The magical power inside **E.D.L.C**

YEC

開創未來的科技動力

永隆科技股份有限公司
YEONG LONG TECHNOLOGIES CO., LTD.

www.yec.com.tw

Type List for Electrical Double Layer Capacitors

Series	Feature	Application	Cap.	ESR/DC	Volt.	Temp. Range
 **PV**	Energy Efficiency	■ Short term UPS system ■ Industrial and automation ■ Telecom system ■ Renewable energy systems ■ Portable device	0.5 F to 100 F	14 mΩ to 1.6Ω	3.0V	-40 ℃ to + 65 ℃

Series Chart for Electrical Double Layer Capacitors

Radial Type

3.0 V Application

PV
0.5F - 100F
3.0V
-40℃ - +65℃

High Capacitance
and Energy Efficiency

No.114 Jifeng Road, Wufeng District, Taichung City 41348, Taiwan (R.O.C.)
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PRODUCT SPECIFICATIONS For POWER & ENERGY & CURRENT

$$* E_{\text{Store}}(Wh) = \frac{1/2CV_R^2}{3600}$$

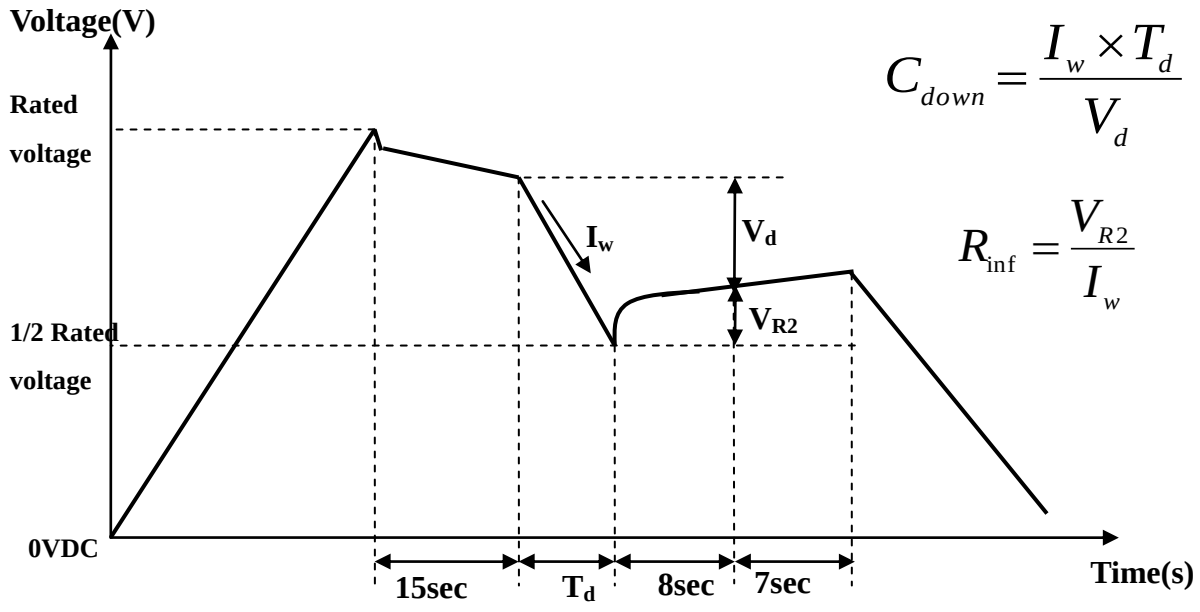
$$* E_{Specific}(Wh/kg) = \frac{1/2CV_R^2}{3600 \times mass} \qquad * E_{Specific}(Wh/l) = \frac{1/2CV_R^2}{3600 \times volume}$$

$$* P_d(W/kg) = \frac{0.12V_R^2}{ESR(DC) \times mass} \qquad * P_{\max}(W/kg) = \frac{V_R^2}{4 \times ESR(DC) \times mass}$$

$$* I_{Max\ Peak\ Current} = \frac{1/2V_R}{1/C + ESR(DC)} \qquad * I_{SC} = \frac{V_R}{ESR(DC)}$$

Capacitance & DC Resistance measuring method

a) Charge the Ultracapacitor to rated voltage at a constant current.
b) Float for 15 seconds without charge current.
c) Discharge the unit to 1/2 rated voltage at a constant current.
d) Rest for 8 seconds.
e) Rest for 7 seconds.
f) Discharge to 0.01VDC.



$$C_{down} = \frac{I_w \times T_d}{V_d}$$

$$R_{\inf} = \frac{V_{R2}}{I_w}$$

For charge and discharge current, please refer to the recommendation suggested by YEC.

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Power Type PV Series

Features

- 3.0V operating voltage
- Small size and low-resistance
- Quick charge & discharge
- Environmentally friendly products
- Extended temperature to 85℃
- Humidity resistance @ RH90%

Certification

- RoHS & REACH compliant
- UL recognized (File No. MH10260)

Recommended Applications

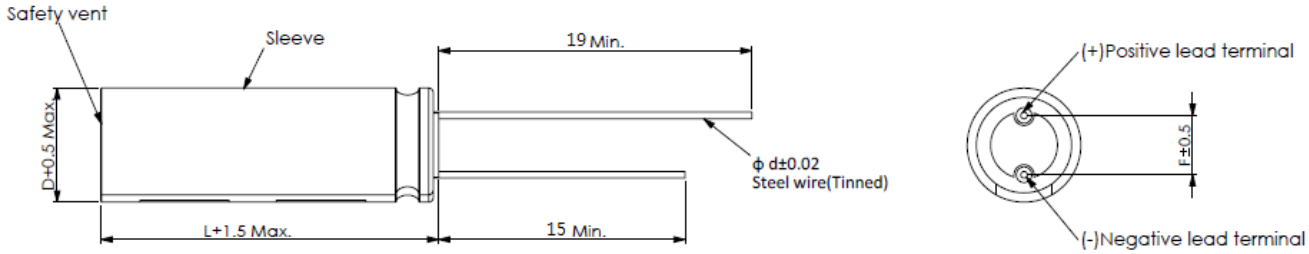
- Pulse power demand
- Hybrid battery packs
- Power tools

Specification

Items	Characteristics	
Rated Voltage	2.7 V	3.0 V
Operating Temp. (Charge)	-40℃ ~ 85℃	-40℃ ~ 65℃
Surge Voltage	3.15 V	
Capacitance Tolerance	-20% ~ +20% of Rated Capacitance	
Storage Temp.	-40 ℃ to 85 ℃	-40 ℃ to 70 ℃

Test	Endurance	Standards
High Temp. Life	1000hrs @ Rated Voltage & Max. Operating Temp.	Must to meet standards as below after test: CAP decline < 30% of Initial measurement. ESR < 2 times specification value.
Shelf Life (Non-Charge)	1000hrs @ Max. Operating Temp.	
Life time	10 Years @ Rated Voltage & 25℃	
Cycle Life	500,000 Cycles @ 25℃ (Operating Between 50%~100% Of Rated Voltage)	

Dimensions



Size List

Size	D	L	d	F
6.3X15	6.3	15	0.5	2.5
8X12	8	12	0.6	3.5
8X16	8	16	0.6	3.5
8X20	8	20	0.6	3.5
8X25	8	25	0.6	3.5
8X28	8	28	0.6	3.5

10X30	10	30	0.6	5.0
12.5X31.5	12.5	31.5	0.8	5.3
12.5X46	12.5	46	0.8	5.3
16X26	16	26	0.8	7.5
16X31.5	16	31.5	0.8	7.5
18X40	18	40	0.8	7.5
18X60	18	60	1.0	7.5

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Rated Cap（F）	Size（mm）	Max. Internal Resistance（mΩ）		Max. LC（mA）	Stored Energy	Specific Energy		Specific Power		Max.Peak Current	Max. continuous current	Isc	Max. Weight（g）	Part Number
measure at 25℃	ΦDXL	AC (1kHz, 1V)	DC	72hrs, 25℃	（Wh）	（Wh/kg）	（Wh/l）	Pd (W/kg)	Pmax (W/kg)	1s to 1/2V (A)	(A)	(A)		
0.5	8X12	400	1600	0.0036	0.0006	0.6250	1.0362	675	1406	0.42	0.05	1.88	1	PV3R0504M0812
1.2	6.3X15	240	600	0.008	0.0015	1.5000	3.2080	1800	3750	1.05	0.12	5.00	1	PV3R0125M0615
2	8X16	180	350	0.01	0.0025	1.9231	3.1085	2374	4945	1.77	0.2	8.57	1.3	PV3R0205M0816
3.3	8X20	160	300	0.012	0.0041	2.5781	4.3192	2250	4688	2.49	0.33	10.00	1.6	PV3R0335M0820
5	8X25	80	150	0.015	0.0063	2.8409	4.9736	3273	6818	4.29	0.5	20.00	2.2	PV3R0505M0825
6	8X28	70	130	0.015	0.0075	3.2609	5.3288	3612	7525	5.06	0.6	23.08	2.3	PV3R0605M0828
10	10X30	40	80	0.03	0.0125	3.6765	5.3052	3971	8272	8.33	1	37.50	3.4	PV3R0106M1030
15	12.5X31.5	30	50	0.06	0.0188	3.9894	4.8504	4596	9574	12.86	1.5	60.00	4.7	PV3R0156M1232
25	16X26	25	33	0.075	0.0313	4.1667	5.9779	4364	9091	20.55	2.5	90.91	7.5	PV3R0256M1626
34	12.5X46	16	26	0.08	0.0425	5.0000	7.5287	4887	10181	27.07	3.4	115.38	8.5	PV3R0346M1246
35	16X31.5	20	30	0.09	0.0438	5.1471	6.9078	4235	8824	25.61	3.5	100.00	8.5	PV3R0356M1632
60	18X40	12	20	0.18	0.0750	4.6875	7.3683	3375	7031	40.91	6	150.00	16	PV3R0606M1840
100	18X60	10	16	0.225	0.1250	5.6818	8.1870	3068	6392	57.69	10	187.50	22	PV3R0107M1860

Note. If standard product does not meet your need, please contact us to enquire for customized one.

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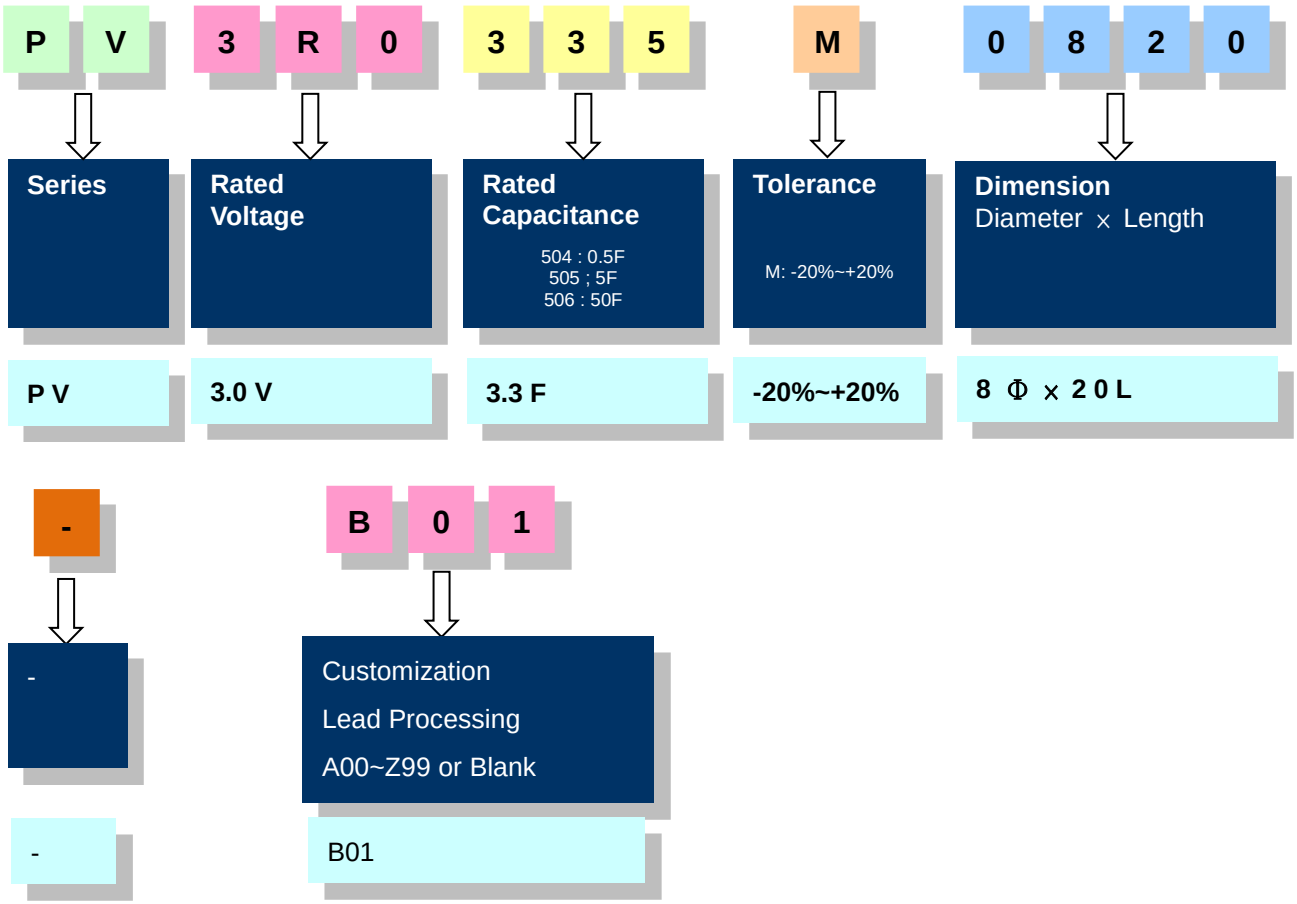
Part Numbering System



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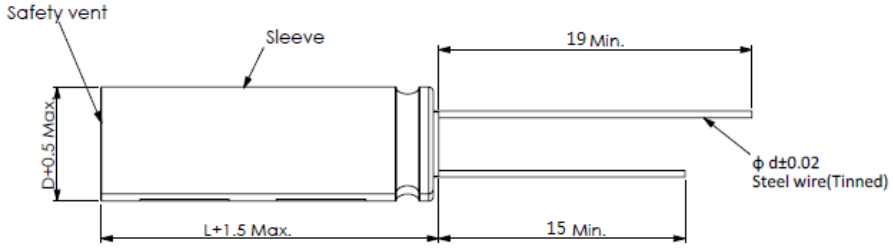
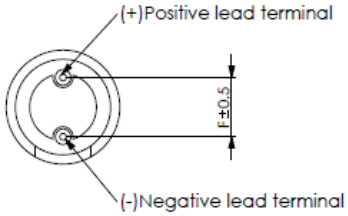


D	L	d	F
8	12	0.6	3.5



Standard Ratings

Rated Cap (F)	Size (mm)	Max. Internal Resistance (mΩ)		Max. LC (mA)	Stored Energy	Specific Energy		Specific Power		Max.Peak Current	Max. continuous current	Isc	Max. Weight (g)	Part Number
measure at 25℃	ΦDXL	AC (1kHz,1V)	DC	72hrs, 25℃	(Wh)	(Wh/kg)	(Wh/l)	Pd (W/kg)	Pmax (W/kg)	1s to 1/2V (A)	(A)	(A)		
0.5	8X12	400	1600	0.0036	0.0006	0.6250	1.0362	675	1406	0.42	0.05	1.88	1	PV3R0504M0812

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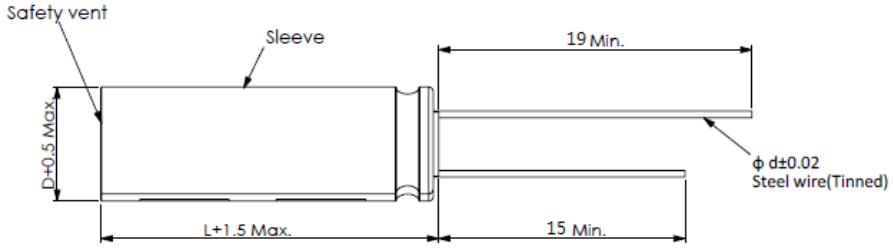
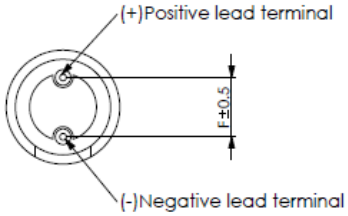


D	L	d	F
6.3	15	0.5	2.5



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measure at 25℃	ΦDXL	AC (1kHz,1V)	DC	72hrs, 25℃	(Wh)	(Wh/kg)	(Wh/l)	Pd (W/kg)	Pmax (W/kg)	1s to 1/2V (A)	(A)	(A)		
1.2	6.3X15	240	600	0.008	0.0015	1.5000	3.2080	1800	3750	1.05	0.12	5.00	1	PV3R0125M0615

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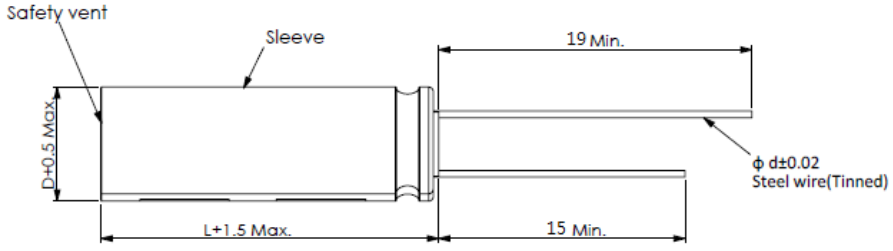
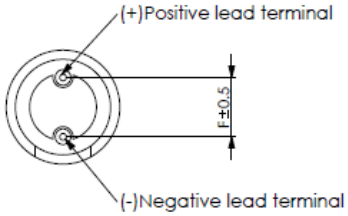


D	L	d	F
8	16	0.6	3.5



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measure at 25℃	ΦDXL	AC (1kHz,1V)	DC	72hrs, 25℃	(Wh)	(Wh/kg)	(Wh/l)	Pd (W/kg)	Pmax (W/kg)	1s to 1/2V (A)	(A)	(A)		
2	8X16	180	350	0.01	0.0025	1.9231	3.1085	2374	4945	1.77	0.2	8.57	1.3	PV3R0205M0816

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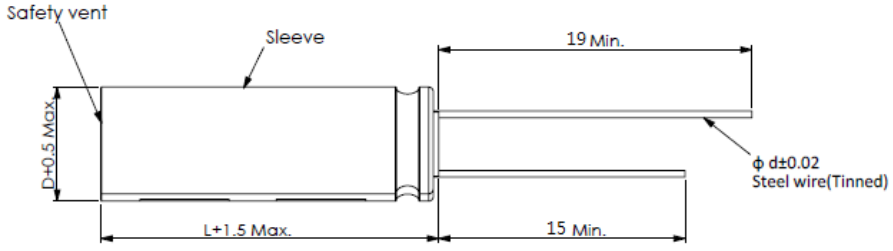
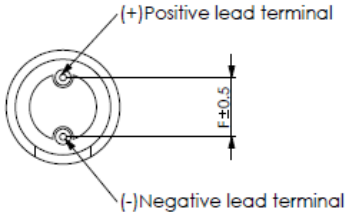


D	L	d	F
8	20	0.6	3.5



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3.3	8X20	160	300	0.012	0.0041	2.5781	4.3192	2250	4688	2.49	0.33	10.00	1.6	PV3R0335M0820

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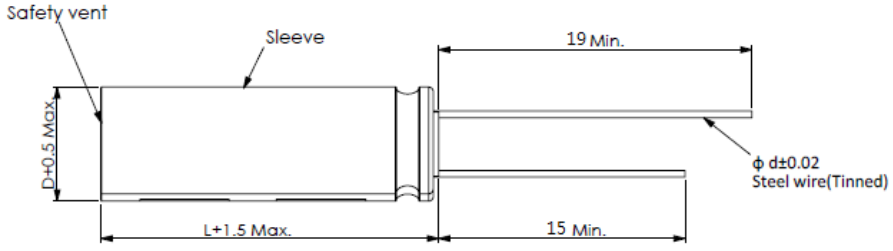

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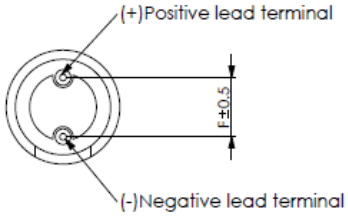
8	25	0.6	3.5



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5	8X25	80	150	0.015	0.0063	2.8409	4.9736	3273	6818	4.29	0.5	20.00	2.2	PV3R0505M0825

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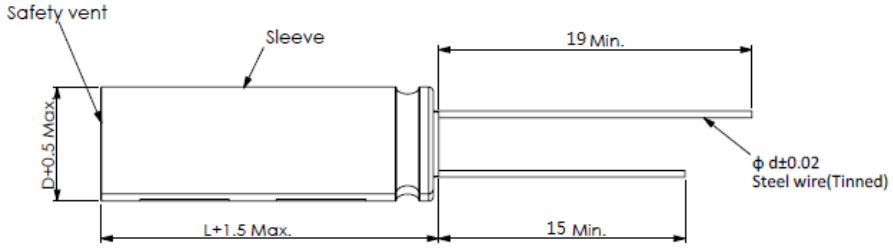
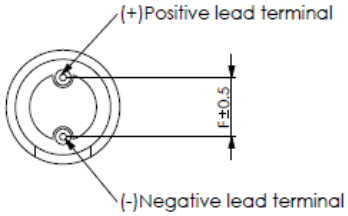
Cycle Life	500,000 Cycles @ 25℃ (Operating Between 50%~100% Of Rated Voltage)	

Dimensions



D	L	d	F
8	28	0.6	3.5



Standard Ratings

Rated Cap (F)	Size (mm)	Max. Internal Resistance (mΩ)		Max. LC (mA)	Stored Energy	Specific Energy		Specific Power		Max.Peak Current	Max. continuous current	Isc	Max. Weight (g)	Part Number
measure at 25℃	ΦDXL	AC (1kHz,1V)	DC	72hrs, 25℃	(Wh)	(Wh/kg)	(Wh/l)	Pd (W/kg)	Pmax (W/kg)	1s to 1/2V (A)	(A)	(A)		
6	8X28	70	130	0.015	0.0075	3.2609	5.3288	3612	7525	5.06	0.6	23.08	2.3	PV3R0605M0828

※DC IR is calculated by voltage drop(ΔV) which is measured by the period of time from discharge start to 10 milliseconds later.

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Power Type PV Series

Features

- 3.0V operating voltage
- Small size and low-resistance
- Quick charge & discharge
- Environmentally friendly products
- Extended temperature to 85℃
- Humidity resistance @ RH90%

Certification

- RoHS & REACH compliant
- UL recognized (File No. MH10260)

Recommended Applications

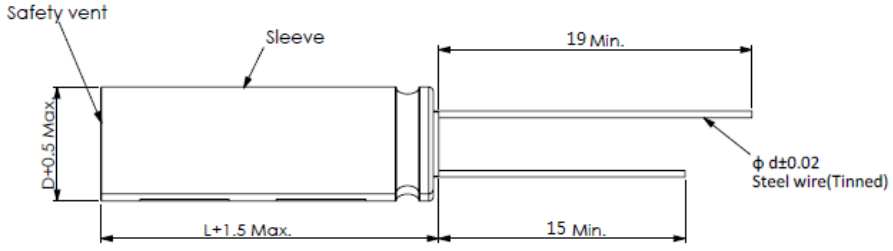
- Pulse power demand
- Hybrid battery packs
- Power tools

Specification

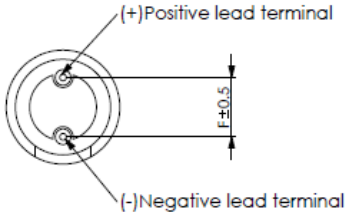
Items	Characteristics	
Rated Voltage	2.7 V	3.0 V
Operating Temp. (Charge)	-40℃ ~ 85℃	-40℃ ~ 65℃
Surge Voltage	3.15 V	
Capacitance Tolerance	-20% ~ +20% of Rated Capacitance	
Storage Temp.	-40 ℃ to 85 ℃	-40 ℃ to 70 ℃

Test	Endurance	Standards
High Temp. Life	1000hrs @ Rated Voltage & Max. Operating Temp.	Must to meet standards as below after test: CAP decline < 30% of Initial measurement. ESR < 2 times specification value.
Shelf Life (Non-Charge)	1000hrs @ Max. Operating Temp.	
Life time	10 Years @ Rated Voltage & 25℃	
Cycle Life	500,000 Cycles @ 25℃ (Operating Between 50%~100% Of Rated Voltage)	

Dimensions



D	L	d	F
10	30	0.6	5.0



Standard Ratings

Rated Cap (F)	Size (mm)	Max. Internal Resistance (mΩ)		Max. LC (mA)	Stored Energy	Specific Energy		Specific Power		Max.Peak Current	Max. continuous current	Isc	Max. Weight (g)	Part Number
measure at 25℃	ΦDXL	AC (1kHz,1V)	DC	72hrs, 25℃	(Wh)	(Wh/kg)	(Wh/l)	Pd (W/kg)	Pmax (W/kg)	1s to 1/2V (A)	(A)	(A)		
10	10X30	40	80	0.03	0.0125	3.6765	5.3052	3971	8272	8.33	1	37.50	3.4	PV3R0106M1030

※DC IR is calculated by voltage drop(ΔV) which is measured by the period of time from discharge start to 10 milliseconds later.

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Power Type PV Series

Features

- 3.0V operating voltage
- Small size and low-resistance
- Quick charge & discharge
- Environmentally friendly products
- Extended temperature to 85℃
- Humidity resistance @ RH90%

Certification

- RoHS & REACH compliant
- UL recognized (File No. MH10260)

Recommended Applications

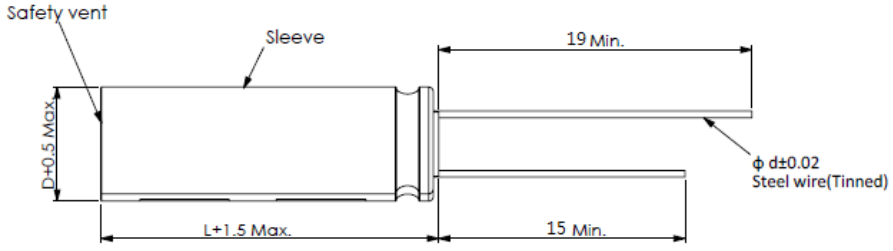
- Pulse power demand
- Hybrid battery packs
- Power tools

Specification

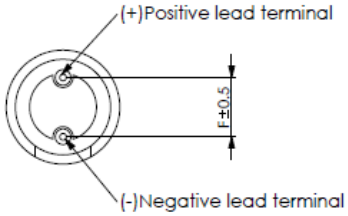
Items	Characteristics	
Rated Voltage	2.7 V	3.0 V
Operating Temp. (Charge)	-40℃ ~ 85℃	-40℃ ~ 65℃
Surge Voltage	3.15 V	
Capacitance Tolerance	-20% ~ +20% of Rated Capacitance	
Storage Temp.	-40 ℃ to 85 ℃	-40 ℃ to 70 ℃

Test	Endurance	Standards
High Temp. Life	1000hrs @ Rated Voltage & Max. Operating Temp.	Must to meet standards as below after test: CAP decline < 30% of Initial measurement. ESR < 2 times specification value.
Shelf Life (Non-Charge)	1000hrs @ Max. Operating Temp.	
Life time	10 Years @ Rated Voltage & 25℃	
Cycle Life	500,000 Cycles @ 25℃ (Operating Between 50%~100% Of Rated Voltage)	

Dimensions



D	L	d	F
12.5	31.5	0.8	5.3



Standard Ratings

Rated Cap（F）	Size（mm）	Max. Internal Resistance（mΩ）		Max. LC（mA）	Stored Energy	Specific Energy		Specific Power		Max.Peak Current	Max. continuous current	Isc	Max. Weight（g）	Part Number
measure at 25℃	ΦDXL	AC (1kHz,1V)	DC	72hrs, 25℃	（Wh）	（Wh/kg）	（Wh/l）	Pd (W/kg)	Pmax (W/kg)	1s to 1/2V (A)	(A)	(A)		
15	12.5X31.5	30	50	0.06	0.0188	3.9894	4.8504	4596	9574	12.86	1.5	60.00	4.7	PV3R0156M1232

※DC IR is calculated by voltage drop(ΔV) which is measured by the period of time from discharge start to 10 milliseconds later.

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Power Type PV Series

Features

- 3.0V operating voltage
- Small size and low-resistance
- Quick charge & discharge
- Environmentally friendly products
- Extended temperature to 85℃
- Humidity resistance @ RH90%

Certification

- RoHS & REACH compliant
- UL recognized (File No. MH10260)

Recommended Applications

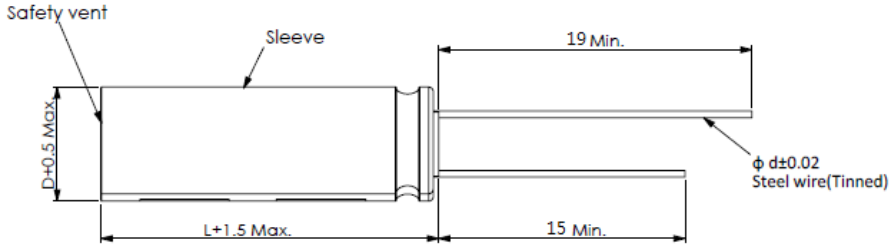
- Pulse power demand
- Hybrid battery packs
- Power tools

Specification

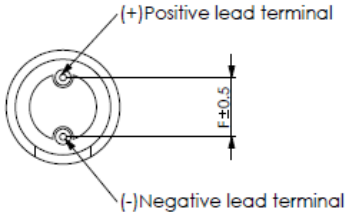
Items	Characteristics	
Rated Voltage	2.7 V	3.0 V
Operating Temp. (Charge)	-40℃ ~ 85℃	-40℃ ~ 65℃
Surge Voltage	3.15 V	
Capacitance Tolerance	-20% ~ +20% of Rated Capacitance	
Storage Temp.	-40 ℃ to 85 ℃	-40 ℃ to 70 ℃

Test	Endurance	Standards
High Temp. Life	1000hrs @ Rated Voltage & Max. Operating Temp.	Must to meet standards as below after test: CAP decline < 30% of Initial measurement. ESR < 2 times specification value.
Shelf Life (Non-Charge)	1000hrs @ Max. Operating Temp.	
Life time	10 Years @ Rated Voltage & 25℃	
Cycle Life	500,000 Cycles @ 25℃ (Operating Between 50%~100% Of Rated Voltage)	

Dimensions



D	L	d	F
16	26	0.8	7.5



Standard Ratings

Rated Cap（F）	Size（mm）	Max. Internal Resistance（mΩ）		Max. LC（mA）	Stored Energy	Specific Energy		Specific Power		Max.Peak Current	Max. continuous current	Isc	Max. Weight（g）	Part Number
measure at 25℃	ΦDXL	AC (1kHz,1V)	DC	72hrs, 25℃	（Wh）	（Wh/kg）	（Wh/l）	Pd (W/kg)	Pmax (W/kg)	1s to 1/2V (A)	(A)	(A)		
25	16X26	25	33	0.075	0.0313	4.1667	5.9779	4364	9091	20.55	2.5	90.91	7.5	PV3R0256M1626

※DC IR is calculated by voltage drop(ΔV) which is measured by the period of time from discharge start to 10 milliseconds later.

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Power Type PV Series

Features

- 3.0V operating voltage
- Small size and low-resistance
- Quick charge & discharge
- Environmentally friendly products
- Extended temperature to 85℃
- Humidity resistance @ RH90%

Certification

- RoHS & REACH compliant
- UL recognized (File No. MH10260)

Recommended Applications

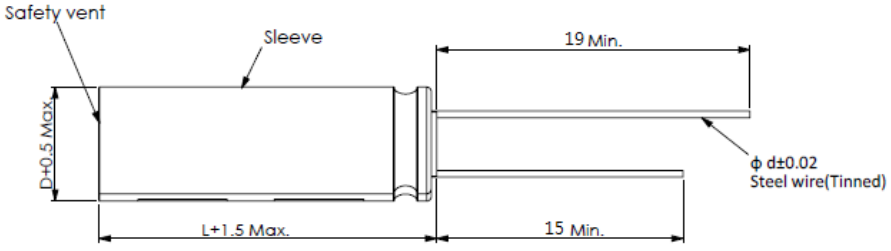
- Pulse power demand
- Hybrid battery packs
- Power tools

Specification

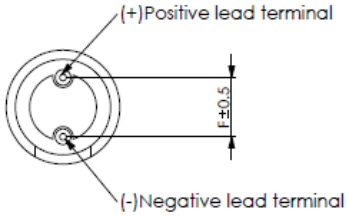
Items	Characteristics	
Rated Voltage	2.7 V	3.0 V
Operating Temp. (Charge)	-40℃ ~ 85℃	-40℃ ~ 65℃
Surge Voltage	3.15 V	
Capacitance Tolerance	-20% ~ +20% of Rated Capacitance	
Storage Temp.	-40 ℃ to 85 ℃	-40 ℃ to 70 ℃

Test	Endurance	Standards
High Temp. Life	1000hrs @ Rated Voltage & Max. Operating Temp.	Must to meet standards as below after test: CAP decline < 30% of Initial measurement. ESR < 2 times specification value.
Shelf Life (Non-Charge)	1000hrs @ Max. Operating Temp.	
Life time	10 Years @ Rated Voltage & 25℃	
Cycle Life	500,000 Cycles @ 25℃ (Operating Between 50%~100% Of Rated Voltage)	

Dimensions



D	L	d	F
12.5	46	0.8	5.3



Standard Ratings

Rated Cap (F)	Size (mm)	Max. Internal Resistance (mΩ)		Max. LC (mA)	Stored Energy	Specific Energy		Specific Power		Max.Peak Current	Max. continuous current	Isc	Max. Weight (g)	Part Number
measure at 25℃	ΦDXL	AC (1kHz,1V)	DC	72hrs, 25℃	(Wh)	(Wh/kg)	(Wh/l)	Pd (W/kg)	Pmax (W/kg)	1s to 1/2V (A)	(A)	(A)		
34	12.5X46	16	26	0.08	0.0425	5.0000	7.5287	4887	10181	27.07	3.4	115.38	8.5	PV3R0346M1246

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Power Type PV Series

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- Environmentally friendly products
- Extended temperature to 85℃
- Humidity resistance @ RH90%

Certification

- RoHS & REACH compliant
- UL recognized (File No. MH10260)

Recommended Applications

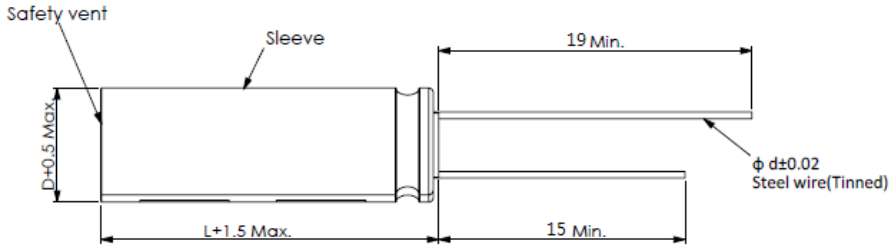
- Pulse power demand
- Hybrid battery packs
- Power tools

Specification

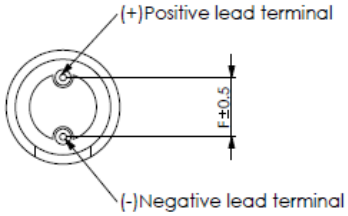
Items	Characteristics	
Rated Voltage	2.7 V	3.0 V
Operating Temp. (Charge)	-40℃ ~ 85℃	-40℃ ~ 65℃
Surge Voltage	3.15 V	
Capacitance Tolerance	-20% ~ +20% of Rated Capacitance	
Storage Temp.	-40 ℃ to 85 ℃	-40 ℃ to 70 ℃

Test	Endurance	Standards
High Temp. Life	1000hrs @ Rated Voltage & Max. Operating Temp.	Must to meet standards as below after test: CAP decline < 30% of Initial measurement. ESR < 2 times specification value.
Shelf Life (Non-Charge)	1000hrs @ Max. Operating Temp.	
Life time	10 Years @ Rated Voltage & 25℃	
Cycle Life	500,000 Cycles @ 25℃ (Operating Between 50%~100% Of Rated Voltage)	

Dimensions



D	L	d	F
16	31.5	0.8	7.5



Standard Ratings

Rated Cap (F)	Size (mm)	Max. Internal Resistance (mΩ)		Max. LC (mA)	Stored Energy	Specific Energy		Specific Power		Max.Peak Current	Max. continuous current	Isc	Max. Weight (g)	Part Number
measure at 25℃	ΦDXL	AC (1kHz,1V)	DC	72hrs, 25℃	(Wh)	(Wh/kg)	(Wh/l)	Pd (W/kg)	Pmax (W/kg)	1s to 1/2V (A)	(A)	(A)		
35	16X31.5	20	30	0.09	0.0438	5.1471	6.9078	4235	8824	25.61	3.5	100.00	8.5	PV3R0356M1632

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Power Type PV Series

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- UL recognized (File No. MH10260)

Recommended Applications

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Specification

Items	Characteristics	
Rated Voltage	2.7 V	3.0 V
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High Temp. Life	1000hrs @ Rated Voltage & Max. Operating Temp.	Must to meet standards as below after test: CAP decline < 30% of Initial measurement. ESR < 2 times specification value.
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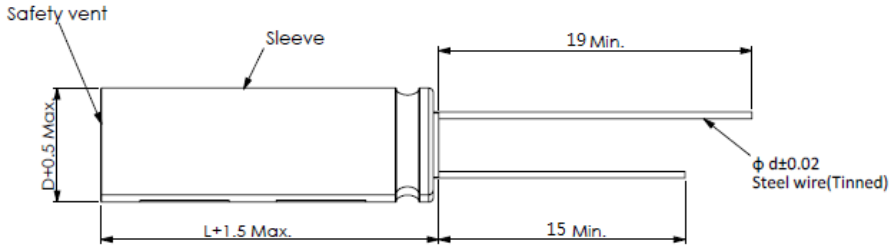
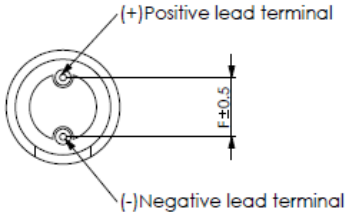
Dimensions



D	L	d	F
18	40	0.8	7.5



Standard Ratings

Rated Cap (F)	Size (mm)	Max. Internal Resistance (mΩ)		Max. LC (mA)	Stored Energy	Specific Energy		Specific Power		Max.Peak Current	Max. continuous current	Isc	Max. Weight (g)	Part Number
measure at 25℃	ΦDXL	AC (1kHz,1V)	DC	72hrs, 25℃	(Wh)	(Wh/kg)	(Wh/l)	Pd (W/kg)	Pmax (W/kg)	1s to 1/2V (A)	(A)	(A)		
60	18X40	12	20	0.18	0.0750	4.6875	7.3683	3375	7031	40.91	6	150.00	16	PV3R0606M1840

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Power Type PV Series

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Certification

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- UL recognized (File No. MH10260)

Recommended Applications

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- Hybrid battery packs
- Power tools

Specification

Items	Characteristics	
Rated Voltage	2.7 V	3.0 V
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High Temp. Life	1000hrs @ Rated Voltage & Max. Operating Temp.	Must to meet standards as below after test: CAP decline < 30% of Initial measurement. ESR < 2 times specification value.
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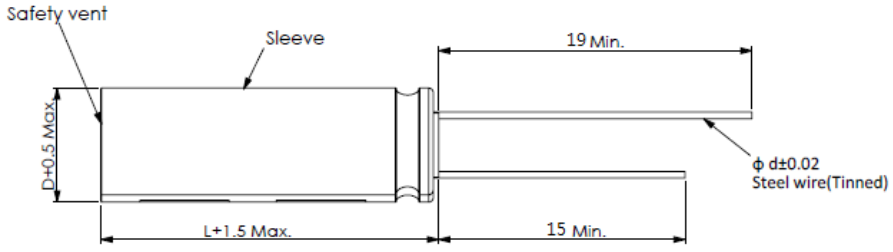
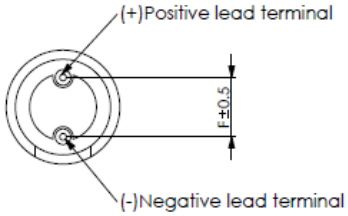
Dimensions



D	L	d	F
18	60	1.0	7.5



Standard Ratings

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measure at 25℃	ΦDXL	AC (1kHz,1V)	DC	72hrs, 25℃	(Wh)	(Wh/kg)	(Wh/l)	Pd (W/kg)	Pmax (W/kg)	1s to 1/2V (A)	(A)	(A)		
100	18X60	10	16	0.225	0.1250	5.6818	8.1870	3068	6392	57.69	10	187.50	22	PV3R0107M1860

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