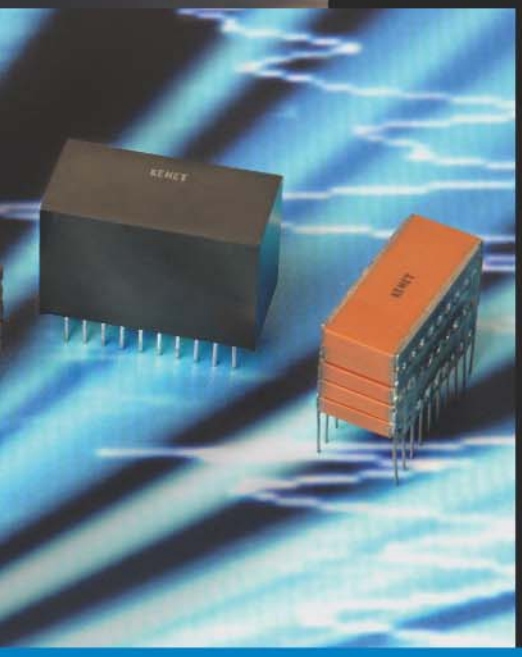

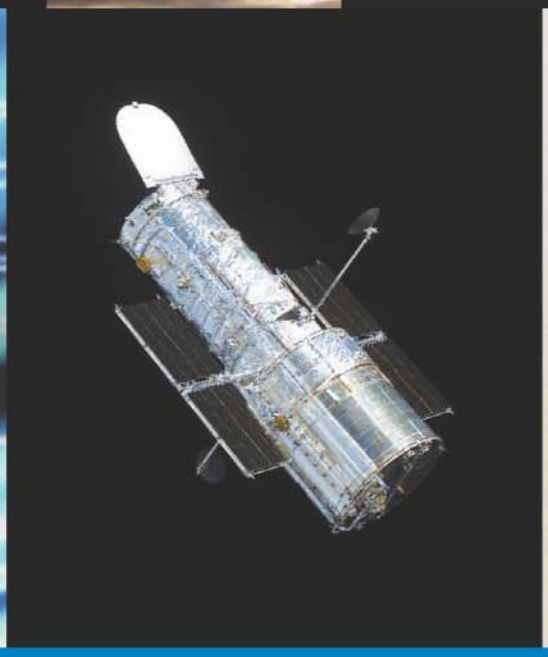

MIL-PRF-49470 Ceramic Stacked Capacitors

www.kemet.com

F-3114C 1/08

The Capacitance Company

KEMET

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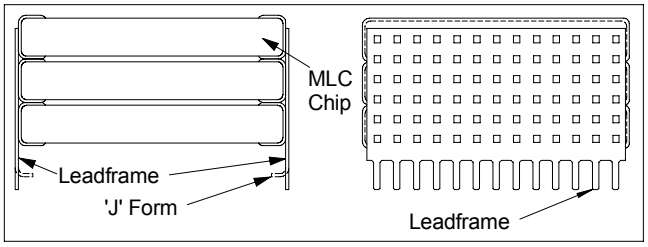
KEMET is now on the QPL list for Switch Mode Power Supply (SMPS) Military Stacked Capacitors with MIL-PRF-49470 standard B Level reliability availability. These devices are intended for high reliability SMPS and pulse energy applications. Their low Equivalent Series Resistance (ESR) and Equivalent Series Inductance (ESL) make them ideally suited for input and output filtering of power supply applications as well as snubber applications. The multilayer construction also creates high thermal transfer functions, resulting in very little temperature rise for the generated power giving the capacitors excellent high current handling capability.

The performance benefits of ceramic are being realized in many applications that were heretofore unavailable to these capacitors. The replacement of larger capacitance electrolytic capacitors with smaller value ceramics is a common occurrence today, but there are still some larger capacitance values required of the MLCC.

The capacitors are constructed using large chip sizes, much larger than those available for standard surface-mount applications. Because they are so

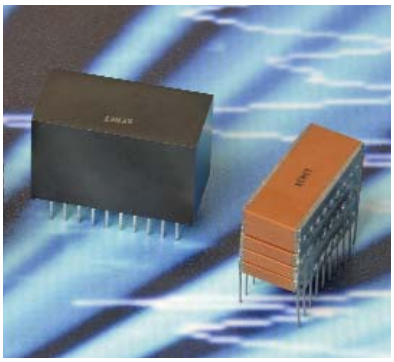


large, mounting these devices directly to the PC board would more than likely generate cracking because of straight mechanical strain, or strain which occurs because of mismatches in CTE (coefficient of thermal expansion) between the board and the ceramic.

This strain is proportional to the distance between the termination pads on the PC board and results in an increasing propensity for failure among the larger SMT chips. The leadframe is attached to the chip stack (from singular to multiple chips) and creates a mechanical relief between the ceramic device and the board, so they are not bound to each other. The contact to the chips is usually a perforated, vertical, metal plate while the contact to the board is through a pin structure. The pin structure located at the bottom of the leadframe consists of multiple pins at 100 mil centers. The formation of these pins can be surface mountable styles "L" and "J" (or gull-wing), or as through-hole insertion pins style "N."

This multi-pin arrangement allows the extremely low ESR and ESL of the chip package to be presented to the circuit without any significant increases. This arrangement also allows a very efficient thermal transfer path to exist between the chip package and the PC board, as most of the thermal dissipation for this package will be through the leadframe connection.

These capacitors are available in case codes 3, 4, & 5. They are available in X7R dielectric, in voltage ranges from 50 VDC to 500 VDC. The chip stack is horizontal and the leadframe attachment is a high-temperature solder. They are also available as unpotted bare chips or as a potted assembly. MIL-PRF-49470 and DSCC drawing 87106 (X7R) are used to establish a baseline part for high-reliability applications.



Capacitance values at 50 VDC are available up to 47 µF (X7R). Care must be exercised when using the bare chips to ensure there can be no mechanical damage imposed on the mounted parts, although the potted devices reduce this potential dramatically.

Larger Case codes 1, 2, & 6 will be available for order in Q3CY08. The T level high reliability space level version will be available in calendar year 2009.

KEMET is qualified to supply MIL-PRF-49470/1 unencapsulated X7R Case Codes 3, 4, & 5 ceramic SMPS capacitors in voltage ratings 50V, 100V, 200V, and 500V. KEMET is also qualified to supply MIL-PRF-49470/2 encapsulated X7R Case Codes 3, 4, & 5 ceramic SMPS capacitors in voltage ratings 50V, 100V, 200V, and 500V.

The DSCC drawing 87106 has been cancelled (http://www.dscc.dla.mil/Downloads/MilSpec/DsccDwg/87106.pdf). However, KEMET is able to supply to the DSCC 87106 drawing per customer request. KEMET will supply to the DSCC 87106 drawing with an exception taken to performing Group B Inspections on a per lot basis. Per DSCC drawing section 4.2.2 the acquiring activity, at its discretion, may accept a certificate of compliance (CofC) with Group B inspections in lieu of performing Group B inspections. KEMET 87106 orders will include the CofC stating compliance to the 87106 requirements. KEMET's MIL-PRF-49470 QPL status confirms KEMET's compliance to the Group B testing requirements.

The MIL-PRF-49470 capacitors are preferred over the DSCC drawing 87106 capacitors as outlined in NASA's Electronic Parts and Packaging website:http://nepp.nasa.gov/npsl/Capacitors/87106/87106aps.htm. The M49470 military specification product provides additional quality assurance provisions that are not required by the DSCC drawing. These extra provisions helped to create a more robust replacement for the 87106 capacitors.

MIL-PRF-49470 Requirements:

Electrical Specifications

Rated Voltage: 50V, 100V, 200V, 500V

Voltage-Temperature Coefficient:

Dielectric	Voltage	Bias = 0V	Bias = Vr
BX	50V, 100V	±15%	+15%, -25%
BR	200V	±15%	+15%, -40%
BQ	500V	±15%	+15%, -50%

Capacitance: Measured in accordance with method 305 of MIL-STD-202 (1kHz ± 100Hz at 1.0Vrms ± 0.2Vrms open circuit voltage).

Dissipation Factor: Dissipation factor measured at same conditions as capacitance measurement. For X7R capacitors DF maximum is 2.5%.

Insulation Resistance:

- @25°C, rated voltage 100GΩ or 1,000MΩ-µF, whichever is less
- @125°C, rated voltage 10GΩ or 100MΩ-µF, whichever is less

Dielectric Withstanding Voltage (DWV):
DWV will be tested at 250% of rated voltage except for 500V rated parts which will be tested at 150% of rated voltage.

Performance Requirements:

Reference KEMET Stacked Capacitor Test Methods (Page 18) for the Group A and Group B test requirements per MIL-PRF-49470.

DSCC Website links:

DSCC Website related to MIL-PRF-49470 dimensional, electrical, physical, testing and part number options:

http://www.dscc.dla.mil/Downloads/MilSpec/Docs/MIL-PRF-49470/prf49470.pdf

DSCC Website for 49470/1 SMPS Capacitors

http://www.dscc.dla.mil/Downloads/MilSpec/Docs/MIL-PRF-49470/prf49470ss1.pdf

DSCC Website for 49470/2 SMPS Capacitors

http://www.dscc.dla.mil/Downloads/MilSpec/Docs/MIL-PRF-49470/prf49470ss2.pdf

Ordering Information Requirements per 87106 DSCC Drawing:

The contract or purchase order should specify the following:

1. Complete Military Part Number
   Drawing #: 87106 Dash Number XXX
   (Example: 87106-001)

2. Requirements for Delivery of one copy of the conformance inspection data or certificate of compliance that parts have passed conformance inspection with each shipment of parts by the manufacturer. (KEMET will provide a CofC with each shipment as standard practice)

3. Requirements for packaging and packing. (KEMET will provide capacitors in a cardboard box with foam inserts as standard practice)

*4. Whether the manufacturer performs the group B inspections, or provides certification of compliance with Group B inspections.
   *(KEMET will only offer the CofC option. KEMET will not perform Group B inspections on a per lot basis. KEMET's standard CofC will include notification of conformance to Group B inspections.)

5. Requirements for notification of change of product to acquiring activity, if applicable.

Electrical Specifications

Operating Temperature Range:
The operating temperature range is -55°C to 125°C.

Rated Voltage: 50V, 100V, 200V, 500V

Temperature Coefficient:

Dielectric	Voltage	Bias = 0V	Bias = Vr
BX	50V, 100V	±15%	+15%, -25%
BR	200V	±15%	+15%, -40%
BQ	500V	±15%	+15%, -50%

Capacitance: Measured in accordance with method 305 of MIL-STD-202 (1kHz±100Hz at 1.0Vrms ± 0.2Vrms open circuit voltage).

Dissipation Factor: Dissipation factor measured at same conditions as capacitance measurement. For X7R capacitors DF maximum is 2.5%.

Insulation Resistance:
- @25°C, rated voltage: 100GΩ or 1,000MΩ-µF, whichever is less
- @125°C, rated voltage: 10GΩ or 100MΩ-µF, whichever is less

Dielectric Withstanding Voltage (DWV):
DWV will be tested at 250% of rated voltage except for 500V rated parts which will be tested at 150% of rated voltage.

Performance Characteristics & Test Methods:
The following tests are in accordance with MIL-PRF-49470

1. Thermal Shock & Voltage Conditioning
2. Solderability
3. Vibration, high frequency
4. Immersion
5. Shock, specified pulse
6. Moisture resistance
7. Resistance to soldering heat
8. Resistance to solvents
9. Life

Marking: 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 87106 with the manufacturer's name or code and date code minimum. Case sizes 4 & 5 shall be marked with coded cap and tolerance minimum. Full marking shall be included on the package.

DSCC Website Notification of 87106 Cancellation:

http://www.dscc.dla.mil/Downloads/MilSpec/DsccDwg/87106.pdf

MIL-PRF-49470 ORDERING INFORMATION

M49470	R	01	474	K	C	N
Performance Specification indicating MIL-PRF-49470	Characteristic (1.2.1.1)	Performance Specification sheet number (indicating MIL-PRF-49470/1)	Capacitance (1.2.1.2)	Capacitance Tolerance (1.2.1.3)	Rated Voltage (1.2.1.4)	Configuration (see 1.2.1.5)

KEMET ORDERING INFORMATION

L1 R N 30 C 106 K S 12

Product Family
L1 = Unencapsulated
L2 = Encapsulated

Temperature Characteristic

Dielectric	Cap Change	
	Without Voltage	With Voltage
X = BX (50V & 100V)	±15%	+15%, -25%
R = BR (200V)	±15%	+15%, -40%
Q = BQ (500V)	±15%	+15%, -50%

Lead Type
N = Straight pin lead; J = Formed J lead;
L = Formed L lead

Case Code
30 = Case code 3
40 = Case code 4
50 = Case code 5

Voltage Code
5 = 50 VDC
1 = 100 VDC
2 = 200 VDC
C = 500 VDC

Capacitance
First two digits represent significant figures.
Third digit specifies number of zeros.
106 = 10 µF

Capacitance Tolerance
K = ±10%
M = ±20%

Test Level
B = MIL-PRF-49470 "B" Level
*C = 87106
S = Standard
X = Special

Maximum Height (A dim)

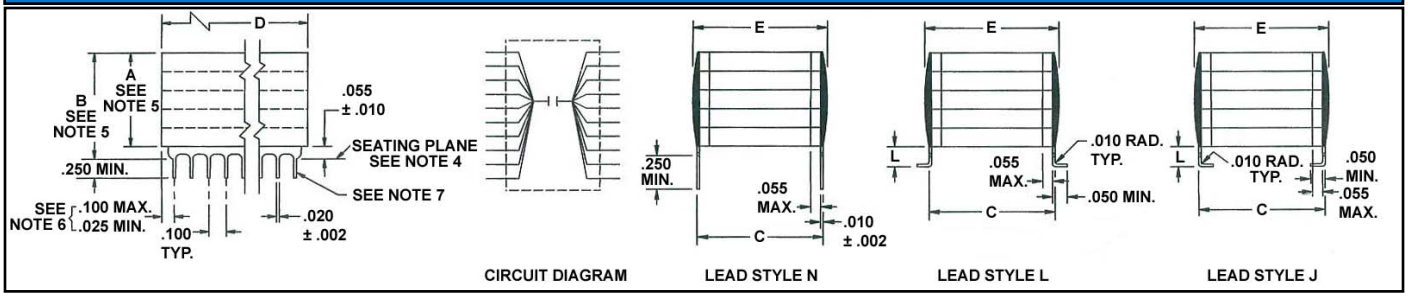
Encapsulated	*Unencapsulated*
27 = 0.270"	12 = 0.120"
39 = 0.390"	24 = 0.240"
53 = 0.530"	36 = 0.360"
66 = 0.660"	48 = 0.480"
80 = 0.800"	65 = 0.650"

* 4.2.2 Certification: The acquiring activity, at its discretion, may accept a certificate of compliance with group B inspections in lieu of performing group B inspections (see 6.1.3 for guidance).

STACKED MLCC SHIPPING CONTAINER PART QUANTITIES

Case Code	Qty per Small Box 7.5" x 7.5" Box Size	Qty per Large Box 13.0" x 13.0" Box Size
3	28	104
4	36	144
5	64	225

MIL-PRF-49470/1 DIMENSIONS – KEMET SERIES L1



Notes:
1. Dimensions are in inches.
2. Metric equivalents for C, D and E dimensions are provided for general information only.
3. Unless otherwise specified, tolerances are ±.010" (0.25mm)
4. Lead frame configuration is shown as typical above the seating plane. (A seating plane is only required for lead style N.)
5. Refer to the KEMET Part Number and the KEMET Ordering Information for specific maximum A dimension. For maximum B dimension, add .065" (1.65mm) 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" (2.54mm) maximum and .012" (0.30mm) minimum.
7. Lead alignment within pin rows shall be within ±.005" (0.13mm).

KEMET L1 SERIES UNENCAPSULATED MIL-PRF-49470/1 DIMENSIONS - IN (MM)

Case Code	C ±0.025 (0.635)	D		E (Max)	Number of Leads per Side
		Min	Max		
3	0.45 (11.43)	0.95 (24.13)	1.075 (27.30)	0.50 (12.70)	10
4	0.40 (10.16)	0.35 (8.89)	0.425 (10.80)	0.44 (11.18)	4
5	0.25 (6.35)	0.224 (5.69)	0.275 (6.98)	0.30 (7.62)	3

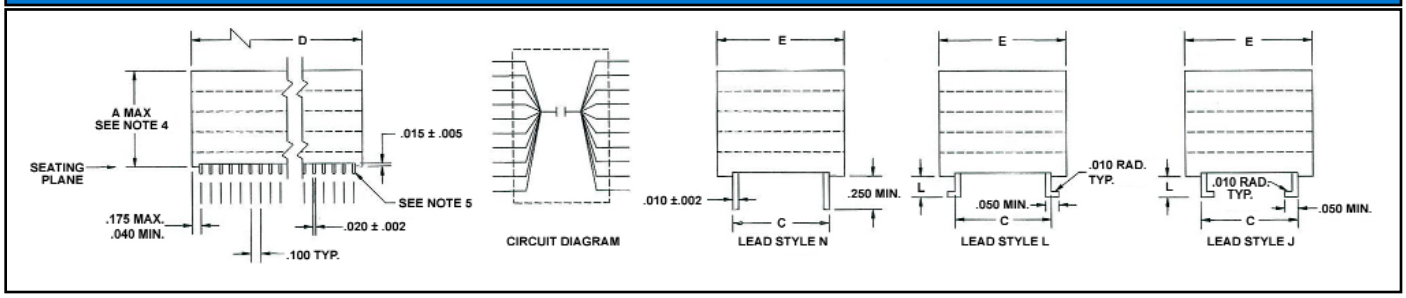
49470 STANDARD PROFILE

49470 Lead Style (Last digit of PIN)	Lead Style	Stack Height Profile (Dimension A - Last two digits of KEMET PN)	Formed Lead Height Inches (mm)
N	N (straight)	Standard	0.250 Min (6.35)
J	J (formed)	Standard	0.070 ± 0.010 (1.78 ±0.25)
L	L (formed)	Standard	0.070 ± 0.010 (1.78 ±0.25)

DIMENSION CONVERSION INCHES - MM

Inches	mm
0.002	0.05
0.010	0.25
0.020	0.51
0.025	0.64
0.050	1.27
0.055	1.40
0.070	1.78
0.100	2.54
0.224	5.69
0.250	6.35
0.275	6.98
0.300	7.62
0.350	8.89
0.400	10.16
0.425	10.80
0.440	11.18
0.450	11.43
0.500	12.70
0.800	20.32
0.870	22.10
0.950	24.13
1.075	27.30
1.250	31.75
1.350	34.29
1.450	36.83
1.535	38.99
1.950	49.53
2.075	52.70

MIL-PRF-49470/2 DIMENSIONS – KEMET SERIES L2



Notes:
1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerances are ±.010” (0.25mm)
4. Refer to KEMET Part Number and KEMET ordering information.
5. Lead alignment within pin rows shall be within ±.005” (0.13mm).

KEMET L2 SERIES ENCAPSULATED MIL-PRF-49470/2 DIMENSIONS - IN (MM)

Case Code	C ±0.025 (±0.635)	D ±0.025 (±0.635)	E (Max)	Number of Leads per Side
3	0.45 (11.43)	1.155 (29.3)	0.58 (14.73)	10
4	0.40 (10.16)	0.485 (12.32)	0.485 (12.32)	4
5	0.25 (6.35)	0.355 (9.02)	0.355 (9.02)	3

DIMENSION CONVERSION INCHES - MM

Inches	mm
0.002	0.05
0.010	0.25
0.020	0.51
0.025	0.64
0.050	1.27
0.055	1.40
0.070	1.78
0.100	2.54
0.224	5.69
0.250	6.35
0.275	6.98
0.300	7.62
0.350	8.89
0.400	10.16
0.425	10.80
0.440	11.18
0.450	11.43
0.500	12.70
0.800	20.32
0.870	22.10
0.950	24.13
1.075	27.30
1.250	31.75
1.350	34.29
1.450	36.83
1.535	38.99
1.950	49.53
2.075	52.70

49470 STANDARD PROFILE

49470 Lead Style (Last digit of PIN)	Lead Style	Stack Height Profile (Dimension A - Last two digits of KEMET PN)	Formed Lead Height Inches (mm)
N	N (straight)	Standard	0.250 Min (6.35)
J	J (formed)	Standard	0.070 ± 0.010 (1.78 ±0.25)
L	L (formed)	Standard	0.070 ± 0.010 (1.78 ±0.25)

MIL-PRF-49470 & DSCC DRAWING 87106 CROSS REFERENCE

87106 Dash Number	Military Style	KEMET Part Number	Cap (µF)	Voltage	Capacitance Tolerance	Case Code
001	M49470X01105KAN	L1XN505105KB12	1.0	50	±10%	5
002	M49470X01105MAN	L1XN505105MB12	1.0	50	±20%	5
003	M49470X01125KAN	L1XN505125KB12	1.2	50	±10%	5
004	M49470X01125MAN	L1XN505125MB12	1.2	50	±20%	5
005	M49470X01155KAN	L1XN505155KB24	1.5	50	±10%	5
006	M49470X01155MAN	L1XN505155MB24	1.5	50	±20%	5
007	M49470X01185KAN	L1XN505185KB24	1.8	50	±10%	5
008	M49470X01185MAN	L1XN505185MB24	1.8	50	±20%	5
009	M49470X01225KAN	L1XN505225KB24	2.2	50	±10%	5
010	M49470X01225MAN	L1XN505225MB24	2.2	50	±20%	5
011	M49470X01275KAN	L1XN505275KB36	2.7	50	±10%	5
012	M49470X01275MAN	L1XN505275MB36	2.7	50	±20%	5
013	M49470X01335KAN	L1XN505335KB36	3.3	50	±10%	5
014	M49470X01335MAN	L1XN505335MB36	3.3	50	±20%	5
015	M49470X01395KAN	L1XN505395KB48	3.9	50	±10%	5
016	M49470X01395MAN	L1XN505395MB48	3.9	50	±20%	5
017	M49470X01475KAN	L1XN505475KB48	4.7	50	±10%	5
018	M49470X01475MAN	L1XN505475MB48	4.7	50	±20%	5
019	M49470X01565KAN	L1XN505565KB65	5.6	50	±10%	5
020	M49470X01565MAN	L1XN505565MB65	5.6	50	±20%	5
021	M49470X01825KAN	L1XN405825KB36	8.2	50	±10%	4
022	M49470X01825MAN	L1XN405825MB36	8.2	50	±20%	4
023	M49470X01106KAN	L1XN405106KB48	10	50	±10%	4
024	M49470X01106MAN	L1XN405106MB48	10	50	±20%	4
025	M49470X01126KAN	L1XN405126KB48	12	50	±10%	4
026	M49470X01126MAN	L1XN405126MB48	12	50	±20%	4
027	M49470X01156KAN	L1XN405156KB65	15	50	±10%	4
028	M49470X01156MAN	L1XN405156MB65	15	50	±20%	4
029	M49470X01186KAN	L1XN305186KB24	18	50	±10%	3
030	M49470X01186MAN	L1XN305186MB24	18	50	±20%	3
031	M49470X01226KAN	L1XN305226KB36	22	50	±10%	3
032	M49470X01226MAN	L1XN305226MB36	22	50	±20%	3
033	M49470X01276KAN	L1XN305276KB36	27	50	±10%	3
034	M49470X01276MAN	L1XN305276MB36	27	50	±20%	3
035	M49470X01336KAN	L1XN305336KB36	33	50	±10%	3
036	M49470X01336MAN	L1XN305336MB36	33	50	±20%	3
037	M49470X01396KAN	L1XN305396KB48	39	50	±10%	3
038	M49470X01396MAN	L1XN305396MB48	39	50	±20%	3
039	M49470X01476KAN	L1XN305476KB65	47	50	±10%	3
040	M49470X01476MAN	L1XN305476MB65	47	50	±20%	3

Note: All L1 part numbers are also available in the L2 style.

MIL-PRF-49470 & DSCC DRAWING 87106 CROSS REFERENCE

87106 Dash Number	Military Style	KEMET Part Number	Cap (µF)	Voltage	Capacitance Tolerance	Case Code
055	M49470X01684KBN	L1XN501684KB12	0.68	100	10%	5
056	M49470X01684MBN	L1XN501684MB12	0.68	100	20%	5
057	M49470X01824KBN	L1XN501824KB24	0.82	100	10%	5
058	M49470X01824MBN	L1XN501824MB24	0.82	100	20%	5
059	M49470X01105KBN	L1XN501105KB24	1.0	100	10%	5
060	M49470X01105MBN	L1XN501105MB24	1.0	100	20%	5
061	M49470X01125KBN	L1XN501125KB24	1.2	100	10%	5
062	M49470X01125MBN	L1XN501125MB24	1.2	100	20%	5
063	M49470X01155KBN	L1XN501155KB36	1.5	100	10%	5
064	M49470X01155MBN	L1XN501155MB36	1.5	100	20%	5
065	M49470X01185KBN	L1XN501185KB36	1.8	100	10%	5
066	M49470X01185MBN	L1XN501185MB36	1.8	100	20%	5
067	M49470X01225KBN	L1XN501225KB48	2.2	100	10%	5
068	M49470X01225MBN	L1XN501225MB48	2.2	100	20%	5
069	M49470X01275KBN	L1XN501275KB48	2.7	100	10%	5
070	M49470X01275MBN	L1XN501275MB48	2.7	100	20%	5
071	M49470X01335KBN	L1XN501335KB65	3.3	100	10%	5
072	M49470X01335MBN	L1XN501335MB65	3.3	100	20%	5
073	M49470X01395KBN	L1XN401395KB36	3.9	100	10%	4
074	M49470X01395MBN	L1XN401395MB36	3.9	100	20%	4
075	M49470X01475KBN	L1XN401475KB36	4.7	100	10%	4
076	M49470X01475MBN	L1XN401475MB36	4.7	100	20%	4
077	M49470X01565KBN	L1XN401565KB48	5.6	100	10%	4
078	M49470X01565MBN	L1XN401565MB48	5.6	100	20%	4
079	M49470X01685KBN	L1XN401685KB48	6.8	100	10%	4
080	M49470X01685MBN	L1XN401685MB48	6.8	100	20%	4
081	M49470X01825KBN	L1XN401825KB65	8.2	100	10%	4
082	M49470X01825MBN	L1XN401825MB65	8.2	100	20%	4
083	M49470X01126KBN	L1XN301126KB24	12	100	10%	3
084	M49470X01126MBN	L1XN301126MB24	12	100	20%	3
085	M49470X01156KBN	L1XN301156KB36	15	100	10%	3
086	M49470X01156MBN	L1XN301156MB36	15	100	20%	3
087	M49470X01186KBN	L1XN301186KB36	18	100	10%	3
088	M49470X01186MBN	L1XN301186MB36	18	100	20%	3
089	M49470X01226KBN	L1XN301226KB48	22	100	10%	3
090	M49470X01226MBN	L1XN301226MB48	22	100	20%	3
091	M49470X01276KBN	L1XN301276KB65	27	100	10%	3
092	M49470X01276MBN	L1XN301276MB65	27	100	20%	3
113	M49470R01474KCN	L1RN502474KB24	0.47	200	10%	5
114	M49470R01474MCN	L1RN502474MB24	0.47	200	20%	5
115	M49470R01564KCN	L1RN502564KB24	0.56	200	10%	5

Note: All L1 part numbers are also available in the L2 style.

MIL-PRF-49470 & DSCC DRAWING 87106 CROSS REFERENCE

87106 Dash Number	Military Style	KEMET Part Number	Cap (µF)	Voltage	Capacitance Tolerance	Case Code
116	M49470R01564MCN	L1RN502564MB24	0.56	200	20%	5
117	M49470R01684KCN	L1RN502684KB36	0.68	200	10%	5
118	M49470R01684MCN	L1RN502684MB36	0.68	200	20%	5
119	M49470R01824KCN	L1RN502824KB36	0.82	200	10%	5
120	M49470R01824MCN	L1RN502824MB36	0.82	200	20%	5
121	M49470R01105KCN	L1RN502105KB48	1.0	200	10%	5
122	M49470R01105MCN	L1RN502105MB48	1.0	200	20%	5
123	M49470R01125KCN	L1RN502125KB48	1.2	200	10%	5
124	M49470R01125MCN	L1RN502125MB48	1.2	200	20%	5
125	M49470R01155KCN	L1RN502155KB65	1.5	200	10%	5
126	M49470R01155MCN	L1RN502155MB65	1.5	200	20%	5
127	M49470R01185KCN	L1RN402185KB36	1.8	200	10%	4
128	M49470R01185MCN	L1RN402185MB36	1.8	200	20%	4
129	M49470R01225KCN	L1RN402225KB36	2.2	200	10%	4
130	M49470R01225MCN	L1RN402225MB36	2.2	200	20%	4
131	M49470R01275KCN	L1RN402275KB48	2.7	200	10%	4
132	M49470R01275MCN	L1RN402275MB48	2.7	200	20%	4
133	M49470R01335KCN	L1RN402335KB48	3.3	200	10%	4
134	M49470R01335MCN	L1RN402335MB48	3.3	200	20%	4
135	M49470R01395KCN	L1RN402395KB65	3.9	200	10%	4
136	M49470R01395MCN	L1RN402395MB65	3.9	200	20%	4
137	M49470R01475KCN	L1RN302475KB24	4.7	200	10%	3
138	M49470R01475MCN	L1RN302475MB24	4.7	200	20%	3
139	M49470R01565KCN	L1RN302565KB24	5.6	200	10%	3
140	M49470R01565MCN	L1RN302565MB24	5.6	200	20%	3
141	M49470R01685KCN	L1RN302685KB36	6.8	200	10%	3
142	M49470R01685MCN	L1RN302685MB36	6.8	200	20%	3
143	M49470R01825KCN	L1RN302825KB36	8.2	200	10%	3
144	M49470R01825MCN	L1RN302825MB36	8.2	200	20%	3
145	M49470R01106KCN	L1RN302106KB48	10	200	10%	3
146	M49470R01106MCN	L1RN302106MB48	10	200	20%	3
147	M49470R01126KCN	L1RN302126KB65	12	200	10%	3
148	M49470R01126MCN	L1RN302126MB65	12	200	20%	3
173	M49470Q01154KEN	L1QN50C154KB12	0.15	500	10%	5
174	M49470Q01154MEN	L1QN50C154MB12	0.15	500	20%	5
175	M49470Q01184KEN	L1QN50C184KB24	0.18	500	10%	5
176	M49470Q01184MEN	L1QN50C184MB24	0.18	500	20%	5

Note: All L1 part numbers are also available in the L2 style.

MIL-PRF-49470 & DSCC DRAWING 87106 CROSS REFERENCE

87106 Dash Number	Military Style	KEMET Part Number	Cap (µF)	Voltage	Capacitance Tolerance	Case Code
177	M49470Q01224KEN	L1QN50C224KB24	0.22	500	10%	5
178	M49470Q01224MEN	L1QN50C224MB24	0.22	500	20%	5
179	M49470Q01274KEN	L1QN50C274KB24	0.27	500	10%	5
180	M49470Q01274MEN	L1QN50C274MB24	0.27	500	20%	5
181	M49470Q01334KEN	L1QN50C334KB36	0.33	500	10%	5
182	M49470Q01334MEN	L1QN50C334MB36	0.33	500	20%	5
183	M49470Q01394KEN	L1QN50C394KB36	0.39	500	10%	5
184	M49470Q01394MEN	L1QN50C394MB36	0.39	500	20%	5
185	M49470Q01474KEN	L1QN50C474KB36	0.47	500	10%	5
186	M49470Q01474MEN	L1QN50C474MB36	0.47	500	20%	5
187	M49470Q01564KEN	L1QN50C564KB48	0.56	500	10%	5
188	M49470Q01564MEN	L1QN50C564MB48	0.56	500	20%	5
189	M49470Q01684KEN	L1QN50C684KB65	0.68	500	10%	5
190	M49470Q01684MEN	L1QN50C684MB65	0.68	500	20%	5
191	M49470Q01105KEN	L1QN40C105KB36	1.0	500	10%	4
192	M49470Q01105MEN	L1QN40C105MB36	1.0	500	20%	4
193	M49470Q01125KEN	L1QN40C125KB36	1.2	500	10%	4
194	M49470Q01125MEN	L1QN40C125MB36	1.2	500	20%	4
195	M49470Q01155KEN	L1QN40C155KB48	1.5	500	10%	4
196	M49470Q01155MEN	L1QN40C155MB48	1.5	500	20%	4
197	M49470Q01185KEN	L1QN40C185KB65	1.8	500	10%	4
198	M49470Q01185MEN	L1QN40C185MB65	1.8	500	20%	4
199	M49470Q01275KEN	L1QN30C275KB36	2.7	500	10%	3
200	M49470Q01275MEN	L1QN30C275MB36	2.7	500	20%	3
201	M49470Q01335KEN	L1QN30C335KB36	3.3	500	10%	3
202	M49470Q01335MEN	L1QN30C335MB36	3.3	500	20%	3
203	M49470Q01395KEN	L1QN30C395KB36	3.9	500	10%	3
204	M49470Q01395MEN	L1QN30C395MB36	3.9	500	20%	3
205	M49470Q01475KEN	L1QN30C475KB48	4.7	500	10%	3
206	M49470Q01475MEN	L1QN30C475MB48	4.7	500	20%	3
207	M49470Q01565KEN	L1QN30C565KB65	5.6	500	10%	3
208	M49470Q01565MEN	L1QN30C565MB65	5.6	500	20%	3
223	M49470X01685KAN	L1XN405685KB36	6.8	50	10%	4
224	M49470X01685MAN	L1XN405685MB36	6.8	50	20%	4
229	M49470X01106KBN	L1XN301106KB24	10	100	10%	3
230	M49470X01106MBN	L1XN301106MB24	10	100	20%	3
231	M49470Q01824KEN	L1QN40C824KB36	0.82	500	10%	4
232	M49470Q01824MEN	L1QN40C824MB36	0.82	500	20%	4
233	M49470Q01225KEN	L1QN30C225KB24	2.2	500	10%	3
234	M49470Q01225MEN	L1QN30C225MB24	2.2	500	20%	3

Note: All L1 part numbers are also available in the L2 style.

MIL-PRF-49470 & DSCC DRAWING 87106 CROSS REFERENCE

87106 Dash Number	Military Style	KEMET Part Number	Cap (µF)	Voltage	Capacitance Tolerance	Case Code
241	M49470X01105KAJ	L1XJ505105KB12	1.0	50	10%	5
242	M49470X01105MAJ	L1XJ505105MB12	1.0	50	20%	5
243	M49470X01125KAJ	L1XJ505125KB12	1.2	50	10%	5
244	M49470X01125MAJ	L1XJ505125MB12	1.2	50	20%	5
245	M49470X01155KAJ	L1XJ505155KB24	1.5	50	10%	5
246	M49470X01155MAJ	L1XJ505155MB24	1.5	50	20%	5
247	M49470X01185KAJ	L1XJ505185KB24	1.8	50	10%	5
248	M49470X01185MAJ	L1XJ505185MB24	1.8	50	20%	5
249	M49470X01225KAJ	L1XJ505225KB24	2.2	50	10%	5
250	M49470X01225MAJ	L1XJ505225MB24	2.2	50	20%	5
251	M49470X01275KAJ	L1XJ505275KB36	2.7	50	10%	5
252	M49470X01275MAJ	L1XJ505275MB36	2.7	50	20%	5
253	M49470X01335KAJ	L1XJ505335KB36	3.3	50	10%	5
254	M49470X01335MAJ	L1XJ505335MB36	3.3	50	20%	5
255	M49470X01395KAJ	L1XJ505395KB48	3.9	50	10%	5
256	M49470X01395MAJ	L1XJ505395MB48	3.9	50	20%	5
257	M49470X01475KAJ	L1XJ505475KB48	4.7	50	10%	5
258	M49470X01475MAJ	L1XJ505475MB48	4.7	50	20%	5
259	M49470X01565KAJ	L1XJ505565KB65	5.6	50	10%	5
260	M49470X01565MAJ	L1XJ505565MB65	5.6	50	20%	5
261	M49470X01685KAJ	L1XJ405685KB36	6.8	50	10%	4
262	M49470X01685MAJ	L1XJ405685MB36	6.8	50	20%	4
263	M49470X01825KAJ	L1XJ405825KB36	8.2	50	10%	4
264	M49470X01825MAJ	L1XJ405825MB36	8.2	50	20%	4
265	M49470X01106KAJ	L1XJ405106KB48	10	50	10%	4
266	M49470X01106MAJ	L1XJ405106MB48	10	50	20%	4
267	M49470X01126KAJ	L1XJ405126KB48	12	50	10%	4
268	M49470X01126MAJ	L1XJ405126MB48	12	50	20%	4
269	M49470X01156KAJ	L1XJ405156KB65	15	50	10%	4
270	M49470X01156MAJ	L1XJ405156MB65	15	50	20%	4
271	M49470X01186KAJ	L1XJ305186KB24	18	50	10%	3
272	M49470X01186MAJ	L1XJ305186MB24	18	50	20%	3
273	M49470X01226KAJ	L1XJ305226KB36	22	50	10%	3
274	M49470X01226MAJ	L1XJ305226MB36	22	50	20%	3
275	M49470X01276KAJ	L1XJ305276KB36	27	50	10%	3
276	M49470X01276MAJ	L1XJ305276MB36	27	50	20%	3
277	M49470X01336KAJ	L1XJ305336KB36	33	50	10%	3
278	M49470X01336MAJ	L1XJ305336MB36	33	50	20%	3
279	M49470X01396KAJ	L1XJ305396KB48	39	50	10%	3
280	M49470X01396MAJ	L1XJ305396MB48	39	50	20%	3
281	M49470X01476KAJ	L1XJ305476KB65	47	50	10%	3
282	M49470X01476MAJ	L1XJ305476MB65	47	50	20%	3

Note: All L1 part numbers are also available in the L2 style.

MIL-PRF-49470 & DSCC DRAWING 87106 CROSS REFERENCE

87106 Dash Number	Military Style	KEMET Part Number	Cap (µF)	Voltage	Capacitance Tolerance	Case Code
301	M49470X01684KBJ	L1XJ501684KB12	0.68	100	10%	5
302	M49470X01684MBJ	L1XJ501684MB12	0.68	100	20%	5
303	M49470X01824KBJ	L1XJ501824KB24	0.82	100	10%	5
304	M49470X01824MBJ	L1XJ501824MB24	0.82	100	20%	5
305	M49470X01105KBJ	L1XJ501105KB24	1.0	100	10%	5
306	M49470X01105MBJ	L1XJ501105MB24	1.0	100	20%	5
307	M49470X01125KBJ	L1XJ501125KB24	1.2	100	10%	5
308	M49470X01125MBJ	L1XJ501125MB24	1.2	100	20%	5
309	M49470X01155KBJ	L1XJ501155KB36	1.5	100	10%	5
310	M49470X01155MBJ	L1XJ501155MB36	1.5	100	20%	5
311	M49470X01185KBJ	L1XJ501185KB36	1.8	100	10%	5
312	M49470X01185MBJ	L1XJ501185MB36	1.8	100	20%	5
313	M49470X01225KBJ	L1XJ501225KB48	2.2	100	10%	5
314	M49470X01225MBJ	L1XJ501225MB48	2.2	100	20%	5
315	M49470X01275KBJ	L1XJ501275KB48	2.7	100	10%	5
316	M49470X01275MBJ	L1XJ501275MB48	2.7	100	20%	5
317	M49470X01335KBJ	L1XJ501335KB65	3.3	100	10%	5
318	M49470X01335MBJ	L1XJ501335MB65	3.3	100	20%	5
319	M49470X01395KBJ	L1XJ401395KB36	3.9	100	10%	4
320	M49470X01395MBJ	L1XJ401395MB36	3.9	100	20%	4
321	M49470X01475KBJ	L1XJ401475KB36	4.7	100	10%	4
322	M49470X01475MBJ	L1XJ401475MB36	4.7	100	20%	4
323	M49470X01565KBJ	L1XJ401565KB48	5.6	100	10%	4
324	M49470X01565MBJ	L1XJ401565MB48	5.6	100	20%	4
325	M49470X01685KBJ	L1XJ401685KB48	6.8	100	10%	4
326	M49470X01685MBJ	L1XJ401685MB48	6.8	100	20%	4
327	M49470X01825KBJ	L1XJ401825KB65	8.2	100	10%	4
328	M49470X01825MBJ	L1XJ401825MB65	8.2	100	20%	4
329	M49470X01106KBJ	L1XJ301106KB24	10	100	10%	3
330	M49470X01106MBJ	L1XJ301106MB24	10	100	20%	3
331	M49470X01126KBJ	L1XJ301126KB24	12	100	10%	3
332	M49470X01126MBJ	L1XJ301126MB24	12	100	20%	3
333	M49470X01156KBJ	L1XJ301156KB36	15	100	10%	3
334	M49470X01156MBJ	L1XJ301156MB36	15	100	20%	3
335	M49470X01186KBJ	L1XJ301186KB36	18	100	10%	3
336	M49470X01186MBJ	L1XJ301186MB36	18	100	20%	3
337	M49470X01226KBJ	L1XJ301226KB48	22	100	10%	3
338	M49470X01226MBJ	L1XJ301226MB48	22	100	20%	3
339	M49470X01276KBJ	L1XJ301276KB65	27	100	10%	3
340	M49470X01276MBJ	L1XJ301276MB65	27	100	20%	3

Note: All L1 part numbers are also available in the L2 style.

MIL-PRF-49470 & DSCC DRAWING 87106 CROSS REFERENCE

87106 Dash Number	Military Style	KEMET Part Number	Cap (µF)	Voltage	Capacitance Tolerance	Case Code
361	M49470R01474KCJ	L1RJ502474KB24	0.47	200	10%	5
362	M49470R01474MCJ	L1RJ502474MB24	0.47	200	20%	5
363	M49470R01564KCJ	L1RJ502564KB24	0.56	200	10%	5
364	M49470R01564MCJ	L1RJ502564MB24	0.56	200	20%	5
365	M49470R01684KCJ	L1RJ502684KB36	0.68	200	10%	5
366	M49470R01684MCJ	L1RJ502684MB36	0.68	200	20%	5
367	M49470R01824KCJ	L1RJ502824KB36	0.82	200	10%	5
368	M49470R01824MCJ	L1RJ502824MB36	0.82	200	20%	5
369	M49470R01105KCJ	L1RJ502105KB48	1.0	200	10%	5
370	M49470R01105MCJ	L1RJ502105MB48	1.0	200	20%	5
371	M49470R01125KCJ	L1RJ502125KB48	1.2	200	10%	5
372	M49470R01125MCJ	L1RJ502125MB48	1.2	200	20%	5
373	M49470R01155KCJ	L1RJ502155KB65	1.5	200	10%	5
374	M49470R01155MCJ	L1RJ502155MB65	1.5	200	20%	5
375	M49470R01185KCJ	L1RJ402185KB36	1.8	200	10%	4
376	M49470R01185MCJ	L1RJ402185MB36	1.8	200	20%	4
377	M49470R01225KCJ	L1RJ402225KB36	2.2	200	10%	4
378	M49470R01225MCJ	L1RJ402225MB36	2.2	200	20%	4
379	M49470R01275KCJ	L1RJ402275KB48	2.7	200	10%	4
380	M49470R01275MCJ	L1RJ402275MB48	2.7	200	20%	4
381	M49470R01335KCJ	L1RJ402335KB48	3.3	200	10%	4
382	M49470R01335MCJ	L1RJ402335MB48	3.3	200	20%	4
383	M49470R01395KCJ	L1RJ402395KB65	3.9	200	10%	4
384	M49470R01395MCJ	L1RJ402395MB65	3.9	200	20%	4
385	M49470R01475KCJ	L1RJ302475KB24	4.7	200	10%	3
386	M49470R01475MCJ	L1RJ302475MB24	4.7	200	20%	3
387	M49470R01565KCJ	L1RJ302565KB24	5.6	200	10%	3
388	M49470R01565MCJ	L1RJ302565MB24	5.6	200	20%	3
389	M49470R01685KCJ	L1RJ302685KB36	6.8	200	10%	3
390	M49470R01685MCJ	L1RJ302685MB36	6.8	200	20%	3
391	M49470R01825KCJ	L1RJ302825KB36	8.2	200	10%	3
392	M49470R01825MCJ	L1RJ302825MB36	8.2	200	20%	3
393	M49470R01106KCJ	L1RJ302106KB48	10	200	10%	3
394	M49470R01106MCJ	L1RJ302106MB48	10	200	20%	3
395	M49470R01126KCJ	L1RJ302126KB65	12	200	10%	3
396	M49470R01126MCJ	L1RJ302126MB65	12	200	20%	3
421	M49470Q01154KEJ	L1QJ50C154KB12	0.15	500	10%	5
422	M49470Q01154MEJ	L1QJ50C154MB12	0.15	500	20%	5
423	M49470Q01184KEJ	L1QJ50C184KB24	0.18	500	10%	5
424	M49470Q01184MEJ	L1QJ50C184MB24	0.18	500	20%	5

Note: All L1 part numbers are also available in the L2 style.

MIL-PRF-49470 & DSCC DRAWING 87106 CROSS REFERENCE

87106 Dash Number	Military Style	KEMET Part Number	Cap (µF)	Voltage	Capacitance Tolerance	Case Code
425	M49470Q01224KEJ	L1QJ50C224KB24	0.22	500	10%	5
426	M49470Q01224MEJ	L1QJ50C224MB24	0.22	500	20%	5
427	M49470Q01274KEJ	L1QJ50C274KB24	0.27	500	10%	5
428	M49470Q01274MEJ	L1QJ50C274MB24	0.27	500	20%	5
429	M49470Q01334KEJ	L1QJ50C334KB36	0.33	500	10%	5
430	M49470Q01334MEJ	L1QJ50C334MB36	0.33	500	20%	5
431	M49470Q01394KEJ	L1QJ50C394KB36	0.39	500	10%	5
432	M49470Q01394MEJ	L1QJ50C394MB36	0.39	500	20%	5
433	M49470Q01474KEJ	L1QJ50C474KB36	0.47	500	10%	5
434	M49470Q01474MEJ	L1QJ50C474MB36	0.47	500	20%	5
435	M49470Q01564KEJ	L1QJ50C564KB48	0.56	500	10%	5
436	M49470Q01564MEJ	L1QJ50C564MB48	0.56	500	20%	5
437	M49470Q01684KEJ	L1QJ50C684KB65	0.68	500	10%	5
438	M49470Q01684MEJ	L1QJ50C684MB65	0.68	500	20%	5
439	M49470Q01824KEJ	L1QJ40C824KB36	0.82	500	10%	4
440	M49470Q01824MEJ	L1QJ40C824MB36	0.82	500	20%	4
441	M49470Q01105KEJ	L1QJ40C105KB36	1.0	500	10%	4
442	M49470Q01105MEJ	L1QJ40C105MB36	1.0	500	20%	4
443	M49470Q01125KEJ	L1QJ40C125KB36	1.2	500	10%	4
444	M49470Q01125MEJ	L1QJ40C125MB36	1.2	500	20%	4
445	M49470Q01155KEJ	L1QJ40C155KB48	1.5	500	10%	4
446	M49470Q01155MEJ	L1QJ40C155MB48	1.5	500	20%	4
447	M49470Q01185KEJ	L1QJ40C185KB65	1.8	500	10%	4
448	M49470Q01185MEJ	L1QJ40C185MB65	1.8	500	20%	4
449	M49470Q01225KEJ	L1QJ30C225KB24	2.2	500	10%	3
450	M49470Q01225MEJ	L1QJ30C225MB24	2.2	500	20%	3
451	M49470Q01275KEJ	L1QJ30C275KB36	2.7	500	10%	3
452	M49470Q01275MEJ	L1QJ30C275MB36	2.7	500	20%	3
453	M49470Q01335KEJ	L1QJ30C335KB36	3.3	500	10%	3
454	M49470Q01335MEJ	L1QJ30C335MB36	3.3	500	20%	3
455	M49470Q01395KEJ	L1QJ30C395KB36	3.9	500	10%	3
456	M49470Q01395MEJ	L1QJ30C395MB36	3.9	500	20%	3
457	M49470Q01475KEJ	L1QJ30C475KB48	4.7	500	10%	3
458	M49470Q01475MEJ	L1QJ30C475MB48	4.7	500	20%	3
459	M49470Q01565KEJ	L1QJ30C565KB65	5.6	500	10%	3
460	M49470Q01565MEJ	L1QJ30C565MB65	5.6	500	20%	3

Note: All L1 part numbers are also available in the L2 style.

MIL-PRF-49470/1 PART NUMBER CROSS REFERENCE

MIL-PRF-49470 P/N	KEMET P/N	Cap (µF)	Case Code
50 Volts			
M49470X01105(1)A(2)	L1X(2)505105(1)B12	1.0	5
M49470X01125(1)A(2)	L1X(2)505125(1)B12	1.2	5
M49470X01155(1)A(2)	L1X(2)505155(1)B24	1.5	5
M49470X01185(1)A(2)	L1X(2)505185(1)B24	1.8	5
M49470X01225(1)A(2)	L1X(2)505225(1)B24	2.2	5
M49470X01275(1)A(2)	L1X(2)505275(1)B36	2.7	5
M49470X01335(1)A(2)	L1X(2)505335(1)B36	3.3	5
M49470X01395(1)A(2)	L1X(2)505395(1)B48	3.9	5
M49470X01475(1)A(2)	L1X(2)505475(1)B48	4.7	5
M49470X01565(1)A(2)	L1X(2)505565(1)B65	5.6	5
M49470X01685(1)A(2)	L1X(2)405685(1)B36	6.8	4
M49470X01825(1)A(2)	L1X(2)405825(1)B36	8.2	4
M49470X01106(1)A(2)	L1X(2)405106(1)B48	10	4
M49470X01126(1)A(2)	L1X(2)405126(1)B48	12	4
M49470X01156(1)A(2)	L1X(2)405156(1)B65	15	4
M49470X01186(1)A(2)	L1X(2)305186(1)B24	18	3
M49470X01226(1)A(2)	L1X(2)305226(1)B36	22	3
M49470X01276(1)A(2)	L1X(2)305276(1)B36	27	3
M49470X01336(1)A(2)	L1X(2)305336(1)B36	33	3
M49470X01396(1)A(2)	L1X(2)305396(1)B48	39	3
M49470X01476(1)A(2)	L1X(2)305476(1)B65	47	3
100 Volts			
M49470X01684(1)B(2)	L1X(2)501684(1)B12	0.68	5
M49470X01824(1)B(2)	L1X(2)501824(1)B24	0.82	5
M49470X01105(1)B(2)	L1X(2)501105(1)B24	1.0	5
M49470X01125(1)B(2)	L1X(2)501125(1)B24	1.2	5
M49470X01155(1)B(2)	L1X(2)501155(1)B36	1.5	5
M49470X01185(1)B(2)	L1X(2)501185(1)B36	1.8	5
M49470X01225(1)B(2)	L1X(2)501225(1)B48	2.2	5
M49470X01275(1)B(2)	L1X(2)501275(1)B48	2.7	5
M49470X01335(1)B(2)	L1X(2)501335(1)B65	3.3	5
M49470X01395(1)B(2)	L1X(2)401395(1)B36	3.9	4
M49470X01475(1)B(2)	L1X(2)401475(1)B36	4.7	4
M49470X01565(1)B(2)	L1X(2)401565(1)B48	5.6	4
M49470X01685(1)B(2)	L1X(2)401685(1)B48	6.8	4
M49470X01825(1)B(2)	L1X(2)401825(1)B65	8.2	4
M49470X01106(1)B(2)	L1X(2)301106(1)B24	10	3
M49470X01126(1)B(2)	L1X(2)301126(1)B24	12	3
M49470X01156(1)B(2)	L1X(2)301156(1)B36	15	3
M49470X01186(1)B(2)	L1X(2)301186(1)B36	18	3
M49470X01226(1)B(2)	L1X(2)301226(1)B48	22	3
M49470X01276(1)B(2)	L1X(2)301276(1)B65	27	3

MIL-PRF-49470 P/N	KEMET P/N	Cap (µF)	Case Code
200 Volts			
M49470R01474(1)C(2)	L1R(2)502474(1)B24	0.47	5
M49470R01564(1)C(2)	L1R(2)502564(1)B24	0.56	5
M49470R01684(1)C(2)	L1R(2)502684(1)B36	0.68	5
M49470R01824(1)C(2)	L1R(2)502824(1)B36	0.82	5
M49470R01105(1)C(2)	L1R(2)502105(1)B48	1.0	5
M49470R01125(1)C(2)	L1R(2)502125(1)B48	1.2	5
M49470R01155(1)C(2)	L1R(2)502155(1)B65	1.5	5
M49470R01185(1)C(2)	L1R(2)402185(1)B36	1.8	4
M49470R01225(1)C(2)	L1R(2)402225(1)B36	2.2	4
M49470R01275(1)C(2)	L1R(2)402275(1)B48	2.7	4
M49470R01335(1)C(2)	L1R(2)402335(1)B48	3.3	4
M49470R01395(1)C(2)	L1R(2)402395(1)B65	3.9	4
M49470R01475(1)C(2)	L1R(2)302475(1)B24	4.7	3
M49470R01565(1)C(2)	L1R(2)302565(1)B24	5.6	3
M49470R01685(1)C(2)	L1R(2)302685(1)B36	6.8	3
M49470R01825(1)C(2)	L1R(2)302825(1)B36	8.2	3
M49470R01106(1)C(2)	L1R(2)302106(1)B48	10	3
M49470R01126(1)C(2)	L1R(2)302126(1)B65	12	3
500 Volts			
M49470Q01154(1)E(2)	L1Q(2)50C154(1)B12	0.15	5
M49470Q01184(1)E(2)	L1Q(2)50C184(1)B24	0.18	5
M49470Q01224(1)E(2)	L1Q(2)50C224(1)B24	0.22	5
M49470Q01274(1)E(2)	L1Q(2)50C274(1)B24	0.27	5
M49470Q01334(1)E(2)	L1Q(2)50C334(1)B36	0.33	5
M49470Q01394(1)E(2)	L1Q(2)50C394(1)B36	0.39	5
M49470Q01474(1)E(2)	L1Q(2)50C474(1)B36	0.47	5
M49470Q01564(1)E(2)	L1Q(2)50C564(1)B48	0.56	5
M49470Q01684(1)E(2)	L1Q(2)50C684(1)B65	0.68	5
M49470Q01824(1)E(2)	L1Q(2)40C824(1)B36	0.82	4
M49470Q01105(1)E(2)	L1Q(2)40C105(1)B36	1.0	4
M49470Q01125(1)E(2)	L1Q(2)40C125(1)B36	1.2	4
M49470Q01155(1)E(2)	L1Q(2)40C155(1)B48	1.5	4
M49470Q01185(1)E(2)	L1Q(2)40C185(1)B65	1.8	4
M49470Q01225(1)E(2)	L1Q(2)30C225(1)B24	2.2	3
M49470Q01275(1)E(2)	L1Q(2)30C275(1)B36	2.7	3
M49470Q01335(1)E(2)	L1Q(2)30C335(1)B36	3.3	3
M49470Q01395(1)E(2)	L1Q(2)30C395(1)B36	3.9	3
M49470Q01475(1)E(2)	L1Q(2)30C475(1)B48	4.7	3
M49470Q01565(1)E(2)	L1Q(2)30C565(1)B65	5.6	3

To complete Part Numbers, insert the following letters:
(1) Available Capacitance Tolerances: K, M
(2) Available Lead Styles: N, J, L

MIL-PRF-49470/2 PART NUMBER CROSS REFERENCE

MIL-PRF-49470 P/N	KEMET P/N	Cap (µF)	Case Code
50 Volts			
M49470X02105(1)A(2)	L2X(2)505105(1)B27	1.0	5
M49470X02125(1)A(2)	L2X(2)505125(1)B27	1.2	5
M49470X02155(1)A(2)	L2X(2)505155(1)B39	1.5	5
M49470X02185(1)A(2)	L2X(2)505185(1)B39	1.8	5
M49470X02225(1)A(2)	L2X(2)505225(1)B39	2.2	5
M49470X02275(1)A(2)	L2X(2)505275(1)B53	2.7	5
M49470X02335(1)A(2)	L2X(2)505335(1)B53	3.3	5
M49470X02395(1)A(2)	L2X(2)505395(1)B66	3.9	5
M49470X02475(1)A(2)	L2X(2)505475(1)B66	4.7	5
M49470X02565(1)A(2)	L2X(2)505565(1)B80	5.6	5
M49470X02685(1)A(2)	L2X(2)405685(1)B53	6.8	4
M49470X02825(1)A(2)	L2X(2)405825(1)B53	8.2	4
M49470X02106(1)A(2)	L2X(2)405106(1)B66	10	4
M49470X02126(1)A(2)	L2X(2)405126(1)B66	12	4
M49470X02156(1)A(2)	L2X(2)405156(1)B80	15	4
M49470X02186(1)A(2)	L2X(2)305186(1)B39	18	3
M49470X02226(1)A(2)	L2X(2)305226(1)B53	22	3
M49470X02276(1)A(2)	L2X(2)305276(1)B53	27	3
M49470X02336(1)A(2)	L2X(2)305336(1)B53	33	3
M49470X02396(1)A(2)	L2X(2)305396(1)B66	39	3
M49470X02476(1)A(2)	L2X(2)305476(1)B80	47	3
100 Volts			
M49470X02684(1)B(2)	L2X(2)501684(1)B27	0.68	5
M49470X02824(1)B(2)	L2X(2)501824(1)B39	0.82	5
M49470X02105(1)B(2)	L2X(2)501105(1)B39	1.0	5
M49470X02125(1)B(2)	L2X(2)501125(1)B39	1.2	5
M49470X02155(1)B(2)	L2X(2)501155(1)B53	1.5	5
M49470X02185(1)B(2)	L2X(2)501185(1)B53	1.8	5
M49470X02225(1)B(2)	L2X(2)501225(1)B66	2.2	5
M49470X02275(1)B(2)	L2X(2)501275(1)B66	2.7	5
M49470X02335(1)B(2)	L2X(2)501335(1)B80	3.3	5
M49470X02395(1)B(2)	L2X(2)401395(1)B53	3.9	4
M49470X02475(1)B(2)	L2X(2)401475(1)B53	4.7	4
M49470X02565(1)B(2)	L2X(2)401565(1)B66	5.6	4
M49470X02685(1)B(2)	L2X(2)401685(1)B66	6.8	4
M49470X02825(1)B(2)	L2X(2)401825(1)B80	8.2	4
M49470X02106(1)B(2)	L2X(2)301106(1)B39	10	3
M49470X02126(1)B(2)	L2X(2)301126(1)B39	12	3
M49470X02156(1)B(2)	L2X(2)301156(1)B53	15	3
M49470X02186(1)B(2)	L2X(2)301186(1)B53	18	3
M49470X02226(1)B(2)	L2X(2)301226(1)B66	22	3
M49470X02276(1)B(2)	L2X(2)301276(1)B80	27	3

MIL-PRF-49470 P/N	KEMET P/N	Cap (µF)	Case Code
200 Volts			
M49470R02474(1)C(2)	L2R(2)502474(1)B39	0.47	5
M49470R02564(1)C(2)	L2R(2)502564(1)B39	0.56	5
M49470R02684(1)C(2)	L2R(2)502684(1)B53	0.68	5
M49470R02824(1)C(2)	L2R(2)502824(1)B53	0.82	5
M49470R02105(1)C(2)	L2R(2)502105(1)B66	1.0	5
M49470R02125(1)C(2)	L2R(2)502125(1)B66	1.2	5
M49470R02155(1)C(2)	L2R(2)502155(1)B80	1.5	5
M49470R02185(1)C(2)	L2R(2)402185(1)B53	1.8	4
M49470R02225(1)C(2)	L2R(2)402225(1)B53	2.2	4
M49470R02275(1)C(2)	L2R(2)402275(1)B66	2.7	4
M49470R02335(1)C(2)	L2R(2)402335(1)B66	3.3	4
M49470R02395(1)C(2)	L2R(2)402395(1)B80	3.9	4
M49470R02475(1)C(2)	L2R(2)302475(1)B39	4.7	3
M49470R02565(1)C(2)	L2R(2)302565(1)B39	5.6	3
M49470R02685(1)C(2)	L2R(2)302685(1)B53	6.8	3
M49470R02825(1)C(2)	L2R(2)302825(1)B53	8.2	3
M49470R02106(1)C(2)	L2R(2)302106(1)B66	10	3
M49470R02126(1)C(2)	L2R(2)302126(1)B80	12	3
500 Volts			
M49470Q02154(1)E(2)	L2Q(2)50C154(1)B27	0.15	5
M49470Q02184(1)E(2)	L2Q(2)50C184(1)B39	0.18	5
M49470Q02224(1)E(2)	L2Q(2)50C224(1)B39	0.22	5
M49470Q02274(1)E(2)	L2Q(2)50C274(1)B39	0.27	5
M49470Q02334(1)E(2)	L2Q(2)50C334(1)B53	0.33	5
M49470Q02394(1)E(2)	L2Q(2)50C394(1)B53	0.39	5
M49470Q02474(1)E(2)	L2Q(2)50C474(1)B53	0.47	5
M49470Q02564(1)E(2)	L2Q(2)50C564(1)B66	0.56	5
M49470Q02684(1)E(2)	L2Q(2)50C684(1)B80	0.68	5
M49470Q02824(1)E(2)	L2Q(2)40C824(1)B53	0.82	4
M49470Q02105(1)E(2)	L2Q(2)40C105(1)B53	1.0	4
M49470Q02125(1)E(2)	L2Q(2)40C125(1)B53	1.2	4
M49470Q02155(1)E(2)	L2Q(2)40C155(1)B66	1.5	4
M49470Q02185(1)E(2)	L2Q(2)40C185(1)B80	1.8	4
M49470Q02225(1)E(2)	L2Q(2)30C225(1)B39	2.2	3
M49470Q02275(1)E(2)	L2Q(2)30C275(1)B53	2.7	3
M49470Q02335(1)E(2)	L2Q(2)30C335(1)B53	3.3	3
M49470Q02395(1)E(2)	L2Q(2)30C395(1)B53	3.9	3
M49470Q02475(1)E(2)	L2Q(2)30C475(1)B66	4.7	3
M49470Q02565(1)E(2)	L2Q(2)30C565(1)B80	5.6	3

To complete Part Numbers, insert the following letters:
(1) Available Capacitance Tolerances: K, M
(2) Available Lead Styles: N, J, L

KEMET STACKED CAPACITORS TEST METHODS

KEMET Stacked Capacitors Test Methods		KEMET Standard (S)	Customer Drawing (X)	MIL-PRF-49470 B Level
Test Description	**Test Method**			
In-Process Inspection				
Ultrasonic Scanning (C-SAM)	Meet EIA-469 Criteria	Not Required	Optional per SCD	Not Required
DPA Analysis	EIA-469	Not Required	Optional per SCD	Not Required
In-Process Visual Inspection	Per MIL-PRF-49470	Yes (KEMET Std)	Yes (KEMET Std)	Yes (KEMET Std)
Group A Requirements				
Thermal Shock	MIL-STD-202 Method 107	Not Required	Optional per SCD	Yes 5 Cycles
Voltage Conditioning	Per MIL-PRF-49470	Not Required	Optional per SCD	Yes 96 hrs (Stack)
≤200V	200%Vr @125°C			
500V	120%Vr @125°C			
Visual and Mechanical Inspection	Per MIL-PRF-49470	Yes (KEMET Std)	Yes (Per Lot)	Yes (Per Lot)
Solderability	MIL-STD-202 Method 208	Not Required	Optional per SCD	Yes (Per Inspection Lot)
DPA Analysis	EIA-469	Not Required	Optional per SCD	Not Required
Group B Requirements				
Voltage-Temperature Limits (TCVC)	Per MIL-PRF-49470	Not Required	Optional per SCD	Yes (Periodic)
Resistance to Solvents	MIL-STD-202 Method 215	Not Required	Optional per SCD	Yes (Periodic)
Terminal Strength	MIL-STD-202 Method 211	Not Required	Optional per SCD	Yes (Periodic)
Resistance to Soldering Heat	MIL-STD-202 Method 210	Not Required	Optional per SCD	Yes (Periodic)
Moisture Resistance	MIL-STD-202 Method 106	Not Required	Optional per SCD	Yes (Periodic)
Marking Legibility	Per MIL-PRF-49470	Not Required	Optional per SCD	Yes (Periodic)
Low Voltage Humidity Testing	MIL-STD-202 Method 103	Not Required	Optional per SCD	Not Required
Life Test	MIL-STD-202 Method 108			
≤200V	200%Vr @125°C	Not Required	Optional per SCD	Yes (Periodic)
500V	120%Vr @125°C	Not Required	Optional per SCD	Yes (Periodic)
Thermal Shock	MIL-STD-202 Method 107	Not Required	Optional per SCD	Not Required
Visual/100% Electrial Testing Cap/DF/IR/DWV	Standard	Yes	Yes	Yes

APPLICATION NOTES FOR MIL-PRF-49470

Note: DSCC-DWG-87106 for similarly constructed parts was CANCELED Jan 2005. Use MIL-PRF-49470 parts as a direct replacement.

When available MIL-PRF-49470 SMPS capacitors are preferred over DSCC-DWG-87106 capacitors. The MIL-PRF-49470 specification was developed as part of a cooperative effort amongst the US Military, NASA and the SMPS suppliers to produce a robust replacement for the DSCC drawing. The MIL spec product provides additional quality assurance provisions which are NOT required by the DSCC drawing. Some of the benefits of the MIL-PRF-49470 product over the DSCC-DWG-87106 product include:

Requirement	MIL-PRF-49470	DSCC-DWG-87106
Formal Qualification Process (QPL Established)	Yes	No
MIL-STD-790 Compliance	Yes	No
DSCC Audits	Yes	No
Routine Qualification Maintenance Testing (ie., Life Testing)	Yes	No
Group A Percent Defective Allowed (PDA) Specified	Yes	No
Prohibits Mixing of Chips from Different Production Lots within a Single SMPS Stack Lot	Yes	No

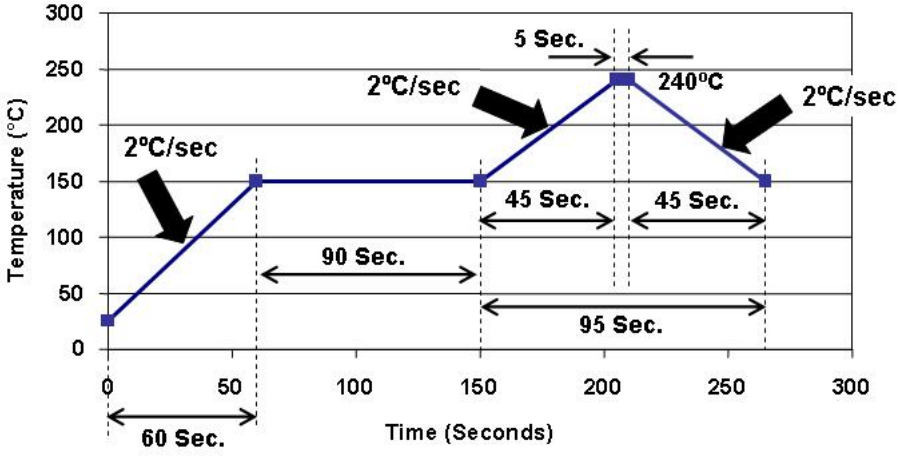
SOLDERING RECOMMENDATIONS FOR CERAMIC STACKED CAPACITORS

Ceramic stacked capacitors are large mass devices and much care should be taken when soldering these capacitors. For this reason, hand soldering is not a recommended soldering method for these devices. Following the proper soldering guidelines is critical in order to prevent thermal cracking.

PRE-HEATING AND REFLOW PROFILE

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.

KEMET RECOMMENDED SOLDER REFLOW PROFILE



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