



CAPACITORS FOR POWER ELECTRONICS



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ENERGIZING IDEAS

**CORNELL
DUBILIER**

BATTERY BACKUP

TABLE OF CONTENTS

SERIES	DESCRIPTION
RJD	RJD: Highest Power Rating With Long Life
DGH	DGH: +85°C Low ESR Supercapacitor
DCN	DCN: +60°C, Radial Lead Supercapacitors
DCR	DCR: +70°C, Radial Lead Supercapacitors
DER	DER: +70°C, Radial Lead Supercapacitors
DSF	DSF: +85°C, High Voltage
VMF	VMF: Hybrid LIC
VPF	VPF: Hybrid LIC
EDC	EDC: +70°C, Long Life
EDS	EDS: +85°C, Long Life



FEATURES

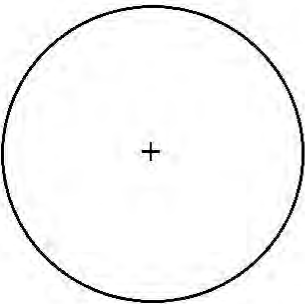
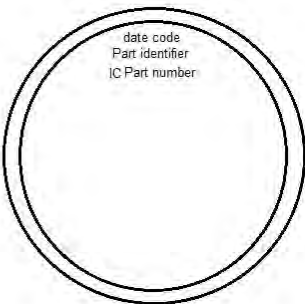
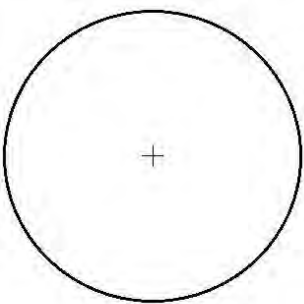

Highest power rating with long life – Standard parts stocked*

APPLICATIONS

Wearable electronic & IoT devices – Memory backup circuits

Nominal Voltage	3.7VDC (4.2VDC to 3.0VDC)	
Operating Temperature Range	-20°C to +60°C	
Storage Temperature Range	-20°C to +60°C (one month) -20°C to +40°C (up to 3 months) -20°C to +25°C (up to 6 months)	
Storage Capacity	Nominal	See part listing 0.2C rate, 3.0V cut-off
	Minimum	See part listing 0.2C rate, 3.0V cut-off
Charging Voltage	4.2VDC \pm 0.03V	
Charging current	0.5CA	
Charging Time	< 3.0 hours	
Charging method	Constant Current / Constant Voltage (CCCV)	
Discharge Current	Standard	0.2CA
	Maximum	2CA
Discharge Cut-off Voltage	3.0V	
Anode	Graphite	
Cathode	Lithium nickel manganese cobalt oxide	
Certification	UL1642 – MH28281	

Markings

Standard (bare cells)		Non-Standard Terminations	
			
Front	Back	Front	Back



Standard Coin Cell Options

IC Part Number	Capacity (mAh)		Charging Current (mA)	Discharge Current (mA)		Maximum Internal Resistance (mΩ)	Approx. Weight (g)	Maximum Diameter (D mm)	Thickness (T mm)
	Nom.	Min.		STD	MAX				
RJD2048	120	110	55	22	220	700	4.2	20.02	5.0
RJD2430C1	110	104	52	20.8	208	500	4.5	24.5	3.15
RJD2440	150	140	70	28	280	800	5.4	24.5	4.3
RJD2450	200	190	95	38	380	500	6.5	24.5	5.4
RJD3032	200	190	95	38	380	600	7.2	30	3.4
RJD3048	300	290	145	58	580	400	9.3	30	4.9
RJD3555	545	515	257.5	103	1030	200	14.1	35.2	5.7

Standard PCM & Connector Options

IC Part Number	Capacity (mAh)		Charging Current (mA)	Discharge Current (mA)		Maximum Internal Resistance (mΩ)	Approx. Weight (g)	Maximum Diameter (D mm)	Thickness (T mm)
	Nom.	Min.		STD	MAX				
RJD3048HPPV30M	300	290	145	58	580	700	9.3	30	5.7
RJD3555HPPV30M	545	515	257.5	103	1030	500	14.1	35.2	6.4

Standard Leaded Options

IC Part Number	Capacity (mAh)		Charging Current (mA)	Discharge Current (mA)		Maximum Internal Resistance (mΩ)	Approx. Weight (g)	Maximum Diameter (D mm)	Thickness (T mm)
	Nom.	Min.		STD	MAX				
RJD2048ST1	120	110	55	22	220	700	4.2	20.02	5.4
RJD2430C1ST1	110	104	52	20.8	208	500	4.5	24.5	3.55
RJD2440ST1	150	140	70	28	280	800	5.4	24.5	4.7
RJD2450ST1	200	190	95	38	380	500	6.5	24.5	5.8
RJD3032ST1	200	190	95	38	380	600	7.2	30	3.8
RJD3048ST1	300	290	145	58	580	400	9.3	30	5.3
RJD3555ST1	545	515	257.5	103	1030	200	14.1	35.2	6.1



Cell Dimensions

IC Part Number	Fresh Cell				Cycled cell (after 500 cycles)	
	Shipping (Charged)		Full Charge		Full Charge	
	Maximum Diameter (D mm)	Maximum Thickness (T mm)	Maximum Diameter (D mm)	Maximum Thickness (T mm)	Maximum Diameter (D mm)	Maximum Thickness (T mm)
RJD2032C1	20.02	3.5	20.02	3.6	20.02	3.7
RJD2048	20.02	5	20.02	5.2	20.02	5.3
RJD2430C1	24.5	3.15	24.5	3.25	24.5	3.3
RJD2440	24.5	4.3	24.5	4.4	24.5	4.5
RJD2450	24.5	5.4	24.5	5.5	24.5	5.6
RJD3032	30	3.4	30	3.5	30	3.6
RJD3048	30	4.9	30	4.9	30	5.2
RJD3555	35.2	5.7	35.2	5.8	35.2	5.9

Part Numbering

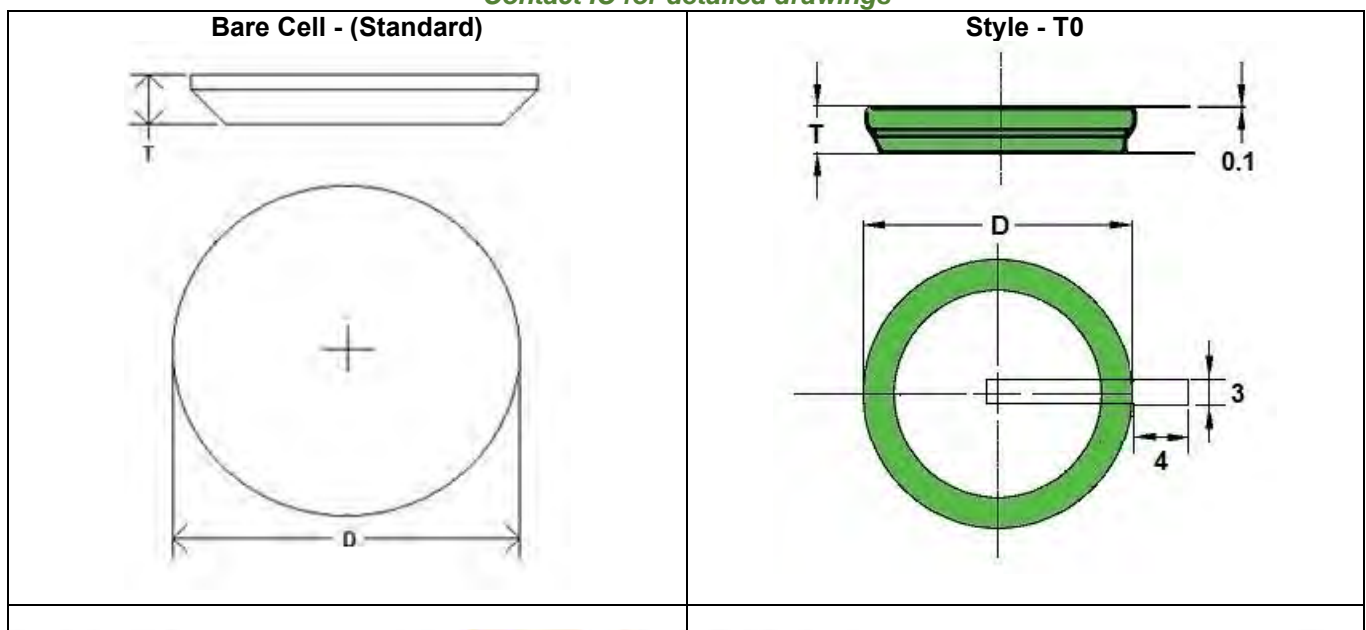
RJD 2032C1 A B C D E
 Section 1 Section 2 Section 3 Section 4 Section 5 Section 6

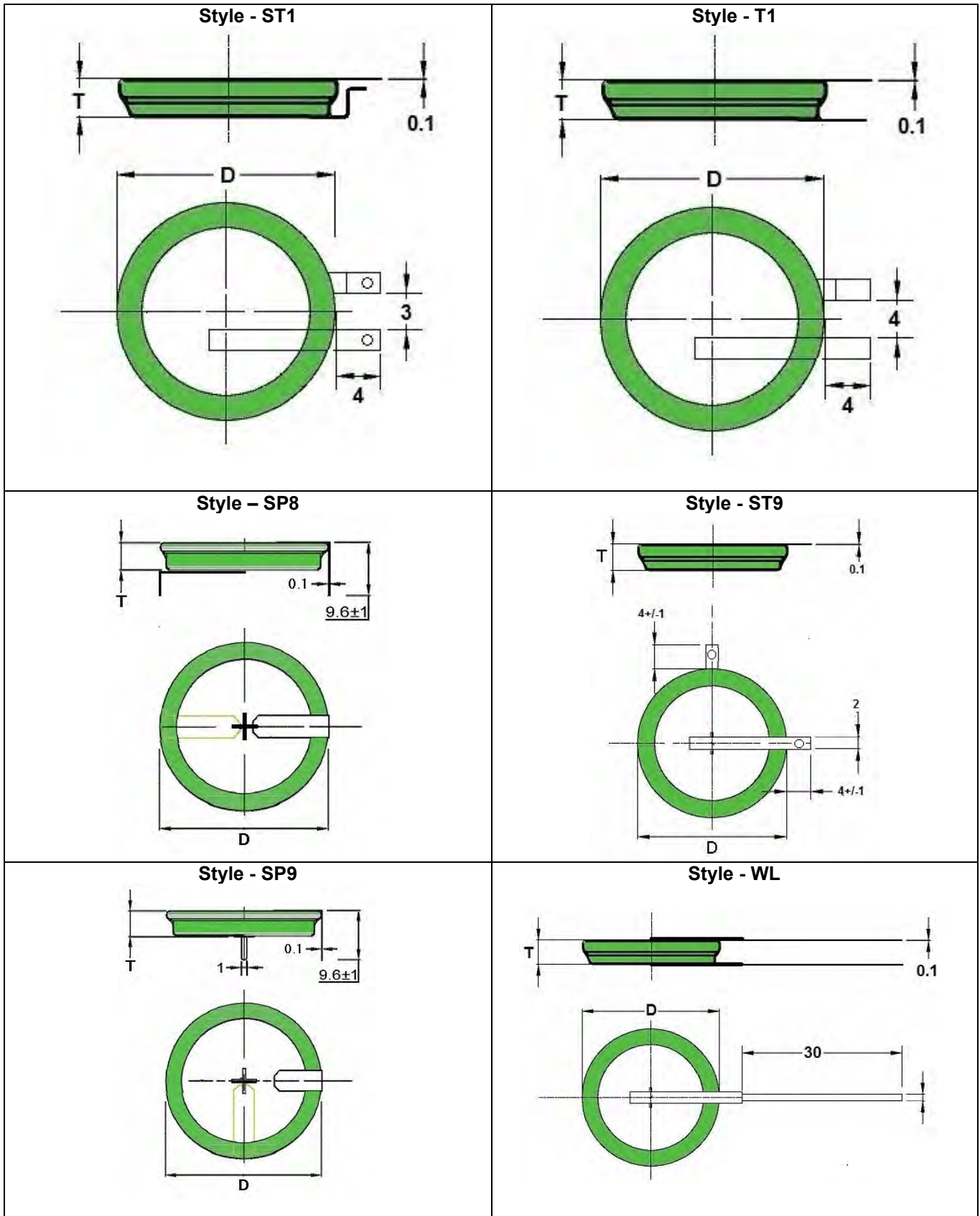
Section 1 – IC standard part number (Bare cell)

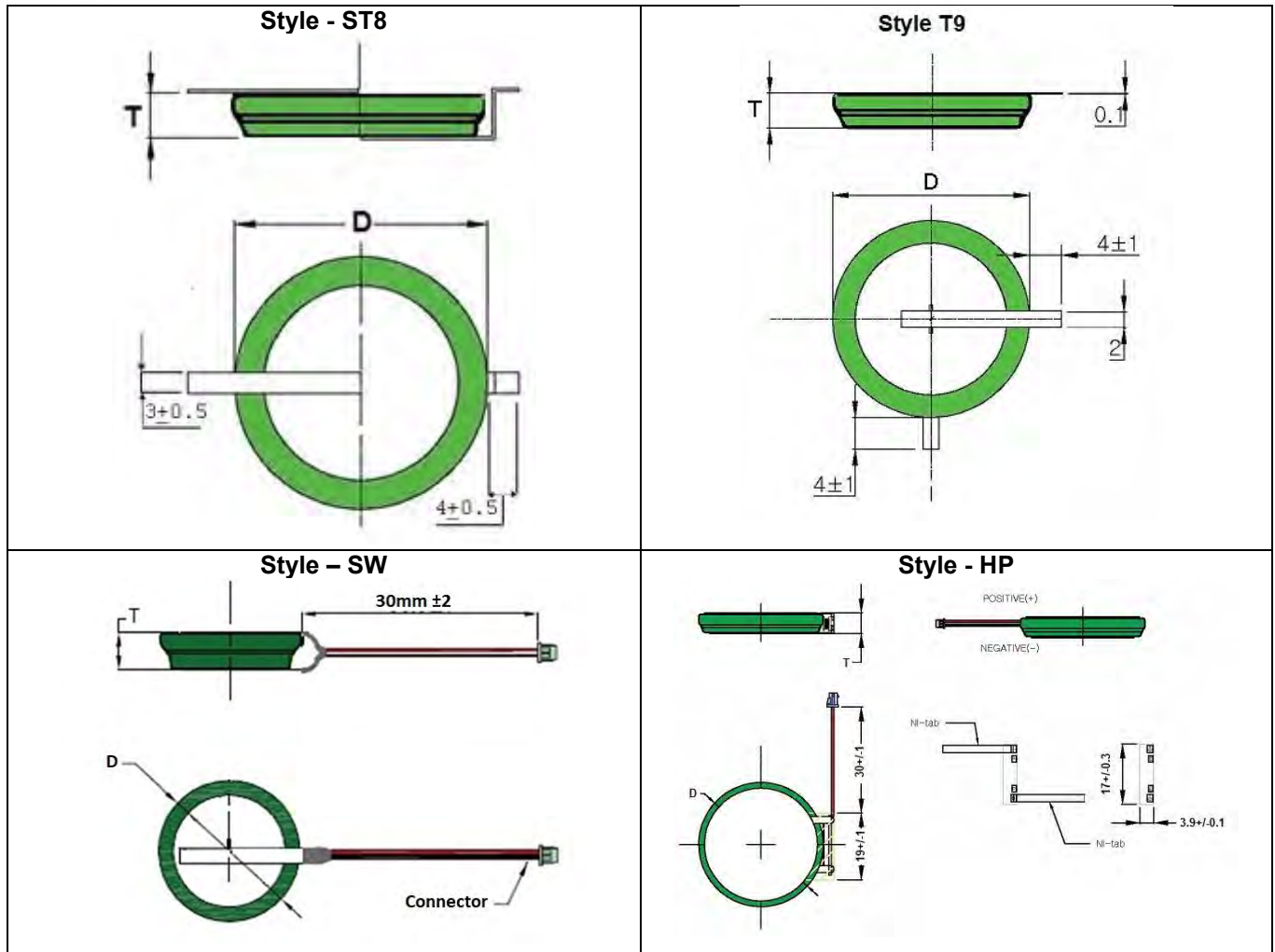
Section 2 –Termination style

Termination Styles

Contact IC for detailed drawings







Contact IC if other termination type is preferred

Section 3 – Connector supplied with PCM indicator, with connector is standard (Code P)

Connector with PCM	Connector without PCM
P	N

Section 4 - Wire gauge for types SW and HP, 30 gauge is standard (Code V).

*Contact IC if a different wire gauge is needed.

Section 5 – Lead Length for types SW and HP, 30mm. is the standard. (Code 30)

*Contact IC if a different wire length is needed.

Section 6 – Connector option for types SW and HP, Molex is standard (Code M)



Connector types

IC Code	M (Standard)	J
Connector Manufacturer	Molex	JST
Connector Part Number	51021-0200	ACHR-02V-S
Drawing		
Detailed specifications location	http://www.molex.com/pdm_docs/sd/51021_0200_sd.pdf	http://www.jst.com/home23.html

HP lead style are supplied with a PCM (Protection Circuit Module).
 PCM Type: Powerlogics part # RJD 201 or RJD 9901 (see Protection Circuit Module section below for complete specifications).

PCM option

Protection Circuit Module

(Only for HP lead style)

Specification	RJD 9901	RJD 201
PCM used with indicated corresponding bare cell part number	RJD3032 RJD3048 RJD3555	RJD2032C1, RJD2048, RJD2430C1, RJD2440, RJD2450
Main IC	SP31ABE	MP29A
PCB	SALTEK, APEX	SALTEK, APEX
FET	X	X
PTC	MicroSMD175F-2 (TE)	X
L terminal	X	X
Capacitor	2Point	2Point
Resistor	2Point	1Point
Dimension(L*W*T)	16.9*3.9*2.0mm	11.0X3.5X1.75mm
Wake-up Function	NO	NO
Overcharge Detection Voltage	4.275V ± 25mV	4.25V~4.3V
Overcharge Detection Delay Time	700.0mSec ~ 1300mSec	800.0mSec ~ 1200mSec
Over-Discharge Detection Voltage	2.242V~2.358V	2.76V~2.84V
Over-Discharge Detection Delay Time	14.0mSec~26.0mSec	16.0mSec~24.0mSec



Over-Discharge Current Detection	1.2 ~ 4.0A	0.77 ~ 1.76A
Overcharge Current Detection	0.9A ~ 4.4A	0.9A ~ 4.4A
Over-Discharge Current Protection Delay Time	8.0mSec ~ 16.0mSec	4.8mSec ~ 7.2mSec
Short Detection Delay Time	100μs ~ 500μs	280μs ~ 560μs
PCM Impedance	< 220mΩ	< 46mΩ
Operation Current Consumption	Max 6.0μA(TYP 4.0μA)	Max 6.0μA(TYP 3.0μA)
Power-Down Mode Current Consumption	Max 0.1μA	Max 0.1μA
Distance Between B+, B- Tab	13.93mm	5.25mm

Battery Operation Instruction:

Charging

- Charge the battery in a temperature range of 0°C to + 45°C.
- Charge the battery at a constant current of 0.5C until 4.20VDC±0.03VDC per cell is attained. Charge rates greater than 1C are NOT recommended. (C: Rated Capacity of Battery)
- Maintain charge voltage at 4.20VDC per cell for 3.0 hours (recommended for maximum capacity).
** Use a constant current, constant voltage (CC/CV) lithium-ion (Li+) battery charge controller.*
** Do not continue to charge battery over specified time.*

Discharging

- Recommended cut-off voltage to 3.0VDC. Recommended maximum discharge rate is 2C at constant current.
- For maximum performance, discharge the battery in a temperature range of -20°C to + 45°C.

Protection Circuit

Protection circuit can be provided upon request. However, protection circuit may be omitted for most applications without damaging performance and safety. Please consult our engineering staff for technical advice.

Storage Recommendations

Storage Temperature and Humidity

Store the battery within a temperature range of -20°C to +45°C, low humidity, non-corrosive gas atmosphere and no condensation on the battery.

Long Period Storage

In case of a long storage period (more than 3 months), store the battery within a temperature range of -20°C to +25°C, low humidity and non-corrosive gas atmosphere.

Standard Test Conditions

Unless otherwise specified, all tests are conducted at 25°C ± 3°C and relative humidity of 65% ± 20%.



Electrical Characteristics

Standard Charge and Discharge Conditions

- A. The "Standard Charge" means charging the Cell with initial charge current (0.5C) and with a constant voltage of 4.2VDC (± 0.03 VDC) and the specified cut-off current (see table 1) at 25°C for 3 hours.
- B. Standard discharge means discharging cell with constant discharge current (0.2C)(see table 1) and with 3.0VDC cut-off voltage at 25°C
- C. Initial Discharge Capacity
- D. The initial capacity measured under the standard test conditions
- E. Initial Discharge Capacity: See standard part listing
- F. Initial Internal resistance: see standard part listing
- G. Internal resistance measured at 1 kHz after Standard Charge.
- H. Cycle Life (500 cycles): See table 1
- I. Temperature dependence of discharge capacity. See discharge table.
- J. Relative capacity at each temperature measured with a constant discharge current (0.2C) with 3.0VDC cutoff after the standard charge shown below.

Discharge Table

IC Part Number	Discharge Temperature			
	-20°C	-10°C	25°C	60°C
RJD2032C1	>60 %	>80%	100 %	>95%
RJD2048	>60 %	>80%	100 %	>80%
RJD2430C1	>60 %	>80%	100 %	>95%
RJD2440	>60 %	>80%	100 %	>80%
RJD2450	>60 %	>80%	100 %	>80%
RJD3032	>60 %	>80%	100 %	>80%
RJD3048	>60 %	>80%	100 %	>80%
RJD3555	>60 %	>80%	100 %	>80%

Table 1

IC Part Number	Charging Current (0.5C) (mA)	Constant Discharge Current (0.2C) (mA)	Charging end condition (at CV mode) (mA)	Capacity after 500 cycles (mAh)
RJD2032C1	40	16	2.4	56
RJD2048	60	24	3.6	77
RJD2430C1	55	22	3.3	72.8
RJD2440	75	30	4.5	98
RJD2450	100	40	6	133
RJD3032	100	40	6	133
RJD3048	150	60	9	203
RJD3555	250	100	15	350



Discharge Characteristics on Current Load (C-Rate)

Relative capacity at each load, measured with constant discharge current 0.2C, 0.5C, 1.0C, 2C with 3.0VDC cut-off after Standard Charge shown below.

Charge Current	Discharge Current			
Standard Charge	0.2 CA	0.5 CA	1 CA	2.0 CA
	100 %	> 95 %	> 90 %	> 50 %

Shipment

The Cell shall be shipped with 30% of the nominal voltage. (Nominal Cell voltage range: 3.7 ~ 3.8 V). 30% SOC is only for air transport.

Storage Characteristics

After storage at the conditions listed below, the battery is measured at the standard charge and discharge conditions stated under the electrical characteristics.

Storage Condition	Charge State	Capacity Retention	Capacity Recovery
20 days at 60°C	Shipping charge	-	> 85%
20 days at 60°C	Full charge	> 70%	> 85%
60 days at 60°C	Full charge	> 40%	> 60%
30 days at 60°C, 90%RH	Full charge	> 40%	> 70%

Safety Test

Test	Test Method	Criteria
High Temperature	Storing a cell at 90°C for 4 hours after being charged to 4.2VDC	No leakage
High Temperature and High Humidity	Storing a cell at 60°C and 90% RH for 1 week after being charged to 4.2VDC	No leakage
Thermal Shock Test	Store a fully charged cell (4.2VDC) at 60°C for 2 hours then at -20°C for 2 hours. 10 cycles with a maximum transition time of 5 minutes.	No leakage
Hot Box Test	A cell is to be heated in a gravity convection oven. The temperature of the oven is to be raised 5°C+/- 2°C per minute to a temperature of 130°C and remain at that temperature for 10 minutes	No explosion, No fire
Overcharge Test	Charge the test samples with constant current (3C) and voltage 4.5VDC. Test samples remain on test for 2.5 hours	No explosion, No fire
Impact Test	A test cell is to be placed on a flat surface. The bar of 9.1 kg weight and 15.8 mm diameter is dropped from a height of 610 mm onto the cell.	No explosion, No fire



Short-Circuit Test	A cell is to be short-circuited by connecting the positive and negative terminals of the battery with copper wire having a maximum resistance load of 100mΩ.	No fire or explosion, until battery is completely discharged
Nail Test	A stainless steel nail having a diameter of 4.0 mm is punched through the cell until the nail has passed through the opposite side of the cell.	No explosion, No fire
Applying Pressure	Placing pressure on entire surface of a fully charged cell with 7kg for 72 hours	No leakage, No weight decrease

Precautions and Safety Instructions

Lithium-Ion rechargeable batteries subjected to abusive conditions can become damaged and/or cause personal injury. Please read and observe the standard battery precautions below before using.

Note 1. The customer is required to contact Illinois Capacitor in advance, if and when the customer needs other applications or operating conditions other than those described in this document.

Note 2. Illinois Capacitor will take no responsibility for any accident where the cell is used under other conditions than those described in this document.

Precautions and Safety Instructions:

- a. Do not expose the battery to extreme heat or flame.
- b. Do not short circuit, over-charge or over-discharge the battery.
- c. Do not subject the battery to strong mechanical shocks.
- d. Do not immerse the battery in water or sea water, or get it wet.
- e. Do not reverse the polarity of the battery for any reason.
- f. Do not disassemble or modify the battery.
- g. Do not remove charge/discharge protection circuitry.
- h. Do not handle or store with metallic objects like necklaces, coins or hairpins, etc.
- i. Do not use the battery if possible damage or deformation is present.
- j. Do not connect battery to the plug socket or car-cigarette-plug.
- k. Do not directly solder onto the battery. Only spot weld lead onto battery. Soldering iron temperature should be limited to 350°C with a soldering time of <5 seconds.
- l. Do not place batteries in a solder bath.
- m. Do not touch a leaked battery directly.
- n. Do not use for other equipment.
- o. Do not mix Lithium-ion batteries.
- p. Do not use or leave the battery in direct sunlight (or in heated car by sunshine).
- q. Keep battery away from children.
- r. Use only the specified charger and observe charging requirement.
- s. Do not drive a nail into battery or strike battery with another battery or insert a screw into the battery
- t. Do not smash or throw battery.
- u. Recharge the battery every 6 months.
- v. Follow recommended charging conditions when charging battery.



Warnings:

- a. Do not swallow. Keep out of reach of infants and children. If swallowed call physician immediately.
- b. Do not put battery in microwave or pressure cooker.
- c. Do not use battery together with a primary battery, such as dry battery types or batteries with different capacities.
- d. Do not replace battery with a different type or model.
- e. Discontinue use of battery if an unusual odor, discoloration, deformation, internal heating or other unusual characteristic changes are detected.
- f. Do not have any leaked electrolyte come in contact with eyes. If contact occurs flush eyes immediately with water and consult a doctor.
- g. If charging does not stop after expected charging time, stop charging battery.

Requirement for Safety Assurance

For safety assurance, please discuss the equipment design, its system and protection circuit of Lithium-ion battery with Illinois capacitor in advance.

Consult with Illinois Capacitor about high rate current, rapid charge and special application.



FEATURES

Very Fast Charge/Discharge – High Power Density – Lower ESR –
RoHS Compliant

APPLICATIONS

Battery Backup/Alternative – Pulse Power – Energy Harvesting – LED
Displays – Mechanical Actuators – Audio Systems

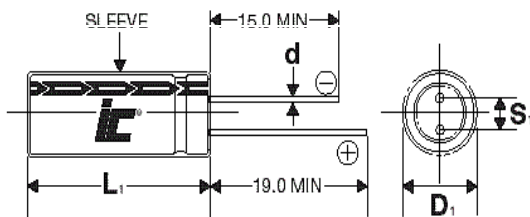
Operating Temperature Range	-40°C to +85°C	
Storage Temperature	-40°C to +70°C	
Capacitance Tolerance @ 20°C	-10% +30% (Q Tolerance) -20% +20% (M Tolerance)	
Voltage (Vdc) (+65°C / +85°C)	2.7V / 2.3V	
Life Time	1500 hours with rated voltage applied at rated temperature	
	Capacitance change	≤30% of initially measured values
	ESR	≤200% of initially specified values*
	Leakage current	≤100% specified maximum value
Shelf Life	1000 hours with no voltage applied at 65°C	
	Capacitance change	≤30% of initially measured values
	ESR	≤200% of initially specified values
Life Cycles (25°C) 1 cycle= Charge to WVDC for 20s, constant voltage charging for 10s, discharge to ½ WVDC for 20s, rest for 10s	500,000 cycles	
	Capacitance change	<30% of initially measured values
	ESR change	<200% of initially specified values

*ESR Change ≤4x at 85°C

[RoHS Compliant](#)

810a Recognized

D = 6.3 to 18mm



Lead spacing VS. Case diameter						
D	6.3	8	10	12.5	16	18
S	2.5	3.5	5.0	5.0	7.5	7.5
d	0.6	0.6	0.6	0.6	0.8	0.8
α	1.5	1.5	2.0	2.0	2.0	2.0

L₁=L+α mm
D₁=D+0.5mm
S₁=S±0.5mm

Americas / EU

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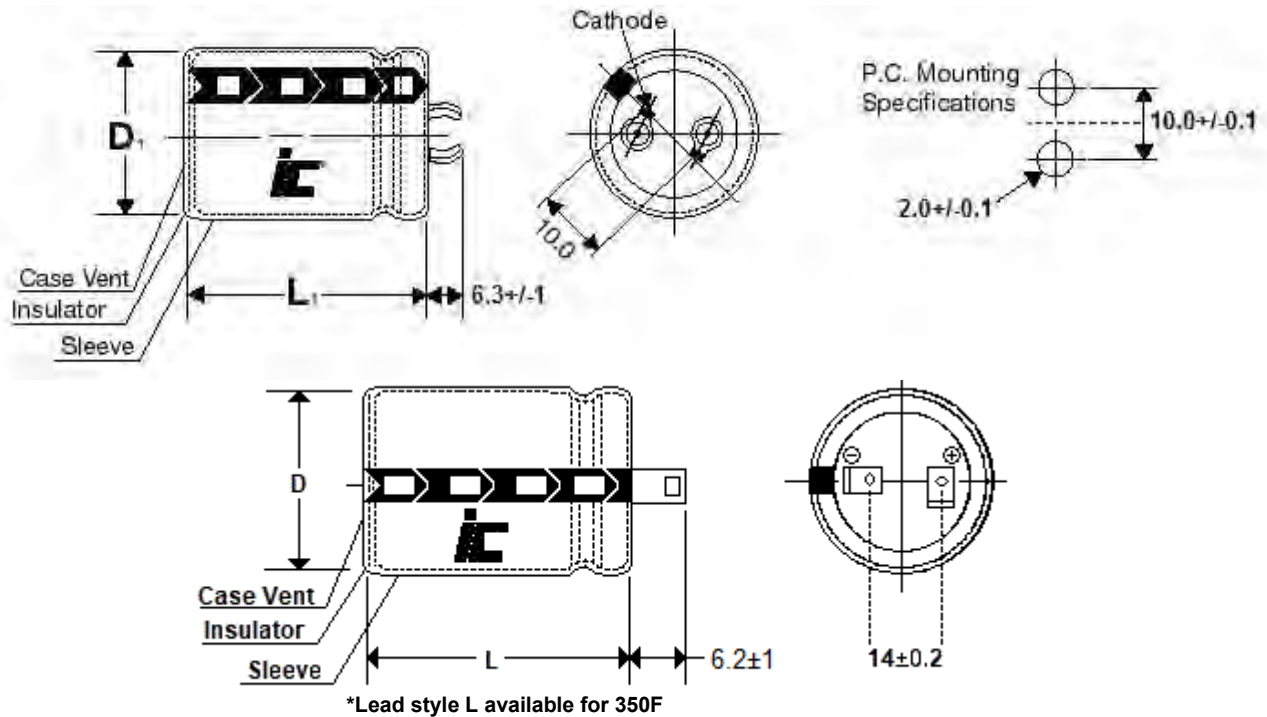


Asia

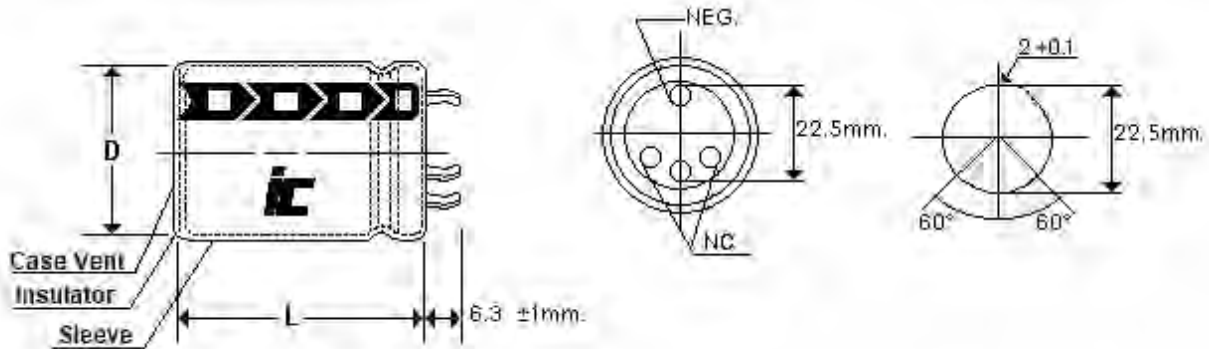
Phone: 852-2793-0931
Email: cdeasia@cde.com



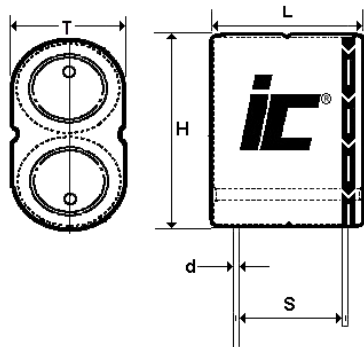
Capacitance 100F to 350F



Capacitance 400F to 600F



5.5 Volt Parts



Capacitance (F)	Dims (LxHxT) (mm) ±2.0mm	Lead spacing (S) (mm) +/-0.5mm	Lead diameter (d) (mm)
0.5	17x17x8.5	12	0.6
1	17x17x8.5	12	0.6
1.5	17x23x8.5	12	0.6
2.5	21x23x11	15.5	0.6
3.5	21x27x11	15.5	0.6
5	26x27x13	18	0.6

DGH

High pulse power, extends battery life

WVDC	Capacitance (F)	IC PART NUMBER	MAX Current (A) (1 Sec.)	Maximum Continuous Current (A) ($\Delta T=15^{\circ}C$)	Short Circuit Current (A)	ESR AC 1 kHz (m Ω)	DC ESR (m Ω) 20°C	Max stored energy (mWh)	LC (mA), (72 hrs)	Energy Density (Wh/kg)	Energy Volumetric Density (Wh/l)	Power Density (kW/kg)	Power Volumetric Density (kW/l)
2.7	1.0	DGH105Q2R7	0.96	0.6	6.8	200	400	1.01	0.008	0.92	1.44	1.988	3.109
2.7	1.2	DGH125M2R7	0.94	0.10	4.5	300	600	1.22	0.008	1.52	2.59	1.82	3.12
2.7	1.5	DGH155M2R7	1.1	0.13	4.8	280	560	1.5	0.008	1.6	2.7	1.64	2.78
2.7	2.0	DGH205Q2R7	1.8	0.7	11	130	250	2.03	0.01	1.688	2.879	2.916	4.975
2.7	3.0	DGH305Q2R7	2.8	1.2	18	80	150	3.04	0.012	2.17	3.023	4.166	5.804
2.7	3.3	DGH335Q2R7	3	1.2	18	80	150	3.34	0.014	2.228	3.325	3.888	5.804
2.7	5.0	DGH505Q2R7	4.1	1.3	21	70	130	5.06	0.016	2.531	3.225	3.365	4.286
2.7	6.0	DGH605Q2R7	4.5	0.51	21	70	130	6.08	0.016	2.89	3.86	3.2	4.28
2.7	7.0	DGH705Q2R7	6.1	1.7	34	55	80	7.09	0.02	2.835	3.611	4.374	5.572
2.7	10.0	DGH106Q2R7	8.4	3.5	45	40	60	10.13	0.03	3.894	5.159	5.608	7.429
2.7	10.0	DGH106Q2R7B	8.4	3.5	45	40	60	10.13	0.03	2.978	4.299	4.288	6.191
2.7	10.0	DGH106Q2R7C	8.4	3.5	45	40	60	10.13	0.03	3.38	5.16	4.86	7.4
2.7	15.0	DGH156Q2R7	11.6	2.4	54	30	50	15.19	0.045	3.375	4.127	3.888	4.755
2.7	20.0	DGH206Q2R7	15	2.6	68	30	40	20.25	0.06	3.11	4.02	3.36	4.3
2.7	25.0	DGH256Q2R7	18	3.1	77	25	35	25.31	0.08	2.978	5.038	2.941	4.975
2.7	30.0	DGH306Q2R7	21.3	4.0	90	22	30	30.38	0.1	3.79	5.03	3.64	4.8
2.7	50.0	DGH506Q2R7	32.1	5.2	123	15	22	50.63	0.14	3.616	4.976	2.84	3.909
2.7	70.0	DGH706Q2R7	39.4	5.8	135	14	20	70.88	0.16	3.938	5.573	2.43	3.439
2.7	100.0	DGH107Q2R7	61.4	8.3	225	8	12	101.25	0.3	4.821	5.922	3.471	4.264
2.7	200.0	DGH207Q2R7	90	10	270	6	10	202.5	0.7	5.192	5.732	2.243	2.476
2.7	350.0	DGH357Q2R7	212	18.9	771	3	3.5	354.38	1	5.452	6.134	3.845	4.329
2.7	350.0	DGH357Q2R7L	212	18.9	771	3	3.5	354.4	1	5.452	6.134	3.845	4.329
2.7	400.0	DGH407Q2R7	225	18.9	771	3	3.5	405	1	5.956	7.016	4.02	4.736
2.7	470.0	DGH477Q2R7	240	18.9	771	3	3.5	475.88	1.3	6.609	8.244	3.471	4.33
2.7	600.0	DGH607Q2R7	261	18	771	3	3.5	608	1.5	7.41	9.02	3.05	3.71
5.5	0.5	DGH504Q5R5	0.96	0.6	6.8	400	800	2.1	0.008	0.955	0.855	2.063	1.847
5.5	1.0	DGH105Q5R5	1.8	0.7	11	280	520	4.2	0.01	1.681	1.71	2.904	2.955
5.5	1.5	DGH155Q5R5	2.8	1.2	18	160	300	6.3	0.012	2.101	1.896	4.033	3.641
5.5	2.5	DGH255Q5R5	4.1	1.3	21	140	260	10.5	0.016	2.02	1.977	2.685	2.628
5.5	3.5	DGH355Q5R5	6.1	1.7	34	110	160	14.71	0.02	2.451	2.358	3.781	3.638
5.5	5.0	DGH505Q5R5	8.4	3.5	45	80	120	21	0.03	2.531	2.302	3.645	3.315

DGH

High pulse power, extends
battery life

WVDC	Capacitance (F)	IC PART NUMBER	Weight (grams)	Volume (mL)	Dims DxL LxHxT (mm)	Lead Spacing S (mm)	Lead Diameter d (mm)
2.7	1.0	DGH105Q2R7	0.8	0.703	8x14	3.5	0.6
2.7	1.2	DGH125M2R7	0.8	0.47	6.3x15	2.5	0.5
2.7	1.5	DGH155M2R7	0.95	0.56	6.3x18	2.6	0.5
2.7	2.0	DGH205Q2R7	1	0.703	8x14	3.5	0.6
2.7	3.0	DGH305Q2R7	1.4	1.01	8x20	3.5	0.6
2.7	3.3	DGH335Q2R7	1.5	1.01	8x20	3.5	0.6
2.7	5.0	DGH505Q2R7	2.1	1.57	10x20	5	0.6
2.7	6.0	DGH605Q2R7	2.1	1.57	10x20	5	0.6
2.7	7.0	DGH705Q2R7	2.3	1.96	10x25	5	0.6
2.7	10.0	DGH106Q2R7	3.2	1.96	10x30	5	0.6
2.7	10.0	DGH106Q2R7B	3.6	2.36	12.5x25	5	0.6
2.7	10.0	DGH106Q2R7C	2.7	1.96	10x25	5	0.6
2.7	15.0	DGH156Q2R7	4.5	3.68	12.5x30	5	0.6
2.7	20.0	DGH206Q2R7	7	5.03	16x25	7.5	0.8
2.7	25.0	DGH256Q2R7	7	5.03	16x25	7.5	0.8
2.7	30.0	DGH306Q2R7	9.7	6.03	16x30	7.5	0.8
2.7	50.0	DGH506Q2R7	12.8	10.17	18x40	7.5	0.8
2.7	70.0	DGH706Q2R7	15	12.72	18x50	7.5	0.8
2.7	100.0	DGH107Q2R7	20	17.1	22x45	10	1.2
2.7	200.0	DGH207Q2R7	36	35.33	30x50	10	1.2
2.7	350.0	DGH357Q2R7	64	57.73	35x60	10	1.2
2.7	350.0	DGH357Q2R7L	64	57.73	35x60	18.4	1.2
2.7	400.0	DGH407Q2R7	70	57.73	35x60	22.5	1.2
2.7	470.0	DGH477Q2R7	75	57.73	35x60	22.5	1.2
2.7	600.0	DGH607Q2R7	82	67.35	35x70	22.5	1.2
5.5	0.5	DGH504Q5R5	2.2	2.46	17x17x8.5	12	0.6
5.5	1.0	DGH105Q5R5	2.5	2.46	17x17x8.5	12	0.6
5.5	1.5	DGH155Q5R5	3	3.32	17x23x8.5	12	0.6
5.5	2.5	DGH255Q5R5	5.2	5.31	21x23x11	15.5	0.6
5.5	3.5	DGH355Q5R5	6	6.24	21x27x11	15.5	0.6
5.5	5.0	DGH505Q5R5	8.3	9.13	26x27x13	18	0.6



FEATURES

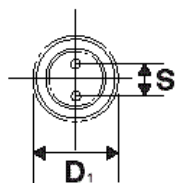
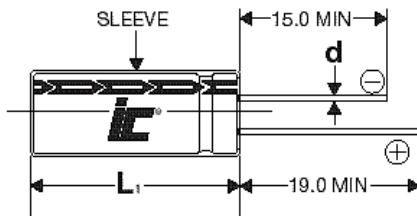
Very fast charge/discharge – High power density – IEC 62391 compliant – Circuit board mountable

APPLICATIONS

Battery backup/ alternative – Pulse power – Energy harvesting – LED Displays – Mechanical actuators – Audio systems

Operating Temperature Range		-40°C to +60°C		
Storage Temperature		-40°C to +70°C		
Capacitance Tolerance @ 20°C		+30%/-10% (Q tolerance), +20%/-20% (M tolerance) +10%/-10% (K tolerance), +50%/-20% (S tolerance)		
Surge Voltage	WVDC	2.7	5.5	
	SVDC	2.8	5.7	
Maximum Current	See standard part listing		1 second discharge to ½ WVDC	
Operating Current	See standard part listing		5 second discharge to ½ WVDC	
Leakage Current	See standard part listing		72 hours, 25°C	
Life Time	1000 hours with rated voltage applied at 60°C			
	Capacitance change	±30% of initially measured values		
	ESR	≤200% of initially specified values		
	Leakage current	≤ specified maximum value		
Shelf Life	1000 hours with no voltage applied at 60°C			
	Capacitance change	±30% of initially measured values		
	ESR	≤200% of initially specified values		
Life Cycles (25°C) 1 cycle= Charge to WVDC for 20s, constant voltage charging for 10s, discharge to ½ WVDC for 20s, rest for 10 s	500,000 cycles			
	Capacitance change	±30% of initially measured values		
	ESR change	≤200% of initially specified values		

$D \leq 18\text{mm}$



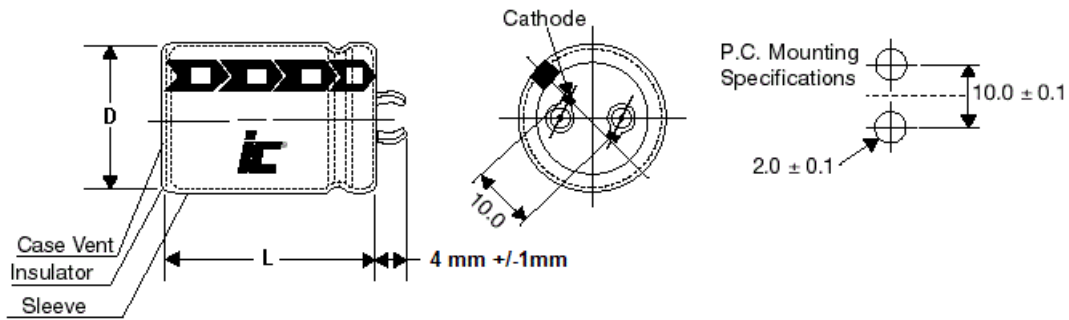
Lead spacing VS. Case diameter						
D	4	8(L<20)	8(L≥20)	10	16	18
S	1.5	3.5	3.5	5.0	7.5	7.5
d	0.45	0.5	0.6	0.6	0.8	0.8

$L_1 = L + 1.5\text{mm}$
 $D_1 = D + 0.5\text{mm}$
 $S_1 = S \pm 0.5\text{mm}$

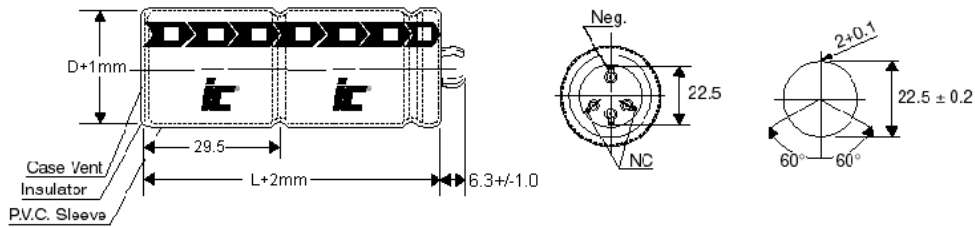


Snap in types

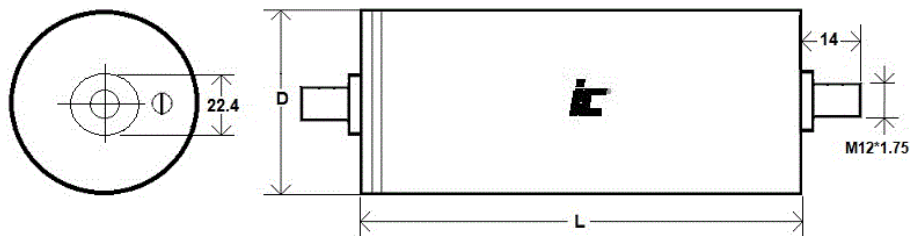
$D \geq 20\text{mm}$



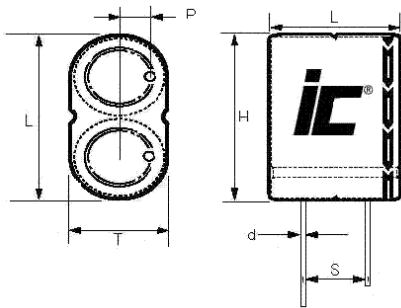
Capacitance = 400F



Capacitance = 500F to 650F



5.5 Volt units



Capacitance (F)	Dims (LxHxT) (mm) +1.0mm	Lead spacing S (mm) +/-0.5mm	Lead diameter d (mm)	P (mm)
1	17x19.5x9	12.3	0.6	1.75
1.5	17.5x23.5x9	10.5	0.6	1.75
2	21.5x23.5x11	10.5	0.6	2.5
2.5	21.5x23.5x11	10.5	0.6	2.5

DCN

High pulse power, extends battery life

Capacitance (F)	WVDC	IC PART NUMBER	MAX Current (A)	Maximum Continuous Current (A) ($\Delta T=15^{\circ}C$)	Short Circuit Current (A)	ESR AC 1 kHz (m Ω)	DC ESR (m Ω) 20°C	Max stored energy (mWh)	LC (mA), (72 hrs)	Energy Density (Wh/kg)	Energy Volumetric Density (Wh/l)	Power Density (kW/kg)	Power Volumetric Density (kW/l)
0.3	2.7	304DCN2R7SCBB	0.5	0.2	1.8	1000	1500	0.30375	0.006	1.2	0.879	2.333	13.18
1.0	2.7	105DCN2R7S	0.73	0.4	3.17	400	850	1.0125	0.008	1.0771	1.6786	1.0949	1.7062
1.0	5.5	105DCN5R5M	1.42	0.36	6.11	600	850	4.2139	0.1	1.1571	1.3187	1.1109	1.2659
1.5	5.5	155DCN5R5M	4.125	0.65	11	320	500	6.3021	0.12	1.40046	1.70269	4.0333	4.9
2.0	2.7	205DCN2R7S	1.39	0.5	5.74	280	470	2.025	0.01	1.7609	2.5179	1.6185	2.3143
2.0	5.5	205DCN5R5M	2.81	0.85	11.74	300	470	8.4028	0.14	2.02	10.0899	11.2	5.96
2.5	5.5	255DCN5R5Q	5.09	1.1	13.75	220	400	10.5035	0.15	2.025	1.8218	5.3834	4.8431
3.0	2.7	305DCN2R7Q	2.31	0.8	10.8	160	250	3.0375	0.012	2.2668	3.0215	2.6113	3.4807
3.3	2.7	335DCN2R7MGJG	2.36	0.8	10	160	270	3.34125	0.014	1.6	2.127	1.58	2.063
4.7	2.7	475DCN2R7SGJG	2.92	0.9	10.8	140	250	4.7588	0.016	2.2134	3.0295	1.6275	2.2277
5.0	2.7	505DCN2R7Q	6.75	0.99	13.5	110	200	5.0625	0.015	2.025	3.2229	1.7496	2.7846
10.0	2.7	106DCN2R7M	5.87	1.4	20.7	80	130	10.125	0.03	3.3638	4.2972	2.2356	2.856
10.0	2.7	106DCN2R7STJD	5.63	1.4	19.3	80	140	10.125	0.03	2.5859	3.3002	1.5981	2.0367
22.0	2.7	226DCN2R7SKJD	10.3	2.1	31.7	40	85	22.275	0.06	2.9542	4.4315	1.365	2.0475
25.0	2.7	256DCN2R7Q	16.46	2.7	45	30	60	25.3125	0.049	7.54	5.0358	3.1654	4.1437
30.0	2.7	306DCN2R7M	14.5	2.7	45	30	60	30.375	0.07	3.7593	5.0358	1.8045	2.4172
50.0	2.7	506DCN2R7Q	22.5	4	675	25	40	50.625	0.16	3.061	4.9736	1.058	2.1486
100.0	2.7	107DCN2R7Q	35.5	5.8	96.4	18	28	101.25	0.3	4.6107	5.919	1.4227	1.8264
100.0	2.7	107DCN2R7SLB	35.5	5.8	96.4	20	28	101.25	0.3	5.0373	6.6315	1.5544	2.0463
150.0	2.7	157DCN2R7M	42.6	7	108	16	25	151.875	0.55	4.8522	5.6254	1.118	1.2961
200.0	2.7	207DCN2R7M	54	8.3	135	15	20	202.5	0.7	4.927	5.7296	1.0642	1.2376
250.0	2.7	257DCN2R7SDP	61.4	9.1	150	13	18	253.125	0.8	5.3289	6.5109	1.0297	1.2628
350.0	2.7	357DCN2R7M	90.9	12.7	225	10	12	354.375	1	5.0053	6.1388	1.0297	1.2628
400.0	2.7	407DCN2R7Q	93.1	12.7	225	10	12	405	1.2	5.7857	7.016	1.0414	1.263
650.0	2.7	657DCN2R7SZZ	577	62	3370	0.65	0.8	658.125	2.3	3.3	3.879	5.468	6.446

DCN

High pulse power, extends battery life

Capacitance (F)	WVDC	IC PART NUMBER	Weight (grams)	Volume (mL)	Dims DxL LxHxT (mm)	Lead Spacing S (mm)	Lead Diameter d (mm)
0.3	2.7	304DCN2R7SCBB	2.012	0.0138	4x11	1.5	0.45
1.0	2.7	105DCN2R7S	0.94	0.603	8x12	3.5	0.5
1.0	5.5	105DCN5R5M	3.5	3.071	17.5x19.5x9	11.8	0.6
1.5	5.5	155DCN5R5M	4.5	3.701	17.5x23.5x9	8.3	0.6
2.0	2.7	205DCN2R7S	1.15	0.804	8x16	3.5	0.5
2.0	5.5	205DCN5R5M	5	5.558	21x24x11	15.5	0.6
2.5	5.5	255DCN5R5Q	5	5.558	22x24x11	10.5	0.6
3.0	2.7	305DCN2R7Q	1.34	1.005	8x20	3.5	0.6
3.3	2.7	335DCN2R7MGJG	2.09	1.005	10x20	5	0.6
4.7	2.7	475DCN2R7SGJG	2.15	1.571	10x20	5	0.6
5.0	2.7	505DCN2R7Q	2.5	1.571	10x20	5	0.6
10.0	2.7	106DCN2R7M	3.01	2.356	10x30	5	0.6
10.0	2.7	106DCN2R7STJD	3.91	3.068	12.5x25	5	0.6
22.0	2.7	226DCN2R7SKJD	7.54	5.027	16x25	7.5	0.8
25.0	2.7	256DCN2R7Q	7.54	5.027	16x25	7.5	0.8
30.0	2.7	306DCN2R7M	8.08	6.032	16x30	7.5	0.8
50.0	2.7	506DCN2R7Q	13.01	10.179	18x40	7.5	0.8
100.0	2.7	107DCN2R7Q	21.96	17.106	22x45	10	1.5
100.0	2.7	107DCN2R7SLB	20.1	15.268	18x60	7.5	0.8
150.0	2.7	157DCN2R7M	31.3	26.998	25x55	10	1.5
200.0	2.7	207DCN2R7M	41.1	35.343	30x50	10	1.5
250.0	2.7	257DCN2R7SDP	47.5	38.877	30x55	10	1.5
350.0	2.7	357DCN2R7M	70.8	57.727	35x60	10	1.5
400.0	2.7	407DCN2R7Q	70	57.7	35x60	22.5	1.5
650.0	2.7	657DCN2R7SZZ	199	170	60x60	10	1.5



FEATURES

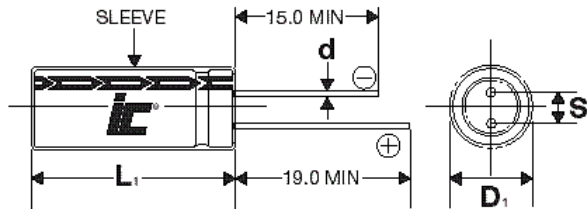
Very fast charge/discharge – High power density – IEC 62391 compliant – Circuit board mountable

APPLICATIONS

Battery backup/ alternative – Pulse power – Energy harvesting – LED Displays – Mechanical actuators – Audio systems

Operating Temperature Range		-25°C to +70°C	
Capacitance Tolerance		-20%/+50% @ 20°C	
Surge Voltage	WVDC	2.3	
	SVDC	2.5	
Maximum Current		See standard part listing	1 second discharge to ½ WVDC
Leakage Current		See standard part listing	72 hours, 25°C
Endurance		1000 hours at rated voltage and 70°C	
		Capacitance Change	±30% of initially measured values
		ESR	≤200% of initially specified values
Life Cycles (25°C) 1 cycle= Charge to WVDC for 20s, constant voltage charging for 10s, discharge to ½ WVDC for 20s, rest for 10 s		25,000 cycles	
		Capacitance Change	±30% of initially measured values
		ESR	≤200% of initially specified values

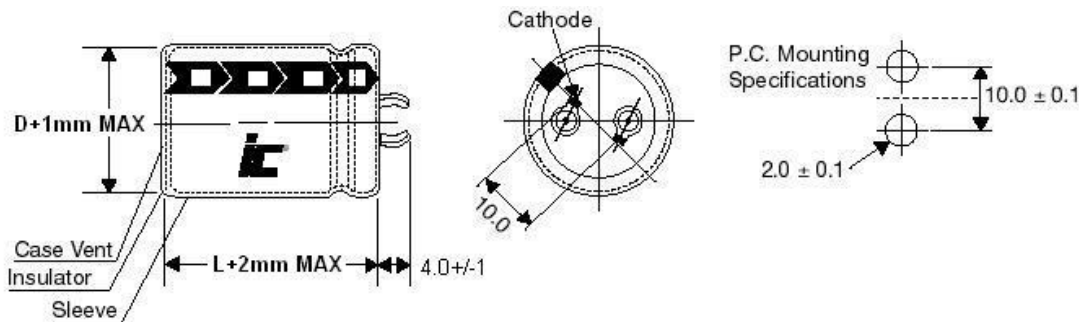
Diameters: ≤22 mm



D	10	16	18	22
S	5.0	7.5	7.5	10
d	0.6	0.8	0.8	1.0

L₁=L+1.5mm
D₁=D+0.5mm
S₁=S±0.5mm

Diameters: >22mm



DCR

Radial lead, high energy

Capacitance (F)	WVDC	IC PART NUMBER	MAX Current (A)	ESR AC 1 kHz (mΩ)	DC ESR (mΩ) 20°C	Max stored energy (mWh)	LC (mA), (72 hrs)	Specific Energy Gravimetric Density (wh/kg)	Specific Energy Volumetric Density (wh/l)	Specific Power Gravimetric Density (kw/kg)	Specific Power Volumetric Density (kw/l)	Weight (grams)	Volume (mL)	Dims DxL (mm)	Lead Spacing (mm)
10.0	2.3	106DCR2R3SGU	2.3	220	400	7.3472	0.05	3.6736	4.6774	0.794	1.0103	2	1.5708	10x20	5
22.0	2.3	226DCR2R3STU	5.34	120	170	16.1639	0.065	4.6852	6.5858	1.082	1.5214	3.45	2.4544	12.5x20	5
30.0	2.3	306DCR2R3STV	5.95	100	160	22.0417	0.085	5.8004	7.1845	1.044	1.2932	3.8	3.068	12.5x25	5
50.0	2.3	506DCR2R3SKV	9.58	60	100	36.7361	0.11	5.248	7.3084	0.9069	1.2629	7	5.0265	16x25	7.5
70.0	2.3	706DCR2R3SKY	11.58	50	85	51.4306	0.15	6.1593	7.3084	0.894	1.0613	8.35	7.0372	16x35	7.5
120.0	2.3	127DCR2R3SLZ	15.68	35	65	88.1667	0.4	6.6291	8.6618	0.734	0.9595	13.3	10.179	18x40	7.5
220.0	2.3	227DCR2R3SNI	23.21	25	45	161.1639	0.9	6.4656	9.0472	0.5643	0.7896	25	17.866	22x47	10
400.0	2.3	407DCR2R3SDG	41.82	20	25	293.8889	2	4.432	9.2393	0.3829	0.7983	66.31	31.809	30x45	10
600.0	2.3	607DCR2R3SDZ	53.08	15	20	440.8333	4	6.5649	10.394	0.473	0.7484	67.15	42.412	30x60	10
800.0	2.3	807DCR2R3SEK	70.77	10	15	587.7778	7.2	7.9926	8.7275	0.5755	0.6284	73.54	67.348	35x70	10



FEATURES

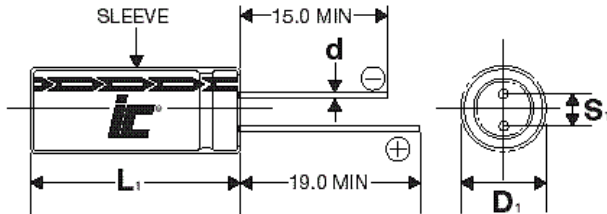
High Capacitance – Very fast charge/discharge – High power density

APPLICATIONS

Battery backup/ alternative – LED Displays – DC/DC converters – Pulse power

Operating Temperature Range		-25°C to +70°C	
Storage Temperature		-40°C to +70°C	
Capacitance Tolerance		+50%/ -20% @ 25°C	
Surge voltage	WVDC	2.5	
	SVDC	2.7	
Maximum Current		See standard part listing	0.5*WVDC/(ESR_{DC}+(1/C))
Leakage Current		See standard part listing	72 hours, 25°C
Life time		1000 hours at rated voltage and 70°C	
		Capacitance change	±30% of initially measured values
		ESR	≤200% of initially specified values
Life cycles (25°C) 1 cycle= Charge to WVDC for 20s, constant voltage charging for 10s, discharge to ½ WVDC for 20s, rest for 10 s		500,000 cycles	
		Capacitance change	±30% of initially measured values
		ESR	≤200% of initially specified values

D= 8 to 18mm



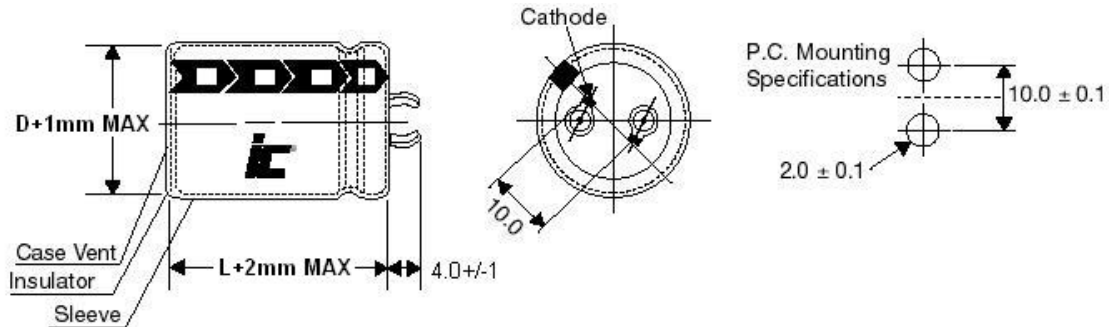
Lead spacing VS. Case diameter					
D	8(L>20)	8(L>20)	10	16	18
S	3.5	3.5	5.0	7.5	7.5
d	0.5	0.6	0.6	0.8	0.8

L₁=L+1.5mm
D₁=D+0.5mm
S₁=S±0.5mm

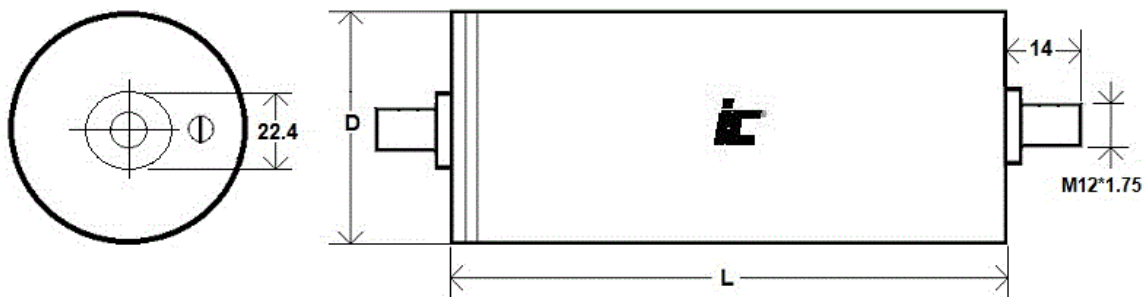


Snap in types

$$20\text{mm} \leq D < 60\text{mm}$$



Capacitance = 500F to 650F



DER

Radial lead, +70°C

Capacitance (F)	WVDC	IC PART NUMBER	MAX Current (A)	ESR AC 1 kHz (mΩ)	DC ESR (mΩ) 20°C	Max stored energy (mWh)	LC (mA), (72 hrs)	Specific Energy Gravimetric Density (wh/kg)	Specific Energy Volumetric Density (wh/l)	Specific Power Gravimetric Density (kw/kg)	Specific Power Volumetric Density (kw/l)	Weight (grams)	Volume (mL)	Dims DxL (mm)	Lead Spacing (mm)
1.0	2.5	105DER2R5SFN	0.63	500	1000	0.868	0.008	1.0117	1.4391	0.8741	1.2434	0.858	0.603	8x12	3.5
2.0	2.5	205DER2R5SFQ	1.19	350	550	1.736	0.01	1.6001	2.1587	1.2568	1.6955	1.085	0.804	8x16	3.5
3.0	2.5	305DER2R5SFU	1.91	200	320	2.604	0.012	2.075	2.5904	1.8675	2.3314	1.255	1.005	8x20	3.5
3.3	2.5	335DER2R5SGU	2.01	200	320	2.865	0.014	1.3641	1.8237	1.1161	1.4921	2.1	1.571	10x20	5
4.7	2.5	475DER2R5SGU	2.49	180	290	4.08	0.016	1.7997	2.5973	1.1408	1.6464	2.267	1.571	10x20	5
7.0	2.5	705DER2R5SGV	3.44	140	220	6.076	0.02	2.3736	3.0947	1.3317	1.7362	2.56	1.963	10x25	5
10.0	2.5	106DER2R5SGW	5	100	150	8.681	0.03	2.7957	3.6841	1.6103	2.1221	3.105	2.356	10x30	5
10.0	2.5	106DER2R5STV	4.81	100	160	8.681	0.03	2.4887	2.8294	1.3439	1.5279	3.488	3.068	12.5x25	5
22.0	2.5	226DER2R5SKV	8.59	60	100	19.097	0.06	2.6639	3.7993	1.0462	1.4921	7.169	5.027	16x25	7.5
30.0	2.5	306DER2R5SKW	12.1	40	70	26.042	0.07	3.1486	4.3174	1.2954	1.7763	8.271	6.032	16x30	7.5
50.0	2.5	506DER2R5SLZ	17.9	30	50	43.403	0.16	3.061	4.2641	1.058	1.4737	13.01	10.179	18x40	7.5
100.0	2.5	107DER2R5SBG	27.8	25	35	86.806	0.3	4.4379	5.0746	1.0955	1.2527	19.56	17.106	22x45	10
100.0	2.5	107DER2R5SLB	27.8	25	35	86.806	0.3	4.1613	5.6854	1.0273	1.4035	20.86	15.268	18x60	7.5
150.0	2.5	157DER2R5SCP	34.1	22	30	130.207	0.55	3.8523	4.8229	0.7396	0.926	33.8	26.998	25x55	10
200.0	2.5	207DER2R5SDH	41.7	20	25	173.611	0.7	4.4075	4.9122	0.7616	0.8488	39.39	35.343	30x50	10
250.0	2.5	257DER2R5SDP	48.1	18	22	217.014	0.8	4.4977	5.582	0.7065	0.8769	48.25	38.877	30x55	10
350.0	2.5	357DER2R5SEZ	70	12	15	303.819	1	4.5818	5.2631	0.754	0.8661	66.31	57.727	35x60	0
500.0	2.5	507DER2R5SEW	89	10	12	434.028	1.3	3.7	4.7486	0.5328	0.6838	117.3	91.4	35x95	0
650.0	2.5	657DER2R5SZZ	502	0.8	0.95	564.236	2.3	2.5	3.326	3.498	4.6537	225.7	169.65	60x60	0



FEATURES

High Voltage – Very Fast Charge/Discharge – High Power Density – Lower ESR
RoHS Compliant

APPLICATIONS

Battery Backup/Alternative – Pulse Power – Energy Harvesting – LED Displays – Mechanical Actuators – Audio Systems

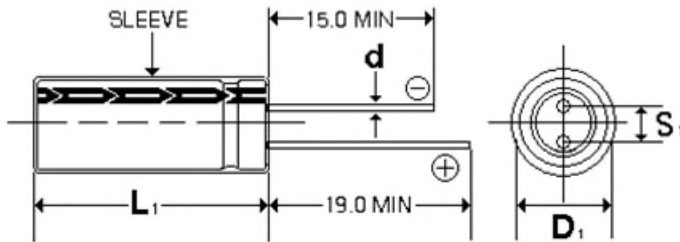
Operating Temperature Range	-40°C to +85°C	
Storage Temperature	-40°C to +70°C	
Capacitance Tolerance @ 20°C	-10% +30% (Q Tolerance) -20% +20% (M Tolerance)	
Voltage (Vdc) (+65°C/+85°C)	3.0V / 2.5V 6.0V / 5.0V 9.0V / 7.5V	
Life Time	1000 hours with rated voltage applied at rated temperature	
	Capacitance change	±30% of initially measured values
	ESR	<400% of initially specified values <200% of initially specified values (100F to 600F)
	Leakage current	≤100% specified maximum value
Shelf Life	1000 hours with no voltage applied at 65°C	
	Capacitance change	±30% of initially measured values
	ESR	<200% of initially specified values
Life Cycles (25°C) 1 cycle= Charge to WVDC for 20s, constant voltage charging for 10s, discharge to ½ WVDC for 20s, rest for 10s	500,000 cycles	
	Capacitance change	±30% of initially measured values
	ESR change	<200% of initially specified values

[RoHS Compliant](#)

810a Recognized



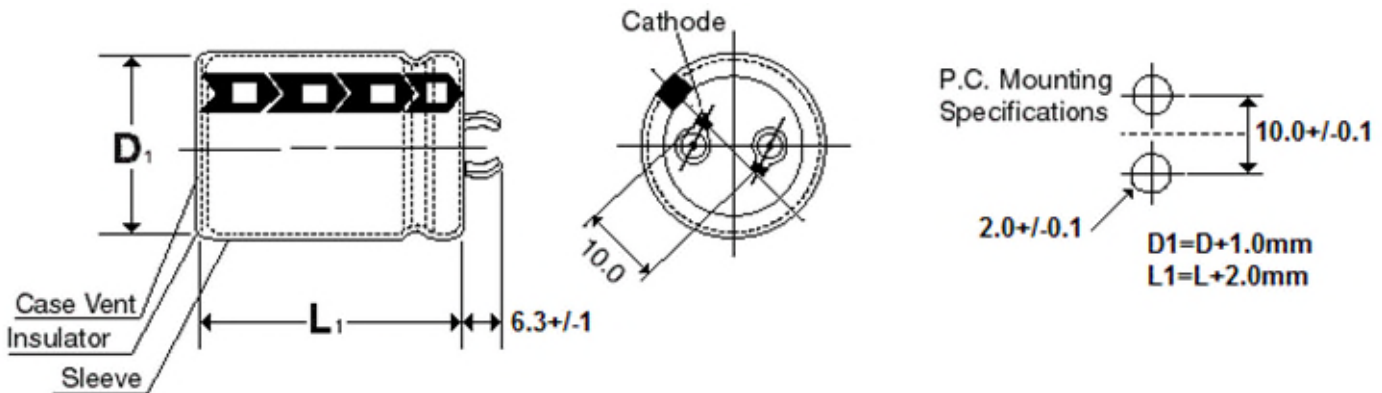
Diameter 6.3 mm to 18 mm



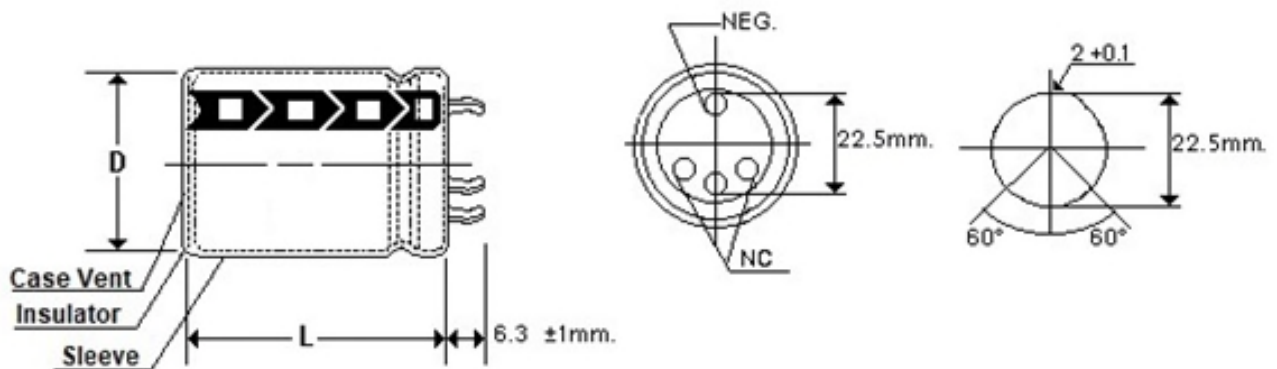
Lead spacing VS. Case diameter						
D	6.3	8	10	12.5	16	18
S	2.5	3.5	5.0	5.0	7.5	7.5
d	0.6	0.6	0.6	0.6	0.8	0.8
α	1.5	1.5	2.0	2.0	2.0	2.0

$L_1 = L + \alpha$ mm
 $D_1 = D + 0.5$ mm
 $S_1 = S \pm 0.5$ mm
 $d = d \pm 0.05$ mm

Diameter > 18 mm to < 35 mm

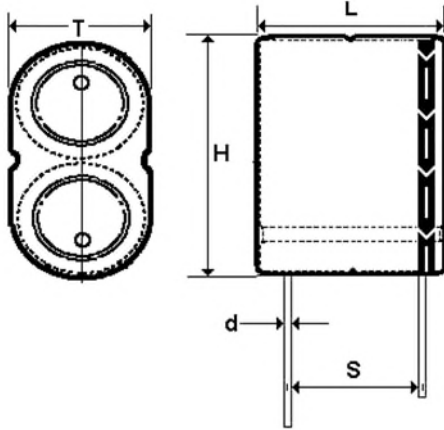


Diameter 35 mm



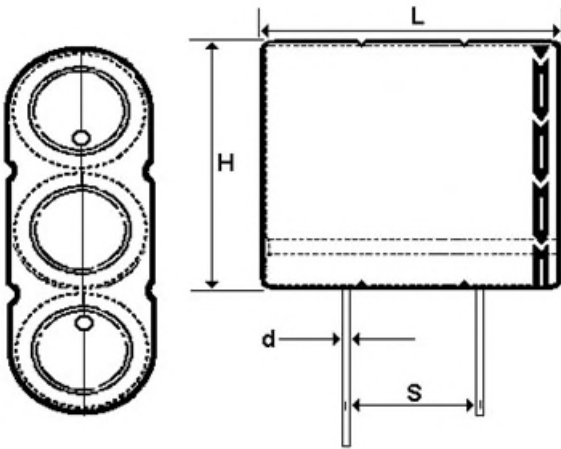


Capacitance 1.5F to 5F 6 Volts



Capacitance (F)	Dims (LxHxT) (mm) +1.0 mm	Lead spacing (S) (mm) ±0.5 mm	Lead diameter (d) (mm) ±0.05mm
1.5	17x22x8.5	12	0.6
2.5	21x22x11	15.5	0.6
3.5	21x27x11	15.5	0.6
5	21x32x11	15.5	0.6

Capacitance 0.33F to 5F 9 Volts



Capacitance (F)	Dims (LxHxT) (mm) ±1.0 mm	Lead spacing (S) (mm) ±1.0 mm	Lead diameter (d) (mm) ±0.05mm
0.33	25x16x8.5	13.5	0.6
0.5	21x20x6.5	11	0.6
0.67	25x16x8.5	13.5	0.6
1	25x22x8.5	13.5	0.6
1.66	31x23x11	16	0.6
3.3	31x27x11	16	0.6
5	39x33x13	21	0.6

DSF

High pulse power, extends battery life

WVDC	Capacitance (F)	IC PART NUMBER	MAX Current (A) (1 Sec.)	Maximum Continuous Current (A) ($\Delta T=15^{\circ}C$)	Short Circuit Current (A)	ESR AC 1 kHz (m Ω)	DC ESR (m Ω) 20 $^{\circ}C$	Max stored energy (mWh)	LC (mA), (72 hrs)	Energy Density (Wh/kg)	Energy Volumetric Density (Wh/l)	Power Density (kW/kg)	Power Volumetric Density (kW/l)
3	1.2	DSF125M3R0	0.98	0.11	4.29	350	700	1.5	0.01	1.88	3.21	1.93	3.3
3	1.5	DSF155M3R0	1.15	0.14	4.6	320	640	1.88	0.008	1.97	3.34	1.78	3.01
3	2.0	DSF205Q3R0	1.9	1.80	9.38	160	320	2.5	0.012	2.5	3.55	3.38	4.8
3	3.0	DSF305Q3R0	3.1	1.4	20	80	150	3.8	0.014	2.67	3.71	5.14	6.6
3	4.0	DSF405M3R0	3.66	0.38	18.75	80	160	5	0.012	3.57	4.97	4.82	6.71
3	5.0	DSF505Q3R0	4.5	2.2	23	70	130	6.3	0.02	2.97	3.98	3.95	5.3
3	7.0	DSF705Q3R0	6.7	2.4	38	55	80	8.8	0.03	3.8	4.46	5.86	6.9
3	10.0	DSF106Q3R0C	5.3	0.89	16.6	90	180	12.5	0.045	4.46	3.36	2.14	3.1
3	10.0	DSF106Q3R0	9.4	3.4	50	40	60	12.5	0.045	3.9	5.3	5.63	7.6
3	11.0	DSF116Q3R0	7.86	1.02	30	50	100	13.75	0.045	4.3	5.83	3.38	4.58
3	15.0	DSF156Q3R0B	10.98	1.40	42	35	70	18.75	0.055	4.57	1.12	3.76	0.9
3	15.0	DSF156Q3R0	10.98	1.40	42.86	35	70	18.75	0.055	3.99	5.09	3.283	4.191
3	25.0	DSF256Q3R0	20	4.4	86	25	35	31.3	0.1	4.46	6.21	4.4	6.1
3	35.0	DSF356Q3R0	19.09	3.13	60	25	50	43.75	0.1	4.97	6.91	2.45	3.41
3	50.0	DSF506Q3R0	35.7	7.10	136	15	22	62.5	0.15	4.88	6.14	3.83	4.8
3	70.0	DSF706Q3R0	27.3	5.9	75	20	40	87.5	0.45	5.18	8.7	1.6	2.7
3	100.0	DSF107Q3R0	68.2	8.3	250	8	12	125	0.3	5.95	7.31	4.3	5.3
3	110.0	DSF117Q3R0	59.8	6.3	188	18	36	137.5	0.21	6.25	9	3.07	4.4
3	200.0	DSF207Q3R0	100	10	300	6	10	250	0.7	6.94	7.07	3	3.1
3	350.0	DSF357Q3R0	236	18.9	857	3	3.5	437.5	1	6.73	7.58	4.75	5.4
3	400.0	DSF407Q3R0	250	18.9	857	3	3.5	500	1	7.35	8.66	4.96	5.9
3	470.0	DSF477Q3R0	267	18.9	857	3	3.5	587.5	1.3	8.05	10.18	4.23	5.4
3	600.0	DSF607Q3R0	290	20	587	3	3.5	750	1.5	9.15	11.1	4.12	5.4
6	1.5	DSF155Q6R0HAE	3.1	1.4	20	180	320	7.5	0.013	2.5	2.52	16.6	16.8
6	2.5	DSF255Q6R0JBE	4.05	2.2	23	160	280	12.5	0.018	3.1	2.51	14.1	11.3
6	3.5	DSF355Q6R0JBF	6.7	2.40	38	130	180	17.5	0.025	3.5	3	13.8	11.9
6	5.0	DSF505Q6R0JBG	9.4	3.4	50	100	140	25	0.04	3.57	3.62	12.9	13
9	0.33	DSF334Q9R0HDL	0.83	0.09	3.75	1200	2400	4	0.2	1.56	2.66	1.56	2.7
9	0.5	DSF504M9R0ZBN	1.14	0.14	4.68	980	1940	5.6	0.2	1.97	3.35	1.97	3.4
9	0.67	DSF674Q9R0HDL	1.82	0.19	9.18	500	980	7.5	0.25	2.5	3.56	2.48	3.6
9	1.0	DSF105Q9R0HDR	3.04	0.29	18.75	320	620	11.2	0.3	2.68	3.71	2.68	3.71
9	1.66	DSF165Q9R0JSE	4.1	0.47	18	260	500	18.7	0.4	2.98	3.98	2.97	4
9	3.3	DSF335Q9R0JSF	5.34	0.88	16.6	290	560	37	0.9	4.46	6.4	4.46	6.4
9	5.0	DSF505Q9R0KZT	10.98	1.4	42.9	125	230	56.2	1.1	3.99	5.1	3.98	5.1

DSF

High pulse power, extends battery life

WVDC	Capacitance (F)	IC PART NUMBER	Weight (grams)	Volume (mL)	Dims DxL LxHxT (mm)	Lead Spacing S (mm)	Lead Diameter d (mm)
3	1.2	DSF125M3R0	0.8	0.47	6.3x15	2.5	0.5
3	1.5	DSF155M3R0	0.95	0.56	6.3x18	2.5	0.5
3	2.0	DSF205Q3R0	1	0.7	8x14	3.5	0.6
3	3.0	DSF305Q3R0	1.4	1.01	8x20	3.5	0.6
3	4.0	DSF405M3R0	1.4	1.01	8x20	3.5	0.6
3	5.0	DSF505Q3R0	2.2	1.57	10x20	5	0.6
3	7.0	DSF705Q3R0	2.3	1.96	10x25	5	0.6
3	10.0	DSF106Q3R0C	2.8	1.96	10x25	5	0.6
3	10.0	DSF106Q3R0	3.2	2.36	10x30	5	0.6
3	11.0	DSF116Q3R0	3.2	2.36	10x30	5	0.6
3	15.0	DSF156Q3R0B	4.1	3.07	12.5x25	5	0.6
3	15.0	DSF156Q3R0	4.7	3.68	12.5x30	5	0.6
3	25.0	DSF256Q3R0	7.4	5.03	16x25	7.5	0.8
3	35.0	DSF356Q3R0	8.8	6.33	16x31.5	7.5	0.8
3	50.0	DSF506Q3R0	13.8	10.18	18x40	7.5	0.8
3	70.0	DSF706Q3R0	16.9	10.05	16x50	7.5	0.8
3	100.0	DSF107Q3R0	20	17.11	22x45	10	1.2
3	110.0	DSF117Q3R0	22	15.27	18x60	7.5	0.8
3	200.0	DSF207Q3R0	36	35.3	30x50	10	1.2
3	350.0	DSF357Q3R0	73	57.73	35x60	22.5	1.2
3	400.0	DSF407Q3R0	73	57.73	35x60	22.5	1.2
3	470.0	DSF477Q3R0	73	57.73	35x60	22.5	1.2
3	600.0	DSF607Q3R0	90	67.35	35x70	22.5	1.2
6	1.5	DSF155Q6R0HAE	3	2.97	17x23x8.5	12	0.6
6	2.5	DSF255Q6R0JBE	5.2	4.97	21x22x11	15.5	0.6
6	3.5	DSF355Q6R0JBF	6	5.83	21x27x11	15.5	0.6
6	5.0	DSF505Q6R0JBG	8.3	6.91	21x32x11	15.5	0.6
9	0.33	DSF334Q9R0HDL	4	3.4	25x16x8.5	13.5	0.6
9	0.5	DSF504M9R0ZBN	5	2.73	21x20x6.5	11	0.6
9	0.67	DSF674Q9R0HDL	4	3.4	25x16x8.5	13.5	0.6
9	1.0	DSF105Q9R0HDR	5.5	4.67	25x22x8.5	13.5	0.6
9	1.66	DSF165Q9R0JSE	7.5	7.84	31x23x11	16	0.6
9	3.3	DSF335Q9R0JSF	11	9.21	31x27x11	16	0.6
9	5.0	DSF505Q9R0KZT	13	16.7	39x33x13	21	0.6



FEATURES

High Voltage – Very Fast Charge/Discharge – High Power Density –
RoHS Compliant

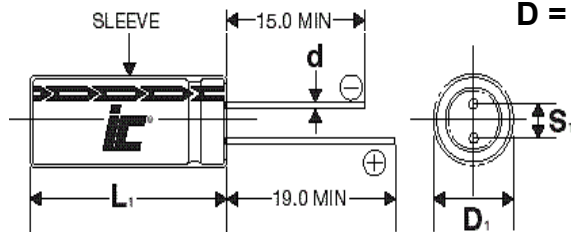
APPLICATIONS

Solar/Wind Energy Storage – Pulse Power – Energy Harvesting –
UPS Systems – Smart Electric Meters

Operating Temperature Range		-15°C to +85°C	
Storage Temperature		-40°C to +70°C	
Capacitance Tolerance @ 25°C		±20%	
Voltage (Vdc) (+70°C/+85°C)	WVDC	3.8	3.8V / 3.5V
	SVDC	4.2	
	Minimum	2.5	
Life Time	1000 hours with rated voltage applied at 70°C		
	Capacitance change	±30% of initially measured values	
	ESR	<200% of initially specified values	
	Leakage current	≤100% specified maximum value	
Shelf Life	1000 hours with no voltage applied at 70°C		
	Capacitance change	±30% of initially measured values	
	ESR	<200% of initially specified values	
Life Cycles (25°C) 1 cycle = Charge / Discharge from 3.8~2.5VDC	500,000 cycles		
	Capacitance change	±30% of initially measured values	
	ESR change	<200% of initially specified values	

[RoHS Compliant](#)

810a Recognized



D = 8 to 16mm

Lead spacing VS. Case diameter				
D	8	10	12.5	16
S	3.5	5.0	5.0	7.5
d	0.6	0.6	0.6	0.8
α	1.5	2.0	2.0	2.0

$L_1 = L + \alpha$ mm
 $D_1 = D + 0.5$ mm
 $S_1 = S \pm 0.5$ mm

Notes

1. Maintain balanced voltages when used in multiple series or parallel connections. (Consult CDE engineering for guidance)
2. When using metal tooling, trim and bend leads separately. Parts store a charge. Avoid shorting leads. (Consult CDE engineering for guidance)
3. Manual soldering temperature should not exceed 350°C and soldering time should not exceed 4 seconds. (Wave and reflow soldering not recommended)

[Full Material Handling Guidelines](#)

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VMF

High pulse power, extends battery life

WVDC	Capacitance (F)	IC PART NUMBER	Weight (grams)	Volume (mL)	Dims DxL LxHxT (mm)	Lead Spacing S (mm)	Lead Diameter d (mm)
3.8	10.0	VMF106M3R8	1.4	0.703	8x14	3.5	0.6
3.8	25.0	VMF256M3R8	1.8	1.01	8x20	3.5	0.6
3.8	30.0	VMF306M3R8	2.2	1.26	8x25	3.5	0.6
3.8	40.0	VMF406M3R8	2.5	1.26	10x16	5	0.6
3.8	50.0	VMF506M3R8	3.2	1.57	10x20	5	0.6
3.8	70.0	VMF706M3R8	3.8	1.96	10x25	5	0.6
3.8	120.0	VMF127M3R8	5.4	3.07	12.5x25	5	0.6
3.8	220.0	VMF227M3R8	9.4	5.03	16x25	7.5	0.8

WVDC	Capacitance (F)	IC PART NUMBER	MAX Current (A) (1 Sec.)	Maximum Continuous Current (A) ($\Delta T=15^{\circ}C$)	Short Circuit Current (A)	ESR AC 1 kHz (m Ω)	DC ESR (m Ω) 20 $^{\circ}C$	Max stored energy (mWh)	LC (μA), (72 hrs)
3.8	10.0	VMF106M3R8	0.5	0.05	2.53	500	1500	11	2
3.8	25.0	VMF256M3R8	0.8	0.125	5.85	300	650	28	2.5
3.8	30.0	VMF306M3R8	0.9	0.15	5.43	250	700	34	3
3.8	40.0	VMF406M3R8	1	0.15	6.91	250	550	46	3
3.8	50.0	VMF506M3R8	1.5	0.2	8.44	200	450	57	4
3.8	70.0	VMF706M3R8	3	0.35	15.2	100	250	80	5
3.8	120.0	VMF127M3R8	5	0.6	19	80	200	137	7
3.8	220.0	VMF227M3R8	8	1.1	38	60	100	250	12



FEATURES

High Voltage – Very Fast Charge/Discharge – High Power Density –
RoHS Compliant

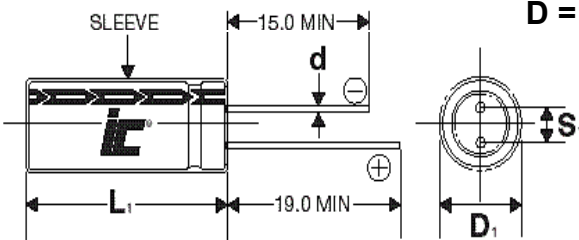
APPLICATIONS

Solar/Wind Energy Storage – Pulse Power – Energy Harvesting –
UPS Systems – Smart Electric Meters

Operating Temperature Range		-25°C to +70°C	
Storage Temperature		-30°C to +70°C	
Capacitance Tolerance @ 25°C		±20%	
Voltage (Vdc)	WVDC	3.8	3.8V
	SVDC	4.2	
	Minimum	2.5	
Life Time	1000 hours with rated voltage applied at 70°C		
	Capacitance change	±30% of initially measured values	
	ESR	<200% of initially specified values	
	Leakage current	≤100% specified maximum value	
Shelf Life	1000 hours with no voltage applied at 60°C		
	Capacitance change	±30% of initially measured values	
	ESR	<200% of initially specified values	
Life Cycles (25°C) 1 cycle = Charge / Discharge from 3.8~2.5VDC	250,000 cycles		
	Capacitance change	±30% of initially measured values	
	ESR change	<200% of initially specified values	

[RoHS Compliant](#)

810a Recognized



D = 10 to 16mm

Lead spacing VS. Case diameter			
D	10	12.5	16
S	5.0	5.0	7.5
d	0.6	0.6	0.8
α	2.0	2.0	2.0

$$L_1 = L + \alpha \text{ mm}$$

$$D_1 = D + 0.5 \text{ mm}$$

$$S_1 = S + 0.5 \text{ mm}$$

Notes:

- Maintain balanced voltages when used in multiple series or parallel connections. (Consult CDE engineering for guidance)
- When using metal tooling, trim and bend leads separately. Parts store a charge. Avoid shorting leads. (Consult CDE engineering for guidance)
- Manual soldering temperature should not exceed 350°C and soldering time should not exceed 4 seconds. (Wave and reflow soldering not recommended)

[Full Material Handling Guidelines](#)

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VPF

High pulse power, extends battery life

WVDC	Capacitance (F)	IC PART NUMBER	Weight (grams)	Volume (mL)	Dims DxL LxHxT (mm)	Lead Spacing S (mm)	Lead Diameter d (mm)
3.8	40.0	VPF406M3R8	2.5	1.26	10x16	5	0.6
3.8	50.0	VPF506M3R8	2.1	1.57	10x20	5	0.6
3.8	70.0	VPF706M3R8	2.3	1.96	10x25	5	0.6
3.8	120.0	VPF127M3R8	3.91	3.07	12.5x25	5	0.6
3.8	220.0	VPF227M3R8	7	5.03	16x25	7.5	0.8

WVDC	Capacitance (F)	IC PART NUMBER	MAX Current (A) (1 Sec.)	Maximum Continuous Current (A) ($\Delta T=15^{\circ}C$)	Short Circuit Current (A)	ESR AC 1 kHz (m Ω)	DC ESR (m Ω) 20°C	Max stored energy (mWh)	LC (μA), (72 hrs)
3.8	40.0	VPF406M3R8	1	0.15	6.9	250	550	46	4
3.8	50.0	VPF506M3R8	2.8	0.5	8.4	200	450	57	6
3.8	70.0	VPF706M3R8	4.9	0.7	15.2	100	250	80	8
3.8	120.0	VPF127M3R8	6.2	1.2	19	80	200	137	12
3.8	220.0	VPF227M3R8	12.4	2.2	38	60	100	250	25

Type EDC, 70 °C Long Life Electric Double Layer Supercapacitor



Type EDC, 70 °C electric double layer supercapacitors offer high capacitance values in a thru hole stacked coin type package. Primarily designed for integrated circuit voltage backup, the capacitors can also be used to deliver the initial power from batteries.

Highlights

- Long life
- High discharge current
- 70 °C Operating temperature

Specifications

Operating Temperature Range	-25 °C to +70 °C
Rated Voltage Range	5.5 Vdc to 6.3 Vdc
Capacitance Range	0.047 F to 1.5 F
Life, Moisture and Temperature Characteristics	After the following procedures have been performed, measure the capacitance and ESR at +20 °C.
Life Test:	Apply the max. operating voltage for 1000 h at +70 °C
Capacitance Change	±30% of the initial measured value
ESR	≤ 4 times the initial specified value
Shelf Life:	Subject the capacitor to 1000 hours without voltage at +70 °C.
Capacitance Change	±30% of the initial measured value
ESR	≤ 4 times the initial specified value
Moisture Resistance:	Subject the capacitor to 240 hours at +40 °C at 90 to 95% RH without voltage.
Capacitance Change	±30% of the initial measured value
ESR	≤ 3 times the initial specified value
Temperature Cycling	Stabilize the capacitor at each of the following temperatures for 1 hour in sequence, and then measure the capacitance and ESR at that temperature.
	<ol style="list-style-type: none"> 1. +20 °C 2. -25 °C 3. +20 °C 4. +70 °C 5. +20 °C
Capacitance Change (at -25 °C)	±30% of the initial measured value
ESR (at -25 °C)	≤ 5 times the initial measured value
Capacitance Change (at +85 °C)	±30% of the initial measured value
ESR (at +85 °C)	≤ 4 times the initial measured value
Capacitance Change (Step 5 at +20 °C)	±10% of the initial measured value
ESR (Step 5 at +20 °C)	meets the initial specified value
RoHS Compliant without Exemptions	

Type EDC, 70 °C Long Life Electric Double Layer Supercapacitor Ratings

5.5 VDC					
CDE Part Number	Cap F	ESR 1 kHz Ω	Case Code		
			V Type	H Type	C Type
EDC473Z5R5*	0.047	120	V1	H1	C1
EDC104Z5R5*	0.1	75	V1	H1	C1
EDC224Z5R5*	0.22	75	V1	H1	C1
EDC334Z5R5*	0.33	75	V1	H1	C1
EDC474Z5R5*	0.47	50	V1	H1	C1
EDC105Z5R5*	1	30	V2	H2	C2
EDC155Z5R5*	1.5	30	V2	H2	C2

*V, H, or C

6.3 VDC			
CDE Part Number	Cap F	ESR 1 kHz Ω	Case Code
EDC104Z6R3C	0.1	120	C3
EDC224Z6R3C	0.22	75	C3
EDC334Z6R3C	0.33	75	C3
EDC474Z6R3C	0.47	50	C4
EDC684Z6R3C	0.68	50	C4
EDC105Z6R3C	1	30	C4

Part Numbering System

EDC
Series

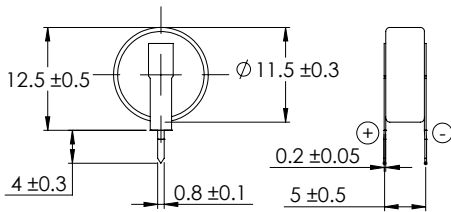
224
Capacitance
224 = 0.22 F
473 = 0.047 F
105 = 1.0 F

Z
Tolerance
-20/+80%

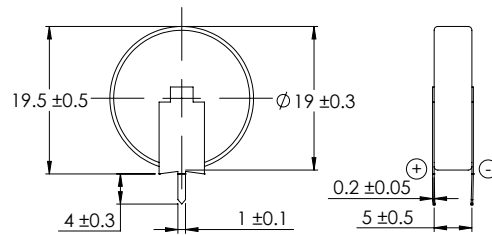
5R5
Voltage
5R5 = 5.5 Vdc

C
Case Style
C = Radial
H = Horizontal Style
V = Vertical Style

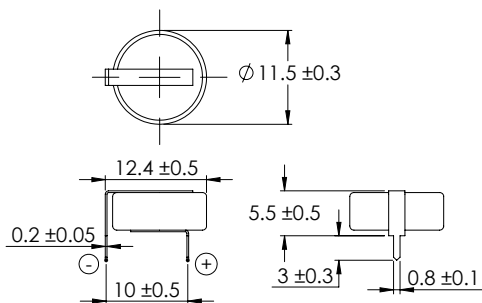
EDC Outline Drawing



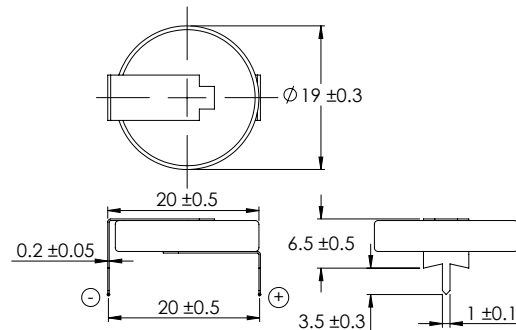
V1



V2



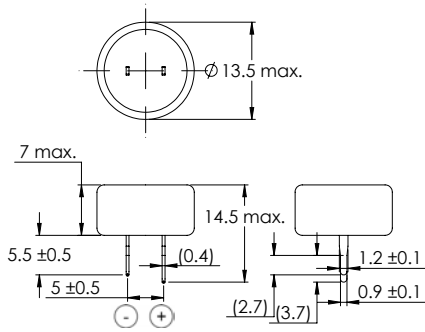
H1



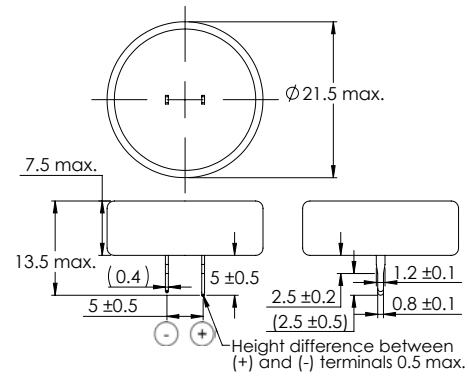
H2

Type EDC, 70 °C Long Life Electric Double Layer Supercapacitor

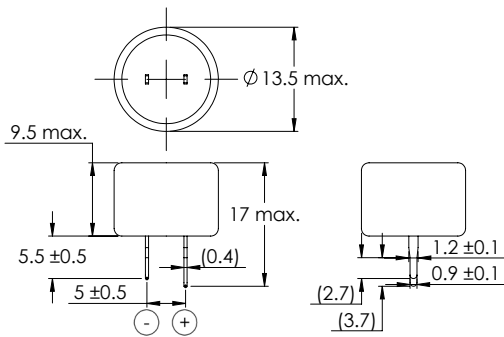
EDC Outline Drawing



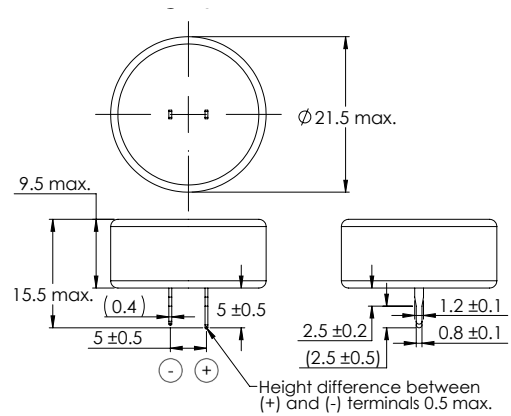
C1



C2



C3



C4

Recommended Soldering Procedures

Hand Soldering	Use a 30W iron with a max. temperature of 350 °C for 3 seconds.
Wave Soldering	Pre-heat circuit board to a surface temp of 110 °C for a max. of 60 seconds, with a max. component temperature of 100 °C. Min. printed circuit board thickness of 0.8 mm. Recommended solder bath temperature of 240 °C with a max. dipping time of 5 seconds.

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Type EDS, 85 °C Long Life Electric Double Layer Supercapacitor



Type EDS, 85 °C electric double layer supercapacitors offer high capacitance values in a thru hole stacked coin type package. Primarily designed for integrated circuit voltage backup, the capacitors can also be used to deliver the initial power from batteries.

Highlights

- Long life
- High discharge current
- 85 °C Operating temperature

Specifications

Operating Temperature Range	-25 °C to +85 °C
Rated Voltage Range	3.6 Vdc to 5.5 Vdc
Capacitance Range	0.047 F to 1.5 F
Life, Moisture and Temperature Characteristics	After the following procedures have been performed, measure the capacitance and ESR at +20 °C.
Life Test:	Apply the max. operating voltage for 1000 h at +85 °C
Capacitance Change	±30% of the initial measured value
ESR	≤ 4 times the initial specified value
Shelf Life:	Subject the capacitor to 1000 hours without voltage at +85 °C.
Capacitance Change	±30% of the initial measured value
ESR	≤ 4 times the initial specified value
Moisture Resistance:	Subject the capacitor to 240 hours at +40 °C at 90 to 95% RH without voltage.
Capacitance Change	±10% of the initial measured value
ESR	meets the initial specified value
Temperature Cycling	Stabilize the capacitor at each of the following temperatures for 1 hour in sequence, and then measure the capacitance and ESR at that temperature.
	1. +20 °C 2. -25 °C 3. +20 °C 4. +85 °C 5. +20 °C
Capacitance Change (at -25 °C)	±30% of the initial measured value
ESR (at -25 °C)	≤ 5 times the initial measured value
Capacitance Change (at +85 °C)	±30% of the initial measured value
ESR (at +85 °C)	≤ 4 times the initial measured value
Capacitance Change (Step 5 at +20 °C)	±10% of the initial measured value
ESR (Step 5 at +20 °C)	meets the initial specified value
RoHS Compliant without Exemptions	

Type EDS, 85 °C Long Life Electric Double Layer Supercapacitor

3.6 VDC					
CDE Part Number	Cap F	ESR 1 kHz Ω	Case Code		
			V Type	H Type	C Type
EDS473Z3R6*	0.047	120	V1	H1	C1
EDS104Z3R6*	0.1	75	V1	H1	C1
EDS224Z3R6*	0.22	75	V1	H1	C1
EDS334Z3R6*	0.33	75	V1	H1	C1
EDS474Z3R6*	0.47	50	V1	H1	C1
EDS105Z3R6*	1	30	V2	H2	C2
EDS155Z3R6*	1.5	30	V2	H2	C2

*V, H, or C

5.5 VDC			
CDE Part Number	Cap F	ESR 1 kHz Ω	Case Code
EDS104Z5R5C	0.1	120	C3
EDS224Z5R5C	0.22	75	C3
EDS334Z5R5C	0.33	75	C3
EDS474Z5R5C	0.47	50	C4
EDS684Z5R5C	0.68	50	C4
EDS105Z5R5C	1	30	C4

Part Numbering System

EDS

Series

224

Capacitance

224 = 0.22 F
473 = 0.047 F
105 = 1.0 F

Z

Tolerance

-20/+80%

5R5

Voltage

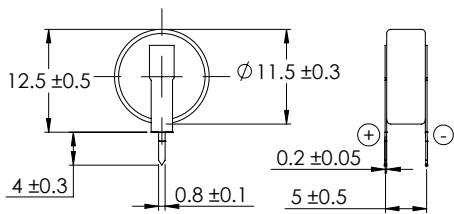
5R5 = 5.5 Vdc

C

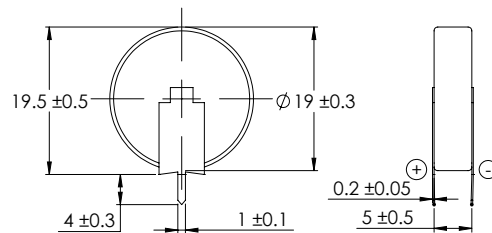
Case Style

C = Radial
H = Horizontal Style
V = Vertical Style

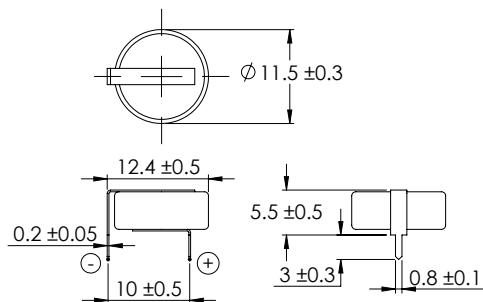
EDS Outline Drawing



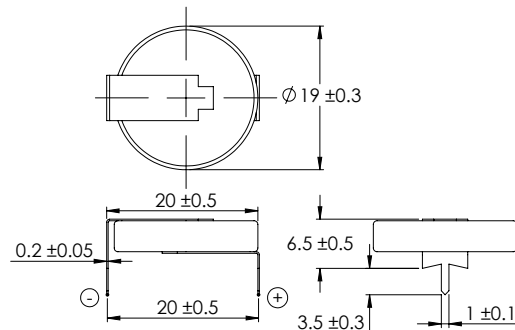
V1



V2



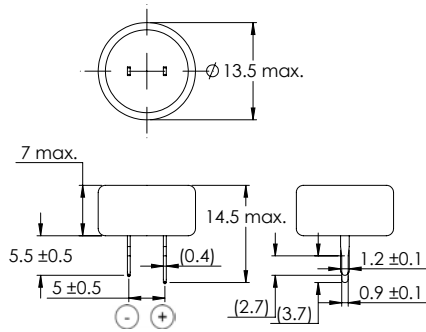
H1



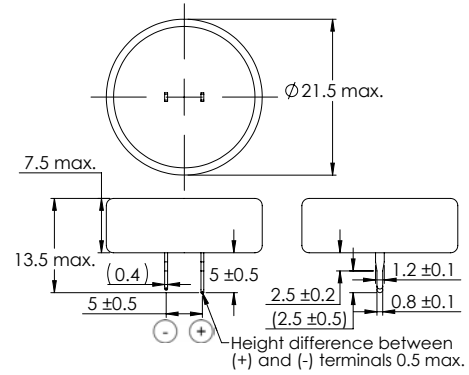
H2

Type EDS, 85 °C Long Life Electric Double Layer Supercapacitor

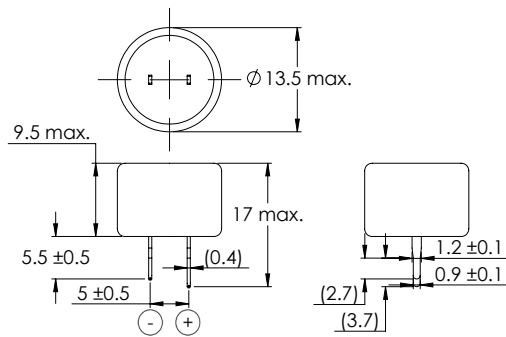
EDS Outline Drawing



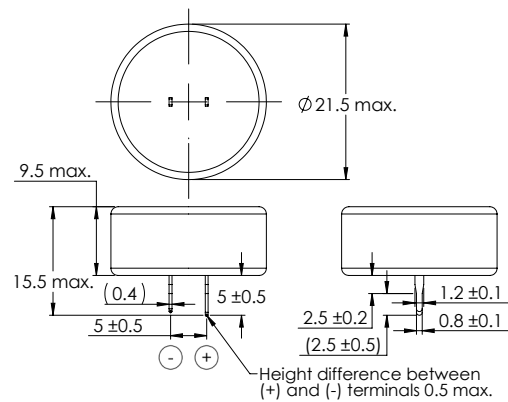
C1



C2



C3



C4

Recommended Soldering Procedures

Hand Soldering	Use a 30W iron with a max. temperature of 350 °C for 3 seconds.
Wave Soldering	Pre-heat circuit board to a surface temp of 110 °C for a max. of 60 seconds, with a max. component temperature of 100 °C. Min. printed circuit board thickness of 0.8 mm. Recommended solder bath temperature of 240 °C with a max. dipping time of 5 seconds.

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