

Applications

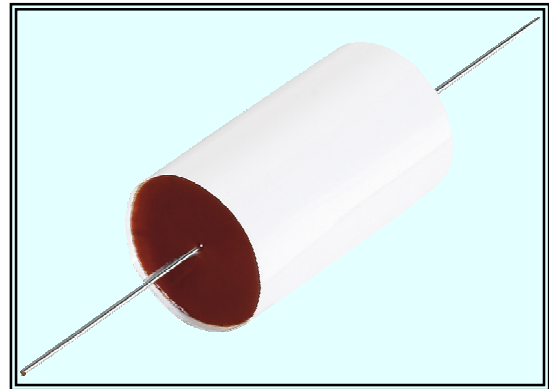
- Protection and commutation
- Electronic Power
- Impulsional fields needing intensive du/dt
- High Current
- Switching power supplies

Main Characteristics

- Dry film-foil technology
- Nominal Voltage: 630 VDC - 2000 VDC
- Climatic category: 40/085/56
- Tolerances $\pm 10\%$, $\pm 5\%$, $\pm 2\%$
- Low ESR

Design

- Metallized Polypropylene film
- Polyester protective wrap
- Tinned copper wire leads
- Insulated wire leads on request
- Epoxy-resin end-seal (UL-V0)



1.0 Nominal Usage Values

DC	Nominal Voltage U_N	$\leq 70^\circ\text{C}$	630	1000	1200	1500	2000
	Category Voltage U_C	85 °C	500	800	960	1200	1600
	Test Voltage U_T	1 min / 23°C	1000	1600	1920	2400	3200
AC	Nominal Voltage U_{N-}	$\leq 70^\circ\text{C}$	300	400	450	500	500
	Category Voltage U_C	85 °C	240	320	360	400	400
	Max Transitory Voltage U_{max-}	70 °C	360	480	540	600	600

2.0 Capacitance Range

$C_n \Rightarrow$	100 pF	1.0 nF	3.3 nF	4.7 nF	10.0 nF	0.180 μF	0.470 μF	0.680 μF	1.0 μF	2.2 μF
630 VDC										
1000 VDC										
1200 VDC										
1500 VDC										
2000 VDC										

3.0 Characteristics

			Min	Typ.	Min
Dissipation Factor	tg δ	1 kHz, U < 5% U _N		2.0	5.0 x 10 ⁻⁴
		10 kHz, U < 5% U _N		3.0	5.0 x 10 ⁻⁴
Insulation Resistance	R _i [MOhms]	500 V, 1 min, 23°C, C ≤ 033 μF	1.0 x 10 ⁻⁵		
Time Constant	R _i C [s]	500 V, 1 min, 23°C	33000		
Temperature Coefficient	α _c	ppm / °C		-200 ±125	
Long term stability	ΔC / C [%]	23°C, 50% HR			± 0.5

4.0 Usage Limits

4.1 Limits of standard current

The value of the superior limits of RMS is determined by the following :

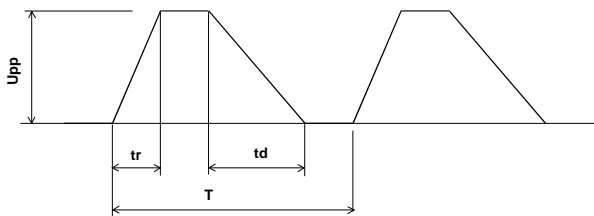
$$I_{rms} = \sqrt{\frac{1}{T} \int_0^T i^2(t) dt} \quad \text{and} \quad I_{rms} \leq I_{eff} \max(f)$$

$$\text{With } I_{eff} \max(f) = I_{eff} \max(10\text{kHz}) \times \left(1 + \frac{f-10}{20}\right) \text{ for } 10 \text{ kHz} < f \leq 30 \text{ kHz}$$

$$\text{and} \quad = 2 \times I_{eff} \max(10\text{kHz}) \text{ for } f > 30\text{kHz}$$

Conditions: $I_{eff} \max \leq 12.5 A_{eff}$, $U(f) \leq U_N(50\text{Hz})$, internal heat $\Delta\theta \leq 15^\circ\text{C}$, $T_{amb} \leq 70^\circ\text{C}$

4.2 Impulsion use



where tr, td are, respectively, time needed for charging and discharging. T equals the cycle time.

with $\left(\frac{du}{dt}\right)_N$ defines at U_N and $T_{amb} \leq 70^\circ\text{C}$ (see data sheets)

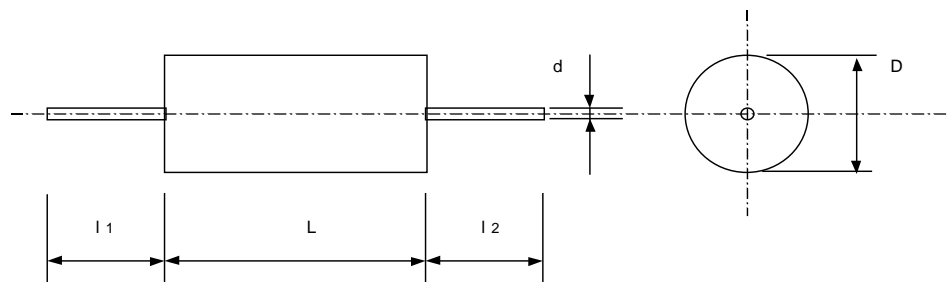
$$\text{Peak current is limited to} \quad \hat{I}_{cr} [A] = C_N [\mu\text{F}] \times \left(\frac{du}{dt}\right)_N$$

and

maximum rise in voltage variation

$$\left(\frac{du}{dt}\right)_{\max} = \frac{U_N}{U_{pp}} \times \left(\frac{du}{dt}\right)_N$$

Maximum recurrence of frequency is determined by:



$$fp \max [\text{p.p.s}] = \frac{1}{T} = \frac{I_{\text{eff max}}^2(f)}{I_{1cr}^2 \times t_r + I_{2cr}^2 \times t_s} \quad \text{with} \quad \hat{I}_{cr1} [\text{A}] = C_N [\mu\text{F}] \times \frac{U_{pp}}{t_r}$$

and

$$\hat{I}_{cr2} [\text{A}] = C_N [\mu\text{F}] \times \frac{U_{pp}}{td}$$

$$\text{as long as } \frac{U_{pp}}{t_r}; \frac{U_{pp}}{td} \leq \left(\frac{du}{dt}\right)_{\max}$$

5.0 Dimensions, Shape:

Capacitors are axial. The variant KPS ... da offers alternative dimensions/characteristics with respect to the KPS ... d series.

D max [mm]	7 ... 12	> 12	l_1, l_2
d [mm]	0.8	1.0	min 30 mm

Capacitors delivered in bulk. On special request we can deliver tape-mounted.

B4F 1	Type	Cn	Dimension			dU / dt max	\hat{I}	ESR	Irms
		[nF]	\varnothing [mm]	L [mm]	\varnothing fil [mm]	[V / μ s]	[A]	[Ohm]	[A]
1	KPS 63-110 d K	10	7.0	20.0	0.8	750	8	0.796	0.57
2	KPS 63-112 d K	12	7.0	20.0	0.8	750	9	0.663	0.63
3	KPS 63-115 d K	15	7.0	20.0	0.8	750	11	0.531	0.70
4	KPS 63-118 d K	18	7.5	20.0	0.8	750	14	0.442	0.80
5	KPS 63-122 d K	22	8.1	20.0	0.8	750	17	0.362	0.92
6	KPS 63-127 d K	27	9.0	20.0	0.8	750	20	0.295	1.09
7	KPS 63-133 d K	33	10.0	20.0	0.8	750	25	0.241	1.28
8	KPS 63-139 d K	39	11.0	20.0	0.8	750	29	0.204	1.47
9	KPS 63-147 d K	47	11.5	20.0	0.8	750	35	0.169	1.66
10	KPS 63-156 d K	56	10.5	27.0	0.8	450	25	0.142	1.94
11	KPS 63-168 d K	68	11.5	27.0	0.8	450	31	0.117	2.25
12	KPS 63-182 d K	82	12.5	27.0	1.0	450	37	0.097	2.60
13	KPS 63-010 d K	100	13.5	27.0	1.0	450	45	0.080	3.00
14	KPS 63-012 d K	120	14.5	27.0	1.0	450	54	0.066	3.43
15	KPS 63-015 d K	150	15.5	27.0	1.0	450	68	0.053	4.00
16	KPS 63-018 d K	180	15.0	33.0	1.0	350	63	0.044	4.65
17	KPS 63-022 d K	220	16.5	33.0	1.0	350	77	0.036	5.44
18	KPS 63-027 d K	270	18.5	33.0	1.0	350	95	0.029	6.46
19	KPS 63-033 d K	330	20.0	33.0	1.0	350	116	0.024	7.49
20	KPS 63-039 d K	390	22.5	33.0	1.0	350	137	0.020	8.76
21	KPS 63-047 d K	470	24.5	33.0	1.0	350	165	0.017	10.15
22	KPS 63-056 d K	560	26.5	33.0	1.0	350	196	0.014	11.64
23	KPS 63-068 d K	680	28.5	33.0	1.0	350	238	0.012	12.50
24	KPS 63-082 d K	820	28.0	45.0	1.0	200	164	0.010	12.50
25	KPS 63-1.0 d K	1'000	26.5	45.0	1.0	200	200	0.008	12.50
26	KPS 63-1.2 d K	1'200	29.5	45.0	1.0	200	240	0.007	12.50
27	KPS 63-1.5 d K	1'500	32.0	45.0	1.0	200	300	0.005	12.50
28	KPS 63-1.8 d K	1'800	36.0	45.0	1.0	200	360	0.004	12.50
29	KPS 63-2.2 d K	2'200	38.0	45.0	1.0	200	440	0.004	12.50

B4F1	Type	Cn	Dimension			dU / dt max	\hat{I} s	ESR	Irms
		[nF]	\varnothing [mm]	L [mm]	\varnothing fil [mm]	[V / μ s]	[A]	[Ohm]	[A]
1	KPS 100-247 d K	4.7	7.0	20.0	0.8	1'200	6	1.693	0.40
2	KPS 100-256 d K	5.6	7.0	20.0	0.8	1'200	7	1.421	0.43
3	KPS 100-268 d K	6.8	7.1	20.0	0.8	1'200	8	1.170	0.48
4	KPS 100-282 d K	8.2	8.0	20.0	0.8	1'200	10	0.970	0.56
5	KPS 100-110 d K	10	8.5	20.0	0.8	1'200	12	0.796	0.64
6	KPS 100-112 d K	12	9.5	20.0	0.8	1'200	14	0.663	0.75
7	KPS 100-115 d K	15	10.0	20.0	0.8	1'200	18	0.531	0.87
8	KPS 100-118 d K	18	11.0	20.0	0.8	1'200	22	0.442	1.00
9	KPS 100-122 d K	22	12.0	20.0	0.8	1'200	26	0.362	1.17
10	KPS 100-127 d K	27	10.0	27.0	0.8	750	20	0.295	1.31
11	KPS 100-133 d K	33	11.0	27.0	0.8	750	25	0.241	1.53
12	KPS 100-139 d K	39	12.0	27.0	0.8	750	29	0.204	1.75
13	KPS 100-147 d K	47	13.0	27.0	1.0	750	35	0.169	2.02
14	KPS 100-156 d K	56	14.5	27.0	1.0	750	42	0.142	2.35
15	KPS 100-168 d K	68	15.5	27.0	1.0	750	51	0.117	2.69
16	KPS 100-182 d K	82	15.0	33.0	1.0	550	45	0.097	3.14
17	KPS 100-010 d K	100	16.0	33.0	1.0	550	55	0.080	3.60
18	KPS 100-012 d K	120	18.0	33.0	1.0	550	66	0.066	4.24
19	KPS 100-015 d K	150	19.5	33.0	1.0	550	83	0.053	4.97
20	KPS 100-018 d K	180	22.0	33.0	1.0	550	99	0.044	5.87
21	KPS 100-022 d K	220	23.5	33.0	1.0	550	121	0.036	6.76
22	KPS 100-027 d K	270	21.5	45.0	1.0	350	95	0.029	8.00
23	KPS 100-033 d K	330	22.5	45.0	1.0	350	116	0.024	9.08
24	KPS 100-039 d K	390	24.5	45.0	1.0	350	137	0.020	10.40
25	KPS 100-047 d K	470	26.5	45.0	1.0	350	165	0.017	11.97
26	KPS 100-056 d K	560	29.0	45.0	1.0	350	196	0.014	12.50
27	KPS 100-068 d K	680	31.5	45.0	1.0	350	238	0.012	12.50
28	KPS 100-082 d K	820	35.0	45.0	1.0	350	287	0.010	12.50
29	KPS 100-1.0 d K	1'000	38.0	45.0	1.0	350	350	0.008	12.50

B4F1	Type	Cn	Dimension			dU / dt max	\hat{I} s	ESR	Irms
		[nF]	\varnothing [mm]	L [mm]	\varnothing fil [mm]	[V / μ s]	[A]	[Ohm]	[A]
1	KPS 120-233 d K	3.3	7.0	20.0	0.8	1'500	5.0	2.411	0.33
2	KPS 120-239 d K	3.9	7.2	20.0	0.8	1'500	5.9	2.040	0.37
3	KPS 120-247 d K	4.7	7.4	20.0	0.8	1'500	7.1	1.693	0.41
4	KPS 120-256 d K	5.6	8.4	20.0	0.8	1'500	8.4	1.421	0.48
5	KPS 120-268 d K	6.8	9.1	20.0	0.8	1'500	10.2	1.170	0.55
6	KPS 120-282 d K	8.2	9.9	20.0	0.8	1'500	12.3	0.970	0.64
7	KPS 120-110 d K	10	10.8	20.0	0.8	1'500	15.0	0.796	0.74
8	KPS 120-112 d K	12	11.7	20.0	0.8	1'500	18.0	0.663	0.85
9	KPS 120-115 d K	15	13.0	20.0	1.0	1'500	22.5	0.531	1.01
10	KPS 120-118 d K	18	10.4	27.0	0.8	900	16.2	0.442	1.10
11	KPS 120-122 d K	22	11.4	27.0	0.8	900	19.8	0.362	1.28
12	KPS 120-127 d K	27	12.3	27.0	1.0	900	24.3	0.295	1.48
13	KPS 120-133 d K	33	13.7	27.0	1.0	900	29.7	0.241	1.74
14	KPS 120-139 d K	39	14.8	27.0	1.0	900	35.1	0.204	1.99
15	KPS 120-147 d K	47	16.2	27.0	1.0	900	42.3	0.169	2.30
16	KPS 120-156 d K	56	14.1	33.0	1.0	650	36.4	0.142	2.51
17	KPS 120-168 d K	68	15.4	33.0	1.0	650	44.2	0.117	2.91
18	KPS 120-182 d K	82	16.9	33.0	1.0	650	53.3	0.097	3.37
19	KPS 120-010 d K	100	18.5	33.0	1.0	650	65.0	0.080	3.93
20	KPS 120-012 d K	120	20.2	33.0	1.0	650	78.0	0.066	4.54
21	KPS 120-015 d K	150	22.4	33.0	1.0	650	97.5	0.053	5.43
22	KPS 120-018 d K	180	19.5	45.0	1.0	450	81.0	0.044	6.16
23	KPS 120-022 d K	220	21.4	45.0	1.0	450	99.0	0.036	7.20
24	KPS 120-027 d K	270	23.6	45.0	1.0	450	121.5	0.029	8.46
25	KPS 120-033 d K	330	26.0	45.0	1.0	450	148.5	0.024	9.92
26	KPS 120-039 d K	390	28.2	45.0	1.0	450	175.5	0.020	11.33
27	KPS 120-047 d K	470	30.9	45.0	1.0	450	211.5	0.017	12.50
28	KPS 120-056 d K	560	33.6	45.0	1.0	450	252.0	0.014	12.50
29	KPS 120-068 d K	680	36.9	45.0	1.0	450	306.0	0.012	12.50

B4F1	Type	Cn	Dimension			dU / dt max	î s	ESR	I _{rms}
			[nF]	ø [mm]	L [mm]				
Pos.						[V / µs]	[A]	[Ohm]	[A]
1	KPS 150-210 d K	1.0	7.0	20.0	0.8	1'800	1.8	7.958	0.19
2	KPS 150-212 d K	1.2	7.0	20.0	0.8	1'800	2.2	6.631	0.20
3	KPS 150-215 d K	1.5	7.0	20.0	0.8	1'800	2.7	5.305	0.23
4	KPS 150-218 d K	1.8	7.0	20.0	0.8	1'800	3.2	4.421	0.25
5	KPS 150-222 d K	2.2	7.0	20.0	0.8	1'800	4.0	3.617	0.27
6	KPS 150-227 d K	2.7	7.5	20.0	0.8	1'800	4.9	2.947	0.31
7	KPS 150-233 d K	3.3	8.0	20.0	0.8	1'800	5.9	2.411	0.36
8	KPS 150-239 d K	3.9	8.5	20.0	0.8	1'800	7.0	2.040	0.40
9	KPS 150-247 d K	4.7	9.2	20.0	0.8	1'800	8.5	1.693	0.46
10	KPS 150-256 d K	5.6	10.4	20.0	0.8	1'800	10.1	1.421	0.54
11	KPS 150-268 d K	6.8	10.9	20.0	0.8	1'800	12.2	1.170	0.61
12	KPS 150-282 d K	8.2	11.8	20.0	0.8	1'800	14.8	0.970	0.71
13	KPS 150-110 d K	10	9.8	27.0	0.8	1'100	11.0	0.796	0.79
14	KPS 150-112 d K	12	10.7	27.0	0.8	1'100	13.2	0.663	0.91
15	KPS 150-115 d K	15	11.8	27.0	0.8	1'100	16.5	0.531	1.08
16	KPS 150-118 d K	18	12.8	27.0	1.0	1'100	19.8	0.442	1.24
17	KPS 150-122 d K	22	13.7	27.0	1.0	1'100	24.2	0.362	1.43
18	KPS 150-127 d K	27	15.1	27.0	1.0	1'100	29.7	0.295	1.67
19	KPS 150-133 d K	33	14.0	33.0	1.0	800	26.4	0.241	1.91
20	KPS 150-139 d K	39	15.1	33.0	1.0	800	31.2	0.204	2.17
21	KPS 150-147 d K	47	16.5	33.0	1.0	800	37.6	0.169	2.51
22	KPS 150-156 d K	56	17.9	33.0	1.0	800	44.8	0.142	2.88
23	KPS 150-168 d K	68	19.6	33.0	1.0	800	54.4	0.117	3.36
24	KPS 150-182 d K	82	21.4	33.0	1.0	800	65.6	0.097	3.90
25	KPS 150-010 d K	100	23.5	33.0	1.0	800	80.0	0.080	4.57
26	KPS 150-012 d K	120	19.7	45.0	1.0	500	60.0	0.066	5.06
27	KPS 150-015 d K	150	21.9	45.0	1.0	500	75.0	0.053	6.03
28	KPS 150-018 d K	180	23.9	45.0	1.0	500	90.0	0.044	6.96
29	KPS 150-022 d K	220	26.3	45.0	1.0	500	110.0	0.036	8.16
30	KPS 150-027 d K	270	29.1	45.0	1.0	500	135.0	0.029	9.61
31	KPS 150-033 d K	330	32.0	45.0	1.0	500	165.0	0.024	11.29
32	KPS 150-039 d K	390	34.7	45.0	1.0	500	195.0	0.020	12.50
33	KPS 150-047 d K	470	38.1	45.0	1.0	500	235.0	0.017	12.50

B4F1 Pos.	Type	Cn	Dimension			dU / dt max	\hat{I} s	ESR	Irms
		[nF]	\varnothing [mm]	L [mm]	\varnothing fil [mm]	[V / μ s]	[A]	[Ohm]	[A]
1	KPS 200-210 d K	1.0	7.0	27.0	0.8	1'800	1.8	7.958	0.21
2	KPS 200-212 d K	1.2	7.0	27.0	0.8	1'800	2.2	6.631	0.23
3	KPS 200-215 d K	1.5	7.0	27.0	0.8	1'800	2.7	5.305	0.26
4	KPS 200-218 d K	1.8	7.3	27.0	0.8	1'800	3.2	4.421	0.29
5	KPS 200-222 d K	2.2	7.9	27.0	0.8	1'800	4.0	3.617	0.33
6	KPS 200-227 d K	2.7	8.6	27.0	0.8	1'800	4.9	2.947	0.38
7	KPS 200-233 d K	3.3	9.3	27.0	0.8	1'800	5.9	2.411	0.44
8	KPS 200-239 d K	3.9	8.3	33.0	0.8	1'300	5.1	2.040	0.49
9	KPS 200-247 d K	4.7	9.5	33.0	0.8	1'300	6.1	1.693	0.58
10	KPS 200-256 d K	5.6	10.5	33.0	0.8	1'300	7.3	1.421	0.67
11	KPS 200-268 d K	6.8	11.0	33.0	0.8	1'300	8.8	1.170	0.76
12	KPS 200-282 d K	8.2	12.0	33.0	0.8	1'300	10.7	0.970	0.88
13	KPS 200-110 d K	10	13.0	33.0	1.0	1'300	13.0	0.796	1.01
14	KPS 200-112 d K	12	14.5	33.0	1.0	1'300	15.6	0.663	1.18
15	KPS 200-115 d K	15	15.5	33.0	1.0	1'300	19.5	0.531	1.37
16	KPS 200-118 d K	18	18.0	33.0	1.0	1'300	23.4	0.442	1.64
17	KPS 200-122 d K	22	14.5	45.0	1.0	800	17.6	0.362	1.82
18	KPS 200-127 d K	27	16.5	45.0	1.0	800	21.6	0.295	2.17
19	KPS 200-133 d K	33	17.5	45.0	1.0	800	26.4	0.241	2.48
20	KPS 200-139 d K	39	19.5	45.0	1.0	800	31.2	0.204	2.87
21	KPS 200-147 d K	47	20.5	45.0	1.0	800	37.6	0.169	3.25
22	KPS 200-156 d K	56	22.5	45.0	1.0	800	44.8	0.142	3.75
23	KPS 200-168 d K	68	24.5	45.0	1.0	800	54.4	0.117	4.34
24	KPS 200-182 d K	82	27.0	45.0	1.0	800	65.6	0.097	5.06
25	KPS 200-010 d K	100	29.5	45.0	1.0	800	80.0	0.080	5.90
26	KPS 200-012 d K	120	33.0	45.0	1.0	800	96.0	0.066	6.94
27	KPS 200-015 d K	150	36.0	45.0	1.0	800	120.0	0.053	8.20
28	KPS 200-018 d K	180	39.5	45.0	1.0	800	144.0	0.044	9.54

KPS ... da 2000 VDC

B4F1 Pos.	Type	Cn	Dimension			dU / dt max	Î s	ESR	Irms
		[nF]	ø [mm]	L [mm]	ø fil [mm]	[V / µs]	[A]	[Ohm]	[A]
1	KPS 200-310 da K	0.10	7.5	20.0	0.8	3'000	0.3	79.577	0.06
2	KPS 200-312 da K	0.12	7.5	20.0	0.8	3'000	0.4	66.315	0.07
3	KPS 200-315 da K	0.15	7.5	20.0	0.8	3'000	0.5	53.052	0.08
4	KPS 200-318 da K	0.18	7.5	20.0	0.8	3'000	0.5	44.210	0.08
5	KPS 200-322 da K	0.22	7.5	20.0	0.8	3'000	0.7	36.172	0.09
6	KPS 200-327 da K	0.27	7.5	20.0	0.8	3'000	0.8	29.473	0.10
7	KPS 200-333 da K	0.33	7.5	20.0	0.8	3'000	1.0	24.114	0.11
8	KPS 200-339 da K	0.39	7.5	20.0	0.8	3'000	1.2	20.404	0.12
9	KPS 200-347 da K	0.47	7.5	20.0	0.8	3'000	1.4	16.931	0.13
10	KPS 200-356 da K	0.56	7.5	20.0	0.8	3'000	1.7	14.210	0.15
11	KPS 200-368 da K	0.68	8.0	20.0	0.8	3'000	2.0	11.703	0.17
12	KPS 200-382 da K	0.82	8.5	20.0	0.8	3'000	2.5	9.705	0.19
13	KPS 200-210 da K	1.0	9.0	20.0	0.8	3'000	3.0	7.958	0.21
14	KPS 200-212 da K	1.2	10.0	20.0	0.8	3'000	3.6	6.631	0.25
15	KPS 200-215 da K	1.5	11.0	20.0	0.8	3'000	4.5	5.305	0.29
16	KPS 200-218 da K	1.8	12.0	20.0	0.8	3'000	5.4	4.421	0.34
17	KPS 200-222 da K	2.2	12.5	20.0	1.0	3'000	6.6	3.617	0.38
18	KPS 200-227 da K	2.7	13.0	20.0	1.0	3'000	8.1	2.947	0.43
19	KPS 200-233 da K	3.3	13.5	20.0	1.0	3'000	9.9	2.411	0.49
20	KPS 200-239 da K	3.9	11.0	27.0	0.8	1'800	7.0	2.040	0.53
21	KPS 200-247 da K	4.7	11.5	27.0	0.8	1'800	8.5	1.693	0.60
22	KPS 200-256 da K	5.6	12.5	27.0	1.0	1'800	10.1	1.421	0.68
23	KPS 200-268 da K	6.8	13.5	27.0	1.0	1'800	12.2	1.170	0.79
24	KPS 200-282 da K	8.2	15.0	27.0	1.0	1'800	14.8	0.970	0.92
25	KPS 200-110 da K	10	16.0	27.0	1.0	1'800	18.0	0.796	1.06
26	KPS 200-112 da K	12	18.0	27.0	1.0	1'800	21.6	0.663	1.24
27	KPS 200-115 da K	15	19.5	27.0	1.0	1'800	27.0	0.531	1.46
28	KPS 200-118 da K	18	22.0	27.0	1.0	1'800	32.4	0.442	1.73
29	KPS 200-122 da K	22	18.5	33.0	1.0	1'300	28.6	0.362	1.85
30	KPS 200-127 da K	27	21.0	33.0	1.0	1'300	35.1	0.295	2.21
31	KPS 200-133 da K	33	22.5	33.0	1.0	1'300	42.9	0.241	2.55
32	KPS 200-139 da K	39	24.5	33.0	1.0	1'300	50.7	0.204	2.93
33	KPS 200-147 da K	47	26.5	33.0	1.0	1'300	61.1	0.169	3.38