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April 2nd,2005.

Component Business Unit
Murata Manufacturing Co.,Ltd.
株式会社 村田制作所　元件事业本部

Murata Global Part Number Explanation
村田公司部品号码说明

MLCC
Chip Monolithic Ceramic Capacitor
独石贴片陶瓷电容

Note : 注 :

The information of this material are as of the date mentioned above. They are subject to change without advance notice. If there are any questions, please contact our sales representatives or product engineers.

对于这些材料信息以上面的日期为准。信息若有变更，恕不另行通知。若有任何疑问，请与我公司销售代表或产品工程师联系。

MURATA MLCC PART NUMBERING

P/N Example : GR M 21 9 R6 1A 105 K A01 L

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MURATA NEW P/N **GR M 21 9 R6 1A 105 K A01 L**

[1]Product ID

[2]Series code

[3]Size code 1(LxW)

[4]Size code 2(T)

[5]Temperature characteristics code

[6]Rated voltage code

[7]Capacitance code

[8]Capacitance tolerance code

[9]Individual specification code

[10]Packaging code

CHIP SIZE CODE (1/2)

P/N Example : GR M 21 9 R6 1A 105 K A01 L

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New Size code						Previous Size code
Size code 1		EIA	EIA-J	Size code 2		
Code	LxW(mm)			Code	T(mm)	
02	0.4±0.03 x 0.2±0.02	01005	0402	2	0.2±0.02	GRM30
03	0.6±0.03 x 0.3±0.03	0201	0603	3	0.3±0.03	GRM33
15	1.0±0.05 x 0.5±0.05	0402	1005	5	0.5±0.05	GRM36
				X	0.25±0.05	GRM36-019
18	1.6±0.1 x 0.8±0.1	0603	1608	8	0.8±0.1	GRM39
				5	0.5+0/0.1	GRM39-024
21	2.0±0.1 x 1.25±0.1	0805	2012	5	0.5+0/0.1	GRM40-024
				6	0.6±0.1	GRM40
				9	0.85±0.1	GRM40
				9	0.85+0/-0.2	GRM40-016
				B	1.25±0.1	GRM40
	2.0±0.15 x 1.25±0.15			B	1.25±0.15	GRM40-034
31	3.2±0.15 x 1.6±0.15	1206	3216	6	0.6±0.1	GRM42-6
				9	0.85±0.1	
				M	1.15±0.1	
	3.2±0.2 x 1.6±0.2			C	1.6±0.2	
	3.2±0.15 x 1.6±0.15			6	0.6+0/-0.15	GRM42-625

CHIP SIZE CODE (2/2)

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P/N Example : GR M 21 9 R6 1A 105 K A01 L

New Size code						Previous Size code
Size code 1		EIA	EIA-J	Size code 2		
Code	LxW(mm)			Code	T(mm)	
32	3.2±0.3 x 2.5±0.2	1210	3225	9	0.85±0.1	GRM42-2
				M	1.15±0.1	
				N	1.35±0.15	
				R	1.8±0.2	
				D	2±0.2	
				E	2.5±0.2	
43	4.5±0.4 x 3.2±0.3	1812	4532	M	1.15±0.1	GRM43-2
				N	1.35±0.15	
				R	1.8±0.2	
				D	2±0.2	
				E	2.5±0.2	
				F	3.2±0.2	
55	5.7±0.4 x 5.0±0.4	2220	5750	M	1.15±0.1	GRM44-1
				N	1.35±0.15	
				R	1.8±0.2	
				D	2±0.2	
				E	2.5±0.2	
				F	3.2±0.2	

TEMP. CHAR. – CLASS 1 (1/3)

P/N Example : GR M 21 9 R6 1A 105 K A01 L

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TC code	Previous TC code	TemperatureRange(C)	Std. Temp.(T)	Temperature Coefficient(ppm/C)
1C	CG	-55 to +125	20	0 +/-30
2C	CH	-55 to +125	20	0 +/-60
3C	CJ	-55 to +125	20	0 +/-120
4C	CK	-55 to +125	20	0 +/-250
5C	C0G	-55 to +125	25	0 +/-30
6C	C0H	-55 to +125	25	0 +/-60
1L	LG	-25 to +85	20	-80 +/-30
2L	LH	-25 to +85	20	-80 +/-60
3L	LJ	-25 to +85	20	-80 +/-120
4L	LK	-25 to +85	20	-80 +/-250
1P	PG	-25 to +85	20	-150 +/-30
2P	PH	-25 to +85	20	-150 +/-60
3P	PJ	-25 to +85	20	-150 +/-120
4P	PK	-25 to +85	20	-150 +/-250
5P	P2J	-55 to +85	25	-150 +/-30
6P	P2H	-55 to +85	25	-150 +/-60

TEMP. CHAR. – CLASS 1 (2/3)

P/N Example : GR M 21 9 R6 1A 105 K A01 L

TC code	Previous TC code	TemperatureRange(C)	Std. Temp.(T)	Temperature Coefficient(ppm/C)
1R	RG	-25 to +85	20	-220 +/-30
2R	RH	-25 to +85	20	-220 +/-60
3R	RJ	-25 to +85	20	-220 +/-120
4R	RK	-25 to +85	20	-220 +/-250
5R	R2J	-55 to +85	25	-220 +/-30
6R	R2H	-55 to +85	25	-220 +/-60
1S	SG	-25 to +85	20	-330 +/-30
2S	SH	-25 to +85	20	-330 +/-60
3S	SJ	-25 to +85	20	-330 +/-120
4S	SK	-25 to +85	20	-330 +/-250
5S	S2J	-55 to +85	25	-330 +/-30
6S	S2H	-55 to +85	25	-330 +/-60
2U	UH	-25 to +85	20	-750 +/-60
3U	UJ	-25 to +85	20	-750 +/-120
4U	UK	-25 to +85	20	-750 +/-250
7U	U2J	-55 to +85	25	-750 +/-120
1X	SL	-20 to +85	20	+350 to -1000

TEMP. CHAR. – CLASS 1 (3/3)

P/N Example : GR M 21 9 R6 1A 105 K A01 L

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[Explanation of Temp Char. Code]

Temperature Characteristics Code Specification

		Cap. Change from	Temp. Coefficient Max 1000ppm/deg. C	Temp. Coefficient 1000ppm~5600ppm/deg. C	Second Digit / Temp. Coefficient (deg. C)					
					C	L	P	R	S	U
					0	-75/-80	-150	-220	-330	-750
First Digit	1	20℃	±30	±120	CG	LG	PG	RG	SG	
	2	20℃	±60	±250	CH	LH	PH	RH	SH	UH
	3	20℃	±120	±500	CJ	LJ	PJ	RJ	SJ	UJ
	4	20℃	±250	±1000	CK	LK	PK	RK	SK	UK
	5	25℃	±30	±120	C0G		P2G	R2G		
	6	25℃	±60	±250	C0H	U1H	P2H	R2H	S2H	UH
	7	25℃	±120	±500	C0J				SJ	U2J
	8	25℃	±250	±1000	C0K					

TEMP. CHAR. – CLASS 2 (1/2)

P/N Example : GR M 21 9 R6 1A 105 K A01 L

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TC code	Previous TC code	Temperature Range(C)	Std. Temp.(C)	Capacitance Change(%)	
				with 0 WV	with 1/2 WV
A9	A	-25 to +85	25	+/-5	+5/-15
V7	X7F	-55 to +125	25	+/-7.5	-
B1	B	-25 to +85	20	+/-10	+10/-30
B3	B	-25 to +85	20	+/-10	-
B5	Y5P	-30 to +85	25	+/-10	-
B6	X5P	-55 to +85	25	+/-10	-
B7	X7P	-55 to +125	25	+/-10	-
R1	R	-55 to +85	20	+/-15	+15/-40
R6	X5R	-55 to +85	25	+/-15	-
R7	X7R	-55 to +125	25	+/-15	-
R9	X8R	-55 to +150	25	+/-15	-
C5	Y5S	-30 to +85	25	+/-22	-
D1	D	-30 to +85	20	+20/-30	+20/-40
D5	Y5T	-30 to +85	25	+20/-30	-
D7	X7T	-55 to +125	25	+22/-33	-
E1	E	-25 to +85	20	+20/-55	+20/-80
E5	Y5U	-30 to +85	25	+22/-56	-
E9	Y4U	-30 to +65	25	+22/-56	-
F1	F	-25 to +85	20	+30/-80	+30/-95
F5	Y5V	-30 to +85	25	+22/-82	-

TEMP. CHAR. – CLASS 2 (2/2)

P/N Example : GR M 21 9 R6 1A 105 K A01 L

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[Explanation of Temp Char. Code]

Temperature Characteristics Code Specification (Class 2)

		Cap. Change from	Second Digit / Temp. Characteristics(Cap. Change:%)							
			A	B	C	D	E	F	R	V
			±5	±10	±20 ±22	+20/-30 +22/-33	+22/-56 +20/-55	+30/-80 +22/-82	±15	±7.5
First Digit	1	20℃		B	C	D	E	F	R	
	2	20℃		B	C		E	F	XNJ	
	3	20℃	A	B	C B/E	D	E	F	R	
	4	25℃		Z5P			Z5U	Z5V		
	5	25℃		Y5P YW	Y5S	Y5T	Y5U	Y5V	Y5R	
	6	25℃		X5P		X5T			X5R	
	7	25℃		X7P W5P	X7S	X7T W5T			X7R W5R	X7F W5F
	8	-		B/BL/BR	X6S	DL	E	F	RD/R/SR	

RATED VOLTAGE

P/N Example : GR M 21 9 R6 1A 105 K A01 L

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1. Voltage Code Explanation

Voltage code	Previous Voltage code	Rated Voltage
0G	4	DC4V
0J	6.3	DC6.3V
1A	10	DC10V
1C	16	DC16V

2. Voltage Code Specification (EIA Standard)

		Second Digit									
		A	B	C	D	E	F	G	H	J	K
First Digit	0	1.0	1.25	1.6	2.0	2.5	3.15	4.0	5.0	6.3	8.0
	1	10	13	16	20	25	32	40	50	63	80
	2	100	125	160	200	250	315	400	500	630	800
	3	1,000	1,250	1,600	2,000	2,500	3,150	4,000	5,000	6,300	8,000
	4	10,000	12,500	16,000	20,000	25,000	31,500	40,000	50,000	63,000	80,000

NOMINAL CAP. VALUE (1/2)

P/N Example : GR M 21 9 R6 1A 105 K A01 L

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On the 2 significant digits

1.Rated capacitance is expressed by 3 digits of Alpha Numeric.

2.First and second letter are expressed by significant number having a pF unit and third letter is defined by the number of 0 following.

3.Decimal point on the 2 significant digits put an alphabet 'R' at the position of decimal point.

Example:	Rated capacitance	New expression	Remarks
	0.5pF	R50	0R5(Old expression)
	0.75pF	R75	
	1.0pF	1R0	010(Old expression)
	1.5pF	1R5	
	10pF	100	$10x10^0$
	15pF	150	$15x10^0$
	150pF	151	$15x10^1$
	1500pF	152	$15x10^2$

NOMINAL CAP. VALUE (2/2)

P/N Example : GR M 21 9 R6 1A 105 K A01 L

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On the 3 significant digits

1.When the number is equal or more than 99.9pF,put the code of table 1 at the position of a decimal point.

2.When the number is equal or more than 101pF, make the third digit into the code of table 1 and consider the third digit as a decimal point position.

3.When the number is equal or more than 1010pF,expressed a special thing with X,Y and Z and its content should be expressed in individual specification of each products.

Example:	Rated capacitance	New Expression	Remarks(Old Expression)
	1.15pF	1E1	1R15
	11.5pF	11E	11R5
	115pF	11Q	1150
	1150pF	11X	1151

Table 1

Third significant digit	Power multiple	code	Power multiple	code
1	0	A	1	L
2	0	B	1	M
3	0	C	1	N
4	0	D	1	P
5	0	E	1	Q
6	0	F	1	S
7	0	G	1	T
8	0	H	1	U
9	0	J	1	V

CAP. TORELANCE

P/N Example : GR M 21 9 R6 1A 105 K A01 L

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Capacitance Tolerance

1.The Capacitance Tolerance code is expressed by one alphabet digit based on JIS C 5101-1(1998).
2.A Special Tolerance, an one sided tolerance and a division tolerance are expressed by using one alphabetic digit with "R", "X" and "Y" respectively. And the contents of those codes are specified in the Individual Specification.
3. Although the tolerance of 10pF has been expressed by pF unit, the expression in % unit is adopted based on IEC Standard from now on.

	A	B	C	D	E	F	G	H	I
TC:10pF>C	±0.15pF	±0.1pF	±0.25pF	±0.5pF	±0.005pF	±1%	±2%	±3%	
TC:10pF<=C		±0.1pF	±0.25pF	±0.5pF	±0.005pF	±1%	±2%	±3%	
HiK				±0.5pF		±1%	±2%	±3%	

	J	K	L	M	N	O	P	Q	R
TC:10pF>C									Special Tol.
TC:10pF<=C	±5%	±10%	±0.01pF	±20%	±30%		±0.02pF	+30/-10%	Special Tol.
HiK	±5%	±10%		±20%	±30%		+100/-0%	+30/-10%	Special Tol.

	S	T	U	V	W	X	Y	Z	
TC:10pF>C					±0.05pF	One sided Tol.	Division Tol.	+80/-20%	
TC:10pF<=C	+50/-20%	+50/-10%		+20/-10%	±0.05pF	One sided Tol.	Division Tol.	+80/-20%	
HiK	+50/-20%	+50/-10%		+20/-10%		One sided Tol.	Division Tol.	+80/-20%	

Note: Tc means Temperature Conpensating type, and HiK means High Dielectric Constant type.

SPECIFICATION CODE

P/N Example : GR M 21 9 R6 1A 105 K A01 L

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GRM188R71H103K **A** **01** D
① ②

① : First digit of Individual Specification	Ceramic Material	Inner Electrode	Under coat metal of Outer Electrode	Characteristics
A	-	Base Metal(Ni)	Base Metal	-
C	-	Base Metal(Ni)	Precious Metal	-
D	-	Precious Metal	Precious Metal	-
E	-	Base Metal(Ni)	Base Metal	High Capacitance
Z	New Material	Precious Metal	Precious Metal	-

② : 01～ZZ: Murata Specification Identify Code

PACKING SPECICIFICATION

P/N Example : GR M 21 9 R6 1A 105 K A01 L

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Packaging Classification code	Packaging Classification	Content	
D	Taping Reel	7 inches Reel	Paper Tape,Std.
E		7 inches Reel	2mm Pitch Paper Tape Std. or Paper Tape,Not Std.Spec.
F		13 inches Reel	2mm Pitch Paper Tape Std. or Paper Tape,Not Std.Spec.
G		Not Std. Reel	Paper Tape
H		Not Std. Reel	Plastic Tape
J		13 inches Reel	Paper Tape
K		13 inches Reel	Plastic Tape
L		7 inches Reel	Plastic Tape
N		Not Std. Reel	Not Std. Spec.
P		Special Taping Reel	
B	Bulk or Bag	Std.	
Q		Not Std.	
C	Bulk Case	Std.	
S		Not Std.	