

Wet Tantalum Capacitors, Wet Sintered Anode TANTALEX[®] Components TANTAPAK[®] Capacitor Assemblies



FEATURES

- Assembly of silver case capacitors
- 200D, case negative, 5 "A" case codes
- 202D
 - Both terminations isolated from case, 12 case codes
 - Similar to Tansitor RW & Mallory TL assemblies
 - Designed to meet MIL-DTL-3965 and DLA 04021 requirements

APPLICATIONS

- Military
- Industrial

PERFORMANCE CHARACTERISTICS

Operating Temperature: -55 °C to +125 °C

Capacitance Tolerance: at 120 Hz, +25 °C
± 20 % standard, ± 10 % available

DC Leakage Current (DCL Max.): at +25 °C

Life Test: capacitors shall withstand 2000 h at a temperature of +85 °C or +125 °C at the rated DC working voltage.

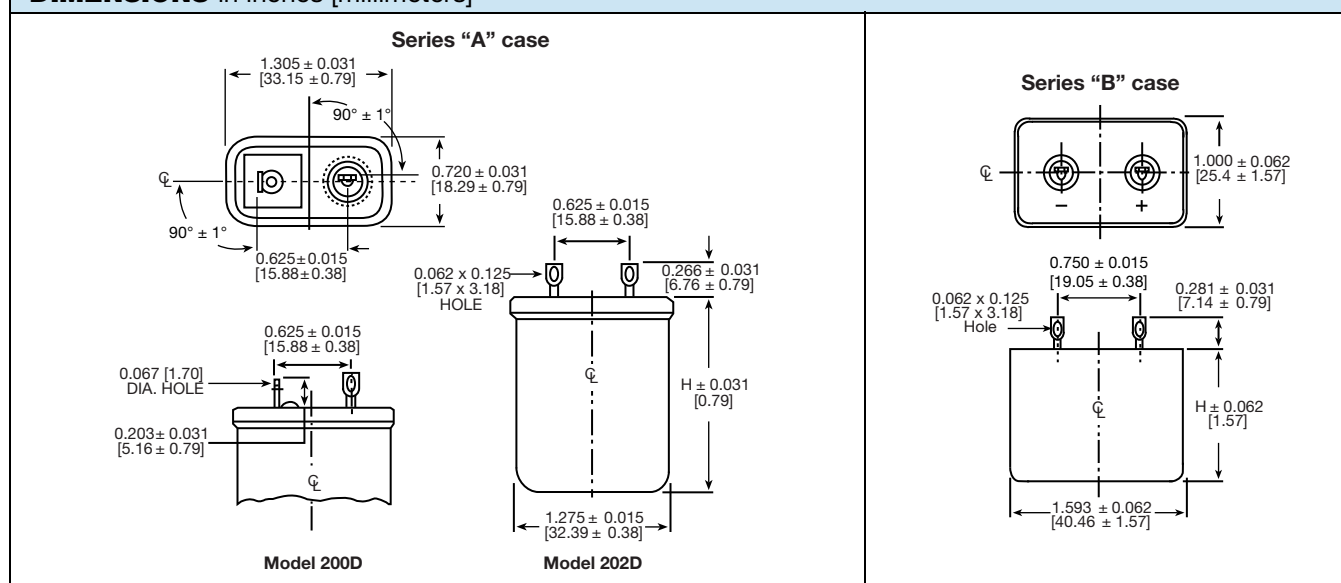
Following the life test:

1. DCL shall not exceed the original requirement.
2. ESR shall not be more than 130 % of the initial requirement.
3. Capacitance shall not change more than ± 25 %.

ORDERING INFORMATION

202D MODEL	318 CAPACITANCE	X0 CAPACITANCE TOLERANCE	006 DC VOLTAGE RATING AT +85 °C	A1 CASE CODE
200D = negative terminal connected to case (Available only in "A" cases) 202D = both terminals insulated from case	This is expressed in picofarads. The first two digits are the significant figures. The third is the number of zeros to follow.	X0 = ± 20 % X9 = ± 10 %	This is expressed in volts. To complete the three-digit block, zeros precede the voltage rating.	See Dimensional Configurations

DIMENSIONS in inches [millimeters]



**DIMENSIONS** in inches [millimeters]

CASE CODE	H CASE HEIGHT	TYPICAL WEIGHT (g)
A1	1.062 [26.97]	45
A2	1.375 [34.93]	60
A3	1.625 [41.28]	80
A4	2.000 [50.80]	100
A5	2.500 [63.50]	125
B1	1.500 [38.10]	170
B2	1.875 [47.63]	210
B3	2.250 [57.15]	250
B4	2.625 [66.68]	290
B5	3.000 [76.20]	335
B6	3.375 [85.73]	380
B7	3.750 [95.25]	420

RATINGS AND CASE CODES TYPE 200D (Standard)

μF	15 V	20 V	25 V	30 V	35 V	40 V	50 V	60 V	75 V	85 V	100 V	125 V	150 V
70													A1
90													A2
100													A3
140													A4
170											A1	A1	
180													A5
220											A2	A2	
260											A1 / A3		
270									A1				
280										A1		A3	
330									A2				
340												A4	
350											A2 / A4		
370										A2			
400							A1		A1 / A3				
410								A1					
430							A1						
440											A3 / A5		
470										A3			
490							A1						
500							A2						
520				A1									
530									A2		A4		
550								A2					
570										A4			
600						A1	A3		A4				
660				A2			A2		A3 / A5				
680								A3					
700											A5		
720					A1								
750										A5			
790									A4				
800						A2	A4						

**RATINGS AND CASE CODES TYPE 200D (Standard)**

μF	15 V	20 V	25 V	30 V	35 V	40 V	50 V	60 V	75 V	85 V	100 V	125 V	150 V
820				A3			A3	A4					
900				A1									
960	A1				A2								
980							A4						
1000						A3	A5						
1100			A1					A5	A5				
1200	A2			A2 / A4	A3	A4							
1300		A1		A5			A5						
1400	A3		A2		A4								
1500				A3									
1600	A1					A5							
1700		A2											
1800			A3	A4									
1900					A5								
2100	A2 / A4												
2200		A3	A4										
2400	A5			A5									
2700	A3	A4											
2900			A5										
3200	A4												
3500		A5											
4300	A5												

RATINGS AND CASE CODES TYPE 200D (Extended)

μF	6 V	8 V	10 V	15 V	20 V	25 V	30 V	35 V	40 V	50 V	60 V	75 V
650												A1
800											A1	
820												A2
960										A1		
980												A3
1000											A2	
1200									A1	A2	A3	
1300												A4
1400								A1		A3		
1500									A2			
1600											A4	A5
1800							A1	A2	A3			
1900										A4		
2000											A5	
2200						A1	A2	A3				
2400									A4	A5		
2600					A1		A3					
2700						A2						
2900								A4				
3000									A5			
3100				A1								
3200							A3					
3300					A2							
3500							A4					



RATINGS AND CASE CODES TYPE 200D (Extended)												
μF	6 V	8 V	10 V	15 V	20 V	25 V	30 V	35 V	40 V	50 V	60 V	75 V
3600								A5				
3900				A2								
4000					A3							
4300						A4						
4400							A5					
4500			A1									
4700				A3								
5300					A4							
5400		A1				A5						
5600			A2									
6200				A4								
6600	A1				A5							
6800		A2	A3									
7800				A5								
8200	A2	A3										
9000			A4									
9900	A3											
11 000		A4	A5									
13 000	A4											
14 000		A5										

RATINGS AND CASE CODES TYPE 202D (Standard)													
μF	15 V	20 V	25 V	30 V	35 V	40 V	50 V	60 V	75 V	85 V	100 V	125 V	150 V
70													A1
90													A2
100													A3
140													A4
170											A1	A1	
180													A5
220											A2	A2	
260											A1 / A3		
270									A1				
280										A1		A3	
330									A2				
340												A4 / B1	
350											A2 / A4		
370										A2			
400							A1		A1 / A3				
410								A1					
430							A1						
440											A3 / A5		
470										A3			
490							A1						
500							A2						
510											B1		
520				A1									
530									A2		A4		
550								A2					
560												B3	



RATINGS AND CASE CODES TYPE 202D (Standard)													
μF	15 V	20 V	25 V	30 V	35 V	40 V	50 V	60 V	75 V	85 V	100 V	125 V	150 V
570										A4			
600						A1	A3		A4	B1			
660				A2			A2		A3 / A5				
670												B4	
680								A3			B2		
700											A5		
720					A1				B1				
750										A5			
790									A4			B5	
800						A2	A4			B2			
820				A3			A3	A4					
850											B3		
900				A1				B1				B6	
960	A1				A2				B2				
980							A4						
1000						A3	A5			B3	B4	B7	
1100			A1				B1	A5	A5				
1200	A2			A2 / A4	A3	A4		B2	B3	B4	B5		
1300		A1		A5		B1	A5						
1400	A3		A2		A4		B2		B4	B5	B6		
1500				A3				B3			B7		
1600	A1				B1	A5				B6			
1700		A2							B5				
1800			A3	A4		B2	B3	B4		B7			
1900					A5				B6				
2000				B1									
2100	A2 / A4							B5					
2200		A3	A4		B2	B3	B4		B7				
2300			B1										
2400	A5			A5				B6					
2500							B5						
2600				B2		B4							
2700	A3	A4			B3			B7					
2800		B1											
2900			A5				B6						
3100			B2			B5							
3200	A4				B4		B7						
3300	B1			B3									
3500		A5				B6							
3800		B2			B5								
3900			B3										
4000				B4		B7							
4300	A5				B6								
4500	B2												
4600				B5									
4700		B3	B4										
4900					B7								
5300				B6									
5500			B5										



RATINGS AND CASE CODES TYPE 202D (Standard)													
μF	15 V	20 V	25 V	30 V	35 V	40 V	50 V	60 V	75 V	85 V	100 V	125 V	150 V
5600	B3	B4											
6000				B7									
6200			B6										
6600		B5											
6700	B4												
7000			B7										
7500		B6											
7800	B5												
8500		B7											
9000	B6												
10 000	B7												

RATINGS AND CASE CODES TYPE 202D (Extended)												
μF	6 V	8 V	10 V	15 V	20 V	25 V	30 V	35 V	40 V	50 V	60 V	75 V
650												A1
800											A1	
820												A2
960										A1		
980												A3
1000											A2	
1200									A1	A2	A3	
1300												A4
1400								A1		A3		
1500									A2			
1600											A4	A5
1800							A1	A2	A3			
1900										A4		
2000											A5	
2200						A1	A2	A3				
2400									A4	A5		
2600					A1		A3					
2700						A2						
2900								A4				
3000									A5			
3100				A1								
3200						A3						
3300					A2							
3500							A4					
3600								A5				
3900				A2				B1				
4000					A3							
4300						A4						
4400							A5					
4500			A1									
4700				A3								
5300					A4							
5400		A1				A5						
5500								B2				
5600			A2									

**RATINGS AND CASE CODES TYPE 202D (Extended)**

μF	6 V	8 V	10 V	15 V	20 V	25 V	30 V	35 V	40 V	50 V	60 V	75 V
6200				A4								
6560				B1								
6600	A1				A5							
6800		A2	A3									
7000								B3				
7800				A5								
8200	A2	A3										
8600								B4				
9000			A4									
9600		B1	B1									
9900	A3											
10 000								B5				
11 000		A4	A5									
12 000	B1	B2						B6				
13 000	A4							B7				
14 000		A5										
15 000	A5											

RATINGS AND CASE CODES TYPE DLA 04021

μF	15 V	30 V	50 V	75 V	100 V	150 V
70						A1
90						A2
100						A3
140						A4
170					A1	
180						A5
220					A2	
260					A3	
270				A1		
330				A2		
350					A4	
400			A1	A3		
430			A1			
440					A5	
500			A2			
520		A1				
600			A3	A4		
660		A2		A5		
800			A4			
820		A3				
960	A1					
1000			A5			
1200	A2	A4				
1300		A5				
1400	A3					
2100	A4					
2400	A5					



STANDARD RATINGS TYPE 200D					
CAPACITANCE (μ F)	CASE CODE	PART NUMBER ⁽¹⁾	MAX. ESR AT +25 °C (Ω)	MAX. IMP. AT -55 °C (Ω)	MAX. RMS RIPPLE 120 Hz (A)
15 V_{DC} AT +85 °C; 10 V_{DC} AT +125 °C					
960	A1	200D967X0015A1	0.25	3.1	1.17
1200	A2	200D128X0015A2	0.21	2.3	1.45
1400	A3	200D148X0015A3	0.18	1.7	1.67
1600	A1	200D168X0015A1	0.25	4.2	1.20
2100	A2	200D218X0015A2	0.19	3.1	1.52
2100	A4	200D218X0015A4	0.12	1.3	2.22
2400	A5	200D248X0015A5	0.10	1.15	2.66
2700	A3	200D278X0015A3	0.15	2.5	1.83
3200	A4	200D328X0015A4	0.13	2.1	2.13
4300	A5	200D438X0015A5	0.095	1.6	2.73
20 V_{DC} AT +85 °C; 13 V_{DC} AT +125 °C					
1300	A1	200D138X0020A1	0.25	5.0	1.20
1700	A2	200D178X0020A2	0.19	3.8	1.52
2200	A3	200D228X0020A3	0.15	3.0	1.83
2700	A4	200D278X0020A4	0.13	2.5	2.13
3500	A5	200D358X0020A5	0.094	1.9	2.75
25 V_{DC} AT +85 °C; 15 V_{DC} AT +125 °C					
1100	A1	200D118X0025A1	0.30	5.3	1.10
1400	A2	200D148X0025A2	0.23	4.0	1.38
1800	A3	200D188X0025A3	0.18	3.2	1.67
2200	A4	200D228X0025A4	0.15	2.7	1.98
2900	A5	200D298X0025A5	0.11	2.0	2.54
30 V_{DC} AT +85 °C; 20 V_{DC} AT +125 °C					
520	A1	200D527X0030A1	0.48	5.3	0.87
660	A2	200D667X0030A2	0.38	4.2	1.08
820	A3	200D827X0030A3	0.31	2.9	1.27
900	A1	200D907X0030A1	0.37	5.8	0.99
1200	A2	200D128X0030A2	0.27	4.4	1.28
1200	A4	200D128X0030A4	0.21	2.3	1.68
1300	A5	200D138X0030A5	0.19	2.1	1.93
1500	A3	200D158X0030A3	0.22	3.5	1.50
1800	A4	200D188X0030A4	0.18	2.9	1.81
2400	A5	200D248X0030A5	0.14	2.2	2.25
35 V_{DC} AT +85 °C; 22 V_{DC} AT +125 °C					
720	A1	200D727X0035A1	0.37	6.3	0.99
960	A2	200D967X0035A2	0.27	4.7	1.28
1200	A3	200D128X0035A3	0.22	3.8	1.51
1400	A4	200D148X0035A4	0.18	3.2	1.81
1900	A5	200D198X0035A5	0.14	2.4	2.25
40 V_{DC} AT +85 °C; 25 V_{DC} AT +125 °C					
600	A1	200D607X0040A1	0.33	6.7	1.04
800	A2	200D807X0040A2	0.25	5.0	1.33
1000	A3	200D108X0040A3	0.20	4.0	1.58
1200	A4	200D128X0040A4	0.17	3.3	1.86
1600	A5	200D168X0040A5	0.13	2.5	2.34
50 V_{DC} AT +85 °C; 35 V_{DC} AT +125 °C					
400	A1	200D407X0050A1	0.50	7.2	0.85
430	A1	200D437X0050A1	0.58	6.4	0.79
490	A1	200D497X0050A1	0.33	7.2	1.04
500	A2	200D507X0050A2	0.40	5.6	1.05
600	A3	200D607X0050A3	0.33	4.1	1.23
660	A2	200D667X0050A2	0.25	5.4	1.33
800	A4	200D807X0050A4	0.25	3.1	1.54
820	A3	200D827X0050A3	0.20	4.3	1.58
980	A4	200D987X0050A4	0.17	3.6	1.86
1000	A5	200D108X0050A5	0.25	2.8	2.84
1300	A5	200D138X0050A5	0.13	2.7	2.34

Note

⁽¹⁾ The part numbers listed are for ± 20 % tolerance. To specify ± 10 % tolerance, change the digit following "X" from "0" to "9".
For requirements or ratings other than those listed, please contact a Vishay representative.



STANDARD RATINGS TYPE 200D					
CAPACITANCE (μ F)	CASE CODE	PART NUMBER ⁽¹⁾	MAX. ESR AT +25 °C (Ω)	MAX. IMP. AT -55 °C (Ω)	MAX. RMS RIPPLE 120 Hz (A)
60 V_{DC} AT +85 °C; 40 V_{DC} AT +125 °C					
410	A1	200D417X0060A1	0.33	7.5	1.04
550	A2	200D557X0060A2	0.25	5.6	1.33
680	A3	200D687X0060A3	0.20	4.5	1.58
820	A4	200D827X0060A4	0.17	3.7	1.86
1100	A5	200D118X0060A5	0.13	2.8	2.34
75 V_{DC} AT +85 °C; 50 V_{DC} AT +125 °C					
270	A1	200D277X0075A1	0.56	8.5	0.80
330	A2	200D337X0075A2	0.46	7.0	0.98
400	A1	200D407X0075A1	0.26	7.5	1.18
400	A3	200D407X0075A3	0.38	5.0	1.15
530	A2	200D537X0075A2	0.20	5.6	1.48
660	A3	200D667X0075A3	0.16	4.5	1.77
600	A4	200D607X0075A4	0.25	3.65	1.54
660	A5	200D667X0075A5	0.23	3.5	1.76
790	A4	200D797X0075A4	0.13	3.7	2.13
1100	A5	200D118X0075A5	0.096	2.8	2.72
85 V_{DC} AT +85 °C; 60 V_{DC} AT +125 °C					
280	A1	200D287X0085A1	0.33	9.2	1.04
370	A2	200D377X0085A2	0.25	6.9	1.33
470	A3	200D477X0085A3	0.20	5.5	1.58
570	A4	200D577X0085A4	0.17	4.6	1.86
750	A5	200D757X0085A5	0.13	3.4	2.34
100 V_{DC} AT +85 °C; 70 V_{DC} AT +125 °C					
170	A1	200D177X0100A1	0.94	15.0	0.62
220	A2	200D227X0100A2	0.72	11.6	0.78
260	A1	200D267X0100A1	0.40	8.3	0.95
260	A3	200D267X0100A3	0.61	8.0	0.91
350	A2	200D357X0100A2	0.30	6.2	1.21
350	A4	200D357X0100A4	0.45	6.5	1.15
440	A3	200D447X0100A3	0.24	5.0	1.44
440	A5	200D447X0100A5	0.36	5.8	1.40
530	A4	200D537X0100A4	0.20	4.2	1.72
700	A5	200D707X0100A5	0.15	3.1	2.18
125 V_{DC} AT +85 °C; 80 V_{DC} AT +125 °C					
170	A1	200D177X0125A1	0.40	15.0	0.95
220	A2	200D227X0125A2	0.30	12.0	1.21
280	A3	200D287X0125A3	0.24	9.0	1.44
340	A4	200D347X0125A4	0.20	7.5	1.72
150 V_{DC} AT +85 °C; 100 V_{DC} AT +125 °C					
70	A1	200D706X0150A1	2.27	28.8	0.40
90	A2	200D906X0150A2	1.77	22.4	0.50
100	A3	200D107X0150A3	1.59	16.4	0.56
140	A4	200D147X0150A4	1.14	12.4	0.72
180	A5	200D187X0150A5	0.88	11.2	0.90

Note

⁽¹⁾ The part numbers listed are for ± 20 % tolerance. To specify ± 10 % tolerance, change the digit following "X" from "0" to "9".
For requirements or ratings other than those listed, please contact a Vishay representative.

**STANDARD RATINGS TYPE 202D**

CAPACITANCE (μ F)	CASE CODE	PART NUMBER ⁽¹⁾	MAX. ESR AT +25 °C (Ω)	MAX. IMP. AT -55 °C (Ω)	MAX. RMS RIPPLE 120 Hz (A)
15 V_{DC} AT +85 °C; 10 V_{DC} AT +125 °C					
960	A1	202D967X0015A1	0.25	3.1	1.17
1200	A2	202D128X0015A2	0.21	2.3	1.45
1400	A3	202D148X0015A3	0.18	1.7	1.67
1600	A1	202D168X0015A1	0.25	4.2	1.20
2100	A2	202D218X0015A2	0.19	3.1	1.52
2100	A4	202D218X0015A4	0.12	1.3	2.22
2400	A5	202D248X0015A5	0.10	1.15	2.66
2700	A3	202D278X0015A3	0.15	2.5	1.83
3200	A4	202D328X0015A4	0.13	2.1	2.13
3300	B1	202D338X0015B1	0.14	3.2	2.17
4300	A5	202D438X0015A5	0.095	1.6	2.73
4500	B2	202D458X0015B2	0.11	2.4	2.65
5600	B3	202D568X0015B3	0.085	1.9	3.24
6700	B4	202D678X0015B4	0.070	1.6	3.80
7800	B5	202D788X0015B5	0.061	1.4	4.28
9000	B6	202D908X0015B6	0.053	1.2	4.84
10 000	B7	202D109X0015B7	0.047	1.1	5.38
20 V_{DC} AT +85 °C; 13 V_{DC} AT +125 °C					
1300	A1	202D138X0020A1	0.25	5.0	1.20
1700	A2	202D178X0020A2	0.19	3.8	1.52
2200	A3	202D228X0020A3	0.15	3.0	1.83
2700	A4	202D278X0020A4	0.13	2.5	2.13
2800	B1	202D288X0020B1	0.14	3.3	2.17
3500	A5	202D358X0020A5	0.094	1.9	2.75
3800	B2	202D388X0020B2	0.11	2.5	2.65
4700	B3	202D478X0020B3	0.085	2.0	3.24
5600	B4	202D568X0020B4	0.071	1.7	3.77
6600	B5	202D668X0020B5	0.061	1.4	4.28
7500	B6	202D758X0020B6	0.053	1.3	4.84
8500	B7	202D858X0020B7	0.047	1.1	5.38
25 V_{DC} AT +85 °C; 15 V_{DC} AT +125 °C					
1100	A1	202D118X0025A1	0.30	5.3	1.10
1400	A2	202D148X0025A2	0.23	4.0	1.38
1800	A3	202D188X0025A3	0.18	3.2	1.67
2200	A4	202D228X0025A4	0.15	2.7	1.98
2300	B1	202D238X0025B1	0.14	3.5	2.17
2900	A5	202D298X0025A5	0.11	2.0	2.54
3100	B2	202D318X0025B2	0.11	2.6	2.65
3900	B3	202D398X0025B3	0.085	2.1	3.24
4700	B4	202D478X0025B4	0.071	1.8	3.77
5500	B5	202D558X0025B5	0.061	1.5	4.28
6200	B6	202D628X0025B6	0.053	1.3	4.84
7000	B7	202D708X0025B7	0.047	1.2	5.38

Note

⁽¹⁾ The part numbers listed are for ± 20 % tolerance. To specify ± 10 % tolerance, change the digit following "X" from "0" to "9".
For requirements or ratings other than those listed, please contact a Vishay representative.

**STANDARD RATINGS TYPE 202D**

CAPACITANCE (μ F)	CASE CODE	PART NUMBER ⁽¹⁾	MAX. ESR AT +25 °C (Ω)	MAX. IMP. AT -55 °C (Ω)	MAX. RMS RIPPLE 120 Hz (A)
30 V_{DC} AT +85 °C; 20 V_{DC} AT +125 °C					
520	A1	202D527X0030A1	0.48	5.3	0.87
660	A2	202D667X0030A2	0.38	4.2	1.08
820	A3	202D827X0030A3	0.31	2.9	1.27
900	A1	202D907X0030A1	0.37	5.8	0.99
1200	A2	202D128X0030A2	0.27	4.4	1.28
1200	A4	202D128X0030A4	0.21	2.3	1.68
1300	A5	202D138X0030A5	0.19	2.1	1.93
1500	A3	202D158X0030A3	0.22	3.5	1.50
1800	A4	202D188X0030A4	0.18	2.9	1.81
2000	B1	202D208X0030B1	0.17	1.7	1.97
2400	A5	202D248X0030A5	0.14	2.2	2.25
2600	B2	202D268X0030B2	0.13	2.8	2.43
3300	B3	202D338X0030B3	0.10	2.2	2.98
4000	B4	202D408X0030B4	0.085	1.8	3.45
4600	B5	202D468X0030B5	0.073	1.6	3.92
5300	B6	202D538X0030B6	0.064	1.4	4.40
6000	B7	202D608X0030B7	0.057	1.2	4.88
35 V_{DC} AT +85 °C; 22 V_{DC} AT +125 °C					
720	A1	202D727X0035A1	0.37	6.3	0.99
960	A2	202D967X0035A2	0.27	4.7	1.28
1200	A3	202D128X0035A3	0.22	3.8	1.51
1400	A4	202D148X0035A4	0.18	3.2	1.81
1600	B1	202D168X0035B1	0.20	3.8	1.82
1900	A5	202D198X0035A5	0.14	2.4	2.25
2200	B2	202D228X0035B2	0.15	2.9	2.27
2700	B3	202D278X0035B3	0.12	2.3	2.72
3200	B4	202D328X0035B4	0.10	1.9	3.18
3800	B5	202D388X0035B5	0.085	1.6	3.63
4300	B6	202D438X0035B6	0.075	1.4	4.07
4900	B7	202D498X0035B7	0.067	1.3	4.51
40 V_{DC} AT +85 °C; 25 V_{DC} AT +125 °C					
600	A1	202D607X0040A1	0.33	6.7	1.04
800	A2	202D807X0040A2	0.25	5.0	1.33
1000	A3	202D108X0040A3	0.20	4.0	1.58
1200	A4	202D128X0040A4	0.17	3.3	1.86
1300	B1	202D138X0040B1	0.20	4.0	1.82
1600	A5	202D168X0040A5	0.13	2.5	2.34
1800	B2	202D188X0040B2	0.15	3.0	2.27
2200	B3	202D228X0040B3	0.12	2.4	2.72
2600	B4	202D268X0040B4	0.10	2.0	3.18
3100	B5	202D318X0040B5	0.086	1.7	3.61
3500	B6	202D358X0040B6	0.075	1.5	4.07
4000	B7	202D408X0040B7	0.057	1.3	4.51

Note

⁽¹⁾ The part numbers listed are for ± 20 % tolerance. To specify ± 10 % tolerance, change the digit following "X" from "0" to "9".
For requirements or ratings other than those listed, please contact a Vishay representative.

**STANDARD RATINGS TYPE 202D**

CAPACITANCE (μ F)	CASE CODE	PART NUMBER ⁽¹⁾	MAX. ESR AT +25 °C (Ω)	MAX. IMP. AT -55 °C (Ω)	MAX. RMS RIPPLE 120 Hz (A)
50 V_{DC} AT +85 °C; 35 V_{DC} AT +125 °C					
400	A1	202D407X0050A1	0.50	7.2	0.85
430	A1	202D437X0050A1	0.58	6.4	0.79
490	A1	202D497X0050A1	0.33	7.2	1.04
500	A2	202D507X0050A2	0.40	5.6	1.05
600	A3	202D607X0050A3	0.33	4.1	1.23
660	A2	202D667X0050A2	0.25	5.4	1.33
800	A4	202D807X0050A4	0.25	3.1	1.54
820	A3	202D827X0050A3	0.20	4.3	1.58
980	A4	202D987X0050A4	0.17	3.6	1.86
1000	A5	202D108X0050A5	0.25	2.8	2.84
1100	B1	202D118X0050B1	0.20	4.2	1.82
1300	A5	202D138X0050A5	0.13	2.7	2.34
1400	B2	202D148X0050B2	0.15	3.1	2.27
1800	B3	202D188X0050B3	0.12	2.5	2.72
2200	B4	202D228X0050B4	0.10	2.0	3.18
2500	B5	202D258X0050B5	0.086	1.8	3.61
2900	B6	202D298X0050B6	0.075	1.6	4.07
3200	B7	202D328X0050B7	0.067	1.4	4.51
60 V_{DC} AT +85 °C; 40 V_{DC} AT +125 °C					
410	A1	202D417X0060A1	0.33	7.5	1.04
550	A2	202D557X0060A2	0.25	5.6	1.33
680	A3	202D687X0060A3	0.20	4.5	1.58
820	A4	202D827X0060A4	0.17	3.7	1.86
900	B1	202D907X0060B1	0.22	4.3	1.73
1100	A5	202D118X0060A5	0.13	2.8	2.34
1200	B2	202D128X0060B2	0.16	3.3	2.19
1500	B3	202D158X0060B3	0.13	2.6	2.62
1800	B4	202D188X0060B4	0.11	2.2	3.03
2100	B5	202D218X0060B5	0.093	1.9	3.47
2400	B6	202D248X0060B6	0.081	1.6	3.9
2700	B7	202D278X0060B7	0.072	1.4	4.35
75 V_{DC} AT +85 °C; 50 V_{DC} AT +125 °C					
270	A1	202D277X0075A1	0.56	8.5	0.80
330	A2	202D337X0075A2	0.46	7.0	0.98
400	A1	202D407X0075A1	0.26	7.5	1.18
400	A3	202D407X0075A3	0.38	5.0	1.15
530	A2	202D537X0075A2	0.20	5.6	1.48
660	A3	202D667X0075A3	0.16	4.5	1.77
600	A4	202D607X0075A4	0.25	3.65	1.54
660	A5	202D667X0075A5	0.23	3.5	1.76
790	A4	202D797X0075A4	0.13	3.7	2.13
720	B1	202D727X0075B1	0.28	4.5	1.54
960	B2	202D967X0075B2	0.21	3.4	1.91
1100	A5	202D118X0075A5	0.096	2.8	2.72
1200	B3	202D128X0075B3	0.17	2.7	2.29
1400	B4	202D148X0075B4	0.14	2.1	2.69
1700	B5	202D178X0075B5	0.12	1.9	3.06
1900	B6	202D198X0075B6	0.11	1.7	3.36
2200	B7	202D228X0075B7	0.095	1.5	3.78

Note

⁽¹⁾ The part numbers listed are for ± 20 % tolerance. To specify ± 10 % tolerance, change the digit following "X" from "0" to "9".
For requirements or ratings other than those listed, please contact a Vishay representative.

**STANDARD RATINGS TYPE 202D**

CAPACITANCE (μ F)	CASE CODE	PART NUMBER ⁽¹⁾	MAX. ESR AT +25 °C (Ω)	MAX. IMP. AT -55 °C (Ω)	MAX. RMS RIPPLE 120 Hz (A)
85 V_{DC} AT +85 °C; 60 V_{DC} AT +125 °C					
280	A1	202D287X0085A1	0.33	9.2	1.04
370	A2	202D377X0085A2	0.25	6.9	1.33
470	A3	202D477X0085A3	0.20	5.5	1.58
570	A4	202D577X0085A4	0.17	4.6	1.86
600	B1	202D607X0085B1	0.28	4.7	1.54
750	A5	202D757X0085A5	0.13	3.4	2.34
800	B2	202D807X0085B2	0.21	3.5	1.91
1000	B3	202D108X0085B3	0.17	2.8	2.29
1200	B4	202D128X0085B4	0.14	2.4	2.69
1400	B5	202D148X0085B5	0.12	2.0	3.06
1600	B6	202D168X0085B6	0.11	1.8	3.36
1800	B7	202D188X0085B7	0.095	1.6	3.78
100 V_{DC} AT +85 °C; 70 V_{DC} AT +125 °C					
170	A1	202D177X0100A1	0.94	15.0	0.62
220	A2	202D227X0100A2	0.72	11.6	0.78
260	A1	202D267X0100A1	0.40	8.3	0.95
260	A3	202D267X0100A3	0.61	8.0	0.91
350	A2	202D357X0100A2	0.30	6.2	1.21
350	A4	202D357X0100A4	0.45	6.5	1.15
440	A3	202D447X0100A3	0.24	5.0	1.44
440	A5	202D447X0100A5	0.36	5.8	1.40
510	B1	202D517X0100B1	0.28	4.8	1.54
530	A4	202D537X0100A4	0.20	4.2	1.72
680	B2	202D687X0100B2	0.21	3.6	1.91
700	A5	202D707X0100A5	0.15	3.1	2.18
850	B3	202D857X0100B3	0.17	2.9	2.29
1000	B4	202D108X0100B4	0.14	2.4	2.69
1200	B5	202D128X0100B5	0.12	2.1	3.06
1400	B6	202D148X0100B6	0.11	1.8	3.36
1500	B7	202D158X0100B7	0.095	1.6	3.78
125 V_{DC} AT +85 °C; 80 V_{DC} AT +125 °C					
170	A1	202D177X0125A1	0.40	15.0	0.95
220	A2	202D227X0125A2	0.30	12.0	1.21
280	A3	202D287X0125A3	0.24	9.0	1.44
340	A4	202D347X0125A4	0.20	7.5	1.72
340	B1	202D347X0125B1	0.28	5.4	1.54
560	B3	202D567X0125B3	0.17	3.2	2.29
670	B4	202D677X0125B4	0.14	2.7	2.69
790	B5	202D797X0125B5	0.12	2.4	3.06
900	B6	202D907X0125B6	0.11	2.0	3.38
1000	B7	202D108X0125B7	0.095	1.8	3.78
150 V_{DC} AT +85 °C; 100 V_{DC} AT +125 °C					
70	A1	202D706X0150A1	2.27	28.8	0.40
90	A2	202D906X0150A2	1.77	22.4	0.50
100	A3	202D107X0150A3	1.59	16.4	0.56
140	A4	202D147X0150A4	1.14	12.4	0.72
180	A5	202D187X0150A5	0.88	11.2	0.90

Note

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EXTENDED RATINGS TYPE 200D					
CAPACITANCE (μ F)	CASE CODE	PART NUMBER	MAX. ESR AT +25 °C (Ω)	MAX. IMP. AT -55 °C (Ω)	MAX. RMS RIPPLE 120 Hz (A)
6 V_{DC} AT +85 °C; 4 V_{DC} AT +125 °C					
6600	A1	200D668X0006A1	0.28	2.3	1.13
8200	A2	200D828X0006A2	0.22	1.8	1.41
9900	A3	200D998X0006A3	0.18	1.5	1.67
13 000	A4	200D139X0006A4	0.14	1.1	2.05
8 V_{DC} AT +85 °C; 5 V_{DC} AT +125 °C					
5400	A1	200D548X0008A1	0.28	2.8	1.13
6800	A2	200D688X0008A2	0.22	2.2	1.41
8200	A3	200D828X0008A3	0.18	1.8	1.67
11000	A4	200D119X0008A4	0.14	1.4	2.05
14 000	A5	200D149X0008A5	0.11	1.1	2.35
10 V_{DC} AT +85 °C; 7 V_{DC} AT +125 °C					
4500	A1	200D458X0010A1	0.28	3.4	1.13
5600	A2	200D568X0010A2	0.22	2.7	1.41
6800	A3	200D688X0010A3	0.18	2.2	1.67
9000	A4	200D908X0010A4	0.14	1.7	2.05
11 000	A5	200D119X0010A5	0.11	1.4	2.35
15 V_{DC} AT +85 °C; 10 V_{DC} AT +125 °C					
3100	A1	200D318X0015A1	0.28	3.9	1.13
3900	A2	200D398X0015A2	0.22	3.1	1.41
4700	A3	200D478X0015A3	0.18	2.6	1.67
6200	A4	200D628X0015A4	0.14	1.9	2.05
7800	A5	200D788X0015A5	0.11	1.6	2.54
20 V_{DC} AT +85 °C; 13 V_{DC} AT +125 °C					
2600	A1	200D268X0020A1	0.28	3.9	1.13
3300	A2	200D338X0020A2	0.22	3.1	1.41
4000	A3	200D408X0020A3	0.18	2.6	1.67
5300	A4	200D538X0020A4	0.14	1.9	2.05
6600	A5	200D668X0020A5	0.11	1.6	2.54
25 V_{DC} AT +85 °C; 15 V_{DC} AT +125 °C					
2200	A1	200D228X0025A1	0.28	4.1	1.13
2700	A2	200D278X0025A2	0.22	3.3	1.41
3200	A3	200D328X0025A3	0.18	2.8	1.67
4300	A4	200D438X0025A4	0.14	2.1	2.05
5400	A5	200D548X0025A5	0.11	1.7	2.54
30 V_{DC} AT +85 °C; 20 V_{DC} AT +125 °C					
1800	A1	200D188X0030A1	0.28	4.5	1.13
2200	A2	200D228X0030A2	0.22	3.6	1.41
2600	A3	200D268X0030A3	0.18	3.0	1.67
3500	A4	200D358X0030A4	0.14	2.3	2.05
4400	A5	200D448X0030A5	0.11	1.8	2.54

Note

- (1) The part numbers listed are for ± 20 % tolerance. To specify ± 10 % tolerance, change the digit following "X" from "0" to "9".
For requirements or ratings other than those listed, please contact a Vishay representative.



EXTENDED RATINGS TYPE 200D					
CAPACITANCE (μ F)	CASE CODE	PART NUMBER	MAX. ESR AT +25 °C (Ω)	MAX. IMP. AT -55 °C (Ω)	MAX. RMS RIPPLE 120 Hz (A)
35 V_{DC} AT +85 °C; 22 V_{DC} AT +125 °C					
1400	A1	200D148X0035A1	0.28	5.1	1.13
1800	A2	200D188X0035A2	0.22	4.1	1.41
2200	A3	200D228X0035A3	0.18	3.4	1.67
2900	A4	200D298X0035A4	0.14	2.6	2.05
3600	A5	200D368X0035A5	0.11	2.1	2.54
40 V_{DC} AT +85 °C; 25 V_{DC} AT +125 °C					
1200	A1	200D128X0040A1	0.28	5.5	1.13
1500	A2	200D158X0040A2	0.22	4.4	1.41
1800	A3	200D188X0040A3	0.18	3.7	1.67
2400	A4	200D248X0040A4	0.14	2.8	2.05
3000	A5	200D308X0040A5	0.11	2.3	2.54
50 V_{DC} AT +85 °C; 35 V_{DC} AT +125 °C					
960	A1	200D967X0050A1	0.28	6.1	1.13
1200	A2	200D128X0050A2	0.22	4.9	1.14
1400	A3	200D148X0050A3	0.18	4.1	1.67
1900	A4	200D198X0050A4	0.14	3.1	2.05
2400	A5	200D248X0050A5	0.11	2.5	2.54
60 V_{DC} AT +85 °C; 40 V_{DC} AT +125 °C					
800	A1	200D807X0060A1	0.28	6.8	1.13
1000	A2	200D108X0060A2	0.22	5.4	1.41
1200	A3	200D128X0060A3	0.18	4.5	1.67
1600	A4	200D168X0060A4	0.14	3.4	2.05
2000	A5	200D208X0060A5	0.11	2.7	2.54
75 V_{DC} AT +85 °C; 50 V_{DC} AT +125 °C					
650	A1	200D657X0075A1	0.28	7.9	1.13
820	A2	200D827X0075A2	0.22	6.3	1.41
980	A3	200D987X0075A3	0.18	5.2	1.64
1300	A4	200D138X0075A4	0.14	3.9	2.05
1600	A5	200D168X0075A5	0.11	3.2	2.54

Note

- ⁽¹⁾ The part numbers listed are for ± 20 % tolerance. To specify ± 10 % tolerance, change the digit following "X" from "0" to "9".
For requirements or ratings other than those listed, please contact a Vishay representative.

**EXTENDED RATINGS TYPE 202D**

CAPACITANCE (μ F)	CASE CODE	PART NUMBER	MAX. ESR AT +25 °C (Ω)	MAX. IMP. AT -55 °C (Ω)	MAX. RMS RIPPLE 120 Hz (A)
6 V_{DC} AT +85 °C; 4 V_{DC} AT +125 °C					
6600	A1	202D668X0006A1	0.28	2.3	1.13
8200	A2	202D828X0006A2	0.22	1.8	1.41
9900	A3	202D998X0006A3	0.18	1.5	1.67
12 000	B1	202D129X0006B1	0.11	0.90	2.54
13 000	A4	202D139X0006A4	0.14	1.1	2.05
15 000	A5	202D159X0006A5	0.12	1.8	2.35
8 V_{DC} AT +85 °C; 5 V_{DC} AT +125 °C					
5400	A1	202D548X0008A1	0.28	2.8	1.13
6800	A2	202D688X0008A2	0.22	2.2	1.41
8200	A3	202D828X0008A3	0.18	1.8	1.67
9600	B1	202D968X0008B1	0.12	1.8	2.54
11000	A4	202D119X0008A4	0.14	1.4	2.05
12 000	B2	202D129X0008B2	0.086	1.3	2.99
14 000	A5	202D149X0008A5	0.11	1.1	2.35
10 V_{DC} AT +85 °C; 7 V_{DC} AT +125 °C					
4500	A1	202D458X0010A1	0.28	3.4	1.13
5600	A2	202D568X0010A2	0.22	2.7	1.41
6800	A3	202D688X0010A3	0.18	2.2	1.67
9000	A4	202D908X0010A4	0.14	1.7	2.05
9600	B1	202D968X0010B1	0.12	1.8	2.54
11 000	A5	202D119X0010A5	0.11	1.4	2.35
15 V_{DC} AT +85 °C; 10 V_{DC} AT +125 °C					
3100	A1	202D318X0015A1	0.28	3.9	1.13
3900	A2	202D398X0015A2	0.22	3.1	1.41
4700	A3	202D478X0015A3	0.18	2.6	1.67
6200	A4	202D628X0015A4	0.14	1.9	2.05
6560	B1	202D668X0015B1	0.16	2.2	2.03
7800	A5	202D788X0015A5	0.11	1.6	2.54
20 V_{DC} AT +85 °C; 13 V_{DC} AT +125 °C					
2600	A1	202D268X0020A1	0.28	3.9	1.13
3300	A2	202D338X0020A2	0.22	3.1	1.41
4000	A3	202D408X0020A3	0.18	2.6	1.67
5300	A4	202D538X0020A4	0.14	1.9	2.05
6600	A5	202D668X0020A5	0.11	1.6	2.54
25 V_{DC} AT +85 °C; 15 V_{DC} AT +125 °C					
2200	A1	202D228X0025A1	0.28	4.1	1.13
2700	A2	202D278X0025A2	0.22	3.3	1.41
3200	A3	202D328X0025A3	0.18	2.8	1.67
4300	A4	202D438X0025A4	0.14	2.1	2.05
5400	A5	202D548X0025A5	0.11	1.7	2.54
30 V_{DC} AT +85 °C; 20 V_{DC} AT +125 °C					
1800	A1	202D188X0030A1	0.28	4.5	1.13
2200	A2	202D228X0030A2	0.22	3.6	1.41
2600	A3	202D268X0030A3	0.18	3.0	1.67
3500	A4	202D358X0030A4	0.14	2.3	2.05
4400	A5	202D448X0030A5	0.11	1.8	2.54

Note

(1) The part numbers listed are for ± 20 % tolerance. To specify ± 10 % tolerance, change the digit following "X" from "0" to "9".
For requirements or ratings other than those listed, please contact a Vishay representative.



EXTENDED RATINGS TYPE 202D					
CAPACITANCE (μ F)	CASE CODE	PART NUMBER	MAX. ESR AT +25 °C (Ω)	MAX. IMP. AT -55 °C (Ω)	MAX. RMS RIPPLE 120 Hz (A)
35 V_{DC} AT +85 °C; 22 V_{DC} AT +125 °C					
1400	A1	202D148X0035A1	0.28	5.1	1.13
1800	A2	202D188X0035A2	0.22	4.1	1.41
2200	A3	202D228X0035A3	0.18	3.4	1.67
2900	A4	202D298X0035A4	0.14	2.6	2.05
3600	A5	202D368X0035A5	0.11	2.1	2.54
3900	B1	202D398X0035B1	0.16	2.7	2.03
5500	B2	202D558X0035B2	0.11	1.9	2.64
7000	B3	202D708X0035B3	0.089	1.5	3.16
8600	B4	202D868X0035B4	0.073	1.2	3.72
10 000	B5	202D109X0035B5	0.062	1.0	4.25
12 000	B6	202D129X0035B6	0.053	0.90	4.84
13 000	B7	202D139X0035B7	0.047	0.79	5.38
40 V_{DC} AT +85 °C; 25 V_{DC} AT +125 °C					
1200	A1	202D128X0040A1	0.28	5.5	1.13
1500	A2	202D158X0040A2	0.22	4.4	1.41
1800	A3	202D188X0040A3	0.18	3.7	1.67
2400	A4	202D248X0040A4	0.14	2.8	2.05
3000	A5	202D308X0040A5	0.11	2.3	2.54
50 V_{DC} AT +85 °C; 35 V_{DC} AT +125 °C					
960	A1	202D967X0050A1	0.28	6.1	1.13
1200	A2	202D128X0050A2	0.22	4.9	1.14
1400	A3	202D148X0050A3	0.18	4.1	1.67
1900	A4	202D198X0050A4	0.14	3.1	2.05
2400	A5	202D248X0050A5	0.11	2.5	2.54
60 V_{DC} AT +85 °C; 40 V_{DC} AT +125 °C					
800	A1	202D807X0060A1	0.28	6.8	1.13
1000	A2	202D108X0060A2	0.22	5.4	1.41
1200	A3	202D128X0060A3	0.18	4.5	1.67
1600	A4	202D168X0060A4	0.14	3.4	2.05
2000	A5	202D208X0060A5	0.11	2.7	2.54
75 V_{DC} AT +85 °C; 50 V_{DC} AT +125 °C					
650	A1	202D657X0075A1	0.28	7.9	1.13
820	A2	202D827X0075A2	0.22	6.3	1.41
980	A3	202D987X0075A3	0.18	5.2	1.64
1300	A4	202D138X0075A4	0.14	3.9	2.05
1600	A5	202D168X0075A5	0.11	3.2	2.54

Note

(1) The part numbers listed are for ± 20 % tolerance. To specify ± 10 % tolerance, change the digit following "X" from "0" to "9".
For requirements or ratings other than those listed, please contact a Vishay representative.

**04021 RATINGS AND CASE CODES**

DLA DRAWING 04021	CAPACITANCE (μF)	CASE CODE	MAX. DCL (μA)		MAX. IMPEDANCE (Ω)
			25 °C	85 °C AND 125 °C	
15 V _{DC} AT 85 °C RATED		17.2 V _{DC} AT 85 °C SURGE		10 V _{DC} AT 125 °C DERATED	
04021-01	960	A1	7	58	3.10
04021-02	1200	A2	9	72	2.30
04021-03	1400	A3	11	84	1.70
04021-04	2100	A4	16	126	1.30
04021-05	2400	A5	18	144	1.15
30 V _{DC} AT 85 °C RATED		34.5 V _{DC} AT 85 °C SURGE		20 V _{DC} AT 125 °C DERATED	
04021-06	520	A1	8	63	5.30
04021-07	660	A2	10	80	4.20
04021-08	820	A3	13	99	2.90
04021-09	1200	A4	18	144	2.30
04021-10	1300	A5	20	156	2.10
50 V _{DC} AT 85 °C RATED		57.5 V _{DC} AT 85 °C SURGE		30 V _{DC} AT 125 °C DERATED	
04021-11	400	A1	10	80	7.20
04021-12	430	A1	10	78	6.40
04021-13	500	A2	13	100	5.60
04021-14	600	A3	15	120	4.10
04021-15	800	A4	20	160	3.10
04021-16	1000	A5	23	180	2.80
75 V _{DC} AT 85 °C RATED		86.2 V _{DC} AT 85 °C SURGE		50 V _{DC} AT 125 °C DERATED	
04021-17	270	A1	9	81	8.50
04021-18	330	A2	12	99	7.00
04021-19	400	A3	15	119	5.00
04021-20	600	A4	20	180	3.65
04021-21	660	A5	23	198	3.50
100 V _{DC} AT 85 °C RATED		115.0 V _{DC} AT 85 °C SURGE		65 V _{DC} AT 125 °C DERATED	
04021-22	170	A1	9	68	15.00
04021-23	220	A2	11	88	11.60
04021-24	260	A3	13	104	8.00
04021-25	350	A4	18	140	6.50
04021-26	440	A5	22	176	5.80
150 V _{DC} AT 85 °C RATED		172.0 V _{DC} AT 85 °C SURGE		100 V _{DC} AT 125 °C DERATED	
04021-27	70	A1	6	42	28.80
04021-28	90	A2	7	54	22.40
04021-29	100	A3	9	60	16.40
04021-30	140	A4	11	84	12.40
04021-31	180	A5	14	104	11.20

ORDERING INFORMATION - DLA PART NUMBER

04021	-29
DLA DRAWING NUMBER	DASH NUMBER

DLA LAND AND MARITIME, COLUMBUS, OHIO	DRAWING NO. 04021
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**MILITARY SPECIFICATION TANTAPAK® CAPACITOR ASSEMBLIES - CROSS REFERENCE**

CAPACITANCE (μ F)	RATED VOLTAGE AT +85 °C	CASE CODE	VISHAY PART NUMBER	(DISCONTINUED) CL55 TYPE ⁽¹⁾ DESIGNATION	(NEW) DLA DRAWING ⁽¹⁾ 04021
960.0	15	A1	202D967X0015A1	CL55BE961MPG	04021-01
1200.0	15	A2	202D128X0015A2	CL55BE122MPG	04021-02
1400.0	15	A3	202D148X0015A3	CL55BE142MPG	04021-03
2100.0	15	A4	202D218X0015A4	CL55BE212MPG	04021-04
2400.0	15	A5	202D248X0015A5	CL55BE242MPG	04021-05
520.0	30	A1	202D527X0030A1	CL55BH521MPG	04021-06
660.0	30	A2	202D667X0030A2	CL55BH661MPG	04021-07
820.0	30	A3	202D827X0030A3	CL55BH821MPG	04021-08
1200.0	30	A4	202D128X0030A4	CL55BH122MPG	04021-09
1300.0	30	A5	202D138X0030A5	CL55BH132MPG	04021-10
400.0	50	A1	202D407X0050A1	CL55BJ401MPG	04021-11
430.0	50	A1	202D437X0050A1	CL55BJ431MPG	04021-12
500.0	50	A2	202D507X0050A2	CL55BJ501MPG	04021-13
600.0	50	A3	202D607X0050A3	CL55BJ601MPG	04021-14
800.0	50	A4	202D807X0050A4	CL55BJ801MPG	04021-15
1000.0	50	A5	202D108X0050A5	CL55BJ102MPG	04021-16
270.0	75	A1	202D277X0075A1	CL55BL271MPG	04021-17
330.0	75	A2	202D337X0075A2	CL55BL331MPG	04021-18
400.0	75	A3	202D407X0075A3	CL55BL401MPG	04021-19
600.0	75	A4	202D607X0075A4	CL55BL601MPG	04021-20
660.0	75	A5	202D667X0075A5	CL55BL661MPG	04021-21
170.0	100	A1	202D177X0100A1	CL55BN171MPG	04021-22
220.0	100	A2	202D227X0100A2	CL55BN221MPG	04021-23
260.0	100	A3	202D267X0100A3	CL55BN261MPG	04021-24
350.0	100	A4	202D357X0100A4	CL55BN351MPG	04021-25
440.0	100	A5	202D447X0100A5	CL55BN441MPG	04021-26
70.0	150	A1	202D706X0150A1	CL55BQ700MPG	04021-27
90.0	150	A2	202D906X0150A2	CL55BQ900MPG	04021-28
100.0	150	A3	202D107X0150A3	CL55BQ101MPG	04021-29
140.0	150	A4	202D147X0150A4	CL55BQ141MPG	04021-30
180.0	150	A5	202D187X0150A5	CL55BQ181MPG	04021-31

Note

⁽¹⁾ Vishay is no longer qualified to provide military CL55 type which has been discontinued.
It has been replaced by an equivalent product built to DLA drawing 04021



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