Reference Specification	(R - 0) 151-ELJ-NJ-***
[PART NAME] CHIP INDUCTOR (NJ type)	11- 1

1. SCOPE

This specification covers the CHIP INDUCTOR to be delivered to

2. PART NUMBER OF PRODUCTS

This part number of the products in this specification shall be ELJ NJ ****F2

3. TEST CONDITIONS

The ambient temperature shall be 5 to 35degreeC and the relative humidity 35 to 85%, unless otherwise specified.
When the test result is doubtful, the sample in question shall be tested again at 20+/-2degreeC,65+/-5%RH.

4. APPEARANCE,DIMENSIONS AND CONSTRUCTION

Inductors shall be free from distortion, damage or contaminants, and shall be within dimensions specified.

5. ELECTRICAL CHARACTERISTICS

As specified in the electrical characteristics table.

6. RELIABILITY CHARACTERISTICS

As specified in the reliability characteristics table.

7. PACKAGE

The products shall be packed so as not allow absorption damege.
The following indications shall be marked on the packege.

1. CUSTOMER'S P/N and MATSUSHITA'S P/N
2. Quantity
3. Manufacture's name

8. OPERATING TEMPERATURE

-40 to +85 degreeC

9. OTHERS

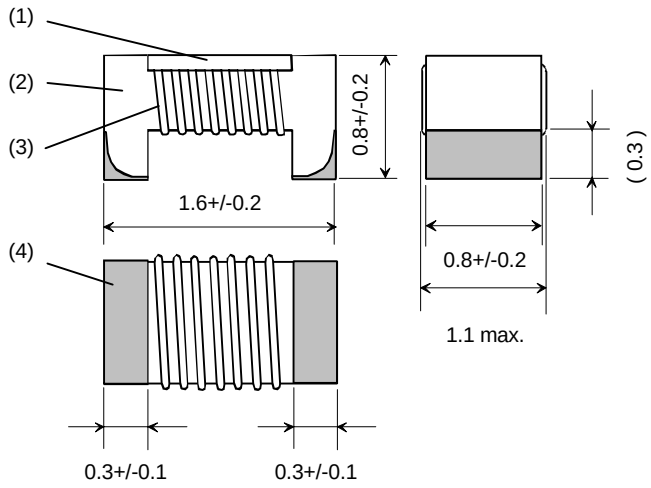
The customer is requested to store the products at the normal temperature (-5 to +35degreeC) and the normal humidity (85%RH max.) in the packages we supplied.
The package shall not be exposed to direct sunlight and harmful gas and care should be taken so as not to cause dew.

No.	DATE	REVISION	CHECK

APPROVAL		CHECK		DESIGN	
14-Feb-02		14-Feb-02		14-Feb-02	
T.Yoshizawa		M.Taoka		S.Nakamura	

APPEARANCE, DIMENTIONS AND CONSTRUCTION

[UNIT] : mm



	PART NAME	MATERIAL
(1)	ENCLOSURE	Epoxy Resin
(2)	CORE	Ceramic
(3)	COIL	Polyurethan Enameled Copper Wire
(4)	TERMINAL	Ag metaliging + Ni plating + Solder plating

PART NUMBER

MATSUSHITA'S PART NUMBER

E L J N J * * * * F 2

1 2 3

1	INDUCTANCE	8.2nH : 8N2 , 56nH : 56N , 100nH : R10
2	TOLERANCE	E : +/- 0.5nH , J : +/- 5% Z : +/- 0.2nH , G : +/- 2%
3	PACKAGING	F : Emboss Tape (178 Reel)

Reference Specification

151-ELJ-NJ-***

[PART NAME]

CHIP INDUCTOR (NJ type)

11 - 3

ELECTRICAL CHARACTERISTICS

ELJ NJ series

CUSTOMER'S PART NUMBER	MATSUSHITA'S PART NUMBER	INDUCTANCE NOMINAL (nH)	INDUCTANCE TOLERANCE (% , nH)		INDUCTANCE TEST FREQ. (MHz)	Q min.	Q TEST FREQ. (MHz)	SRF min. (MHz)	DCR max. (OHM)	IDC max. (mA)
	ELJNJ3N3*F2	3.3		Z :		26		6000	0.06	850
	ELJNJ3N9*F2	3.9	E :	+/-0.2nH		35		6000	0.06	850
	ELJNJ4N7*F2	4.7	+/-0.5nH			35		6000	0.06	850
	ELJNJ5N6*F2	5.6		Z :		35		6000	0.08	750
	ELJNJ6N8*F2	6.8		+/-0.2nH		35		6000	0.08	700
	ELJNJ8N2*F2	8.2				35		6000	0.10	630
	ELJNJ9N5*F2	9.5				35		6000	0.10	650
	ELJNJ10N*F2	10				35		6000	0.10	630
	ELJNJ12N*F2	12				35		6000	0.13	550
	ELJNJ15N*F2	15			250	40	250	5000	0.13	550
	ELJNJ18N*F2	18				40		5000	0.15	510
	ELJNJ22N*F2	22				40		4600	0.17	480
	ELJNJ27N*F2	27				40		3800	0.20	440
	ELJNJ33N*F2	33	J :	G :		40		3500	0.23	420
	ELJNJ39N*F2	39	+/-5%	+/-2%		40		3200	0.25	400
	ELJNJ47N*F2	47				38		3000	0.28	380
	ELJNJ56N*F2	56			200	38	200	2700	0.30	360
	ELJNJ68N*F2	68				38		2300	0.35	340
	ELJNJ82N*F2	82				34		2200	0.48	290
	ELJNJR10*F2	100			150	34	150	2000	0.62	250
	ELJNJR12*F2	120				32		1700	0.90	210
	ELJNJR15*F2	150				32		1400	1.30	160
	ELJNJR18*F2	180			100	25	100	1300	2.00	140
	ELJNJR22*F2	220				25		1200	2.20	120

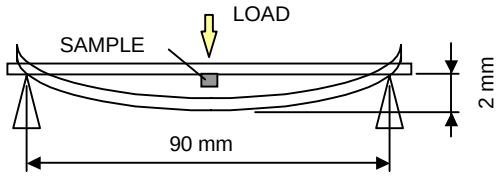
CAUTION : MATSUSHITA'S PART NUMBER

* : TOLERANCE SYMBOL

RELIABILITY CHARACTERISTICS (1)

	ITEM	SPECIFICATION	TEST METHOD/CONDITION
ENVIROMENTAL	TEMPERATURE CHARACTERISTICS	Variation of inductance shall be with in +/- 5% Variation of Q shall be with in +/-20%	-40 to +85 degreeC Standard : Values at 20degreeC
	HUMIDITY CHARACTERISTICS	There shall not be short or open circuiting. Variation of inductance shall be with in +/-5%. Variation of Q shall be with in +/-20%.	Inductors shall be stored to 90 to 95%RH at 60+/-2degreeC for 500+/-8 hours. Measurements shall be made after 1 hour stabilization at room temperature.
	HEAT RESISTANCE		Inductors shall be stored to 85+/-2degreeC for 500+/-8 hours. Measurements shall be made after 1 hour stabilization at room temperature.
	THERMAL SHOCK		Inductors shall be stored 100 times to the following temperature cycle. 1. -40℃ , 30 minutes 2. +85℃ , 30 minutes Measurements shall be made after 1 hour stabilization at room temperature.
	LOW TEMPERATURE STORAGE		Inductors shall be stored to -40+/-2degreeC for 500+/-8 hours. Measurements shall be made after 1 hour stabilization at room temperature.
LIFE	HIGH TEMPERATURE LOAD LIFE	There shall not be case deformation or change in appearance. Variation of inductance shall be with in +/-5%. Variation of Q shall be with in +/-20%.	With rated current applied, inductors shall be stored at 85+/-2degreeC for 500+/-8 hours. Measurements shall be made after 1 hour stabilization at room temperature.
	HUMIDITY LOAD LIFE		With rated current applied, inductors shall be stored to 90 to 95%RH at 60+/-2degreeC for 500+/-8 hours. Measurements shall be made after 1 hour stabilization at room temperature.

RELIABILITY CHARACTERISTICS (2)

	ITEM	SPECIFICATION	TEST METHOD/CONDITION
OTHERS	SOLDERABILITY	The terminals shall be at least 90% coverd with solder.	After fluxing, inductors shall be dipped in a melted solder bath at 230+/-5degreeC for 3+/-0.5 seconds.
	RESISTANCE TO SOLDERING HEAT	There shall not be case deformation or change in appearance. Variation of inductance shall be with in +/-5%. Variation of Q shall be with in +/-20%.	After a 150+/-10℃ preheat cycle for 3 minutes, inductors shall be reflow soldered at 240+/-10 degreeC for 5+/-0.5 seconds, and repeat 2 times.
	VIBRATION LOW FREQUENCY FREQUENCY		Amplitude : 1.5mm Frequency : 10 to 55Hz, Period : 60 sec. Motion shall be applied for 2 hours in each of the 3 mutually perpendicular directions.
	SHOCK		Inductors shall be dropped 10 times from a height of 1m onto a wooden board.
	ELECTRODE PEEL STRENGTH	There shall not be case deformation or change in appearance. There shall be no evidence of intermittent contact or open circuiting.	A static load of 5N using a R0.5 push tool shall be applied on the core of the component and in the length direction of the side and held for 10 seconds.
	TERMINAL BENDING STRENGTH		A load shall be applied to inductors soldered on PCB till it is bent 2mm then it retuns to original position. This cycle shall be repeated 5 times. 
	RESISTANCE TO SOLVENTS	There shall not be case deformation or change in appearance.	Inductors shall be stored to ISOPROPYL-ALCOHOL for 10 minutes respectively.

PACKAGING

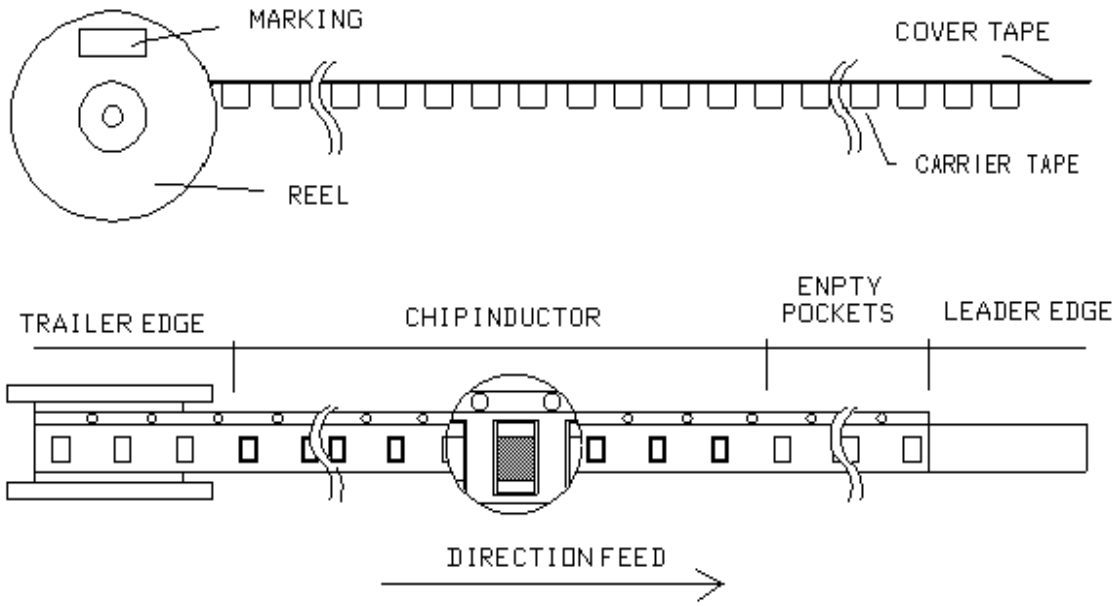
TAPING

Embossed carrier tape (8mm width, 4mm pitch) and 178mm diameter reel shall be employed as per JIS C 0806.

1. QUANTITY PER REEL

3000 pcs. There shall not be more empty pockets than two and those pockets shall not be consecutive.

2. PACKAGING



2-1.

As shown above, there shall be a leading edge consisting of 25 empty pockets as well as cover tape and a trailing edge consisting of 10 or more empty pockets.

2-2.

Both electrodes shall be vertical to the longitude of the pockets.

2-3.

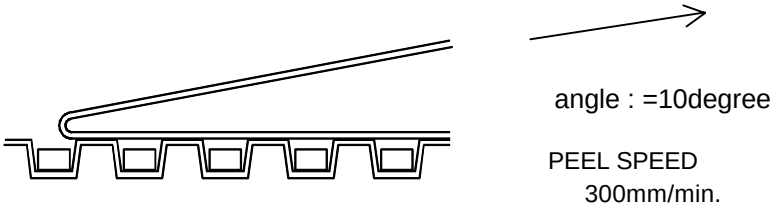
Inductors shall be oriented as specified on the above illustration.

2-4. MARKING

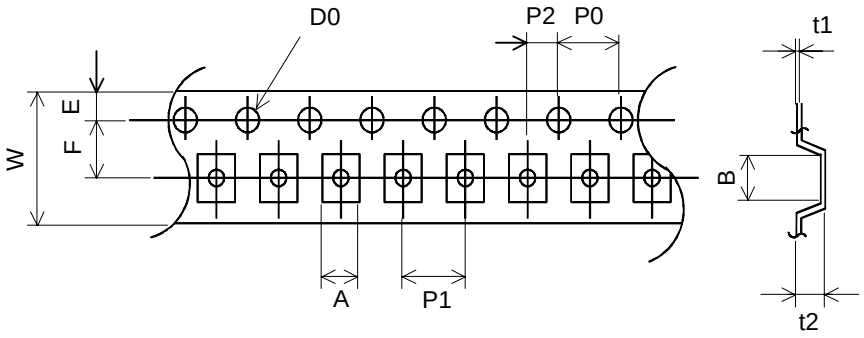
Customer's P/N, MATSUSHITA'S P/N, quantity and manufacture's name shall be marked on the reel.

3. COVER TAPE PEEL STRENGTH AND TEST METHOD

The cover tape peel strength shall be 0.098 to 0.68N when measured as shown below.



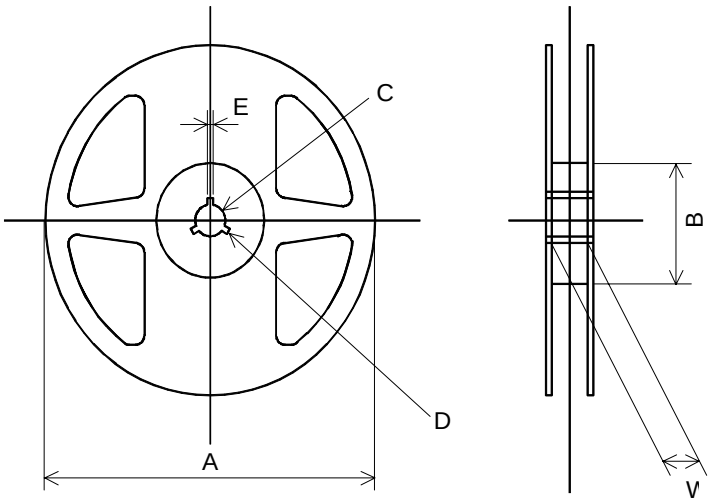
4. CARRIER TAPE DIMENSIONS



CODE	DIMENSION	
A	1.15	+/-0.20
B	1.95	+/-0.20
W	8.00	+/-0.30
F	3.50	+/-0.05
E	1.75	+/-0.10
P1	4.00	+/-0.10
P2	2.00	+/-0.05
P0	4.00	+/-0.10
D0	1.52	+/-0.05
t1	(0.30)	
t2	1.30	max.

[UNIT] : mm

5. REEL DIMENSIONS



CODE	DIMENSION	
A	178	+/-2.0
B	60	+/-0.5
C	13.0	+/-0.5
D	21.0	+/-0.8
E	2.0	+/-0.5
W	9.0	+/-0.3

[UNIT] : mm

MEASUREMENT METHOD OF ELECTRICAL CHARACTERISTICS

1. MEASUREMENT OF L AND Q (HP4291A)

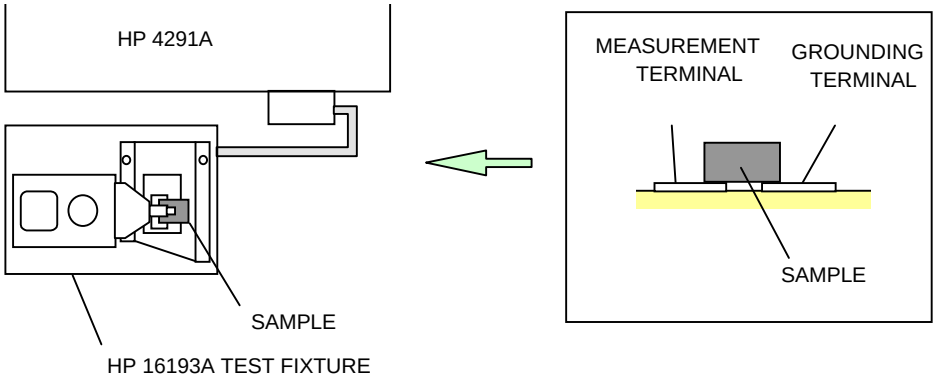
L and Q value shll be read after fixing sample inductor as shown below.

[Calibration]

1-1. Calibrate on the standard terminator (OPEN, SHORT, LOAD, LOW LOSS CAP.).

1-2. The measurement instrument shall be connected with the TESTFIXTURE (HP16193A).

1-3. The calibration shall be conducted again at short and open circuiting.



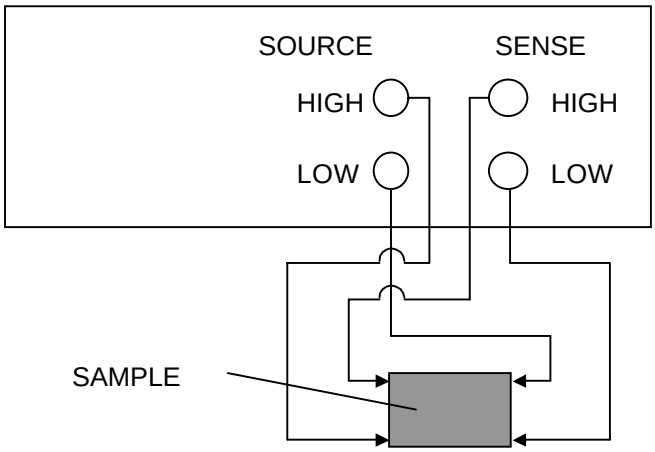
2. MEASUREMENT OF Rdc (YHP3456A)

2-1. Rdc. Shall be measured with 4-wire method after fixing sample inductor as shown as below.

2-2. Rdc. is calculated according to the following formula.

Rdc. (at20degreeC) = (234.5+20) / (234.5+T) X R

T : Ambient temperature (degreeC) R : Rdc. at T (degreeC)
234.5 : Reciprocal of temperature coefficient for copper.



3. MEASUREMENT OF SRF (HP8753B,HP85047A)

3-1.

After the TESTFIXTURE (HP16193A) is connected with PORT-1 of the S parameter test set, the calibration shall be conducted at open short circuiting.

3-2.

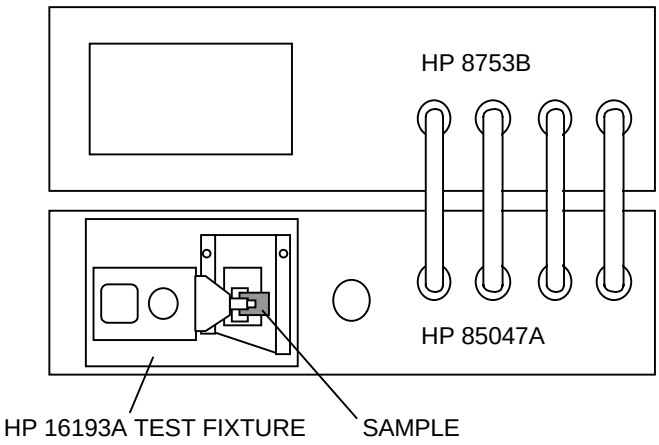
After removing the TESTFIXTURE (HP16193A), the standard impedance of 50OHM is connected with PORT-1 of the S parameter test set and the load calibration shall be conducted.

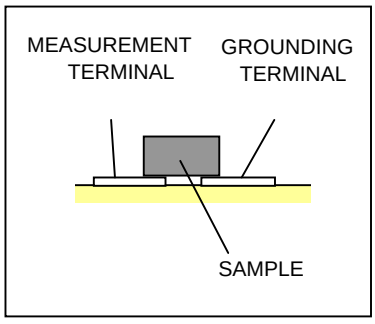
3-3.

After the TESTFIXTURE (HP16193A) is again connected with PORT-1 of the S parameter test set, the phase of reflected wave shall be measured.
The electric length must be set so that phase angle gets zero.

3-4.

The sample inductor shall be fixed as shown below and the frequency at which the phase angle of the reflected wave is zero.





Reference Specification

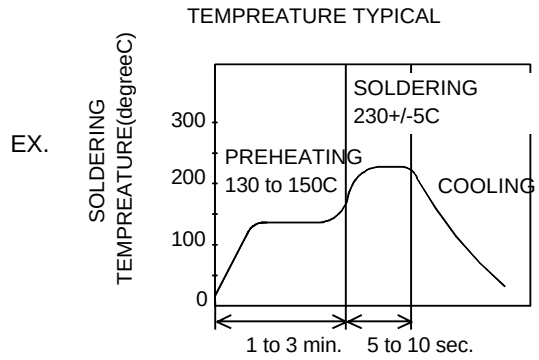
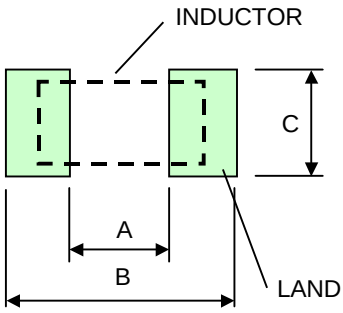
151-ELJ-NJ-***

[PART NAME]

CHIP INDUCTOR (NJ type)

11 - 11

PRECATION FOR USE OF CHIP INDUCTOR

ITEM	CONTENTS	REMARKS
SOLDERING	This type of reflow soldering should be conducted for up to 60 seconds in electrode temperature range of 200degreeC or more, and for no more than 5 seconds at a peak temperature of 240degreeC.  Please do not use at flow soldering.	Reflow soldering at most two times. Second reflow soldering should be conducted after PCB cool off.
RECOMMENDED LAND DIMENTIONS	 CODE / DIMENSION A: 0.8 to 1.0 B: 2.0 to 2.6 C: 0.7 to 0.9 [UNIT] : mm	
MOUNTING	Please do not use a pin of push when do automatic mounting.	
RESOLDERING WITH A SOLDERING IRON	The temperature of the tip of the soldering iron should be 280degreeC or less, 5 seconds. And resoldering with a soldering iron should be limited to 1 time, and after that should be cooling these. The temperature of the tip of the soldering iron should be 350degreeC or less, 2 seconds. And resoldering with a soldering iron should be limited to 1 time, and after that should be cooling these.	Do not touch the resin and the wire of chip inductor with the tip of the soldering iron.
OTHERS	This product uses ceramic or a ferrite. Please pay attention when treat a product so that chips or cracks do not occur. Please is involved with winding part with tweezers. And please pay attention enough when use metal tweezers not to injure winding part and an electrode. The upper part of a product does coating with resin, but please pay attention not to damage it with automatic mounting or tweezers.	