



RF Inductors

Chip Wirewound Inductor Molded Type - EM Series / 模压型贴片绕线电感器

► Features

- Lead-free materials is used for the plating on the terminals.
- The product uses metal terminals, which realize excellent connection reliability.
- High resistance to heat, humidity, mechanical shocks and presser. Accurate dimensions for automatically surface mounted.
- The product has good heat durability that withstands lead-free compatible reflow soldering conditions.

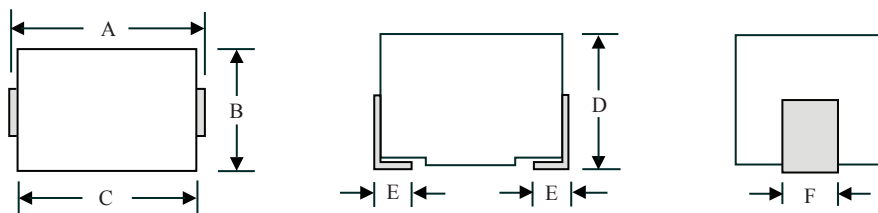
► Applications

- TCEM serials high reliable wire would chip inductors for communication, equipment, instrument, video & been developed in response to the trend toward higher density mounting of parts in electric circuits.

► Operating temperature

- Range: -25 ~ +85 °C.

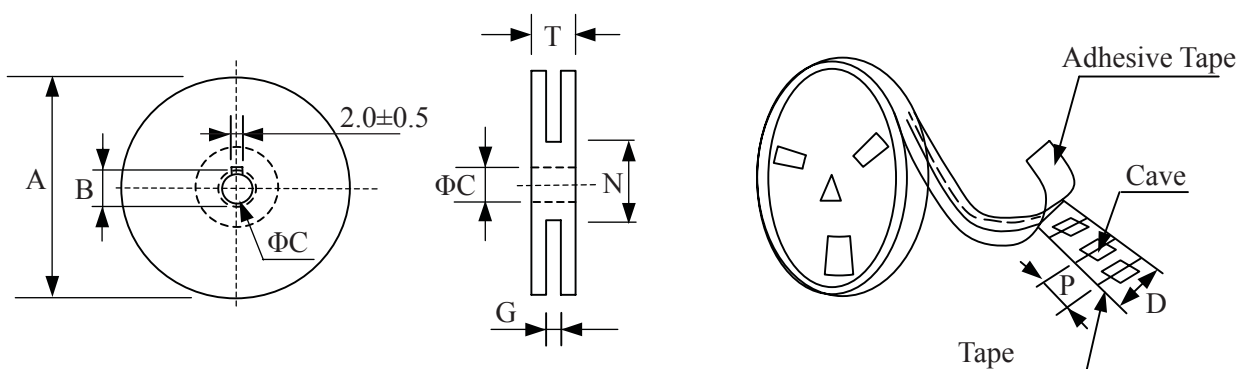
► Chip Wirewound Inductor Configurations & Dimensions (unit: mm)



Type	A	B	C	D	E	F
TCEM322522N(1210)	3.2 ± 0.4	2.5 ± 0.2	2.9 ± 0.3	2.2 ± 0.2	0.6 ± 0.2	1.0 ± 0.2
TCEM453232N(1812)	4.5 ± 0.4	3.2 ± 0.2	4.2 ± 0.3	3.2 ± 0.2	1.0 ± 0.2	1.2 ± 0.2

► Packaging - Chip Wirewound Inductors

TYPE	A	B	C	D	G	N	T
8mm	178	21.0 ± 0.8	13.0 ± 0.5	8	10 max	50 min	14.4 max
12mm	178	21.0 ± 0.8	13.0 ± 0.5	10	14 max	50 min	14.4 max





► Electrical Characteristics for TCEM322522N(1210) Series - Chip Wirewound Inductors

Part Number	Inductance (μH)	Tolerance (%)	Q (min)	Test Freq. (MHZ)	SRF (MHz)(min)	DCR (Ω)(max)	IDC (mA)
TCEM322522N - R10*	0.10	±20,±10	28	100	700	0.44	450
TCEM322522N - R12*	0.12	±20,±10	30	25.2	500	0.22	450
TCEM322522N - R15*	0.15	±20,±10	30	25.2	450	0.25	450
TCEM322522N - R18*	0.18	±20,±10	30	25.2	400	0.28	450
TCEM322522N - R22*	0.22	±20,±10	30	25.2	350	0.32	450
TCEM322522N - R27*	0.27	±20,±10	30	25.2	320	0.36	450
TCEM322522N - R33*	0.33	±20,±10	30	25.2	300	0.40	450
TCEM322522N - R39*	0.39	±20,±10	30	25.2	250	0.45	450
TCEM322522N - R47*	0.47	±20,±10	30	25.2	220	0.50	450
TCEM322522N - R56*	0.56	±20,±10	30	25.2	180	0.55	450
TCEM322522N - R68*	0.68	±20,±10	30	25.2	160	0.60	450
TCEM322522N - R82*	0.82	±20,±10	30	25.2	140	0.65	450
TCEM322522N - 1R0*	1.00	±10,±5	30	7.96	120	0.70	400
TCEM322522N - 1R2*	1.20	±10,±5	30	7.96	100	0.75	390
TCEM322522N - 1R5*	1.50	±10,±5	30	7.96	85	0.85	370
TCEM322522N - 1R8*	1.80	±10,±5	30	7.96	80	0.90	350
TCEM322522N - 2R2*	2.20	±10,±5	30	7.96	75	1.00	320
TCEM322522N - 2R7*	2.70	±10,±5	30	7.96	70	1.10	290
TCEM322522N - 3R3*	3.30	±10,±5	30	7.96	60	1.20	260
TCEM322522N - 3R9*	3.90	±10,±5	30	7.96	55	1.30	250
TCEM322522N - 4R7*	4.70	±10,±5	30	7.96	50	1.50	220
TCEM322522N - 5R6*	5.60	±10,±5	30	7.96	45	1.60	200
TCEM322522N - 6R8*	6.80	±10,±5	30	7.96	40	1.80	180
TCEM322522N - 8R2*	8.20	±10,±5	30	7.96	35	2.00	170
TCEM322522N - 100*	10.0	±10,±5	30	2.52	30	2.10	150
TCEM322522N - 120*	12.0	±10,±5	30	2.52	20	2.50	140
TCEM322522N - 150*	15.0	±10,±5	30	2.52	20	2.80	130
TCEM322522N - 180*	18.0	±10,±5	30	2.52	20	3.30	120
TCEM322522N - 220*	22.0	±10,±5	30	2.52	20	3.70	110
TCEM322522N - 270*	27.0	±10,±5	30	2.52	20	5.00	80
TCEM322522N - 330*	33.0	±10,±5	30	2.52	17	5.60	70
TCEM322522N - 390*	39.0	±10,±5	30	2.52	16	6.40	65
TCEM322522N - 470*	47.0	±10,±5	30	2.52	15	7.00	60
TCEM322522N - 560*	56.0	±10,±5	30	2.52	13	8.00	55
TCEM322522N - 680*	68.0	±10,±5	30	2.52	12	9.00	50
TCEM322522N - 820*	82.0	±10,±5	30	2.52	11	10.0	45
TCEM322522N - 101*	100	±10,±5	20	0.796	10	10.0	40
TCEM322522N - 121*	120	±10,±5	20	0.796	10	11.0	70
TCEM322522N - 151*	150	±10,±5	20	0.796	8	15.0	65
TCEM322522N - 181*	180	±10,±5	20	0.796	7	17.0	60
TCEM322522N - 221*	220	±10,±5	20	0.796	7	21.0	50

Note: Test equipment L, Q: HP4285A +16034E, or equivalent
SRF: HP8753C NETWORK ANALYZER, or equivalent.
DC resistance: AX-111A DIGITAL MILLIOHM METER, or equivalent.





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► Electrical Characteristics for TCEM453232N(1812) Series

Part Number	Inductance (μH)	Tolerance (%)	Q (min)	Test Freq. (MHZ)	SRF (MHz)(min)	DCR (Ω)(max)	IDC (mA)
TCEM453232N - R10*	0.10	±10,±20	25	25.2	300	0.18	800
TCEM453232N - R12*	0.12	±10,±20	30	25.2	280	0.20	770
TCEM453232N - R15*	0.15	±10,±20	30	25.2	250	0.22	730
TCEM453232N - R18*	0.18	±10,±20	30	25.2	220	0.24	700
TCEM453232N - R22*	0.22	±10,±20	30	25.2	200	0.25	665
TCEM453232N - R27*	0.27	±10,±20	30	25.2	180	0.26	635
TCEM453232N - R33*	0.33	±10,±20	30	25.2	165	0.28	605
TCEM453232N - R39*	0.39	±10,±20	30	25.2	150	0.30	575
TCEM453232N - R47*	0.47	±10,±20	30	25.2	145	0.32	545
TCEM453232N - R56*	0.56	±10,±20	30	25.2	140	0.36	520
TCEM453232N - R68*	0.68	±10,±20	30	25.2	135	0.40	500
TCEM453232N - R82*	0.82	±10,±20	30	25.2	130	0.45	475
TCEM453232N - 1R0*	1.00	±10,±20	40	7.96	100	0.50	450
TCEM453232N - 1R2*	1.20	±10,±20	40	7.96	80	0.55	430
TCEM453232N - 1R5*	1.50	±10,±20	40	7.96	70	0.60	410
TCEM453232N - 1R8*	1.80	±10,±20	40	7.96	60	0.65	390
TCEM453232N - 2R2*	2.20	±10,±20	40	7.96	55	0.70	380
TCEM453232N - 2R7*	2.70	±10,±20	40	7.96	50	0.75	370
TCEM453232N - 3R3*	3.30	±10,±20	40	7.96	45	0.80	355
TCEM453232N - 3R9*	3.90	±10,±20	40	7.96	40	0.90	330
TCEM453232N - 4R7*	4.70	±10,±20	40	7.96	35	1.00	315
TCEM453232N - 5R6*	5.60	±10,±20	40	7.96	33	1.10	300
TCEM453232N - 6R8*	6.80	±10,±20	40	7.96	27	1.20	285
TCEM453232N - 8R2*	8.20	±5,±10	40	7.96	25	1.40	270
TCEM453232N - 100*	10.0	±5,±10	40	2.52	20	1.60	250
TCEM453232N - 120*	12.0	±5,±10	40	2.52	18	2.00	225
TCEM453232N - 150*	15.0	±5,±10	40	2.52	17	2.50	200
TCEM453232N - 180*	18.0	±5,±10	40	2.52	15	2.80	190
TCEM453232N - 220*	22.0	±5,±10	40	2.52	13	3.20	180
TCEM453232N - 270*	27.0	±5,±10	40	2.52	12	3.60	170
TCEM453232N - 330*	33.0	±5,±10	40	2.52	11	4.00	160
TCEM453232N - 390*	39.0	±5,±10	40	2.52	10	4.50	150
TCEM453232N - 470*	47.0	±5,±10	40	2.52	10	5.00	140
TCEM453232N - 560*	56.0	±5,±10	40	2.52	9	5.50	135
TCEM453232N - 680*	68.0	±5,±10	40	2.52	9	6.00	130
TCEM453232N - 820*	82.0	±5,±10	40	2.52	8	7.00	120
TCEM453232N - 101*	100	±5,±10	30	0.796	8	8.00	110
TCEM453232N - 121*	120	±5,±10	30	0.796	6	8.00	110
TCEM453232N - 151*	150	±5,±10	30	0.796	5	9.00	105

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Part Number	Inductance (μH)	Tolerance(%)	Q (min)	Test Freq. (MHZ)	SRF (MHz)(min)	DCR (Ω)(max)	IDC (mA)
TCEM453232N - 181*	180	±5,±10	30	0.796	5	9.50	102
TCEM453232N - 221*	220	±5,±10	30	0.796	4	10.0	100
TCEM453232N - 271*	270	±5,±10	30	0.796	4	12.0	92
TCEM453232N - 331*	330	±5,±10	30	0.796	3.5	14.0	85
TCEM453232N - 391*	390	±5,±10	30	0.796	3	18.0	80
TCEM453232N - 471*	470	±5,±10	30	0.796	3	26.0	62
TCEM453232N - 561*	560	±5,±10	20	0.796	3	30.0	50
TCEM453232N - 681*	680	±5,±10	20	0.796	3	30.0	50
TCEM453232N - 821*	820	±5,±10	20	0.796	2.5	35.0	30
TCEM453232N - 102*	1000	±5,±10	10	0.252	2.5	40.0	30

Note: Test equipment L, Q: HP4285A +16034E, or equivalent
 SRF: HP8753C NETWORK ANALYZER, or equivalent.
 DC resistance: AX-111A DIGITAL MILLIOHM METER, or equivalent.

► Chip Wirewound Inductor Mechanical Performance Test

REQUIREMENTS	CHARACTERISTICS	TEST METHOD(DIS C 5321)
Terminal Strength	No evidence of damage	Terminals shall withstand a pull of 0.5Kgf in a horizonal direction
Vibration	Δ L/L shall be within ±3%. No evidence of damage	2 hours in each direction of X,Y,Z on p-Board at a frequency range of 10-55-10HZ with 1.5mm amplitude
Dropping	Δ L/L shall be within ±3%. No evidence of damage	Dropping 1m over the ground of concetete or cement

► Chip Wirewound Inductor Electrical Performance Test

REQUIREMENTS	CHARACTERISTICS	TEST METHOD(JIS C 5321)
Resistance to Soldering Heat	No evidence of damage Δ L/L shall be within ±3%	Immerse in the solder (H63A) of 260±5°C for 10±1sec, leave for 2hrs at normal TEMP
Solderability	More than 90% surface to be covered with new soldering	AV100V 60 SEC.
Dielectric with standing voltage	No veridence of breakdown resistor 1000 Mohm and over	DC500V 30 SEC.
Insulation Resistance	No veidence of breakdown, resistor 1000 Mohm and over	DC 500V 30 SEC.



RF Inductors

► Chip Wirewound Inductor Climatic Test

REQUIREMENTS	CHARACTERISTICS	TEST METHOD(JIS C 5321)
LOW TEMP. Characteristics	No evidence of damage, $\Delta L/L$ within $\pm 5\%$, Q/Q within $\pm 30\%$	Immerse in the solder (H63A) of $260 \pm 5^\circ\text{C}$ for 10 ± 1 sec, leave for 2hrs at normal TEMP.
TEMP. Cycling	No evidence of damage, $\Delta L/L$ within $\pm 5\%$	Keep for 30 min. at TEMP. of $-25^\circ\text{C} \sim +85^\circ\text{C}$ Cat 5 cycle case of TEMP. change from low to high and V.V.
Temperature Characteristics	$\Delta L/L$ within $\pm 3\%$	$\Delta L/L$ to be measured at the temperature of between -25°C and $+85^\circ\text{C}$
Moisture load Characteristics	No evidence of damage, $\Delta L/L$ within $\pm 5\%$, Q/Q within $\pm 30\%$	TEMP. $40 \pm 2^\circ\text{C}$, Humidity 90~95% 96 ± 2 hrs, measurements shall be performed after 1~2hrs at normal TEMP..
High TEMP. overload Characteristics	No evidence of damage, $\Delta L/L$ within $\pm 5\%$, Q/Q within $\pm 30\%$	Leave for 96 ± 2 hrs in a bath of TEMP. $85 \pm 2^\circ\text{C}$, measurements shall be performed after 1~2hrs at normal TEMP.

► How to Order

TCEM322522N - 1R0 M

①
②
③

① Chip Wirewound Inductors Molded Type: TCEM322522N, TCEM453232N

② Inductance

Code	Inductance
R10	$0.10\mu\text{H}$
1R0	$1.00\mu\text{H}$
100	$10.00 \times 10^0\mu\text{H}$
101	$10.00 \times 10^1\mu\text{H}$
102	$10.00 \times 10^2\mu\text{H}$
103	$10.00 \times 10^3\mu\text{H}$

③ Tolerance

Code	Tolerance
J	5%
K	10%
M	20%