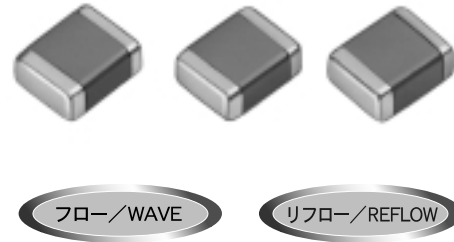


# 大容量積層セラミックコンデンサ HIGH VALUE MULTILAYER CERAMIC CAPACITORS

|                 |    |     |            |
|-----------------|----|-----|------------|
| OPERATING TEMP. | BJ | BJ  | -25~+85°C  |
|                 |    | X7R | -55~+125°C |
|                 |    | X5R | -55~+85°C  |
|                 | F  | F   | -25~+85°C  |
|                 |    | Y5V | -30~+85°C  |



## 特長 FEATURES

- 電極にNi金属を使用し、端子電極部にメッキをしてあることにより、はんだ付け性および耐熱性にすぐれ、マイグレーションもほとんど発生せず、高い信頼性を示します
- 等価直列抵抗(ESR)が小さく、ノイズ吸収性にすぐれています。特にタンタルおよびアルミ電解コンデンサに比較した場合
- 高い許容リップル電流値
- 高い定格電圧でありながら小型形状
- 絶縁抵抗、破壊電圧が高く信頼性にすぐれる等の特徴があります

- The use of Nickel(Ni) as material for both the internal and external electrodes improves the solderability and heat resistance characteristics. This almost completely eliminates migration and raises the level of reliability significantly.
- Low equivalent series resistance(ESR) provides excellent noise absorption characteristics.
- Compared to tantalum or aluminum electrolytic capacitors these ceramic capacitors offer a number of excellent features, including:  
Higher permissible ripple current values  
Smaller case sizes relative to rated voltage  
Improved reliability due to higher insulation resistance and break-down voltage.

## 用途 APPLICATIONS

- デジタル回路全般
- 電源バイパスコンデンサ  
液晶モジュール用  
液晶駆動電圧ライン用  
電源電圧の高いLSI、IC、OPアンプ用
- 平滑コンデンサ  
DC-DCコンバータ(入力、出力側用)  
スイッチング電源(2次側用)

- General digital circuit
- Power supply bypass capacitors  
Liquid crystal modules  
Liquid crystal drive voltage lines  
LSI, IC, converters(both for input and output)
- Smoothing capacitors  
DC-DC converters (both for input and output)  
Switching power supplies (secondary side)

## 形名表記法 ORDERING CODE

**1**

| 定格電圧 (VDC) |     |
|------------|-----|
| A          | 4   |
| J          | 6.3 |
| L          | 10  |
| E          | 16  |
| T          | 25  |
| G          | 35  |
| U          | 50  |

**2**

| シリーズ名 |         |
|-------|---------|
| M     | 積層コンデンサ |

**3**

| 端子電極 |      |
|------|------|
| K    | メッキ品 |

**4**

| 形状寸法 (EIA)L×W(mm) |          |
|-------------------|----------|
| 107(0603)         | 1.6×0.8  |
| 212(0805)         | 2.0×1.25 |
| 316(1206)         | 3.2×1.6  |
| 325(1210)         | 3.2×2.5  |
| 432(1812)         | 4.5×3.2  |
| 550(2220)         | 5.7×5.0  |

**5**

| 温度特性 (%) |                                 |
|----------|---------------------------------|
| △F       | ± <sup>30</sup> / <sub>80</sub> |
| BJ       | ±10                             |

△=スペース

**6**

| 公称静電容量 (pF) |           |
|-------------|-----------|
| 例           |           |
| 473         | 47,000    |
| 105         | 1,000,000 |

**7**

| 容量許容差 |                                   |
|-------|-----------------------------------|
| K     | ±10 %                             |
| M     | ±20 %                             |
| Z     | ± <sup>80</sup> / <sub>20</sub> % |

**8**

| 製品厚み (mm) |      |
|-----------|------|
| A         | 0.8  |
| D         | 0.85 |
| F         | 1.15 |
| G         | 1.25 |
| H         | 1.5  |
| L         | 1.6  |
| N         | 1.9  |
| M         | 2.5  |

**9**

| 個別仕様 |    |
|------|----|
| -    | 標準 |

**10**

| 包装 |          |
|----|----------|
| B  | 単品 (袋づめ) |
| T  | リールテーピング |

**11**

| 当社管理記号 |      |
|--------|------|
| △      | 標準品  |
| △      | スペース |

J M K 3 1 6 B J 1 0 6 M L - T ○

1 2 3 4 5 6 7 8 9 10 11

**1**

| Rated voltage(VDC) |     |
|--------------------|-----|
| A                  | 4   |
| J                  | 6.3 |
| L                  | 10  |
| E                  | 16  |
| T                  | 25  |
| G                  | 35  |
| U                  | 50  |

**2**

| Series name |                               |
|-------------|-------------------------------|
| M           | Multilayer ceramic capacitors |

**3**

| End termination |        |
|-----------------|--------|
| K               | Plated |

**4**

| Dimensions(case size)(mm) |          |
|---------------------------|----------|
| 107(0603)                 | 1.6×0.8  |
| 212(0805)                 | 2.0×1.25 |
| 316(1206)                 | 3.2×1.6  |
| 325(1210)                 | 3.2×2.5  |
| 432(1812)                 | 4.5×3.2  |
| 550(2220)                 | 5.7×5.0  |

**5**

| Temperature characteristics code |                              |
|----------------------------------|------------------------------|
| △F                               | Y5V<br>-30~+85°C<br>+22/-82% |
| BJ                               | X7R<br>-55~+125°C<br>±15%    |
| BJ                               | X5R<br>-55~+85°C<br>±15%     |

△=Blank space

**6**

| Nominal capacitance(pF) |           |
|-------------------------|-----------|
| example                 |           |
| 473                     | 47,000    |
| 105                     | 1,000,000 |

**7**

| Capacitance tolerances(%) |                                 |
|---------------------------|---------------------------------|
| K                         | ±10                             |
| M                         | ±20                             |
| Z                         | ± <sup>80</sup> / <sub>20</sub> |

**8**

| Thickness(mm) |      |
|---------------|------|
| A             | 0.8  |
| D             | 0.85 |
| F             | 1.15 |
| G             | 1.25 |
| H             | 1.5  |
| L             | 1.6  |
| N             | 1.9  |
| M             | 2.5  |

**9**

| Special code |                   |
|--------------|-------------------|
| -            | Standard products |

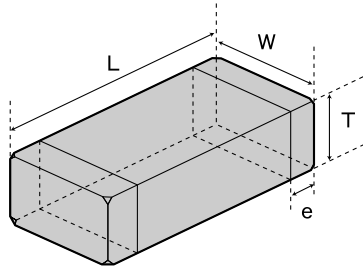
**10**

| Packaging |             |
|-----------|-------------|
| B         | Bulk        |
| T         | Tape & reel |

**11**

| Internal code |                   |
|---------------|-------------------|
| △             | Standard products |
| △             | Blank space       |

# 外形寸法 EXTERNAL DIMENSIONS



| Type(EIA)           | L                         | W                         | T                          |   | e   |
|---------------------|---------------------------|---------------------------|----------------------------|---|---|
| □MK107 (0603)       | 1.6±0.10<br>(0.063±0.004) | 0.8±0.10<br>(0.031±0.004) | 0.8±0.10<br>(0.031±0.004)  | A | 0.35±0.25<br>(0.014±0.010)  |
| □MK212 (0605) *1 *2 | 2.0±0.10<br>(0.079±0.004) | 1.25±0.10<br>(0.049±0.04) | 0.85±0.10<br>(0.033±0.004) | D | 0.5±0.25<br>(0.020±0.010)   |
|                     |                           |                           | 1.25±0.10<br>(0.049±0.04)  | G |   |
|                     |                           |                           | 0.85±0.10<br>(0.033±0.004) | D |   |
| □MK316 (1206)       | 3.2±0.15<br>(0.126±0.006) | 1.6±0.15<br>(0.063±0.006) | 1.15±0.10<br>(0.045±0.04)  | F | 0.5 <sup>+0.35</sup> <sub>-0.25</sub><br>(0.020 <sup>+0.014</sup> <sub>-0.010</sub> ) |
|                     |                           |                           | 1.6±0.20<br>(0.063±0.008)  | L |   |
|                     |                           |                           | 0.85±0.10<br>(0.033±0.004) | D |   |
|                     |                           |                           | 1.15±0.10<br>(0.045±0.04)  | F |   |
| □MK325 (1210)       | 3.2±0.30<br>(0.126±0.012) | 2.5±0.20<br>(0.098±0.008) | 1.5±0.10<br>(0.059±0.004)  | H | 0.6±0.3<br>(0.024±0.012)  |
|                     |                           |                           | 1.9±0.20<br>(0.075±0.008)  | N |   |
|                     |                           |                           | 2.5±0.20<br>(0.098±0.008)  | M |   |
|                     |                           |                           | 1.5±0.10<br>(0.059±0.004)  | H |   |
|                     |                           |                           | 1.9±0.20<br>(0.075±0.008)  | N |   |
| □MK432 (1812)       | 4.5±0.40<br>(0.177±0.016) | 3.2±0.30<br>(0.126±0.012) | 2.5±0.20<br>(0.098±0.008)  | M | 0.9±0.6<br>(0.035±0.024)  |
| □MK550 (2220)       | 5.7±0.40<br>(0.224±0.016) | 5.0±0.3<br>(0.197±0.012)  | 2.5±0.20<br>(0.098±0.008)  | M | 0.3~2.0<br>(0.012~0.079)  |

注：\*1. ±0.2mm交差、\*2. ±0.15mm交差あり  
 Note: \*1. Including dimension tolerance ±0.2mm (±0.008inch).  
 \*2. Including dimension tolerance ±0.15mm (±0.006inch).

Unit : mm (inch)

# 概略バリエーション AVAILABLE CAPACITANCE RANGE

汎用積層セラミックコンデンサ General Multilayer Ceramic Capacitors

| Cap | Type         | 107       |        |        |       | 212    |        |       |        | 316    |       |        |        | 325   |        |        |       | 432    |       |    |    | 550 |    |    |     |    |    |     |     |
|-----|--------------|-----------|--------|--------|-------|--------|--------|-------|--------|--------|-------|--------|--------|-------|--------|--------|-------|--------|-------|----|----|-----|----|----|-----|----|----|-----|-----|
|     |              | Temp.Char | BJ/X7R | BJ/X5R | F/Y5V | BJ/X7R | BJ/X5R | F/Y5V | BJ/X7R | BJ/X5R | F/Y5V | BJ/X7R | BJ/X5R | F/Y5V | BJ/X7R | BJ/X5R | F/Y5V | BJ/X5R | F/Y5V |    |    |     |    |    |     |    |    |     |     |
|     | VDC          | 25        | 16     | 10     | 6.3   | 16     | 10     | 6.3   | 4      | 50     | 16    | 10     | 6.3    | 50    | 35     | 25     | 16    | 10     | 6.3   | 50 | 35 | 25  | 16 | 10 | 6.3 | 25 | 10 | 6.3 | 6.3 |
|     | [μF]         |           |        |        |       |        |        |       |        |        |       |        |        |       |        |        |       |        |       |    |    |     |    |    |     |    |    |     |     |
|     | [pF:3digits] | 223       | A      |        |       |        |        |       |        | D      |       |        |        |       |        |        |       |        |       |    |    |     |    |    |     |    |    |     |     |
|     |              | 0.033     | 333    | A      |       |        |        |       |        | D      |       |        |        |       |        |        |       |        |       |    |    |     |    |    |     |    |    |     |     |
|     |              | 0.047     | 473    | A      |       |        |        |       |        | G      |       |        |        |       |        |        |       |        |       |    |    |     |    |    |     |    |    |     |     |
|     |              | 0.068     | 683    | A      |       |        |        |       |        | D      |       |        |        |       |        |        |       |        |       |    |    |     |    |    |     |    |    |     |     |
|     |              | 0.10      | 104    | A      |       |        |        |       |        | G      |       |        |        |       |        |        |       |        |       |    |    |     |    |    |     |    |    |     |     |
|     |              | 0.15      | 154    |        | A     |        |        |       |        | G      |       |        |        |       |        |        |       |        |       |    |    |     |    |    |     |    |    |     |     |
|     |              | 0.22      | 224    |        | A     |        |        |       |        | G      |       |        |        |       |        |        |       |        |       |    |    |     |    |    |     |    |    |     |     |
|     |              | 0.33      | 334    |        | A     |        |        |       |        | G      |       |        |        |       |        |        |       |        |       |    |    |     |    |    |     |    |    |     |     |
|     |              | 0.47      | 474    |        | A     |        |        |       |        | G      |       |        |        |       |        |        |       |        |       |    |    |     |    |    |     |    |    |     |     |
|     |              | 0.68      | 684    |        | A     |        |        |       |        | G      |       |        |        |       |        |        |       |        |       |    |    |     |    |    |     |    |    |     |     |
|     |              | 1.0       | 105    |        | A     |        |        |       |        | G      |       |        |        |       |        |        |       |        |       |    |    |     |    |    |     |    |    |     |     |
|     |              | 1.5       | 155    |        |       |        |        |       |        | G      |       |        |        |       |        |        |       |        |       |    |    |     |    |    |     |    |    |     |     |
|     |              | 2.2       | 225    |        |       |        |        |       |        | A      |       |        |        |       |        |        |       |        |       |    |    |     |    |    |     |    |    |     |     |
|     |              | 3.3       | 335    |        |       |        |        |       |        | G      |       |        |        |       |        |        |       |        |       |    |    |     |    |    |     |    |    |     |     |
|     |              | 4.7       | 475    |        |       |        |        |       |        | G      |       |        |        |       |        |        |       |        |       |    |    |     |    |    |     |    |    |     |     |
|     |              | 6.8       | 685    |        |       |        |        |       |        | G      |       |        |        |       |        |        |       |        |       |    |    |     |    |    |     |    |    |     |     |
|     |              | 10.0      | 106    |        |       |        |        |       |        | G      |       |        |        |       |        |        |       |        |       |    |    |     |    |    |     |    |    |     |     |
|     |              | 22.0      | 226    |        |       |        |        |       |        | G      |       |        |        |       |        |        |       |        |       |    |    |     |    |    |     |    |    |     |     |
|     |              | 47.0      | 476    |        |       |        |        |       |        | G      |       |        |        |       |        |        |       |        |       |    |    |     |    |    |     |    |    |     |     |
|     |              | 100.0     | 107    |        |       |        |        |       |        | G      |       |        |        |       |        |        |       |        |       |    |    |     |    |    |     |    |    |     |     |

低背積層セラミックコンデンサ Low profile Multilayer Ceramic Capacitors

| Cap | Type         | 212       |        |    |       | 316    |        |       |    | 325    |        |       |    |     |    |    |
|-----|--------------|-----------|--------|----|-------|--------|--------|-------|----|--------|--------|-------|----|-----|----|----|
|     |              | Temp.Char | BJ/X7R |    | F/Y5V | BJ/X7R | BJ/X5R | F/Y5V |    | BJ/X7R | BJ/X5R | F/Y5V |    |     |    |    |
|     | VDC          |           | 16     | 10 | 10    | 6.3    | 10     | 6.3   | 10 | 6.3    | 10     | 6.3   | 10 | 6.3 | 16 | 10 |
|     | [μF]         |           |        |    |       |        |        |       |    |        |        |       |    |     |    |    |
|     | [pF:3digits] |           |        |    |       |        |        |       |    |        |        |       |    |     |    |    |
|     |              | 0.47      | 474    | D  |       |        |        |       |    |        |        |       |    |     |    |    |
|     |              | 0.68      | 684    | D  |       |        |        |       |    |        |        |       |    |     |    |    |
|     |              | 1.0       | 105    |    | D     |        |        |       |    |        |        |       |    |     |    |    |
|     |              | 2.2       | 225    |    |       | D      |        |       |    |        |        |       |    |     |    |    |
|     |              | 3.3       | 335    |    |       |        | D      |       |    |        |        |       |    |     |    |    |
|     |              | 4.7       | 475    |    |       |        |        | D     |    |        |        |       |    |     |    |    |
|     |              | 6.8       | 685    |    |       |        |        |       | D  |        |        |       |    |     |    |    |
|     |              | 10.0      | 106    |    |       |        |        |       |    | D      |        |       |    |     |    |    |
|     |              | 22.0      | 226    |    |       |        |        |       |    |        | D      |       |    |     |    | F  |

| 温度特性コード<br>Temp. char.Code | 温度特性<br>Temperature characteristics |      |                               |                        | 静電容量許容差(%)<br>Capacitance tolerance | tanδ(%)<br>Dissipation factor |                                  |
|----------------------------|-------------------------------------|------|-------------------------------|------------------------|-------------------------------------|-------------------------------|----------------------------------|
|                            | 標準規格<br>Applicable standard         |      | 温度範囲(°C)<br>Temperature range | 基準温度(°C)<br>Ref. Temp. |                                     |                               | 静電容量変化率(%)<br>Capacitance change |
|                            |                                     |      |                               |                        |                                     |                               |                                  |
| BJ                         | JIS                                 | BJ   | -25~85                        | 20                     | ±20(M)<br>±10(K)                    | 2.5%max.**                    |                                  |
|                            | EIA                                 | X7R* | -55~125                       | 25                     |                                     |                               |                                  |
| F                          | JIS                                 | F    | -25~85                        | 20                     | +80<br>-80<br>-20 (Z)               | 7.0%max.***                   |                                  |
|                            | EIA                                 | Y5V  | -30~85                        | 25                     |                                     |                               |                                  |

★Some exceptions apply. Refer to the available capacitance range table for the parts which are only available in X5R.  
 ★★3.5%max : LMKtype ; 107type (C≤0.47μF), 212type (C≤1.0μF), 316/325/432type  
 EMKtype ; 107/212/316/325type  
 TMKtype ; 316type (C>0.47μF), 325type, 432type  
 GMKtype ; 212type, 316type, 325type  
 UMKtype ; 212type (C>0.1μF), 316type (C≥0.47μF), 325type  
 ★★★5.0%max : JMKtype ; 107type, 212type, 316type, 325type, 432type, 550type  
 LMKtype ; 107type (C>0.47μF), 212type (C≥2.2μF)

★★★10%max : AMKtype ; 212type  
 ★★9%max : LMKtype ; 212type, 汎用316type (C=10μF)  
 低背316type (C=4.7μF)  
 UMKtype ; 325type  
 16%max : JMKtype ; 107/212/316/325/432type  
 LMKtype ; 107/325/432, 汎用316type (C>10μF)

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