

# SMD Safety Capacitor GB/GF series



Sep. 5, 2016



# Capacitors Line-Up



## Small, Thin & High-Cap.

## High Reliability

**Ultra Small Size**  
(0201M, 0402M, 0603M)

**High Capacitance**  
(2.5V~100V, ~220μF)

**Automotive**  
(ISO9001, AEC-Q200, TS16949)

**Implant Class D Aerospace**

**Embedded**  
(110μm~, Cu VIA Connection)

**Polymer Electrolysis**  
(2.5V~25V, ~470μF)

**Metal Terminal**  
(25V~1kV, ~100μF)

**Epoxy coating**  
(~220μF, ~2kV)

**Soft Terminal**  
(ISO9001, AEC-Q200, TS16949)

**EDLC**  
(~1000mF, 4.2V)

**Low ESL**  
(~4.3μF, 10μF)

**Anti Acoustic noise**  
(1608M, ~22μF)

**High Voltage**  
(250V~10kV)

**Ultra High Voltage**  
(DC10~50kV, AC10~25kV)

**Safety Recognized**  
(Safety Approved - 13 countries)

**Wire bondable**  
(0808M, ~0.47μF)

**Non Magnetic**  
(MRI application)

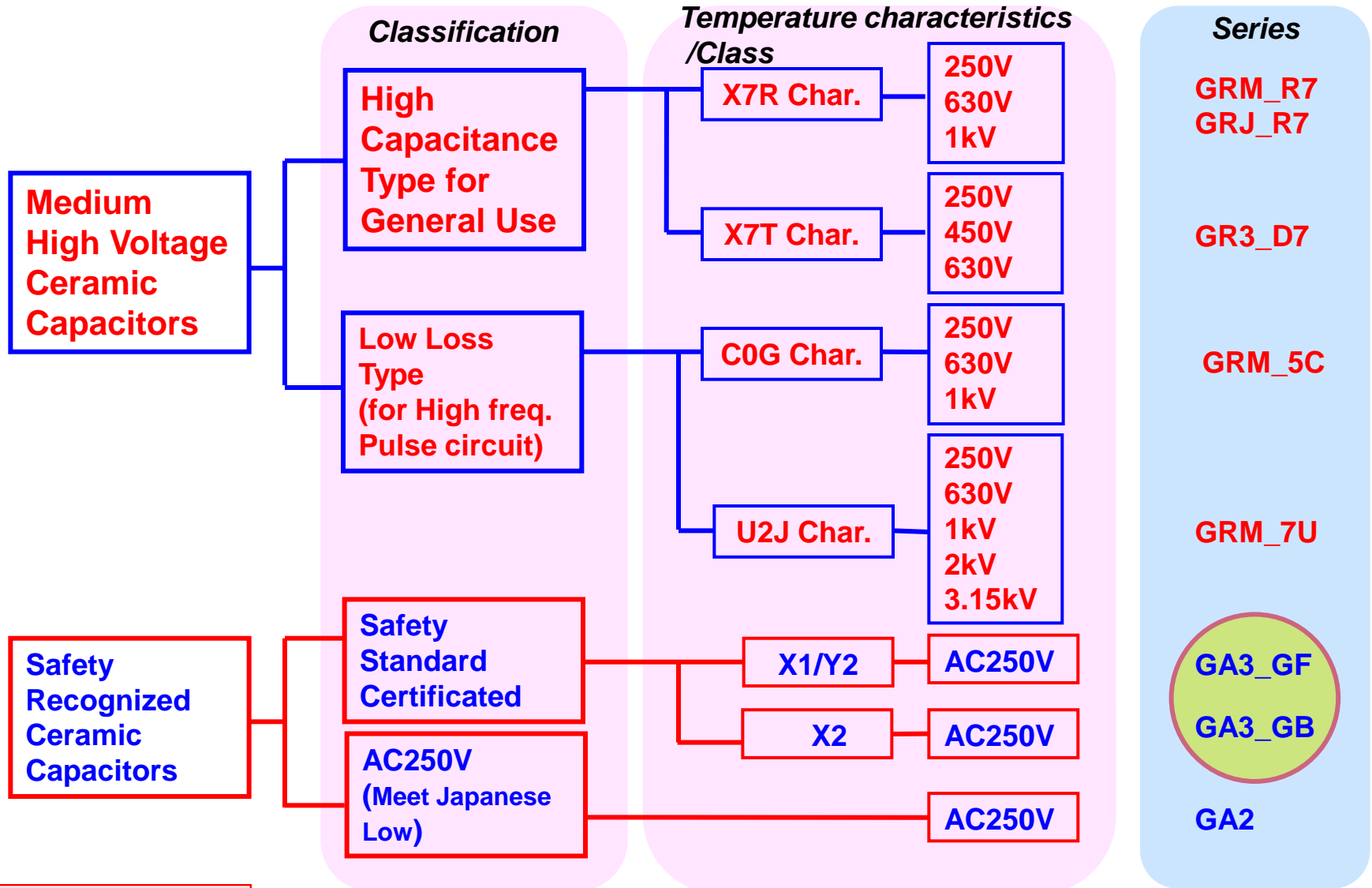
**High Q**  
(25V~500V, 1GHz~10GHz)

**High Power**  
(~1,600V, ~4μF)

## Application Specific(ASC)

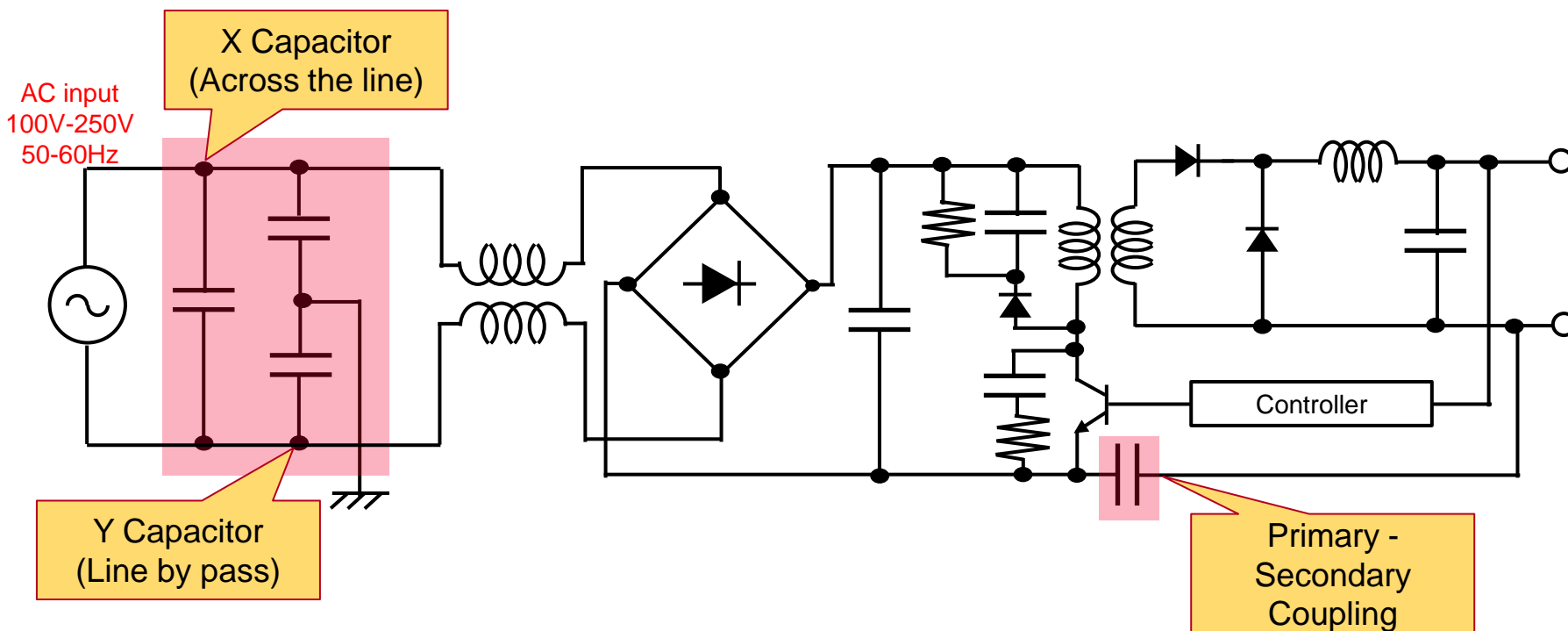
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# Classification And Series (for General-Use) -Chip Monolithic Ceramic Capacitors -



**Confidential**

# AC line filter



| Class | MLCC type  |   | Leaded type  |  |
|-------|--|---|--|--|
|       | GB  | GF  | KX  | KY  |
| X1    | -  | ○   | ○  | ○  |
| X2    | ○  | ○   | ○  | ○  |
| Y1    | -  | -   | ○  | -  |
| Y2    | -  | ○   | ○  | ○  |

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# Monolithic Safety Standard Certified Capacitor

## Type GB : Class X2 / AC250V(r.m.s.)

|            |          |           |          |            |               |             |          |                               |          |
|------------|----------|-----------|----------|------------|---------------|-------------|----------|-------------------------------|----------|
| <b>GA</b>  | <b>3</b> | <b>**</b> | <b>*</b> | <b>**</b>  | <b>GB</b>     | <b>***</b>  | <b>*</b> | <b>***</b>                    | <b>*</b> |
| Product ID | Series   | L X W     | T        | Temp. Char | Rated Voltage | Capacitance | Cap.-tol | Individual Specification Code | Packing  |

**Cap. expansion**

### Feature

- Capacitance Range : 10-56nF
- Base metal electrode type
- Safety Certification IEC60384-14

### Application

- Power Supply X2 Capacitor

### Line up

- 2220 size : 10- 56nF
- Item Name : GA355XR7GB563KW\*\*L
- Thickness : 1.5~2.7mm
- TC Code : X7R



|             |     |     |     |     |     |     |     |     |
|-------------|-----|-----|-----|-----|-----|-----|-----|-----|
|             | 103 | 153 | 223 | 333 | 473 | 563 | 683 | 104 |
| Old Type GB |     |     |     |     |     |     |     |     |
| New Type GB |     |     |     |     |     |     |     |     |

Sample: OK, MP : OK

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# Safety Certified Capacitor

| Safety Organization<br>(安全機関) | Class<br>(クラス) | Standard No.<br>(規格番号) | Certificate No.*<br>(認定番号) |
|-------------------------------|----------------|------------------------|----------------------------|
| UL                            | X2             | UL60384-14             | E37921                     |
| VDE                           | X2             | EN60384-14             | 94729                      |
| SEMKO                         | X2             | IEC60384-14            | 1607238                    |
| ESTI                          | X2             | IEC60384-14            | 16.0212                    |

\* Above Certificate No. may be changed on account of the revision of standards and the renewal of certification.

(\* 認定番号は適用規格の改訂、取得範囲の変更により変わることがあります。)

# Safety Standard Certified GA3 series

## Type GF : X1/Y2class / AC250V(r.m.s.)

|            |          |           |          |            |               |             |          |                               |          |
|------------|----------|-----------|----------|------------|---------------|-------------|----------|-------------------------------|----------|
| <b>GA</b>  | <b>3</b> | <b>**</b> | <b>*</b> | <b>*</b>   | <b>GF</b>     | <b>***</b>  | <b>*</b> | <b>***</b>                    | <b>*</b> |
| Product ID | Series   | L X W     | T        | Temp. Char | Rated Voltage | Capacitance | Cap.-tol | Individual Specification Code | Packing  |

**High Cap. Downsized**

### Feature

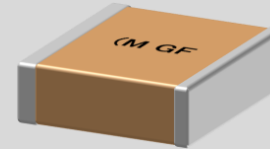
- Compared to lead type capacitors, this capacitor is greatly downsized and low-profiled
- +125 degree C guaranteed
- Only reflow soldering

### Application

- Ideal for use as Y capacitor or X capacitor for various switching power Supplies

### Lineup

- 4.5×2.0mm : 10-1000pF
- 5.7×2.8mm and over : 100-330pF  
( MP ; '11Q4 plan)
- 5.7×2.8mm and over : 470-4700pF
- Thickness T : 1.0~2.0mm
- Temp. char. : SL, X7R



### Standard Certification

| Applications         |                          |  |
|----------------------|--------------------------|--|
| Size                 | Switching power supplies | Communication Network devices<br>Such as a modem |
| 4.5 × 2.0mm          | -                        | ◎  |
| 5.7 × 2.8mm and over | ◎                        | ◎  |

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# Safety Certified Capacitor

**Type GF** Size: 4.5×2.0mm: 1808  
P/N: GA34\*\*\*\*GF\*\*\*\*\*

This product is applicable only for the instruments certified by EN/IEC60950-1

1. For D-A coupling and line-filter for tranceless DAA modem
2. For line filter for Information and telecommunications equipment

EN/IEC60950-1認定機器だけに使用可能です。

1. トランスレスDAAモデムのD-A間カップリング、ラインフィルタ用
2. 各種情報通信機器のラインフィルタ用

| Safety Organization<br>(安全機関) | Standard No.<br>(規格番号)    | Certificate No.*<br>(認定番号) |
|-------------------------------|---------------------------|----------------------------|
| UL                            | UL60950-1                 | E316111                    |
| SEMKO (Y2)<br>note 1)         | EN60384-14<br>IEC60384-14 | 1611685                    |

note 1): Certified except for insulating distance and applicable only for the instruments certified by EN/IEC60950-1

note 1): 絶縁距離を除いた認定取得品のため、EN/IEC60950-1認定機器でのみ使用可能です。

**Type GF** Size: 5.7×2.8mm size(2211) or 5.7×5.0mm size(2220)  
P/N: GA35\*\*\*\*GF\*\*\*\*\*

This product is applicable as X or Y capacitor

各種スイッチング電源のYコンデンサ、およびXコンデンサとして使用できます。

| Safety Organization<br>(安全機関) | Standard No.<br>(規格番号) | Certificate No.*<br>(認定番号) |
|-------------------------------|------------------------|----------------------------|
| UL (X1Y2)                     | UL60384-14             | E37921                     |
| VDE (X1Y2)                    | EN60384-14             | 40024096                   |
| SEMKO (Y2)                    | IEC60384-14            | 1611746                    |

\* Above Certificate No. may be changed on account of the revision of standards and renewal of certification.

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# GA3 series / SL, X7R Char.

TC: SL Char : +350/-1000ppm/°C (25 to 85°C), X7R Char : +/-15% (-55 to 125°C)

## <Type GF>

| Type      | Size | TC     | WV     | Cap. |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----------|------|--------|--------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|           |      |        |        | 100  | 150 | 220 | 330 | 470 | 680 | 101 | 151 | 221 | 331 | 471 | 681 | 102 | 152 | 222 | 472 | 103 | 153 | 223 | 333 | 473 |
| GA3<br>42 | 1808 | SL,X7R | AC250V | ■    | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   |
| GA3<br>52 | 2211 | X7R    | AC250V | ■    | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   |
| GA3<br>55 | 2220 | X7R    | AC250V | ■    | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   |

## <Type GB>

| Type      | Size | TC  | WV     | Cap. |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----------|------|-----|--------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|           |      |     |        | 100  | 150 | 220 | 330 | 470 | 680 | 101 | 151 | 221 | 331 | 471 | 681 | 102 | 152 | 222 | 472 | 103 | 153 | 223 | 333 | 473 |
| GA3<br>55 | 2220 | X7R | AC250V | ■    | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   | ■   |

Mass Production  
Sample : Available



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# THANK YOU !