

Reference Specification

200°C Operation Leaded MLCC for Automotive with AEC-Q200 RHS Series

Product specifications in this catalog are as of Nov. 2020, and are subject to change or obsolescence without notice.

Please consult the approval sheet before ordering. Please read rating and Cautions first.

⚠ CAUTION

1. OPERATING VOLTAGE

When DC-rated capacitors are to be used in AC or ripple current circuits, be sure to maintain the Vp-p value of the applied voltage or the Vo-p which contains DC bias within the rated voltage range. When the voltage is started to apply to the circuit or it is stopped applying, the irregular voltage may be generated for a transit period because of resonance or switching. Be sure to use a capacitor within rated voltage containing these irregular voltage.

When DC-rated capacitors are to be used in input circuits from commercial power source (AC filter), be sure to use Safety Recognized Capacitors because various regulations on withstand voltage or impulse withstand established for each equipment should be taken into considerations.

Voltage	DC Voltage	DC+AC Voltage	AC Voltage	Pulse Voltage(1)	Pulse Voltage(2)
Positional Measurement	Vo-p	Vo-p	Vp-p	Vp-p	Vp-p

2. OPERATING TEMPERATURE AND SELF-GENERATED HEAT

Keep the surface temperature of a capacitor below the upper limit of its rated operating temperature range. Be sure to take into account the heat generated by the capacitor itself.

When the capacitor is used in a high-frequency current, pulse current or the like, it may have the self-generated heat due to dielectric-loss. In case of Class 2 capacitors (Temp.Char. : X7R,X7S,X8L, etc.), applied voltage should be the load such as self-generated heat is within 20 °C on the condition of atmosphere temperature 25 °C. Please contact us if self-generated heat is occurred with Class 1 capacitors (Temp.Char. : C0G,U2J,X8G, etc.). When measuring, use a thermocouple of small thermal capacity-K of ϕ 0.1mm and be in the condition where capacitor is not affected by radiant heat of other components and wind of surroundings. Excessive heat may lead to deterioration of the capacitor's characteristics and reliability.

3. Fail-safe

Be sure to provide an appropriate fail-safe function on your product to prevent a second damage that may be caused by the abnormal function or the failure of our product.

4. OPERATING AND STORAGE ENVIRONMENT

The insulating coating of capacitors does not form a perfect seal; therefore, do not use or store capacitors in a corrosive atmosphere, especially where chloride gas, sulfide gas, acid, alkali, salt or the like are present. And avoid exposure to moisture. Before cleaning, bonding, or molding this product, verify that these processes do not affect product quality by testing the performance of a cleaned, bonded or molded product in the intended equipment. Store the capacitors where the temperature and relative humidity do not exceed 5 to 40 °C and 20 to 70%. Use capacitors within 6 months.

5. VIBRATION AND IMPACT

Do not expose a capacitor or its leads to excessive shock or vibration during use.

6. SOLDERING

When soldering this product to a PCB/PWB, do not exceed the solder heat resistance specification of the capacitor. Subjecting this product to excessive heating could melt the internal junction solder and may result in thermal shocks that can crack the ceramic element.

7. BONDING AND RESIN MOLDING, RESIN COAT

In case of bonding, molding or coating this product, verify that these processes do not affect the quality of capacitor by testing the performance of a bonded or molded product in the intended equipment. In case of the amount of applications, dryness / hardening conditions of adhesives and molding resins containing organic solvents (ethyl acetate, methyl ethyl ketone, toluene, etc.) are unsuitable, the outer coating resin of a capacitor is damaged by the organic solvents and it may result, worst case, in a short circuit.

The variation in thickness of adhesive or molding resin may cause a outer coating resin cracking and/or ceramic element cracking of a capacitor in a temperature cycling.

8. TREATMENT AFTER BONDING AND RESIN MOLDING, RESIN COAT

When the outer coating is hot (over 100 °C) after soldering, it becomes soft and fragile. So please be careful not to give it mechanical stress.

Failure to follow the above cautions may result, worst case, in a short circuit and cause fuming or partial dispersion when the product is used.

9. 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 equipment6. Transportation equipment (vehicles, trains, ships, etc.)7. Traffic signal equipment8. Disaster prevention / crime prevention equipment

9. Data-processing equipment exerting influence on public

10. Application of similar complexity and/or reliability requirements to the applications listed in the above.

NOTICE

1. CLEANING (ULTRASONIC CLEANING)

To perform ultrasonic cleaning, observe the following conditions.

Rinse bath capacity: Output of 20 watts per liter or less.

Rinsing time: 5 min maximum.

Do not vibrate the PCB/PWB directly.

Excessive ultrasonic cleaning may lead to fatigue destruction of the lead wires.

2. Soldering and Mounting

Insertion of the Lead Wire

- When soldering, insert the lead wire into the PCB without mechanically stressing the lead wire.
- Insert the lead wire into the PCB with a distance appropriate to the lead space.

3. CAPACITANCE CHANGE OF CAPACITORS

• Class 2 capacitors (Temp.Char. : X7R,X7S,X8L, etc.)

Class 2 capacitors an aging characteristic, whereby the capacitor continually decreases its capacitance slightly if the capacitor leaves for a long time. Moreover, capacitance might change greatly depending on a surrounding temperature or an applied voltage. So, it is not likely to be able to use for the time constant circuit.

Please contact us if you need a detail information.

⚠ 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 this specification.

1. Application

This specification is applied to 200°C Operation Leaded MLCC RHS series in accordance with AEC-Q200 requirements used for Automotive Electronic equipment.

2. Rating

• Applied maximum temperature up to 200°C

Note: Maximum accumulative time to 200°C is within 2000 hours.

• Part number configuration

ex.) RHS 7G 101 0 Α2 H01 В Temperature Series Rated Capacitance Capacitance Dimension Lead Individual Packing voltage specification tolerance style Characteristic code code code code

Series

Code	Content
RHS	Epoxy coated, 200°C max.

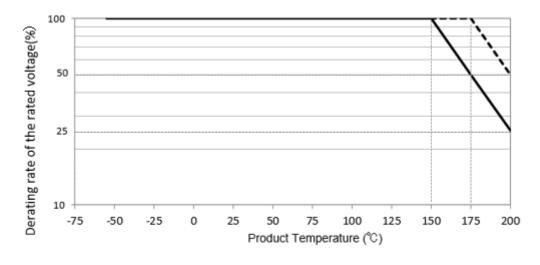
• Temperature characteristic

Code	Temp. Char.	Temp. Range	Temp. coeff.(ppm/°C)	Standard Temp.	Operating Temp. Range
	000	-55∼25°C	0+30/-72		
7G	CCG (Murata code)	25∼125°C	0±30	25°C	-55 ~ 200°C
	(Ividiala code)	125∼200°C	0+72/-30		

• Rated voltage

Code	Rated voltage
2A	DC100V

When the product temperature exceeds 150°C, please use this product within the voltage and temperature derated conditions in the figure below.



----- Temp. Char.: CCG, Rated Voltage: 100V, Capacitance: 100pF-1000pF

Temp. Char.: CCG, Rated Voltage: 100V, Capacitance: 1200pF-3300pF

Capacitance

The first two digits denote significant figures; the last digit denotes the multiplier of 10 in pF. ex.) In case of 101.

$$10 \times 10^1 = 100 pF$$

• Capacitance tolerance

Code	Capacitance tolerance
J	+/-5%

• Dimension code

Code	Dimensions (LxW) mm max.
0	3.9 x 3.5
1	4.2 x 3.5

• Lead code

Code	Lead style	Lead spacing (mm)
A2	Straight type	2.5+/-0.8
DG	Straight taping type	2.5+0.4/-0.2
K1	Inside crimp type	5.0+/-0.8
M2	Inside crimp taping type	5.0+0.6/-0.2

Lead wire is solder coated CP wire.

• Individual specification code

Murata's control code

Please refer to [Part number list].

• Packing style code

Code	Packing style
Α	Taping type of Ammo
В	Bulk type

3. Marking

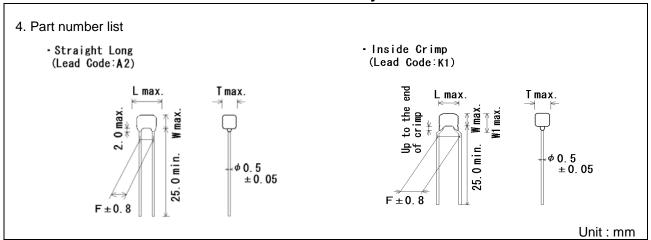
Temp. char. Capacitance : Letter code : 4 (CCG char.)

: 3 digit numbers Capacitance

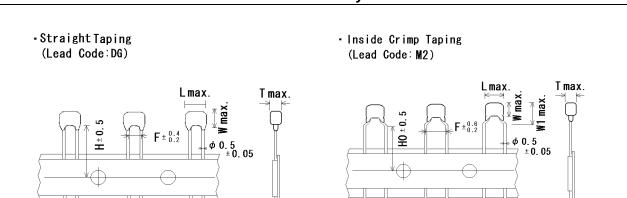
Capacitance tolerance: Code

(Ex.)

(LA.)	
Rated voltage Dimension code	100V
0,1	4 101J



Murata Part Number RHS7G2A101J0A2H01B RHS7G2A121J0A2H01B	T.C.	Rated Volt. (V)	Cap.	Cap. tol.						Lead	qty.
	CCG				L	W	W1	F	Т	Code	(pcs)
RHS7G2A121J0A2H01B		100	100pF	±5%	3.9	3.5	-	2.5	2.6	0A2	500
	CCG	100	120pF	±5%	3.9	3.5	-	2.5	2.6	0A2	500
RHS7G2A151J0A2H01B	CCG	100	150pF	±5%	3.9	3.5	-	2.5	2.6	0A2	500
RHS7G2A181J0A2H01B	CCG	100	180pF	±5%	3.9	3.5	-	2.5	2.6	0A2	500
RHS7G2A221J0A2H01B	CCG	100	220pF	±5%	3.9	3.5	-	2.5	2.6	0A2	500
RHS7G2A271J0A2H01B	CCG	100	270pF	±5%	3.9	3.5	-	2.5	2.6	0A2	500
RHS7G2A331J0A2H01B	CCG	100	330pF	±5%	3.9	3.5	-	2.5	2.6	0A2	500
RHS7G2A391J0A2H01B	CCG	100	390pF	±5%	3.9	3.5	-	2.5	2.6	0A2	500
RHS7G2A471J0A2H01B	CCG	100	470pF	±5%	3.9	3.5	-	2.5	2.6	0A2	500
RHS7G2A561J0A2H01B	CCG	100	560pF	±5%	3.9	3.5	-	2.5	2.6	0A2	500
RHS7G2A681J0A2H01B	CCG	100	680pF	±5%	3.9	3.5	-	2.5	2.6	0A2	500
RHS7G2A821J0A2H01B	CCG	100	820pF	±5%	3.9	3.5	-	2.5	2.6	0A2	500
RHS7G2A102J0A2H01B	CCG	100	1000pF	±5%	3.9	3.5	-	2.5	2.6	0A2	500
RHS7G2A122J0A2H01B	CCG	100	1200pF	±5%	3.9	3.5	-	2.5	2.6	0A2	500
RHS7G2A152J0A2H01B	CCG	100	1500pF	±5%	3.9	3.5	-	2.5	2.6	0A2	500
RHS7G2A182J1A2H01B	CCG	100	1800pF	±5%	4.2	3.5	-	2.5	2.8	1A2	500
RHS7G2A222J1A2H01B	CCG	100	2200pF	±5%	4.2	3.5	-	2.5	2.8	1A2	500
RHS7G2A272J1A2H01B	CCG	100	2700pF	±5%	4.2	3.5	-	2.5	2.8	1A2	500
RHS7G2A332J1A2H01B	CCG	100	3300pF	±5%	4.2	3.5	-	2.5	2.8	1A2	500
RHS7G2A101J0K1H01B	CCG	100	100pF	±5%	3.9	3.5	6.0	5.0	2.6	0K1	500
RHS7G2A121J0K1H01B	CCG	100	120pF	±5%	3.9	3.5	6.0	5.0	2.6	0K1	500
RHS7G2A151J0K1H01B	CCG	100	150pF	±5%	3.9	3.5	6.0	5.0	2.6	0K1	500
RHS7G2A181J0K1H01B	CCG	100	180pF	±5%	3.9	3.5	6.0	5.0	2.6	0K1	500
RHS7G2A221J0K1H01B	CCG	100	220pF	±5%	3.9	3.5	6.0	5.0	2.6	0K1	500
RHS7G2A271J0K1H01B	CCG	100	270pF	±5%	3.9	3.5	6.0	5.0	2.6	0K1	500
RHS7G2A331J0K1H01B	CCG	100	330pF	±5%	3.9	3.5	6.0	5.0	2.6	0K1	500
RHS7G2A391J0K1H01B	CCG	100	390pF	±5%	3.9	3.5	6.0	5.0	2.6	0K1	500
RHS7G2A471J0K1H01B	CCG	100	470pF	±5%	3.9	3.5	6.0	5.0	2.6	0K1	500
RHS7G2A561J0K1H01B	CCG	100	560pF	±5%	3.9	3.5	6.0	5.0	2.6	0K1	500
RHS7G2A681J0K1H01B	CCG	100	680pF	±5%	3.9	3.5	6.0	5.0	2.6	0K1	500
RHS7G2A821J0K1H01B	CCG	100	820pF	±5%	3.9	3.5	6.0	5.0	2.6	0K1	500
RHS7G2A102J0K1H01B	CCG	100	1000pF	±5%	3.9	3.5	6.0	5.0	2.6	0K1	500
RHS7G2A122J0K1H01B	CCG	100	1200pF	±5%	3.9	3.5	6.0	5.0	2.6	0K1	500
RHS7G2A152J0K1H01B	CCG	100	1500pF	±5%	3.9	3.5	6.0	5.0	2.6	0K1	500
RHS7G2A182J1K1H01B	CCG	100	1800pF	±5%	4.2	3.5	5.0	5.0	2.8	1K1	500
RHS7G2A222J1K1H01B	CCG	100	2200pF	±5%	4.2	3.5	5.0	5.0	2.8	1K1	500
RHS7G2A272J1K1H01B	CCG	100	2700pF	±5%	4.2	3.5	5.0	5.0	2.8	1K1	500
RHS7G2A332J1K1H01B	CCG	100	3300pF	±5%	4.2	3.5	5.0	5.0	2.8	1K1	500



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Customer Part Number	Murata Part Number	T.C.	DC Rated volt.	Cap.	Cap. tol.				on (mr		1	Size Lead	Pac
			(V)			L	W	W1	F	Т	H/H0	Code	(pc
	RHS7G2A101J0DGH01A	CCG	100	100pF	±5%	3.9	3.5	-	2.5	2.6	20.0	0DG	200
	RHS7G2A121J0DGH01A	CCG	100	120pF	±5%	3.9	3.5	-	2.5	2.6	20.0	0DG	200
	RHS7G2A151J0DGH01A	CCG	100	150pF	±5%	3.9	3.5	-	2.5	2.6	20.0	0DG	200
	RHS7G2A181J0DGH01A	CCG	100	180pF	±5%	3.9	3.5	-	2.5	2.6	20.0	0DG	200
	RHS7G2A221J0DGH01A	CCG	100	220pF	±5%	3.9	3.5	-	2.5	2.6	20.0	0DG	200
	RHS7G2A271J0DGH01A	CCG	100	270pF	±5%	3.9	3.5	-	2.5	2.6	20.0	0DG	20
	RHS7G2A331J0DGH01A	CCG	100	330pF	±5%	3.9	3.5	-	2.5	2.6	20.0	0DG	20
	RHS7G2A391J0DGH01A	CCG	100	390pF	±5%	3.9	3.5	-	2.5	2.6	20.0	0DG	20
	RHS7G2A471J0DGH01A	CCG	100	470pF	±5%	3.9	3.5	-	2.5	2.6	20.0	0DG	20
	RHS7G2A561J0DGH01A	CCG	100	560pF	±5%	3.9	3.5	-	2.5	2.6	20.0	0DG	20
	RHS7G2A681J0DGH01A	CCG	100	680pF	±5%	3.9	3.5	-	2.5	2.6	20.0	0DG	20
	RHS7G2A821J0DGH01A	CCG	100	820pF	±5%	3.9	3.5	-	2.5	2.6	20.0	0DG	20
	RHS7G2A102J0DGH01A	CCG	100	1000pF	±5%	3.9	3.5	-	2.5	2.6	20.0	0DG	20
	RHS7G2A122J0DGH01A	CCG	100	1200pF	±5%	3.9	3.5	-	2.5	2.6	20.0	0DG	20
	RHS7G2A152J0DGH01A	CCG	100	1500pF	±5%	3.9	3.5	-	2.5	2.6	20.0	0DG	2
	RHS7G2A182J1DGH01A	CCG	100	1800pF	±5%	4.2	3.5	-	2.5	2.8	20.0	1DG	2
	RHS7G2A222J1DGH01A	CCG	100	2200pF	±5%	4.2	3.5	-	2.5	2.8	20.0	1DG	2
	RHS7G2A272J1DGH01A	CCG	100	2700pF	±5%	4.2	3.5	-	2.5	2.8	20.0	1DG	2
	RHS7G2A332J1DGH01A	CCG	100	3300pF	±5%	4.2	3.5	-	2.5	2.8	20.0	1DG	2
	RHS7G2A101J0M2H01A	CCG	100	100pF	±5%	3.9	3.5	6.0	5.0	2.6	20.0	0M2	2
	RHS7G2A121J0M2H01A	CCG	100	120pF	±5%	3.9	3.5	6.0	5.0	2.6	20.0	0M2	2
	RHS7G2A151J0M2H01A	CCG	100	150pF	±5%	3.9	3.5	6.0	5.0	2.6	20.0	0M2	2
	RHS7G2A181J0M2H01A	CCG	100	180pF	±5%	3.9	3.5	6.0	5.0	2.6	20.0	0M2	2
	RHS7G2A221J0M2H01A	CCG	100	220pF	±5%	3.9	3.5	6.0	5.0	2.6	20.0	0M2	2
	RHS7G2A271J0M2H01A	CCG	100	270pF	±5%	3.9	3.5	6.0	5.0	2.6	20.0	0M2	2
	RHS7G2A331J0M2H01A	CCG	100	330pF	±5%	3.9	3.5	6.0	5.0	2.6	20.0	0M2	2
	RHS7G2A391J0M2H01A	CCG	100	390pF	±5%	3.9	3.5	6.0	5.0	2.6	20.0	0M2	2
	RHS7G2A471J0M2H01A	CCG	100	470pF	±5%	3.9	3.5	6.0	5.0	2.6	20.0	0M2	2
	RHS7G2A561J0M2H01A	CCG	100	560pF	±5%	3.9	3.5	6.0	5.0	2.6	20.0	0M2	2
	RHS7G2A681J0M2H01A	CCG	100	680pF	±5%	3.9	3.5	6.0	5.0	2.6	20.0	0M2	2
	RHS7G2A821J0M2H01A	CCG	100	820pF	±5%	3.9	3.5	6.0	5.0	2.6	20.0	0M2	2
	RHS7G2A102J0M2H01A	CCG	100	1000pF	±5%	3.9	3.5	6.0	5.0	2.6	20.0	0M2	2
	RHS7G2A122J0M2H01A	CCG	100	1200pF	±5%	3.9	3.5	6.0	5.0	2.6	20.0	0M2	2
	RHS7G2A152J0M2H01A	CCG	100	1500pF	±5%	3.9	3.5	6.0	5.0	2.6	20.0	0M2	2
	RHS7G2A182J1M2H01A	CCG	100	1800pF	±5%	4.2	3.5	5.0	5.0	2.8	20.0	1M2	2
	RHS7G2A222J1M2H01A	CCG	100	2200pF	±5%	4.2	3.5	5.0	5.0	2.8	20.0	1M2	2
	RHS7G2A272J1M2H01A	CCG	100	2700pF	±5%	4.2	3.5	5.0	5.0	2.8	20.0	1M2	20
	RHS7G2A332J1M2H01A	CCG	100	3300pF	±5%	4.2	3.5	5.0	5.0	2.8	20.0	1M2	20

_		Q200	tandard Specifications and Test Metho							
Test Item 1 Pre-and Post-Stress		Item	Specification	AEC-Q200 Test Method						
	Pre-and Post Electrical Tes			-						
	High Temperature	Appearance	No defects or abnormalities except color change of outer coating.	e of Sit the capacitor for 1,000±12h at 200±5°C. Let sit for 24±2h *room condition, then measure.						
	Exposure (Storage)	Capacitance Change	Within ±3% or ±0.3pF (Whichever is larger)							
		Q	Q ≥ 350							
		I.R.	1,000M Ω min.							
3	Temperature Cycling	Appearance	No defects or abnormalities except color change of outer coating	Perform the 1,000 cycles according to the four heat treatments listed in the following table. Let sit for 24±2 h at *room condition						
		Capacitance Change	·	then measure.						
		Q	(Whichever is larger) Q ≥ 350	Step 1 2 3 4						
		I.R.	1,000MΩ min.	Temp. (°C) -55+0/-3 Room Z00+5/-0 Room Temp. Time 15±3 1 15±3 1						
1	Moisture	Annearance	No defeate or abnormalities	Apply the 24h heat (25 to 65°C) and humidity (80 to 98%)						
	Resistance	Appearance Capacitance	No defects or abnormalities Within ±5% or ± 0.5pF	treatment shown below, 10 consecutive times.						
		Change	(Whichever is larger)	Let sit for 24±2 h at *room condition, then measure.						
		Q	Q ≥ 200	Temperature Humidity Humidity Humidity 80~98% Humidity 80~98% Humidity 80~98% Humidity						
		I.R.	500M Ω min.	(°C) Humidity 80~98% Humidity 80~98% Humid 90~98% \(\neg \) 90~98% \(\neg \) 90~98%						
				65						
				60						
				55						
				950 845						
				1 2 40 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1						
				 						
				30 (4)						
				25 75 +10						
				15 - 2 °C						
				10 Initial measurement						
				5						
				0 -5						
				-10						
				One cycle 24 hours						
5	Biased	Appearance	No defects or abnormalities	Hours Apply the rated voltage and DC1.3+0.2/-0 V (add 100k Ω resist						
	Humidity	Capacitance	Within ±5% or ± 0.5pF	at 85±3°C and 80 to 85% humidity for 1,000±12h.						
		Change	(Whichever is larger)	Remove and let sit for 24±2 h at *room condition, then measur						
		Q I.R.	$\label{eq:condition} \begin{array}{l} Q \geq 200 \\ 500 M\Omega \text{ min.} \end{array}$	The charge/discharge current is less than 50mA.						
6	Operational	Appearance	No defects or abnormalities except color	Apply voltage in Table for 1,000±12h at 200±5°C.						
	Life		change of outer coating	Let sit for 24±2 h at *room condition, then measure.						
			Within ±3% or ±0.3pF	The charge/discharge current is less than 50mA.						
		Change Q	(Whichever is larger) Q≥ 350	Capacitance Test Voltage						
		I.R.	1,000MΩ min.	100pF-1000pF 50% of the rated voltage						
				1200pF-3300pF 25% of the rated voltage						
	External Visu		No defects or abnormalities	Visual inspection						
	Physical Dime	ension	Within the specified dimensions	Using calipers and micrometers.						
u	Marking Resistance	Appearance	To be easily legible. No defects or abnormalities	Visual inspection Per MIL-STD-202 Method 215						
	to Solvents		Within the specified tolerance	Solvent 1 : 1 part (by volume) of isopropyl alcohol						
10		Q	Q ≥ 1,000	3 parts (by volume) of mineral spirits						
10				Solvent 2 : Terpene defluxer						
10		I.R.	10,000M Ω min.							
10		I.R.	10,000M Ω min.	Solvent 3 : 42 parts (by volume) of water 1part (by volume) of propylene glycol						

No.	AEC-Q200 Test Item		Specification		AEC-Q200 Test Method				
11	Mechanical	Appearance	No defects or abnormalities		Three shocks in each direction should be applied a mutually perpendicular axes of the test specimen (1				
	Shock	Capacitance	Within the specified tolerance	The spec	The specified test pulse should be Half-sine and should he duration :0.5ms, peak value:1,500G and velocity change:				
		Q	Q ≥ 1,000	duration	, , , , , , , , , , , , , , , , , , , ,			4.7111	
12	Vibration	Appearance	No defects or abnormalities		The capacitor should be subjected to a simple harmonic r having a total amplitude of 1.5mm, the frequency being va uniformly between the approximate limits of 10 and 2,000				
		Capacitance	Within the specified tolerance	uniformly					
		Q	Q ≥ 1,000	should be	The frequency range, from 10 to 2,000Hz and return to 10Hz should be traversed in approximately 20 min. This motion should be applied for 12 items in each 3 mutually perpendic directions (total of 36 times).				
13-1	Resistance to Soldering Heat (Non-Preheat)	Appearance	No defects or abnormalities		The lead wires should be immersed in the melted solder 1.5 2.0mm from the root of terminal at 260±5°C for 10±1 second				
		Capacitance	Within ±2.5% or ±0.25pF	2.011111	Post-treatment Capacitor should be stored for 24±2 hours at *room condit				
		Change	(Whichever is larger)	Post-tr					
		Dielectric Strength (Between terminals)	No defects	Capacit					
13-2	Resistance to	Appearance	No defects or abnormalities		First the capacitor should be stored at 120+0/-5°C for 60 seconds. Then, the lead wires should be immersed in the melted seconds.				
	Soldering Heat (On-Preheat)	Capacitance	Within ±2.5% or ±0.25pF						
	,	Change	(Whichever is larger)	1.5 to 2	0mm from the	root of terminal	at 260±5°C for 7.	r 7.5+0/-1	
		Dielectric Strength	No defects	seconds	seconds.				
		(Between		_					
		terminals)			 Post-treatment Capacitor should be stored for 24±2 h 				
13-3	Resistance to	Appearance	No defects or abnormalities	Test cor		stored for 24±2	nours at "room co	onaitio	
13-3	Soldering Heat	Appearance	140 delects of abriefficialities			-tip : 350+10°C			
	(soldering iron method)	Capacitance	Within ±2.5% or ±0.25pF		Termperature of iron-tip: 350±10°C Soldering time: 3.5±0.5 seconds Soldering position Straight Lead:1.5 to 2.0mm from the root of terminal.				
		Change	(Whichever is larger)						
		Dielectric	No defects	Straigh					
		Strength		Crimp	Crimp Lead:1.5 to 2.0mm from the end of lead bend.				
		(Between							
		terminals)			 Post-treatment Capacitor should be stored for 24 		hours at *room co	nditic	
14	Thermal Shock	Appearance	No defects or abnormalities		Perform the 300 cycles according to the two heat t				
		Capacitance	Within ±5% or ±0.5pF		the following table(Maximum transfer time is 20s.). Let sit for				
		Change (Whichever is larger)		24±2 h a		on, then measu		7	
		Q Q≥350	Q ≥ 350		Step	1	2	-	
		I.R.	1,000MΩ min.		Temp. (°C)	-55+0/-3	200+5/-0		
					Time	15±3	15±3	1	
15	ESD	Appearance	No defects or abnormalities	Per AEC	(min.) ·Q200-002	10±0	10±0		
10		Appearance Capacitance	Within the specified tolerance	- 317.20					
16		Q	Q ≥ 1,000	\dashv					
		I.R.	10,000MΩ min.						
			Lead wire should be soldered with uniforn	The term	inal of a capa	citor is dipped in	to a colution of at	hanol	
16	Solderability				The terminal of a capacitor is dipped into a solution of ethanol (JIS-K-8101) and rosin (JIS-K-5902) (25%rosin in weight				
			circumferential direction.		propotion) and then into molten solder (JIS-Z-3282) for 2±0.5 s				
					,		,		
					In both cases the depth of dipping is up to about 1.5 to 2mm frethe terminal body.				
				Tomp of	coldor :				
					Temp. of solder: 245±5°C Lead Free Solder(Sn-3.0Ag-0.5Cu)				
				1 ZTU_U	235±5°C H60A or H63A Eutectic Solder				

No.	AEC-Q200 Test Item		Specifications		AEC-Q200 Test Method				
17	Electrical	Apperance	No defects or abnormalities		Visual inspection.				
	Characte-	Capacitance	Within the specified tolerance		The capacitance, Q should be measured at 25°C at the frequer				
	rization	Q	Q ≥ 1,000		and voltage shown in the table.				
					Nominal Cap. Frequency Voltage				
					C ≤ 1000pF 1±0.1MHz AC0.5 to 5V(ms) C > 1000pF 1±0.1kHz AC1±0.2V(ms)				
		Insulation Resistance (I.R.)	Room Temperature	10,000MΩ min.	The insulation resistance should be measured at 25±3 °C with DC voltage not exceeding the rated voltage at normal temperat and humidity and within 2 min. of charging. (Charge/Discharge current ≤ 50mA)				
			High Temperature	20MΩ min.	The insulation resistance should be measured at 200±5 °C wi DC voltage not exceeding voltage in Table and within 2 min. o charging. (Charge/Discharge current ≤ 50mA)				
					Capacitance Test Voltage				
					100pF-1000pF 50% of the rated voltage				
					1200pF-3300pF 25% of the rated voltage				
		Dielectric Strength	Terminals	No defects or abnormalities No defects or abnormalities	The capacitor should not be damaged when voltage in Table i applied between the terminations for 1 to 5 seconds. (Charge/Discharge current ≤ 50mA.)				
					Rated voltage Test voltage DC100V 300% of the rated voltage				
					The capacitor is placed in a container with metal balls of 1mm diameter so that each terminal, short-circuit, is kept approximately 2mm from the balls as shown in the figure, and voltage in table is impressed for 1 to 5 seconds between capacitor terminals and metal balls. (Charge/Discharge current ≤ 50mA.)				
					Rated voltage Test voltage DC100V 250% of the rated voltage				
18	Terminal Tensile Strength Strength		Termination not to be broken or loosened		As in the figure, fix the capacitor body, apply the force gradual to each lead in the radial direction of the capacitor until reachi 10N and then keep the force applied for 10±1 seconds.				
		Bending Strength	Termination not to be broken or loosened		Each lead wire should be subjected to a force of 2.5N and then be bent 90° at the point of egress in one direction. Each wire in the returned to the original position and bent 90° in the opposed direction at the rate of one bend per 2 to 3 seconds.				
19	Capacitance	1	Within the spe	ecified Tolerance.	The capacitance change should be measured after 5min. at				
-	Temperature Characteristics		0+30/-72ppm/°C (-55~25°C) 0±30ppm/°C (25~125°C)		each specified temperature step.				
					Step Temperature(°C)				
			U+72/-30pp	om/°C (125~200°C)	1 25±2				
					2 -55±3				
					3 25±2				
					4 200±5				
					5 25±2				
					The temperature coefficient is determind using the capacitance measured in step 3 as a reference. When cycling the temperature sequentially from step 1 through 5 (-55°C to +150°C) the capacitance should be within the specified tolerance for the temperature coefficient and capacitance change as Table A. The capacitance drift is caluculated by dividing the differences between the maximum and minimum measured values in the 1, 3 and 5 by the capacitance value in step 3.				

ESRH05C

6. Packing specification

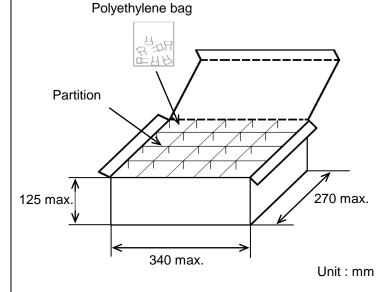
•Bulk type (Packing style code : B)

The size of packing case and packing way

The number of packing = *1 Packing quantity *2 n

*1 : Please refer to [Part number list].

*2 : Standard n = 20 (bag)



Note)

The outer package and the number of outer packing be changed by the order getting amount.

- •Ammo pack taping type (Packing style code : A)
 - · A crease is made every 25 pitches, and the tape with capacitors is packed zigzag into a case.
 - · When body of the capacitor is piled on other body under it.

Position of label

Position of label

Capacitor

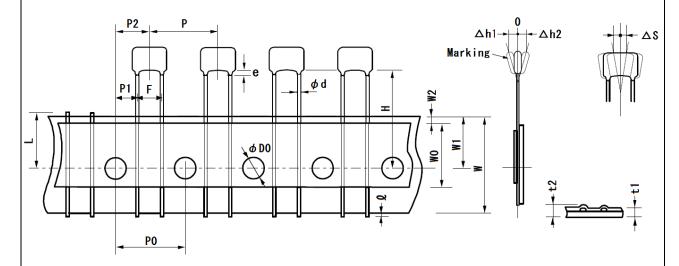
Base tape

Hold down tape upper

7. Taping specification

7-1. Dimension of capacitors on tape
Straight taping type < Lead code : DG >

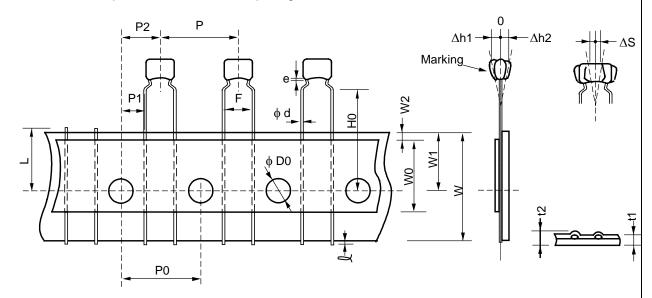
Pitch of component 12.7mm / Lead spacing 2.5mm



Unit: mm

Item	Code	Dimensions	Remarks	
Pitch of component	Р	12.7+/-1.0		
Pitch of sprocket hole	P0	12.7+/-0.2		
Lead spacing	F	2.5+0.4/-0.2		
Length from hole center to component center	P2	6.35+/-1.3		
Length from hole center to lead	P1	5.1+/-0.7	Deviation of progress direction	
Deviation along tape, left or right defect	ΔS	0+/-2.0	They include deviation by lead bend .	
Carrier tape width	W	18.0+/-0.5		
Position of sprocket hole	W1	9.0+0/-0.5	Deviation of tape width direction	
Lead distance between reference and bottom plane	Н	20.0+/-0.5		
Protrusion length	Q.	0.5 max.		
Diameter of sprocket hole	D0	4.0+/-0.1		
Lead diameter	d	0.50+/-0.05		
Total tape thickness	t1	0.6+/-0.3		
Total thickness of tape and lead wire	t2	1.5 max.	They include hold down tape thickness.	
	∆h1	1.0 max.		
Deviation across tape	∆h2	1.0 IIIax.		
Portion to cut in case of defect	L	11.0+0/-1.0		
Hold down tape width	W0	9.5 min.		
Hold down tape position	W2	1.5+/-1.5		
Coating extension on lead	е	2.0 max.		

Inside crimp taping type < Lead code : M2 > Pitch of component 12.7mm / Lead spacing 5.0mm

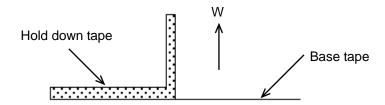


Unit : mm

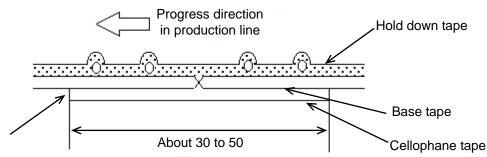
Item	Code	Dimensions	Remarks	
Pitch of component	Р	12.7+/-1.0		
Pitch of sprocket hole	P0	12.7+/-0.2		
Lead spacing	F	5.0+0.6/-0.2		
Length from hole center to component center	P2	6.35+/-1.3	Deviation of any and discretion	
Length from hole center to lead	P1	3.85+/-0.7	Deviation of progress direction	
Deviation along tape, left or right defect	ΔS	0+/-2.0	They include deviation by lead bend .	
Carrier tape width	W	18.0+/-0.5		
Position of sprocket hole	W1	9.0+0/-0.5	Deviation of tape width direction	
Lead distance between reference and bottom plane	НО	20.0+/-0.5		
Protrusion length	l	0.5 max.		
Diameter of sprocket hole	D0	4.0+/-0.1		
Lead diameter	φd	0.50+/-0.05		
Total tape thickness	t1	0.6+/-0.3		
Total thickness of tape and lead wire	t2	1.5 max.	They include hold down tape thickness.	
Desiration appearation a	∆h1	2.0 max. (Dimension code : W)		
Deviation across tape	∆h2	1.0 max. (except as above)		
Portion to cut in case of defect	L	11.0+0/-1.0		
Hold down tape width	W0	9.5 min.		
Hold down tape position	W2	1.5+/-1.5		
Coating extension on lead	е	Up to the end of o	rimp	

7-2. Splicing way of tape

1) Adhesive force of tape is over 3N at test condition as below.



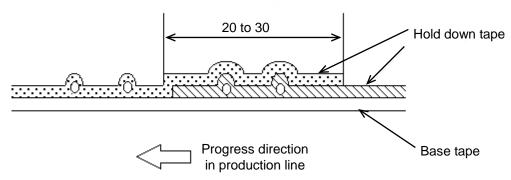
- 2) Splicing of tape
 - a) When base tape is spliced
 - •Base tape shall be spliced by cellophane tape. (Total tape thickness shall be less than 1.05mm.)



No lifting for the direction of progressing

Unit: mm

- b) When hold down tape is spliced
 - •Hold down tape shall be spliced with overlapping. (Total tape thickness shall be less than 1.05mm.)



Unit: mm

- c) When both tape are spliced
 - •Base tape and hold down tape shall be spliced with splicing tape.

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