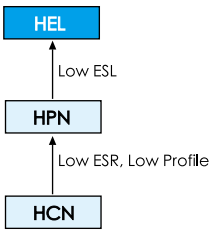
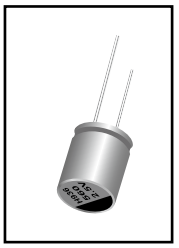
HEL SERIES

- Low ESL 105℃, 2000 hours
- Ultra Low ESR, high ripple current capability
- Applications: DC/DC Converter, Switching Power Supply, Back up Power Supplies for CPU etc.
- RoHS Compliant

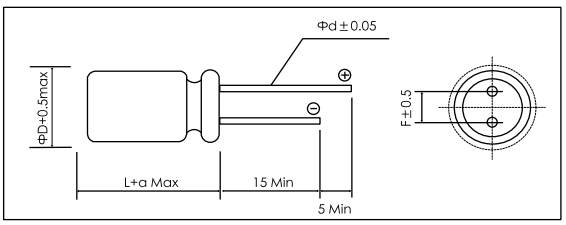




Items	Characteristics
Operating Temperature Range (℃)	-55 ~ +105
Voltage Range (V)	2.5 ~ 16
Capacitance Range (μF) (20℃, 120Hz)	100 ~ 1000
Capacitance Tolerance (20℃, 120Hz)	± 20%
Surge Voltage	U_R x 1.15
Leakage Current (μA) ※1	Please see the attached ratings list (20℃, 2min)
Dissipation Factor (20℃, 120Hz)	Please see the attached ratings list
Equivalent Series Resistance (20℃, 100kHz)	Please see the attached ratings list
Temperature Characteristics (Max Impedance Ratio at 100kHz)	$Z_{+105℃} / Z_{+20℃} \leqslant 1.25$ $Z_{-55℃} / Z_{+20℃} \leqslant 1.25$
Endurance	**2000h, Rated voltage applied at 105℃** Capacitance change: within ± 20% of the initial measured value Dissipation Factor (Tan δ): ⩽150% of initial specified value ESR: ⩽150% of initial specified value DC Leakage Current: ⩽ the initial specified value
Damp heat(Steady state)	**1000h, No-applied voltage 60℃, 90~95% RH** Capacitance change: within ± 20% of the initial measured value Dissipation Factor (Tan δ): ⩽150% of initial specified value ESR: ⩽150% of initial specified value DC Leakage Current: ⩽ the initial specified value (after voltage processing)
Resistance to soldering heat	**Flow method (260±5℃×10s)** Capacitance change: within ± 5% of the initial measured value Dissipation Factor (Tan δ): ⩽the initial specified value ESR: ⩽the initial specified value DC Leakage Current: ⩽ the initial specified value (after voltage processing)

※1 In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105℃.

Dimensions mm



(unit:mm)

Size Code	ΦD±0.5	L	amax	F±0.5	Φd±0.05
E05	5	5	1.0	2.0	0.45
E08	5	8	1.0	2.0	0.5
E09	5	9	1.0	2.0	0.5
E10	5	10	1.0	2.0	0.5
E11	5	11	1.0	2.0	0.5
S09	5.5	9	1.0	2.5	0.5
S11	5.5	11	1.0	2.5	0.5
F05	6.3	5	1.0	2.5	0.45
F08	6.3	8	1.0	2.5	0.5
F09	6.3	9	1.0	2.5	0.5
F11	6.3	11	1.0	2.5	0.5
F12	6.3	12	1.0	2.5	0.5

Size List

Cap.(μF) \ U_R[S.V] (V)	2.5 [2.9]	4 [4.6]	6.3 [7.2]	6.8 [7.8]	7 [8]	7.5 [8.6]	10 [12]	12 [14]	16 [18]
100							E08		F08
120							E08		
220							F08	E11	E11
270			E08	E08	E08	E08	E10.F08	E11	E11.F09
330	F08		E08	E08	E08	E08	E10.F09	E10.S09	F09.F11
390			E08.E09.E10	E09	E09	E09			F12
470	F08		E11.F08	F08	F08	E10.F08	F09		F12
500						E10			
560	F08	F08	F08	F08	F08	F08	F11		
680			F08.F09	F09	F09	F09	F11		
820	F08		F09.S11.F11						
1000			F11						

Ratings for **HEL** Series

U_R Code	Rated Capacitance 20℃,120Hz	Max ESR 20℃,100kHz	Rated Ripple Current 105℃,100kHz	Dissipation Factor 20℃,120Hz	Leakage Current 20℃,2min	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mArms)	(%)	(μA)	(mm)	-
2.5 0E	330	7	5600	10	500.0	6.3x8	PCR0EEL331MF08□□
	470	7	5600	10	500.0	6.3x8	PCR0EEL471MF08□□
	560	7	5600	10	500.0	6.3x8	PCR0EEL561MF08□□
	820	7	5600	10	500.0	6.3x8	PCR0EEL821MF08□□
4 0G	560	7	5600	10	500.0	6.3x8	PCR0GEL561MF08□□
6.3 0J	270	11	3700	10	340.2	5x8	PCR0JEL271ME08□□
	330	11	3700	10	415.8	5x8	PCR0JEL331ME08□□
	390	11	3700	10	491.4	5x8	PCR0JEL391ME08□□
	390	11	3700	10	491.4	5x9	PCR0JEL391ME09□□
	390	11	3700	10	491.4	5x10	PCR0JEL391ME10□□
	470	11	3700	10	592.2	5x11	PCR0JEL471ME11□□
	470	8	5000	10	592.2	6.3x8	PCR0JEL471MF08□□
	560	8	5000	10	705.6	6.3x8	PCR0JEL561MF08□□
	680	8	5000	10	856.8	6.3x8	PCR0JEL681MF08□□
	680	8	5000	10	856.8	6.3x9	PCR0JEL681MF09□□
	820	8	5000	10	1033.2	6.3x9	PCR0JEL821MF09□□
	820	10	4500	10	1033.2	5.5 x11	PCR0JEL821MS11□□
	820	8	5000	10	1033.2	6.3x11	PCR0JEL821MF11□□
	1000	8	5000	10	1260.0	6.3x11	PCR0JEL102MF11□□
6.8 06	270	11	3700	10	367.2	5x8	PCR06EL271ME08□□
	330	11	3700	10	448.8	5x8	PCR06EL331ME08□□
	390	11	3700	10	530.4	5x9	PCR06EL391ME09□□
	470	8	5000	10	639.2	6.3x8	PCR06EL471MF08□□
	560	8	5000	10	761.6	6.3x8	PCR06EL561MF08□□
	680	8	5000	10	924.8	6.3x9	PCR06EL681MF09□□
7 07	270	11	3700	10	378.0	5x8	PCR07EL271ME08□□
	330	11	3700	10	462.0	5x8	PCR07EL331ME08□□
	390	11	3700	10	546.0	5x9	PCR07EL391ME09□□
	470	8	5000	10	658.0	6.3x8	PCR07EL471MF08□□
	560	8	5000	10	784.0	6.3x8	PCR07EL561MF08□□
	680	8	5000	10	952.0	6.3x9	PCR07EL681MF09□□
7.5 75	270	11	3700	10	405.0	5x8	PCR75EL271ME08□□
	330	11	3700	10	495.0	5x8	PCR75EL331ME08□□
	390	11	3700	10	585.0	5x9	PCR75EL391ME09□□
	470	11	3100	10	705.0	5x10	PCR75EL471ME10□□
	500	11	3100	10	750.0	5x10	PCR75EL501ME10□□
	470	8	5000	10	705.0	6.3x8	PCR75EL471MF08□□
	560	8	5000	10	840.0	6.3x8	PCR75EL561MF08□□
	680	8	5000	10	1020.0	6.3x9	PCR75EL681MF09□□
10 1A	100	24	2490	10	200.0	5x8	PCR1AEL101ME08□□
	120	24	2490	10	240.0	5x8	PCR1AEL121ME08□□
	220	10	4680	10	500.0	6.3x8	PCR1AEL221MF08□□
	270	10	4680	10	540.0	6.3x8	PCR1AEL271MF08□□
	270	11	3100	10	648.0	5x10	PCRA2EL271ME10□□
	330	11	3100	10	792.0	5x10	PCRA2EL331ME10□□
	330	15	3600	10	660.0	6.3x9	PCRA2EL331MF09□□
	470	12	4100	10	940.0	6.3x9	PCR1AEL471MF09□□
	560	12	4100	10	1120.0	6.3x11	PCR1AEL561MF11□□
	680	15	3600	10	1360.0	6.3x11	PCR1AEL681MF11□□
12 A2	220	15	3000	12	704.0	5x11	PCR1CEL221ME11□□
	270	15	3000	12	864.0	5x11	PCR1CEL271ME11□□
	330	11	3100	10	792.0	5X10	PCRA2EL331ME10□□
	330	15	3000	10	792.0	5.5X9	PCRA2EL331MS09□□
16 1C	100	10	4680	10	500.0	6.3x8	PCR1CEL101MF08□□
	220	15	3000	12	704.0	5X11	PCR1CEL221ME11□□
	270	15	3000	12	864.0	5X11	PCR1CEL271ME11□□
	270	15	3600	12	864.0	6.3x9	PCR1CEL271MF09□□
	330	15	3600	12	1056.0	6.3x9	PCR1CEL331MF09□□
	330	15	3600	12	1056.0	6.3x11	PCR1CEL331MF11□□
	390	15	3600	12	1248.0	6.3x12	PCR1CEL391MF12□□
	470	15	3600	12	1504.0	6.3x12	PCR1CEL471MF12□□

Customer products are available on request.

Frequency coefficient for ripple current

Frequency	120Hz ≤ f < 1kHz	1kHz ≤ f < 10kHz	10kHz ≤ f < 100kHz	100kHz ≤ f < 500kHz
Coefficient	0.05	0.3	0.7	1