Aluminum Capacitors
Miniature, Axial Lead, High Reliability

FEATURES

- Wide temperature range
- Foil tantalum replacement
- Unique Teflon end seal for long life
- High vibration capability
- Life test 2000 h at + 125 °C
- 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	0 WV_{DC} to 75 WV_{DC} $I = 0.15 \sqrt{CV}$ I in µA, C in µF, V in Volts 100 WV_{DC} to 250 WV_{DC} $I = 0.15 \sqrt{CV} + 5$

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])

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

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
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	600D226F020DE4	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

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

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.

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.

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