DAWNCAP®

Catalogue

DAWN CAPACITORS
POWER ELECTRONIC CAPACITORS

At any time, we may change the contents of this manual. For more information, please refer to our website or consult the sales staff.

http://www.dawncap.cn www.dawncapacitors.com

E-mail:dawncapacitor@163.com

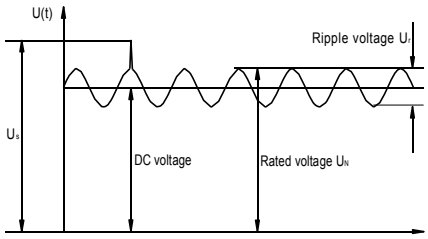
1.Technical terms and definitions

1.1 rated capacitance cn

The test condition is 20 ± 5 ° C, 100Hz, and the measured capacitor capacity.

1.2 Rated voltage Un

The design rating of capacitor refers to the maximum or peak value of non reverse voltage waveform.



1.3Unrepeatable peak (aperiodic surge) voltage us

For the voltage exceeding the rated value caused by equipment switch or line fault, the duration of each time shall not exceed 50dms,

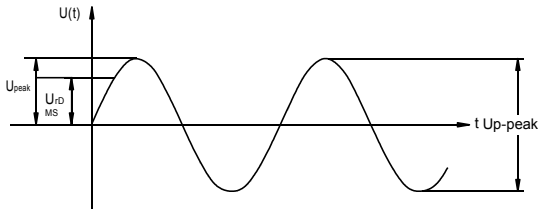
and the maximum number of times allowed is 1000.

1.4 ripple voltage ur Ur

Peak to peak of AC component of unidirectional rectified voltage

1.5 Rated AC voltage Ur DMS

Root mean square of the maximum sine wave AC voltage in continuous operation.



1.6 A.C Peak voltage Upeak

Allowable A.C peak voltage in continuous operation

1.7 DU/DT

The rise or fall time of the maximum voltage is generally described
as the value that the capacitor can withstand the rise or fall of voltage per microsecond

1.8 Maximum non repeatable voltage rise (du/dt)s

Transient and non repeatable voltage rise peak due to fault。

1.9 Test voltage between electrodes Ut-t

Routine test items under room temperature before delivery. At the user's site, it is allowed to conduct another test according to 80% of the test voltage indicated in the product specification.

1.10 test voltage ut-c between electrode and shell

For the routine test items at room temperature, the withstand voltage between the electrode and the shell shall be tested after the electrode is short circuited. Repeated tests are allowed at the user's site.

1.11 peak current ipeak

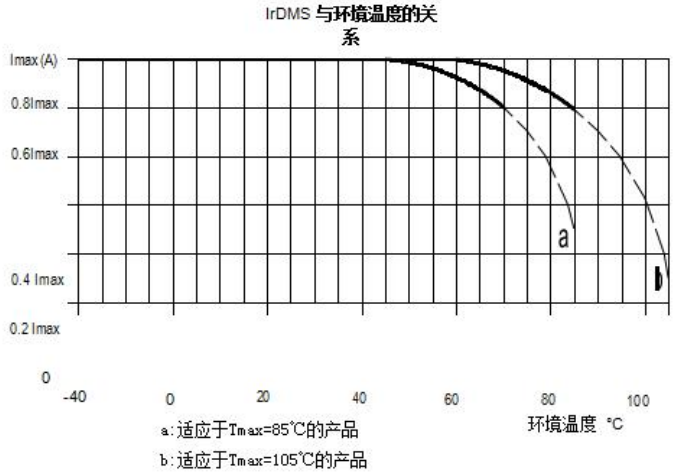
Maximum allowable repeatable current amplitude during continuous operation. Ipeak = Cn x (du/dt)

1.12 maximum current Imax

The maximum effective current during continuous operation. The maximum current given in the data sheet depends on the maximum power loss or the current limit of the capacitor terminal.

Relationship between irdms and ambient temperature:

a: 85 ° C
b:105 ° C



1.13 non repetitive peak current (surge) is

The maximum current that occurs temporarily and unrepeatedly due to a fault. The duration of each time shall not exceed 50dms, and the maximum number of occurrences allowed is 1000. Is=Cn × (du / dt) s

1.14 equivalent series resistance ESR

The equivalent resistance value of all resistance related factors in the capacitor. Circuit power loss used to calculate current.

1.15 self inductance LS

The inductance of a capacitor due to its own structure.

1.16 insulation resistance I.R

It is usually expressed by the charging time constant R · C: under the ambient temperature of 20 ± 5 ° C and the voltage of 100VDC, the reading 1 minute after the capacitor is fully charged, measure the leakage current and calculate the IR It is usually expressed by charging time constant R.C. the unit of R.C is s:

s= MΩ × μF

1.17 resonance frequency fr

Capacitance and self inductance will form a series resonant circuit. Outside this resonant frequency, if the inductive reactance of the LC line is dominant, the capacitor will present the characteristics of an inductance

$$Fr = \frac{1}{2\pi\sqrt{Cn \times Ls}}$$

1.18 Dielectric loss factor Tanδ0

Fixed loss factor of capacitor dielectric material at rated frequency.

1.19 loss factor Tan δ

tan δ= two × π × f × Cn × ESR

1.20 thermal resistance RTH

It refers to the rising value of the hot spot temperature of the capacitor corresponding to the loss of the capacitor.

1.21 maximum power loss Pmax

$$Pmax = \frac{Ths - Te}{Rth}$$

1.22 ambient temperature te

The air temperature around the capacitor, the test point is 10 cm away from the vertical height of the capacitor shell.Hot spot temperature ths The highest temperature inside the capacitor

1.23Hot spot temperature ths

The highest temperature inside the capacitor.

1.24 minimum climate temperature Tmin

Minimum allowable temperature of capacitor in use

1.25 maximum climate temperature Tmax

The maximum allowable temperature when the capacitor is used, that is, the maximum temperature of the shell.

1.26 rated energy storage WN

Energy storage capacity of capacitor during charging at rated voltage

Wn = 1/2 x Cn x (Un)2

1.27 air gap L

The shortest distance between the conductive parts of the electrode or between the electrode and the housing.

1.28 creepage distance K

The shortest distance between the conductive parts of the electrode or the insulating surface between the electrode and the shell.

1.29 altitude

The maximum allowable altitude is 2000 meters. With the decrease of atmospheric pressure, arc discharge is more likely to occur between electrodes. When used at high altitude, the capacitor is not easy to dissipate heat, which will lead to increased loss and failure.

1.30 storage temperature

Allowable storage temperature range of capacitor.

1.31 life expectancy Le

The expected life of capacitor depends on the internal temperature and dielectric field strength. Relationship between life expectancy and voltage

Le = Ln x (Un/Uw)7

Le = life expectancy at operating voltage (H) ln = life expectancy at rated voltage (H) UN = rated voltage (V)

UW = working voltage (V)

Relationship between life expectancy and temperature

Le = LTo x 2(To-Ths)/11

Le = life expectancy at actual hot spot temperature (H) LTO = hot spot temperature 70 ° Life expectancy at C (H) to = hot spot temperature 70 ° C (° C)

Ths = hot spot temperature in actual operation (° C)

2. Installation and operation guide

2.1 overvoltage circuit breaker

When using explosion-proof capacitors, it must be ensured that:

the connecting wire must have a certain elasticity to prevent the connecting wire from pulling and losing the explosion-prooffunction during explosion-proof action. an expansion space ≥ 12mm shall be reserved above the electrode of the capacitor.

2.2 installation position

In addition to the specially specified series, for example, DAF / DMB / DRG series can only be installed vertically, that is, the electrode is above, and other capacitors can adopt different installation directions. However, pay attention to the following situations: aluminum shell capacitors and rectangular metal shell capacitors with voltage higher than 3600v must be installed horizontally. for capacitors with high voltage or circular steel shell, horizontal installation is allowed, but the manufacturer should be consulted in advance.

2.3 assembly

If the vibration stress does not exceed 5g, the bolts at the bottom of aluminum shell capacitor with diameter 60 mm and height 160 mm can be used for fixing. For larger diameter and vibration stress greater than 5g, the capacitor needs to be fixed with clamp ring.

Bolt installation data:

Bolt diameter	Bolt length	Maximum torque
M8	10mm	4.5N.m
M10	12mm	6N.m
M12	16mm	8N.m

2.4 installing terminals

The tightening torque of bolts and nuts for installing terminals can be referred to a separate data sheet. These torques cannot be used on plastic parts.

Bolt diameter	Maximum torque
M5	2.5N.m
M6	4.5N.m
M8	8.5N.m

Screw diameter	Maximum torque
M8	8.5N.m
M10	12N.m
M12	15N.m

2.4.1 the maximum cross section of connecting wire shall be in accordance with VDE / din

Flexible wires should be used for terminals with ceramics as insulators, so as to avoid mechanical stress on ceramics.

The wiring outside the capacitor needs to consider that the heat cannot be transmitted to other components, and also consider keeping the heat away from the terminal of the capacitor.

2.5 grounding

According to VDE 0100, both bottom bolts and iron hoops can be used for grounding. Single pole and fully insulated capacitors can not be grounded. When the metal clamp is used for grounding, the paint on the surface of the clamp needs to be removed.

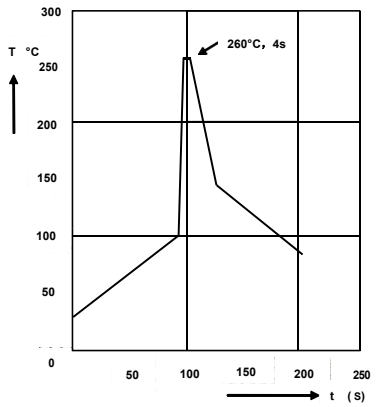
2.6 safety protection measures

When using, pay attention to the self charging phenomenon, and the capacitor contains high electric energy, and observe appropriate safety protection measures.

2.7 welding conditions of axial and box capacitors on PCB

In order to control the temperature inside the capacitor, the setting of welding temperature shall not exceed the following limit: soldering bath temperature 260 ± 5 ° C. For box capacitors with a foot distance greater than 10mm, the welding time is 4S. When welding, it must be ensured that the capacitor will not be damaged due to overheating: if the cross section of the conductor is greater than 1.5 mm2, the welding method shall not be adopted, but the fastening connection method shall be adopted.

do not weld in the heat concentrated part.



Tin dipping depth	The horizontal plane of capacitor body or substrate is upward 2.0 +0/-0.5mm
Protective plate	Heat absorption plate, (1.5 ± 0.5) mm thick, It is placed between the capacitor body and the tin material
Evaluation criteria: Visual inspection C/C○ Tanδ	 No visible damage 2％for DTC/DTG/DRB/DTG 5％for DTC/DTG/DRB/DTG

3. End of product life and waste disposal

Dawncap capacitor materials strictly comply with national regulations:
chemical prohibition regulations
CFC halogen prohibition regulations
Our products do not contain PCB, so there is no need to deal with scrapped products according to the special management regulations on waste disposal.
We need to be responsible for the environment, so we hope users should be careful when dealing with waste products. In any case, we hope users will consult the waste disposal department for relevant regulations.

4. Transportation and packaging

In terms of product packaging, dawncap naturally supports the needs of environmental protection.
use environmentally friendly materials and try to use product packaging.
pallets shall be used as far as possible, and the pallets shall be fixed with environmental friendly PE or PP plastic belts.
cardboard is preferred for the isolation layer of pallet and packing box.

5.Product application description

5.1dc Link Application

The rated voltage of the capacitor must be equal to or greater than the sum of the applied voltage and the line ripple voltage: UN ≥ UDC + ur / 2
Select the corresponding capacitance CN and rated voltage UN according to the parameters in the data sheet; At the same time, the maximum effective current that the capacitor can withstand during long-term operation needs to be verified. Maximum effective
IMAX depends on the terminals of the capacitor and the values specified in the data sheet.
The surge voltage in the following range will not have a significant impact on the shortening of the expected life of the capacitor:

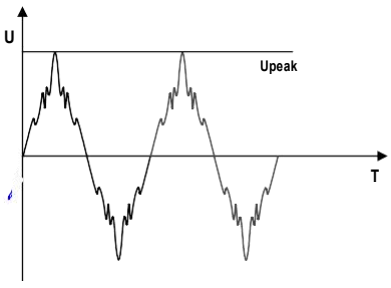
Repetitive surge voltage	Maximum duration
1.1 × Un	Working time totle 30%
1.15 × Un	30 min/d 5
1.2× Un	min/d 1
1.3× Un	min/d
1.5 × Un	100 DMS ，No more than 1000 次

5.2 Ac application

The rated voltage of the capacitor must be equal to or greater than the maximum of upeak1 and upeak2. Select the corresponding capacitance CN and rated voltage UN according to the parameters in the data sheet; At the same time, the maximum effective current that the capacitor can withstand during long-term operation needs to be verified. The maximum effective IMAX depends on the terminals of the capacitor and the values specified in the data sheet.

5.3 Ac filtering application

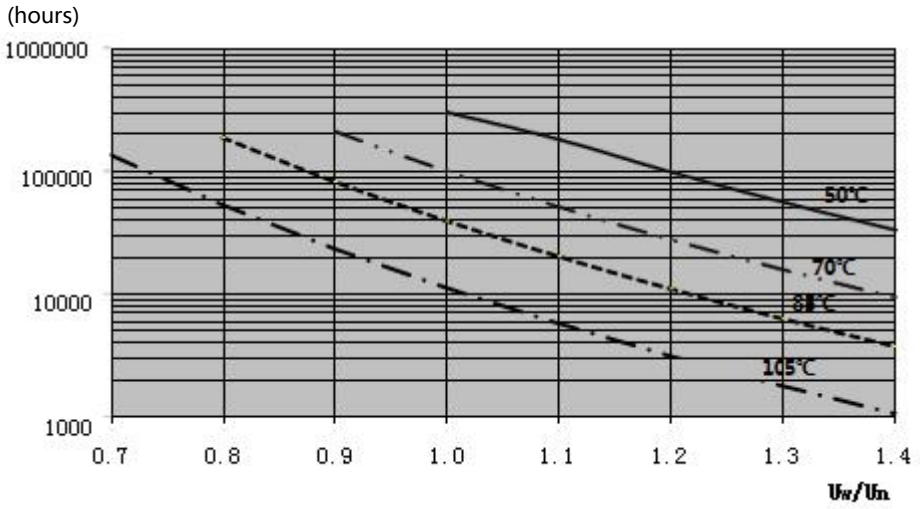
The standard for selecting the rated voltage UN of AC filter capacitor is not the effective voltage urdms, but the peak voltage formed by the superposition of various harmonics, which is calculated by instrument test or according to the harmonic data provided. In any case, the rated voltage of the capacitor must be greater than the peak voltage in the line.



5.4 service life

The working life of the capacitor depends on the temperature and dielectric field strength inside the capacitor under working conditions. The average life of the capacitor design is 100000 hours. (allowable failure rate ≤ 150ppm). These values are related to the hot spot temperature indicated in the selection table.

The following icons illustrate the relationship between life, temperature and operating voltage:

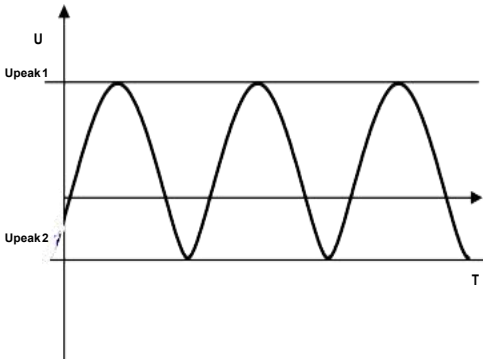


5.5 Life Declaration and invalidation

There may be unreasonable assumptions, and users will form a wrong idea about the service life: as long as the rated service temperature and working voltage are reduced, the service life of the capacitor will be one million hours or more. Please note that the statement about the life of the capacitor is purely theoretical.

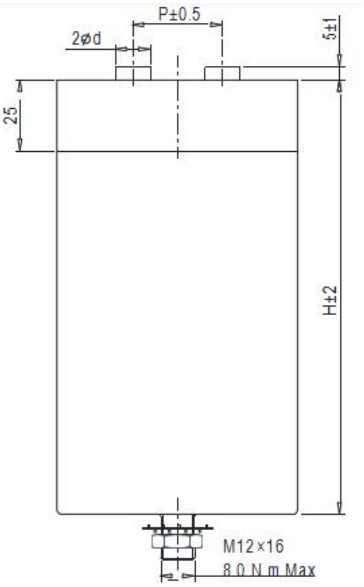
5.6 failure modes

Plastic film capacitors have two typical failure modes: open circuit or short circuit (or high resistance short circuit). In addition, capacitance drift, unstable working temperature, high loss or low insulation resistance will lead to capacitor failure. All failures are caused by dielectric degradation caused by exceeding the limits of electrical, mechanical and environmental factors during operation.



Product features

Reference standard : IEC 61071
medium : Metallized polypropylene film
structure: Dry non inductive structure, aluminum shell packaging, plastic support, resin filling（UL94 V-0）

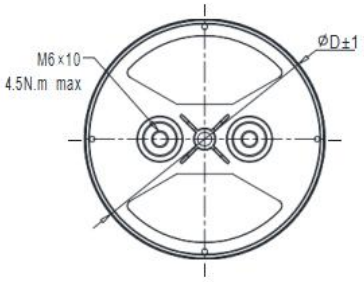


Electrical characteristics

working temperature : - 40 ~ + 85 ˚C
Capacity range : 180 至 4800μF
Rated voltage : 900 ~ 1200 VDC
Capacity deviation : ± 5% , ± 10%
Loss factor : ≤3×10^{-3} @ 100 Hz, 20±5˚C
life expectancy : 100,000 hour @ Un, 70 ˚C (hotspottemperature)
Interelectrode withstand voltage : 1.5Un (DC) @ 10s, 20±5˚C
Polar shell withstand voltage : (1.5Un+1000)VAC, minimum 3000VAC (10s,50Hz)
insulation resistance : (IR×Cn) 30000s (No more than 30GΩ), 100VDC (20±5˚C) , 1minute

Application

Wind power generation, solar inverter
Electric vehicle motor drive
Switching Mode Power Supply Elevator.



Lead out size

D= 76, 86mm	D= 96mm	D= 116mm	D= 136mm
d= 12.5mm	d= 12.5mm	d= 14mm	d= 14mm
P= 32mm	P= 45mm	P= 50mm	P= 50mm

Carharacteristic parameter

ordering code	CAP. (μF)	D (mm)	H (mm)	Ipeak (A)	IrDMS@45˚C @10KHz	ESR@1.0KHz (mΩ)	Ls (nH)	Rth (k/W)	Wn (Ws)	Weight (Kg)
Un 700VDC , Us 1050V , Ur 150V										
DHD-700-500-FSB1	500	76	95	1650	43	1.8	≤50	4.6	123	0.58
DHD-700-680-FSB1	680	86	95	2244	48	1.6	≤50	3.9	167	0.71
DHD-700-700-FSB1	700	76	120	1750	44	1.9	≤60	4.1	172	0.70
DHD-00-800-FSB1	800	76	145	3200	60	1.1	≤45	3.7	196	0.87
DHD-700-845-FSB1	845	96	100	2789	53	1.6	≤50	3.4	207	0.87
DHD-700-900-FSB1	900	86	120	2250	49	1.8	≤60	3.5	221	0.87
DHD-700-1000-FSB1	1000	76	175	3300	62	1.2	≤50	3.3	245	1.02
DHD-700-1050-FSB1	1050	86	145	4200	66	1.1	≤45	3.2	257	1.08
DHD-700-1100-FSB1	1100	96	125	2750	54	1.7	≤60	3.0	270	1.07
DHD-700-1200-FSB1	1200	116	100	3960	63	1.5	≤50	2.6	294	1.35
DHD-700-1300-FSB3	1300	96	150	5200	71	1.1	≤45	2.8	319	1.33
DHD-700-1300-FSB1	1300	86	175	4290	68	1.1	≤50	2.9	319	1.28
DHD-700-1300-FSB2	1300	76	225	3250	64	1.3	≤60	2.9	319	1.28
DHD-700-1600-FSB1	1600	96	180	5280	74	1.1	≤50	2.5	392	1.58
DHD-700-1600-FSB2	1600	116	125	4000	64	1.6	≤60	2.3	392	1.64
DHD-700-1700-FSB2	1700	136	100	5610	71	1.4	≤50	2.1	417	1.82
DHD-700-1700-FSB1	1700	86	225	4250	71	1.2	≤60	2.5	417	1.60
DHD-700-1900-FSB1	1900	116	150	7600	82	1.0	≤45	2.1	466	2.02
DHD-700-2200-FSB1	2200	96	230	5500	78	1.1	≤60	2.2	539	1.96
DHD-700-2400-FSB1	2400	136	125	6000	73	1.5	≤60	1.9	588	2.19
DHD-700-2400-FSB2	2400	116	180	7920	85	1.0	≤50	2.0	588	2.36
DHD-700-2800-FSB1	2800	136	150	11200	93	1.0	≤45	1.7	686	2.72
DHD-700-3300-FSB1	3300	116	230	8250	90	1.1	≤60	1.7	809	2.92
DHD-700-3500-FSB1	3500	136	180	11550	96	1.0	≤50	1.6	858	3.19
DHD-700-4800-FSB1	4800	136	230	12000	101	1.0	≤60	1.4	1176	3.95

Carharacteristic parameter

ordering code	CAP (μF)	D (mm)	H (mm)	Ipeak (A)	IrDMS@45°C @10KHz (A)	ESR@1.0KHz (mΩ)	Ls (nH)	Rth (k/W)	Wn (Ws)	Weight (Kg)
Un 800VDC , Us 1200V , Ur 175V										
DHD-800-370-FSB1	370	76	95	1665	42	1.8	≤50	4.6	118	0.58
DHD-800-490-FSB1	490	86	95	2205	48	1.7	≤50	3.9	157	0.72
DHD-800-500-FSB1	500	76	120	1500	43	2.0	≤60	4.1	160	0.70
DHD-800-580-FSB1	580	76	145	2900	59	1.2	≤45	3.7	186	0.87
DHD-800-600-FSB1	600	96	100	2700	52	1.6	≤50	3.4	192	0.88
DHD-800-680-FSB1	680	86	120	2040	49	1.8	≤60	3.5	218	0.87
DHD-800-700-FSB1	700	76	175	3150	60	1.2	≤50	3.3	224	1.02
DHD-800-750-FSB1	750	86	145	3750	65	1.1	≤45	3.2	240	1.09
DHD-800-820-FSB1	820	96	125	2460	53	1.7	≤60	3.0	262	1.07
DHD-800-900-FSB1	900	116	100	4050	62	1.5	≤50	2.6	288	1.35
DHD-800-900-FSB2	900	96	150	4500	70	1.1	≤45	2.8	288	1.34
DHD-800-950-FSB1	950	86	175	4275	67	1.2	≤50	2.9	304	1.28
DHD-800-1000-FSB1	1000	76	225	3000	63	1.3	≤60	2.9	320	1.27
DHD-800-1200-FSB1	1200	96	180	5400	73	1.1	≤50	2.5	384	1.57
DHD-800-1200-FSB2	1200	116	125	3600	63	1.6	≤60	2.3	384	1.63
DHD-800-1300-FSB1	1300	136	100	5850	71	1.5	≤50	2.1	416	1.81
DHD-800-1300-FSB2	1300	86	225	3900	70	1.2	≤60	2.5	416	1.59
DHD-800-1400-FSB1	1400	116	150	7000	82	1.0	≤45	2.1	448	2.02
DHD800-1600-FSB1	1600	96	230	4800	76	1.2	≤60	2.2	512	1.97
DHD-800-1700-FSB1	1700	136	125	5100	73	1.5	≤60	1.9	544	2.21
DHD-800-1800-FSB1	1800	116	180	8100	85	1.1	≤50	2.0	576	2.35
DHD-800-2000-FSB1	2000	136	150	10000	92	1.0	≤45	1.7	640	2.73
DHD-800-2400-FSB1	2400	116	230	7200	89	1.1	≤60	1.7	768	2.92
DHD800-2500-FSB1	2500	136	180	11250	95	1.0	≤50	1.6	800	3.20
DHD-800-3500-FSB1	3500	136	230	10500	100	1.1	≤60	1.4	1120	3.96
Un 1100VDC , Us 1650V , Ur 225V										
DHD-1100-220-FSB1	220	76	95	1496	41	2.0	≤50	4.6	133	0.58
DHD-1100-300-FSB2	300	86	95	2040	46	1.8	≤50	3.9	182	0.72
DHD1100-300-FSB1	300	76	120	1500	41	2.2	≤60	4.1	182	0.70
DHD-1100-345-FSB1	345	76	145	2691	57	1.2	≤45	3.7	209	0.87
DHD-1100-360-FSB1	360	96	100	2448	51	1.7	≤50	3.4	218	0.88
DHD-1100-400-FSB1	400	86	120	2000	46	2.0	≤60	3.5	242	0.87
DHD-1100-450-FSB1	450	76	175	3060	59	1.3	≤50	3.3	272	1.02
DHD-1100-460-FSB1	460	86	145	3588	64	1.2	≤45	3.2	278	1.08
DHD-1100-490-FSB1	490	96	125	2450	51	1.9	≤60	3.0	296	1.07
DHD-1100-550-FSB1	550	96	150	4290	69	1.1	≤45	2.8	333	1.34
DHD-1100-550-FSB2	550	116	100	3740	61	1.6	≤50	2.6	333	1.34
DHD-1100-600-FSB0	600	86	175	4080	66	1.2	≤50	2.9	363	1.27
DHD-1100-600-FSB2	600	76	225	3000	61	1.4	≤60	2.9	363	1.27
DHD-1100-720-FSB1	720	96	180	4896	72	1.2	≤50	2.5	436	1.57
DHD-1100-750-FSB1	750	116	125	3750	62	1.7	≤60	2.3	454	1.62
DHD-1100-800-FSB1	800	136	100	5440	70	1.5	≤50	2.1	484	1.80
DHD-1100-800-FSB0	800	86	225	4000	68	1.3	≤60	2.5	484	1.59
DHD-1100-850-FSB1	850	116	150	6630	81	1.1	≤45	2.1	514	2.01
DHD-1100-980-FSB1	980	96	230	4900	75	1.2	≤60	2.2	593	1.96
DHD-1100-1050-FSB1	1050	136	125	5250	71	1.6	≤60	1.9	635	2.20
DHD-1100-1050-FSB2	1050	116	180	7140	83	1.1	≤50	2.0	635	2.36
DHD-1100-1200-FSB1	1200	136	150	9360	91	1.0	≤45	1.7	726	2.73
DHD-1100-1400-FSB1	1400	116	230	7000	87	1.1	≤60	1.7	847	2.94
DHD-1100-1500-FSB1	1500	136	180	10200	94	1.1	≤50	1.6	908	3.21
DHD-1100-2100-FSB1	2100	136	230	10500	99	1.1	≤60	1.4	1271	3.96

ordering code	CAP. (μF)	D (mm)	H (mm)	Ipeak (A)	IrDMS@45°C @10KHz (A)	ESR@1.0KHz (mΩ)	Ls (nH)	Rth (k/W)	Wn (Ws)	Weight (Kg)
DHD-1200-180-FSB1	180	76	95	1440	40	2.1	≤50	4.6	130	0.58
DHD-1200-230-FSB1	230	86	95	1840	45	1.9	≤50	3.9	166	0.73
DHD-1200-250-FSB1	250	76	120	1500	40	2.3	≤60	4.1	180	0.70
DHD-1200-280-FSB1	280	76	145	2800	56	1.3	≤45	3.7	202	0.88
DHD-1200-300-FSB1	300	96	100	2400	50	1.8	≤50	3.4	216	0.88
DHD-1200-330-FSB1	330	86	120	1980	45	2.1	≤60	3.5	238	0.88
DHD-1200-360-FSB1	360	76	175	2880	58	1.3	≤50	3.3	259	1.03
DHD-1200-380-FSB1	380	86	145	3800	63	1.2	≤45	3.2	274	1.09
DHD-1200-400-FSB1	400	96	125	2400	50	1.9	≤60	3.0	288	1.09
DHD-1200-450-FSB1	450	116	100	3600	60	1.6	≤50	2.6	324	1.36
DHD-1200-480-FSB1	480	86	175	3840	65	1.2	≤50	2.9	346	1.29
DHD-1200-500-FSB1	500	76	225	3000	60	1.5	≤60	2.9	360	1.28
DHD-1200-580-FSB1	580	96	180	4640	70	1.2	≤50	2.5	418	1.59
DHD-1200-600-FSB1	600	116	125	3600	61	1.7	≤60	2.3	432	1.65
DHD-1200-650-FSB1	650	136	100	5200	69	1.5	≤50	2.1	468	1.82
DHD-1200-680-FSB0	680	86	225	4080	66	1.4	≤60	2.5	490	1.60
DHD-1200-700-FSB2	700	116	150	7000	80	1.1	≤45	2.1	504	2.03
DHD-1200-780-FSB1	780	96	230	4680	73	1.3	≤60	2.2	562	2.00
DHD-1200-880-FSB1	880	136	125	5280	71	1.6	≤60	1.9	634	2.21
DHD-1200-880-FSB2	880	116	180	7040	83	1.1	≤50	2.0	634	2.38
DHD1200-1000-FSB1	1000	136	150	10000	91	1.0	≤45	1.7	720	2.75
DHD-1200-1200-FSB1	1200	116	230	7200	86	1.2	≤60	1.7	864	2.95
DHD-1200-1300-FSB1	1300	136	180	10400	94	1.1	≤50	1.6	936	3.21
DHD-1200-1700-FSB1	1700	136	230	10200	98	1.1	≤60	1.4	1224	4.02