

# K05 TYPE -40°C +105°C 5000H

RoHS Compliant

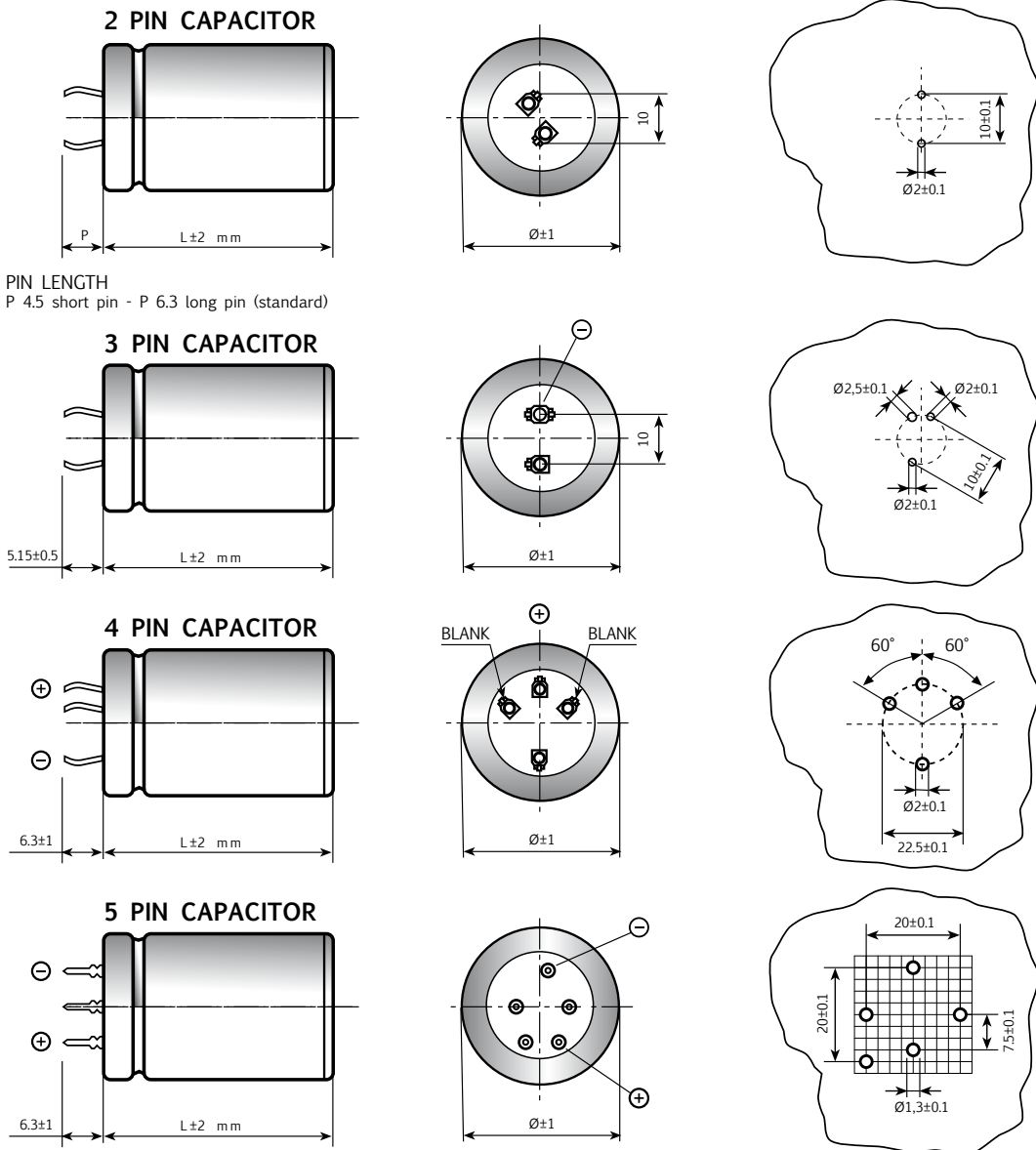
- Surge-proof capacitor in aluminium can with insulation sleeve.
- Safety vent at bottom case or aside case.
- Snap in terminals for PCB mounting.
- Very high CV for unit volume with low ESR.
- High ripple current, in small dimensions case size.
- Extended temperature range with outstanding reliability.

## APPLICATIONS

Professional switch mode power supplies. Professional power electronics.

Dimensions in mm.

Circuit board hole dimensions



$\varnothing$	22	25	30	35	40	45	50
2 PIN	●	●	●	●	●		
3 PIN		●	●	●			
4 PIN				●	●	●	●
5 PIN					●		

On demand, only for capacitors with diam  $\geq 35$ mm: octagonal can shape for long stress vibration applications.

## SPECIFICATIONS

<b>Temperature Range</b>	Operating: -40°C +105°C Storage : Preferably below +25°C, not exceeding +40°C	[Environmental classification 40/105/56 IEC-68]
<b>Rated Voltage Range (V<sub>r</sub>)</b>	from 16V to 500V DC	
<b>Surge Voltage (V<sub>p</sub>)</b>	V <sub>p</sub> = 1.15 V <sub>r</sub> (V <sub>r</sub> ≤ 250V DC) V <sub>p</sub> = 1.10 V <sub>r</sub> (V <sub>r</sub> > 250V DC)	
<b>Rated Capacitance Range</b>	from 68 µF to 47,000 µF	
<b>Capacitance Tolerance</b>	±20% at 100 Hz, 20°C [M class IEC-62]	
<b>Leakage Current (I<sub>L</sub>) (mA, 5 min, 20°C)</b>	max I <sub>L</sub> = 0.006 C <sub>r</sub> V <sub>r</sub> + 4 µA At 85°C max I <sub>L</sub> = 0.02 C <sub>r</sub> V <sub>r</sub> µA	Kendeil product limit : I <sub>L</sub> = 0.003 C <sub>r</sub> V <sub>r</sub>
<b>Ripple current (I<sub>r</sub>)</b>	Refer to table at 105°C and 100Hz. For different temperature and frequency multiplier must be used as follows:	
	FREQUENCY	50Hz 100Hz 500 Hz 1000Hz >10kHz
	MULTIPLIER (0-25V V <sub>r</sub> DC)	0.91 1.0 1.15 1.15 1.2
	MULTIPLIER (40-100V V <sub>r</sub> DC)	0.88 1.0 1.35 1.40 1.45
	MULTIPLIER (160-450V V <sub>r</sub> DC)	0.88 1.0 1.45 1.50 1.55
	AMBIENT TEMP.	35°C 45°C 55°C 65°C 75°C 85°C 95°C 105°C 110°C
	MULTIPLIER	3.0 2.80 2.60 2.40 2.20 1.80 1.50 1.0 0.5
	Maximum internal temperature 108°C	
<b>Insulation Resistance</b>	At 100V DC for 1 min is >100 MΩ across insulating sleeve and terminals.	
<b>Vibration Resistance</b>	Frequency range: 10 Hz to 500 Hz, amplitude 0.75 mm max acceleration 10g for 3x2 h	
<b>Withstand voltage (between terminals bundled and plate)</b>	2500 VAC for 1 min	
<b>Life test</b>	After 2,000 hours application of rated voltage at 105°C capacitors meet characteristics aside:	
	for all sizes with V ≤ 100V; all voltage capacitors with diameter ≤ 35mm	Cap change ≤ ±20% tan δ ≤ 200% Leakage current (I <sub>L</sub> ) < initial limit Impedance (Z) ≤ 200%
	for V ≥ 160V and for capacitors with diameter ≥ 40mm	Cap change ≤ ±10% tan δ ≤ 130% Leakage current (I <sub>L</sub> ) < initial limit Impedance (Z) ≤ 130%
<b>Shelf life</b>	After leaving capacitors under no load for 500 hours at 105°C, when restored at 20°C meet specifications aside	Cap change ≤ ±15% tan δ ≤ 150% Leakage current (I <sub>L</sub> ) < initial limit
<b>Useful life (V<sub>n</sub>, Temp rated I ripple applied)</b>	250,000 h at 40°C 15,000 h at 85°C 5,000 h at 105°C	
<b>Failure percentage Failure rate</b>	≤ 1% (during useful life) ≤ 30 fit (30 10 <sup>-9</sup> /h) (V <sub>r</sub> ≤ 160V DC) ≤ 40 fit (40 10 <sup>-9</sup> /h) (V <sub>r</sub> > 160V DC)	
<b>Self inductance</b>	Approx. 20 nH	
<b>Damp heat test (V<sub>n</sub> applied, 2000 hours, 85% RH)</b>	Stable electrical parameters in humidity ambient condition 85°C	
<b>Electrolyte</b>	All the capacitors of this series have self-extinguishing electrolyte in accordance with IEC EN 60695-11-10	
<b>Marking information</b>	minus pole band aside within an angle of 41° ± 25°	
<b>Reference standards</b>	CECC 30.301 - IEC 60384-4 LONG LIFE GRADE	

## K05 TYPE STANDARD RATINGS

Cap $\mu\text{F}$	$\varnothing \times L$ mm	Tan $\delta$ MAX 100 Hz 20°C	ESR TYP m $\Omega$ 100 Hz 20°C	Z TYP m $\Omega$ 10 kHz 20°C	I <sub>r</sub> a.c. A max 100 Hz 105°C	PART NUMBER termination digit excluded
6800	25x30	0.30	55	40	1.9	K05016682_PM0C030
10000	25x40	0.40	45	35	2.0	K05016103_PM0C040
10000	30x30	0.40	40	35	2.0	K05016103_PM0D030
15000	25x40	0.45	40	35	2.6	K05016153_PM0C040
15000	30x40	0.45	40	35	2.8	K05016153_PM0D040
22000	30x40	0.60	35	24	3.1	K05016223_PM0D040
22000	35x40	0.60	35	24	3.3	K05016223_PM0E040
33000	35x50	0.70	25	20	3.6	K05016333_PM0E050
47000	35x50	0.90	22	20	4.9	K05016473_PM0E050

**RATED  
VOLTAGE  
VDC**

**16V**

Cap $\mu\text{F}$	$\varnothing \times L$ mm	Tan $\delta$ MAX 100 Hz 20°C	ESR TYP m $\Omega$ 100 Hz 20°C	Z TYP m $\Omega$ 10 kHz 20°C	I <sub>r</sub> a.c. A max 100 Hz 105°C	PART NUMBER termination digit excluded
4700	25x30	0.25	53	45	1.8	K05025472_PM0C030
6800	25x30	0.25	50	38	2.0	K05025682_PM0C030
6800	30x30	0.30	50	38	2.2	K05025682_PM0D030
10000	25x40	0.40	40	35	2.4	K05025103_PM0C040
10000	30x30	0.40	40	35	2.3	K05025103_PM0D030
15000	30x40	0.45	39	28	2.9	K05025153_PM0D040
15000	35x40	0.45	39	28	3.2	K05025153_PM0E040
22000	35x50	0.60	30	22	3.3	K05025223_PM0E050
33000	35x50	0.70	22	18	4.3	K05025333_PM0E050

**RATED  
VOLTAGE  
VDC**

**25V**

Cap $\mu\text{F}$	$\varnothing \times L$ mm	Tan $\delta$ MAX 100 Hz 20°C	ESR TYP m $\Omega$ 100 Hz 20°C	Z TYP m $\Omega$ 10 kHz 20°C	I <sub>r</sub> a.c. A max 100 Hz 105°C	PART NUMBER termination digit excluded
3300	25x30	0.20	72	58	1.5	K05040332_PM0C030
4700	25x30	0.20	50	38	1.8	K05040472_PM0C030
4700	30x25	0.20	50	38	1.8	K05040472_PM0D025
6800	25x40	0.30	48	33	2.3	K05040682_PM0C040
6800	30x30	0.30	48	33	2.4	K05040682_PM0D030
10000	30x40	0.40	39	28	2.8	K05040103_PM0D040
10000	35x30	0.40	39	28	2.9	K05040103_PM0E030
10000	35x40	0.40	39	28	3.1	K05040103_PM0E040
15000	30x40	0.45	32	22	2.8	K05040153_PM0D040
15000	35x40	0.45	32	22	3.7	K05040153_PM0E040
22000	35x40	0.55	28	20	5.1	K05040223_PM0E040
22000	35x50	0.55	28	20	5.4	K05040223_PM0E050

**RATED  
VOLTAGE  
VDC**

**40V**

## K05 TYPE STANDARD RATINGS

**RATED  
VOLTAGE  
VDC**

**50V**

Cap $\mu\text{F}$	$\varnothing \times L$ mm	Tan $\delta$ MAX 100 Hz 20°C	ESR TYP m $\Omega$ 100 Hz 20°C	Z TYP m $\Omega$ 10 kHz 20°C	I <sub>r</sub> a.c. A max 100 Hz 105°C	PART NUMBER termination digit excluded
2200	25x30	0.20	72	58	1.5	K05050222_PM0C030
3300	25x30	0.20	48	38	1.6	K05050332_PM0C030
4700	25x30	0.20	50	35	2.0	K05050472_PM0C030
4700	30x25	0.20	50	35	2.0	K05050472_PM0D025
6800	30x30	0.30	46	28	2.9	K05050682_PM0D030
6800	30x40	0.30	46	28	3.2	K05050682_PM0D040
10000	30x40	0.35	31	22	3.4	K05050103_PM0D040
10000	35x30	0.35	31	22	3.2	K05050103_PM0E030
15000	35x50	0.45	26	18	4.7	K05050153_PM0E050
22000	40x50	0.50	25	18	5.5	K05050223_PM0F050

**RATED  
VOLTAGE  
VDC**

**63V**

Cap $\mu\text{F}$	$\varnothing \times L$ mm	Tan $\delta$ MAX 100 Hz 20°C	ESR TYP m $\Omega$ 100 Hz 20°C	Z TYP m $\Omega$ 10 kHz 20°C	I <sub>r</sub> a.c. A max 100 Hz 105°C	PART NUMBER termination digit excluded
2200	25x30	0.15	79	60	1.5	K05063222_PM0C030
3300	25x40	0.15	50	40	2.3	K05063332_PM0C040
3300	30x30	0.15	50	40	2.1	K05063332_PM0D030
4700	25x40	0.20	40	29	2.2	K05063472_PM0C040
4700	30x30	0.20	40	29	2.4	K05063472_PM0D030
4700	30x40	0.20	40	29	2.8	K05063472_PM0D040
6800	30x40	0.30	35	25	3.0	K05063682_PM0D040
6800	35x40	0.30	35	25	4.4	K05063682_PM0E040
10000	35x50	0.35	30	23	5.3	K05063103_PM0E050

**RATED  
VOLTAGE  
VDC**

**100V**

Cap $\mu\text{F}$	$\varnothing \times L$ mm	Tan $\delta$ MAX 100 Hz 20°C	ESR TYP m $\Omega$ 100 Hz 20°C	Z TYP m $\Omega$ 10 kHz 20°C	I <sub>r</sub> a.c. A max 100 Hz 105°C	PART NUMBER termination digit excluded
1000	22x30	0.10	127	100	1.3	K05100102_PM0B030
1000	25x30	0.10	127	100	1.7	K05100102_PM0C030
1000	30x25	0.10	127	100	1.7	K05100102_PM0D025
1500	25x40	0.12	105	82	2.0	K05100152_PM0C040
1500	30x30	0.12	105	82	1.8	K05100152_PM0D030
2200	30x30	0.15	71	60	2.7	K05100222_PM0D030
2200	30x40	0.15	71	60	2.7	K05100222_PM0D040
3300	30x50	0.15	48	39	3.0	K05100332_PM0D050
3300	35x40	0.15	48	39	3.3	K05100332_PM0E040
4700	35x40	0.15	42	30	3.6	K05100472_PM0E040
4700	35x50	0.20	33	26	4.4	K05100472_PM0E050
5600	35x50	0.20	33	24	4.5	K05100562_PM0E050
5600	40x50	0.20	33	24	4.8	K05100562_PM0F050
6800	35x50	0.20	32	23	4.5	K05100682_PM0E050
6800	40x50	0.20	33	24	4.9	K05100682_PM0F050

## K05 TYPE STANDARD RATINGS

Cap $\mu\text{F}$	$\varnothing \times \text{L}$ mm	Tan $\delta$ MAX 100 Hz 20°C	ESR TYP m $\Omega$ 100 Hz 20°C	Z TYP m $\Omega$ 10 kHz 20°C	I <sub>r</sub> a.c. A max 100 Hz 105°C	PART NUMBER termination digit excluded
220	22x30	0.10	440	340	0.9	K05200221_PM0B030
220	25x30	0.10	440	340	1.1	K05200221_PM0C030
330	22x30	0.10	240	133	1.1	K05200331_PM0B030
330	25x25	0.10	240	133	0.7	K05200331_PM0C025
330	25x30	0.10	240	133	1.2	K05200331_PM0C030
470	25x30	0.10	169	98	1.6	K05200471_PM0C030
680	25x40	0.10	145	87	1.7	K05200681_PM0C040
680	30x40	0.10	145	87	2.0	K05200681_PM0D040
1000	30x40	0.10	95	63	2.1	K05200102_PM0D040
1000	35x30	0.10	95	63	2.4	K05200102_PM0E030
1500	30x50	0.10	70	41	2.4	K05200152_PM0D050
1500	35x50	0.10	70	41	2.6	K05200152_PM0E050
2200	35x50	0.12	45	33	2.8	K05200222_PM0E050

**RATED  
VOLTAGE  
VDC**

**200V**

Cap $\mu\text{F}$	$\varnothing \times \text{L}$ mm	Tan $\delta$ MAX 100 Hz 20°C	ESR TYP m $\Omega$ 100 Hz 20°C	Z TYP m $\Omega$ 10 kHz 20°C	I <sub>r</sub> a.c. A max 100 Hz 105°C	PART NUMBER termination digit excluded
100	25x30	0.10	950	730	0.7	K05250101_PM0C030
150	25x30	0.10	530	290	0.7	K05250151_PM0C030
220	25x30	0.10	370	240	0.9	K05250221_PM0C030
330	30x30	0.10	260	153	1.2	K05250331_PM0D030
470	25x40	0.10	180	110	1.5	K05250471_PM0C040
470	30x30	0.10	180	110	1.5	K05250471_PM0D030
680	35x40	0.10	145	95	1.8	K05250681_PM0E040
1000	35x40	0.10	98	65	2.0	K05250102_PM0E040
1000	35x50	0.10	98	65	2.6	K05250102_PM0E050
1500	35x50	0.12	75	43	2.8	K05250152_PM0E050

**RATED  
VOLTAGE  
VDC**

**250V**

PLEASE TO CONTACT OUR TECHNICAL SERVICE FOR MORE INFORMATION OR SPEC-IN ANALYSIS.

## K05 TYPE STANDARD RATINGS

Cap µF	Ø x L mm	Tan δ MAX 100 Hz 20°C	ESR TYP m Ω 100 Hz 20°C	Z TYP m Ω 10 kHz 20°C	Ir a.c. A max 100 Hz 105°C	PART NUMBER termination digit excluded
68	22x30	0.10	1405	1050	0.47	K05400680_PM0B030
100	22x30	0.10	796	550	0.5	K05400101_PM0B030
100	25x30	0.10	796	550	0.5	K05400101_PM0C030
150	25x30	0.10	530	380	0.6	K05400151_PM0C030
150	30x30	0.10	530	380	0.8	K05400151_PM0D030
220	25x40	0.10	360	250	1.0	K05400221_PM0C040
220	30x30	0.10	360	250	1.1	K05400221_PM0D030
270	25x40	0.10	320	199	1.2	K05400271_PM0C040
330	25x50	0.10	249	170	1.3	K05400331_PM0C050
330	30x40	0.10	240	170	1.4	K05400331_PM0D040
330	35x30	0.10	240	170	1.4	K05400331_PM0E030
470	30x50	0.10	170	125	1.9	K05400471_PM0D050
470	35x40	0.10	170	125	1.9	K05400471_PM0E040
470	35x50	0.10	170	125	2.2	K05400471_PM0E050
680	35x50	0.10	158	110	2.2	K05400681_PM0E050
680	40x50	0.10	158	110	2.4	K05400681_PM0F050
820	35x60	0.10	121	97	2.5	K05400821_PM0E060
1000	40x60	0.10	110	90	3.1	K05400102_PM0F060
1500	40X97	0.10	99	68	5.8	K05400152_PM0F097

**RATED  
VOLTAGE  
VDC**

**400V**

Cap µF	Ø x L mm	Tan δ MAX 100 Hz 20°C	ESR TYP m Ω 100 Hz 20°C	Z TYP m Ω 10 kHz 20°C	Ir a.c. A max 100 Hz 105°C	PART NUMBER termination digit excluded
68	22x30	0.10	1405	1050	0.47	K05450680_PM0B030
100	25x30	0.10	796	710	0.5	K05450101_PM0C030
100	30x25	0.10	796	550	0.7	K05450101_PM0D025
100	30x30	0.10	796	550	0.8	K05450101_PM0D030
150	25x40	0.10	660	490	0.9	K05450151_PM0C040
150	30x30	0.10	530	380	0.8	K05450151_PM0D030
150	30x40	0.10	530	380	1.0	K05450151_PM0D040
220	25x50	0.10	380	310	0.9	K05450221_PM0C050
220	30x40	0.10	360	250	1.1	K05450221_PM0D040
220	35x30	0.10	360	250	1.0	K05450221_PM0E030
330	30x50	0.10	240	170	1.25	K05450331_PM0D050
330	35x40	0.10	240	170	1.3	K05450331_PM0E040
330	35x50	0.10	240	170	1.4	K05450331_PM0E050
470	35x50	0.10	170	125	1.8	K05450471_PM0E050
680	35x50	0.15	160	116	2.1	K05450681_PM0E050
680	35x60	0.12	158	110	2.2	K05450681_PM0E060
820	40x60	0.13	125	100	2.3	K05450821_PM0F060
1000	40x60	0.13	110	90	3.2	K05450102_PM0F060
1500	40X97	0.15	90	80	5.1	K05450152_PM0F097

**RATED  
VOLTAGE  
VDC**

**450V**

## K05 TYPE STANDARD RATINGS

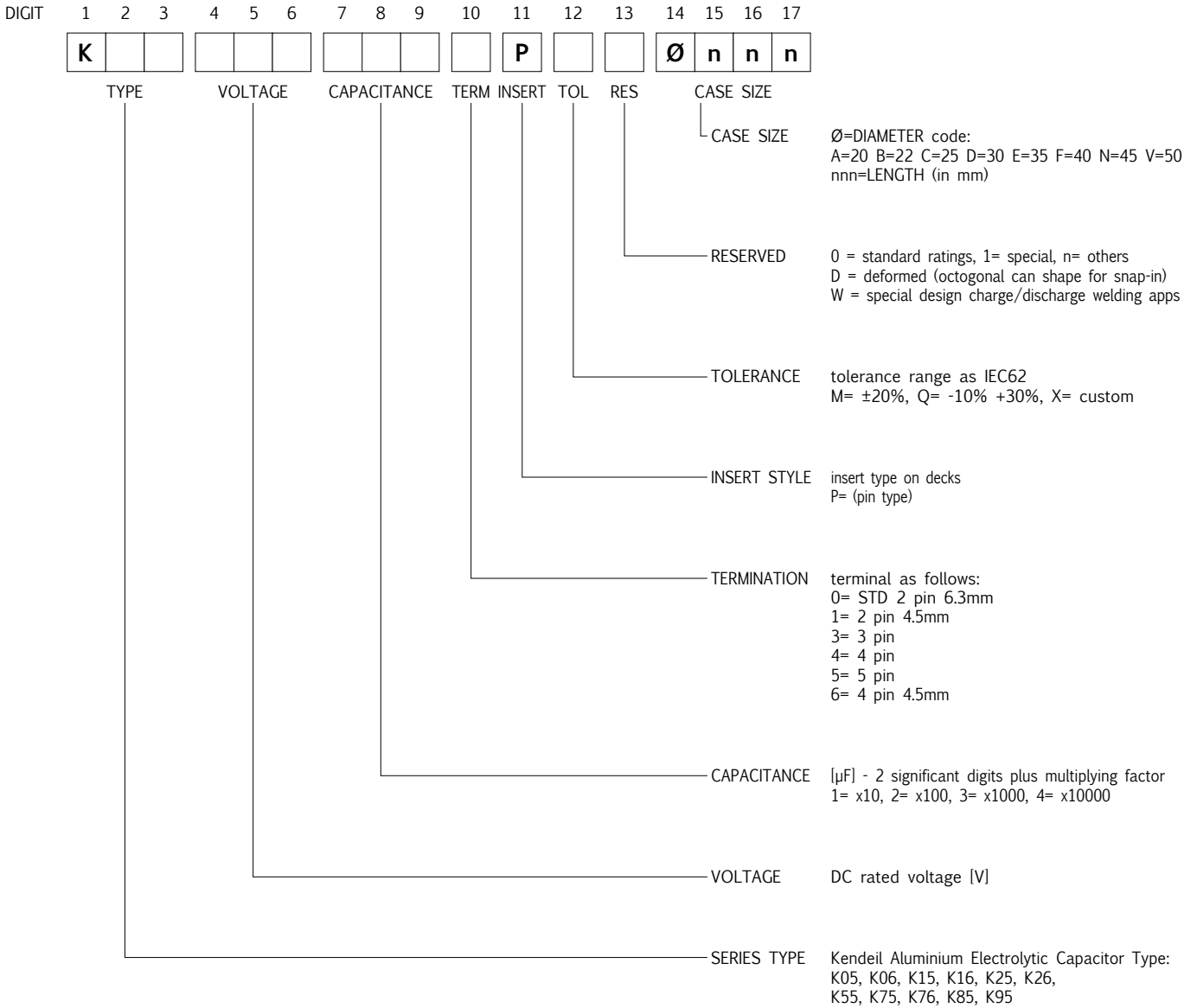
Cap $\mu\text{F}$	$\varnothing \times L$ mm	Tan $\delta$ MAX 100 Hz 20°C	ESR TYP m $\Omega$ 100 Hz 20°C	Z TYP m $\Omega$ 10 kHz 20°C	Ir a.c. A max 100 Hz 105°C	PART NUMBER termination digit excluded
68	25x30	0.10	1490	1070	0.42	K05500680_PM0C030
100	30x30	0.10	935	620	0.55	K05500101_PM0D030
150	30x40	0.10	620	410	0.75	K05500151_PM0D040
180	30x50	0.10	512	340	0.90	K05500181_PM0D050
220	35x40	0.10	455	295	0.95	K05500221_PM0E040
270	35x50	0.11	320	214	1.60	K05500271_PM0E050
330	35x50	0.11	296	203	1.65	K05500331_PM0E050
330	35x60	0.11	296	203	1.78	K05500331_PM0E060
330	40x50	0.11	296	203	1.80	K05500331_PM0F050
470	40x60	0.13	211	156	2.00	K05500471_PM0F060

**RATED  
VOLTAGE  
VDC**

**500V**

# PART NUMBER SYSTEM FOR SNAP-IN TYPE CAPACITORS

New PART-NUMBER CODE in use since Sep 2010. Total length is 17 digits.  
Please see examples below and have a reference code from the standard ratings capacitors pages.



### EXAMPLES

K	0	5	4	5	0	4	7	1	0	P	M	0	E	0	5	0
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K05 450V 470µF, standard pin, ±20%, 35x50

Specifications subject to change without notice