



# Inductors for high frequency circuits

Multilayer ceramic

**MHQ-P series**

# MHQ0603P<sub>type</sub>

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**MHQ0603P**

**0603 [0201 inch]\***

\* Dimensions code JIS[EIA]

## REMINDERS FOR USING THESE PRODUCTS

Before using these products, be sure to request the delivery specifications.

### SAFETY REMINDERS

Please pay sufficient attention to the warnings for safe designing when using this product.

#### REMINDERS

- The storage period is less than 12 months. Be sure to follow the storage conditions (temperature: 5 to 40°C, humidity: 10 to 75% RH or less).  
If the storage period elapses, the soldering of the terminal electrodes may deteriorate.
- Do not use or store in locations where there are conditions such as gas corrosion (salt, acid, alkali, etc.).
- Before soldering, be sure to preheat components.  
The preheating temperature should be set so that the temperature difference between the solder temperature and chip temperature does not exceed 150°C.
- Soldering corrections after mounting should be within the range of the conditions determined in the specifications.  
If overheated, a short circuit, performance deterioration, or lifespan shortening may occur.
- When embedding a printed circuit board where a chip is mounted to a set, be sure that residual stress is not given to the chip due to the overall distortion of the printed circuit board and partial distortion such as at screw tightening portions.
- Self heating (temperature increase) occurs when the power is turned ON, so the tolerance should be sufficient for the set thermal design.
- Carefully lay out the coil for the circuit board design of the non-magnetic shield type.  
A malfunction may occur due to magnetic interference.
- Use a wrist band to discharge static electricity in your body through the grounding wire.
- Do not expose the products to magnets or magnetic fields.
- Do not use for a purpose outside of the contents regulated in the delivery specifications.
- The products listed on this catalog are intended for use in general electronic equipment (AV equipment, telecommunications equipment, home appliances, amusement equipment, computer equipment, personal equipment, office equipment, measurement equipment, industrial robots) under a normal operation and use condition.  
The products are not designed or warranted to meet the requirements of the applications listed below, whose performance and/or quality require a more stringent level of safety or reliability, or whose failure, malfunction or trouble could cause serious damage to society, person or property.  
If you intend to use the products in the applications listed below or if you have special requirements exceeding the range or conditions set forth in the each catalog, please contact us.

- (1) Aerospace/aviation equipment
- (2) Transportation equipment (cars, electric trains, ships, etc.)
- (3) Medical equipment
- (4) Power-generation control equipment
- (5) Atomic energy-related equipment
- (6) Seabed equipment
- (7) Transportation control equipment

- (8) Public information-processing equipment
- (9) Military equipment
- (10) Electric heating apparatus, burning equipment
- (11) Disaster prevention/crime prevention equipment
- (12) Safety equipment
- (13) Other applications that are not considered general-purpose applications

When designing your equipment even for general-purpose applications, you are kindly requested to take into consideration securing protection circuit/device or providing backup circuits in your equipment.

# Inductors for high frequency circuits

## Multilayer ceramic

Product compatible with RoHS directive  
Halogen-free  
Compatible with lead-free solders

# Overview of MHQ0603P series

## FEATURES

- Unique ceramic material and configuration allows for the realization of high Q characteristics that are equivalent to that of air core wound inductors.
- Multilayer method allows for a lineup with fine increments of inductance.

## APPLICATION

Smart phones, tablet terminals, high frequency modules (PAs, VCOs, FEMs , etc.), Bluetooth, W-LAN, UWB, tuners and other high frequency circuits for the mobile communication industry

## PART NUMBER CONSTRUCTION


MHQ	0603	P	0N6	B	T	000					
Series name	LxWxH dimensions (mm)		Inductance (nH)		Inductance tolerance		Packaging style	Internal code			
	0603	0.65x0.35x0.35	P		0N6	0.6	B	±0.1nH	T	Taping	000
			1N1	1.1	C			±0.2nH			
			11N	11	S			±0.3nH			
					H			±3%			
					J			±5%			

## OPERATING TEMPERATURE RANGE, PACKAGE QUANTITY, PRODUCT WEIGHT

Type	Temperature ranges		Package quantity (pieces/reel)	Individual weight (mg)
	Operating temperature (°C)	Storage temperature* (°C)		
MHQ0603P	-55 to +125	-55 to +125	15000	0.2

\* The storage temperature range is for after the circuit board is mounted.

- RoHS Directive Compliant Product: See the following for more details. <https://product.tdk.com/info/en/environment/rohs/index.html>
- Halogen-free: indicates that Cl content is less than 900ppm, Br content is less than 900ppm, and that the total Cl and Br content is less than 1500ppm.

 Please be sure to request delivery specifications that provide further details on the features and specifications of the products for proper and safe use. Please note that the contents may change without any prior notice due to reasons such as upgrading.

# MHQ0603P type

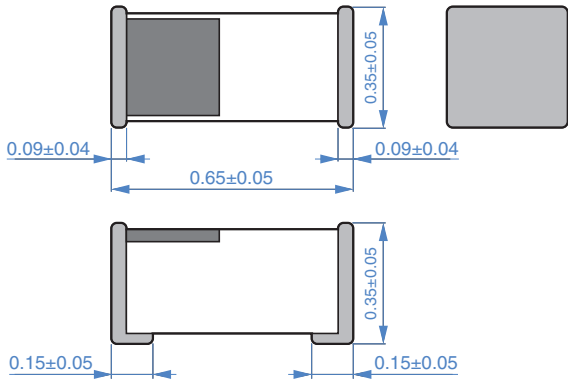
## RECOMMENDED REFLOW PROFILE



Preheating			Soldering		Peak	
Temp.		Time	Temp.	Time	Temp.	Time
T1	T2	t1	T3	t2	T4	t3
150°C	180°C	60 to 120s	230°C	30 to 60s	250 to 260°C	10s max.

# MHQ0603P type

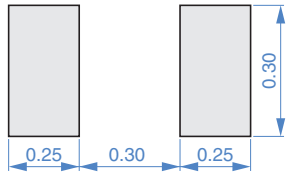
## SHAPE & DIMENSIONS



Dimensions in mm



## RECOMMENDED LAND PATTERN



Dimensions in mm

Please be sure to request delivery specifications that provide further details on the features and specifications of the products for proper and safe use. Please note that the contents may change without any prior notice due to reasons such as upgrading.

# MHQ0603P type

## ELECTRICAL CHARACTERISTICS

### CHARACTERISTICS SPECIFICATION TABLE

L (nH)	Tolerance	L measuring frequency (MHz)	Q min.	Q measuring frequency (MHz)	Self-resonant frequency		DC resistance		Rated current (mA)max.	Part No.
					(GHz)min.	(GHz)typ.	( $\Omega$ )max.	( $\Omega$ )typ.		
0.6	$\pm 0.1$ nH	500	—	500	10.0	20.0	0.07	0.02	1000	MHQ0603P0N6BT000
0.6	$\pm 0.2$ nH	500	—	500	10.0	20.0	0.07	0.02	1000	MHQ0603P0N6CT000
0.7	$\pm 0.1$ nH	500	—	500	10.0	20.0	0.07	0.02	1000	MHQ0603P0N7BT000
0.7	$\pm 0.2$ nH	500	—	500	10.0	20.0	0.07	0.02	1000	MHQ0603P0N7CT000
0.8	$\pm 0.1$ nH	500	—	500	10.0	20.0	0.07	0.02	1000	MHQ0603P0N8BT000
0.8	$\pm 0.2$ nH	500	—	500	10.0	20.0	0.07	0.02	1000	MHQ0603P0N8CT000
0.9	$\pm 0.1$ nH	500	—	500	10.0	18.8	0.07	0.02	1000	MHQ0603P0N9BT000
0.9	$\pm 0.2$ nH	500	—	500	10.0	18.8	0.07	0.02	1000	MHQ0603P0N9CT000
1.0	$\pm 0.1$ nH	500	—	500	10.0	19.3	0.07	0.03	1000	MHQ0603P1N0BT000
1.0	$\pm 0.2$ nH	500	—	500	10.0	19.3	0.07	0.03	1000	MHQ0603P1N0CT000
1.0	$\pm 0.3$ nH	500	—	500	10.0	19.3	0.07	0.03	1000	MHQ0603P1N0ST000
1.1	$\pm 0.1$ nH	500	—	500	10.0	19.3	0.07	0.03	1000	MHQ0603P1N1BT000
1.1	$\pm 0.2$ nH	500	—	500	10.0	19.3	0.07	0.03	1000	MHQ0603P1N1CT000
1.1	$\pm 0.3$ nH	500	—	500	10.0	19.3	0.07	0.03	1000	MHQ0603P1N1ST000
1.2	$\pm 0.1$ nH	500	—	500	10.0	20.0	0.08	0.04	1000	MHQ0603P1N2BT000
1.2	$\pm 0.2$ nH	500	—	500	10.0	20.0	0.08	0.04	1000	MHQ0603P1N2CT000
1.2	$\pm 0.3$ nH	500	—	500	10.0	20.0	0.08	0.04	1000	MHQ0603P1N2ST000
1.3	$\pm 0.1$ nH	500	—	500	10.0	20.0	0.10	0.06	800	MHQ0603P1N3BT000
1.3	$\pm 0.2$ nH	500	—	500	10.0	20.0	0.10	0.06	800	MHQ0603P1N3CT000
1.3	$\pm 0.3$ nH	500	—	500	10.0	20.0	0.10	0.06	800	MHQ0603P1N3ST000
1.4	$\pm 0.1$ nH	500	—	500	10.0	18.6	0.10	0.06	800	MHQ0603P1N4BT000
1.4	$\pm 0.2$ nH	500	—	500	10.0	18.6	0.10	0.06	800	MHQ0603P1N4CT000
1.4	$\pm 0.3$ nH	500	—	500	10.0	18.6	0.10	0.06	800	MHQ0603P1N4ST000
1.5	$\pm 0.1$ nH	500	16	500	10.0	19.5	0.10	0.05	800	MHQ0603P1N5BT000
1.5	$\pm 0.2$ nH	500	16	500	10.0	19.5	0.10	0.05	800	MHQ0603P1N5CT000
1.5	$\pm 0.3$ nH	500	16	500	10.0	19.5	0.10	0.05	800	MHQ0603P1N5ST000
1.6	$\pm 0.1$ nH	500	16	500	10.0	17.5	0.10	0.06	800	MHQ0603P1N6BT000
1.6	$\pm 0.2$ nH	500	16	500	10.0	17.5	0.10	0.06	800	MHQ0603P1N6CT000
1.6	$\pm 0.3$ nH	500	16	500	10.0	17.5	0.10	0.06	800	MHQ0603P1N6ST000
1.7	$\pm 0.1$ nH	500	16	500	10.0	16.7	0.10	0.07	800	MHQ0603P1N7BT000
1.7	$\pm 0.2$ nH	500	16	500	10.0	16.7	0.10	0.07	800	MHQ0603P1N7CT000
1.7	$\pm 0.3$ nH	500	16	500	10.0	16.7	0.10	0.07	800	MHQ0603P1N7ST000
1.8	$\pm 0.1$ nH	500	16	500	10.0	15.8	0.12	0.07	700	MHQ0603P1N8BT000
1.8	$\pm 0.2$ nH	500	16	500	10.0	15.8	0.12	0.07	700	MHQ0603P1N8CT000
1.8	$\pm 0.3$ nH	500	16	500	10.0	15.8	0.12	0.07	700	MHQ0603P1N8ST000
1.9	$\pm 0.1$ nH	500	16	500	10.0	16.1	0.12	0.08	700	MHQ0603P1N9BT000
1.9	$\pm 0.2$ nH	500	16	500	10.0	16.1	0.12	0.08	700	MHQ0603P1N9CT000
1.9	$\pm 0.3$ nH	500	16	500	10.0	16.1	0.12	0.08	700	MHQ0603P1N9ST000
2.0	$\pm 0.1$ nH	500	16	500	10.0	13.8	0.12	0.08	700	MHQ0603P2N0BT000
2.0	$\pm 0.2$ nH	500	16	500	10.0	13.8	0.12	0.08	700	MHQ0603P2N0CT000
2.0	$\pm 0.3$ nH	500	16	500	10.0	13.8	0.12	0.08	700	MHQ0603P2N0ST000
2.1	$\pm 0.1$ nH	500	16	500	10.0	12.7	0.15	0.08	700	MHQ0603P2N1BT000
2.1	$\pm 0.2$ nH	500	16	500	10.0	12.7	0.15	0.08	700	MHQ0603P2N1CT000
2.1	$\pm 0.3$ nH	500	16	500	10.0	12.7	0.15	0.08	700	MHQ0603P2N1ST000

· Short bar residual inductance =0.48nH

#### Measurement equipment

Measurement item	Product No.	Manufacturer
L、Q	4991A+16197A	Keysight Technologies
Self-resonant frequency	8720C	Keysight Technologies
DC resistance	Type-7561	Yokogawa

\* Equivalent measurement equipment may be used.

# MHQ0603P type

## ELECTRICAL CHARACTERISTICS

### CHARACTERISTICS SPECIFICATION TABLE

L	L measuring frequency		Q	Q measuring frequency		Self-resonant frequency		DC resistance		Rated current	Part No.
	(nH)	Tolerance		(MHz)	min.	(MHz)	(GHz)min.	(GHz)typ.	( $\Omega$ )max.		
2.2	$\pm 0.1$ nH	500	16	500	10.0	13.2	0.15	0.09	700	MHQ0603P2N2BT000	
2.2	$\pm 0.2$ nH	500	16	500	10.0	13.2	0.15	0.09	700	MHQ0603P2N2CT000	
2.2	$\pm 0.3$ nH	500	16	500	10.0	13.2	0.15	0.09	700	MHQ0603P2N2ST000	
2.3	$\pm 0.1$ nH	500	16	500	10.0	12.5	0.15	0.08	700	MHQ0603P2N3BT000	
2.3	$\pm 0.2$ nH	500	16	500	10.0	12.5	0.15	0.08	700	MHQ0603P2N3CT000	
2.3	$\pm 0.3$ nH	500	16	500	10.0	12.5	0.15	0.08	700	MHQ0603P2N3ST000	
2.4	$\pm 0.1$ nH	500	16	500	8.0	11.7	0.15	0.08	700	MHQ0603P2N4BT000	
2.4	$\pm 0.2$ nH	500	16	500	8.0	11.7	0.15	0.08	700	MHQ0603P2N4CT000	
2.4	$\pm 0.3$ nH	500	16	500	8.0	11.7	0.15	0.08	700	MHQ0603P2N4ST000	
2.5	$\pm 0.1$ nH	500	16	500	8.0	11.1	0.25	0.17	500	MHQ0603P2N5BT000	
2.5	$\pm 0.2$ nH	500	16	500	8.0	11.1	0.25	0.17	500	MHQ0603P2N5CT000	
2.5	$\pm 0.3$ nH	500	16	500	8.0	11.1	0.25	0.17	500	MHQ0603P2N5ST000	
2.6	$\pm 0.1$ nH	500	16	500	8.0	11.1	0.25	0.16	500	MHQ0603P2N6BT000	
2.6	$\pm 0.2$ nH	500	16	500	8.0	11.1	0.25	0.16	500	MHQ0603P2N6CT000	
2.6	$\pm 0.3$ nH	500	16	500	8.0	11.1	0.25	0.16	500	MHQ0603P2N6ST000	
2.7	$\pm 0.1$ nH	500	16	500	8.0	10.5	0.25	0.16	500	MHQ0603P2N7BT000	
2.7	$\pm 0.2$ nH	500	16	500	8.0	10.5	0.25	0.16	500	MHQ0603P2N7CT000	
2.7	$\pm 0.3$ nH	500	16	500	8.0	10.5	0.25	0.16	500	MHQ0603P2N7ST000	
2.8	$\pm 0.1$ nH	500	16	500	8.0	10.6	0.25	0.18	500	MHQ0603P2N8BT000	
2.8	$\pm 0.2$ nH	500	16	500	8.0	10.6	0.25	0.18	500	MHQ0603P2N8CT000	
2.8	$\pm 0.3$ nH	500	16	500	8.0	10.6	0.25	0.18	500	MHQ0603P2N8ST000	
2.9	$\pm 0.1$ nH	500	16	500	8.0	10.8	0.30	0.19	450	MHQ0603P2N9BT000	
2.9	$\pm 0.2$ nH	500	16	500	8.0	10.8	0.30	0.19	450	MHQ0603P2N9CT000	
2.9	$\pm 0.3$ nH	500	16	500	8.0	10.8	0.30	0.19	450	MHQ0603P2N9ST000	
3.0	$\pm 0.1$ nH	500	16	500	8.0	10.3	0.30	0.19	450	MHQ0603P3N0BT000	
3.0	$\pm 0.2$ nH	500	16	500	8.0	10.3	0.30	0.19	450	MHQ0603P3N0CT000	
3.0	$\pm 0.3$ nH	500	16	500	8.0	10.3	0.30	0.19	450	MHQ0603P3N0ST000	
3.1	$\pm 0.1$ nH	500	16	500	8.0	10.5	0.30	0.19	450	MHQ0603P3N1BT000	
3.1	$\pm 0.2$ nH	500	16	500	8.0	10.5	0.30	0.19	450	MHQ0603P3N1CT000	
3.1	$\pm 0.3$ nH	500	16	500	8.0	10.5	0.30	0.19	450	MHQ0603P3N1ST000	
3.2	$\pm 0.1$ nH	500	16	500	7.0	9.5	0.20	0.13	550	MHQ0603P3N2BT000	
3.2	$\pm 0.2$ nH	500	16	500	7.0	9.5	0.20	0.13	550	MHQ0603P3N2CT000	
3.2	$\pm 0.3$ nH	500	16	500	7.0	9.5	0.20	0.13	550	MHQ0603P3N2ST000	
3.3	$\pm 0.1$ nH	500	16	500	7.0	9.6	0.25	0.15	500	MHQ0603P3N3BT000	
3.3	$\pm 0.2$ nH	500	16	500	7.0	9.6	0.25	0.15	500	MHQ0603P3N3CT000	
3.3	$\pm 0.3$ nH	500	16	500	7.0	9.6	0.25	0.15	500	MHQ0603P3N3ST000	
3.4	$\pm 0.1$ nH	500	16	500	6.5	9.3	0.25	0.14	500	MHQ0603P3N4BT000	
3.4	$\pm 0.2$ nH	500	16	500	6.5	9.3	0.25	0.14	500	MHQ0603P3N4CT000	
3.4	$\pm 0.3$ nH	500	16	500	6.5	9.3	0.25	0.14	500	MHQ0603P3N4ST000	
3.5	$\pm 0.1$ nH	500	16	500	6.5	9.5	0.25	0.17	500	MHQ0603P3N5BT000	
3.5	$\pm 0.2$ nH	500	16	500	6.5	9.5	0.25	0.17	500	MHQ0603P3N5CT000	
3.5	$\pm 0.3$ nH	500	16	500	6.5	9.5	0.25	0.17	500	MHQ0603P3N5ST000	
3.6	$\pm 0.1$ nH	500	16	500	6.5	9.1	0.25	0.16	500	MHQ0603P3N6BT000	
3.6	$\pm 0.2$ nH	500	16	500	6.5	9.1	0.25	0.16	500	MHQ0603P3N6CT000	
3.6	$\pm 0.3$ nH	500	16	500	6.5	9.1	0.25	0.16	500	MHQ0603P3N6ST000	

· Short bar residual inductance =0.48nH

#### Measurement equipment

Measurement item	Product No.	Manufacturer
L, Q	4991A+16197A	Keysight Technologies
Self-resonant frequency	8720C	Keysight Technologies
DC resistance	Type-7561	Yokogawa

\* Equivalent measurement equipment may be used.

# MHQ0603P type

## ELECTRICAL CHARACTERISTICS

### CHARACTERISTICS SPECIFICATION TABLE

L (nH)	Tolerance	L measuring frequency (MHz)	Q min.	Q measuring frequency (MHz)	Self-resonant frequency		DC resistance		Rated current (mA)max.	Part No.
					(GHz)min.	(GHz)typ.	( $\Omega$ )max.	( $\Omega$ )typ.		
3.7	$\pm 0.1$ nH	500	16	500	6.5	9.1	0.25	0.17	450	MHQ0603P3N7BT000
3.7	$\pm 0.2$ nH	500	16	500	6.5	9.1	0.25	0.17	450	MHQ0603P3N7CT000
3.7	$\pm 0.3$ nH	500	16	500	6.5	9.1	0.25	0.17	450	MHQ0603P3N7ST000
3.8	$\pm 0.1$ nH	500	16	500	6.5	9.1	0.30	0.19	450	MHQ0603P3N8BT000
3.8	$\pm 0.2$ nH	500	16	500	6.5	9.1	0.30	0.19	450	MHQ0603P3N8CT000
3.8	$\pm 0.3$ nH	500	16	500	6.5	9.1	0.30	0.19	450	MHQ0603P3N8ST000
3.9	$\pm 0.1$ nH	500	16	500	6.5	9.2	0.35	0.23	400	MHQ0603P3N9BT000
3.9	$\pm 0.2$ nH	500	16	500	6.5	9.2	0.35	0.23	400	MHQ0603P3N9CT000
3.9	$\pm 0.3$ nH	500	16	500	6.5	9.2	0.35	0.23	400	MHQ0603P3N9ST000
4.0	$\pm 0.1$ nH	500	16	500	6.0	8.5	0.35	0.26	400	MHQ0603P4N0BT000
4.0	$\pm 0.2$ nH	500	16	500	6.0	8.5	0.35	0.26	400	MHQ0603P4N0CT000
4.0	$\pm 0.3$ nH	500	16	500	6.0	8.5	0.35	0.26	400	MHQ0603P4N0ST000
4.1	$\pm 0.1$ nH	500	16	500	6.0	8.3	0.35	0.22	400	MHQ0603P4N1BT000
4.1	$\pm 0.2$ nH	500	16	500	6.0	8.3	0.35	0.22	400	MHQ0603P4N1CT000
4.1	$\pm 0.3$ nH	500	16	500	6.0	8.3	0.35	0.22	400	MHQ0603P4N1ST000
4.2	$\pm 0.1$ nH	500	16	500	6.0	8.2	0.35	0.23	400	MHQ0603P4N2BT000
4.2	$\pm 0.2$ nH	500	16	500	6.0	8.2	0.35	0.23	400	MHQ0603P4N2CT000
4.2	$\pm 0.3$ nH	500	16	500	6.0	8.2	0.35	0.23	400	MHQ0603P4N2ST000
4.3	$\pm 0.2$ nH	500	16	500	6.0	8.2	0.35	0.23	400	MHQ0603P4N3CT000
4.3	$\pm 0.3$ nH	500	16	500	6.0	8.2	0.35	0.23	400	MHQ0603P4N3ST000
4.3	$\pm 3\%$	500	16	500	6.0	8.2	0.35	0.23	400	MHQ0603P4N3HT000
4.7	$\pm 0.2$ nH	500	16	500	5.5	7.9	0.40	0.25	350	MHQ0603P4N7CT000
4.7	$\pm 0.3$ nH	500	16	500	5.5	7.9	0.40	0.25	350	MHQ0603P4N7ST000
4.7	$\pm 3\%$	500	16	500	5.5	7.9	0.40	0.25	350	MHQ0603P4N7HT000
5.1	$\pm 0.2$ nH	500	16	500	5.5	7.8	0.40	0.24	350	MHQ0603P5N1CT000
5.1	$\pm 0.3$ nH	500	16	500	5.5	7.8	0.40	0.24	350	MHQ0603P5N1ST000
5.1	$\pm 3\%$	500	16	500	5.5	7.8	0.40	0.24	350	MHQ0603P5N1HT000
5.6	$\pm 0.2$ nH	500	16	500	5.0	7.1	0.40	0.29	350	MHQ0603P5N6CT000
5.6	$\pm 0.3$ nH	500	16	500	5.0	7.1	0.40	0.29	350	MHQ0603P5N6ST000
5.6	$\pm 3\%$	500	16	500	5.0	7.1	0.40	0.29	350	MHQ0603P5N6HT000
6.2	$\pm 0.3$ nH	500	16	500	4.0	6.7	0.70	0.52	300	MHQ0603P6N2ST000
6.2	$\pm 3\%$	500	16	500	4.0	6.7	0.70	0.52	300	MHQ0603P6N2HT000
6.8	$\pm 3\%$	500	16	500	4.0	6.8	0.70	0.53	300	MHQ0603P6N8HT000
6.8	$\pm 5\%$	500	16	500	4.0	6.8	0.70	0.53	300	MHQ0603P6N8JT000
7.5	$\pm 3\%$	500	16	500	3.8	5.7	0.50	0.37	300	MHQ0603P7N5HT000
7.5	$\pm 5\%$	500	16	500	3.8	5.7	0.50	0.37	300	MHQ0603P7N5JT000
8.2	$\pm 3\%$	500	16	500	3.8	5.4	0.90	0.64	250	MHQ0603P8N2HT000
8.2	$\pm 5\%$	500	16	500	3.8	5.4	0.90	0.64	250	MHQ0603P8N2JT000
9.1	$\pm 3\%$	500	16	500	3.8	5.5	0.90	0.62	250	MHQ0603P9N1HT000
9.1	$\pm 5\%$	500	16	500	3.8	5.5	0.90	0.62	250	MHQ0603P9N1JT000
10	$\pm 3\%$	500	16	500	3.5	5.2	1.20	0.86	240	MHQ0603P10NHT000
10	$\pm 5\%$	500	16	500	3.5	5.2	1.20	0.86	240	MHQ0603P10NJT000
11	$\pm 3\%$	500	16	500	3.2	4.6	1.30	0.89	240	MHQ0603P11NHT000
11	$\pm 5\%$	500	16	500	3.2	4.6	1.30	0.89	240	MHQ0603P11NJT000

• Short bar residual inductance =0.48nH

#### Measurement equipment

Measurement item	Product No.	Manufacturer
L、Q	4991A+16197A	Keysight Technologies
Self-resonant frequency	8720C	Keysight Technologies
DC resistance	Type-7561	Yokogawa

\* Equivalent measurement equipment may be used.



# MHQ0603P type

## ELECTRICAL CHARACTERISTICS

### CHARACTERISTICS SPECIFICATION TABLE

L	Tolerance	L measuring frequency (MHz)	Q	Q measuring frequency (MHz)	Self-resonant frequency		DC resistance		Rated current (mA)max.	Part No.
					(GHz)min.	(GHz)typ.	(Ω)max.	(Ω)typ.		
12	±3%	500	16	500	3.2	4.6	1.40	0.77	240	MHQ0603P12NHT000
12	±5%	500	16	500	3.2	4.6	1.40	0.77	240	MHQ0603P12NJT000
13	±3%	500	16	500	3.2	4.5	1.50	1.01	180	MHQ0603P13NHT000
13	±5%	500	16	500	3.2	4.5	1.50	1.01	180	MHQ0603P13NJT000
15	±3%	500	16	500	2.8	4.2	1.50	1.05	180	MHQ0603P15NHT000
15	±5%	500	16	500	2.8	4.2	1.50	1.05	180	MHQ0603P15NJT000
16	±3%	500	16	500	2.5	4.0	1.70	1.21	180	MHQ0603P16NHT000
16	±5%	500	16	500	2.5	4.0	1.70	1.21	180	MHQ0603P16NJT000
18	±3%	500	16	500	2.4	3.7	1.70	1.21	180	MHQ0603P18NHT000
18	±5%	500	16	500	2.4	3.7	1.70	1.21	180	MHQ0603P18NJT000
20	±3%	500	16	500	2.4	3.5	2.00	1.38	160	MHQ0603P20NHT000
20	±5%	500	16	500	2.4	3.5	2.00	1.38	160	MHQ0603P20NJT000
22	±3%	500	16	500	2.2	3.3	2.00	1.40	160	MHQ0603P22NHT000
22	±5%	500	16	500	2.2	3.3	2.00	1.40	160	MHQ0603P22NJT000
24	±3%	500	16	500	2.1	3.1	2.20	1.55	160	MHQ0603P24NHT000
24	±5%	500	16	500	2.1	3.1	2.20	1.55	160	MHQ0603P24NJT000
27	±3%	500	16	500	2.0	2.9	2.20	1.55	160	MHQ0603P27NHT000
27	±5%	500	16	500	2.0	2.9	2.20	1.55	160	MHQ0603P27NJT000
30	±3%	500	16	500	1.9	2.7	2.70	1.98	160	MHQ0603P30NHT000
30	±5%	500	16	500	1.9	2.7	2.70	1.98	160	MHQ0603P30NJT000
33	±3%	300	14	300	1.8	2.5	2.80	2.06	160	MHQ0603P33NHT000
33	±5%	300	14	300	1.8	2.5	2.80	2.06	160	MHQ0603P33NJT000
36	±3%	300	14	300	1.7	2.4	2.80	2.08	160	MHQ0603P36NHT000
36	±5%	300	14	300	1.7	2.4	2.80	2.08	160	MHQ0603P36NJT000
39	±3%	300	14	300	1.6	2.3	3.00	2.24	160	MHQ0603P39NHT000
39	±5%	300	14	300	1.6	2.3	3.00	2.24	160	MHQ0603P39NJT000

· Short bar residual inductance =0.48nH

○ Measurement equipment

Measurement item	Product No.	Manufacturer
L, Q	4991A+16197A	Keysight Technologies
Self-resonant frequency	8720C	Keysight Technologies
DC resistance	Type-7561	Yokogawa

\* Equivalent measurement equipment may be used.

⚠ Please be sure to request delivery specifications that provide further details on the features and specifications of the products for proper and safe use.  
Please note that the contents may change without any prior notice due to reasons such as upgrading.

# MHQ0603P type

## ELECTRICAL CHARACTERISTICS

### L, Q FREQUENCY CHARACTERISTICS TABLE

L(nH)typ.					Q typ.					Part No.
500MHz	800MHz	1.8GHz	2.0GHz	2.4GHz	500MHz	800MHz	1.8GHz	2.0GHz	2.4GHz	
0.6	0.6	0.6	0.6	0.6	29min.	38min.	58min.	60min.	66min.	MHQ0603P0N6BT000
0.6	0.6	0.6	0.6	0.6	29min.	38min.	58min.	60min.	66min.	MHQ0603P0N6CT000
0.7	0.7	0.7	0.7	0.7	29min.	38min.	58min.	60min.	66min.	MHQ0603P0N7BT000
0.7	0.7	0.7	0.7	0.7	29min.	38min.	58min.	60min.	66min.	MHQ0603P0N7CT000
0.8	0.8	0.8	0.8	0.8	29min.	38min.	58min.	60min.	66min.	MHQ0603P0N8BT000
0.8	0.8	0.8	0.8	0.8	29min.	38min.	58min.	60min.	66min.	MHQ0603P0N8CT000
0.9	0.9	0.9	0.9	0.9	29min.	38min.	58min.	60min.	66min.	MHQ0603P0N9BT000
0.9	0.9	0.9	0.9	0.9	29min.	38min.	58min.	60min.	66min.	MHQ0603P0N9CT000
1.0	1.0	1.0	1.0	1.0	29min.	38min.	58min.	60min.	66min.	MHQ0603P1N0BT000
1.0	1.0	1.0	1.0	1.0	29min.	38min.	58min.	60min.	66min.	MHQ0603P1N0CT000
1.0	1.0	1.0	1.0	1.0	29min.	38min.	58min.	60min.	66min.	MHQ0603P1N0ST000
1.1	1.1	1.1	1.1	1.1	29min.	38min.	58min.	60min.	66min.	MHQ0603P1N1BT000
1.1	1.1	1.1	1.1	1.1	29min.	38min.	58min.	60min.	66min.	MHQ0603P1N1CT000
1.1	1.1	1.1	1.1	1.1	29min.	38min.	58min.	60min.	66min.	MHQ0603P1N1ST000
1.2	1.2	1.2	1.2	1.2	29min.	38min.	58min.	60min.	66min.	MHQ0603P1N2BT000
1.2	1.2	1.2	1.2	1.2	29min.	38min.	58min.	60min.	66min.	MHQ0603P1N2CT000
1.2	1.2	1.2	1.2	1.2	29min.	38min.	58min.	60min.	66min.	MHQ0603P1N2ST000
1.3	1.3	1.3	1.3	1.3	29min.	38min.	58min.	60min.	66min.	MHQ0603P1N3BT000
1.3	1.3	1.3	1.3	1.3	29min.	38min.	58min.	60min.	66min.	MHQ0603P1N3CT000
1.3	1.3	1.3	1.3	1.3	29min.	38min.	58min.	60min.	66min.	MHQ0603P1N3ST000
1.4	1.4	1.4	1.4	1.4	29min.	38min.	58min.	60min.	66min.	MHQ0603P1N4BT000
1.4	1.4	1.4	1.4	1.4	29min.	38min.	58min.	60min.	66min.	MHQ0603P1N4CT000
1.4	1.4	1.4	1.4	1.4	29min.	38min.	58min.	60min.	66min.	MHQ0603P1N4ST000
1.5	1.5	1.5	1.5	1.5	29	38	58	60	66	MHQ0603P1N5BT000
1.5	1.5	1.5	1.5	1.5	29	38	58	60	66	MHQ0603P1N5CT000
1.5	1.5	1.5	1.5	1.5	29	38	58	60	66	MHQ0603P1N5ST000
1.6	1.6	1.6	1.6	1.6	28	37	56	60	66	MHQ0603P1N6BT000
1.6	1.6	1.6	1.6	1.6	28	37	56	60	66	MHQ0603P1N6CT000
1.6	1.6	1.6	1.6	1.6	28	37	56	60	66	MHQ0603P1N6ST000
1.7	1.7	1.7	1.7	1.7	30	39	62	65	71	MHQ0603P1N7BT000
1.7	1.7	1.7	1.7	1.7	30	39	62	65	71	MHQ0603P1N7CT000
1.7	1.7	1.7	1.7	1.7	30	39	62	65	71	MHQ0603P1N7ST000
1.8	1.8	1.8	1.8	1.8	29	38	59	62	69	MHQ0603P1N8BT000
1.8	1.8	1.8	1.8	1.8	29	38	59	62	69	MHQ0603P1N8CT000
1.8	1.8	1.8	1.8	1.8	29	38	59	62	69	MHQ0603P1N8ST000
1.9	1.9	1.9	1.9	1.9	28	38	57	60	66	MHQ0603P1N9BT000
1.9	1.9	1.9	1.9	1.9	28	38	57	60	66	MHQ0603P1N9CT000
1.9	1.9	1.9	1.9	1.9	28	38	57	60	66	MHQ0603P1N9ST000
2.0	2.0	2.0	2.0	2.0	27	35	55	58	64	MHQ0603P2N0BT000
2.0	2.0	2.0	2.0	2.0	27	35	55	58	64	MHQ0603P2N0CT000
2.0	2.0	2.0	2.0	2.0	27	35	55	58	64	MHQ0603P2N0ST000
2.1	2.1	2.1	2.1	2.2	29	37	58	62	68	MHQ0603P2N1BT000
2.1	2.1	2.1	2.1	2.2	29	37	58	62	68	MHQ0603P2N1CT000
2.1	2.1	2.1	2.1	2.2	29	37	58	62	68	MHQ0603P2N1ST000

○ Measurement equipment

Product No.	Manufacturer
4291B+16193A	Keysight Technologies

\* Equivalent measurement equipment may be used.

⚠ Please be sure to request delivery specifications that provide further details on the features and specifications of the products for proper and safe use.  
Please note that the contents may change without any prior notice due to reasons such as upgrading.

# MHQ0603P type

## ELECTRICAL CHARACTERISTICS

### L, Q FREQUENCY CHARACTERISTICS TABLE

L(nH)typ.					Q typ.					Part No.
500MHz	800MHz	1.8GHz	2.0GHz	2.4GHz	500MHz	800MHz	1.8GHz	2.0GHz	2.4GHz	
2.2	2.2	2.2	2.2	2.3	28	37	57	61	68	MHQ0603P2N2BT000
2.2	2.2	2.2	2.2	2.3	28	37	57	61	68	MHQ0603P2N2CT000
2.2	2.2	2.2	2.2	2.3	28	37	57	61	68	MHQ0603P2N2ST000
2.3	2.3	2.3	2.3	2.4	31	40	61	64	71	MHQ0603P2N3BT000
2.3	2.3	2.3	2.3	2.4	31	40	61	64	71	MHQ0603P2N3CT000
2.3	2.3	2.3	2.3	2.4	31	40	61	64	71	MHQ0603P2N3ST000
2.4	2.4	2.4	2.4	2.5	31	41	62	64	71	MHQ0603P2N4BT000
2.4	2.4	2.4	2.4	2.5	31	41	62	64	71	MHQ0603P2N4CT000
2.4	2.4	2.4	2.4	2.5	31	41	62	64	71	MHQ0603P2N4ST000
2.5	2.5	2.5	2.6	2.6	25	32	51	53	59	MHQ0603P2N5BT000
2.5	2.5	2.5	2.6	2.6	25	32	51	53	59	MHQ0603P2N5CT000
2.5	2.5	2.5	2.6	2.6	25	32	51	53	59	MHQ0603P2N5ST000
2.6	2.6	2.6	2.7	2.7	26	34	54	56	62	MHQ0603P2N6BT000
2.6	2.6	2.6	2.7	2.7	26	34	54	56	62	MHQ0603P2N6CT000
2.6	2.6	2.6	2.7	2.7	26	34	54	56	62	MHQ0603P2N6ST000
2.7	2.7	2.7	2.8	2.8	26	34	54	57	63	MHQ0603P2N7BT000
2.7	2.7	2.7	2.8	2.8	26	34	54	57	63	MHQ0603P2N7CT000
2.7	2.7	2.7	2.8	2.8	26	34	54	57	63	MHQ0603P2N7ST000
2.8	2.8	2.8	2.9	2.9	26	35	54	55	62	MHQ0603P2N8BT000
2.8	2.8	2.8	2.9	2.9	26	35	54	55	62	MHQ0603P2N8CT000
2.8	2.8	2.8	2.9	2.9	26	35	54	55	62	MHQ0603P2N8ST000
2.9	2.9	2.9	3.0	3.0	24	31	48	51	56	MHQ0603P2N9BT000
2.9	2.9	2.9	3.0	3.0	24	31	48	51	56	MHQ0603P2N9CT000
2.9	2.9	2.9	3.0	3.0	24	31	48	51	56	MHQ0603P2N9ST000
3.0	3.0	3.0	3.1	3.1	23	30	46	48	52	MHQ0603P3N0BT000
3.0	3.0	3.0	3.1	3.1	23	30	46	48	52	MHQ0603P3N0CT000
3.0	3.0	3.0	3.1	3.1	23	30	46	48	52	MHQ0603P3N0ST000
3.1	3.1	3.2	3.2	3.2	24	32	49	51	57	MHQ0603P3N1BT000
3.1	3.1	3.2	3.2	3.2	24	32	49	51	57	MHQ0603P3N1CT000
3.1	3.1	3.2	3.2	3.2	24	32	49	51	57	MHQ0603P3N1ST000
3.2	3.2	3.3	3.3	3.4	27	35	53	55	61	MHQ0603P3N2BT000
3.2	3.2	3.3	3.3	3.4	27	35	53	55	61	MHQ0603P3N2CT000
3.2	3.2	3.3	3.3	3.4	27	35	53	55	61	MHQ0603P3N2ST000
3.3	3.3	3.4	3.4	3.5	25	32	48	50	54	MHQ0603P3N3BT000
3.3	3.3	3.4	3.4	3.5	25	32	48	50	54	MHQ0603P3N3CT000
3.3	3.3	3.4	3.4	3.5	25	32	48	50	54	MHQ0603P3N3ST000
3.4	3.4	3.5	3.5	3.6	27	35	53	55	61	MHQ0603P3N4BT000
3.4	3.4	3.5	3.5	3.6	27	35	53	55	61	MHQ0603P3N4CT000
3.4	3.4	3.5	3.5	3.6	27	35	53	55	61	MHQ0603P3N4ST000
3.5	3.5	3.6	3.6	3.7	25	33	50	52	57	MHQ0603P3N5BT000
3.5	3.5	3.6	3.6	3.7	25	33	50	52	57	MHQ0603P3N5CT000
3.5	3.5	3.6	3.6	3.7	25	33	50	52	57	MHQ0603P3N5ST000
3.6	3.6	3.7	3.7	3.8	26	33	50	52	57	MHQ0603P3N6BT000
3.6	3.6	3.7	3.7	3.8	26	33	50	52	57	MHQ0603P3N6CT000
3.6	3.6	3.7	3.7	3.8	26	33	50	52	57	MHQ0603P3N6ST000

#### ○ Measurement equipment

Product No.	Manufacturer
4291B+16193A	Keysight Technologies

\* Equivalent measurement equipment may be used.

# MHQ0603P type

## ELECTRICAL CHARACTERISTICS

### L, Q FREQUENCY CHARACTERISTICS TABLE

L(nH)typ.					Q typ.					Part No.
500MHz	800MHz	1.8GHz	2.0GHz	2.4GHz	500MHz	800MHz	1.8GHz	2.0GHz	2.4GHz	
3.7	3.7	3.8	3.8	3.9	26	34	51	52	58	MHQ0603P3N7BT000
3.7	3.7	3.8	3.8	3.9	26	34	51	52	58	MHQ0603P3N7CT000
3.7	3.7	3.8	3.8	3.9	26	34	51	52	58	MHQ0603P3N7ST000
3.8	3.8	3.9	3.9	4.0	24	32	49	51	56	MHQ0603P3N8BT000
3.8	3.8	3.9	3.9	4.0	24	32	49	51	56	MHQ0603P3N8CT000
3.8	3.8	3.9	3.9	4.0	24	32	49	51	56	MHQ0603P3N8ST000
3.9	3.9	4.0	4.1	4.2	23	30	47	49	54	MHQ0603P3N9BT000
3.9	3.9	4.0	4.1	4.2	23	30	47	49	54	MHQ0603P3N9CT000
3.9	3.9	4.0	4.1	4.2	23	30	47	49	54	MHQ0603P3N9ST000
4.0	4.0	4.1	4.2	4.3	26	34	52	53	59	MHQ0603P4N0BT000
4.0	4.0	4.1	4.2	4.3	26	34	52	53	59	MHQ0603P4N0CT000
4.0	4.0	4.1	4.2	4.3	26	34	52	53	59	MHQ0603P4N0ST000
4.1	4.1	4.2	4.3	4.4	23	30	46	48	52	MHQ0603P4N1BT000
4.1	4.1	4.2	4.3	4.4	23	30	46	48	52	MHQ0603P4N1CT000
4.1	4.1	4.2	4.3	4.4	23	30	46	48	52	MHQ0603P4N1ST000
4.2	4.2	4.3	4.4	4.5	24	31	46	48	52	MHQ0603P4N2BT000
4.2	4.2	4.3	4.4	4.5	24	31	46	48	52	MHQ0603P4N2CT000
4.2	4.2	4.3	4.4	4.5	24	31	46	48	52	MHQ0603P4N2ST000
4.3	4.3	4.4	4.5	4.6	25	33	49	51	56	MHQ0603P4N3CT000
4.3	4.3	4.4	4.5	4.6	25	33	49	51	56	MHQ0603P4N3ST000
4.3	4.3	4.4	4.5	4.6	25	33	49	51	56	MHQ0603P4N3HT000
4.7	4.7	4.9	4.9	5.1	24	31	47	49	54	MHQ0603P4N7CT000
4.7	4.7	4.9	4.9	5.1	24	31	47	49	54	MHQ0603P4N7ST000
4.7	4.7	4.9	4.9	5.1	24	31	47	49	54	MHQ0603P4N7HT000
5.1	5.1	5.3	5.4	5.5	25	32	49	51	56	MHQ0603P5N1CT000
5.1	5.1	5.3	5.4	5.5	25	32	49	51	56	MHQ0603P5N1ST000
5.1	5.1	5.3	5.4	5.5	25	32	49	51	56	MHQ0603P5N1HT000
5.6	5.6	5.9	6.0	6.2	24	31	46	48	52	MHQ0603P5N6CT000
5.6	5.6	5.9	6.0	6.2	24	31	46	48	52	MHQ0603P5N6ST000
5.6	5.6	5.9	6.0	6.2	24	31	46	48	52	MHQ0603P5N6HT000
6.2	6.2	6.6	6.7	7.0	21	28	42	43	47	MHQ0603P6N2ST000
6.2	6.2	6.6	6.7	7.0	21	28	42	43	47	MHQ0603P6N2HT000
6.8	6.8	7.2	7.4	7.7	22	28	43	44	48	MHQ0603P6N8HT000
6.8	6.8	7.2	7.4	7.7	22	28	43	44	48	MHQ0603P6N8JT000
7.5	7.5	8.1	8.3	8.8	24	30	44	45	48	MHQ0603P7N5HT000
7.5	7.5	8.1	8.3	8.8	24	30	44	45	48	MHQ0603P7N5JT000
8.2	8.2	8.9	9.2	9.7	21	27	39	40	42	MHQ0603P8N2HT000
8.2	8.2	8.9	9.2	9.7	21	27	39	40	42	MHQ0603P8N2JT000
9.1	9.2	9.9	10.2	10.9	23	29	42	44	46	MHQ0603P9N1HT000
9.1	9.2	9.9	10.2	10.9	23	29	42	44	46	MHQ0603P9N1JT000
10.0	10.0	11.0	11.0	12.0	22	28	41	42	43	MHQ0603P10NHT000
10.0	10.0	11.0	11.0	12.0	22	28	41	42	43	MHQ0603P10NJT000
11.0	11.0	12.0	13.0	14.0	21	27	37	38	39	MHQ0603P11NHT000
11.0	11.0	12.0	13.0	14.0	21	27	37	38	39	MHQ0603P11NJT000

#### ○ Measurement equipment

Product No.	Manufacturer
4291B+16193A	Keysight Technologies

\* Equivalent measurement equipment may be used.

# MHQ0603P type

## ELECTRICAL CHARACTERISTICS

### L, Q FREQUENCY CHARACTERISTICS TABLE

L(nH)typ.					Q typ.					Part No.
500MHz	800MHz	1.8GHz	2.0GHz	2.4GHz	500MHz	800MHz	1.8GHz	2.0GHz	2.4GHz	
12.0	12.0	14.0	14.0	16.0	23	29	41	41	41	MHQ0603P12NHT000
12.0	12.0	14.0	14.0	16.0	23	29	41	41	41	MHQ0603P12NJT000
13.0	13.0	15.0	16.0	18.0	21	27	36	36	36	MHQ0603P13NHT000
13.0	13.0	15.0	16.0	18.0	21	27	36	36	36	MHQ0603P13NJT000
15.0	15.0	18.0	19.0	21.0	23	29	37	37	36	MHQ0603P15NHT000
15.0	15.0	18.0	19.0	21.0	23	29	37	37	36	MHQ0603P15NJT000
16.0	16.0	19.0	20.0	23.0	22	28	37	37	35	MHQ0603P16NHT000
16.0	16.0	19.0	20.0	23.0	22	28	37	37	35	MHQ0603P16NJT000
18.0	18.0	22.0	24.0	28.0	23	28	36	35	33	MHQ0603P18NHT000
18.0	18.0	22.0	24.0	28.0	23	28	36	35	33	MHQ0603P18NJT000
20.0	21.0	26.0	28.0	34.0	22	27	33	32	27	MHQ0603P20NHT000
20.0	21.0	26.0	28.0	34.0	22	27	33	32	27	MHQ0603P20NJT000
22.0	23.0	29.0	32.0	40.0	23	29	34	33	28	MHQ0603P22NHT000
22.0	23.0	29.0	32.0	40.0	23	29	34	33	28	MHQ0603P22NJT000
24.0	25.0	34.0	38.0	—	22	26	29	27	—	MHQ0603P24NHT000
24.0	25.0	34.0	38.0	—	22	26	29	27	—	MHQ0603P24NJT000
27.0	28.0	38.0	44.0	—	23	28	30	28	—	MHQ0603P27NHT000
27.0	28.0	38.0	44.0	—	23	28	30	28	—	MHQ0603P27NJT000
30.0	32.0	47.0	—	—	22	27	—	—	—	MHQ0603P30NHT000
30.0	32.0	47.0	—	—	22	27	—	—	—	MHQ0603P30NJT000
33.0	35.0	55.0	—	—	22	27	—	—	—	MHQ0603P33NHT000
33.0	35.0	55.0	—	—	22	27	—	—	—	MHQ0603P33NJT000
36.0	38.0	67.0	—	—	22	26	—	—	—	MHQ0603P36NHT000
36.0	38.0	67.0	—	—	22	26	—	—	—	MHQ0603P36NJT000
39.0	42.0	79.0	—	—	23	26	—	—	—	MHQ0603P39NHT000
39.0	42.0	79.0	—	—	23	26	—	—	—	MHQ0603P39NJT000

#### ○ Measurement equipment

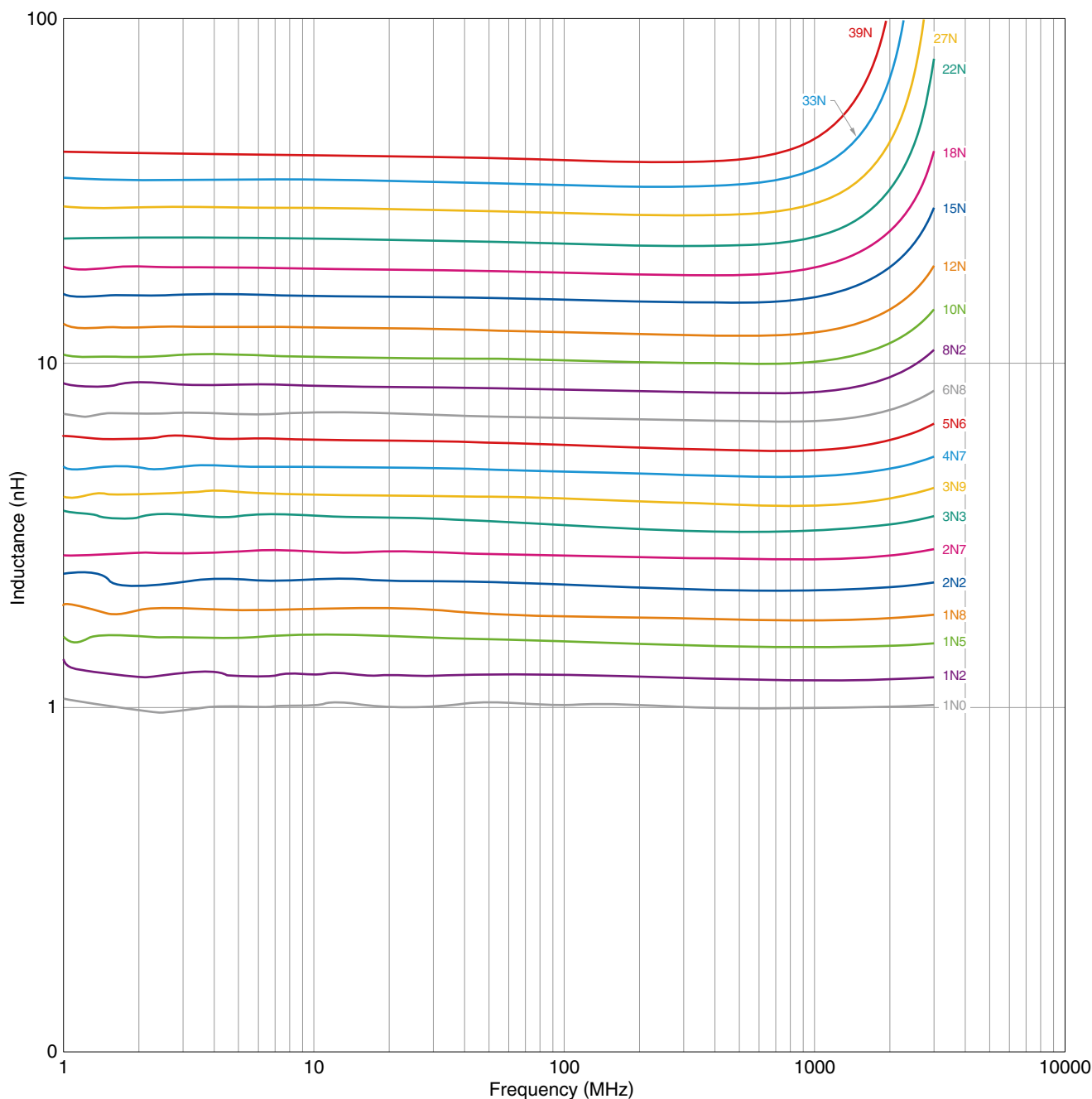
Product No.	Manufacturer
4291B+16193A	Keysight Technologies

\* Equivalent measurement equipment may be used.

# MHQ0603P type

## ELECTRICAL CHARACTERISTICS

### L FREQUENCY CHARACTERISTICS GRAPH (EXAMPLE)



○ Measurement equipment

Product No.	Manufacturer
E4991+16193A	Keysight Technologies

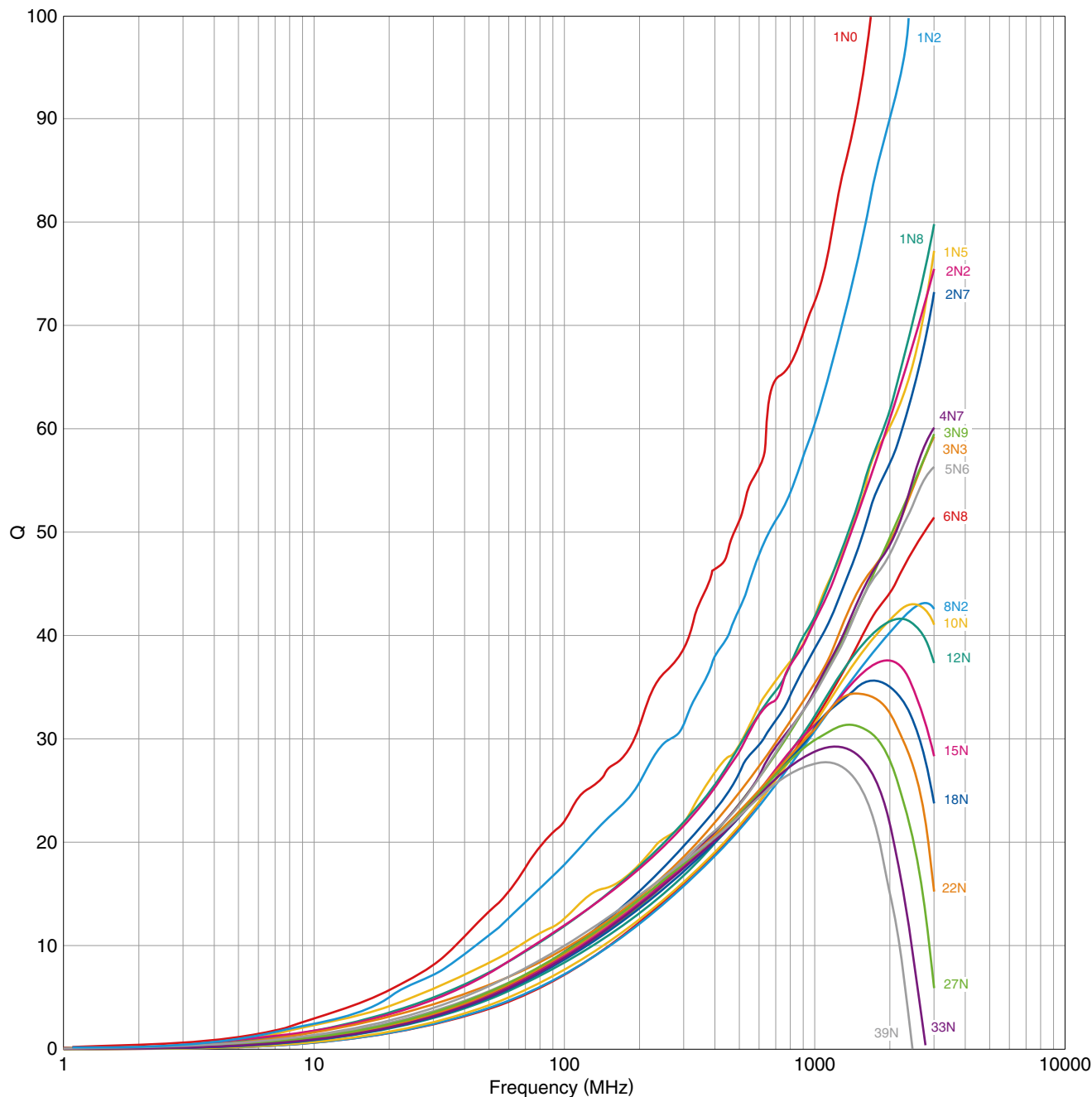
\* Equivalent measurement equipment may be used.

⚠ Please be sure to request delivery specifications that provide further details on the features and specifications of the products for proper and safe use.  
Please note that the contents may change without any prior notice due to reasons such as upgrading.

# MHQ0603P type

## ELECTRICAL CHARACTERISTICS

### Q FREQUENCY CHARACTERISTICS GRAPH (EXAMPLE)



○ Measurement equipment

Product No.	Manufacturer
E4991+16193A	Keysight Technologies

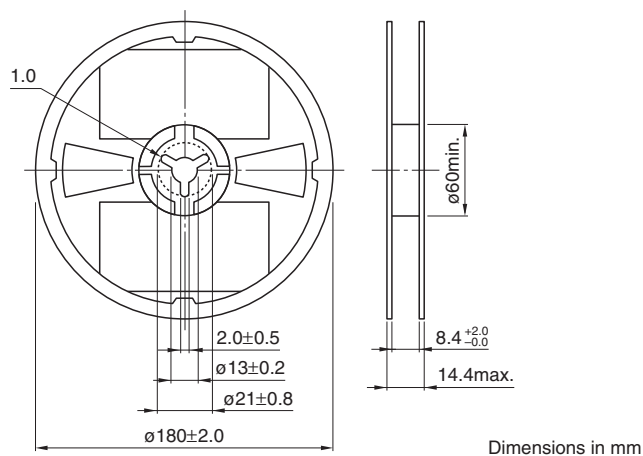
\* Equivalent measurement equipment may be used.

Please be sure to request delivery specifications that provide further details on the features and specifications of the products for proper and safe use.  
Please note that the contents may change without any prior notice due to reasons such as upgrading.

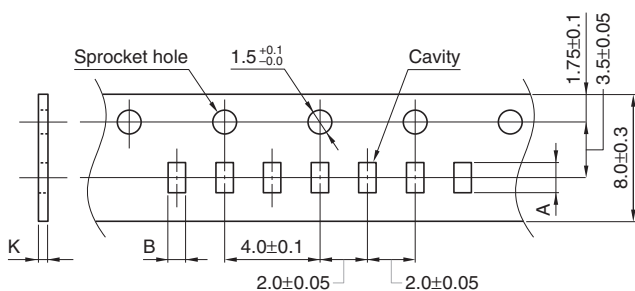
# MHQ0603P type

## PACKAGING STYLE

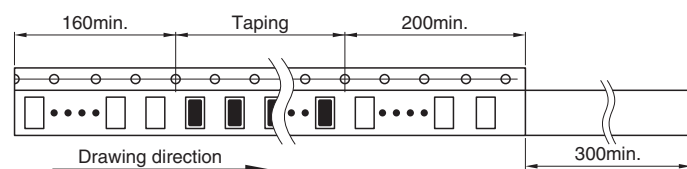
### REEL DIMENSIONS



### TAPE DIMENSIONS



Type	A	B	K
<b>MHQ0603P</b>	0.74±0.05	0.44±0.05	0.60 max.



Please be sure to request delivery specifications that provide further details on the features and specifications of the products for proper and safe use. Please note that the contents may change without any prior notice due to reasons such as upgrading.