

Type 3188 Aluminum Electrolytic Screw Terminals

Type 3188, 85 °C Long Life, High-Capacitance, Computer Grade, Aluminum Choice of Potted or Rilled High-Vibration Construction



Long-Life Grade of Best Value Screw Terminal Type

The Type 3188 has twice the life of the 3186 and twice the ripple current capability. Like the 3186, Type 3188 is available with the capacitor element potted in place for lower cost or secured by rills, spoon shaped dimples in the side of the can. Rilled construction offers the industry's highest vibration and shock withstanding and excellent heat transfer into the sides and bottom of the can. Besides increasing ripple current handling, the rilled construction extends the opportunity for Type 3188 into military and transportation settings that require rugged mechanical capability.

Highlights

- Rilled cans withstand high shock and vibration.
- Potted cans are the lowest cost screw-terminal type
- 2 times the ripple current capability
- High capacitance per can

Specifications

Operating Temperature:Rated	-40 °C to 85 °C
Voltage:	16 to 450 Vdc
Capacitance:	270 µF to 1.0 F
Capacitance Tolerance:	-10% +75% up to 100 Vdc, -10 + 50% 200 Vdc & up
DC Leakage Current:	≤6√CV µA (6 mA max.) at 5 minutes
Cold Impedence:	-20 °C multiple of 25 °C Z ≤ 8 for 16 – 50V, 4 for 63 – 100V, 3 for 150V and up.
Ripple Current Multipliers:	Ambient Temperature

45 °C	55 °C	65 °C	75 °C	85 °C
2.24	2.00	1.73	1.41	1.00

Frequency

	60 Hz	120 Hz	300 Hz	1000 Hz	≥10 kHz
16 – 100 V	0.90	1.00	1.15	1.25	1.30
200 – 500 V	0.90	1.00	1.25	1.40	1.50

Series Inductance:

case dia (in)	ESL (nH)	case dia (in)	ESL (nH)
1.375	18	2.5	27
1.75	23	3	29
2	25		

Life Endurance Test:

4,000 h at 85 °C and rated voltage
 ΔCapacitance ±10%
 ESR 200% of limit
 DCL 100% of limit

Shelf Life:

500 h @ 85 °C and no voltage
 ΔCapacitance ±10%
 ESR 175% of limit
 DCL 200% of limit

Vibration:

Potted: 10 to 55 Hz, 0.06" and 10g max, 1.5 h ea. of 2 axis
 Rilled: 10 to 55 Hz, 0.06" and 15g max, 1.5 h ea. of 2 axis



Complies with the EU Directive 2002/95/EC requirement restricting the use of Lead (Pb), Mercury (Hg), Cadmium (Cd), Hexavalent chromium (Cr(VI)), PolyBrominated Biphenyls (PBB) and PolyBrominated Diphenyl Ethers (PBDE).

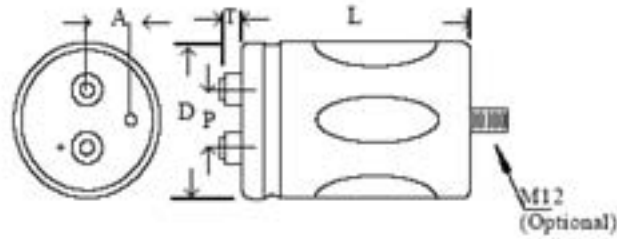
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Case Dimensions, Uninsulated Bare Can

Case Code	Diameter (D)		Length (L)		Pitch (P)		Plug (A)		Typical		Optional Bracket Part No.
	±0.031 (Inches)	±0.79 (mm)	±0.062 (Inches)	±1.157 (mm)	±0.014 (Inches)	±0.356 (mm)	A (Inches)	A (mm)	Weight (oz)	Weight (g)	
BA	1.375	34.9	2.125	54.0	0.500	12.7	0.390	9.9	2.53	72	115058-06
BB	1.375	34.9	2.625	66.7	0.500	12.7	0.390	9.9	3.17	90	115058-06
BC	1.375	34.9	3.125	79.4	0.500	12.7	0.390	9.9	3.70	105	115058-06
BD	1.375	34.9	3.625	92.1	0.500	12.7	0.390	9.9	4.22	120	115058-06
BE	1.375	34.9	4.125	104.8	0.500	12.7	0.390	9.9	4.75	135	115058-06
BF	1.375	34.9	4.625	117.5	0.500	12.7	0.390	9.9	5.98	170	115058-06
BG	1.375	34.9	5.125	130.2	0.500	12.7	0.390	9.9	7.74	220	115058-06
BH	1.375	34.9	5.625	142.9	0.500	12.7	0.390	9.9	9.50	270	115058-06
DA	1.75	44.5	2.125	54.0	0.750	19.1	0.453	11.5	5.63	160	115058-15
DB	1.75	44.5	2.625	66.7	0.750	19.1	0.453	11.5	6.16	175	115058-15
DC	1.75	44.5	3.125	79.4	0.750	19.1	0.453	11.5	6.34	180	115058-15
DD	1.75	44.5	3.625	92.1	0.750	19.1	0.453	11.5	7.22	205	115058-15
DE	1.75	44.5	4.125	104.8	0.750	19.1	0.453	11.5	7.74	220	115058-15
DF	1.75	44.5	4.625	117.5	0.750	19.1	0.453	11.5	8.27	235	115058-15
DG	1.75	44.5	5.125	130.2	0.750	19.1	0.453	11.5	8.80	250	115058-15
DH	1.75	44.5	5.625	142.9	0.750	19.1	0.453	11.5	9.50	270	115058-15
EA	2	50.8	2.125	54.0	0.875	22.2	0.500	12.7	5.98	170	115058-09
EB	2	50.8	2.625	66.7	0.875	22.2	0.500	12.7	6.34	180	115058-09
EC	2	50.8	3.125	79.4	0.875	22.2	0.500	12.7	6.69	190	115058-09
ED	2	50.8	3.625	92.1	0.875	22.2	0.500	12.7	7.74	220	115058-09
EE	2	50.8	4.125	104.8	0.875	22.2	0.500	12.7	8.98	255	115058-09
EF	2	50.8	4.625	117.5	0.875	22.2	0.500	12.7	10.21	290	115058-09
EG	2	50.8	5.125	130.2	0.875	22.2	0.500	12.7	11.26	320	115058-09
EH	2	50.8	5.625	142.9	0.875	22.2	0.500	12.7	8.80	250	115058-09
FB	2.5	63.5	2.625	66.7	1.125	28.6	0.625	15.9	10.56	300	115058-14
FC	2.5	63.5	3.125	79.4	1.125	28.6	0.625	15.9	13.02	370	115058-14
FD	2.5	63.5	3.625	92.1	1.125	28.6	0.625	15.9	14.08	400	115058-14
FE	2.5	63.5	4.125	104.8	1.125	28.6	0.625	15.9	15.66	445	115058-14
FF	2.5	63.5	4.625	117.5	1.125	28.6	0.625	15.9	21.12	600	115058-14
FG	2.5	63.5	5.125	130.2	1.125	28.6	0.625	15.9	22.88	650	115058-14
FH	2.5	63.5	5.625	142.9	1.125	28.6	0.625	15.9	21.12	600	115058-14
GC	3	76.2	3.125	79.4	1.250	31.8	0.750	19.1	18.30	520	115058-11
GD	3	76.2	3.625	92.1	1.250	31.8	0.750	19.1	20.06	570	115058-11
GE	3	76.2	4.125	104.8	1.250	31.8	0.750	19.1	21.12	600	115058-11
GF	3	76.2	4.625	117.5	1.250	31.8	0.750	19.1	25.34	720	115058-11
GG	3	76.2	5.125	130.2	1.250	31.8	0.750	19.1	29.92	850	115058-11
GH	3	76.2	5.625	142.9	1.250	31.8	0.750	19.1	34.14	970	115058-11
GJ	3	76.2	5.825	148.0	1.250	31.8	0.750	19.1	36.96	1050	115058-11
GN	3	76.2	8.625	219.1	1.250	31.8	0.750	19.1	51.39	1460	115058-11

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Outline Drawing



Case Dimensions Insulation Adders

	Diameter (D)		Length (L)	
	(in)	(mm)	(in)	(mm)
0.008" PVC	0.02	0.51	0.032	0.81
0.012" PVC	0.03	0.63	0.062	1.58

Terminal Dimensions

Terminal Style	For Case Diameters	Code	Post Diameter		H max		Thread	min Full Thread		Torque	
			in	mm	in	mm		in	mm	in-lb	N-m
Low Post	1½ to 3	B	0.314	8.0	0.094	2.4	10-32	0.218	5.5	25	2.82
High Post	1½ to 3	A	0.314	8.0	0.281	7.1	10-32	0.375	9.5	25	2.82
High Current, Low	2½ & 3	D	0.684	17.4	0.125	3.2	¼-28	0.344	8.7	60	6.78
High Current, High	2½ & 3	K	0.684	17.4	0.281	7.1	¼-28	0.469	11.9	60	6.78
M5 Post, Small	1½ to 2	M	0.314	8.0	0.281	7.1	M5	0.375	9.5	25	2.82
M6 Low Post	3	J	0.684	17.4	0.125	3.2	M6	0.344	8.7	60	6.78

[Click here to see Hardware & Mounting Options](#)

Part Numbering System

3188	GH	562	T	400	M	P	A1
Type	Case Code	Capacitance	Tolerance	Voltage	Terminal	Insulation	Construction*
		562=5600 µF	M= ±20%	016=16 Vdc	A=high post	P=0.008" PVC	A1=potted
		223=22000 µF	S= -10 +30%	450=450 Vdc	B=low post	H=0.012" PVC	R1=rilled
		821=820 µF	T= -10 +50%		D=high current low post	with mounting clamp/bracket	S1=stud & potted**
			U= -10 +75%		K=high current high post	R=0.008" PVC	T1=stud & rilled**
					M=M5 high post	J=0.012" PVC	
					J=M6 low post		

* Construction code is also a sequence number, e.g., A1, A2,---,A9, B1,B2,---, for customer specifications. Sequence number 1 in A1, R1, S1 and T1 denotes the standard catalog capacitor with no special requirements.

**Mounting stud not available for 1.375" diameter cases, case codes BA, BC and BE

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Ratings

Capacitance (μ F)	Catalog Part Number	ESR max 120 Hz, 25°C (m Ω)	Ripple max 120 Hz, 85 °C potted (A)rilled(A)	Case Size DxL (in)
16 Volts (20 Volts Surge)				
22000	3188BA223U016APA1	10.0	10.5 12.00	1.375 X 2.125
39000	3188BC393U016APA1	7.0	15.2 17.00	1.375 X 3.125
56000	3188BE563U016APA1	6.0	18.9 21.00	1.375 X 4.125
82000	3188EC823U016APA1	6.0	21.4 24.00	2.00 X 3.125
120000	3188EE124U016APA1	6.0	26.5 30.00	2.00 X 4.125
150000	3188EG154U016APA1	4.0	27.0 30.00	2.00 X 5.125
150000	3188EH154U016APA1	4.0	27.3 30.00	2.00 X 5.625
220000	3188FE224U016DPA1	3.0	38.9 44.00	2.50 X 4.125
270000	3188FF274U016DPA1	3.0	42.5 48.00	2.50 X 4.625
330000	3188FH334U016DPA1	3.0	45.0 50.00	2.50 X 5.625
330000	3188GE334U016DPA1	3.0	43.9 50.00	3.00 X 4.125
390000	3188GF394U016DPA1	3.0	44.2 50.00	3.00 X 4.625
470000	3188GH474U016DPA1	2.0	44.6 50.00	3.00 X 5.625
820000	3188GN824U016DPA1	2.0	46.3 50.00	3.00 X 8.625
1000000	3188GN105U016DPA1	2.0	46.3 50.00	3.00 X 8.625
25 Volts (30 Volts Surge)				
12000	3188BA123U025APA1	32.0	6.0 6.80	1.375 X 2.125
22000	3188BC223U025APA1	22.0	8.6 9.60	1.375 X 3.125
33000	3188BE333U025APA1	17.0	10.8 12.00	1.375 X 4.125
56000	3188EC563U025APA1	7.0	18.8 21.00	2.00 X 3.125
82000	3188EE823U025APA1	5.0	24.8 28.00	2.00 X 4.125
100000	3188EG104U025APA1	5.0	27.0 30.00	2.00 X 5.125
120000	3188EH124U025APA1	4.0	27.3 30.00	2.00 X 5.625
120000	3188FE124U025DPA1	5.0	31.0 35.00	2.50 X 4.125
150000	3188FF154U025DPA1	4.0	33.6 38.00	2.50 X 4.625
180000	3188FH184U025DPA1	4.0	36.9 41.00	2.50 X 5.625
180000	3188GE184U025DPA1	4.0	36.8 42.00	3.00 X 4.125
220000	3188GF224U025DPA1	4.0	40.7 46.00	3.00 X 4.625
270000	3188GH274U025DPA1	4.0	43.8 49.00	3.00 X 5.625
470000	3188GN474U025DPA1	3.0	46.3 50.00	3.00 X 8.625
40 Volts (50 Volts Surge)				
8200	3188BA822U040APA1	39.0	5.4 6.10	1.375 X 2.125
12000	3188BC123U040APA1	27.0	7.8 8.70	1.375 X 3.125
18000	3188BE183U040APA1	20.0	9.9 11.00	1.375 X 4.125
27000	3188EC273U040APA1	9.0	17.0 19.00	2.00 X 3.125
47000	3188EE473U040APA1	6.0	22.1 25.00	2.00 X 4.125
56000	3188EG563U040APA1	5.0	27.0 30.00	2.00 X 5.125
68000	3188EH683U040APA1	5.0	27.3 30.00	2.00 X 5.625
68000	3188FE683U040DPA1	5.0	28.3 32.00	2.50 X 4.125
82000	3188FF823U040DPA1	5.0	31.0 35.00	2.50 X 4.625
100000	3188FH104U040DPA1	5.0	34.2 38.00	2.50 X 5.625
100000	3188GE104U040DPA1	5.0	33.3 38.00	3.00 X 4.125
120000	3188GF124U040DPA1	4.0	37.2 42.00	3.00 X 4.625
150000	3188GH154U040DPA1	4.0	41.1 46.00	3.00 X 5.625
270000	3188GN274U040DPA1	3.0	46.3 50.00	3.00 X 8.625

Capacitance (μ F)	Catalog Part Number	ESR max 120 Hz, 25°C (m Ω)	Ripple max 120 Hz, 85 °C potted (A)rilled(A)	Case Size DxL (in)
50 Volts (63 Volts Surge)				
6800	3188BA682U050APA1	42.0	5.2 5.90	1.375 X 2.125
10000	3188BC103U050APA1	28.0	7.5 8.40	1.375 X 3.125
15000	3188BE153U050APA1	21.0	9.9 11.00	1.375 X 4.125
27000	3188EC273U050APA1	15.0	12.5 14.00	2.00 X 3.125
39000	3188EE393U050APA1	11.0	16.8 19.00	2.00 X 4.125
47000	3188EG473U050APA1	10.0	18.9 21.00	2.00 X 5.125
56000	3188EH563U050APA1	9.0	21.8 24.00	2.00 X 5.625
56000	3188FE563U050APA1	8.0	23.0 26.00	2.50 X 4.125
68000	3188FF683U050APA1	7.0	25.7 29.00	2.50 X 4.625
82000	3188FH823U050DPA1	6.0	30.6 34.00	2.50 X 5.625
82000	3188GE823U050DPA1	6.0	28.1 32.00	3.00 X 4.125
100000	3188GF104U050DPA1	6.0	31.9 36.00	3.00 X 4.625
120000	3188GH124U050DPA1	5.0	34.8 39.00	3.00 X 5.625
220000	3188GN224U050DPA1	4.0	46.3 50.00	3.00 X 8.625
63 Volts (75 Volts Surge)				
4700	3188BA472U063APA1	42.0	5.2 5.90	1.375 X 2.125
6800	3188BC682U063APA1	29.0	7.5 8.40	1.375 X 3.125
10000	3188BE103U063APA1	21.0	9.9 11.00	1.375 X 4.125
18000	3188EC183U063APA1	15.0	12.5 14.00	2.00 X 3.125
27000	3188EE273U063APA1	11.0	16.8 19.00	2.00 X 4.125
33000	3188EG333U063APA1	9.0	20.7 23.00	2.00 X 5.125
39000	3188EH393U063APA1	9.0	22.7 25.00	2.00 X 5.625
39000	3188FE393U063APA1	8.0	23.0 26.00	2.50 X 4.125
47000	3188FF473U063APA1	7.0	24.8 28.00	2.50 X 4.625
56000	3188FH563U063DPA1	7.0	27.9 31.00	2.50 X 5.625
56000	3188GE563U063DPA1	7.0	28.1 32.00	3.00 X 4.125
68000	3188GF683U063DPA1	6.0	31.9 36.00	3.00 X 4.625
82000	3188GH823U063DPA1	5.0	34.8 39.00	3.00 X 5.625
150000	3188GN154U063DPA1	4.0	46.3 50.00	3.00 X 8.625
75 Volts (95 Volts Surge)				
2700	3188BA272U075APA1	46.0	5.0 5.70	1.375 X 2.125
4700	3188BC472U075APA1	30.0	7.3 8.20	1.375 X 3.125
6800	3188BE682U075APA1	22.0	9.0 10.00	1.375 X 4.125
12000	3188EC123U075APA1	16.0	12.5 14.00	2.00 X 3.125
18000	3188EE183U075APA1	12.0	15.9 18.00	2.00 X 4.125
22000	3188EG223U075APA1	10.0	19.8 22.00	2.00 X 5.125
27000	3188EH273U075APA1	9.0	21.8 24.00	2.00 X 5.625
27000	3188FE273U075APA1	8.0	22.1 25.00	2.50 X 4.125
33000	3188FF333U075APA1	7.0	24.8 28.00	2.50 X 4.625
39000	3188FH393U075DPA1	6.0	29.7 33.00	2.50 X 5.625
39000	3188GE393U075DPA1	6.0	28.9 33.00	3.00 X 4.125
47000	3188GF473U075DPA1	6.0	31.0 35.00	3.00 X 4.625
56000	3188GH563U075DPA1	5.0	36.6 41.00	3.00 X 5.625
100000	3188GN104U075DPA1	4.0	46.3 50.00	3.00 X 8.625

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Capacitance (μ F)	Catalog Part Number	ESR max	Ripple max	Case Size DxL (in)
		120 Hz, 25°C (m Ω)	120 Hz, 85 °C potted (A) rilled (A)	
100 Volts (125 Volts Surge)				
1800	3188BA182U100APA1	79.0	3.5 4.00	1.375 X 2.125
2700	3188BC272U100APA1	51.0	5.3 5.90	1.375 X 3.125
4700	3188BE472U100APA1	32.0	8.0 8.90	1.375 X 4.125
6800	3188EC682U100APA1	64.0	6.1 6.80	2.00 X 3.125
10000	3188EE103U100APA1	38.0	8.9 10.00	2.00 X 4.125
12000	3188EG123U100APA1	34.0	9.9 11.00	2.00 X 5.125
15000	3188EH153U100APA1	28.0	11.8 13.00	2.00 X 5.625
18000	3188FE183U100APA1	18.0	15.0 17.00	2.50 X 4.125
22000	3188FF223U100APA1	14.0	17.7 20.00	2.50 X 4.625
22000	3188FH223U100APA1	25.0	13.5 15.00	2.50 X 5.625
27000	3188GE273U100APA1	13.0	19.3 22.00	3.00 X 4.125
27000	3188GF273U100APA1	20.0	19.5 18.00	3.00 X 4.625
39000	3188GH393U100AA1	16.0	16.1 21.00	3.00 X 5.625
56000	3188GN563U100APA1	14.0	23.1 25.00	3.00 X 8.625
200 Volts (250 Volts Surge)				
680	3188BA681T200APA1	130.0	2.5 2.90	1.375 X 2.125
1200	3188BC122T200APA1	76.0	3.7 4.10	1.375 X 3.125
1800	3188BE182T200APA1	53.0	6.2 6.90	1.375 X 4.125
2700	3188EC272T200APA1	76.0	5.5 6.20	2.00 X 3.125
3900	3188EE392T200APA1	51.0	7.5 8.50	2.00 X 4.125
4700	3188EG472T200APA1	36.0	9.9 11.00	2.00 X 5.125
5600	3188EH562T200APA1	20.0	13.6 15.00	2.00 X 5.625
6800	3188FE682T200APA1	24.0	12.4 14.00	2.50 X 4.125
8200	3188FF822T200APA1	21.0	14.2 16.00	2.50 X 4.625
10000	3188FH103T200APA1	17.0	18.0 20.00	2.50 X 5.625
10000	3188GE103T200APA1	25.0	14.0 16.00	3.00 X 4.125
12000	3188GF123T200APA1	22.0	15.9 18.00	3.00 X 4.625
15000	3188GH153T200APA1	19.0	18.8 21.00	3.00 X 5.625
22000	3188GN223T200APA1	15.0	23.1 25.00	3.00 X 8.625
250 Volts (300 Volts Surge)				
470	3188BA471T250APA1	130.0	2.5 2.90	1.375 X 2.125
820	3188BC821T250APA1	86.0	4.2 4.70	1.375 X 3.125
1200	3188BE122T250APA1	54.0	6.1 6.80	1.375 X 4.125
1800	3188EC182T250APA1	76.0	6.2 6.90	2.00 X 3.125
2700	3188EE272T250APA1	52.0	7.4 8.40	2.00 X 4.125
3300	3188EG332T250APA1	22.0	12.6 14.00	2.00 X 5.125
3900	3188EH392T250APA1	19.0	14.5 16.00	2.00 X 5.625
4700	3188FE472T250APA1	25.0	12.4 14.00	2.50 X 4.125
5600	3188FF562T250APA1	20.0	14.2 16.00	2.50 X 4.625

Capacitance (μ F)	Catalog Part Number	ESR max	Ripple max	Case Size DxL (in)
		120 Hz, 25°C (m Ω)	120 Hz, 85 °C potted (A) rilled (A)	
250 Volts (300 Volts Surge)				
6800	3188FH682T250APA1	17.0	16.2 18.00	2.50 X 5.625
6800	3188GE682T250APA1	17.0	15.8 18.00	3.00 X 4.125
8200	3188GF822T250APA1	24.0	14.2 16.00	3.00 X 4.625
10000	3188GH103T250APA1	18.0	18.8 21.00	3.00 X 5.625
12000	3188GN123T250APA1	16.0	23.1 25.00	3.00 X 8.625
350 Volts (400 Volts Surge)				
330	3188BA331T350APA1	290.0	1.7 1.90	1.375 X 2.125
560	3188BC561T350APA1	191.0	2.6 2.90	1.375 X 3.125
820	3188BE821T350APA1	129.0	3.8 4.20	1.375 X 4.125
1200	3188EC122T350APA1	122.0	4.5 5.00	2.00 X 3.125
1800	3188EE182T350APA1	74.0	6.5 7.30	2.00 X 4.125
2200	3188EG222T350APA1	49.0	8.2 9.10	2.00 X 5.125
2700	3188EH272T350APA1	39.0	9.0 10.00	2.00 X 5.625
2700	3188FE272T350APA1	47.0	8.9 10.00	2.50 X 4.125
3300	3188FF332T350APA1	39.0	10.6 12.00	2.50 X 4.625
3900	3188FH392T350APA1	34.0	11.7 13.00	2.50 X 5.625
3900	3188GE392T350APA1	34.0	11.4 13.00	3.00 X 4.125
4700	3188GF472T350APA1	34.0	12.4 14.00	3.00 X 4.625
5600	3188GH562T350APA1	28.0	14.3 16.00	3.00 X 5.625
10000	3188GN103T350APA1	18.0	23.1 25.00	3.00 X 8.625
400 Volts (450 Volts Surge)				
270	3188BA271T400APA1	333.0	1.5 1.70	1.375 X 2.125
470	3188BC471T400APA1	224.0	2.6 2.90	1.375 X 3.125
680	3188BE681T400APA1	134.0	3.7 4.10	1.375 X 4.125
1000	3188EC102T400APA1	127.0	4.3 4.80	2.00 X 3.125
1500	3188EE152T400APA1	63.0	6.9 7.80	2.00 X 4.125
1800	3188EG182T400APA1	53.0	7.9 8.80	2.00 X 5.125
2200	3188EH222T400APA1	45.0	8.9 9.80	2.00 X 5.625
2200	3188FE222T400APA1	45.0	8.7 9.80	2.50 X 4.125
2700	3188FF272T400APA1	47.0	9.5 10.70	2.50 X 4.625
3300	3188FH332T400APA1	35.0	11.7 13.00	2.50 X 5.625
3300	3188GE332T400APA1	35.0	11.4 13.00	3.00 X 4.125
3900	3188GF392T400APA1	37.0	11.5 13.00	3.00 X 4.625
4700	3188GH472T400APA1	31.0	13.4 15.00	3.00 X 5.625
8200	3188GN822T400APA1	24.0	20.4 22.00	3.00 X 8.625
450 Volts (525 Volts Surge)				
1000	3188EE102T450APA1	102.0	4.9 5.50	2.00 X 4.125
1500	3188EG152T450APA1	70.0	6.7 7.40	2.00 X 5.125
2200	3188FF222T450APA1	46.0	9.3 10.50	2.50 X 4.625
3300	3188GF332T450APA1	34.0	12.2 13.80	3.00 X 4.625
3900	3188GH392T450APA1	22.0	17.1 19.10	3.00 X 5.625