Disc - Type EMIFIL® (A miniature three-terminal capacitor)
DSN6 series Reference Specification

1.Scope

This reference specification applies to Disc-Type EMIFIL® (A miniature three-terminal capacitor).

2.Part Numbering

(Ex.) DS N 6 N C5 1H 271 Q93 A
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

①Product ID (Disc-Type EMIFIL®)
②Structure N : No Ferrite Beads Type
③Style
④Features
⑤Temperature Characteristics
⑥Rated Voltage
⑦Capacitance Marked three digits system.(Ex. 270pF→271)
⑧Lead Type

Q5□ : Bulk (in mm)

	Long Lead Type	Short Lead Type	
Straight Lead Type	**Q55**	**Q56**	**Q54**
Lead Length(l)	25.0 min.	6.0±1.0	4.0±0.5

Lead Length (l) : See item 9.

Q9□ : Taping (in mm)

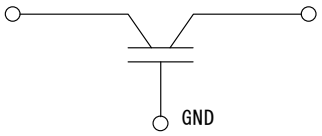
Straight Lead Type	**Q91**	**Q92**	**Q93**
Dimension H	20.0±1.0	16.5±1.0	18.5±1.0

Dimension H : See item 9.

⑨Packaging Code A : Ammo Pack / B : Bulk

3.Rating

Operating temperature : -25 to +85°C
Storage Temperature : -25 to +85°C
Insulation Resistance : 5000MΩ min.
Rated Current : 6A(DC)
Equivalent Circuit :



Unit Mass (Typical value) : 0.35g
Others : See Table 1

Table 1

Customer Part Number	Murata Part Number	Temperature Characteristics	Capacitance	Rated Voltage	Withstanding Voltage
	DSN6NC51H220Q55B	±22%	22pF± 20%	50V(DC)	125 V(DC)
	DSN6NC51H220Q56B				
	DSN6NC51H220Q54B				
	DSN6NC51H220Q91A				
	DSN6NC51H220Q92A				
	DSN6NC51H220Q93A				
	DSN6NC51H330Q55B		33pF± 20%		
	DSN6NC51H330Q56B				
	DSN6NC51H330Q54B				
	DSN6NC51H330Q91A				
	DSN6NC51H330Q92A				
	DSN6NC51H330Q93A				
	DSN6NC51H470Q55B		47pF± 20%		
	DSN6NC51H470Q56B				
	DSN6NC51H470Q54B				
	DSN6NC51H470Q91A				
	DSN6NC51H470Q92A				
	DSN6NC51H470Q93A				

Customer Part Number	Murata Part Number	Temperature Characteristics	Capacitance	Rated Voltage	Withstanding Voltage
	DSN6NC51H101Q55B	±22%	100pF± 20%	50V(DC)	125 V(DC)
	DSN6NC51H101Q56B				
	DSN6NC51H101Q54B				
	DSN6NC51H101Q91A				
	DSN6NC51H101Q92A				
	DSN6NC51H101Q93A				
	DSN6NC51H271Q55B		270pF± 20%		
	DSN6NC51H271Q56B				
	DSN6NC51H271Q54B				
	DSN6NC51H271Q91A				
	DSN6NC51H271Q92A				
	DSN6NC51H271Q93A				
	DSN6NC51H102Q55B		1000pF± 20%		
	DSN6NC51H102Q56B				
	DSN6NC51H102Q54B				
	DSN6NC51H102Q91A				
	DSN6NC51H102Q92A				
	DSN6NC51H102Q93A				
	DSN6NC51H222Q55B		2200pF± 20%		
	DSN6NC51H222Q56B				
	DSN6NC51H222Q54B				
	DSN6NC51H222Q91A				
	DSN6NC51H222Q92A				
	DSN6NC51H222Q93A				

4.Testing Conditions

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

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

5.Style and Dimension

See item 9.

6.Marking

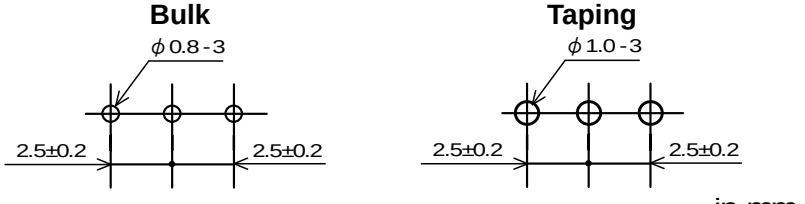
Capacitance	Marked real number. (22pF to 47pF) Ex. 22pF→22 Marked three digits system.(100pF to 2200pF) Ex.1000pF→102
Rated Voltage	It is expressed by line under Cap.Value(－)

7.Performance

No.	Item	Specification	Test Method
7.1	Appearance and Dimensions	Meet item 10.	Visual Inspection and measured with Slide Calipers.
7.2	Marking	Marking is able to be read easily.	Visual Inspection.
7.3	Capacitance and Tolerance	Meet item 3.	Table 2 Frequency / Test Voltage / Capacitance 1±0.1MHz / 3 V(rms) max. / 22pF～100pF 1±0.1kHz / 3 V(rms) max. / 270pF～2200pF
7.4	Insulation Resistance(I.R.)	Meet item 3.	Test Voltage : Rated Voltage Time : 1 minute
7.5	Withstanding Voltage	Products shall not be damaged.	Test Voltage : 2.5 times for Rated Voltage Time : 1 to 5 seconds Charge Current : 10 mA max. It shall be applied between input / output terminal and ground terminal.

<table>
<tr><th>No.</th><th>Item</th><th>Specification</th><th>Test Method</th></tr>
<tr><td>7.6</td><td>Temperature Characteristics</td><td>Meet item 3.</td><td>Capacitance shall be measured at each step specified in Table 4 after reaching the thermal equilibrium.
The capacitance change against the capacitance at step 3 shall be calculated.
Table3
<table><tr><td>Step</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr><tr><td>Temp. (°C)</td><td>+25±2</td><td>-25±2</td><td>+25±2</td><td>+85±2</td><td>+25±2</td></tr></table></td></tr>
<tr><td>7.7</td><td>Solderability</td><td>Along the circumference of terminal shall be covered with new solder at least 75%.</td><td>Flux : Ethanol solution of rosin,25(wt)%
(dipped for 5 to 10 seconds)
Pre-heat : 150±10℃, 60～90 s
Solder : Sn-3.0Ag-0.5Cu
Solder Temperature : 245±5℃
Immersion Time : 2 ± 0.5 seconds
Immersion Depth :
2 to 2.5 mm from the bottom of the body.</td></tr>
<tr><td>7.8</td><td>Resistance to Soldering Heat</td><td>Meet Table 4.
Table 4
<table><tr><td>Appearance</td><td>No damaged.</td></tr><tr><td>Capacitance Change</td><td>within ± 5%</td></tr><tr><td>Withstanding Voltage</td><td>No damaged.</td></tr></table></td><td>Flux : Ethanol solution of rosin,25(wt)%
(dipped for 5 to 10 seconds)
Pre-heat : 150±10℃, 60～90 s
Solder : Sn-3.0Ag-0.5Cu
Solder Temperature : 270± 5°C
Immersion Time : 3± 0.5 seconds
Immersion Depth :
1.6 ± 0.8 mm from the bottom of the body.
Then measured after exposure in the room condition for 4 to 24hours.</td></tr>
<tr><td>7.9</td><td>Humidity</td><td>Meet Table 5.
Table 5
<table><tr><td>Appearance</td><td>No damaged.</td></tr><tr><td>Capacitance Change</td><td>within ± 10%</td></tr><tr><td>Insulation Resistance</td><td>1000MΩ min.</td></tr></table></td><td>Temperature : 40 ± 2°C
Humidity : 90 to 95 %(RH)
Time : 500 hours(+24-0 hours)
Then measured after exposure in the room condition for 4 to 24hours.</td></tr>
<tr><td>7.10</td><td>Humidity Life</td><td>Meet Table6.
Table 6
<table><tr><td>Appearance</td><td>No damaged.</td></tr><tr><td>Capacitance Change</td><td>within ± 10%</td></tr><tr><td>Insulation Resistance</td><td>500MΩ min.</td></tr></table></td><td>Temperature : 40 ± 2°C
Humidity : 90 to 95 %(RH)
Time : 500 hours(+24-0 hours)
Applying Voltage : Rated Voltage
Charge Current : 10 mA max.
Then measured after exposure in the room condition for 4 to 24hours.</td></tr>
<tr><td>7.11</td><td>Heat Life</td><td>Meet Table 5.</td><td>Temperature : 85 ± 3°C
Time : 1000 hours(+48-0 hours)
Applying Voltage : 2 times of DC rated voltage
Charge Current : 10 mA max.
Then measured after exposure in the room condition for 4 to 24hours.</td></tr>
</table>

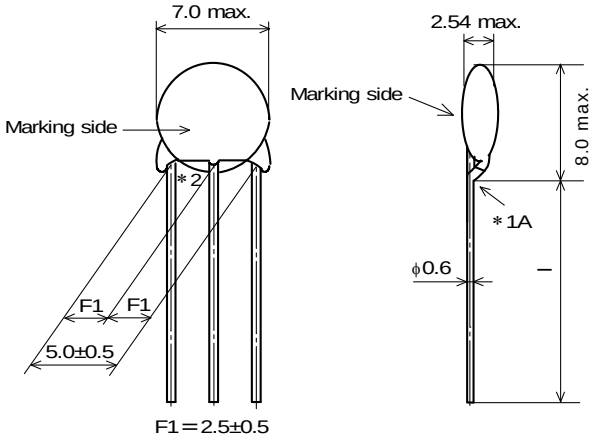
8.Mounting Hole



in mm

9.Style and Dimension

Bulk(Straight Lead Type) : Q5□



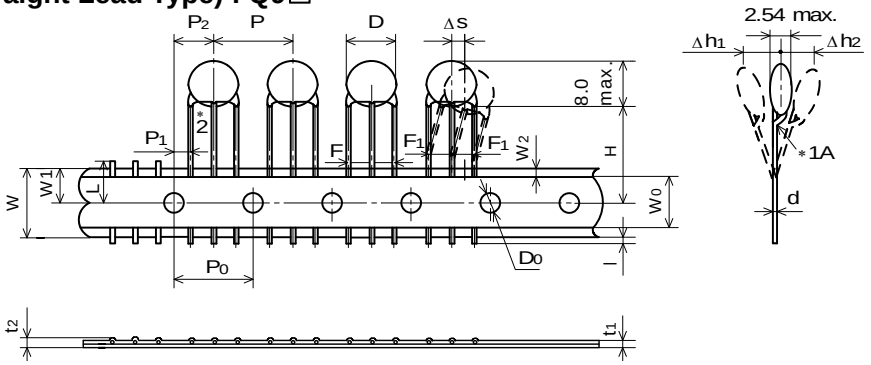
∗1.Coating extending on leads does not exceed the start of bend.(Point A).
∗2.Exposed electrodes are covered with solder.

Lead Type	l
Q55	25.0 min.
Q56	6.0±1.0
Q54	4.0±0.5

(in mm)

(All symbols in the illustrations below are described in Table 7)

Taping(Straight Lead Type) : Q9□



∗1.Coating extending on leads does not exceed the start of bend.(Point A)
∗2.Exposed electrodes are covered with solder.

Table 7

Code	Description	Dimensions		Remark
P	Pitch of Component	12.7		Product Inclination ΔS Determines Crossing
P_0	Pitch of Sprocket Hole	12.7±0.2		
P_1	Length from Hole Center to Lead	3.85±0.7		
P_2	Length from Hole Center to Component Center	6.35±1.3		Shift In Tape In Direction of Feed
D	Width of Body	7.0 max.		
ΔS	Deviation along tape, Left or Right	0±1.0		
W	Carrier Tape Width	18.0±0.5		
W_1	Position of Sprocket Hole	9.0 +0 / -0.6		Tape Widthwise Shift
l	Protrusion Length	+0.5 ~ -1.0		
D_0	Diameter of Sprocket Hole	φ 4.0±0.1		
d	Lead Diameter	φ 0.6		
t_1	Total Tape Thickness	0.7±0.2		Includes Thickness of Bonding Tape
t_2	Total Thickness,Tape and Lead Wire	1.5 max.		
Δh_1	Deviation across Tape,front	1.0 max.		
Δh_2	Deviation across Tape,rear	1.0 max.		
L	Portion to Cut in Case of Defect	11.0 +0 / -1.0		
W_0	Hold Down Tape Width	12.0±0.5		
W_2	Hold Down Tape Position	1.5±1.5		
H	Lead length between sprocket hole and forming position	**Q91**	20.0±1.0	
		Q92	16.5±1.0	
		Q93	18.5±1.0	
F	Lead Spacing	5.0 +0.8 / -0.2		
F_1		2.5 +0.4 / -0.2		

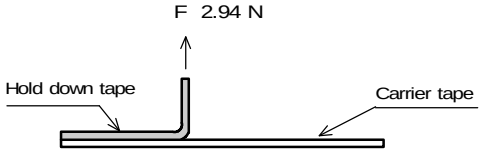
(in mm)

10.Taping

10.1 Supplement condition of taping

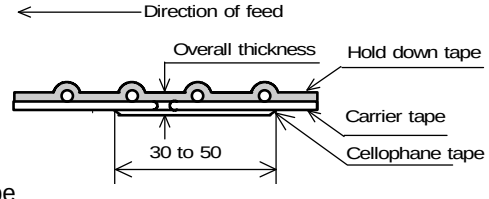
(1) A maximum of 0.3% of the components quantity per reel or Ammo pack may be missing without consecutive missing components.

(2) The adhesive power of the tape shall have over 2.94N at the following condition.



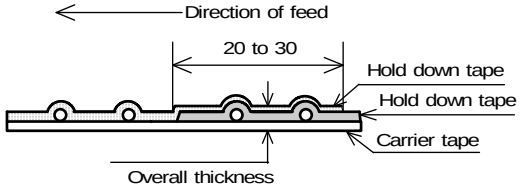
(3) Splicing method of tape

1. Carrier tape Carrier tape shall be spliced by cellophane tape.
Overall thickness shall be less than 1.05 mm.



(in mm)

2. Hold down tape
Hold down tape shall be spliced with overlapping.
Overall thickness shall be less than 1.05 mm.



(in mm)

3. Both carrier tape and hold down tape
Both tapes shall be cut zigzag and spliced with splicing tape.

11. Packing

11.1 Packing quantity

The standard packing quantity is as follows.
(The packing quantity may be changed due to a fraction of order.)

Minimum Packing Form and Quantity

Terminal Configuration		A Unit Quantity Bulk : in a plastic bag Taping : in an Ammo pack	* Standard Quantity in a container (corrugated cardboard box)
Bulk	Long Lead Type (Q55)	250 pcs.	5000 pcs.
	Short Lead Type (Q54/Q56)	500 pcs.	10000 pcs.
Taping (Q91/ Q92/ Q93)		2000 pcs.	20000 pcs.

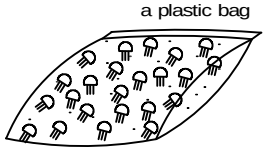
* A quantity in a container is depending on a quantity of an order.

11.2 Packing Form

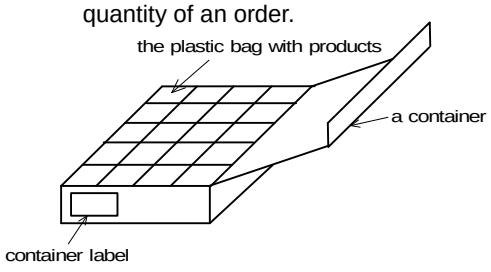
(1) Bulk

<A plastic bag pack>

1.Products are packed into a plastic bag.



2.The plastic bags are put into a container (corrugated cardboard box) depending on a quantity of an order.



(2) Taping

<An Ammo pack>

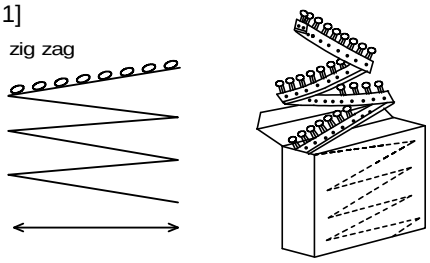
1 .Folding the tape per 25 pitches,products are packed into an Ammo package so that each product of each layer wound zigzag is put on top of one another. [Fig 1]

2. The dimensions of the Ammo package are indicated in [Fig 2].

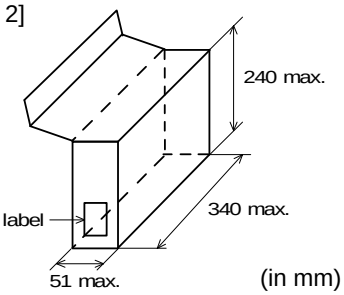
3. The Ammo packages are put into a container (corrugated cardboard box) depending on a quantity of an order.

4. Not less than 3 consecutive of component shall be missing on both edge of tape.

[Fig 1]



[Fig 2]



(in mm)

The unloading direction : Right

The hold down tape : Upper

The product body : Left along the unloading direction

12.Marking on package

12.1 Unit Package

Bulk : Marked on a plastic bag.

Taping : Marked on a label stuck on an ammo package.

Marking on a unit package consists of :

Customer part number**,** MURATA part number, Inspection number(∗1), RoHS marking(∗2), Quantity, etc

∗1) « Expression of Inspection No. » $\underset{(1)}{\square\square}$ $\underset{(2)}{OOOO}$ $\underset{(3)}{\times\times\times}$

(1) Factory Code

(2) Date First digit : Year / Last digit of year
Second digit : Month / Jan. to Sep. → 1 to 9, Oct. to Dec. → O,N,D
Third, Fourth digit : Day

(3) Serial No.

∗2) « Expression of RoHS marking » ROHS – $\underset{(1)}{Y}$ $\underset{(2)}{(\triangle)}$

(1) RoHS regulation conformity parts.

(2) MURATA classification number

12.2 Container

Marking on the label sticked on a container consists of :

Customer name Purchasing Order Number, Customer Part Number, MURATA part number, RoHS marking (∗2), Quantity, etc

13. ⚠ Caution

13.1 Mounting holes

Mounting holes should be designed as specified in this specifications.

Or different design from this specifications may cause cracks in ceramics which may lead to smoking / firing.

13.2 Caution for the product angle adjust work

Take care not to apply any mechanical stress to product body at the lead terminal bending process for product angle adjustment after insertion.

13.3 Limitation of Applications

Please contact us before using our products for the applications listed below which require especially high reliability for the prevention of defects which might directly cause damage to the third party's life, body or property.

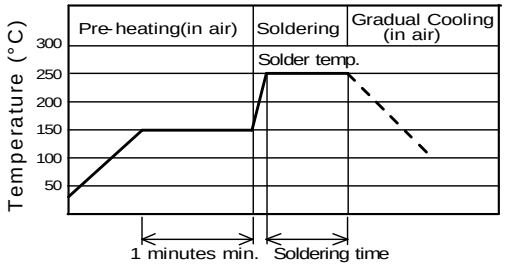
(1) Aircraft equipment
(2) Aerospace equipment
(3) Undersea equipment
(4) Power plant control equipment
(5) Medical equipment
(6) Transportation equipment (vehicles, trains, ships, etc.)
(7) Traffic signal equipment
(8) Disaster prevention / crime prevention equipment
(9) Data-processing equipment
(10) Applications of similar complexity and /or reliability requirements to the applications listed in the above

14. Notice

14.1 Soldering

(1) Use rosin-based flux. Do not use strong acidic flux with halide content exceeding 0.2(wt)% (chlorine conversion value).
Use Sn-3.0Ag-0.5Cu solder

(2) Standard flow soldering profile.



Solder temperature	Soldering time
250～260 °C	4～6s

(3) Resistance to soldering iron goes in the following condition that tip temperature is 350 °C max. and soldering time is 5 s max.
(4) Products and the leads should not be subjected to any mechanical stress during soldering process. (and also while subjected to the equivalent high temperature.)

14.2 Cleaning

Products shall be cleaned on following conditions.
(1) Cleaning Temperature: 60℃ max.(40℃ max. for Isopropyl alcohol).
(2) Ultrasonic cleaning shall comply with the following conditions, avoiding the resonance phenomenon at the mounted products and P.C.B.
Power : 20W / l max.
Frequency : 28kHz ~ 40kHz
Time : 5 minutes max.
(3) Cleaning agent
1. alcohol cleaning agents.
・Isopropyl alcohol (IPA)
2. Aqueous cleaning agent
・Pine Alpha ST-100S
(4) Ensure that residual flux and residual cleaning agent is completely removed.
Products should be thoroughly dried after aqueous agent has been removed with de-ionized water.
(5) For other cleaning methods, please contact Murata engineering.

14.3 Operating Environment

(1) Do not use products in corrosive gases such as chlorine gas, acid or sulfide gas.
(2) Do not use products in the environment where water, oil or organic solvents may adhere to products.
(3) Do not adhere any resin to products, coat nor mold products with any resin (including adhesive)to prevent mechanical and chemical stress on products.

14.4 Storage and handling requirements.

(1) Storage period
Use the products within 12 months after deliverd.
Solderability should be checked if this period is exceeded.
(2) Storage environment condition
To prevent products quality deterioration, storage conditions should be controlled as follows ;
1. Temperature : -10 to 40 degrees centigrade
2. Humidity : 15% to 85% relative humidity
3. Products should be stored without sudden changes in temperature and humidity.
Don't keep products in corrosive gases such as sulfur,chlorine gas or acid,
or it may cause oxidization of lead terminals resulting in poor solderability.
4. Products should be stored on the palette for the prevention of the influence from humidity, dust and so on.
5. Products should be stored in the warehouse without heat shock, vibration,direct sunlight and so on.
(3) Handling Conditions
Care should be taken when transporting or handling product to avoid excessive vibration or mechanical shock.

15. ⚠ Note

(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 reference 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.

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