

## ● Part Numbering

### Chip Monolithic Ceramic Capacitors

(Part Number)

|    |   |    |   |    |    |     |   |     |   |
|----|---|----|---|----|----|-----|---|-----|---|
| GR | M | 18 | 8 | B1 | 1H | 102 | K | A01 | K |
| ①  | ② | ③  | ④ | ⑤  | ⑥  | ⑦   | ⑧ | ⑨   | ⑩ |

#### ① Product ID

#### ② Series

| Product ID | Code | Series                                          |
|------------|------|-------------------------------------------------|
| GR         | M    | Tin Plated Layer                                |
|            | 4    | Only for Information Devices / Tip & Ring       |
|            | 7    | Only for Camera Flash Circuit                   |
| ER         | B    | High Frequency Type                             |
| GQ         | M    | High Frequency for Flow/Reflow Soldering        |
| GM         | A    | Monolithic Microchip                            |
| GN         | M    | Capacitor Array                                 |
| LL         | L    | Low ESL Wide Width Type                         |
|            | C    | Automotive Low ESL Wide Width Type              |
|            | A    | Eight-termination Low ESL Type                  |
|            | M    | Ten-termination Low ESL Type                    |
| GJ         | M    | High Frequency Low Loss Type<br>Tin Plated Type |
|            | 6    | High Frequency Low Loss Type                    |
| GA         | 2    | for AC250V (r.m.s.)                             |
|            | 3    | Safety Standard Recognized Type                 |
| GC         | P    | Automotive Soldering Electrode                  |
|            | M    | Automotive Tin Plated Layer                     |

#### ③ Dimension (L×W)

| Code | Dimension (L×W)                  | EIA   |
|------|----------------------------------|-------|
| 02   | 0.4×0.2mm                        | 01005 |
| 03   | 0.6×0.3mm                        | 0201  |
| 05   | 0.5×0.5mm                        | 0202  |
| 08   | 0.8×0.8mm                        | 0303  |
| 11   | 1.25×1.0mm                       | 0504  |
| 15   | 1.0×0.5mm                        | 0402  |
| 18   | 1.6×0.8mm                        | 0603  |
| 1D   | 1.4×1.4mm                        |       |
| 1X   | Depends on individual standards. |       |
| 21   | 2.0×1.25mm                       | 0805  |
| 22   | 2.8×2.8mm                        | 1111  |
| 31   | 3.2×1.6mm                        | 1206  |
| 32   | 3.2×2.5mm                        | 1210  |
| 3X   | Depends on individual standards. |       |
| 42   | 4.5×2.0mm                        | 1808  |
| 43   | 4.5×3.2mm                        | 1812  |
| 52   | 5.7×2.8mm                        | 2211  |
| 55   | 5.7×5.0mm                        | 2220  |

#### ④ Dimension (T)

| Code | Dimension (T)                    |
|------|----------------------------------|
| 2    | 0.2mm                            |
| 2    | 2-elements (Array Type)          |
| 3    | 0.3mm                            |
| 4    | 4-elements (Array Type)          |
| 5    | 0.5mm                            |
| 6    | 0.6mm                            |
| 7    | 0.7mm                            |
| 8    | 0.8mm                            |
| 9    | 0.85mm                           |
| A    | 1.0mm                            |
| B    | 1.25mm                           |
| C    | 1.6mm                            |
| D    | 2.0mm                            |
| E    | 2.5mm                            |
| F    | 3.2mm                            |
| M    | 1.15mm                           |
| N    | 1.35mm                           |
| R    | 1.8mm                            |
| S    | 2.8mm                            |
| Q    | 1.5mm                            |
| X    | Depends on individual standards. |

With the array type GNM series, "Dimension(T)" indicates the number of elements.

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⑤ Temperature Characteristics

| Temperature Characteristic Codes |                 |     | Temperature Characteristics |                   |                                               | Operating Temperature Range |
|----------------------------------|-----------------|-----|-----------------------------|-------------------|-----------------------------------------------|-----------------------------|
| Code                             | Public STD Code |     | Reference Temperature       | Temperature Range | Capacitance Change or Temperature Coefficient |                             |
| 1X                               | SL *1           | JIS | 20°C                        | 20 to 85°C        | +350 to -1000ppm/°C                           | -55 to 125°C                |
| 2C                               | CH *1           | JIS | 20°C                        | 20 to 125°C       | 0±60ppm/°C                                    | -55 to 125°C                |
| 2P                               | PH *1           | JIS | 20°C                        | 20 to 85°C        | -150±60ppm/°C                                 | -25 to 85°C                 |
| 2R                               | RH *1           | JIS | 20°C                        | 20 to 85°C        | -220±60ppm/°C                                 | -25 to 85°C                 |
| 2S                               | SH *1           | JIS | 20°C                        | 20 to 85°C        | -330±60ppm/°C                                 | -25 to 85°C                 |
| 2T                               | TH *1           | JIS | 20°C                        | 20 to 85°C        | -470±60ppm/°C                                 | -25 to 85°C                 |
| 3C                               | CJ *1           | JIS | 20°C                        | 20 to 125°C       | 0±120ppm/°C                                   | -55 to 125°C                |
| 3P                               | PJ *1           | JIS | 20°C                        | 20 to 85°C        | -150±120ppm/°C                                | -25 to 85°C                 |
| 3R                               | RJ *1           | JIS | 20°C                        | 20 to 85°C        | -220±120ppm/°C                                | -25 to 85°C                 |
| 3S                               | SJ *1           | JIS | 20°C                        | 20 to 85°C        | -330±120ppm/°C                                | -25 to 85°C                 |
| 3T                               | TJ *1           | JIS | 20°C                        | 20 to 85°C        | -470±120ppm/°C                                | -25 to 85°C                 |
| 3U                               | UJ *1           | JIS | 20°C                        | 20 to 85°C        | -750±120ppm/°C                                | -25 to 85°C                 |
| 4C                               | CK *1           | JIS | 20°C                        | 20 to 125°C       | 0±250ppm/°C                                   | -55 to 125°C                |
| 5C                               | C0G *1          | EIA | 25°C                        | 25 to 125°C       | 0±30ppm/°C                                    | -55 to 125°C                |
| 5G                               | X8G *1          | EIA | 25°C                        | 25 to 150°C       | 0±30ppm/°C                                    | -55 to 150°C                |
| 6C                               | C0H *1          | EIA | 25°C                        | 25 to 125°C       | 0±60ppm/°C                                    | -55 to 125°C                |
| 6C                               | CH *1,*3        | EIA | 25°C                        | 25 to 125°C       | 0±60ppm/°C                                    | -55 to 125°C                |
| 6P                               | P2H *1          | EIA | 25°C                        | 25 to 85°C        | -150±60ppm/°C                                 | -55 to 125°C                |
| 6R                               | R2H *1          | EIA | 25°C                        | 25 to 85°C        | -220±60ppm/°C                                 | -55 to 125°C                |
| 6S                               | S2H *1          | EIA | 25°C                        | 25 to 85°C        | -330±60ppm/°C                                 | -55 to 125°C                |
| 6T                               | T2H *1          | EIA | 25°C                        | 25 to 85°C        | -470±60ppm/°C                                 | -55 to 125°C                |
| 7C                               | CJ *1*3         | EIA | 25°C                        | 25 to 125°C       | 0±120ppm/°C                                   | -55 to 125°C                |
| 7U                               | U2J *1          | EIA | 25°C                        | 25 to 85°C        | -750±120ppm/°C                                | -55 to 125°C                |
| 8C                               | CK *1,*3        | EIA | 25°C                        | 25 to 125°C       | 0±250ppm/°C                                   | -55 to 125°C                |
| B1                               | B *2            | JIS | 20°C                        | -25 to 85°C       | ±10%                                          | -25 to 85°C                 |
| B3                               | B               | JIS | 20°C                        | -25 to 85°C       | ±10%                                          | -25 to 85°C                 |
| C7                               | X7S             | EIA | 25°C                        | -55 to 125°C      | ±22%                                          | -55 to 125°C                |
| E4                               | Z5U             | EIA | 25°C                        | 10 to 85°C        | +22, -56%                                     | 10 to 85°C                  |
| F1                               | F *2            | JIS | 20°C                        | -25 to 85°C       | +30, -80%                                     | -25 to 85°C                 |
| F5                               | Y5V             | EIA | 25°C                        | -30 to 85°C       | +22, -82%                                     | -30 to 85°C                 |
| L8                               | X8L             | EIA | 25°C                        | -55 to 150°C      | +15, -40%                                     | -55 to 150°C                |
| R1                               | R *2            | JIS | 20°C                        | -55 to 125°C      | ±15%                                          | -55 to 125°C                |
| R3                               | R               | JIS | 20°C                        | -55 to 125°C      | ±15%                                          | -55 to 125°C                |
| R6                               | X5R             | EIA | 25°C                        | -55 to 85°C       | ±15%                                          | -55 to 85°C                 |
| R7                               | X7R             | EIA | 25°C                        | -55 to 125°C      | ±15%                                          | -55 to 125°C                |
| R9                               | X8R             | EIA | 25°C                        | -55 to 150°C      | ±15%                                          | -55 to 150°C                |
| C8                               | X6S             | EIA | 25°C                        | -55 to 105°C      | ±22%                                          | -55 to 105°C                |
| 9E                               | ZLM             | *4  | 20°C                        | -25 to 20°C       | -4700+100/-2500ppm/°C                         | -25 to 85°C                 |
|                                  |                 |     |                             | 20 to 85°C        | -4700+500/-1000ppm/°C                         |                             |
| W0                               | -               | -   | 25°C                        | -55 to 125°C      | ±10% *5                                       | -55 to 125°C                |
|                                  |                 |     |                             |                   | +22, -33% *6                                  |                             |

\*1 Please refer to table for Capacitance Change under reference temperature.

\*2 Capacitance change is specified with 50% rated voltage applied.

\*3 ER series only.

\*3,\*4 Murata Temperature Characteristic Code.

\*5 Apply DC350V bias.

\*6 No DC bias.

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●Capacitance Change from each temperature

JIS Code

| Murata Code | Capacitance Change from 20°C (%) |       |       |       |       |       |
|-------------|----------------------------------|-------|-------|-------|-------|-------|
|             | -55°C                            |       | -25°C |       | -10°C |       |
|             | Max.                             | Min.  | Max.  | Min.  | Max.  | Min.  |
| 1X          | —                                | —     | —     | —     | —     | —     |
| 2C          | 0.82                             | -0.45 | 0.49  | -0.27 | 0.33  | -0.18 |
| 2P          | —                                | —     | 1.32  | 0.41  | 0.88  | 0.27  |
| 2R          | —                                | —     | 1.70  | 0.72  | 1.13  | 0.48  |
| 2S          | —                                | —     | 2.30  | 1.22  | 1.54  | 0.81  |
| 2T          | —                                | —     | 3.07  | 1.85  | 2.05  | 1.23  |
| 3C          | 1.37                             | -0.90 | 0.82  | -0.54 | 0.55  | -0.36 |
| 3P          | —                                | —     | 1.65  | 0.14  | 1.10  | 0.09  |
| 3R          | —                                | —     | 2.03  | 0.45  | 1.35  | 0.30  |
| 3S          | —                                | —     | 2.63  | 0.95  | 1.76  | 0.63  |
| 3T          | —                                | —     | 3.40  | 1.58  | 2.27  | 1.05  |
| 3U          | —                                | —     | 4.94  | 2.84  | 3.29  | 1.89  |
| 4C          | 2.56                             | -1.88 | 1.54  | -1.13 | 1.02  | -0.75 |

EIA Code

| Murata Code | Capacitance Change from 25°C (%) |       |       |       |       |       |
|-------------|----------------------------------|-------|-------|-------|-------|-------|
|             | -55°C                            |       | -30°C |       | -10°C |       |
|             | Max.                             | Min.  | Max.  | Min.  | Max.  | Min.  |
| 5C/5G       | 0.58                             | -0.24 | 0.40  | -0.17 | 0.25  | -0.11 |
| 6C          | 0.87                             | -0.48 | 0.59  | -0.33 | 0.38  | -0.21 |
| 6P          | 2.33                             | 0.72  | 1.61  | 0.50  | 1.02  | 0.32  |
| 6R          | 3.02                             | 1.28  | 2.08  | 0.88  | 1.32  | 0.56  |
| 6S          | 4.09                             | 2.16  | 2.81  | 1.49  | 1.79  | 0.95  |
| 6T          | 5.46                             | 3.28  | 3.75  | 2.26  | 2.39  | 1.44  |
| 7U          | 8.78                             | 5.04  | 6.04  | 3.47  | 3.84  | 2.21  |

ER□ Series

| Murata Code | Capacitance Change from 25°C (%) |       |       |       |       |       |
|-------------|----------------------------------|-------|-------|-------|-------|-------|
|             | -55°C                            |       | -30°C |       | -10°C |       |
|             | Max.                             | Min.  | Max.  | Min.  | Max.  | Min.  |
| 5C          | 0.43                             | -0.22 | 0.28  | -0.16 | 0.17  | -0.11 |
| 6C          | 0.73                             | -0.44 | 0.48  | -0.32 | 0.29  | -0.20 |
| 7C          | 1.33                             | -0.93 | 0.88  | -0.64 | 0.54  | -0.42 |
| 8C          | 2.61                             | -0.97 | 1.73  | -1.36 | 1.07  | -0.86 |

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#### ⑥ Rated Voltage

| Code | Rated Voltage                                          |
|------|--------------------------------------------------------|
| 0G   | DC4V                                                   |
| 0J   | DC6.3V                                                 |
| 1A   | DC10V                                                  |
| 1C   | DC16V                                                  |
| 1E   | DC25V                                                  |
| 1H   | DC50V                                                  |
| 2A   | DC100V                                                 |
| 2D   | DC200V                                                 |
| 2E   | DC250V                                                 |
| YD   | DC300V                                                 |
| 2H   | DC500V                                                 |
| 2J   | DC630V                                                 |
| 3A   | DC1kV                                                  |
| 3D   | DC2kV                                                  |
| 3F   | DC3.15kV                                               |
| BB   | DC350V (for Camera Flash Circuit)                      |
| E2   | AC250V                                                 |
| GB   | X2; AC250V (Safety Standard Recognized Type GB)        |
| GC   | X1/Y2; AC250V (Safety Standard Recognized Type GC)     |
| GD   | Y3; AC250V (Safety Standard Recognized Type GD)        |
| GF   | Y2, X1/Y2; AC250V (Safety Standard Recognized Type GF) |

#### ⑧ Capacitance Tolerance

| Code | Capacitance Tolerance            | TC                  | Series                  | Capacitance Step |                |
|------|----------------------------------|---------------------|-------------------------|------------------|----------------|
| B    | ±0.1pF                           | CΔ                  | GJM                     | ≤5pF             | E24 Series,1pF |
| C    | ±0.25pF                          | CΔ-SL               | GRM/ERB/GQM             | ≤5pF             | * 1pF          |
|      |                                  | CΔ                  | GJM                     | <10pF            | E24 Series,1pF |
| D    | ±0.5pF                           | CΔ-SL               | GRM                     | 6.0 to 9.0pF     | * 1pF          |
|      |                                  | CΔ                  | ERB/GQM/GJM             | 5.1 to 9.1pF     | E24 Series     |
| F    | ±1%                              | CΔ                  | GRM03/15/GJM03/15       | 5.0 to 9.9pF     | 0.1pF          |
| G    | ±2%                              | CΔ                  | GJM                     | ≥10pF            | E12 Series     |
|      |                                  | CΔ                  | GQM                     | ≥10pF            | E24 Series     |
|      |                                  | CΔ                  | GRM03/15/GJM03/15       | 2.0 to 9.9pF     | 0.1pF          |
| J    | ±5%                              | CΔ-SL               | GRM/GA3                 | ≥10pF            | E12 Series     |
|      |                                  | CΔ                  | ERB/GQM/GJM             | ≥10pF            | E24 Series     |
|      |                                  | CΔ                  | GRM03/15/GJM03/15       | 1.0 to 4.9pF     | 0.1pF          |
| K    | ±10%                             | B, R, X7R, X5R, ZLM | GRM/GR7/GA3             | E6 Series        |                |
|      |                                  |                     | GR4                     | E12 Series       |                |
|      |                                  | CΔ                  | GRM03/15/GJM03/15       | 0.2 to 1.9pF     | 0.1pF          |
| M    | ±20%                             | Z5U                 | GRM                     | E3 Series        |                |
|      |                                  | B, R, X7R, X7S      | GRM/GMA/LLL/LLC/LLA/LLM | E6 Series        |                |
|      |                                  | X7R                 | GA2                     | E3 Series        |                |
|      |                                  | CΔ                  | GRM03/15/GJM03/15       | 0.1 to 0.9pF     | 0.1pF          |
| Z    | +80%, -20%                       | F, Y5V              | GRM                     | E3 Series        |                |
| R    | Depends on individual standards. |                     |                         |                  |                |

\* E24 series is also available.

#### ⑨ Individual Specification Code

Expressed by three figures.

#### ⑦ Capacitance

Expressed by three figures. The unit is pico-farad (pF). The first and second figures are significant digits, and the third figure expresses the number of zeros which follow the two numbers. If there is a decimal point, it is expressed by the capital letter "R". In this case, all figures are significant digits.

Ex.)

| Code | Capacitance |
|------|-------------|
| R50  | 0.5pF       |
| 1R0  | 1.0pF       |
| 100  | 10pF        |
| 103  | 10000pF     |

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**ⓐ Packaging**

| Code | Packaging                |
|------|--------------------------|
| L    | ø178mm Plastic Taping    |
| D    | ø178mm Paper Taping      |
| K    | ø330mm Plastic Taping    |
| J    | ø330mm Paper Taping      |
| E    | ø178mm Special Packaging |
| F    | ø330mm Special Packaging |
| B    | Bulk                     |
| C    | Bulk Case                |
| T    | Bulk Tray                |