Reference Only

Chip EMIFIL LC Combined Type for Large Current
NFE61HT□□□□2A9□ Reference Specification [AEC-Q200]

1. Scope

This reference specification applies to Chip EMIFIL LC Combined Type for Large Current NFE61H Series for Automotive Electronics based on AEC-Q200.

2. Part Numbering

NF	E	61	HT	101	Z	2A	9	L
Product ID	Structure	Dimension (L× W)	Features	Capacitance	Characteristics	Rated Voltage	Electrode	Packaging Code (L: Taping / B: Bulk)

3. Rating

Customer Part Number	Murata Part Number	Capacitance	Rated Voltage	Withstanding Voltage	Rated Current	Insulation Resistance	ESD Rank 2:2kV
	NFE61HT330U2A9L	33pF ± 30%	100 V (DC)	250 V(DC)	2 A(DC)	1000 MΩ min.	2
	NFE61HT330U2A9B						
	NFE61HT680R2A9L	68pF ± 30%					
	NFE61HT680R2A9B						
	NFE61HT101Z2A9L	100pF ± 30%					
	NFE61HT101Z2A9B						
	NFE61HT181C2A9L	180pF ± 30%					
	NFE61HT181C2A9B						
	NFE61HT361C2A9L	360pF ± 20%					
	NFE61HT361C2A9B						
	NFE61HT681D2A9L	680pF ± 30%					
	NFE61HT681D2A9B						
	NFE61HT102F2A9L	1000pF $\pm^{80}_{20}$ %					
	NFE61HT102F2A9B						
	NFE61HT332Z2A9L	3300pF $\pm^{80}_{20}$ %					
	NFE61HT332Z2A9B						

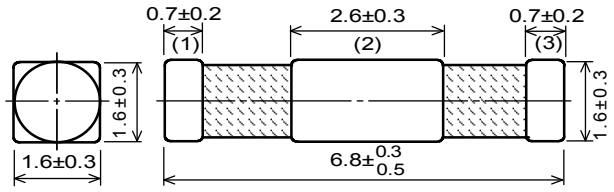
• Operating Temperature: - 55 °C to + 125 °C • Storage Temperature: - 55 °C to + 125 °C

4. Standard Testing Condition

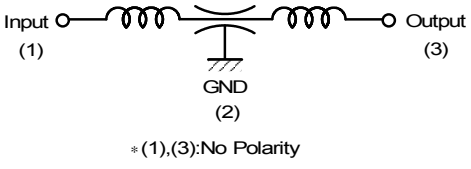
<Unless otherwise specified>
Temperature : Ordinary Temp. 15°C to 35°C
Humidity : Ordinary Humidity 25 %(RH) to 85 %(RH)

<In case of doubt>
Temperature: 20°C ± 2°C
Humidity : 60 %(RH) to 70 %(RH)
Atmospheric pressure : 86kPa to 106kPa

5. Style and Dimensions



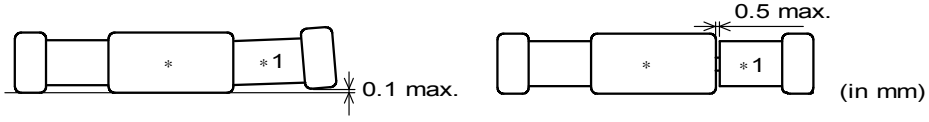
■ Equivalent Circuit



∗(1),(3):No Polarity

■ Unit Mass(Typical value)
0.062g

Note : Gap and bend between ceramic capacitor(∗) and ferrite bead(∗1) may come out as illustrated below, however, these are not affect the performance, mounting and reliability of the products.

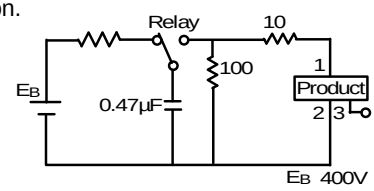


¦ Insertion Loss Characteristics (I.L.) (Typ.) (50 system)

6. Marking

No marking.

7. Electrical Performance

No.	Item	Specification	Test Method
7.1	Capacitance	Meet item 3.	Table 1 Capacitance / Voltage / Frequency 33,68,100 (pF) / 1 to 5 V(rms) / 1MHz±10% 180,360,680 1000,3300 (pF) / 1±0.2 V(rms) / 1kHz±10%
7.2	Insulation Resistance(I.R.)	Meet item 3.	Voltage : 100 V(DC) Time : 60 ± 5 seconds
7.3	Withstanding Voltage	Products shall not be damaged.	Test Voltage : 250 V(DC) Testing Time : 1 to 5 seconds Limit the charging current: 10mA max.
7.4	Resistance to Surge Voltage	Meet Table 2. Table 2 Appearance: No damaged Cap. Change: 33,68,100 180,360 680 (pF) within ±15%; 1000 3300 (pF) within ±30% I.R.: 1000 M min. Withstanding Voltage: No damaged	Attenuating transient voltage of exponential function shall be applied to products on the condition.  Peak Voltage : 400 V Force Period : 1 s The number of Surges : 10^5

8. Q200 Requirement

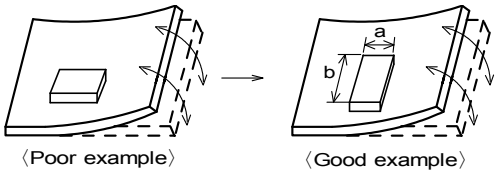
8-1. Performance (based on Table 13 for Ferrite EMI SUPPRESSORS/FILTERS)

AEC-Q200 Rev.D issued June. 1 2010

AEC-Q200			Murata Specification / Deviation
No.	Stress	Test Method	
3	High Temperature Exposure (Storage)	1000hours at 125C Set for 24hours at room temperature, then measured.	Meet TABLE A after testing. Table A Appearance: No damage Capacitance Change (33pF-100pF: 1MHz+/-10%) (180pF-3300pF: 1kHz+/-10%): 33pF to 680pF: Within +/-15% at 20C; 1000pF to 3300pF: Within +/-30% at 20C I.R.: 1000M ohm min. Withstanding Voltage: No damage

(1) P.C.B. shall be designed so that products are not subject to the mechanical stress for board warpage.

〔Products direction〕

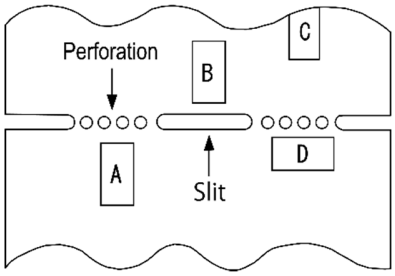


Products shall be located in the sideways direction (Length:a<b) to the mechanical stress.

(2) Components location on P.C.B. separation.

It is effective to implement the following measures, to reduce stress in separating the board.
It is best to implement all of the following three measures; however, implement as many measures as possible to reduce stress.

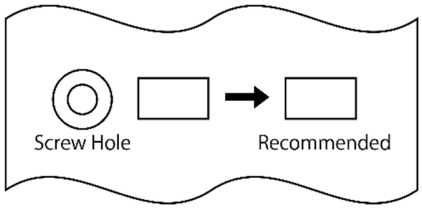
Contents of Measures	Stress Level
(1) Turn the mounting direction of the component parallel to the board separation surface.	A > D *1
(2) Add slits in the board separation part.	A > B
(3) Keep the mounting position of the component away from the board separation surface.	A > C



*1 A > D is valid when stress is added vertically to the perforation as with Hand Separation.If a Cutting Disc is used, stress will be diagonal to the PCB, therefore A > D is invalid.

(3) Mounting Components Near Screw Holes

When a component is mounted near a screw hole, it may be affected by the board deflection that occurs during the tightening of the screw. Mount the component in a position as far away from the screw holes as possible.



13.4. Standard Soldering Conditions

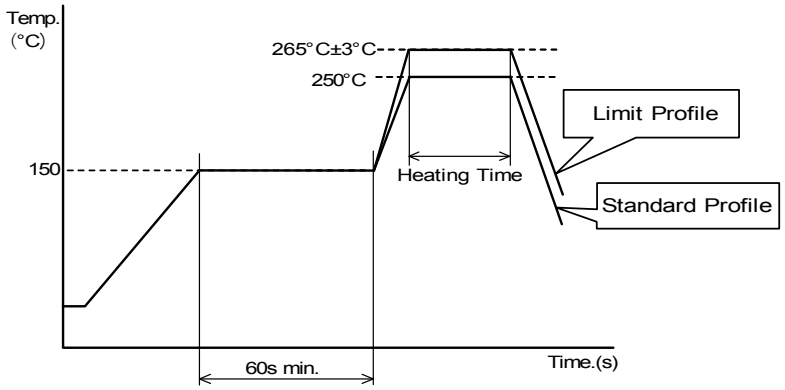
On flow soldering (e.g. double wave soldering), use the product in consideration of the conditions of solder, solder temperature and immersion time (melting time) because longer soldering time may cause the corrosion of the electrode.

On dipping soldering, use the product in consideration of the conditions of solder, solder temperature, flux, preheat and so on because de-wetting may be caused.

Standard soldering profile and the limit soldering profile is as follows.

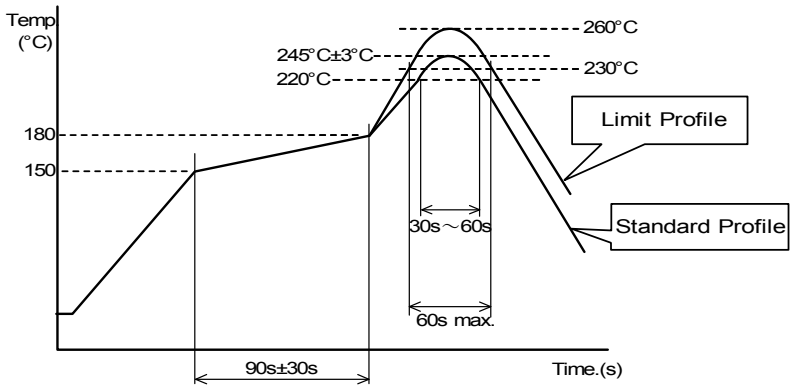
The excessive soldering conditions may cause leaching of the electrode and/or resulting in the deterioration of product quality.

< Flow Soldering Profile >



	Standard Profile	Limit Profile
Pre-heating	150°C , 60s min.	
Heating	250°C , 4s ~ 6s	265°C ± 3°C , 5s max.
Cycle of flow	2 times	2 times

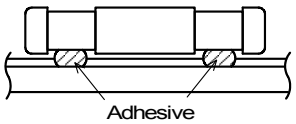
< Reflow Soldering Profile >

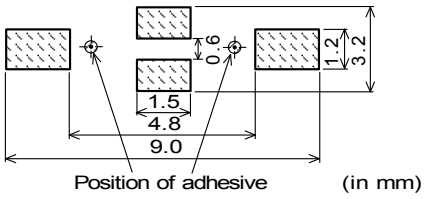


	Standard Profile	Limit Profile
Pre-heating	150°C ~ 180°C , 90s ± 30s	
Heating	above 220°C , 30s ~ 60s	above 230°C , 60s max.
Peak temperature	245°C ± 3°C	260°C , 10s
Cycle of reflow	2 times	2 times

13.5. Printing of Adhesive (Flow Soldering)

Adhesive amount shall be about 0.5mg for one position to obtain enough adhesive strength.
The adhesive position is as follows.

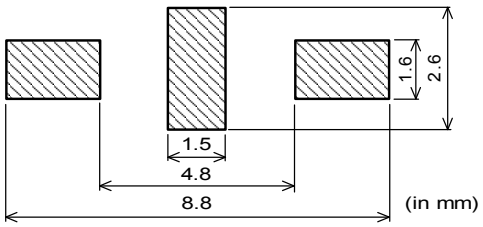




13.6. Solder paste printing for reflow

- Standard thickness of the solder paste should be 150μm to 200μm.
- Use the solder paste printing pattern of the right pattern.
- For the resist and copper foil pattern, use standard land dimensions.

• Standard printing pattern of solder paste.



13.7. Reworking with Soldering iron

The following conditions shall be strictly followed when using a soldering iron.

- Pre-heating : 150°C, 1 min
- Soldering iron output : 30W max.
- Tip temperature : 350°C max.
- Tip diameter : ϕ3mm max.
- Soldering time : 3(+1,-0) s
- Times : 2times max.

Note: Do not directly touch the products with the tip of the soldering iron in order to prevent the crack on the ceramic material due to the thermal shock.

13.8. Cleaning Conditions

Products shall be cleaned on the following conditions.

(1) Cleaning temperature shall be limited to 60°C max. (40°C max. for IPA.)

(2) Ultrasonic cleaning shall comply with the following conditions, with avoiding the resonance phenomenon at the mounted products and P.C.B.

Power: 20W / l max. Frequency: 28kHz to 40kHz Time: 5 minutes max.

(3) Cleaner

1. Cleaner
   ・Isopropyl alcohol (IPA)
2. Aqueous agent
   ・PINE ALPHA ST-100S

(4) There shall be no residual flux and residual cleaner after cleaning.
In the case of using aqueous agent, products shall be dried completely after rinse with de-ionized water in order to remove the cleaner.

(5) Other cleaning
Please contact us.

13.9. Operating Environment

Do not use this product under the following environmental conditions, on deterioration of the performance, such as insulation resistance may result from the use.

(1) in the corrodible atmosphere (acidic gases, alkaline gases, chlorine, sulfur gases, organic gases and etc.)
(2) in the atmosphere where liquid such as organic solvent, may splash on the products.

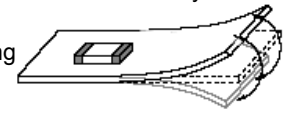
13.10. Resin coating

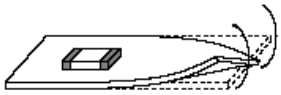
It may affect on the product's performance when using resin for coating / molding products. So please pay your careful attention when you select resin. In prior to use, please make the reliability evaluation with the product mounted in your application set.

13.11. Handling of a substrate

After mounting products on a substrate, do not apply any stress to the product caused by bending or twisting to the substrate when cropping the substrate, inserting and removing a connector from the substrate or tightening screw to the substrate.

Excessive mechanical stress may cause cracking in the product.

Bending 

Twisting 

13.12. Storage condition

(1) Storage period

Use the products within 12 months after delivered.
Solderability should be checked if this period is exceeded.

(2) Storage environment condition

・Products should be stored in the warehouse on the following conditions.
Temperature : - 10 °C to + 40 °C
Humidity : 15 % to 85% relative humidity No rapid change on temperature and 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 stored on the palette for the prevention of the influence from humidity, dust and so on.
・Products should be stored in the warehouse without heat shock, vibration, direct sunlight and so on.
・Products should be stored under the airtight packaged condition.

(3) Delivery

Care should be taken when transporting or handling product to avoid excessive vibration or mechanical shock.

14. ⚠ Notes

(1)Please make sure that your product has been evaluated in view of your specifications with our product being mounted to your product.

(2)You are requested not to use our product deviating from the agreed specifications.

(3)The contents of this reference specification are subject to change without advance notice.
Please approve our product specifications or transact the approval sheet for product specifications before ordering.