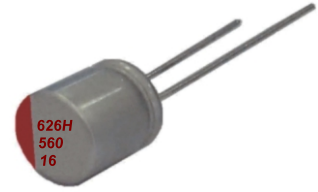


PH series

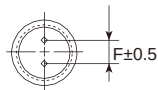
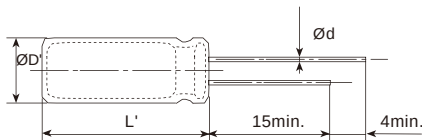
- Endurance: +105°C 2,000 hours
- High Capacitance
- Recommended Applications: Charger. Ripple current can be applied.
- RoHS Compliant and lead-free



SPECIFICATIONS

Items	Characteristics								
Category Temperature Range	-55~+105℃								
Rated Working Voltage Range	6.3~25 V _{dc}								
Nominal Capacitance Range	10~2200μF								
Capacitance Tolerance	±20%(M) (at 20℃,120Hz)								
DC Leakage Current	I≤0.2CV or 500μA, whichever is greater. Where, I:Max.leakage current (μA),C:Nominal capacitance (μF),V: Rated voltage (V) (at 20℃ after 2 minutes)								
Dissipation Factor (tanδ)	Rated Voltage(V _{dc})	6.3	6.8	7.5	10	16	20	25	(at 20℃,120Hz)
	tanδ (max.)	0.08			0.12				
ESR(100kHz,20℃)	Value in characteristics table								
Temperature Characteristic (Impedance Ratio at 100kHz)	Z(+105℃)/Z(+20℃)≤1.25 Z(-55℃)/Z(+20℃)≤1.25								
Endurance	After applying rated voltage for 2,000 hours at 105℃,the capacitors shall meet the following requirements.								
	Appearance	No significant damage							
	Capacitance Change	≤±20% of the initial value							
	D.F. (tanδ)	≤200% of the initial specified value							
	ESR	≤200% of the initial specified value							
	Leakage Current	≤The initial specified value							
Humidity Test	After subjecting to 90~95% RH for 2,000 hours at 60℃ without voltage applied, the capacitors shall meet the requirement as surge test.								
Surge Test	After subjecting to 1,000 cycles each consisting of charge with the surge voltage specified at normal temperature for 30 seconds through a protective resistor and discharge for 5 minutes 30 seconds, the capacitors shall meet the following requirements.								
	Appearance	No significant damage							
	Capacitance Change	≤±20% of the initial value							
	D.F. (tanδ)	≤150% of the initial specified value							
	ESR	≤150% of the initial specified value							
	Leakage Current	≤The initial specified value							

DIMENSIONS[mm]



ØD	5	5.5	6.3	8	10
Ød	0.5	0.5	0.5	0.6	0.6
F	2.0	2.5	2.5	3.5	5.0
ØD'	ØD-0.1~+0.5				
L'	L+1.0max.		L-0.5~+1		

PART NUMBERING SYSTEM

S	P	H	1	C	M	5	6	1	F	1	1	O	0	0	R	A	X	X	X

PH series

■ STANDARD RATINGS

VDC (SV)	Cap (μF)	Size ΦD×L(mm)	ESR (mΩ,20°C,100kHz)(max.)	Rated ripple current (mA rms/105°C,100kHz)	Leakage Current (μA)(max.)	Part Number
6.3 (7.2)	220	5×7	16	4000	500	SPH0JM221D07O00RAXXX
	270	5×7	16	4300	500	SPH0JM271D07O00RAXXX
		5×8	16	4600	500	SPH0JM331D08O00RAXXX
	330	6.3×5	20	3600	500	SPH0JM331E05O00RAXXX
		6.3×8	12	4600	500	SPH0JM331E08O00RAXXX
	390	5×9	16	4700	500	SPH0JM391D09O00RAXXX
		5×10	16	4900	592	SPH0JM471D10O00RAXXX
	470	5.5×9	16	4700	592	SPH0JM471B09O00RAXXX
		6.3×7	16	4400	592	SPH0JM471E07O00RAXXX
		6.3×8	12	5000	592	SPH0JM471E08O00RAXXX
	500	5×9	16	4700	630	SPH0JM501D09O00RAXXX
		5.5×9	16	4900	706	SPH0JM561B09O00RAXXX
	560	6.3×8	16	5500	706	SPH0JM561E08O00RAXXX
		6.3×9	16	5800	857	SPH0JM681E09O00RAXXX
	680	5.5×9	16	5500	857	SPH0JM681B09O00RAXXX
		8×9	16	5200	857	SPH0JM681F09O00RAXXX
	820	6.3×9	16	5800	1033	SPH0JM821E09O00RAXXX
		8×9	12	5400	1033	SPH0JM821F09O00RAXXX
	1000	6.3×10	8	5900	1260	SPH0JM102E10O00RAXXX
		8×9	9	5500	1260	SPH0JM102F09O00RAXXX
		8×11	8	5900	1260	SPH0JM102F11O00RAXXX
	1200	8×11	8	6000	1512	SPH0JM122F11O00RAXXX
		8×11	8	6200	1890	SPH0JM152F11O00RAXXX
	1500	10×12	8	6300	1890	SPH0JM152G12O00RAXXX
	1800	10×10	8	6300	2268	SPH0JM182G10O00RAXXX
	2200	8×14	8	6500	2772	SPH0JM222F14O00RAXXX
		10×12	8	6600	2772	SPH0JM222G12O00RAXXX
6.8 (7.8)	220	5×7	18	3500	500	SPH0CM221D07O00RAXXX
	270	5×7	18	3800	500	SPH0CM271D07O00RAXXX
		6.3×8	18	4100	500	SPH0CM271E08O00RAXXX
	330	5×8	18	4000	500	SPH0CM331D08O00RAXXX
		6.3×5	23	3300	500	SPH0CM331E05O00RAXXX
		6.3×7	18	3600	500	SPH0CM331E07O00RAXXX
	390	5×9	18	4100	530	SPH0CM391D09O00RAXXX
		5×9	18	4300	639	SPH0CM471D09O00RAXXX
	470	6.3×7	18	3900	639	SPH0CM471E07O00RAXXX
		6.3×8	18	4700	762	SPH0CM561E08O00RAXXX
	560	6.3×8	18	4700	762	SPH0CM561E08O00RAXXX
	680	6.3×9	18	5000	925	SPH0CM681E09O00RAXXX
	820	6.3×9	18	5100	1115	SPH0CM821E09O00RAXXX
	1000	6.3×11	11	5400	1360	SPH0CM102E11O00RAXXX
7 (8.1)		8×11	9	5400	1360	SPH0CM102F11O00RAXXX
	150	5×6	27	1600	500	SPH0QM151D06O00RAXXX
	220	5×7	18	3400	500	SPH0QM221D07O00RAXXX
	270	5×8	18	3600	500	SPH0QM271D08O00RAXXX
	330	5×9	18	3800	500	SPH0QM331D09O00RAXXX
	470	6.3×8	18	4000	658	SPH0QM471E08O00RAXXX
		5.5×9	18	3800	658	SPH0QM471B09O00RAXXX
	560	6.3×8	18	4200	784	SPH0QM561E08O00RAXXX
	680	6.3×9	11	4400	952	SPH0QM681E09O00RAXXX
	820	6.3×10	11	4700	1148	SPH0QM821E10O00RAXXX
7.5 (8.6)		8×9	11	4800	1148	SPH0QM821F09O00RAXXX
	220	5×7	18	3300	500	SPH0AM221D07O00RAXXX
	270	5×8	18	3500	500	SPH0AM271D08O00RAXXX
	330	5×9	18	3700	500	SPH0AM331D09O00RAXXX
	390	5×9	18	3700	585	SPH0AM391D09O00RAXXX
		6.3×7	23	3400	705	SPH0AM471E07O00RAXXX
	470	5.5×9	18	3700	705	SPH0AM471B09O00RAXXX
		5×9	18	3700	705	SPH0AM471B09O00RAXXX
		5.5×8	23	3300	705	SPH0AM471B08O00RAXXX
	500	5.5×9	18	3800	750	SPH0AM501B09O00RAXXX
	560	6.3×8	18	4100	840	SPH0AM561E08O00RAXXX
	680	6.3×9	11	4300	1020	SPH0AM681E09O00RAXXX
	820	6.3×10	11	4600	1230	SPH0AM821E10O00RAXXX
		8×9	11	4800	1230	SPH0AM821F09O00RAXXX
	1000	8×11	11	4900	1500	SPH0AM102F11O00RAXXX
		6.3×11	11	4700	1500	SPH0AM102E11O00RAXXX
	1200	8×11	11	5000	1800	SPH0AM122F11O00RAXXX
		6.8×11	11	4800	1800	SPH0AM122Q11O00RAXXX
	1500	8×11	11	5100	2250	SPH0AM152F11O00RAXXX
		6.8×13	11	5000	2250	SPH0AM152Q13O00RAXXX
	1800	8×14	11	5400	2700	SPH0AM182F14O00RAXXX
	2200	10×12	11	6000	3300	SPH0AM222G12O00RAXXX
10 (11.5)	47	5×7	28	2500	500	SPH1AM470D07O00RAXXX
	56	5×7	28	2500	500	SPH1AM560D07O00RAXXX
	68	5×7	28	2600	500	SPH1AM680D07O00RAXXX

PH series

■ STANDARD RATINGS

VDC (SV)	Cap (μF)	Size ΦDxL(mm)	ESR (mΩ, 20°C, 100kHz) (max.)	Rated ripple current (mA rms/105°C, 100kHz)	Leakage Current (μA)(max.)	Part Number
10 (11.5)	82	5×7	28	2700	500	SPH1AM820D07O00RAXXX
	100	5×7	28	2700	500	SPH1AM101D07O00RAXXX
		6.3×5	24	2600	500	SPH1AM101E05O00RAXXX
	150	5×7	16	2800	500	SPH1AM151D07O00RAXXX
	180	6.3×7	16	3200	500	SPH1AM181E07O00RAXXX
		5×9	16	3200	500	SPH1AM221D09O00RAXXX
	220	6.3×5	20	3200	500	SPH1AM221E05O00RAXXX
		6.3×8	12	3600	500	SPH1AM221E08O00RAXXX
	270	6.3×8	16	3500	540	SPH1AM271E08O00RAXXX
		6.3×8	16	3700	660	SPH1AM331E08O00RAXXX
	330	8×9	12	3900	660	SPH1AM331F09O00RAXXX
		6.3×10	9	4000	660	SPH1AM331E10O00RAXXX
	390	6.3×8	16	3900	780	SPH1AM391E08O00RAXXX
		5.5×9	16	3900	940	SPH1AM471B09O00RAXXX
	470	6.3×8	16	3900	940	SPH1AM471E08O00RAXXX
		8×9	12	4000	940	SPH1AM471F09O00RAXXX
		8×11	9	6400	940	SPH1AM471F11O00RAXXX
	560	8×9	12	4100	1120	SPH1AM561F09O00RAXXX
		6.3×10	10	4100	1120	SPH1AM561E10O00RAXXX
	680	8×11	9	4400	1360	SPH1AM681F11O00RAXXX
		8×8	16	3700	1360	SPH1AM681F08O00RAXXX
	820	8×11	9	4600	1640	SPH1AM821F11O00RAXXX
		8×11	9	4800	2000	SPH1AM102F11O00RAXXX
	1000	10×12	8	6000	2000	SPH1AM102G12O00RAXXX
		8×12	8	5100	2400	SPH1AM122F12O00RAXXX
	1200	10×12	8	6200	2400	SPH1AM122G12O00RAXXX
		10×12	8	6300	3000	SPH1AM152G12O00RAXXX
	1500	8×14	8	5500	3000	SPH1AM152F14O00RAXXX
	1800	10×13	8	6600	3600	SPH1AM182G13O00RAXXX
	2200	10×15	8	7000	4400	SPH1AM222G15O00RAXXX
12 (13.8)	220	4×10	14	2200	528	SPH1TM221C10O00RAXXX
		5.5×9	18	3300	792	SPH1TM331B09O00RAXXX
	330	6.3×8	18	3300	792	SPH1TM331E08O00RAXXX
		5×10	18	3300	792	SPH1TM331D10O00RAXXX
	470	5.5×9	18	3400	1128	SPH1TM471B09O00RAXXX
		6.3×9	18	3600	1128	SPH1TM471E09O00RAXXX
	560	6.3×10	14	3600	1344	SPH1TM561E10O00RAXXX
		6.3×11	14	3800	1632	SPH1TM681E11O00RAXXX
	680	8×10	14	3900	1632	SPH1TM681F10O00RAXXX
	820	8×11	11	4000	1968	SPH1TM821F11O00RAXXX
	1000	8×12	11	4200	2400	SPH1TM102F12O00RAXXX
	1200	8×14	11	4600	2880	SPH1TM122F14O00RAXXX
	1500	8×16	11	5000	3600	SPH1TM152F16O00RAXXX
16 (18.4)	22	5×9	64	1800	500	SPH1CM220D09O00RAXXX
	47	5×7	16	2300	500	SPH1CM470D07O00RAXXX
	56	5×7	16	2400	500	SPH1CM560D07O00RAXXX
	68	5×7	16	2400	500	SPH1CM680D07O00RAXXX
	82	5×8	16	2500	500	SPH1CM820D08O00RAXXX
		5×7	16	2500	500	SPH1CM101D07O00RAXXX
	100	6.3×5	20	2400	500	SPH1CM101E05O00RAXXX
		6.3×8	16	3200	500	SPH1CM101E08O00RAXXX
	120	5×8	16	2700	500	SPH1CM121D08O00RAXXX
	150	5×8	16	2700	500	SPH1CM151D08O00RAXXX
		5×8	16	2800	576	SPH1CM181D08O00RAXXX
	180	6.3×7	12	2800	576	SPH1CM181E07O00RAXXX
		5×10	16	2900	704	SPH1CM221D10O00RAXXX
	220	6.3×8	16	3100	704	SPH1CM221E08O00RAXXX
		6.3×10	12	3300	704	SPH1CM221E10O00RAXXX
		5.5×9	16	3100	864	SPH1CM271B09O00RAXXX
	270	6.3×8	16	3100	864	SPH1CM271E08O00RAXXX
		8×9	16	3300	864	SPH1CM271F09O00RAXXX
		5.5×9	16	3300	1056	SPH1CM331B09O00RAXXX
	330	6.3×9	16	3300	1056	SPH1CM331E09O00RAXXX
		6.3×10	12	3500	1056	SPH1CM331E10O00RAXXX
		6.3×11	12	3400	1504	SPH1CM471E11O00RAXXX
	470	8×11	12	5200	1504	SPH1CM471F11O00RAXXX
		8×9	10	4700	1504	SPH1CM471F09O00RAXXX
		8×11	12	3600	1792	SPH1CM561F11O00RAXXX
	560	8×13	12	3700	1792	SPH1CM561F13O00RAXXX
		10×12	9	4000	1792	SPH1CM561G12O00RAXXX
	680	8×11	12	3900	2176	SPH1CM681F11O00RAXXX
		10×12	9	4100	2176	SPH1CM681G12O00RAXXX
	820	8×13	8	4000	2624	SPH1CM821F13O00RAXXX
		10×12	9	4300	2624	SPH1CM821G12O00RAXXX
	1000	10×12	9	4600	3200	SPH1CM102G12O00RAXXX
	1200	10×15	9	4900	3840	SPH1CM122G15O00RAXXX

Conductive Polymer
Radial Type

PH series

■ STANDARD RATINGS

VDC (SV)	Cap (μF)	Size ΦD×L (mm)	ESR (mΩ, 20°C, 100kHz) (max.)	Rated ripple current (mA rms/105°C, 100kHz)	Leakage Current (μA) (max.)	Part Number
16 (18.4)	1500	10×12	9	5500	4800	SPH1CM152G12O00RAXXX
		10×18	9	6300	4800	SPH1CM152G18O00RAXXX
	1800	10×14	9	6200	5000	SPH1CM182G14O00RAXXX
		10×17	9	6600	5000	SPH1CM222G17O00RAXXX
	2200	10×15	9	6300	5000	SPH1CM222G15O00RAXXX
20 (23.0)	33	5×8	36	2000	500	SPH1DM330D08O00RAXXX
	39	5×8	36	2000	500	SPH1DM390D08O00RAXXX
	47	5×8	36	2300	500	SPH1DM470D08O00RAXXX
	56	5×9	36	2200	500	SPH1DM560D09O00RAXXX
	68	6.3×8	27	2200	500	SPH1DM680E08O00RAXXX
	82	6.3×8	27	2300	500	SPH1DM820E08O00RAXXX
	100	6.3×8	27	2300	500	SPH1DM101E08O00RAXXX
	120	6.3×8	27	2400	500	SPH1DM121E08O00RAXXX
	150	6.3×10	18	2500	600	SPH1DM151E10O00RAXXX
	180	8×9	27	2600	720	SPH1DM181F09O00RAXXX
	220	8×11	18	2700	880	SPH1DM221F11O00RAXXX
	270	8×11	18	2800	1080	SPH1DM271F11O00RAXXX
		8×11	18	2900	1320	SPH1DM331F11O00RAXXX
	330	6.3×11	18	2200	1320	SPH1DM331E11O00RAXXX
		10×12	18	3000	1880	SPH1DM471G12O00RAXXX
	470	8×16	18	3200	1880	SPH1DM471F16O00RAXXX
		8×11	18	2500	1880	SPH1DM471F11O00RAXXX
	560	10×12	18	3300	2240	SPH1DM561G12O00RAXXX
		8×16	18	3400	2240	SPH1DM561F16O00RAXXX
		10×15	18	3500	2720	SPH1DM681G15O00RAXXX
	680	8×14	18	2800	2720	SPH1DM681F14O00RAXXX
	820	10×18	18	3600	3280	SPH1DM821G18O00RAXXX
	1000	10×18	18	4100	4000	SPH1DM102G18O00RAXXX
25 (28.8)	10	5×8	56	2000	500	SPH1EM100D08O00RAXXX
	22	5×9	48	2000	500	SPH1EM220D09O00RAXXX
	33	5×9	48	2100	500	SPH1EM330D09O00RAXXX
	39	5×8	48	2100	500	SPH1EM390D08O00RAXXX
	47	5×9	48	2200	500	SPH1EM470D09O00RAXXX
	56	5×9	48	2300	500	SPH1EM560D09O00RAXXX
	68	6.3×7	24	2400	500	SPH1EM680E07O00RAXXX
	82	6.3×7	24	2400	500	SPH1EM820E07O00RAXXX
		6.3×8	24	2800	500	SPH1EM101E08O00RAXXX
	100	6.3×10	16	3200	500	SPH1EM101E10O00RAXXX
		8×11	16	3400	500	SPH1EM101F11O00RAXXX
	120	6.3×8	24	2800	600	SPH1EM121E08O00RAXXX
	150	6.3×10	16	3200	750	SPH1EM151E10O00RAXXX
	180	6.3×10	16	3200	900	SPH1EM181E10O00RAXXX
		8×9	24	2800	900	SPH1EM181F09O00RAXXX
		8×11	16	3400	1100	SPH1EM221F11O00RAXXX
	220	10×12	16	4000	1100	SPH1EM221G12O00RAXXX
		5.5×10	16	2100	1100	SPH1EM221B10O00RAXXX
	270	8×11	16	3400	1350	SPH1EM271F11O00RAXXX
		8×11	16	3500	1650	SPH1EM331F12O00RAXXX
	330	10×12	16	4300	1650	SPH1EM331G12O00RAXXX
		10×10	20	3200	1650	SPH1EM331G10O00RAXXX
		10×12	16	4600	2350	SPH1EM471G12O00RAXXX
		8×16	16	3900	2350	SPH1EM471F16O00RAXXX
	470	8×11	16	3400	2350	SPH1EM471F11O00RAXXX
		10×10	20	3200	2350	SPH1EM471G10O00RAXXX
	560	10×12	16	4600	2800	SPH1EM561G12O00RAXXX
		8×12	16	3500	2800	SPH1EM561F12O00RAXXX
		10×15	16	4900	3400	SPH1EM681G15O00RAXXX
	680	10×12	16	4700	3400	SPH1EM681G12O00RAXXX
		8×14	16	3900	3400	SPH1EM681F14O00RAXXX
	820	10×18	16	5100	4100	SPH1EM821G18O00RAXXX
		10×12	16	4700	4100	SPH1EM821G12O00RAXXX
	1000	10×18	16	5100	5000	SPH1EM102G18O00RAXXX

Specifications subject to change without notice.