# THE DATASHEET OF

# GRM033R71A822KA01D

## Part Numbering

### Chip Multilayer Ceramic Capacitors for General

(Part Number)

| GR | M | 18 | 8 | B1 | 1H | 102 | K | A01 | D |
|---|---|---|---|---|---|---|---|---|---|
| ❶ | ❷ | ❸ | ❹ | ❺ | ❻ | ❼ | ❽ | ❾ | ❿ |

❶Product ID ❷Series

| Product ID | Code | Series |
|---|---|---|
| GA | 2 | Based on the Electrical Appliance and Material Safety Law of Japan Chip Multilayer Ceramic Capacitors for General Purpose |
| | 3 | Safety Standard Certified Chip Multilayer Ceramic Capacitors for General Purpose |
| GC | H | Chip Multilayer Ceramic Capacitors for Implantable Medical Devices (Non Life Support Circuit) |
| GJ | 4 | Low Distortion Chip Multilayer Ceramic Capacitors for General Purpose |
| | M | High Q Chip Multilayer Ceramic Capacitors for General Purpose |
| GM | A | Wire Bonding Mount Multilayer Microchip Capacitors for General Purpose |
| | D | Wire Bonding/AuSn Soldering Mount Chip Multilayer Ceramic Capacitors for General Purpose |
| GQ | M | High Q and High Power Chip Multilayer Ceramic Capacitors for General Purpose |
| GR | 3 | High Effective Capacitance & High Ripple Current Chip Multilayer Ceramic Capacitors for General Purpose |
| | 4 | Chip Multilayer Ceramic Capacitors for Ethernet LAN and Primary-secondary coupling of DC-DC Converters |
| | | Chip Multilayer Ceramic Capacitors for Splitter Circuit of G-Fast, xDSL |
| | J | Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose |
| | M | Chip Multilayer Ceramic Capacitors for General Purpose |
| | | Chip Multilayer Ceramic Capacitors for LCD Backlight Inverter Circuit only |
| GX | M | Water Repellent Chip Multilayer Ceramic Capacitors for General Purpose |
| KR | 3 | High Effective Capacitance & High Allowable Ripple Current Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose |
| | M | Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose |
| LL | A | 8 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose |
| | L | LW Reversed Low ESL Chip Multilayer Ceramic Capacitors for General Purpose |
| | M | 10 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose |
| | R | LW Reversed Controlled ESR Low ESL Chip Multilayer Ceramic Capacitors for General Purpose |
| ZR | A | Chip Multilayer Ceramic Capacitors on Interposer Board for General Purpose |
| | B | Chip Multilayer Ceramic Capacitors on Interposer Board for General Purpose |

❸Chip Dimensions (LxW) (Except **ZRA**)

| Code | Dimensions (LxW) | EIA |
|---|---|---|
| 01 | 0.25x0.125mm | 008004 |
| 02 | 0.4x0.2mm | 01005 |
| 0D | 0.38x0.38mm | 015015 |
| MD | 0.5x0.25mm | 015008 |
| 03 | 0.6x0.3mm | 0201 |
| 05 | 0.5x0.5mm | 0202 |
| 08 | 0.8x0.8mm | 0303 |
| 1U | 0.6x1.0mm | 02404 |
| 15 | 1.0x0.5mm | 0402 |
| 18 | 1.6x0.8mm | 0603 |
| JN | 1.8x1.0mm | 0704 |
| 21 | 2.0x1.25mm | 0805 |
| 22 | 2.8x2.8mm | 1111 |
| 31 | 3.2x1.6mm | 1206 |
| 32 | 3.2x2.5mm | 1210 |
| 42 | 4.5x2.0mm | 1808 |
| 43 | 4.5x3.2mm | 1812 |
| 52 | 5.7x2.8mm | 2211 |
| 55 | 5.7x5.0mm | 2220 |

❸Dimensions (LxW) (**ZRA** Only)

| Code | Dimensions (LxW) |
|---|---|
| 21 | 2.4x1.65mm |

Continued on the following page.↗

(Part Number)

| GR | M | 18 | 8 | B1 | 1H | 102 | K | A01 | D |
|---|---|---|---|---|---|---|---|---|---|
| ❶ | ❷ | ❸ | ❹ | ❺ | ❻ | ❼ | ❽ | ❾ | ❿ |

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❹Height Dimension (T) (Except **KR**☐)

| Code | Dimension (T) |
|---|---|
| **1** | 0.125mm |
| **2** | 0.2mm |
| **3** | 0.3mm |
| **4** | 0.4mm |
| **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 |
| **M** | 1.15mm |
| **Q** | 1.5mm |
| **S** | 2.8mm |
| **X** | Depends on individual standards. |

❹Height Dimension (T) (**KR**☐ Only)

| Code | Dimension (T) |
|---|---|
| **E** | 1.8mm |
| **F** | 1.9mm |
| **K** | 2.7mm |
| **L** | 2.8mm |
| **Q** | 3.7mm |
| **T** | 4.8mm |
| **W** | 6.4mm |

Continued on the following page.↗

(Part Number)

| GR | M | 18 | 8 | B1 | 1H | 102 | K | A01 | D |
|---|---|---|---|---|---|---|---|---|---|
| ❶ | ❷ | ❸ | ❹ | ❺ | ❻ | ❼ | ❽ | ❾ | ❿ |

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❺Temperature Characteristics

| Temperature Characteristic Codes | | | Temperature Characteristics | | | Operating Temperature Range | Capacitance Change Each Temperature (%) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | −55°C | | *4 | | −10°C | |
| Code | Public STD Code | | Reference Temperature | Temperature Range | Capacitance Change or Temperature Coefficient | | Max. | Min. | Max. | Min. | Max. | Min. |
| 1C | CG | JIS | 20°C | 20 to 125°C | 0±30ppm/°C | −55 to 125°C | 0.54 | −0.23 | 0.33 | −0.14 | 0.22 | −0.09 |
| 1X | SL | JIS | 20°C | 20 to 85°C | +350 to −1000ppm/°C | −55 to 125°C | - | - | - | - | - | - |
| 2C | CH | JIS | 20°C | 20 to 125°C | 0±60ppm/°C | −55 to 125°C | 0.82 | −0.45 | 0.49 | −0.27 | 0.33 | −0.18 |
| 3C | CJ | JIS | 20°C | 20 to 125°C | 0±120ppm/°C | −55 to 125°C | 1.37 | −0.9 | 0.82 | −0.54 | 0.55 | −0.36 |
| 3U | UJ | JIS | 20°C | 20 to 85°C | −750±120ppm/°C | −25 to 85°C | - | - | 4.94 | 2.84 | 3.29 | 1.89 |
| 4C | CK | JIS | 20°C | 20 to 125°C | 0±250ppm/°C | −55 to 125°C | 2.56 | −1.88 | 1.54 | −1.13 | 1.02 | −0.75 |
| 5C | C0G | EIA | 25°C | 25 to 125°C | 0±30ppm/°C | −55 to 125°C | 0.58 | −0.24 | 0.4 | −0.17 | 0.25 | −0.11 |
| 5G | X8G | *2 | 25°C | 25 to 150°C | 0±30ppm/°C | −55 to 150°C | 0.58 | −0.24 | 0.4 | −0.17 | 0.25 | −0.11 |
| 7U | U2J | EIA | 25°C | 25 to 125°C *3 | −750±120ppm/°C | −55 to 125°C | 8.78 | 5.04 | 6.04 | 3.47 | 3.84 | 2.21 |
| B1 | B *1 | 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 | - | - | - | - | - | - |
| C6 | X5S | EIA | 25°C | −55 to 85°C | ±22% | −55 to 85°C | - | - | - | - | - | - |
| C7 | X7S | EIA | 25°C | −55 to 125°C | ±22% | −55 to 125°C | - | - | - | - | - | - |
| C8 | X6S | EIA | 25°C | −55 to 105°C | ±22% | −55 to 105°C | - | - | - | - | - | - |
| D7 | X7T | EIA | 25°C | −55 to 125°C | +22%, −33% | −55 to 125°C | - | - | - | - | - | - |
| D8 | X6T | EIA | 25°C | −55 to 105°C | +22%, −33% | −55 to 105°C | - | - | - | - | - | - |
| E7 | X7U | EIA | 25°C | −55 to 125°C | +22%, −56% | −55 to 125°C | - | - | - | - | - | - |
| R1 | R *1 | 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 | - | - | - | - | - | - |
| R8 | R *1 | JIS | 20°C | −25 to 85°C | ±15% | −25 to 85°C | - | - | - | - | - | - |
| Z7 | X7R | EIA | 25°C | −55 to 125°C | ±15% *5 | −55 to 125°C | - | - | - | - | - | - |

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

*2 Murata Temperature Characteristic Code.

*3 Rated Voltage 100Vdc max: 25 to 85°C

*4 −25°C (Reference Temperature 20°C) / −30°C (Reference Temperature 25°C)

*5 Range of capacitance change rate with 50% rated voltage applied (See detailed specifications sheet).

Continued on the following page.↗

(Part Number)

| GR | M | 18 | 8 | B1 | 1H | 102 | K | A01 | D |
|---|---|---|---|---|---|---|---|---|---|
| ❶ | ❷ | ❸ | ❹ | ❺ | ❻ | ❼ | ❽ | ❾ | ❿ |

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❻Rated Voltage

| Code | Rated Voltage |
|---|---|
| **0E** | DC2.5V |
| **0G** | DC4V |
| **0J** | DC6.3V |
| **1A** | DC10V |
| **1C** | DC16V |
| **1E** | DC25V |
| **1H** | DC50V |
| **1J** | DC63V |
| **2A** | DC100V |
| **2D** | DC200V |
| **2E** | DC250V |
| **2W** | DC450V |
| **2H** | DC500V |
| **2J** | DC630V |
| **3A** | DC1kV |
| **3D** | DC2kV |
| **3F** | DC3.15kV |
| **E2** | AC250V |
| **GB** | X2; AC250V (Safety Standard Certified Type GB) |
| **GD** | Y3; AC250V (Safety Standard Certified Type GD) |
| **GF** | Y2, X1/Y2; AC250V (Safety Standard Certified Type GF) |
| **YA** | DC35V |

❼Capacitance

Expressed by three-digit alphanumerics. The unit is picofarad (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.
If any alphabet, other than "**R**", is included, this indicates the specific part number is a non-standard part.

Ex.)

| Code | Capacitance |
|---|---|
| **R50** | 0.50pF |
| **1R0** | 1.0pF |
| **100** | 10pF |
| **103** | 10000pF |

❽Capacitance Tolerance

| Code | Capacitance Tolerance |
|---|---|
| **B** | ±0.1pF |
| **C** | ±0.25pF |
| **D** | ±0.5pF (Less than 10pF) |
| | ±0.5% (10pF and over) |
| **F** | ±1% |
| **G** | ±2% |
| **J** | ±5% |
| **K** | ±10% |
| **M** | ±20% |
| **R** | Depends on individual standards. |
| **W** | ±0.05pF |

❾Individual Specification Code (Except **LLR**)

Expressed by three figures.

❾ESR (**LLR** Only)

| Code | ESR |
|---|---|
| **E01** | 100mΩ |
| **E03** | 220mΩ |
| **E05** | 470mΩ |
| **E07** | 1000mΩ |

❿Packaging

| Code | Packaging |
|---|---|
| **L** | ø180mm Embossed Taping |
| **D/E/W** | ø180mm Paper Taping |
| **K** | ø330mm Embossed Taping |
| **J/F** | ø330mm Paper Taping |
| **T** | Bulk Tray |

Please contact us if you find any part number not provided in this table.

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