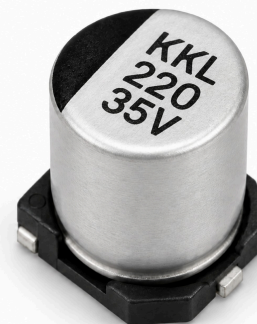


KKL Series

SMD Aluminium Electrolytic Capacitors (V-chip)

Features

- Designed for reflow soldering
- Designed for surface mounting on high-density PCB
- RoHS 2.0 compliant
- 219 SVHC & REACH compliant



TEMPERATURE RANGE
-55°C ... +105°C

RATED VOLTAGE
6.3 – 100 V

CAPACITANCE
1 – 2200 μ F

ENDURANCE
105°C 3000~5000 h

Specifications

Category temp. range	-55°C to +105°C	
Capacitance tolerance	$\pm 20\%$ (120 Hz / +20 °C)	
Leakage current	$I \leq 0.01 \text{ CV}$ or $3 \mu\text{A}$ whichever is greater (after 2 minutes)	
Tan δ	See the characteristics list	
Endurance	After applying rated working voltage for 3000/5000 hours at +105 °C ± 2 °C, and then being stabilized at +20 °C, capacitors shall meet the following limits.	
	Test Time	$\Phi D \leq 6.3\text{mm}$: 3000H, $\Phi D \geq 8\text{mm}$: 5000H
	Capacitance change	Within $\pm 30\%$ of the initial value
	Dissipation factor (tan δ)	Less than 300% of the initial value
	Leakage current	Within the initial limit
Shelf life	After storage for 1000 h at +105 °C ± 2 °C with no voltage applied and then being stabilized at +20 °C, capacitors shall meet the limits specified in endurance.	
Resistance to soldering heat	After reflow soldering and then being stabilized at +20 °C, capacitors shall meet the following limits.	
	Capacitance change	Within $\pm 10\%$ of the initial value
	Dissipation factor (tan δ)	Within the initial limit
	Leakage current	Within the initial limit

Low-temperature characteristics

Rated voltage (V)	6.3	10	16	25	35	50	63	80	100
Z(-25°C)/Z(+20°C)	4	4	3	2	2	2	2	3	3
Z(-55°C)/Z(+20°C)	15	8	6	4	4	4	3	3	3

Impedance ratio at 120 Hz

Ripple current frequency correction factor

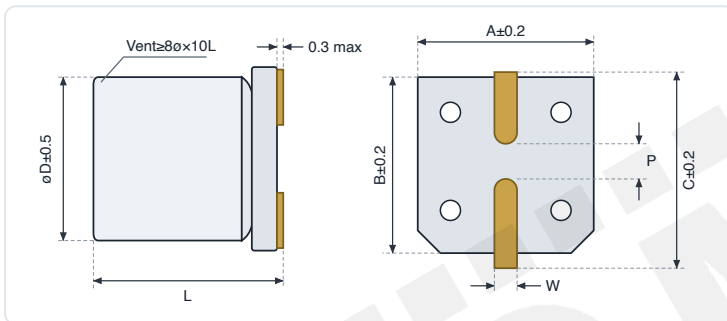
Frequency	50Hz	120Hz	1kHz	10kHz $\leq$
$C \leq 1000\mu\text{F}$	0.7	1.0	1.2	1.3
$C > 1000\mu\text{F}$	0.85	1.0	1.1	1.15

Standard ratings

$\mu F \setminus V$	6.3	10	16	25	35	50	63	80	100
1						4×5.7			
2.2						4×5.7			
3.3						4×5.7			
4.7					4×5.7	5×5.7			6.3×7.7
10			4×5.7	5×5.7	5×5.7	6.3×5.7	6.3×7.7		8×10.5
22	4×5.7	5×5.7	5×5.7	6.3×5.7	6.3×5.7	6.3×7.7	8×10.5		10×10.5
33	5×5.7	5×5.7	6.3×5.7	6.3×5.7	6.3×7.7	8×10.5	10×10.5		10×10.5
47	5×5.7	6.3×5.7	6.3×5.7	6.3×7.7	8×10.5	8×10.5	10×10.5		12.5×13.5
100	6.3×5.7	6.3×7.7	6.3×7.7	8×10.5	10×10.5	10×10.5	12.5×13.5	12.5×13.5	12.5×13.5
150		8×10.5						12.5×13.5	
220	6.3×7.7	8×10.5	8×10.5	10×10.5	10×10.5	12.5×13.5	12.5×13.5		
330	8×10.5	10×10.5	10×10.5	10×10.5	12.5×13.5				
470	10×10.5	10×10.5	10×10.5	12.5×13.5	12.5×13.5				
1000	10×10.5	10×13	12.5×13.5						
1500	12.5×13.5	12.5×13.5	12.5×13.5						
2200	12.5×13.5	12.5×13.5							

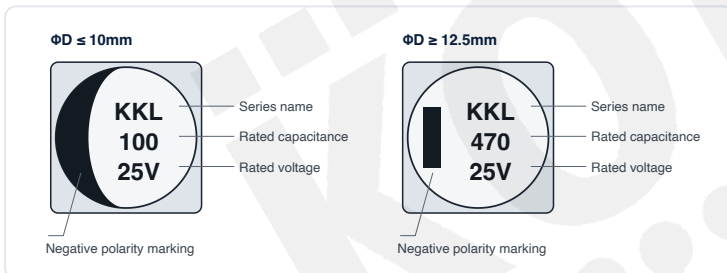
Case size $\Phi D \times L$ (mm). Full ratings in the characteristics list.

Dimensions and marking



ΦD	L	A	B	C	W	P ± 0.2
4	5.7 ± 0.3	4.3	4.3	5.1	0.5~0.8	1.0
5	5.7 ± 0.3	5.3	5.3	6.1	0.5~0.8	1.3
6.3	5.7 ± 0.3	6.6	6.6	7.3	0.5~0.8	2.2
6.3	7.7 ± 0.3	6.6	6.6	7.3	0.5~0.8	2.2
8	10.5 ± 0.5	8.3	8.3	9.2	0.7~1.2	3.1
10	10.5 ± 0.5	10.3	10.3	11.2	0.7~1.2	4.4
10	13 ± 0.5	10.3	10.3	11.2	0.7~1.2	4.4
12.5	13.5 ± 0.5	13.0	13.0	14.0	1.0~1.4	4.4

Unit: mm



Marking: black

Part number system

KKL Series name KKL series	1C Rated voltage 16V	221 Capacitance 220 μF	M Capacitance tolerance $\pm 20 \%$	0810 Case Size 8 Φ X10.5L
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Example: KKL1C221M0810

Characteristics list

Rated voltage (V)	Capacitance ($\pm 20\%$) (μF)	ΦD (mm)	L (mm)	Rated ripple current① (mA rms)	$\tan \delta$ ②	Part Number③	MPQ (pcs/reel)
6.3	22	4	5.7	22	0.30	KKL0J220M0406	2000
6.3	33	5	5.7	35	0.30	KKL0J330M0506	1000
6.3	47	5	5.7	38	0.30	KKL0J470M0506	1000
6.3	100	6.3	5.7	69	0.30	KKL0J101M0606	1000
6.3	220	6.3	7.7	101	0.30	KKL0J221M0607	1000
6.3	330	8	10.5	141	0.30	KKL0J331M0810	500
6.3	470	10	10.5	320	0.30	KKL0J471M1010	500
6.3	1000	10	10.5	410	0.32	KKL0J102M1010	500
6.3	1500	12.5	13.5	500	0.40	KKL0J152M1313	200
6.3	2200	12.5	13.5	600	0.42	KKL0J222M1313	200
10	22	5	5.7	30	0.24	KKL1A220M0506	1000
10	33	5	5.7	35	0.24	KKL1A330M0506	1000
10	47	6.3	5.7	50	0.24	KKL1A470M0606	1000

Rated voltage (V)	Capacitance (±20%) (μF)	ΦD (mm)	L (mm)	Rated ripple current① (mA rms)	tan δ②	Part Number③	MPQ (pcs/reel)
10	100	6.3	7.7	80	0.24	KKL1A101M0607	1000
10	150	8	10.5	125	0.24	KKL1A151M0810	500
10	220	8	10.5	140	0.24	KKL1A221M0810	500
10	330	10	10.5	290	0.24	KKL1A331M1010	500
10	470	10	10.5	320	0.24	KKL1A471M1010	500
10	1000	10	13	390	0.26	KKL1A102M1013	400
10	1500	12.5	13.5	500	0.36	KKL1A152M1313	200
10	2200	12.5	13.5	600	0.38	KKL1A222M1313	200
16	10	4	5.7	18	0.20	KKL1C100M0406	2000
16	22	5	5.7	30	0.20	KKL1C220M0506	1000
16	33	6.3	5.7	48	0.20	KKL1C330M0606	1000
16	47	6.3	5.7	50	0.20	KKL1C470M0606	1000
16	100	6.3	7.7	81	0.20	KKL1C101M0607	1000
16	220	8	10.5	141	0.20	KKL1C221M0810	500
16	330	10	10.5	290	0.20	KKL1C331M1010	500
16	470	10	10.5	320	0.20	KKL1C471M1010	500
16	1000	12.5	13.5	550	0.32	KKL1C102M1313	200
16	1500	12.5	13.5	600	0.32	KKL1C152M1313	200
25	10	5	5.7	27	0.18	KKL1E100M0506	1000
25	22	6.3	5.7	44	0.18	KKL1E220M0606	1000
25	33	6.3	5.7	50	0.18	KKL1E330M0606	1000
25	47	6.3	7.7	63	0.18	KKL1E470M0607	1000
25	100	8	10.5	116	0.18	KKL1E101M0810	500
25	220	10	10.5	290	0.18	KKL1E221M1010	500
25	330	10	10.5	320	0.18	KKL1E331M1010	500
25	470	12.5	13.5	400	0.28	KKL1E471M1313	200
35	4.7	4	5.7	16	0.16	KKL1V4R7M0406	2000
35	10	5	5.7	27	0.16	KKL1V100M0506	1000
35	22	6.3	5.7	44	0.16	KKL1V220M0606	1000
35	33	6.3	7.7	57	0.16	KKL1V330M0607	1000
35	47	8	10.5	92	0.16	KKL1V470M0810	500
35	100	10	10.5	151	0.16	KKL1V101M1010	500
35	220	10	10.5	320	0.16	KKL1V221M1010	500
35	330	12.5	13.5	320	0.22	KKL1V331M1313	200
35	470	12.5	13.5	350	0.22	KKL1V471M1313	200
50	1	4	5.7	8	0.14	KKL1H010M0406	2000
50	2.2	4	5.7	12	0.14	KKL1H2R2M0406	2000
50	3.3	4	5.7	17	0.14	KKL1H3R3M0406	2000
50	4.7	5	5.7	22	0.14	KKL1H4R7M0506	1000
50	10	6.3	5.7	32	0.14	KKL1H100M0606	1000
50	22	6.3	7.7	58	0.14	KKL1H220M0607	1000
50	33	8	10.5	130	0.14	KKL1H330M0810	500
50	47	8	10.5	141	0.14	KKL1H470M0810	500
50	100	10	10.5	160	0.14	KKL1H101M1010	500
50	220	12.5	13.5	280	0.16	KKL1H221M1313	200
63	10	6.3	7.7	45	0.14	KKL1J100M0607	1000
63	22	8	10.5	65	0.14	KKL1J220M0810	500
63	33	10	10.5	80	0.14	KKL1J330M1010	500
63	47	10	10.5	110	0.14	KKL1J470M1010	500
63	100	12.5	13.5	150	0.14	KKL1J101M1313	200
63	220	12.5	13.5	240	0.16	KKL1J221M1313	200
80	100	12.5	13.5	180	0.16	KKL1K101M1313	200
80	150	12.5	13.5	220	0.16	KKL1K151M1313	200
100	4.7	6.3	7.7	40	0.14	KKL2A4R7M0607	1000
100	10	8	10.5	55	0.14	KKL2A100M0810	500
100	22	10	10.5	70	0.14	KKL2A220M1010	500
100	33	10	10.5	80	0.14	KKL2A330M1010	500
100	47	12.5	13.5	150	0.14	KKL2A470M1313	200
100	100	12.5	13.5	220	0.16	KKL2A101M1313	200

① Rated ripple current (120Hz / +105°C)

② tan δ (120Hz / +20°C)

③ For plastic reel packaging , the Part Number is appended with "PR" at the end.

All product specifications in the catalog are subject to change without notice. Ask factory for the current technical specifications before purchase. (CAT.2021L1)