



**THE DATASHEET OF
GRM188R71H104KA93D**



● Part Numbering

Chip Multilayer Ceramic Capacitors for General

(Part Number)

| | | | | | | | | |
|-----|----|---|----|----|-----|---|-----|---|
| GRM | 18 | 8 | B1 | 1H | 102 | K | A01 | D |
| ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | ⑧ | ⑨ |

① Series

| Code | Series |
|------|--|
| GA2 | Based on the Electrical Appliance and Material Safety Law of Japan Chip Multilayer Ceramic Capacitors for Consumer Electronics & Industrial Equipment |
| GCH | Chip Multilayer Ceramic Capacitors for Implanted Medical Equipment or Medical Equipment [GHTF D] (Non Life Support Circuit) |
| GJ4 | Low Distortion Chip Multilayer Ceramic Capacitors for Consumer Electronics & Industrial Equipment |
| GJM | High Q Chip Multilayer Ceramic Capacitors for Consumer Electronics & Industrial Equipment (≤100Vdc) |
| GMA | Wire Bonding Mount Multilayer Microchip Capacitors for Consumer Electronics & Industrial Equipment |
| GMD | Wire Bonding/AuSn Soldering Mount Chip Multilayer Ceramic Capacitors for Consumer Electronics & Industrial Equipment |
| GQM | High Q and High Power Chip Multilayer Ceramic Capacitors for Consumer Electronics & Industrial Equipment (>100Vdc) |
| GR3 | High Effective Capacitance & High Ripple Current Chip Multilayer Ceramic Capacitors for Consumer Electronics & Industrial Equipment |
| GR4 | Chip Multilayer Ceramic Capacitors for Ethernet LAN and Primary-secondary Coupling of DC-DC Converters for Consumer Electronics & Industrial Equipment |
| | Chip Multilayer Ceramic Capacitors for Splitter Circuit of G-Fast, xDSL for Consumer Electronics & Industrial Equipment |
| GRJ | Chip Multilayer Ceramic Capacitors with Soft Termination for Consumer Electronics & Industrial Equipment |
| GRM | Chip Multilayer Ceramic Capacitors for Consumer Electronics & Industrial Equipment |
| | Chip Multilayer Ceramic Capacitors for LCD Backlight Inverter Circuit only |
| KR3 | High Effective Capacitance & High Allowable Ripple Current Metal Terminal Type Multilayer Ceramic Capacitors for Consumer Electronics & Industrial Equipment |
| KRM | Metal Terminal Type Multilayer Ceramic Capacitors for Consumer Electronics & Industrial Equipment |
| LLA | 8 Terminals Low ESL Chip Multilayer Ceramic Capacitors for Consumer Electronics & Industrial Equipment |
| LLL | LW Reversed Low ESL Chip Multilayer Ceramic Capacitors for Consumer Electronics & Industrial Equipment |
| ZRA | Low Acoustic Noise Chip Multilayer Ceramic Capacitors on Interposer Board for Consumer Electronics & Industrial Equipment |
| ZRB | Low Acoustic Noise Chip Multilayer Ceramic Capacitors on Interposer Board for Consumer Electronics & Industrial Equipment |

② Chip Dimensions (LxW)

| 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 |
| | 2.4x1.65mm (ZRA Only) | - |
| 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 |
| 55 | 5.7x5.0mm | 2220 |

③ Dimension (T)

| Except KR□ | | KR□ Only | |
|------------|----------------------------------|----------|---------------|
| Code | Dimension (T) | Code | Dimension (T) |
| 1 | 0.125mm | E | 1.8mm |
| 2 | 0.2mm | F | 1.9mm |
| 3 | 0.3mm | K | 2.7mm |
| 4 | 0.4mm | L | 2.8mm |
| 5 | 0.5mm | R | 3.6mm |
| 6 | 0.6mm | Q | 3.7mm |
| 7 | 0.7mm | T | 4.8mm |
| 8 | 0.8mm | V | 6.2mm |
| 9 | 0.85mm | W | 6.4mm |
| A | 1.0mm | | |
| B | 1.25mm | | |
| C | 1.6mm | | |
| D | 2.0mm | | |
| E | 2.5mm | | |
| M | 1.15mm | | |
| Q | 1.5mm | | |
| S | 0.16mm | | |
| T | 0.18mm | | |
| X | Depends on individual standards. | | |
| Y | 0.135mm | | |

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④ Temperature Characteristics

| Temperature Characteristic Codes | | | Temperature Characteristics | | | Operating Temperature Range | Capacitance Change Each Temperature (%) | | | | | |
|----------------------------------|-----------------|-----------------------|-----------------------------|---|---------------------|-----------------------------|---|-------|-------|-------|------|-------|
| Code | Public STD Code | Reference Temperature | Temperature Range | Capacitance Change or Temperature Coefficient | -55°C | | *4 | | -10°C | | | |
| | | | | | Max. | | Min. | Max. | Min. | Max. | Min. | |
| 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 | - | - | - | - | - | - |
| L8 | X8L | *2 | 25°C | -55 to 150°C | +15%, -40% | -55 to 150°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 | *2 | 20°C | -25 to 85°C | ±15% | -25 to 85°C | - | - | - | - | - | - |
| Z7 | X7R | *2 | 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).

⑤ Rated Voltage

| Code | | Rated Voltage |
|------------------|-------------------------|---------------|
| Standard Product | Voltage Derated Product | |
| 0E | - | 2.5Vdc |
| 0G | - | 4Vdc |
| 0J | - | 6.3Vdc |
| 1A | - | 10Vdc |
| 1C | - | 16Vdc |
| 1E | - | 25Vdc |
| 1H | - | 50Vdc |
| 1J | - | 63Vdc |
| 2A | EL | 100Vdc |
| 2D | - | 200Vdc |

| Code | | Rated Voltage |
|------------------|-------------------------|---------------|
| Standard Product | Voltage Derated Product | |
| 2E | - | 250Vdc |
| 2W | LP | 450Vdc |
| 2H | LU | 500Vdc |
| 2J | LQ/LV | 630Vdc |
| 3A | LF/LW | 1kVdc |
| 3B | LG/LX | 1.25kVdc |
| 3D | - | 2kVdc |
| 3F | - | 3.15kVdc |
| E2 | - | 250Vac |
| YA | - | 35Vdc |

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(Part Number)

| | | | | | | | | |
|-----|----|---|----|----|-----|---|-----|---|
| GRM | 18 | 8 | B1 | 1H | 102 | K | A01 | D |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

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6 Capacitance

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 |

7 Capacitance 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 |

8 Individual Specification Code

Expressed by three figures.

9 Packaging

| 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.

Looking for pricing, stock, or lifecycle information?

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- ✓ Shortage Management
- ✓ Alternative Solution
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