Surface Mount and Through-Hole Multilayer Ceramic Chip Stacked Capacitors

KPS MIL Series, SMPS Stacked Capacitors, MIL–PRF–49470, DSCC 87106, 25 – 1,000 VDC (Commercial, Military and Space Grades)

Electronic Components
KEMET CHARGED.

Overview

KEMET Power Solutions (KPS) MIL Series ceramic stacked capacitors are available in commercial, military and space grades and are well suited for standard and high reliability switch mode power supply (SMPS) and pulse energy applications. Qualified under performance specification MIL–PRF–49470, our military and space grade products meet or exceed the requirements outlined by DSCC (Defense Supply Center, Columbus) and are available in both B (standard reliability) & T (high reliability) product levels. MIL–PRF–49470 was developed as part of a cooperative effort between the U.S. Military, NASA and SMPS suppliers to produce a robust replacement to cancelled DSCC Drawing 87106.

The KPS MIL Series is constructed using large chip multilayer ceramic capacitors (MLCCs), horizontally stacked and secured to a lead-frame termination system using a high melting point (HMP) solder alloy. The lead frame isolates the MLCCs from the printed circuit board (PCB) while establishing a parallel circuit configuration. Mechanically isolating the capacitors from the PCB improves mechanical and thermal stress performance, while the parallel circuit configuration allows for bulk capacitance in the same or smaller design footprint.

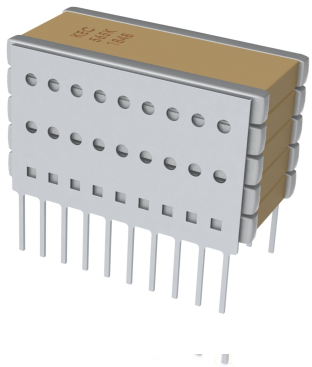
Available in BX, BR, BQ, and X7R dielectrics, these devices are available in unencapsulated styles in both surface mountable and through-hole configurations. Their low Equivalent Series Resistance (ESR) and Equivalent Series Inductance (ESL) make them ideally suited for input and output filtering of power supply as well as snubber applications. The encapsulated styles are primarily used where increased mechanical and environmental protection is required, such as in avionics systems.

Benefits

- –55°C to +125°C operating temperature range
- High frequency performance
- Bulk capacitance in a reduced footprint
- MIL–PRF–49470 QPL
- Military Case Codes 3, 4 and 5
- Space Grade available (“T” Level)
- DSCC approved (87106)
- Commercial/Industrial Grade available
- Customer specific requirements available
- Low ESR and ESL
- High thermal stability
- High ripple current capability
- Higher reliability than aluminum electrolytic or tantalum

Applications

- Military
- Space
- Industrial
- Input and output filtering on power supplies – often found on “capacitor banks“
- Snubber circuits
- Radar filtering (28 V/microwave burst)



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MIL–PRF–49470 Ordering Information

M49470	R	01	474	K	C	N
Performance Specification Indicating MIL-PRF-49470[1]	Dielectric Classification/ Characteristic[2]	Performance Specification Sheet Number (Indicating MIL-PRF-49470/1)[3]	Capacitance Code (pF)	Capacitance Tolerance	Rated Voltage (VDC)	Lead Configuration[4]
M49470 = B level T49470 = T level A T prefix is used in place of the M for T level product.	Q = BQ R = BR X = BX	01 = Unencapsulated	Two significant digits and number of zeros	J = ±5% K = ±10% M = ±20%	A = 50 B = 100 C = 200 E = 500	N = Straight Pin L = Formed L J = Formed J

[1] Indicates performance and reliability requirements. "B" level represents standard reliability."T" level represents high reliability.

[1] Please refer to performance specification sheet MIL–PRF–49470 for details regarding test levels. The latest revision of the specification sheet is available through DSCC.

[1, 3] Test level option "T" is not available on encapsulated stacked devices (i.e. MIL–PRF–49470/2).

[2] Dielectric classification and characteristic details are outlined in the "Electrical Parameters" section of this document.

[4] Lead configuration and dimension details are outlined in the "Dimensions" section of this document.

KPS MIL Series, SMPS Stacks Ordering Information

(Do not use this ordering code if a QPL MIL–SPEC part type is required. Please order using MIL–SPEC ordering code. Details regarding MIL–PRF–49470 QPL ordering information is outlined above.)

L1	R	N	30	C	106	K	S	12	
Product Family[1]	Dielectric Classification/ Characteristic[2]	Lead Configuration[3]	Case Size/ Case Code (CC)	Rated Voltage (VDC)	Capacitance Code (pF)	Capacitance Tolerance	Testing Option[4]	Maximum Height Dimension (in.)[5]	
L1 = Unencapsulated	Q = BQ R = BR X = BX W = X7R	N = Straight L = Formed L J = Formed J	30 = CC 3 40 = CC 4 50 = CC 5	3 = 25 5 = 50 1 = 100 2 = 200 C = 500 B = 630 D = 1,000	Two significant digits and number of zeros	J = ±5% K = ±10% M = ±20%	B = M49470 B level T = M49470 T level C = DSCC87106 S = Commercial X = Non-standard (Customer specific requirements)	Unencapsulated 12 = 0.12" 24 = 0.24" 36 = 0.36" 48 = 0.48" 65 = 0.65"	Encapsulated 27 = 0.27" 39 = 0.39" 53 = 0.53" 66 = 0.66" 80 = 0.80"

[1, 4] Test level option "T" is not available on encapsulated stacked devices, i.e., MIL–PRF–49470/2. If a QPL MIL–Spec part type is required, please order using the MIL–Spec ordering code.

[2] Dielectric classification and characteristic details are outlined in the "Electrical Parameters" section of this document.

[3] Lead configuration and dimension details are outlined in the "Dimensions" section of this document. Additional lead configurations may be available. Contact KEMET for details.

[4] Indicates performance and reliability requirements. Testing option details are outlined in the "Performance & Reliability" section of this document.

[4] Please refer to performance specification sheet MIL–PRF–49470 for additional details regarding test levels. The latest revision of the specification sheet is available through DSCC.

[4] DSCC Drawing 87106 was cancelled on 01/03/2005. MIL–PRF–49470 capacitors are preferred over DSCC Drawing 87106 capacitors.

[5] Maximum height dimensions are provided in product tables 1A, 1B, and 1C of this document

Ordering Information Requirements per DSCC Drawing 87106

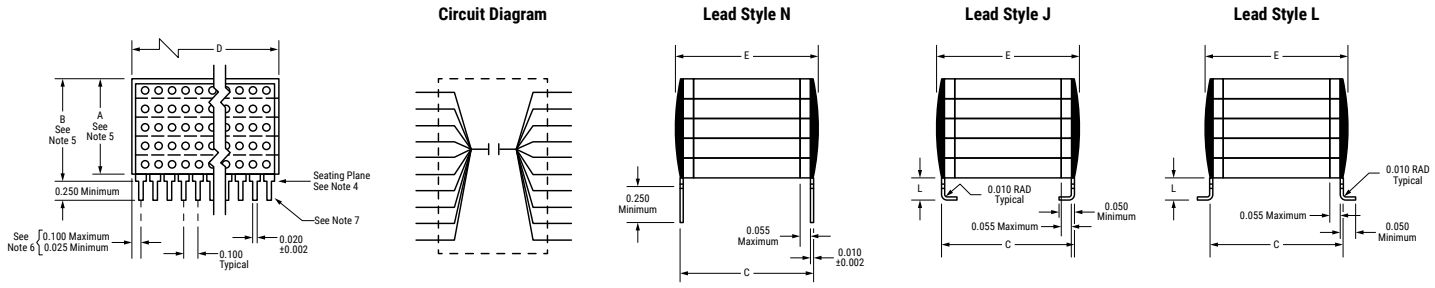
DSCC Drawing 87106 was cancelled on 01/03/2005. Customers can continue to order per 87106 requirements using the original DSCC ordering code,i.e., 87106–001.

When available, MIL–PRF–49470 devices are preferred over DSCC Drawing 87106. The MIL–PRF–49470 military specification product provides additional quality assurance provisions that are not required by the DSCC drawing. These extra provisions create a more robust replacement.

(M49470/1 & L1) Product Dimensions – Inches (Millimeters)

Case Code	C Lead Spacing ±0.025 (0.635)	E Length Maximum	D Width Minimum	D Width Maximum	A Height Maximum	Seating Plane[1] ±0.010 (0.250)	Number of Leads per Side	Mounting Technique
3	0.450 (11.43)	0.500 (12.70)	0.950 (24.13)	1.075 (27.30)	Refer to tables 1A and 1C for specific maximum A dimension	0.055 (1.40)	10	Solder reflow only
4	0.400 (10.16)	0.440 (11.18)	0.350 (8.89)	0.425 (10.80)			4	
5	0.250 (6.35)	0.300 (7.62)	0.224 (5.69)	0.275 (6.98)			3	

[1] *Only applies to lead style "N" (straight).*



1. *Dimensions are in inches.*
2. *Metric equivalents are given for general information only.*
3. *Unless otherwise specified, tolerances are ±0.010 inch (0.25 mm).*
4. *Lead frame configuration is shown as typical above the seating plane. The seating plane shall be configured to create a standoff height of 0.055 inch ±0.010 inch when the part is mounted to a printed circuit board (PCB). The standoff height shall be the distance between the PCB and the bottom of the chip stack. A seating plane is only required for lead style N.*
5. *See Table 1 for specific maximum A dimension. For maximum B dimension, add .065 inch (1.65 mm) to the appropriate A dimension. For all lead styles, the number of chips is determined by the capacitance and voltage rating.*
6. *For case code 5, dimensions shall be .100 inch (2.54 mm) maximum and 0.012 inch (0.30 mm) minimum.*
7. *Lead alignment within pin rows shall be within ±0.005 inch (0.13 mm). Lead alignment between pin rows shall be within one half of the lead width (0.010 inch (0.25 mm)).*

Lead Configurations – Inches (Millimeters)

Lead Style Symbol	Lead Style	L Lead Length
N	(N) Straight	0.250 Minimum (6.35)
L	(L) Formed	0.070 ±0.010 (1.78 ±0.25)
J	(J) Formed	0.070 ±0.010 (1.78 ±0.25)

Additional lead configurations may be available. Contact KEMET for details.

Qualification Inspection Per MIL–PRF–49470

Inspection	Test Method Paragraph
Group I	
Thermal shock and voltage conditioning	4.8.5
Group II	
Visual and mechanical Inspection	4.8.4
Group III	
Low temperature storage	4.8.23
Barometric pressure	4.8.9
Terminal strength	4.8.10
Group IV	
Voltage-temperature limits	4.8.13.1
Vibration, high frequency	4.8.14
Immersion	4.8.15
Group V	
Shock, specified pulse	4.8.16
Resistance to soldering heat	4.8.17
Moisture resistance	4.8.18
Group VI	
DPA (T level only)	4.8.19
Group VII	
Humidity, steady state, low voltage (T level only)	4.8.21
Group VIII	
Life	4.8.22

Environmental Compliance

These devices do not meet RoHS criteria

Electrical Parameters/Performance Characteristics: BQ Dielectric

Item	Parameters/Characteristics
Operating Temperature Range	−55°C to +125°C
Capacitance Change with Reference to +25°C and 0 VDC Applied (TCC)	±15%
Capacitance Change with Reference to +25°C and 100% Rated VDC Applied	+15%, −50%
Aging Rate (Maximum % Capacitance Loss/Decade Hour)	1%
Dielectric Withstanding Voltage (DWV)	250% of rated DC voltage for voltage rating < 500 V 150% of rated DC voltage for voltage rating of 500 V (5±1 seconds and charge/discharge not exceeding 50 mA)
Dissipation Factor (DF) Maximum Limit at 25ºC	2.5%
Insulation Resistance (IR) Limit at 25°C	1,000 megohm microfarads (minimum) or 100 GΩ
Insulation Resistance (IR) Limit at 125°C	100 megohm microfarads (minimum) or 10 GΩ

Regarding aging rate: Capacitance measurements (including tolerance) are indexed to a referee time of 1,000 hours.
To obtain IR limit, divide MΩ-µF value by the capacitance and compare to GΩ limit. Select the lower of the two limits.
Capacitance and dissipation factor (DF) measured under the following conditions:
1 kHz ±100 Hz at 1.0 Vrms ±0.2 Vrms
Note: When measuring capacitance it is important to ensure the set voltage level is held constant. The HP4284 and Agilent E4980 have a feature known as Automatic Level Control (ALC). The ALC feature should be switched to "ON."

Electrical Parameters/Performance Characteristics: BR Dielectric

Item	Parameters/Characteristics
Operating Temperature Range	−55°C to +125°C
Capacitance Change with Reference to +25°C and 0 VDC Applied (TCC)	±15%
Capacitance Change with Reference to +25°C and 100% Rated VDC Applied	+15%, −40%
Aging Rate (Maximum % Capacitance Loss/Decade Hour)	1%
Dielectric Withstanding Voltage (DWV)	250% of rated DC voltage for voltage rating < 500 V 150% of rated DC voltage for voltage rating of 500 V (5±1 seconds and charge/discharge not exceeding 50 mA)
Dissipation Factor (DF) Maximum Limit at 25ºC	2.5%
Insulation Resistance (IR) Limit at 25°C	1,000 megohm microfarads (minimum) or 100 GΩ
Insulation Resistance (IR) Limit at 125°C	100 megohm microfarads (minimum) or 10 GΩ

Regarding aging rate: Capacitance measurements (including tolerance) are indexed to a referee time of 1,000 hours.
To obtain IR limit, divide MΩ-µF value by the capacitance and compare to GΩ limit. Select the lower of the two limits.
Capacitance and dissipation factor (DF) measured under the following conditions:
1 kHz ±100 Hz at 1.0 Vrms ±0.2 Vrms
Note: When measuring capacitance it is important to ensure the set voltage level is held constant. The HP4284 and Agilent E4980 have a feature known as Automatic Level Control (ALC). The ALC feature should be switched to "ON."

Electrical Parameters/Performance Characteristics: BX Dielectric

Item	Parameters/Characteristics
Operating Temperature Range	−55°C to +125°C
Capacitance Change with Reference to +25°C and 0 VDC Applied (TCC)	±15%
Capacitance Change with Reference to +25°C and 100% Rated VDC Applied	+15%, −25%
Aging Rate (Maximum % Capacitance Loss/Decade Hour)	1%
Dielectric Withstanding Voltage (DWV)	250% of rated DC voltage for voltage rating < 500 V 150% of rated DC voltage for voltage rating of 500 V (5±1 seconds and charge/discharge not exceeding 50 mA)
Dissipation Factor (DF) Maximum Limit at 25ºC	2.5%
Insulation Resistance (IR) Limit at 25°C	1000 megohm microfarads (minimum) or 100 GΩ
Insulation Resistance (IR) Limit at 125°C	100 megohm microfarads (minimum) or 10 GΩ

Regarding aging rate: Capacitance measurements (including tolerance) are indexed to a referee time of 1000 hours.
To obtain IR limit, divide MΩ-µF value by the capacitance and compare to GΩ limit. Select the lower of the two limits.
Capacitance and dissipation factor (DF) measured under the following conditions:

1 kHz ±100 Hz at 1.0 Vrms ±0.2 Vrms

Note: When measuring capacitance it is important to ensure the set voltage level is held constant. The HP4284 and Agilent E4980 have a feature known as Automatic Level Control (ALC). The ALC feature should be switched to "ON."

Electrical Parameters/Performance Characteristics: X7R Dielectric

Item	Parameters/Characteristics
Operating Temperature Range	−55°C to +125°C
Capacitance Change with Reference to +25°C and 0 VDC Applied (TCC)	±15%
Aging Rate (Maximum % Capacitance Loss/Decade Hour)	3.0%
Dielectric Withstanding Voltage (DWV)	250% of rated DC voltage for voltage rating < 500V 150% of rated DC voltage for voltage rating of 500V and 630V 120% of rated DC voltage for voltage rating of 1,000V (5±1 seconds and charge/discharge not exceeding 50mA)
Dissipation Factor (DF) Maximum Limit at 25ºC	3.5% (25 V) and 2.5% (50 V to 200 V)
Insulation Resistance (IR) Limit at 25°C	1,000 megohm microfarads or 100 GΩ (Rated voltage applied for 120±5 seconds at 25°C)

Regarding aging rate: Capacitance measurements (including tolerance) are indexed to a referee time of 1000 hours.
To obtain IR limit, divide MΩ-µF value by the capacitance and compare to GΩ limit. Select the lower of the two limits.
Capacitance and dissipation factor (DF) measured under the following conditions:

1 kHz ±50 Hz and 1.0 ±0.2 Vrms if capacitance ≤ 10 µF.

120 Hz ±10 Hz and 0.5 ±0.1 Vrms if capacitance > 10 µF.

Note: When measuring capacitance it is important to ensure the set voltage level is held constant. The HP4284 and Agilent E4980 have a feature known as Automatic Level Control (ALC). The ALC feature should be switched to "ON."

Table 1A – MIL–PRF–49470/1, Product Selection 50 – 200 VDC

MIL–PRF–49470/1 Horizontally Stacked						
MIL–PRF–49470 P/N[1]	Capacitance (µF)	Case Code	Height A inch (mm)	Capacitance Tolerance	Lead Configuration	KEMET P/N[1]
50 VDC – BX Dielectric						
(1)49470X01105(2)A(3)	1	5	0.120 (3.05)	K, M	N, L, J	L1X(3)505105(2)(4)12
(1)49470X01125(2)A(3)	1.2	5	0.120 (3.05)	K, M	N, L, J	L1X(3)505125(2)(4)12
(1)49470X01155(2)A(3)	1.5	5	0.240 (6.10)	K, M	N, L, J	L1X(3)505155(2)(4)24
(1)49470X01185(2)A(3)	1.8	5	0.240 (6.10)	K, M	N, L, J	L1X(3)505185(2)(4)24
(1)49470X01225(2)A(3)	2.2	5	0.240 (6.10)	K, M	N, L, J	L1X(3)505225(2)(4)24
(1)49470X01275(2)A(3)	2.7	5	0.360 (9.14)	K, M	N, L, J	L1X(3)505275(2)(4)36
(1)49470X01335(2)A(3)	3.3	5	0.360 (9.14)	K, M	N, L, J	L1X(3)505335(2)(4)36
(1)49470X01475(2)A(3)	3.9	5	0.480 (12.19)	K, M	N, L, J	L1X(3)505475(2)(4)48
(1)49470X01395(2)A(3)	3.9	5	0.480 (12.19)	K, M	N, L, J	L1X(3)505395(2)(4)48
(1)49470X01565(2)A(3)	5.6	5	0.650 (16.51)	K, M	N, L, J	L1X(3)505565(2)(4)65
(1)49470X01685(2)A(3)	6.8	4	0.360 (9.14)	K, M	N, L, J	L1X(3)405685(2)(4)36
(1)49470X01825(2)A(3)	8.2	4	0.360 (9.14)	K, M	N, L, J	L1X(3)405825(2)(4)36
(1)49470X01106(2)A(3)	10	4	0.480 (12.19)	K, M	N, L, J	L1X(3)405106(2)(4)48
(1)49470X01126(2)A(3)	12	4	0.480 (12.19)	K, M	N, L, J	L1X(3)405126(2)(4)48
(1)49470X01156(2)A(3)	15	4	0.650 (16.51)	K, M	N, L, J	L1X(3)405156(2)(4)65
(1)49470X01186(2)A(3)	18	3	0.240 (6.10)	K, M	N, L, J	L1X(3)305186(2)(4)24
(1)49470X01226(2)A(3)	22	3	0.360 (9.14)	K, M	N, L, J	L1X(3)305226(2)(4)36
(1)49470X01276(2)A(3)	27	3	0.360 (9.14)	K, M	N, L, J	L1X(3)305276(2)(4)36
(1)49470X01336(2)A(3)	33	3	0.360 (9.14)	K, M	N, L, J	L1X(3)305336(2)(4)36
(1)49470X01396(2)A(3)	39	3	0.480 (12.19)	K, M	N, L, J	L1X(3)305396(2)(4)48
(1)49470X01476(2)A(3)	47	3	0.650 (16.51)	K, M	N, L, J	L1X(3)305476(2)(4)65
100 VDC – BX Dielectric						
(1)49470X01684(2)B(3)	0.68	5	0.120 (3.05)	K, M	N, L, J	L1X(3)501684(2)(4)12
(1)49470X01824(2)B(3)	0.82	5	0.240 (6.10)	K, M	N, L, J	L1X(3)501824(2)(4)24
(1)49470X01105(2)B(3)	1	5	0.240 (6.10)	K, M	N, L, J	L1X(3)501105(2)(4)24
(1)49470X01125(2)B(3)	1.2	5	0.240 (6.10)	K, M	N, L, J	L1X(3)501125(2)(4)24
(1)49470X01155(2)B(3)	1.5	5	0.360 (9.14)	K, M	N, L, J	L1X(3)501155(2)(4)36
(1)49470X01185(2)B(3)	1.8	5	0.360 (9.14)	K, M	N, L, J	L1X(3)501185(2)(4)36
(1)49470X01225(2)B(3)	2.2	5	0.480 (12.19)	K, M	N, L, J	L1X(3)501225(2)(4)48
(1)49470X01275(2)B(3)	2.7	5	0.480 (12.19)	K, M	N, L, J	L1X(3)501275(2)(4)48
(1)49470X01335(2)B(3)	3.3	5	0.650 (16.51)	K, M	N, L, J	L1X(3)501335(2)(4)65
(1)49470X01395(2)B(3)	3.9	4	0.360 (9.14)	K, M	N, L, J	L1X(3)401395(2)(4)36
(1)49470X01475(2)B(3)	4.7	4	0.360 (9.14)	K, M	N, L, J	L1X(3)401475(2)(4)36
(1)49470X01565(2)B(3)	5.6	4	0.480 (12.19)	K, M	N, L, J	L1X(3)401565(2)(4)48
(1)49470X01685(2)B(3)	6.8	4	0.480 (12.19)	K, M	N, L, J	L1X(3)401685(2)(4)48
(1)49470X01825(2)B(3)	8.2	4	0.650 (16.51)	K, M	N, L, J	L1X(3)401825(2)(4)65
(1)49470X01106(2)B(3)	10	3	0.240 (6.10)	K, M	N, L, J	L1X(3)301106(2)(4)24
(1)49470X01126(2)B(3)	12	3	0.240 (6.10)	K, M	N, L, J	L1X(3)301126(2)(4)24
(1)49470X01156(2)B(3)	15	3	0.360 (9.14)	K, M	N, L, J	L1X(3)301156(2)(4)36
(1)49470X01186(2)B(3)	18	3	0.360 (9.14)	K, M	N, L, J	L1X(3)301186(2)(4)36
(1)49470X01226(2)B(3)	22	3	0.480 (12.19)	K, M	N, L, J	L1X(3)301226(2)(4)48
(1)49470X01276(2)B(3)	27	3	0.650 (16.51)	K, M	N, L, J	L1X(3)301276(2)(4)65
200 VDC – BR Dielectric						
(1)49470R01474(2)C(3)	0.47	5	0.240 (6.10)	K, M	N, L, J	L1R(3)502474(2)(4)24
(1)49470R01564(2)C(3)	0.56	5	0.240 (6.10)	K, M	N, L, J	L1R(3)502564(2)(4)24
(1)49470R01684(2)C(3)	0.68	5	0.360 (9.14)	K, M	N, L, J	L1R(3)502684(2)(4)36
(1)49470R01824(2)C(3)	0.82	5	0.360 (9.14)	K, M	N, L, J	L1R(3)502824(2)(4)36
(1)49470R01105(2)C(3)	1	5	0.480 (12.19)	K, M	N, L, J	L1R(3)502105(2)(4)48
MIL–PRF–49470 P/N[1]	Capacitance (µF)	Case Code	Height A inch (mm)	Capacitance Tolerance	Lead Configuration	KEMET P/N[1]

[1] Complete P/N requires additional characters in the numbered positions provided in order to indicate product level (B level or T level), capacitance tolerance and lead configuration. For each numbered position, available options are as follows:

(1) Test level character "M" for B level, or "T" for T level (MIL–PRF–49470/1 part number only).

(2) Capacitance tolerance character " K" or " M".

(3) Lead style character " N", "L" or "J".

(4) Test level character "B" for B level, or "T" for T level (KEMET part number only).

Table 1A – MIL–PRF–49470 /1, Product Selection 200 – 500 VDC cont.

MIL–PRF–49470/1 Horizontally Stacked						
MIL–PRF–49470 P/N[1]	Capacitance (µF)	Case Code	Height A inch (mm)	Capacitance Tolerance	Lead Configuration	KEMET P/N[1]
(1)49470R01125(2)C(3)	1.2	5	0.480 (12.19)	K, M	N, L, J	L1R(3)502125(2)(4)48
(1)49470R01155(2)C(3)	1.5	5	0.650 (16.51)	K, M	N, L, J	L1R(3)502155(2)(4)65
(1)49470R01185(2)C(3)	1.8	4	0.360 (9.14)	K, M	N, L, J	L1R(3)402185(2)(4)36
(1)49470R01225(2)C(3)	2.2	4	0.360 (9.14)	K, M	N, L, J	L1R(3)402225(2)(4)36
(1)49470R01275(2)C(3)	2.7	4	0.480 (12.19)	K, M	N, L, J	L1R(3)402275(2)(4)48
(1)49470R01335(2)C(3)	3.3	4	0.480 (12.19)	K, M	N, L, J	L1R(3)402335(2)(4)48
(1)49470R01395(2)C(3)	3.9	4	0.650 (16.51)	K, M	N, L, J	L1R(3)402395(2)(4)65
(1)49470R01475(2)C(3)	4.7	3	0.240 (6.10)	K, M	N, L, J	L1R(3)302475(2)(4)24
(1)49470R01565(2)C(3)	5.6	3	0.240 (6.10)	K, M	N, L, J	L1R(3)302565(2)(4)24
(1)49470R01685(2)C(3)	6.8	3	0.360 (9.14)	K, M	N, L, J	L1R(3)302685(2)(4)36
(1)49470R01825(2)C(3)	8.2	3	0.360 (9.14)	K, M	N, L, J	L1R(3)302825(2)(4)36
(1)49470R01106(2)C(3)	10	3	0.480 (12.19)	K, M	N, L, J	L1R(3)302106(2)(4)48
(1)49470R01126(2)C(3)	12	3	0.650 (16.51)	K, M	N, L, J	L1R(3)302126(2)(4)65
500 VDC – BQ Dielectric						
(1)49470Q01154(2)E(3)	0.15	5	0.120 (3.05)	K, M	N, L, J	L1Q(3)50C154(2)(4)12
(1)49470Q01184(2)E(3)	0.18	5	0.240 (6.10)	K, M	N, L, J	L1Q(3)50C184(2)(4)24
(1)49470Q01224(2)E(3)	0.22	5	0.240 (6.10)	K, M	N, L, J	L1Q(3)50C224(2)(4)24
(1)49470Q01274(2)E(3)	0.27	5	0.240 (6.10)	K, M	N, L, J	L1Q(3)50C274(2)(4)24
(1)49470Q01334(2)E(3)	0.33	5	0.360 (9.14)	K, M	N, L, J	L1Q(3)50C334(2)(4)36
(1)49470Q01394(2)E(3)	0.39	5	0.360 (9.14)	K, M	N, L, J	L1Q(3)50C394(2)(4)36
(1)49470Q01474(2)E(3)	0.47	5	0.360 (9.14)	K, M	N, L, J	L1Q(3)50C474(2)(4)36
(1)49470Q01564(2)E(3)	0.56	5	0.480 (12.19)	K, M	N, L, J	L1Q(3)50C564(2)(4)48
(1)49470Q01684(2)E(3)	0.68	5	0.650 (16.51)	K, M	N, L, J	L1Q(3)50C684(2)(4)65
(1)49470Q01824(2)E(3)	0.82	4	0.360 (9.14)	K, M	N, L, J	L1Q(3)40C824(2)(4)36
(1)49470Q01105(2)E(3)	1	4	0.360 (9.14)	K, M	N, L, J	L1Q(3)40C105(2)(4)36
(1)49470Q01125(2)E(3)	1.2	4	0.360 (9.14)	K, M	N, L, J	L1Q(3)40C125(2)(4)36
(1)49470Q01155(2)E(3)	1.5	4	0.480 (12.19)	K, M	N, L, J	L1Q(3)40C155(2)(4)48
(1)49470Q01185(2)E(3)	1.8	4	0.650 (16.51)	K, M	N, L, J	L1Q(3)40C185(2)(4)65
(1)49470Q01225(2)E(3)	2.2	3	0.240 (6.10)	K, M	N, L, J	L1Q(3)30C225(2)(4)24
(1)49470Q01275(2)E(3)	2.7	3	0.360 (9.14)	K, M	N, L, J	L1Q(3)30C275(2)(4)36
(1)49470Q01335(2)E(3)	3.3	3	0.360 (9.14)	K, M	N, L, J	L1Q(3)30C335(2)(4)36
(1)49470Q01395(2)E(3)	3.9	3	0.360 (9.14)	K, M	N, L, J	L1Q(3)30C395(2)(4)36
(1)49470Q01475(2)E(3)	4.7	3	0.480 (12.19)	K, M	N, L, J	L1Q(3)30C475(2)(4)48
(1)49470Q01565(2)E(3)	5.6	3	0.650 (16.51)	K, M	N, L, J	L1Q(3)30C565(2)(4)65
MIL–PRF–49470 P/N[1]	**Capacitance (µF)**	**Case Code**	**Height A inch (mm)**	**Capacitance Tolerance**	**Lead Configuration**	**KEMET P/N[1]**

[1] Complete P/N requires additional characters in the numbered positions provided in order to indicate product level (B level or T level), capacitance tolerance and lead configuration. For each numbered position, available options are as follows:

(1) Test level character "M" for B level, or "T" for T level (MIL-PRF-49470/1 part number only).

(2) Capacitance tolerance character " K" or " M".

(3) Lead style character " N", "L" or "J".

(4) Test level character "B" for B level, or "T" for T level (KEMET part number only).

Table 1B – Product Selection 25 VDC

Commercial/Non-Standard – Customer Specific Unencapsulated, Horizontally Stacked					
KEMET P/N[1]	**Capacitance (µF)**	**Case Code**	**Height A inch (mm)**	**Capacitance Tolerance**	**Lead Configuration**
25 VDC – BX Dielectric					
L1X(1)503824(2)(3)12	0.82	5	0.120 (3.05)	K, M	N, L, J
L1X(1)503105(2)(3)12	1	5	0.120 (3.05)	K, M	N, L, J
L1X(1)503125(2)(3)12	1.2	5	0.120 (3.05)	K, M	N, L, J
L1X(1)503155(2)(3)12	1.5	5	0.120 (3.05)	K, M	N, L, J
L1X(1)503185(2)(3)24	1.8	5	0.240 (6.10)	K, M	N, L, J
L1X(1)403225(2)(3)12	2.2	4	0.120 (3.05)	K, M	N, L, J
L1X(1)503225(2)(3)24	2.2	5	0.240 (6.10)	K, M	N, L, J
L1X(1)503255(2)(3)24	2.5	5	0.240 (6.10)	K, M	N, L, J
L1X(1)403275(2)(3)12	2.7	4	0.120 (3.05)	K, M	N, L, J
L1X(1)503275(2)(3)24	2.7	5	0.240 (6.10)	K, M	N, L, J
L1X(1)403335(2)(3)12	3.3	4	0.120 (3.05)	K, M	N, L, J
L1X(1)503335(2)(3)36	3.3	5	0.360 (9.14)	K, M	N, L, J
L1X(1)403395(2)(3)12	3.9	4	0.120 (3.05)	K, M	N, L, J
L1X(1)503395(2)(3)36	3.9	5	0.360 (9.14)	K, M	N, L, J
L1X(1)403475(2)(3)12	4.7	4	0.120 (3.05)	K, M	N, L, J
L1X(1)503475(2)(3)36	4.7	5	0.360 (9.14)	K, M	N, L, J
L1X(1)403565(2)(3)24	5.6	4	0.240 (6.10)	K, M	N, L, J
L1X(1)503565(2)(3)48	5.6	5	0.480 (12.19)	K, M	N, L, J
L1X(1)403605(2)(3)24	6	4	0.240 (6.10)	K, M	N, L, J
L1X(1)503605(2)(3)48	6	5	0.480 (12.19)	K, M	N, L, J
L1X(1)303685(2)(3)12	6.8	3	0.120 (3.05)	K, M	N, L, J
L1X(1)403685(2)(3)24	6.8	4	0.240 (6.10)	K, M	N, L, J
L1X(1)503685(2)(3)65	6.8	5	0.650 (16.51)	K, M	N, L, J
L1X(1)403755(2)(3)24	7.5	4	0.240 (6.10)	K, M	N, L, J
L1X(1)503755(2)(3)65	7.5	5	0.650 (16.51)	K, M	N, L, J
L1X(1)303825(2)(3)12	8.2	3	0.120 (3.05)	K, M	N, L, J
L1X(1)403825(2)(3)24	8.2	4	0.240 (6.10)	K, M	N, L, J
L1X(1)303106(2)(3)12	10	3	0.120 (3.05)	K, M	N, L, J
L1X(1)403106(2)(3)24	10	4	0.240 (6.10)	K, M	N, L, J
L1X(1)303116(2)(3)12	11	3	0.120 (3.05)	K, M	N, L, J
L1X(1)303126(2)(3)12	12	3	0.120 (3.05)	K, M	N, L, J
L1X(1)403126(2)(3)36	12	4	0.360 (9.14)	K, M	N, L, J
L1X(1)303156(2)(3)12	15	3	0.120 (3.05)	K, M	N, L, J
L1X(1)403156(2)(3)36	15	4	0.360 (9.14)	K, M	N, L, J
L1X(1)303166(2)(3)24	16	3	0.240 (6.10)	K, M	N, L, J
L1X(1)403166(2)(3)48	16	4	0.480 (12.19)	K, M	N, L, J
L1X(1)303186(2)(3)24	18	3	0.240 (6.10)	K, M	N, L, J
L1X(1)403186(2)(3)48	18	4	0.480 (12.19)	K, M	N, L, J
L1X(1)303206(2)(3)24	20	3	0.240 (6.10)	K, M	N, L, J
L1X(1)403206(2)(3)48	20	4	0.480 (12.19)	K, M	N, L, J
L1X(1)303226(2)(3)24	22	3	0.240 (6.10)	K, M	N, L, J
L1X(1)403226(2)(3)65	22	4	0.650 (16.51)	K, M	N, L, J
L1X(1)403246(2)(3)65	24	4	0.650 (16.51)	K, M	N, L, J
L1X(1)303276(2)(3)24	27	3	0.240 (6.10)	K, M	N, L, J
L1X(1)303306(2)(3)24	30	3	0.240 (6.10)	K, M	N, L, J
L1X(1)303306(2)(3)36	30	3	0.360 (9.14)	K, M	N, L, J
L1X(1)303336(2)(3)36	33	3	0.360 (9.14)	K, M	N, L, J
L1X(1)303396(2)(3)36	39	3	0.360 (9.14)	K, M	N, L, J
L1X(1)303456(2)(3)36	45	3	0.360 (9.14)	K, M	N, L, J
L1X(1)303506(2)(3)48	50	3	0.480 (12.19)	K, M	N, L, J
L1X(1)303546(2)(3)48	54	3	0.480 (12.19)	K, M	N, L, J
L1X(1)303606(2)(3)48	60	3	0.480 (12.19)	K, M	N, L, J
KEMET P/N[1]	**Capacitance (µF)**	**Case Code**	**Height A inch (mm)**	**Capacitance Tolerance**	**Lead Configuration**

[1] Complete part number requires additional characters in the numbered positions provided in order to indicate testing option, capacitance tolerance and lead configuration. For each numbered position, available options are as follows:

(1) Lead style character " N", "L", "M", "J", or "K".

(2) Capacitance tolerance character " K" or " M".

(3) Testing option character "S" for Commercial, or "X" for non-standard (customer specific).

Table 1B – Commercial/Non-Standard – Product Selection 25 – 50 VDC cont.

Commercial/Non-Standard – Customer Specific Unencapsulated, Horizontally Stacked					
KEMET P/N[1]	Capacitance (µF)	Case Code	Height A inch (mm)	Capacitance Tolerance	Lead Configuration
L1X(1)303666(2)(3)65	66	3	0.650 (16.51)	K, M	N, L, J
L1X(1)303726(2)(3)65	72	3	0.650 (16.51)	K, M	N, L, J
L1X(1)303756(2)(3)65	75	3	0.650 (16.51)	K, M	N, L, J
50VDC - BX Dielectric					
L1X(1)505824(2)(3)12	0.82	5	0.120 (3.05)	K, M	N, L, J
L1X(1)505105(2)(3)12	1	5	0.120 (3.05)	K, M	N, L, J
L1X(1)505125(2)(3)12	1.2	5	0.120 (3.05)	K, M	N, L, J
L1X(1)505155(2)(3)12	1.5	5	0.120 (3.05)	K, M	N, L, J
L1X(1)505185(2)(3)24	1.8	5	0.240 (6.10)	K, M	N, L, J
L1X(1)405225(2)(3)12	2.2	4	0.120 (3.05)	K, M	N, L, J
L1X(1)505225(2)(3)24	2.2	5	0.240 (6.10)	K, M	N, L, J
L1X(1)505255(2)(3)24	2.5	5	0.240 (6.10)	K, M	N, L, J
L1X(1)405275(2)(3)12	2.7	4	0.120 (3.05)	K, M	N, L, J
L1X(1)505275(2)(3)24	2.7	5	0.240 (6.10)	K, M	N, L, J
L1X(1)505275(2)(3)36	2.7	5	0.360 (9.14)	K, M	N, L, J
L1X(1)405335(2)(3)12	3.3	4	0.120 (3.05)	K, M	N, L, J
L1X(1)505335(2)(3)36	3.3	5	0.360 (9.14)	K, M	N, L, J
L1X(1)405395(2)(3)12	3.9	4	0.120 (3.05)	K, M	N, L, J
L1X(1)505395(2)(3)36	3.9	5	0.360 (9.14)	K, M	N, L, J
L1X(1)405475(2)(3)12	4.7	4	0.120 (3.05)	K, M	N, L, J
L1X(1)505475(2)(3)36	4.7	5	0.360 (9.14)	K, M	N, L, J
L1X(1)405565(2)(3)24	5.6	4	0.240 (6.10)	K, M	N, L, J
L1X(1)505565(2)(3)48	5.6	5	0.480 (12.19)	K, M	N, L, J
L1X(1)405605(2)(3)24	6	4	0.240 (6.10)	K, M	N, L, J
L1X(1)505605(2)(3)48	6	5	0.480 (12.19)	K, M	N, L, J
L1X(1)305685(2)(3)12	6.8	3	0.120 (3.05)	K, M	N, L, J
L1X(1)405685(2)(3)24	6.8	4	0.240 (6.10)	K, M	N, L, J
L1X(1)505685(2)(3)65	6.8	5	0.650 (16.51)	K, M	N, L, J
L1X(1)405755(2)(3)24	7.5	4	0.240 (6.10)	K, M	N, L, J
L1X(1)505755(2)(3)65	7.5	5	0.650 (16.51)	K, M	N, L, J
L1X(1)305825(2)(3)12	8.2	3	0.120 (3.05)	K, M	N, L, J
L1X(1)405825(2)(3)24	8.2	4	0.240 (6.10)	K, M	N, L, J
L1X(1)305106(2)(3)12	10	3	0.120 (3.05)	K, M	N, L, J
L1X(1)405106(2)(3)24	10	4	0.240 (6.10)	K, M	N, L, J
L1X(1)305116(2)(3)12	11	3	0.120 (3.05)	K, M	N, L, J
L1X(1)305126(2)(3)12	12	3	0.120 (3.05)	K, M	N, L, J
L1X(1)405126(2)(3)36	12	4	0.360 (9.14)	K, M	N, L, J
L1X(1)305156(2)(3)12	15	3	0.120 (3.05)	K, M	N, L, J
L1X(1)405156(2)(3)36	15	4	0.360 (9.14)	K, M	N, L, J
L1X(1)305166(2)(3)24	16	3	0.240 (6.10)	K, M	N, L, J
L1X(1)405166(2)(3)48	16	4	0.480 (12.19)	K, M	N, L, J
L1X(1)305186(2)(3)24	18	3	0.240 (6.10)	K, M	N, L, J
L1X(1)405186(2)(3)48	18	4	0.480 (12.19)	K, M	N, L, J
L1X(1)305206(2)(3)24	20	3	0.240 (6.10)	K, M	N, L, J
L1X(1)405206(2)(3)48	20	4	0.480 (12.19)	K, M	N, L, J
L1X(1)305226(2)(3)24	22	3	0.240 (6.10)	K, M	N, L, J
L1X(1)405226(2)(3)65	22	4	0.650 (16.51)	K, M	N, L, J
L1X(1)405246(2)(3)65	24	4	0.650 (16.51)	K, M	N, L, J
L1X(1)305276(2)(3)24	27	3	0.240 (6.10)	K, M	N, L, J
L1X(1)305306(2)(3)24	30	3	0.240 (6.10)	K, M	N, L, J
L1X(1)305336(2)(3)36	33	3	0.360 (9.14)	K, M	N, L, J
L1X(1)305396(2)(3)36	39	3	0.360 (9.14)	K, M	N, L, J
L1X(1)305456(2)(3)36	45	3	0.360 (9.14)	K, M	N, L, J
KEMET P/N[1]	**Capacitance (µF)**	**Case Code**	**Height A inch (mm)**	**Capacitance Tolerance**	**Lead Configuration**

[1] Complete part number requires additional characters in the numbered positions provided in order to indicate testing option, capacitance tolerance and lead configuration. For each numbered position, available options are as follows:

(1) Lead style character " N", "L" or "J".

(2) Capacitance tolerance character " K" or " M".

(3) Testing option character "S" for Commercial, or "X" for non-standard (customer specific).

Table 1B – Commercial/Non-Standard – Product Selection 50 – 100 VDC cont.

Commercial/Non-Standard – Customer Specific Unencapsulated, Horizontally Stacked					
KEMET P/N[1]	**Capacitance (µF)**	**Case Code**	**Height A inch (mm)**	**Capacitance Tolerance**	**Lead Configuration**
L1X(1)305506(2)(3)48	50	3	0.480 (12.19)	K, M	N, L, J
L1X(1)305546(2)(3)48	54	3	0.480 (12.19)	K, M	N, L, J
L1X(1)305606(2)(3)48	60	3	0.480 (12.19)	K, M	N, L, J
L1X(1)305666(2)(3)65	66	3	0.650 (16.51)	K, M	N, L, J
L1X(1)305726(2)(3)65	72	3	0.650 (16.51)	K, M	N, L, J
L1X(1)305756(2)(3)65	75	3	0.650 (16.51)	K, M	N, L, J
100VDC - BR Dielectric					
L1R(1)501564(2)(3)12	0.56	5	0.120 (3.05)	K, M	N, L, J
L1R(1)501684(2)(3)12	0.68	5	0.120 (3.05)	K, M	N, L, J
L1R(1)501754(2)(3)12	0.75	5	0.120 (3.05)	K, M	N, L, J
L1R(1)501824(2)(3)12	0.82	5	0.120 (3.05)	K, M	N, L, J
L1R(1)501105(2)(3)12	1	5	0.120 (3.05)	K, M	N, L, J
L1R(1)501125(2)(3)12	1.2	5	0.120 (3.05)	K, M	N, L, J
L1R(1)401155(2)(3)12	1.5	4	0.120 (3.05)	K, M	N, L, J
L1R(1)501155(2)(3)24	1.5	5	0.240 (6.10)	K, M	N, L, J
L1R(1)401185(2)(3)12	1.8	4	0.120 (3.05)	K, M	N, L, J
L1R(1)501185(2)(3)24	1.8	5	0.240 (6.10)	K, M	N, L, J
L1R(1)401225(2)(3)12	2.2	4	0.120 (3.05)	K, M	N, L, J
L1R(1)501225(2)(3)24	2.2	5	0.240 (6.10)	K, M	N, L, J
L1R(1)501255(2)(3)24	2.5	5	0.240 (6.10)	K, M	N, L, J
L1R(1)401275(2)(3)12	2.7	4	0.120 (3.05)	K, M	N, L, J
L1R(1)501275(2)(3)36	2.7	5	0.360 (9.14)	K, M	N, L, J
L1R(1)401335(2)(3)12	3.3	4	0.120 (3.05)	K, M	N, L, J
L1R(1)501335(2)(3)36	3.3	5	0.360 (9.14)	K, M	N, L, J
L1R(1)401395(2)(3)12	3.9	4	0.120 (3.05)	K, M	N, L, J
L1R(1)501395(2)(3)48	3.9	5	0.480 (12.19)	K, M	N, L, J
L1R(1)401475(2)(3)24	4.7	4	0.240 (6.10)	K, M	N, L, J
L1R(1)501475(2)(3)48	4.7	5	0.480 (12.19)	K, M	N, L, J
L1R(1)301565(2)(3)12	5.6	3	0.120 (3.05)	K, M	N, L, J
L1R(1)401565(2)(3)24	5.6	4	0.240 (6.10)	K, M	N, L, J
L1R(1)501565(2)(3)65	5.6	5	0.650 (16.51)	K, M	N, L, J
L1R(1)301605(2)(3)12	6	3	0.120 (3.05)	K, M	N, L, J
L1R(1)401605(2)(3)24	6	4	0.240 (6.10)	K, M	N, L, J
L1R(1)501605(2)(3)65	6	5	0.650 (16.51)	K, M	N, L, J
L1R(1)301685(2)(3)12	6.8	3	0.120 (3.05)	K, M	N, L, J
L1R(1)401685(2)(3)24	6.8	4	0.240 (6.10)	K, M	N, L, J
L1R(1)401755(2)(3)24	7.5	4	0.240 (6.10)	K, M	N, L, J
L1R(1)301825(2)(3)12	8.2	3	0.120 (3.05)	K, M	N, L, J
L1R(1)401825(2)(3)36	8.2	4	0.360 (9.14)	K, M	N, L, J
L1R(1)301106(2)(3)12	10	3	0.120 (3.05)	K, M	N, L, J
L1R(1)401106(2)(3)36	10	4	0.360 (9.14)	K, M	N, L, J
L1R(1)301116(2)(3)12	11	3	0.120 (3.05)	K, M	N, L, J
L1R(1)301126(2)(3)24	12	3	0.240 (6.10)	K, M	N, L, J
L1R(1)401126(2)(3)48	12	4	0.480 (12.19)	K, M	N, L, J
L1R(1)301156(2)(3)24	15	3	0.240 (6.10)	K, M	N, L, J
L1R(1)401156(2)(3)48	15	4	0.480 (12.19)	K, M	N, L, J
L1R(1)301166(2)(3)24	16	3	0.240 (6.10)	K, M	N, L, J
L1R(1)401166(2)(3)65	16	4	0.650 (16.51)	K, M	N, L, J
L1R(1)301186(2)(3)24	18	3	0.240 (6.10)	K, M	N, L, J
L1R(1)401186(2)(3)65	18	4	0.650 (16.51)	K, M	N, L, J
L1R(1)301206(2)(3)24	20	3	0.240 (6.10)	K, M	N, L, J
L1R(1)301226(2)(3)36	22	3	0.360 (9.14)	K, M	N, L, J
L1R(1)301276(2)(3)36	27	3	0.360 (9.14)	K, M	N, L, J
KEMET P/N[1]	**Capacitance (µF)**	**Case Code**	**Height A inch (mm)**	**Capacitance Tolerance**	**Lead Configuration**

[1] Complete part number requires additional characters in the numbered positions provided in order to indicate testing option, capacitance tolerance and lead configuration. For each numbered position, available options are as follows:

(1) Lead style character " N", "L" or "J".

(2) Capacitance tolerance character " K" or " M".

(3) Testing option character "S" for Commercial, or "X" for non-standard (customer specific).

Table 1B – Commercial/Non-Standard – Product Selection 100 – 200 VDC cont.

Commercial/Non-Standard – Customer Specific Unencapsulated, Horizontally Stacked					
KEMET P/N[1]	**Capacitance (µF)**	**Case Code**	**Height A inch (mm)**	**Capacitance Tolerance**	**Lead Configuration**
L1R(1)301306(2)(3)36	30	3	0.360 (9.14)	K, M	N, L, J
L1R(1)301336(2)(3)48	33	3	0.480 (12.19)	K, M	N, L, J
L1R(1)301396(2)(3)48	39	3	0.480 (12.19)	K, M	N, L, J
L1R(1)301456(2)(3)65	45	3	0.650 (16.51)	K, M	N, L, J
L1R(1)301506(2)(3)65	50	3	0.650 (16.51)	K, M	N, L, J
200 VDC – BQ Dielectric					
L1Q(1)502334(2)(3)12	0.33	5	0.120 (3.05)	K, M	N, L, J
L1Q(1)502394(2)(3)12	0.39	5	0.120 (3.05)	K, M	N, L, J
L1Q(1)502474(2)(3)12	0.47	5	0.120 (3.05)	K, M	N, L, J
L1Q(1)502564(2)(3)12	0.56	5	0.120 (3.05)	K, M	N, L, J
L1Q(1)502684(2)(3)12	0.68	5	0.120 (3.05)	K, M	N, L, J
L1Q(1)502754(2)(3)12	0.75	5	0.120 (3.05)	K, M	N, L, J
L1Q(1)402824(2)(3)12	0.82	4	0.120 (3.05)	K, M	N, L, J
L1Q(1)502824(2)(3)24	0.82	5	0.240 (6.10)	K, M	N, L, J
L1Q(1)402105(2)(3)12	1	4	0.120 (3.05)	K, M	N, L, J
L1Q(1)502105(2)(3)24	1	5	0.240 (6.10)	K, M	N, L, J
L1Q(1)402125(2)(3)12	1.2	4	0.120 (3.05)	K, M	N, L, J
L1Q(1)502125(2)(3)24	1.2	5	0.240 (6.10)	K, M	N, L, J
L1Q(1)402155(2)(3)12	1.5	4	0.120 (3.05)	K, M	N, L, J
L1Q(1)502155(2)(3)36	1.5	5	0.360 (9.14)	K, M	N, L, J
L1Q(1)402185(2)(3)12	1.8	4	0.120 (3.05)	K, M	N, L, J
L1Q(1)502185(2)(3)36	1.8	5	0.360 (9.14)	K, M	N, L, J
L1Q(1)402225(2)(3)24	2.2	4	0.240 (6.10)	K, M	N, L, J
L1Q(1)502225(2)(3)48	2.2	5	0.480 (12.19)	K, M	N, L, J
L1Q(1)302245(2)(3)12	2.4	3	0.120 (3.05)	K, M	N, L, J
L1Q(1)502255(2)(3)48	2.5	5	0.480 (12.19)	K, M	N, L, J
L1Q(1)302275(2)(3)12	2.7	3	0.120 (3.05)	K, M	N, L, J
L1Q(1)402275(2)(3)24	2.7	4	0.240 (6.10)	K, M	N, L, J
L1Q(1)502275(2)(3)48	2.7	5	0.480 (12.19)	K, M	N, L, J
L1Q(1)302335(2)(3)12	3.3	3	0.120 (3.05)	K, M	N, L, J
L1Q(1)402335(2)(3)24	3.3	4	0.240 (6.10)	K, M	N, L, J
L1Q(1)502335(2)(3)65	3.3	5	0.650 (16.51)	K, M	N, L, J
L1Q(1)302365(2)(3)12	3.6	3	0.120 (3.05)	K, M	N, L, J
L1Q(1)302395(2)(3)12	3.9	3	0.120 (3.05)	K, M	N, L, J
L1Q(1)402395(2)(3)24	3.9	4	0.240 (6.10)	K, M	N, L, J
L1Q(1)302475(2)(3)12	4.7	3	0.120 (3.05)	K, M	N, L, J
L1Q(1)402475(2)(3)36	4.7	4	0.360 (9.14)	K, M	N, L, J
L1Q(1)302565(2)(3)12	5.6	3	0.120 (3.05)	K, M	N, L, J
L1Q(1)402565(2)(3)36	5.6	4	0.360 (9.14)	K, M	N, L, J
L1Q(1)302605(2)(3)12	6	3	0.120 (3.05)	K, M	N, L, J
L1Q(1)402605(2)(3)36	6	4	0.360 (9.14)	K, M	N, L, J
L1Q(1)302685(2)(3)24	6.8	3	0.240 (6.10)	K, M	N, L, J
L1Q(1)402685(2)(3)48	6.8	4	0.480 (12.19)	K, M	N, L, J
L1Q(1)402755(2)(3)48	7.5	4	0.480 (12.19)	K, M	N, L, J
L1Q(1)302825(2)(3)24	8.2	3	0.240 (6.10)	K, M	N, L, J
L1Q(1)402825(2)(3)65	8.2	4	0.650 (16.51)	K, M	N, L, J
L1Q(1)302106(2)(3)24	10	3	0.240 (6.10)	K, M	N, L, J
L1Q(1)402106(2)(3)65	10	4	0.650 (16.51)	K, M	N, L, J
L1Q(1)302116(2)(3)24	11	3	0.240 (6.10)	K, M	N, L, J
L1Q(1)302126(2)(3)36	12	3	0.360 (9.14)	K, M	N, L, J
L1Q(1)302156(2)(3)36	15	3	0.360 (9.14)	K, M	N, L, J
L1Q(1)302166(2)(3)36	16	3	0.360 (9.14)	K, M	N, L, J
L1Q(1)302186(2)(3)48	18	3	0.480 (12.19)	K, M	N, L, J
KEMET P/N[1]	**Capacitance (µF)**	**Case Code**	**Height A inch (mm)**	**Capacitance Tolerance**	**Lead Configuration**

[1] Complete part number requires additional characters in the numbered positions provided in order to indicate testing option, capacitance tolerance and lead configuration. For each numbered position, available options are as follows:

(1) Lead style character " N", "L" or "J".

(2) Capacitance tolerance character " K" or " M".

(3) Testing option character "S" for Commercial, or "X" for non-standard (customer specific).

Table 1B – Commercial/Non-Standard – Product Selection 200 – 630 VDC cont.

Commercial/Non-Standard – Customer Specific Unencapsulated, Horizontally Stacked					
KEMET P/N[1]	**Capacitance (µF)**	**Case Code**	**Height A inch (mm)**	**Capacitance Tolerance**	**Lead Configuration**
L1Q(1)302206(2)(3)48	20	3	0.480 (12.19)	K, M	N, L, J
L1Q(1)302226(2)(3)48	22	3	0.480 (12.19)	K, M	N, L, J
L1Q(1)302276(2)(3)65	27	3	0.650 (16.51)	K, M	N, L, J
500VDC - X7R Dielectric					
L1W(1)50C124(2)(3)12	0.12	5	0.120 (3.05)	K, M	N, L, J
L1W(1)50C154(2)(3)12	0.15	5	0.120 (3.05)	K, M	N, L, J
L1W(1)50C184(2)(3)12	0.18	5	0.120 (3.05)	K, M	N, L, J
L1W(1)50C224(2)(3)12	0.22	5	0.120 (3.05)	K, M	N, L, J
L1W(1)50C274(2)(3)12	0.27	5	0.120 (3.05)	K, M	N, L, J
L1W(1)50C334(2)(3)24	0.33	5	0.240 (6.10)	K, M	N, L, J
L1W(1)40C394(2)(3)12	0.39	4	0.120 (3.05)	K, M	N, L, J
L1W(1)50C394(2)(3)24	0.39	5	0.240 (6.10)	K, M	N, L, J
L1W(1)40C474(2)(3)12	0.47	4	0.120 (3.05)	K, M	N, L, J
L1W(1)50C474(2)(3)24	0.47	5	0.240 (6.10)	K, M	N, L, J
L1W(1)50C564(2)(3)24	0.56	5	0.240 (6.10)	K, M	N, L, J
L1W(1)40C684(2)(3)12	0.68	4	0.120 (3.05)	K, M	N, L, J
L1W(1)50C684(2)(3)36	0.68	5	0.360 (9.14)	K, M	N, L, J
L1W(1)50C754(2)(3)36	0.75	5	0.360 (9.14)	K, M	N, L, J
L1W(1)40C824(2)(3)12	0.82	4	0.120 (3.05)	K, M	N, L, J
L1W(1)50C824(2)(3)36	0.82	5	0.360 (9.14)	K, M	N, L, J
L1W(1)30C105(2)(3)12	1	3	0.120 (3.05)	K, M	N, L, J
L1W(1)40C105(2)(3)24	1	4	0.240 (6.10)	K, M	N, L, J
L1W(1)50C105(2)(3)48	1	5	0.480 (12.19)	K, M	N, L, J
L1W(1)30C125(2)(3)12	1.2	3	0.120 (3.05)	K, M	N, L, J
L1W(1)40C125(2)(3)24	1.2	4	0.240 (6.10)	K, M	N, L, J
L1W(1)50C125(2)(3)65	1.2	5	0.650 (16.51)	K, M	N, L, J
L1W(1)30C155(2)(3)12	1.5	3	0.120 (3.05)	K, M	N, L, J
L1W(1)40C155(2)(3)24	1.5	4	0.240 (6.10)	K, M	N, L, J
L1W(1)50C155(2)(3)65	1.5	5	0.650 (16.51)	K, M	N, L, J
L1W(1)40C185(2)(3)36	1.8	4	0.360 (9.14)	K, M	N, L, J
L1W(1)30C225(2)(3)12	2.2	3	0.120 (3.05)	K, M	N, L, J
L1W(1)40C225(2)(3)36	2.2	4	0.360 (9.14)	K, M	N, L, J
L1W(1)30C245(2)(3)12	2.4	3	0.120 (3.05)	K, M	N, L, J
L1W(1)30C275(2)(3)12	2.7	3	0.120 (3.05)	K, M	N, L, J
L1W(1)40C275(2)(3)48	2.7	4	0.480 (12.19)	K, M	N, L, J
L1W(1)30C335(2)(3)24	3.3	3	0.240 (6.10)	K, M	N, L, J
L1W(1)40C335(2)(3)48	3.3	4	0.480 (12.19)	K, M	N, L, J
L1W(1)30C365(2)(3)24	3.6	3	0.240 (6.10)	K, M	N, L, J
L1W(1)30C395(2)(3)24	3.9	3	0.240 (6.10)	K, M	N, L, J
L1W(1)40C395(2)(3)65	3.9	4	0.650 (16.51)	K, M	N, L, J
L1W(1)30C475(2)(3)24	4.7	3	0.240 (6.10)	K, M	N, L, J
L1W(1)30C565(2)(3)24	5.6	3	0.240 (6.10)	K, M	N, L, J
L1W(1)30C605(2)(3)24	6	3	0.240 (6.10)	K, M	N, L, J
L1W(1)30C685(2)(3)36	6.8	3	0.360 (9.14)	K, M	N, L, J
L1W(1)30C825(2)(3)36	8.2	3	0.360 (9.14)	K, M	N, L, J
L1W(1)30C106(2)(3)48	10	3	0.480 (12.19)	K, M	N, L, J
L1W(1)30C116(2)(3)65	11	3	0.650 (16.51)	K, M	N, L, J
L1W(1)30C126(2)(3)65	12	3	0.650 (16.51)	K, M	N, L, J
630VDC - X7R Dielectric					
L1W(1)50B683(2)(3)12	0.068	5	0.120 (3.05)	K, M	N, L, J
L1W(1)40B104(2)(3)12	0.1	4	0.120 (3.05)	K, M	N, L, J
L1W(1)50B104(2)(3)12	0.1	5	0.120 (3.05)	K, M	N, L, J
KEMET P/N[1]	**Capacitance (µF)**	**Case Code**	**Height A inch (mm)**	**Capacitance Tolerance**	**Lead Configuration**

[1] Complete part number requires additional characters in the numbered positions provided in order to indicate testing option, capacitance tolerance and lead configuration. For each numbered position, available options are as follows:
(1) Lead style character " N", "L" or "J".
(2) Capacitance tolerance character " K" or " M".
(3) Testing option character "S" for Commercial, or "X" for non-standard (customer specific).

Table 1B – Commercial/Non-Standard – Product Selection 630 – 1,000 VDC cont.

Commercial/Non-Standard – Customer Specific Unencapsulated, Horizontally Stacked					
KEMET P/N[1]	**Capacitance (µF)**	**Case Code**	**Height A inch (mm)**	**Capacitance Tolerance**	**Lead Configuration**
L1W(1)50B124(2)(3)12	0.12	5	0.120 (3.05)	K, M	N, L, J
L1W(1)50B154(2)(3)12	0.15	5	0.120 (3.05)	K, M	N, L, J
L1W(1)50B184(2)(3)24	0.18	5	0.240 (6.10)	K, M	N, L, J
L1W(1)30B224(2)(3)12	0.22	3	0.120 (3.05)	K, M	N, L, J
L1W(1)40B224(2)(3)12	0.22	4	0.120 (3.05)	K, M	N, L, J
L1W(1)50B224(2)(3)24	0.22	5	0.240 (6.10)	K, M	N, L, J
L1W(1)50B274(2)(3)24	0.27	5	0.240 (6.10)	K, M	N, L, J
L1W(1)30B334(2)(3)12	0.33	3	0.120 (3.05)	K, M	N, L, J
L1W(1)50B334(2)(3)36	0.33	5	0.360 (9.14)	K, M	N, L, J
L1W(1)40B394(2)(3)12	0.39	4	0.120 (3.05)	K, M	N, L, J
L1W(1)50B394(2)(3)36	0.39	5	0.360 (9.14)	K, M	N, L, J
L1W(1)30B474(2)(3)12	0.47	3	0.120 (3.05)	K, M	N, L, J
L1W(1)40B474(2)(3)24	0.47	4	0.240 (6.10)	K, M	N, L, J
L1W(1)50B474(2)(3)36	0.47	5	0.360 (9.14)	K, M	N, L, J
L1W(1)50B564(2)(3)48	0.56	5	0.480 (12.19)	K, M	N, L, J
L1W(1)30B684(2)(3)12	0.68	3	0.120 (3.05)	K, M	N, L, J
L1W(1)40B684(2)(3)24	0.68	4	0.240 (6.10)	K, M	N, L, J
L1W(1)50B684(2)(3)65	0.68	5	0.650 (16.51)	K, M	N, L, J
L1W(1)50B754(2)(3)65	0.75	5	0.650 (16.51)	K, M	N, L, J
L1W(1)40B824(2)(3)24	0.82	4	0.240 (6.10)	K, M	N, L, J
L1W(1)30B105(2)(3)12	1	3	0.120 (3.05)	K, M	N, L, J
L1W(1)40B105(2)(3)36	1	4	0.360 (9.14)	K, M	N, L, J
L1W(1)30B125(2)(3)12	1.2	3	0.120 (3.05)	K, M	N, L, J
L1W(1)40B125(2)(3)36	1.2	4	0.360 (9.14)	K, M	N, L, J
L1W(1)30B155(2)(3)12	1.5	3	0.120 (3.05)	K, M	N, L, J
L1W(1)40B155(2)(3)48	1.5	4	0.480 (12.19)	K, M	N, L, J
L1W(1)40B185(2)(3)48	1.8	4	0.480 (12.19)	K, M	N, L, J
L1W(1)30B225(2)(3)24	2.2	3	0.240 (6.10)	K, M	N, L, J
L1W(1)40B225(2)(3)65	2.2	4	0.650 (16.51)	K, M	N, L, J
L1W(1)30B245(2)(3)24	2.4	3	0.240 (6.10)	K, M	N, L, J
L1W(1)30B275(2)(3)24	2.7	3	0.240 (6.10)	K, M	N, L, J
L1W(1)30B335(2)(3)36	3.3	3	0.360 (9.14)	K, M	N, L, J
L1W(1)30B365(2)(3)36	3.6	3	0.360 (9.14)	K, M	N, L, J
L1W(1)30B395(2)(3)36	3.9	3	0.360 (9.14)	K, M	N, L, J
L1W(1)30B475(2)(3)36	4.7	3	0.360 (9.14)	K, M	N, L, J
L1W(1)30B565(2)(3)48	5.6	3	0.480 (12.19)	K, M	N, L, J
L1W(1)30B605(2)(3)65	6	3	0.650 (16.51)	K, M	N, L, J
L1W(1)30B685(2)(3)65	6.8	3	0.650 (16.51)	K, M	N, L, J
1000VDC - X7R Dielectric					
L1W(1)50D473(2)(3)12	0.047	5	0.120 (3.05)	K, M	N, L, J
L1W(1)50D683(2)(3)12	0.068	5	0.120 (3.05)	K, M	N, L, J
L1W(1)30D104(2)(3)12	0.1	3	0.120 (3.05)	K, M	N, L, J
L1W(1)40D104(2)(3)12	0.1	4	0.120 (3.05)	K, M	N, L, J
L1W(1)50D104(2)(3)24	0.1	5	0.240 (6.10)	K, M	N, L, J
L1W(1)50D124(2)(3)24	0.12	5	0.240 (6.10)	K, M	N, L, J
L1W(1)50D154(2)(3)36	0.15	5	0.360 (9.14)	K, M	N, L, J
L1W(1)50D184(2)(3)36	0.18	5	0.360 (9.14)	K, M	N, L, J
L1W(1)30D224(2)(3)12	0.22	3	0.120 (3.05)	K, M	N, L, J
L1W(1)40D224(2)(3)12	0.22	4	0.120 (3.05)	K, M	N, L, J
L1W(1)50D224(2)(3)36	0.22	5	0.360 (9.14)	K, M	N, L, J
L1W(1)50D274(2)(3)48	0.27	5	0.480 (12.19)	K, M	N, L, J
L1W(1)30D334(2)(3)12	0.33	3	0.120 (3.05)	K, M	N, L, J
L1W(1)50D334(2)(3)65	0.33	5	0.650 (16.51)	K, M	N, L, J
KEMET P/N[1]	**Capacitance (µF)**	**Case Code**	**Height A inch (mm)**	**Capacitance Tolerance**	**Lead Configuration**

[1] Complete part number requires additional characters in the numbered positions provided in order to indicate testing option, capacitance tolerance and lead configuration. For each numbered position, available options are as follows:

(1) Lead style character " N", "L" or "J".

(2) Capacitance tolerance character " K" or " M".

(3) Testing option character "S" for Commercial, or "X" for non-standard (customer specific).

Table 1B – Commercial/Non-Standard – Product Selection 1,000 VDC cont.

Commercial/Non-Standard – Customer Specific Unencapsulated, Horizontally Stacked					
KEMET P/N[1]	Capacitance (µF)	Case Code	Height A inch (mm)	Capacitance Tolerance	Lead Configuration
L1W(1)40D394(2)(3)24	0.39	4	0.240 (6.10)	K, M	N, L, J
L1W(1)50D394(2)(3)65	0.39	5	0.650 (16.51)	K, M	N, L, J
L1W(1)30D474(2)(3)12	0.47	3	0.120 (3.05)	K, M	N, L, J
L1W(1)40D474(2)(3)24	0.47	4	0.240 (6.10)	K, M	N, L, J
L1W(1)30D684(2)(3)12	0.68	3	0.120 (3.05)	K, M	N, L, J
L1W(1)40D684(2)(3)36	0.68	4	0.360 (9.14)	K, M	N, L, J
L1W(1)40D824(2)(3)48	0.82	4	0.480 (12.19)	K, M	N, L, J
L1W(1)30D105(2)(3)24	1	3	0.240 (6.10)	K, M	N, L, J
L1W(1)40D105(2)(3)65	1	4	0.650 (16.51)	K, M	N, L, J
L1W(1)30D125(2)(3)24	1.2	3	0.240 (6.10)	K, M	N, L, J
L1W(1)30D155(2)(3)36	1.5	3	0.360 (9.14)	K, M	N, L, J
L1W(1)30D225(2)(3)36	2.2	3	0.360 (9.14)	K, M	N, L, J
L1W(1)30D245(2)(3)48	2.4	3	0.480 (12.19)	K, M	N, L, J
L1W(1)30D275(2)(3)48	2.7	3	0.480 (12.19)	K, M	N, L, J
L1W(1)30D335(2)(3)65	3.3	3	0.650 (16.51)	K, M	N, L, J
KEMET P/N[1]	**Capacitance (µF)**	**Case Code**	**Height A inch (mm)**	**Capacitance Tolerance**	**Lead Configuration**

[1] Complete part number requires additional characters in the numbered positions provided in order to indicate testing option, capacitance tolerance and lead configuration. For each numbered position, available options are as follows:

(1) Lead style character " N", "L" or "J".

(2) Capacitance tolerance character " K" or " M".

(3) Testing option character "S" for Commercial, or "X" for non-standard (customer specific).

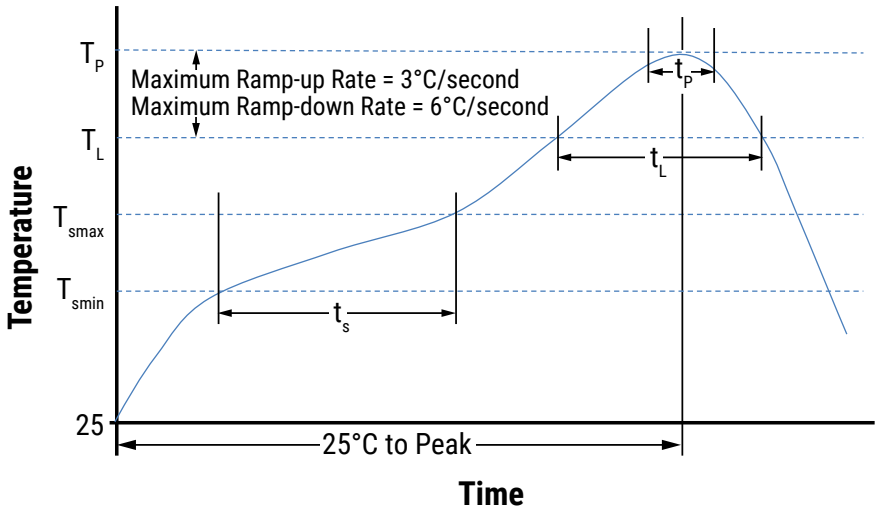
Soldering Process

The capacitors and assemblies outlined in this specification sheet are susceptible to thermal shock damage due to their large ceramic mass. Temperature profiles used should provide adequate temperature rise and cool-down time to prevent damage from thermal shock. In general, KEMET recommends against hand soldering for these types of large ceramic devices.

Recommended Soldering Technique:

- Solder reflow only

Recommended Reflow Soldering Profile:



Profile Feature	Sn-Pb Assembly
Preheat/Soak	
Temperature Minimum (T_{Smin})	100°C
Temperature Maximum (T_{Smax})	150°C
Time (t_s) from T_{smin} to T_{smax})	60-90 seconds
Ramp-up rate (T_L to T_P)	2°C/seconds
Liquidous temperature (T_L)	183°C
Time above liquidous (t_L)	95 seconds
Peak Temperature (T_P)	240°C
Time within 5°C of maximum peak temperature (t_P)	5 seconds
Ramp-down rate (T_P to T_L)	2°C/seconds
Time 25° C to peak temperature	3.5 minutes

Note 1: All temperatures refer to the center of the package, measured on the package body surface that is facing up during assembly reflow

Preheating and Reflow Profile Notes:
Due to differences in the coefficient of thermal expansion for the different materials of construction, it is critical to monitor and control the heating and cooling rates during the soldering process. During the reflow soldering process, the maximum recommended heating and cooling rate (dT/dt) is 4°C/second. To ensure optimal component reliability, KEMET's recommended heating and cooling rate is 2°C/second. After soldering, the capacitors should be air cooled to room temperature before further processing. Forced air cooling is not recommended.

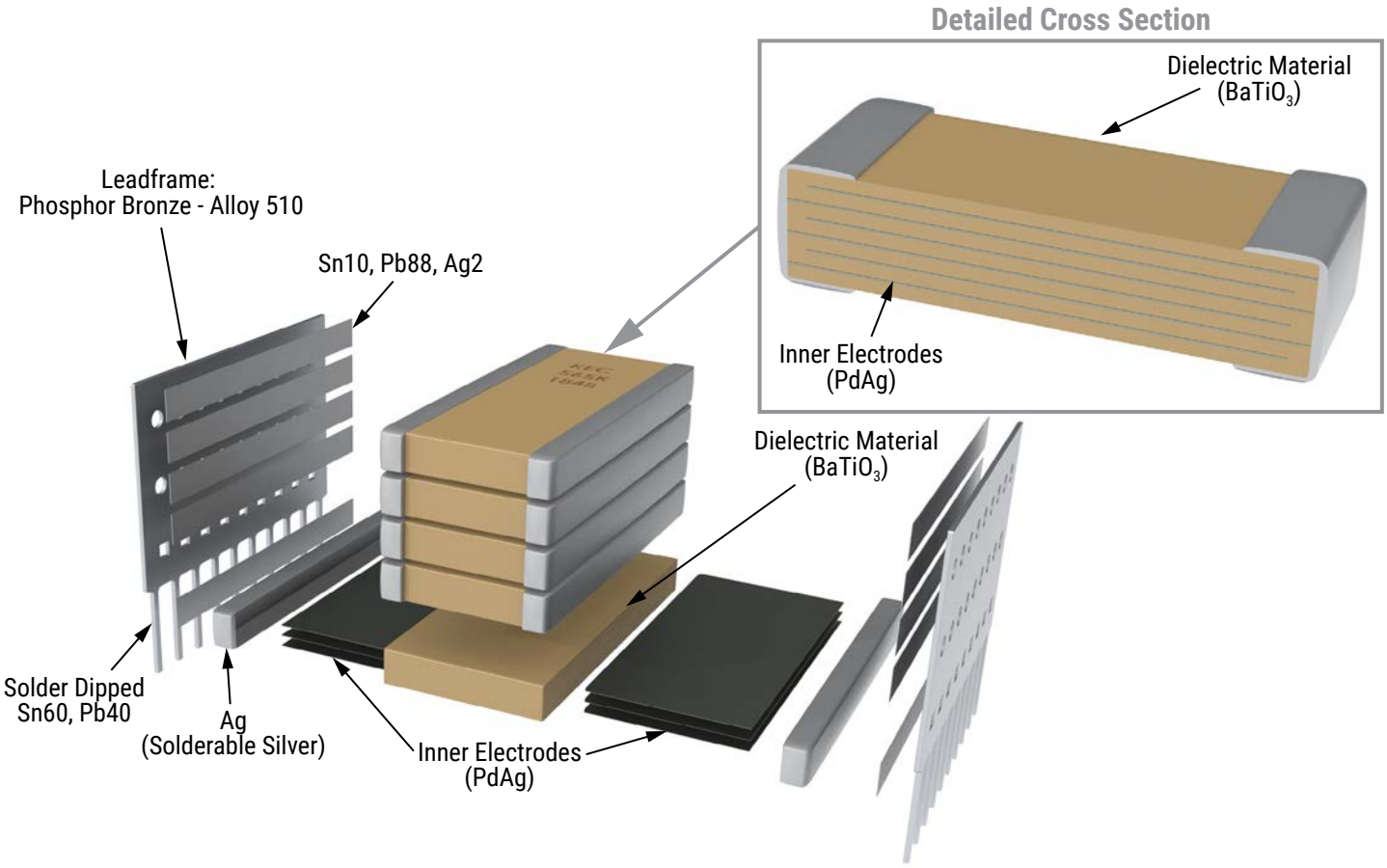
Table 4 – Performance & Reliability: Test Methods and Conditions

Inspection	Test Method	Test Level Option				
		MIL–PRF–49470 B Level (B)	MIL–PRF–49470 T Level (T)	DSSC Drawing 87106 (C)[1]	Commercial (S)	Non-Standard (X)[2]
Ultrasonic Scanning (C-SAM)	Meet EIA–469 Criteria	Not required	Yes (per lot)	Not required	Not required	Optional per Source Controlled Drawing (SCD)
DPA Analysis	EIA–469					
In-Process Visual Inspection	MIL–PRF–49470 Method 4.8.3					
Thermal Shock	MIL–STD–202 Method 107	Yes (5 cycles)	Yes (20 cycles)	Yes (5 cycles)	Not required	Optional per Source Controlled Drawing (SCD)
Voltage Conditioning ≤ 200 V 500 V	MIL–PRF–49470 Method 4.8.5.2 200%V_R at125°C 120%V_R at125°C	Yes (96 hours minimum)	Yes (168 hours minimum)	Yes (96 hours minimum)		
Visual and Mechanical Inspection	MIL–PRF–49470 Method 4.8.4	Yes (per lot)	Yes (per lot)	Yes (per lot)		Yes (per lot)
Solderability	MIL–STD–202 Method 208	Yes (per Inspection lot)		Yes (per inspection lot)		Optional per Source Controlled Drawing (SCD)
DPA Analysis	EIA–469	Not required		Not required		
Voltage–Temperature Limits (TCVC)	MIL–PRF–49470 Method 4.8.13.2	Yes (periodic)	Yes (per lot)	Yes (periodic)	Not required	Optional per Source Controlled Drawing (SCD)
Resistance to Solvents	MIL–STD–202 Method 215					
Terminal Strength	MIL–STD–202 Method 211					
Resistance to Soldering Heat	MIL–STD–202 Method 210					
Moisture Resistance	MIL–STD–202 Method 106					
Marking Legibility	MIL–PRF–49470 Method 4.8.4.1					
Low Voltage Humidity Testing	MIL–STD–202 Method 103	Not required		Not required		
Life Test ≤ 200 V 500 V	MIL–STD–202 Method 108 200%V_R at125°C 120%V_R at125°C	Yes (periodic)		Yes (periodic)		
Thermal Shock	MIL–STD–202 Method 107	Not required		Not required		
Visual and Mechanical Inspection (100%)	KEMET Standard	Yes	Yes	Yes	Yes	Yes
Voltage Conditioning						

[1] *As per discretionary statement outlined in cancelled DSCC Drawing 87106, KEMET will not perform Group B inspections on a per lot basis. KEMET 87106 orders may include a standard certificate of compliance stating compliance to the 87106 requirements, specifically conformance to Group B inspections. Please contact KEMET for additional details*

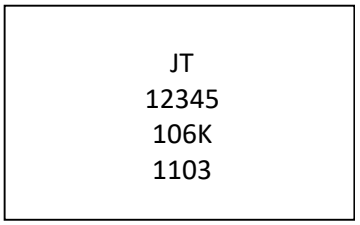
[2] *Non-standard test level option is designated to satisfy customer specific testing requirements that may deviate from those stated in a Mil-Spec or DSCC drawing.*

Construction



Product Marking

Capacitors shall be marked with KEMET's name, trademark or (CAGE) code, date, capacitance and capacitance tolerance codes. The date code shall consist of the year and week. For example, the third week of 2011 would be 1103 using a 4-digit date code or 103 using a 3-digit date code. At the option of the manufacturer, the date code may be placed on a separate line. Full marking shall be included on the package.



Case code 4 or 5 example

MIL–PRF–49470

Capacitor marking will include "JAN" or "J."
Case codes 4 and 5 shall be marked with the following sequence of information:
J brand (1 digit), product level designator (“B” or “T”)
Manufacturer's identification (1 to 5 digits)
Capacitance code (3 digits) and capacitance tolerance (1 digit)
Date code (3 or 4 digits)
Case code 3 shall either be fully marked or partially marked like case code 4 or 5 parts at the option of KEMET.

DSCC 87106

Marking shall be in accordance with MIL–STD–1285, except the parts shall be marked with the part number as specified in paragraph 1.2 of DSCC Drawing 87106 with the manufacturer's name or code and date code minimum. Case sizes 4 and 5 shall be marked with coded capacitance and tolerance minimum. Full marking shall be included on the package.

Storage and Handling

Ceramic chip capacitors should be stored in normal working environments. While the chips themselves are quite robust in other environments, solderability will be degraded by exposure to high temperatures, high humidity, corrosive atmospheres, and long term storage. In addition, packaging materials will be degraded by high temperature–reels may soften or warp and tape peel force may increase. KEMET recommends that maximum storage temperature not exceed 40°C and maximum storage humidity not exceed 70% relative humidity. Temperature fluctuations should be minimized to avoid condensation on the parts and atmospheres should be free of chlorine and sulfur bearing compounds. For optimized solderability chip stock should be used promptly, preferably within 1.5 years of receipt.

Packaging

Shipping Container Packaging Quantities			
Case code	Lead Style	Numbers of Chips in Stack	Maximum Waffle Pack Quantity[1]
3	L/J/N	1, 2, 3, 4, 5	25
4	N/L	1, 2, 3	50
		4, 5	25
	J	1, 2, 3, 4, 5	50
5	N	1, 2, 3	50
		4, 5	25
	L/J	1, 2, 3, 4, 5	50

[1] *Minimum order value applies. Contact KEMET for details.*

Application Notes

Notice of KEMET MIL–PRF–49470 Qualified Products Listing (QPL) Status.

KEMET is qualified to supply MIL–PRF–49470/1 unencapsulated X7R Case Codes 3, 4, & 5 ceramic SMPS capacitors in DC voltage ratings of 50 V, 100 V, 200 V, and 500 V. This qualification includes both "B" and "T" test levels.

KEMET is also qualified to supply MIL–PRF–49470/2 encapsulated X7R Case Codes 3, 4, & 5 ceramic SMPS capacitors in DC voltage ratings of 50 V, 100 V, 200 V, and 500 V. This qualification includes "B" level testing only.

Notice of Cancellation: DSCC Drawing 87106 was cancelled on January 3rd 2005. MIL–PRF–49470 parts are preferred and direct replacements.

MIL–PRF–49470 capacitors are preferred over DSCC 87106 capacitors. The MIL–PRF–49470 specification was developed as part of a cooperative effort between the U.S. Military, NASA and the switch mode power supply capacitor manufacturers to produce a robust direct replacement for the DSCC drawing. The military specification product provides additional quality assurance provisions that are NOT required by the DSCC drawing. Two product levels are offered in MIL–PRF–49470: the standard "B" level and the high reliability "T" level. Some of the benefits of the MIL–PRF–49470 product over the 87106 product include the following: Formal qualification process (QPL established), MIL–STD–790 compliance, DSCC audits, routine qualification maintenance testing, i.e., life testing, group A percent defective allowed (PDA) specified, and prohibiting the mixing of chips from different production lots within a single SMPS capacitor stack lot.

MIL–PRF–49470 "T" Level product is recommended for all high reliability applications. MIL–PRF–49470 "T" level product requires the following in-process inspections and additional group A and B screening inspections that are not part of the normal "B" level flow: In-process screening that includes non-destructive internal examination (chip level) and destructive physical analysis (chip level), group A destructive physical analysis (finished stack level), group B lot specific humidity, steady-state, low voltage (lot sample test), and group B lot specific thermal shock and life test (lot sample test).

For additional information regarding KEMET MIL–PRF–49470 QPL status or cancellation of DSCC Drawing 87106, please visit the DSCC website at: www.dscc.dla.mil.

KEMET Electronics Corporation Sales Offices

For a complete list of our global sales offices, please visit www.kemet.com/sales.

Disclaimer

All product specifications, statements, information and data (collectively, the "Information") in this datasheet are subject to change. The customer is responsible for checking and verifying the extent to which the Information contained in this publication is applicable to an order at the time the order is placed. All Information given herein is believed to be accurate and reliable, but it is presented without guarantee, warranty, or responsibility of any kind, expressed or implied.

Statements of suitability for certain applications are based on KEMET Electronics Corporation's ("KEMET") knowledge of typical operating conditions for such applications, but are not intended to constitute – and KEMET specifically disclaims – any warranty concerning suitability for a specific customer application or use. The Information is intended for use only by customers who have the requisite experience and capability to determine the correct products for their application. Any technical advice inferred from this Information or otherwise provided by KEMET with reference to the use of KEMET's products is given gratis, and KEMET assumes no obligation or liability for the advice given or results obtained.

Although KEMET designs and manufactures its products to the most stringent quality and safety standards, given the current state of the art, isolated component failures may still occur. Accordingly, customer applications which require a high degree of reliability or safety should employ suitable designs or other safeguards (such as installation of protective circuitry or redundancies) in order to ensure that the failure of an electrical component does not result in a risk of personal injury or property damage.

Although all product–related warnings, cautions and notes must be observed, the customer should not assume that all safety measures are indicted or that other measures may not be required.

KEMET is a registered trademark of KEMET Electronics Corporation.