

# Not for new design. Use LDE Series.

General Purpose, High Stability and AC Line EMI Suppression

The Capacitance Company

## GMW Series Unencapsulated Winding, Size 2220, 63 – 630 VDC



### Overview

Polyethylene naphthalate (PEN) film capacitor for surface mounting.

### Applications

Typical applications include bypassing and signal coupling. GMW is a general purpose series designed for the highest reliability and high temperature service.

### Benefits

- Rated voltage: 63 – 630 VDC
- Rated voltage: 40 – 220 VAC
- Capacitance range: 0.001 – 0.47  $\mu$ F
- EIA size: 2220
- Capacitance tolerance:  $\pm$ 10%,  $\pm$ 20%,  $\pm$ 5% on request
- Climatic category: 55/125/56
- RoHS Compliant and lead-free terminations
- Operating temperature range of -55°C to +125°C



### Legacy Part Number System

| GMW            | 5.7              | 102   | K   | 63                             | J91                 | TR12                       |
|----------------|------------------|---|---|--------------------------------|---------------------|----------------------------|
| Series         | Chip Length (mm) | Capacitance Code (pF)   | Capacitance Tolerance                                     | Rated Voltage (VDC)            | Size Code           | Packaging Code             |
| Metallized PEN | 5.7              | First two digits indicate the two most significant digits of the capacitance value in picofarads. The third digit is the number of following zeros. | K = $\pm$ 10%<br>M = $\pm$ 20%<br>J = $\pm$ 5% on request | 63<br>100<br>250<br>400<br>630 | See Dimension Table | See Ordering Options Table |

### New KEMET Part Number System

| F               | 116            | P         | H                   | 102   | K  | 063  | V                          |
|-----------------|----------------|-----------|---------------------|---|--|--|----------------------------|
| Capacitor Class | Series         | Chip Size | Size Code           | Capacitance Code (pF)   | Capacitance Tolerance  | Rated Voltage (VDC)  | Packaging Code             |
| F = Film        | Metallized PEN | P = 2220  | See Dimension Table | First two digits indicate the two most significant digits of the capacitance value in picofarads. The third digit is the number of following zeros. | J = $\pm$ 5%<br>K = $\pm$ 10%<br>Other tolerances on request | 063 = 63<br>100 = 100<br>250 = 250<br>400 = 400<br>630 = 630 | See Ordering Options Table |

One world. One KEMET

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Film Surface Mount Capacitors – General Purpose, High Stability and AC Line EMI Suppression

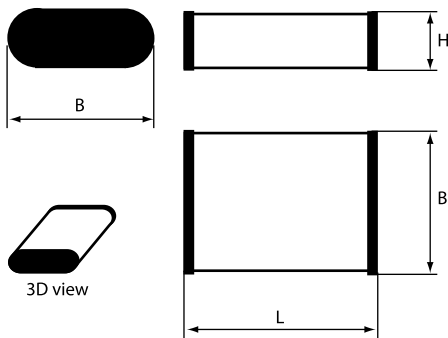
GMW Series Unencapsulated Winding, Size 2220, 63 – 630 VDC



## Ordering Options Table

| Packaging Type                    | KEMET Packaging Code | Legacy Packaging Code |
|-----------------------------------|----------------------|-----------------------|
| <b>Standard Packaging Options</b> |                      |                       |
| Tape & Reel (Standard Reel)       | V                    | TR12                  |
| Bulk (Bag)                        | A                    | BULK                  |

## Dimensions – Millimeters



| KEMET Size Code | Legacy Size Code | Chip Size (EIA) | B       |           | H       |           | L       |           |
|-----------------|------------------|-----------------|---------|-----------|---------|-----------|---------|-----------|
|                 |                  |                 | Nominal | Tolerance | Nominal | Tolerance | Nominal | Tolerance |
| PH              | J91              | 2220            | 5.0     | +/-0.4    | 2.0     | Maximum   | 5.7     | +/-0.4    |
| PP              | J93              | 2220            | 5.0     | +/-0.4    | 3.0     | Maximum   | 5.7     | +/-0.4    |
| PU              | J95              | 2220            | 5.0     | +/-0.4    | 4.0     | Maximum   | 5.7     | +/-0.4    |

## Environmental Compliance

All KEMET surface mount capacitors are RoHS Compliant.

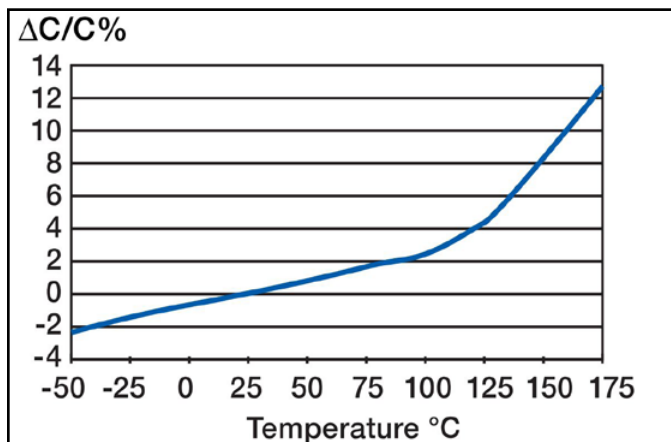


RoHS Compliant

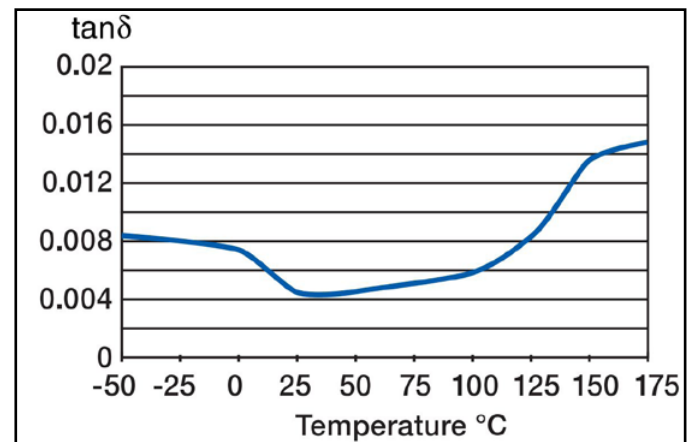
## Performance Characteristics

|                                     |   |                           |               |                                 |                |
|-------------------------------------|---|---------------------------|---------------|---------------------------------|----------------|
| Rated Voltage (VDC)                 | 63  | 100                       | 250           | 400                             | 630            |
| Rated Voltage (VAC)                 | 40  | 63                        | 160           | 200                             | 220            |
| Capacitance Range ( $\mu\text{F}$ ) | 0.001 – 0.47  | 0.001 – 0.22              | 0.001 – 0.068 | 0.001 – 0.015                   | 0.001 – 0.0068 |
| Chip Size (EIA)                     | 2220  |                           |               |                                 |                |
| Capacitance Tolerance               | $\pm 10\%$ , $\pm 20\%$ , $\pm 5\%$ on request  |                           |               |                                 |                |
| Category Temperature Range          | -55°C to +125°C   |                           |               |                                 |                |
| Rated Temperature                   | +100°C  |                           |               |                                 |                |
| Voltage Derating                    | The rated voltage should be decreased with 1.25%/°C from +100°C to +125°C and 1.5%/°C from +125°C to 175°C  |                           |               |                                 |                |
| Climatic Category                   | 55/125/56   |                           |               |                                 |                |
| Test Voltage                        | $1.6 \times V_R$ , 60 seconds   |                           |               |                                 |                |
| Insulation Resistance               | Measured at +20°C According to IEC 60384-19   |                           |               |                                 |                |
|                                     | Minimum Value Between Terminals   |                           |               |                                 |                |
|                                     |   | $C \leq 0.47 \mu\text{F}$ |               |                                 |                |
|                                     | $V_R \leq 100$  | 10,000 M $\Omega$         |               |                                 |                |
|                                     | $V_R > 100$   | 30,000 M $\Omega$         |               |                                 |                |
| Dissipation Factor                  | Maximum Values at +23°C   |                           |               |                                 |                |
|                                     |   | $C \leq 0.1 \mu\text{F}$  |               | $0.1 < C \leq 0.47 \mu\text{F}$ |                |
|                                     | 1 kHz   | 0.6%                      |               | 0.6%                            |                |
|                                     | 10 kHz  | 1.0%                      |               | 1.0%                            |                |
|                                     | 100 kHz   | 2.0%                      |               | 2.5%                            |                |
| Pulse Rise Time                     | The capacitors can withstand an unlimited number of pulses with a $dV/dt$ according to Table 1. For voltages (V) lower than the rated voltage ( $V_R$ ), the specified $dV/dt$ can be multiplied by $V_R/V$ . |                           |               |                                 |                |

## Capacitance vs. Temperature



## Dissipation Factor vs. Temperature



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GMW Series Unencapsulated Winding, Size 2220, 63 – 630 VDC



**Table 1 – Ratings & Part Number Reference**

| VDC | VAC | Cap Value<br>( $\mu$ F) | Size Code<br>(New/Legacy) | Dimensions in mm |     |     | Chip Size | dV/dt<br>(V/ $\mu$ s) | New KEMET<br>Part Number | Legacy Part<br>Number |
|-----|-----|-------------------------|---------------------------|------------------|-----|-----|-----------|-----------------------|--------------------------|-----------------------|
|     |     |                         |                           | B                | H   | L   |           |                       |                          |                       |
| 63  | 40  | 0.0010                  | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 50                    | F116PH102(1)063(2)       | GMW5.7102(1)63J91(2)  |
| 63  | 40  | 0.0012                  | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 50                    | F116PH122(1)063(2)       | GMW5.7122(1)63J91(2)  |
| 63  | 40  | 0.0015                  | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 50                    | F116PH152(1)063(2)       | GMW5.7152(1)63J91(2)  |
| 63  | 40  | 0.0018                  | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 50                    | F116PH182(1)063(2)       | GMW5.7182(1)63J91(2)  |
| 63  | 40  | 0.0022                  | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 50                    | F116PH222(1)063(2)       | GMW5.7222(1)63J91(2)  |
| 63  | 40  | 0.0027                  | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 50                    | F116PH272(1)063(2)       | GMW5.7272(1)63J91(2)  |
| 63  | 40  | 0.0033                  | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 50                    | F116PH332(1)063(2)       | GMW5.7332(1)63J91(2)  |
| 63  | 40  | 0.0039                  | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 50                    | F116PH392(1)063(2)       | GMW5.7392(1)63J91(2)  |
| 63  | 40  | 0.0047                  | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 50                    | F116PH472(1)063(2)       | GMW5.7472(1)63J91(2)  |
| 63  | 40  | 0.0056                  | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 50                    | F116PH562(1)063(2)       | GMW5.7562(1)63J91(2)  |
| 63  | 40  | 0.0068                  | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 50                    | F116PH682(1)063(2)       | GMW5.7682(1)63J91(2)  |
| 63  | 40  | 0.0082                  | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 40                    | F116PH822(1)063(2)       | GMW5.7822(1)63J91(2)  |
| 63  | 40  | 0.010                   | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 40                    | F116PH103(1)063(2)       | GMW5.7103(1)63J91(2)  |
| 63  | 40  | 0.012                   | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 40                    | F116PH123(1)063(2)       | GMW5.7123(1)63J91(2)  |
| 63  | 40  | 0.015                   | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 40                    | F116PH153(1)063(2)       | GMW5.7153(1)63J91(2)  |
| 63  | 40  | 0.018                   | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 40                    | F116PH183(1)063(2)       | GMW5.7183(1)63J91(2)  |
| 63  | 40  | 0.022                   | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 40                    | F116PH223(1)063(2)       | GMW5.7223(1)63J91(2)  |
| 63  | 40  | 0.027                   | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 40                    | F116PH273(1)063(2)       | GMW5.7273(1)63J91(2)  |
| 63  | 40  | 0.033                   | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 40                    | F116PH333(1)063(2)       | GMW5.7333(1)63J91(2)  |
| 63  | 40  | 0.039                   | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 30                    | F116PH393(1)063(2)       | GMW5.7393(1)63J91(2)  |
| 63  | 40  | 0.047                   | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 30                    | F116PH473(1)063(2)       | GMW5.7473(1)63J91(2)  |
| 63  | 40  | 0.056                   | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 30                    | F116PH563(1)063(2)       | GMW5.7563(1)63J91(2)  |
| 63  | 40  | 0.068                   | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 30                    | F116PH683(1)063(2)       | GMW5.7683(1)63J91(2)  |
| 63  | 40  | 0.082                   | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 30                    | F116PH823(1)063(2)       | GMW5.7823(1)63J91(2)  |
| 63  | 40  | 0.10                    | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 30                    | F116PH104(1)063(2)       | GMW5.7104(1)63J91(2)  |
| 63  | 40  | 0.12                    | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 20                    | F116PH124(1)063(2)       | GMW5.7124(1)63J91(2)  |
| 63  | 40  | 0.15                    | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 20                    | F116PH154(1)063(2)       | GMW5.7154(1)63J91(2)  |
| 63  | 40  | 0.18                    | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 20                    | F116PH184(1)063(2)       | GMW5.7184(1)63J91(2)  |
| 63  | 40  | 0.22                    | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 20                    | F116PH224(1)063(2)       | GMW5.7224(1)63J91(2)  |
| 63  | 40  | 0.27                    | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 20                    | F116PH274(1)063(2)       | GMW5.7274(1)63J91(2)  |
| 63  | 40  | 0.33                    | PP/J93                    | 5.0              | 3.0 | 5.7 | 2220      | 20                    | F116PP334(1)063(2)       | GMW5.7334(1)63J93(2)  |
| 63  | 40  | 0.39                    | PP/J93                    | 5.0              | 3.0 | 5.7 | 2220      | 20                    | F116PP394(1)063(2)       | GMW5.7394(1)63J93(2)  |
| 63  | 40  | 0.47                    | PU/J95                    | 5.0              | 4.0 | 5.7 | 2220      | 20                    | F116PU474(1)063(2)       | GMW5.7474(1)63J95(2)  |
| 100 | 63  | 0.0010                  | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 50                    | F116PH102(1)100(2)       | GMW5.7102(1)100J91(2) |
| 100 | 63  | 0.0012                  | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 50                    | F116PH122(1)100(2)       | GMW5.7122(1)100J91(2) |
| 100 | 63  | 0.0015                  | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 50                    | F116PH152(1)100(2)       | GMW5.7152(1)100J91(2) |
| 100 | 63  | 0.0018                  | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 50                    | F116PH182(1)100(2)       | GMW5.7182(1)100J91(2) |
| 100 | 63  | 0.0022                  | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 50                    | F116PH222(1)100(2)       | GMW5.7222(1)100J91(2) |
| 100 | 63  | 0.0027                  | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 50                    | F116PH272(1)100(2)       | GMW5.7272(1)100J91(2) |
| 100 | 63  | 0.0033                  | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 50                    | F116PH332(1)100(2)       | GMW5.7332(1)100J91(2) |
| 100 | 63  | 0.0039                  | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 50                    | F116PH392(1)100(2)       | GMW5.7392(1)100J91(2) |
| 100 | 63  | 0.0047                  | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 50                    | F116PH472(1)100(2)       | GMW5.7472(1)100J91(2) |
| 100 | 63  | 0.0056                  | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 50                    | F116PH562(1)100(2)       | GMW5.7562(1)100J91(2) |
| 100 | 63  | 0.0068                  | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 50                    | F116PH682(1)100(2)       | GMW5.7682(1)100J91(2) |
| 100 | 63  | 0.0082                  | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 40                    | F116PH822(1)100(2)       | GMW5.7822(1)100J91(2) |
| 100 | 63  | 0.010                   | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 40                    | F116PH103(1)100(2)       | GMW5.7103(1)100J91(2) |
| 100 | 63  | 0.012                   | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 40                    | F116PH123(1)100(2)       | GMW5.7123(1)100J91(2) |
| 100 | 63  | 0.015                   | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 40                    | F116PH153(1)100(2)       | GMW5.7153(1)100J91(2) |
| 100 | 63  | 0.018                   | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 40                    | F116PH183(1)100(2)       | GMW5.7183(1)100J91(2) |
| 100 | 63  | 0.022                   | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 40                    | F116PH223(1)100(2)       | GMW5.7223(1)100J91(2) |
| 100 | 63  | 0.027                   | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 40                    | F116PH273(1)100(2)       | GMW5.7273(1)100J91(2) |
| 100 | 63  | 0.033                   | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 40                    | F116PH333(1)100(2)       | GMW5.7333(1)100J91(2) |
| 100 | 63  | 0.039                   | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 30                    | F116PH393(1)100(2)       | GMW5.7393(1)100J91(2) |
| 100 | 63  | 0.047                   | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 30                    | F116PH473(1)100(2)       | GMW5.7473(1)100J91(2) |
| 100 | 63  | 0.056                   | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 30                    | F116PH563(1)100(2)       | GMW5.7563(1)100J91(2) |
| 100 | 63  | 0.068                   | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 30                    | F116PH683(1)100(2)       | GMW5.7683(1)100J91(2) |
| 100 | 63  | 0.082                   | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 30                    | F116PH823(1)100(2)       | GMW5.7823(1)100J91(2) |
| 100 | 63  | 0.10                    | PH/J91                    | 5.0              | 2.0 | 5.7 | 2220      | 30                    | F116PH104(1)100(2)       | GMW5.7104(1)100J91(2) |
| 100 | 63  | 0.12                    | PP/J93                    | 5.0              | 3.0 | 5.7 | 2220      | 30                    | F116PP124(1)100(2)       | GMW5.7124(1)100J93(2) |

(1) K =  $\pm$ 10%, M =  $\pm$ 20%, J =  $\pm$ 5% on request.

(2) Insert ordering code for lead type and packaging. See Ordering Options Table for available options.

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GMW Series Unencapsulated Winding, Size 2220, 63 – 630 VDC



**Table 1 – Ratings & Part Number Reference cont'd**

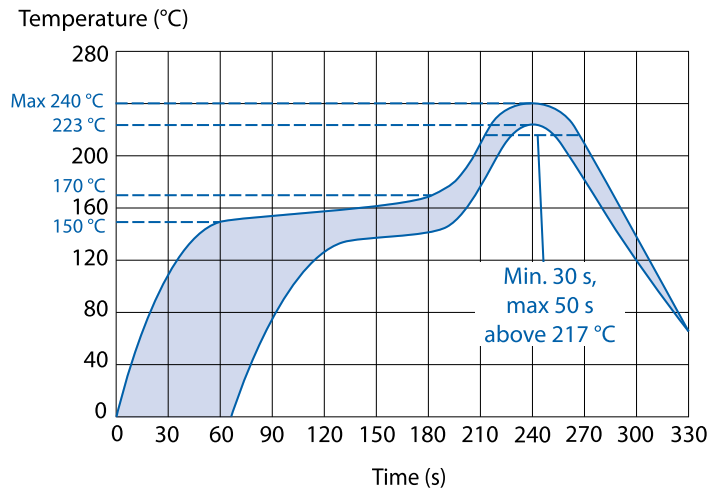
| VDC | VAC | Cap Value<br>( $\mu$ F)         | Size Code<br>(New/Legacy) | Dimensions in mm |        |        | Chip Size | dV/dt<br>(V/ $\mu$ s) | New KEMET<br>Part Number | Legacy Part<br>Number |
|-----|-----|---------------------------------|---------------------------|------------------|--------|--------|-----------|-----------------------|--------------------------|-----------------------|
|     |     |                                 |                           | B                | H      | L      |           |                       |                          |                       |
| 100 | 63  | 0.15                            | PP/J93                    | 5.0              | 3.0    | 5.7    | 2220      | 30                    | F116PP154(1)100(2)       | GMW5.7154(1)100J93(2) |
| 100 | 63  | 0.18                            | PU/J95                    | 5.0              | 4.0    | 5.7    | 2220      | 30                    | F116PU184(1)100(2)       | GMW5.7184(1)100J95(2) |
| 100 | 63  | 0.22                            | PU/J95                    | 5.0              | 4.0    | 5.7    | 2220      | 30                    | F116PU224(1)100(2)       | GMW5.7224(1)100J95(2) |
| 250 | 160 | 0.0010                          | PH/J91                    | 5.0              | 2.0    | 5.7    | 2220      | 50                    | F116PH102(1)250(2)       | GMW5.7102(1)250J91(2) |
| 250 | 160 | 0.0012                          | PH/J91                    | 5.0              | 2.0    | 5.7    | 2220      | 50                    | F116PH122(1)250(2)       | GMW5.7122(1)250J91(2) |
| 250 | 160 | 0.0015                          | PH/J91                    | 5.0              | 2.0    | 5.7    | 2220      | 50                    | F116PH152(1)250(2)       | GMW5.7152(1)250J91(2) |
| 250 | 160 | 0.0018                          | PH/J91                    | 5.0              | 2.0    | 5.7    | 2220      | 50                    | F116PH182(1)250(2)       | GMW5.7182(1)250J91(2) |
| 250 | 160 | 0.0022                          | PH/J91                    | 5.0              | 2.0    | 5.7    | 2220      | 50                    | F116PH222(1)250(2)       | GMW5.7222(1)250J91(2) |
| 250 | 160 | 0.0027                          | PH/J91                    | 5.0              | 2.0    | 5.7    | 2220      | 50                    | F116PH272(1)250(2)       | GMW5.7272(1)250J91(2) |
| 250 | 160 | 0.0033                          | PH/J91                    | 5.0              | 2.0    | 5.7    | 2220      | 50                    | F116PH332(1)250(2)       | GMW5.7332(1)250J91(2) |
| 250 | 160 | 0.0039                          | PH/J91                    | 5.0              | 2.0    | 5.7    | 2220      | 50                    | F116PH392(1)250(2)       | GMW5.7392(1)250J91(2) |
| 250 | 160 | 0.0047                          | PH/J91                    | 5.0              | 2.0    | 5.7    | 2220      | 50                    | F116PH472(1)250(2)       | GMW5.7472(1)250J91(2) |
| 250 | 160 | 0.0056                          | PH/J91                    | 5.0              | 2.0    | 5.7    | 2220      | 50                    | F116PH562(1)250(2)       | GMW5.7562(1)250J91(2) |
| 250 | 160 | 0.0068                          | PH/J91                    | 5.0              | 2.0    | 5.7    | 2220      | 50                    | F116PH682(1)250(2)       | GMW5.7682(1)250J91(2) |
| 250 | 160 | 0.0082                          | PH/J91                    | 5.0              | 2.0    | 5.7    | 2220      | 40                    | F116PH822(1)250(2)       | GMW5.7822(1)250J91(2) |
| 250 | 160 | 0.010                           | PH/J91                    | 5.0              | 2.0    | 5.7    | 2220      | 40                    | F116PH103(1)250(2)       | GMW5.7103(1)250J91(2) |
| 250 | 160 | 0.012                           | PH/J91                    | 5.0              | 2.0    | 5.7    | 2220      | 40                    | F116PH123(1)250(2)       | GMW5.7123(1)250J91(2) |
| 250 | 160 | 0.015                           | PH/J91                    | 5.0              | 2.0    | 5.7    | 2220      | 40                    | F116PH153(1)250(2)       | GMW5.7153(1)250J91(2) |
| 250 | 160 | 0.018                           | PH/J91                    | 5.0              | 2.0    | 5.7    | 2220      | 40                    | F116PH183(1)250(2)       | GMW5.7183(1)250J91(2) |
| 250 | 160 | 0.022                           | PH/J91                    | 5.0              | 2.0    | 5.7    | 2220      | 40                    | F116PH223(1)250(2)       | GMW5.7223(1)250J91(2) |
| 250 | 160 | 0.027                           | PH/J91                    | 5.0              | 2.0    | 5.7    | 2220      | 40                    | F116PH273(1)250(2)       | GMW5.7273(1)250J91(2) |
| 250 | 160 | 0.033                           | PH/J91                    | 5.0              | 2.0    | 5.7    | 2220      | 40                    | F116PH333(1)250(2)       | GMW5.7333(1)250J91(2) |
| 250 | 160 | 0.039                           | PP/J93                    | 5.0              | 3.0    | 5.7    | 2220      | 40                    | F116PP393(1)250(2)       | GMW5.7393(1)250J93(2) |
| 250 | 160 | 0.047                           | PP/J93                    | 5.0              | 3.0    | 5.7    | 2220      | 40                    | F116PP473(1)250(2)       | GMW5.7473(1)250J93(2) |
| 250 | 160 | 0.056                           | PP/J93                    | 5.0              | 3.0    | 5.7    | 2220      | 40                    | F116PP563(1)250(2)       | GMW5.7563(1)250J93(2) |
| 250 | 160 | 0.068                           | PU/J95                    | 5.0              | 4.0    | 5.7    | 2220      | 40                    | F116PU683(1)250(2)       | GMW5.7683(1)250J95(2) |
| 400 | 200 | 0.0010                          | PH/J91                    | 5.0              | 2.0    | 5.7    | 2220      | 50                    | F116PH102(1)400(2)       | GMW5.7102(1)400J91(2) |
| 400 | 200 | 0.0012                          | PH/J91                    | 5.0              | 2.0    | 5.7    | 2220      | 50                    | F116PH122(1)400(2)       | GMW5.7122(1)400J91(2) |
| 400 | 200 | 0.0015                          | PH/J91                    | 5.0              | 2.0    | 5.7    | 2220      | 50                    | F116PH152(1)400(2)       | GMW5.7152(1)400J91(2) |
| 400 | 200 | 0.0018                          | PH/J91                    | 5.0              | 2.0    | 5.7    | 2220      | 50                    | F116PH182(1)400(2)       | GMW5.7182(1)400J91(2) |
| 400 | 200 | 0.0022                          | PH/J91                    | 5.0              | 2.0    | 5.7    | 2220      | 50                    | F116PH222(1)400(2)       | GMW5.7222(1)400J91(2) |
| 400 | 200 | 0.0027                          | PH/J91                    | 5.0              | 2.0    | 5.7    | 2220      | 50                    | F116PH272(1)400(2)       | GMW5.7272(1)400J91(2) |
| 400 | 200 | 0.0033                          | PH/J91                    | 5.0              | 2.0    | 5.7    | 2220      | 50                    | F116PH332(1)400(2)       | GMW5.7332(1)400J91(2) |
| 400 | 200 | 0.0039                          | PH/J91                    | 5.0              | 2.0    | 5.7    | 2220      | 50                    | F116PH392(1)400(2)       | GMW5.7392(1)400J91(2) |
| 400 | 200 | 0.0047                          | PH/J91                    | 5.0              | 2.0    | 5.7    | 2220      | 50                    | F116PH472(1)400(2)       | GMW5.7472(1)400J91(2) |
| 400 | 200 | 0.0056                          | PH/J91                    | 5.0              | 2.0    | 5.7    | 2220      | 50                    | F116PH562(1)400(2)       | GMW5.7562(1)400J91(2) |
| 400 | 200 | 0.0068                          | PH/J91                    | 5.0              | 2.0    | 5.7    | 2220      | 50                    | F116PH682(1)400(2)       | GMW5.7682(1)400J91(2) |
| 400 | 200 | 0.0082                          | PP/J93                    | 5.0              | 3.0    | 5.7    | 2220      | 50                    | F116PP822(1)400(2)       | GMW5.7822(1)400J93(2) |
| 400 | 200 | 0.010                           | PP/J93                    | 5.0              | 3.0    | 5.7    | 2220      | 50                    | F116PP103(1)400(2)       | GMW5.7103(1)400J93(2) |
| 400 | 200 | 0.012                           | PP/J93                    | 5.0              | 3.0    | 5.7    | 2220      | 50                    | F116PP123(1)400(2)       | GMW5.7123(1)400J93(2) |
| 400 | 200 | 0.015                           | PU/J95                    | 5.0              | 4.0    | 5.7    | 2220      | 50                    | F116PU153(1)400(2)       | GMW5.7153(1)400J95(2) |
| 630 | 220 | 0.0010                          | PH/J91                    | 5.0              | 2.0    | 5.7    | 2220      | 50                    | F116PH102(1)630(2)       | GMW5.7102(1)630J91(2) |
| 630 | 220 | 0.0012                          | PH/J91                    | 5.0              | 2.0    | 5.7    | 2220      | 50                    | F116PH122(1)630(2)       | GMW5.7122(1)630J91(2) |
| 630 | 220 | 0.0015                          | PH/J91                    | 5.0              | 2.0    | 5.7    | 2220      | 50                    | F116PH152(1)630(2)       | GMW5.7152(1)630J91(2) |
| 630 | 220 | 0.0018                          | PH/J91                    | 5.0              | 2.0    | 5.7    | 2220      | 50                    | F116PH182(1)630(2)       | GMW5.7182(1)630J91(2) |
| 630 | 220 | 0.0022                          | PH/J91                    | 5.0              | 2.0    | 5.7    | 2220      | 50                    | F116PH222(1)630(2)       | GMW5.7222(1)630J91(2) |
| 630 | 220 | 0.0027                          | PH/J91                    | 5.0              | 2.0    | 5.7    | 2220      | 50                    | F116PH272(1)630(2)       | GMW5.7272(1)630J91(2) |
| 630 | 220 | 0.0033                          | PP/J93                    | 5.0              | 3.0    | 5.7    | 2220      | 50                    | F116PP332(1)630(2)       | GMW5.7332(1)630J93(2) |
| 630 | 220 | 0.0039                          | PP/J93                    | 5.0              | 3.0    | 5.7    | 2220      | 50                    | F116PP392(1)630(2)       | GMW5.7392(1)630J93(2) |
| 630 | 220 | 0.0047                          | PU/J95                    | 5.0              | 4.0    | 5.7    | 2220      | 50                    | F116PU472(1)630(2)       | GMW5.7472(1)630J95(2) |
| 630 | 220 | 0.0056                          | PU/J95                    | 5.0              | 4.0    | 5.7    | 2220      | 50                    | F116PU562(1)630(2)       | GMW5.7562(1)630J95(2) |
| 630 | 220 | 0.0068                          | PU/J95                    | 5.0              | 4.0    | 5.7    | 2220      | 50                    | F116PU682(1)630(2)       | GMW5.7682(1)630J95(2) |
| VDC | VAC | Capacitance<br>Value ( $\mu$ F) | Size Code<br>(New/Legacy) | B (mm)           | H (mm) | L (mm) | Chip Size | dV/dt<br>(V/ $\mu$ s) | New KEMET<br>Part Number | Legacy Part<br>Number |

(1) K =  $\pm$ 10%, M =  $\pm$ 20%, J =  $\pm$ 5% on request.

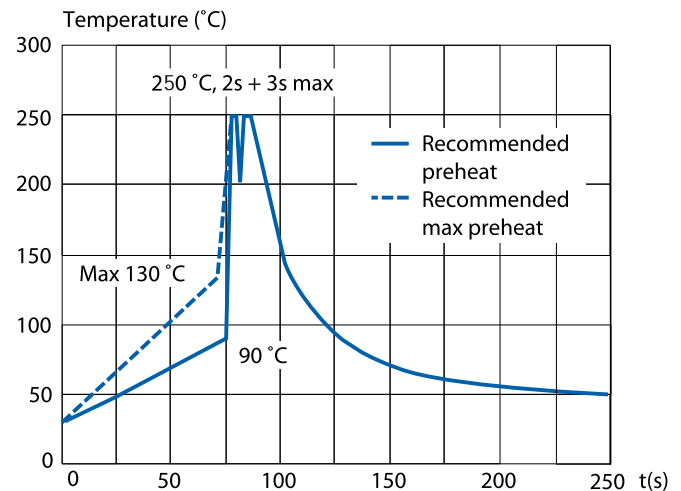
(2) Insert ordering code for lead type and packaging. See Ordering Options Table for available options.

## Soldering Process

Reflow soldering temperature is measured on the top body surface of the component. Preheating temperature should be less than 170°C. The time above 217°C should be less than 50 seconds. The peak temperature must not exceed 240°C.



Wave soldering: The recommended preheating temperature is 90°C (130°C maximum). The peak temperature 250°C may be applied for 2 – 5 seconds maximum. KEMET recommends wave soldering for parts with up to 2 mm height.



## Marking

- Capacitance
- Capacitance tolerance code
- Rated voltage code
- Capacitor type G for GMW
- Manufacturing date code

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GMW Series Unencapsulated Winding, Size 2220, 63 – 630 VDC

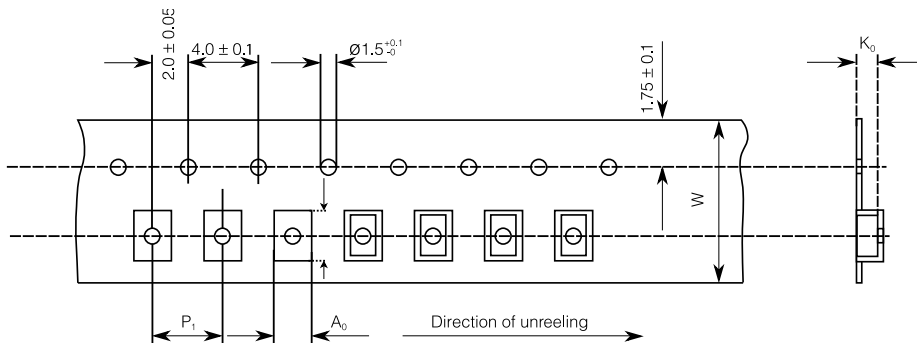


## Packaging Quantities

| Chip Size (EIA) | Base (mm) | Height (mm) | Length (mm) | Bulk | Reel Horizontal Orientation |
|-----------------|-----------|-------------|-------------|------|-----------------------------|
| 2220            | 5.0       | 2.0         | 5.7         | 2000 | 3100                        |
| 2220            | 5.0       | 3.0         | 5.7         | 2000 | 2400                        |
| 2220            | 5.0       | 4.0         | 5.7         | 2000 | 2100                        |

## Carrier Taping & Packaging (IEC 60286-2)

### Horizontal Taping Orientation



| Chip Size (EIA)<br>Horizontal<br>Mounting | Dimensions in mm |         |         | Taping Specification |                |                |                |                |        |                |                |
|---|------------------|---------|---------|----------------------|----------------|----------------|----------------|----------------|--------|----------------|----------------|
|   | B                | H       | L       | W                    | P <sub>1</sub> | A <sub>0</sub> | B <sub>0</sub> | K <sub>0</sub> | D      | W <sub>1</sub> | W <sub>2</sub> |
|   | Nominal          | Nominal | Nominal | -0/+0.3              | +/-0.1         | Nominal        | Nominal        | Nominal        | -/+2.0 | -0/+2          | Maximum        |
| 2220                                      | 5.0              | 2.0     | 5.7     | 12.0                 | 8.0            | 5.5            | 6.0            | 2.8            | 330    | 12.4           | 22.0           |
| 2220                                      | 5.0              | 3.0     | 5.7     | 12.0                 | 8.0            | 5.5            | 6.0            | 3.3            | 330    | 12.4           | 22.0           |
| 2220                                      | 5.0              | 4.0     | 5.7     | 12.0                 | 8.0            | 5.5            | 6.0            | 4.3            | 330    | 12.4           | 22.0           |

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Film Surface Mount Capacitors – General Purpose, High Stability and AC Line EMI Suppression

GMW Series Unencapsulated Winding, Size 2220, 63 – 630 VDC

The Capacitance Company  
**KEMET**  
CHARGED!

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Tel: 86-10-5829-1711

Shanghai, China  
Tel: 86-21-6447-0707

Taipei, Taiwan  
Tel: 886-2-27528585

**Southeast Asia**  
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Tel: 65-6586-1900

Penang, Malaysia  
Tel: 60-4-6430200

Bangalore, India  
Tel: 91-806-53-76817

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GMW Series Unencapsulated Winding, Size 2220, 63 – 630 VDC



## Other KEMET Resources

| Tools                          |   |
|--------------------------------|---|
| Resource                       | Location  |
| Configure A Part: CapEdge      | <a href="http://capacitoredge.kemet.com">http://capacitoredge.kemet.com</a> |
| SPICE & FIT Software           | <a href="http://www.kemet.com/spice">http://www.kemet.com/spice</a>         |
| Search Our FAQs: KnowledgeEdge | <a href="http://www.kemet.com/keask">http://www.kemet.com/keask</a>         |
| Electrolytic LifeCalculator    | <a href="http://www.kemet.com:8080/elc">http://www.kemet.com:8080/elc</a>   |

| Product Information                                  |   |
|--|---|
| Resource   | Location  |
| Products   | <a href="http://www.kemet.com/products">http://www.kemet.com/products</a>                 |
| Technical Resources (Including Soldering Techniques) | <a href="http://www.kemet.com/technicalpapers">http://www.kemet.com/technicalpapers</a>   |
| RoHS Statement                                       | <a href="http://www.kemet.com/rohs">http://www.kemet.com/rohs</a>                         |
| Quality Documents                                    | <a href="http://www.kemet.com/qualitydocuments">http://www.kemet.com/qualitydocuments</a> |

| Product Request         |   |
|-------------------------|---|
| Resource                | Location  |
| Sample Request          | <a href="http://www.kemet.com/sample">http://www.kemet.com/sample</a> |
| Engineering Kit Request | <a href="http://www.kemet.com/kits">http://www.kemet.com/kits</a>     |

| Contact            |   |
|--------------------|---|
| Resource           | Location  |
| Website            | <a href="http://www.kemet.com">www.kemet.com</a>                                    |
| Contact Us         | <a href="http://www.kemet.com/contact">http://www.kemet.com/contact</a>             |
| Investor Relations | <a href="http://www.kemet.com/ir">http://www.kemet.com/ir</a>                       |
| Call Us            | 1-877-MyKEMET   |
| Twitter            | <a href="http://twitter.com/kemetcapacitors">http://twitter.com/kemetcapacitors</a> |

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Film Surface Mount Capacitors – General Purpose, High Stability and AC Line EMI Suppression

GMW Series Unencapsulated Winding, Size 2220, 63 – 630 VDC

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- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
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- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
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