Aluminum Capacitors
Miniature, Axial Lead, High Reliability



FEATURES

- Life test 2000 h at +125 °C
- Wide temperature range
- Foil tantalum replacement
- Unique Teflon end seal for long life
- High vibration capability
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free Available

QUICK REFERENCE DATA

DESCRIPTION	VALUE
Nominal case size Ø D x L in inches [mm]	0.276 x 0.945 [7.0 x 24.0] to 0.374 x 2.677 [9.5 x 68.0]
Operating temperature	-55 °C to +125 °C
Rated capacitance range, C_R	2.2 µF to 2700 µF
Tolerance on C_R	-10 %, +50 %
Rated voltage range, U_R	5 WV_{DC} to 250 WV_{DC}
Termination	2 axial leads
Life validation test at 125 °C	2000 h: ΔCAP ≤ 15 % from initial measurement. ΔESR ≤ 1.3 x initial specified limit. ΔDCL ≤ initial specified limit.
Shelf life at 125 °C	500 h: ΔCAP ≤ 10 % from initial measurement. ΔESR ≤ 1.5 x initial specified limit. ΔDCL ≤ 2 x the initial specified limit.
DC leakage current (after 5 min charge)	$I = 0.15 \sqrt{CV}$ (0 V_{DC} to 75 V_{DC}) $I = 0.15 \sqrt{CV} + 5$ (100 V_{DC} to 250 V_{DC}) I in µA, C in µF, V in Volts

RIPPLE CURRENT MULTIPLIERS

TEMPERATURE	
AMBIENT TEMPERATURE	MULTIPLIERS
+125 °C	1.0
+85 °C	2.0
+75 °C or less	2.4

FREQUENCY (Hz)				
WV_{DC}	50 to 60	100 to 120	300 to 400	> 1000
0 to 30	0.85	1.0	1.04	1.08
31 to 250	0.80	1.0	1.30	1.40

DIMENSIONS in inches [millimeters]

CASE CODE	BARE CASE		WITH OUTER INSULATION	
	DIAMETER	LENGTH	DIAMETER	LENGTH (max.)
KD	0.281 ± 0.016 [7.14 ± 0.40]	0.937 ± 0.031 [23.81 ± 0.79]	0.297 ± 0.031 [7.54 ± 0.79]	1.00 [25.40]
DD	0.375 ± 0.016 [9.53 ± 0.40]	0.937 ± 0.031 [23.81 ± 0.79]	0.391 ± 0.031 [9.92 ± 0.79]	1.00 [25.40]
DE	0.375 ± 0.016 [9.53 ± 0.40]	1.125 ± 0.031 [28.58 ± 0.79]	0.391 ± 0.031 [9.92 ± 0.79]	1.187 [30.16]
DG	0.375 ± 0.016 [9.53 ± 0.40]	1.375 ± 0.031 [34.93 ± 0.79]	0.391 ± 0.031 [9.92 ± 0.79]	1.437 [36.51]
DJ	0.375 ± 0.016 [9.53 ± 0.40]	1.625 ± 0.031 [41.28 ± 0.79]	0.391 ± 0.031 [9.92 ± 0.79]	1.687 [42.86]
DL	0.375 ± 0.016 [9.53 ± 0.40]	2.187 ± 0.031 [55.56 ± 0.79]	0.391 ± 0.031 [9.92 ± 0.79]	2.249 [57.12]
DX	0.375 ± 0.016 [9.53 ± 0.40]	2.687 ± 0.031 [68.26 ± 0.79]	0.391 ± 0.031 [9.92 ± 0.79]	2.749 [69.82]

Note

- Lead diameter AWG 20 (0.032" [0.81 mm])

For technical questions, contact: aluminumcaps4@vishay.com

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ORDERING EXAMPLE

Electrolytic capacitor 600D series: 600D 227 F 010 DE 4

DESCRIPTION	
CODE	**EXPLANATION**
600D	Product type
227	Capacitance value (220 µF)
F	Tolerance (F = -10 % / +50 %)
010	Voltage rating at 85 °C (010 = 10 V)
DE	Can size (see Dimensions table)
4	Sleeve and sealing (4 = polyester sleeve)

Note

- For lead (Pb)-free / RoHS compliant products add suffix “E3” to part number.
  Example: 600D227F010DE4E3

ELECTRICAL DATA AND ORDERING INFORMATION

CAPACITANCE (µF)	PART NUMBER	NOMINAL CASE SIZE D x L	MAX. ESR AT +25 °C 120 Hz	MAX. RIPPLE AT +125 °C 120 Hz
5 WV_{DC} AT +85 °C . . . 3 WV_{DC} AT +125 °C				
220	600D227F005KD4	0.281 x 0.937 [7.14 x 23.8]	1.75	0.127
470	600D477F005DD4	0.375 x 0.937 [9.53 x 23.8]	0.813	0.221
680	600D687F005DE4	0.375 x 1.126 [9.53 x 28.6]	0.564	0.286
1000	600D108F005DG4	0.375 x 1.378 [9.53 x 35.0]	0.388	0.377
1200	600D128F005DJ4	0.375 x 1.626 [9.53 x 41.3]	0.32	0.477
1800	600D188F005DL4	0.375 x 2.185 [9.53 x 55.5]	0.21	0.631
2700	600D278F005DX4	0.375 x 2.685 [9.53 x 68.2]	0.14	0.851
7 WV_{DC} AT +85 °C . . . 5 WV_{DC} AT +125 °C				
180	600D187F007KD4	0.281 x 0.937 [7.14 x 23.8]	2.121	0.115
390	600D397F007DD4	0.375 x 0.937 [9.53 x 23.8]	0.972	0.202
470	600D477F007DE4	0.375 x 1.126 [9.53 x 28.6]	0.813	0.238
680	600D687F007DG4	0.375 x 1.378 [9.53 x 35.0]	0.564	0.312
1000	600D108F007DJ4	0.375 x 1.626 [9.53 x 41.3]	0.388	0.406
1500	600D158F007DL4	0.375 x 2.185 [9.53 x 55.5]	0.26	0.567
2200	600D228F007DX4	0.375 x 2.685 [9.53 x 68.2]	0.175	0.761
10 WV_{DC} AT +85 °C . . . 7 WV_{DC} AT +125 °C				
120	600D127F010KD4	0.281 x 0.937 [7.14 x 23.8]	3.18	0.094
330	600D337F010DD4	0.375 x 0.937 [9.53 x 23.8]	1.16	0.185
390	600D397F010DE4	0.375 x 1.126 [9.53 x 28.6]	0.972	0.218
560	600D567F010DG4	0.375 x 1.378 [9.53 x 35.0]	0.673	0.286
820	600D827F010DJ4	0.375 x 1.626 [9.53 x 41.3]	0.46	0.373
1200	600D128F010DL4	0.375 x 2.185 [9.53 x 55.5]	0.318	0.513
1500	600D158F010DX4	0.375 x 2.685 [9.53 x 68.2]	0.23	0.664
15 WV_{DC} AT +85 °C . . . 10 WV_{DC} AT +125 °C				
100	600D107F015KD4	0.281 x 0.937 [7.14 x 23.8]	3.88	0.085
220	600D227F015DD4	0.375 x 0.937 [9.53 x 23.8]	1.75	0.15
330	600D337F015DE4	0.375 x 1.126 [9.53 x 28.6]	1.16	0.199
470	600D477F015DG4	0.375 x 1.378 [9.53 x 35.0]	0.813	0.26
560	600D567F015DJ4	0.375 x 1.626 [9.53 x 41.3]	0.686	0.305
820	600D827F015DL4	0.375 x 2.185 [9.53 x 55.5]	0.46	0.426
1200	600D128F015DX4	0.375 x 2.685 [9.53 x 68.2]	0.32	0.563

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CAPACITANCE (µF)	PART NUMBER	NOMINAL CASE SIZE D x L	MAX. ESR AT +25 °C 120 Hz	MAX. RIPPLE AT +125 °C 120 Hz
20 WV_{DC} AT +85 °C . . . 15 WV_{DC} AT +125 °C				
68	600D686F020KD4	0.281 x 0.937 [7.14 x 23.8]	4.274	0.081
150	600D157F020DD4	0.375 x 0.937 [9.53 x 23.8]	1.962	0.142
220	600D227F020DE4	0.375 x 1.126 [9.53 x 28.6]	1.325	0.186
330	600D337F020DG4	0.375 x 1.378 [9.53 x 35.0]	0.883	0.25
390	600D397F020DJ4	0.375 x 1.626 [9.53 x 41.3]	0.257	0.299
680	600D687F020DL4	0.375 x 2.185 [9.53 x 55.5]	0.564	0.385
820	600D827F020DX4	0.375 x 2.685 [9.53 x 68.2]	0.36	0.53
30 WV_{DC} AT +85 °C . . . 20 WV_{DC} AT +125 °C				
47	600D476F030KD4	0.281 x 0.937 [7.14 x 23.8]	3.06	0.096
100	600D107F030DD4	0.375 x 0.937 [9.53 x 23.8]	1.50	0.162
150	600D157F030DE4	0.375 x 1.126 [9.53 x 28.6]	1.00	0.215
220	600D227F030DG4	0.375 x 1.378 [9.53 x 35.0]	0.675	0.285
270	600D277F030DJ4	0.375 x 1.626 [9.53 x 41.3]	0.56	0.338
390	600D397F030DL4	0.375 x 2.185 [9.53 x 55.5]	0.375	0.472
560	600D567F030DX4	0.375 x 2.685 [9.53 x 68.2]	0.264	0.62
40 WV_{DC} AT +85 °C . . . 30 WV_{DC} AT +125 °C				
33	600D336F040KD4	0.281 x 0.937 [7.14 x 23.8]	4.50	0.079
82	600D826F040DD4	0.375 x 0.937 [9.53 x 23.8]	1.824	0.147
100	600D107F040DE4	0.375 x 1.126 [9.53 x 28.6]	1.50	0.175
150	600D157F040DG4	0.375 x 1.378 [9.53 x 35.0]	1.00	0.234
180	600D187F040DJ4	0.375 x 1.626 [9.53 x 41.3]	0.844	0.275
270	600D277F040DL4	0.375 x 2.185 [9.53 x 55.5]	0.54	0.394
390	600D397F040DX4	0.375 x 2.685 [9.53 x 68.2]	0.397	0.505
50 WV_{DC} AT +85 °C . . . 40 WV_{DC} AT +125 °C				
22	600D226F050KD4	0.281 x 0.937 [7.14 x 23.8]	6.75	0.065
56	600D566F050DD4	0.375 x 0.937 [9.53 x 23.8]	2.65	0.122
68	600D686F050DE4	0.375 x 1.126 [9.53 x 28.6]	2.17	0.146
100	600D107F050DG4	0.375 x 1.378 [9.53 x 35.0]	1.50	0.192
150	600D157F050DJ4	0.375 x 1.626 [9.53 x 41.3]	1.00	0.253
180	600D187F050DL4	0.375 x 2.185 [9.53 x 55.5]	0.844	0.315
270	600D277F050DX4	0.375 x 2.685 [9.53 x 68.2]	0.54	0.433
60 WV_{DC} AT +85 °C . . . 50 WV_{DC} AT +125 °C				
15	600D156F060KD4	0.281 x 0.937 [7.14 x 23.8]	9.65	0.055
39	600D396F060DD4	0.375 x 0.937 [9.53 x 23.8]	3.85	0.102
47	600D476F060DE4	0.375 x 1.126 [9.53 x 28.6]	3.06	0.123
82	600D826F060DG4	0.375 x 1.378 [9.53 x 35.0]	1.82	0.174
100	600D107F060DJ4	0.375 x 1.626 [9.53 x 41.3]	1.50	0.207
150	600D157F060DL4	0.375 x 2.185 [9.53 x 55.5]	1.00	0.29
220	600D227F060DX4	0.375 x 2.685 [9.53 x 68.2]	0.675	0.388
75 WV_{DC} AT +85 °C . . . 60 WV_{DC} AT +125 °C				
12	600D126F075KD4	0.281 x 0.937 [7.14 x 23.8]	12.3	0.048
27	600D276F075DD4	0.375 x 0.937 [9.53 x 23.8]	5.625	0.084
39	600D396F075DE4	0.375 x 1.126 [9.53 x 28.6]	3.857	0.11
56	600D566F075DG4	0.375 x 1.378 [9.53 x 35.0]	2.64	0.144
82	600D826F075DJ4	0.375 x 1.626 [9.53 x 41.3]	1.82	0.187
120	600D127F075DL4	0.375 x 2.185 [9.53 x 55.5]	1.227	0.261
150	600D157F075DX4	0.375 x 2.685 [9.53 x 68.2]	1.00	0.399

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ELECTRICAL DATA AND ORDERING INFORMATION				
CAPACITANCE (µF)	PART NUMBER	NOMINAL CASE SIZE D x L	MAX. ESR AT +25 °C 120 Hz	MAX. RIPPLE AT +125 °C 120 Hz
100 WV_{DC} AT +85 °C . . . 75 WV_{DC} AT +125 °C				
6.8	600D685F100KD4	0.281 x 0.937 [7.14 x 23.8]	22.5	0.036
22	600D226F100DD4	0.375 x 0.937 [9.53 x 23.8]	6.75	0.077
27	600D276F100DE4	0.375 x 1.126 [9.53 x 28.6]	5.625	0.091
39	600D396F100DG4	0.375 x 1.378 [9.53 x 35.0]	3.857	0.12
56	600D566F100DJ4	0.375 x 1.626 [9.53 x 41.3]	2.64	0.156
82	600D826F100DL4	0.375 x 2.185 [9.53 x 55.5]	1.824	0.215
120	600D127F100DX4	0.375 x 2.685 [9.53 x 68.2]	1.27	0.91
150 WV_{DC} AT +85 °C . . . 100 WV_{DC} AT +125 °C				
3.3	600D335F150KD4	0.281 x 0.937 [7.14 x 23.8]	38.30	0.028
6.8	600D685F150DD4	0.375 x 0.937 [9.53 x 23.8]	19.16	0.046
12	600D126F150DE4	0.375 x 1.126 [9.53 x 28.6]	10.5	0.066
18	600D186F150DG4	0.375 x 1.378 [9.53 x 35.0]	6.85	0.09
22	600D226F150DJ4	0.375 x 1.626 [9.53 x 41.3]	5.75	0.106
33	600D336F150DL4	0.375 x 2.185 [9.53 x 55.5]	3.83	0.148
47	600D476F150DX4	0.375 x 2.685 [9.53 x 68.2]	2.61	0.197
200 WV_{DC} AT +85 °C . . . 150 WV_{DC} AT +125 °C				
3.3	600D335F200KD4	0.281 x 0.937 [7.14 x 23.8]	38.30	0.028
6.8	600D685F200DD4	0.375 x 0.937 [9.53 x 23.8]	19.16	0.046
8.2	600D825F200DE4	0.375 x 1.126 [9.53 x 28.6]	15.50	0.055
12	600D126F200DG4	0.375 x 1.378 [9.53 x 35.0]	10.50	0.073
18	600D186F200DJ4	0.375 x 1.626 [9.53 x 41.3]	6.78	0.098
27	600D276F200DL4	0.375 x 2.185 [9.53 x 55.5]	4.790	0.132
33	600D336F200DX4	0.375 x 2.685 [9.53 x 68.2]	3.830	0.162
250 WV_{DC} AT +85 °C . . . 200 WV_{DC} AT +125 °C				
2.2	600D225F250KD4	0.281 x 0.937 [7.14 x 23.8]	57.50	0.023
5.6	600D565F250DD4	0.375 x 0.937 [9.53 x 23.8]	23.10	0.042
6.8	600D685F250DE4	0.375 x 1.126 [9.53 x 28.6]	19.16	0.05
10	600D106F250DG4	0.375 x 1.378 [9.53 x 35.0]	12.70	0.066
15	600D156F250DJ4	0.375 x 1.626 [9.53 x 41.3]	8.23	0.088
22	600D226F250DL4	0.375 x 2.185 [9.53 x 55.5]	5.75	0.121
27	600D276F250DX4	0.375 x 2.685 [9.53 x 68.2]	4.79	0.146

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ELECTRICAL DATA AND ORDERING INFORMATION - original ratings [1]		
CAPACITANCE (µF)	CASE CODE	PART NUMBER
7 WV_{DC} AT +85 °C . . . 5 WV_{DC} AT +125 °C		
220	DD	600D227G007DD4
270	DE	600D277G007DE4
390	DG	600D397G007DG4
560	DJ	600D567G007DJ4
820	DL	600D827G007DL4
1000	DX	600D108G007DX4
10 WV_{DC} AT +85 °C . . . 7 WV_{DC} AT +125 °C		
100	KD	600D107G010KD4
180	DD	600D187G010DD4
220	DE	600D227G010DE4
330	DG	600D337G010DG4
470	DJ	600D477G010DJ4
680	DL	600D687G010DL4
820	DX	600D827G010DX4
15 WV_{DC} AT +85 °C . . . 10 WV_{DC} AT +125 °C		
68	KD	600D686G015KD4
82	KD	600D826G015KD4
150	DD	600D157G015DD4
180	DE	600D187G015DE4
270	DG	600D277G015DG4
390	DJ	600D397G015DJ4
560	DL	600D567G015DL4
680	DX	600D687G015DX4
20 WV_{DC} AT +85 °C . . . 15 WV_{DC} AT +125 °C		
68	KD	600D686G020KD4
100	DD	600D107G020DD4
220	DG	600D227G020DG4
30 WV_{DC} AT +85 °C . . . 20 WV_{DC} AT +125 °C		
33	KD	600D336G030KD4
47	KD	600D476G030KD4
82	DD	600D826G030DD4
100	DE	600D107G030DE4
120	DG	600D127G030DG4
150	DG	600D157G030DG4
220	DJ	600D227G030DJ4
330	DL	600D337G030DL4
390	DX	600D397G030DX4
40 WV_{DC} AT +85 °C . . . 30 WV_{DC} AT +125 °C		
50	DD	600D506G040DD4
70	DE	600D706G040DE4
100	DG	600D107G040DG4
140	DJ	600D147G040DJ4
210	DL	600D217G040DL4
50 WV_{DC} AT +85 °C . . . 40 WV_{DC} AT +125 °C		
22	KD	600D226G050KD4
33	DD	600D336G050DD4
47	DE	600D476G050DE4
56	DG	600D566G050DG4
68	DG	600D686G050DG4
100	DJ	600D107G050DJ4
150	DL	600D157G050DL4

Note

[1] Type 600D original ratings are recommended for replacement applications only.

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ELECTRICAL DATA AND ORDERING INFORMATION - original ratings (1)		
CAPACITANCE (µF)	CASE CODE	PART NUMBER
60 WV_{DC} AT +85 °C . . . 50 WV_{DC} AT +125 °C		
17	KD	600D176G060KD4
80	DJ	600D806G060DJ4
75 WV_{DC} AT +85 °C . . . 60 WV_{DC} AT +125 °C		
12	KD	600D126F075KD4
22	DD	600D226F075DD4
33	DE	600D336F075DE4
47	DG	600D476F075DG4
68	DJ	600D686F075DJ4
100	DL	600D107F075DL4
120	DX	600D127F075DX4
100 WV_{DC} AT +85 °C . . . 75 WV_{DC} AT +125 °C		
8.2	KD	600D825F100KD4
12	DD	600D126F100DD4
15	DE	600D156F100DE4
22	DG	600D226F100DG4
33	DJ	600D336F100DJ4
47	DL	600D476F100DL4
68	DX	600D686F100DX4
150 WV_{DC} AT +85 °C . . . 100 WV_{DC} AT +125 °C		
4.7	KD	600D475F150KD4
5.6	KD	600D565F150KD4
8.2	DD	600D825F150DD4
12	DE	600D126F150DE4
18	DG	600D186F150DG4
22	DJ	600D226F150DJ4
33	DL	600D336F150DL4
56	DX	600D566F150DX4
200 WV_{DC} AT +85 °C . . . 150 WV_{DC} AT +125 °C		
3.3	KD	-
3.9	KD	-
5.6	DD	-
8	DE	600D805F200DE4
8.2	DE	-
12	DG	-
15	DJ	-
27	DL	-
39	DX	600D396F200DX4
250 WV_{DC} AT +85 °C . . . 200 WV_{DC} AT +125 °C		
2.2	KD	-
3.3	KD	600D335F250KD4
5.6	DD	600D565F250DD4
6.8	DE	600D685F250DE4
10	DG	600D106F250DG4
12	DJ	600D126F250DJ4
22	DL	600D226F250DL4
27	DX	600D276F250DX4

Note

(1) Type 600D original ratings are recommended for replacement applications only.

Statements about product lifetime are based on calculations and internal testing. They should only be interpreted as estimations. Also due to external factors, the lifetime in the field application may deviate from the calculated lifetime. In general, nothing stated herein shall be construed as a guarantee of durability.

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