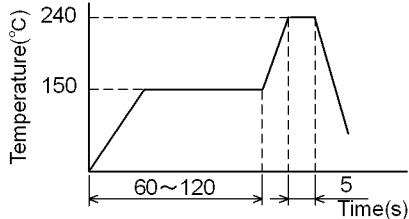
	Item	Standard	Test method
ELECTRICAL CHARACTERISTICS	Temperature characteristics	$\Delta L/L \rightarrow$ Within $\pm 5\%$	Measurement were taken in a temperature range of $-25\text{ }^{\circ}\text{C}$ to $+85\text{ }^{\circ}\text{C}$ and the value at $+20\text{ }^{\circ}\text{C}$ was used as the standard value.
	Rated current	Refer to Table 1.	Whichever small current value : when DC superimposed inductance value is lowered 10 % of initial value or when temperature of winding rises $20\text{ }^{\circ}\text{C}$ at direct current.
	Overcurrent test	No smoke and no fire.	1.5 times the rated current was applied for a period of 5 minutes.
	Insulation resistance	Not less than $1 \times 10^8 \Omega$.	1 mm width of metal band shall be applied around body. 50 V DC shall be applied between metal band and terminal for 30 seconds.
MECHANICAL CHARACTERIST	Bending test	No breakage.	After the coils were soldered to substrates, the middle points of substrates were forced down to a point that was 3.0 mm below the end of the substrates. (Board of 1.6 mm thickness) 
	Tensile strength test	No separation from substrate.	After the coils were soldered to substrates, a force of 10 N was applied in both the X and Y directions for a period of 5 seconds. 
	Body strength test	No breakage.	A static load of 10 N shall be applied to the center in the direction of the arrow and held for 10 seconds. 
ENVIRONMENT TEST	Solderability	Not less than 90 % bonding to electrode surfaces.	Immersion for a period of 5 ± 0.5 seconds in H63A solder at a temperature of $230 \pm 5\text{ }^{\circ}\text{C}$. The flux used was a rosin-core solution containing approximately 25 % methanol.
	Soldering heat resistance test (1) Dip soldering	No pronounced abnormality in appearance.	Immersion for a period of 10 ± 1 seconds in H63A solder at a temperature of $260 \pm 5\text{ }^{\circ}\text{C}$.

Table 3		(5 / 10)
STANDARDS		

	Item	Standard	Test method
ENVIRONMENT TEST	(2)Reflow soldering	No pronounced abnormality in appearance.	Immersion three times for a period of 5 ± 0.5 seconds in H63A solder at a temperature of 240 ± 5 °C. 
	(3)Soldering iron	No pronounced abnormality in appearance.	Apply the soldering iron to electrode. Bit temperature : 350 ± 5 °C Application time of soldering iron : $3 \pm \frac{1}{9}$ seconds The specimen shall be stored at standard atmospheric condition for 24 hours, after which the measurement shall be made.
	Solubility resistance	No pronounced abnormality in appearance.	Dip the component into the isopropyl alcohol bath at the room temperature for 90 seconds.
	Vibration test	Δ L/L→Within ± 5 % No pronounced abnormality in appearance.	After the coils mounted on substrates,1 minutes 10-55-10 cycle-per-second sweeps 1.5 mm-stroke vibrations were applied for 2 hours each in the X, Y and Z directions. (a total of 6 hours)
	Acceleration test	Δ L/L→Within ± 5 % No pronounced abnormality in appearance.	After the coils is mounted on the printed wiring board and soldered. Peak acceleration : 980 m/s^2 Duration of pulse : 6 ms Three successive shock shall be applied in both directions of mutually perpendicular axis (a total of 18 shocks).
	Low-temperature resistance test	Δ L/L→Within ± 10 % Q →The specified standard shall be satisfied.	Measurements were taken after the coils were stored at -40 ± 2 °C for a period of $1\,000 \pm 12$ hours.
	Heat test	Δ L/L→Within ± 10 % Q →The specified standard shall be satisfied.	Measurements were taken after the coils were stored at 85 ± 2 °C for a period of $1\,000 \pm 12$ hours.
	Humidity resistance test	Δ L/L→Within ± 10 % Q →The specified standard shall be satisfied.	Measurements were taken after the coils were stored at 60 ± 2 °C in 90 to 95 % RH for a period of $1\,000 \pm 12$ hours.
	Humidity resistance load test	Δ L/L→Within ± 10 % Q →The specified standard shall be satisfied.	Measurements were taken after the rated current was applied while the coils were stored at 60 ± 2 °C in 90 to 95 % RH for a period of $1\,000 \pm 12$ hours.
	Temperature cycle test	Δ L/L→Within ± 10 % Q →The specified standard shall be satisfied.	Measurements were taken after the coils were stored for 30 minutes, during which they were subjected to 100 temperature cycles of between -40 °C to $+85$ °C.

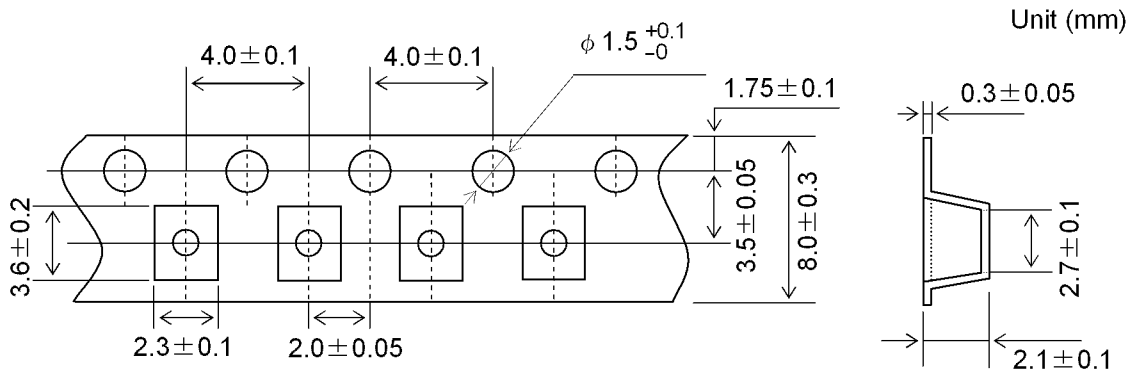
NOTE:※ Unless otherwise specified, measurements were taken within 2 hours after the coils was stored at room temperature and in normal humidity for not less than 1 hour.

Table 4

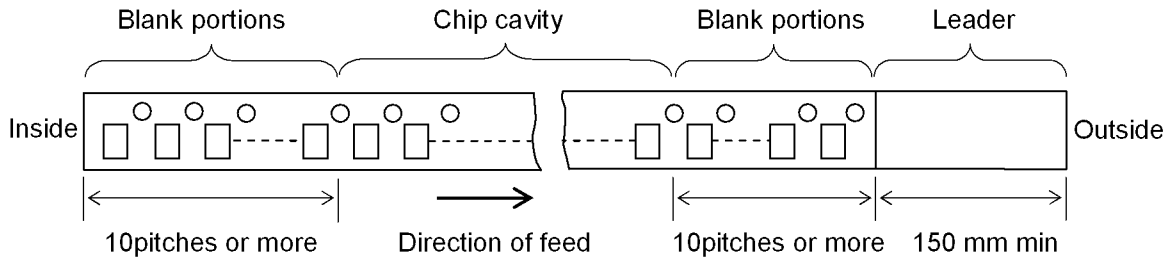
TAPING DIMENSIONS

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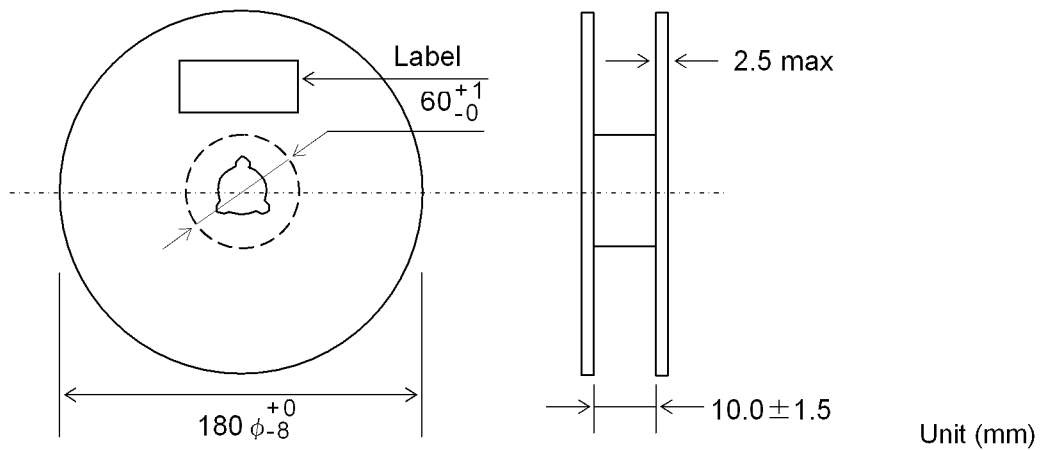
1. Dimensions



2. Direction of rolling



3. Reel



4. Top tape strength

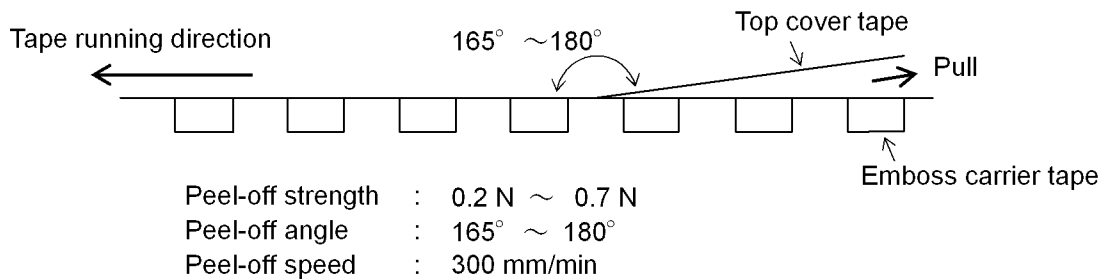


	Table 5	
	PACKING	(7 / 10)

1. The number of components

Each reel shall accommodate 2 000 inductors whether there are empty compartments or not.

2. Packing in tape

Emboss carrier tapes of 8 mm width, 4 mm pitch and ϕ 180 mm-reels shall be used.

3. The allowable number of empty components

The number of empty compartments in a reel, which shall not appear continuously, must be limited to 2.

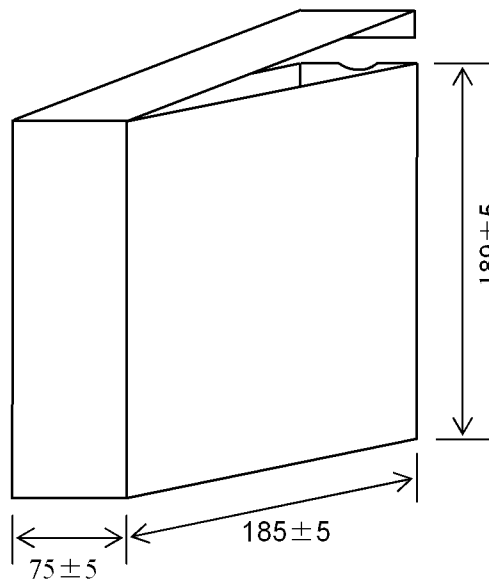
4. Marking

The following items shall be marked legibly each unit pack.

- (1) Manufacturer's name or trademark (abbreviated Manufacturer's name)
- (2) Date of manufacturing or abbreviated codes (include lot No. and Key No.)
(Enabling lot-tracing.)
- (3) Part number
- (4) The name of manufacturing company
- (5) The number of components packed in a reel

5. Dimensions of packing box (taping)

※ Reference



Standard Quantity
10 000 pcs.

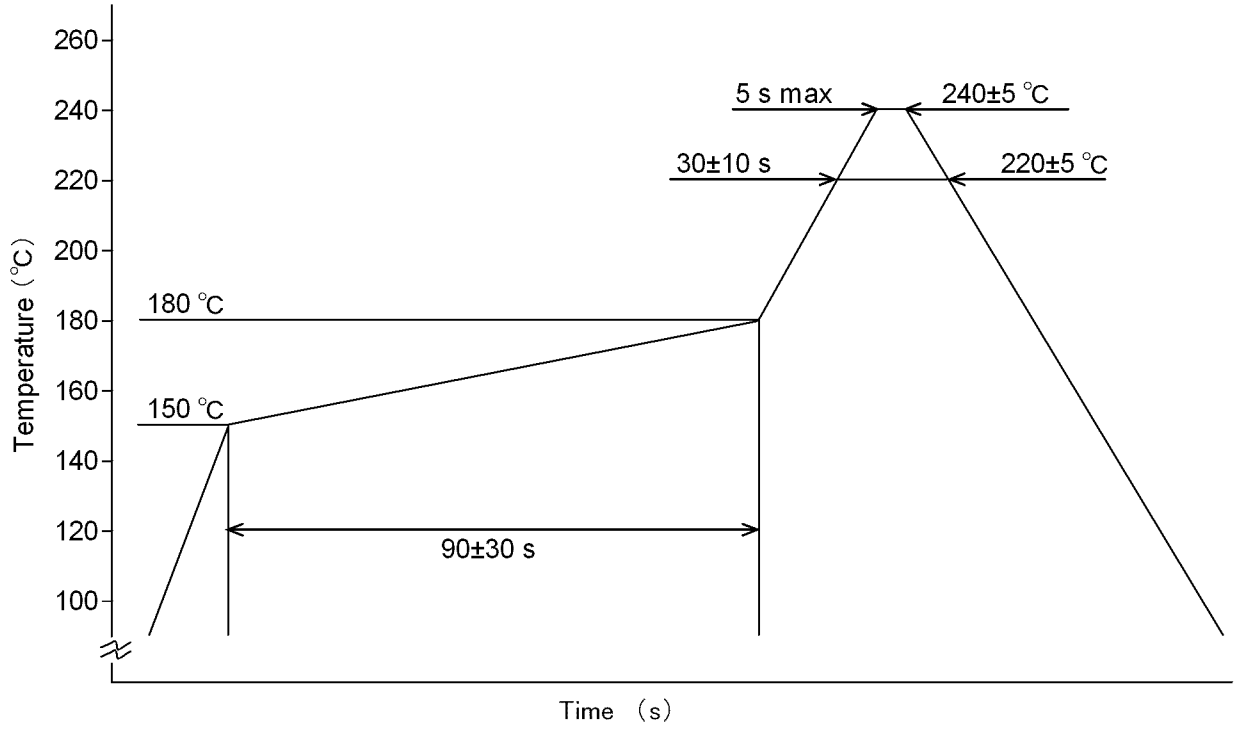
Unit (mm)

Table 6

REFLOW PROFILE CHART

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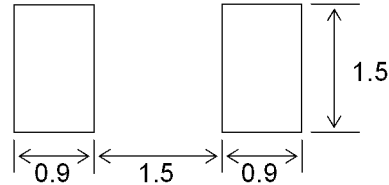
[Recommended Reflow Condition]



※ Max 2 cycles of the above reflow profile should be applied.

1. Surface Mounting

- Mounting and soldering conditions should be checked beforehand.
- Recommended reflow condition : refer to the Reflow Profile on page 9/11.
- Recommended Land-Pattern :



Unit (mm)

- Recommended conditions for using a soldering iron:
Put the soldering iron on the land-pattern.
Soldering iron's temperature Below 350 °C
Duration 3 seconds or less

2. Handling

Keep the inductors away from all magnets and magnetic objects.

3. Storage

To maintain the solderability of terminal electrodes and to keep the packing material in good condition, temperature and humidity in the storage area should be controlled..

Recommended conditions

Ambient temperature	Below 40 °C
Humidity	Below 70 % RH

The ambient temperature must be kept below 30 °C. Even under ideal storage conditions, solderability of inductor's electrodes may decrease as time passes. For this reason, inductors should be used within one year from the time of delivery.

4. Regulations

- No ozone-depleting substances, which are defined as Class- I and Class- II in the US Federal Clean Air Act, are used in the production processes, nor contained in the product.
- Certain brominated flame retardants (PBBs, PBDEs) are not used at all.
- The product and the specifications described above are not included in the list of export regulations in Japan and USA.

5. Production Sites

KOREA TONG YANG YUJUN CO.,LTD. (KOREA)
TAIYO YUDEN (TIANJIN) ELECTRONICS CO., LTD (CHINA)

6. Precautions

At using TAIYO YUDEN products of this specification and in case of using the lead free soldering, We request to use them after confirming of adhesion, temperature of resistance to soldering heat, solderability and soldering shape situation etc sufficiently.

SPECIAL NOTICE

- All of the contents specified here are subject to change without notice due to technical improvements, etc. Therefore, please check latest version of the components specifications carefully before practical application or usage of the components. Please note that Taiyo Yuden Co.,Ltd. shall not be responsible for any of deficiency to components or equipments to be used, which are caused under the condition other than specified in the specification.

- This product is developed, designed and intended for use in general electronics equipments. (for AV, household, office supply, information service, telecommunications, etc.). Before incorporating the components into any equipments in the field such as aerospace, aviation, nuclear control, submarine, transportation, (automotive driving and control, passenger protection, train control, ship control), transportation signal, disaster prevention, medical, public information network etc. where higher safety and reliability are especially required, please contact Taiyo Yuden Co., Ltd. for more detail in advance.
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