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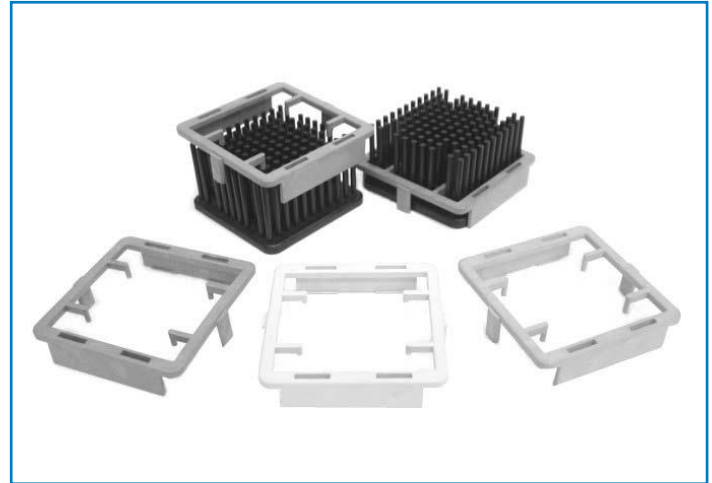
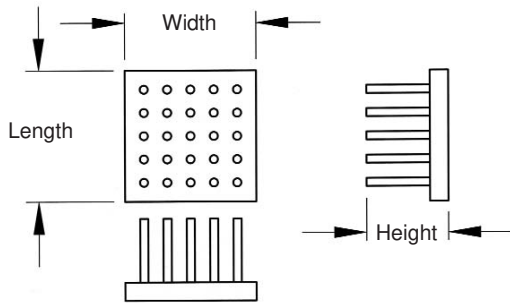
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## FORGED HEAT SINKS WITH PIN FINNS

### DESIGN FEATURES

- Precision forging technology for high power applications
- Omnidirectional pins
- Designed for BGA and other surface mount packages
- Various mounting methods available
- Select from multiple fin heights



### PRODUCT BENEFITS

- No special tools needed for assembly
- No additional holes required on the PCB
- Special clip easily snaps on and self-aligns

### SERIES APR FORGED ALUMINUM HEAT SINKS WITH PIN FINNS

Part Number	Fin Matrix (Rows x Columns)	Length x Width x Height (mm)	Thermal Resistance (°C/Watt)		Pressure Drop (inches of water)
			NATURAL CONVECTION	FORCED CONVECTION @ 200 LFPM	
APR19-19-12CB	5 x 5	18.6 x 18.6 x 11.6	15.66	6.90	0.013
APR19-19-15CB	5 x 5	18.6 x 18.6 x 14.6	15.26	6.60	0.013
APR19-19-18CB	5 x 5	18.6 x 18.6 x 17.6	14.56	5.90	0.013
APR19-19-21CB	5 x 5	18.6 x 18.6 x 20.6	14.53	5.90	0.013
APR19-19-23CB	5 x 5	18.6 x 18.6 x 22.6	14.19	5.58	0.013
APR19-19-28CB	5 x 5	18.6 x 18.6 x 27.6	13.15	5.11	0.013
APR19-19-33CB	5 x 5	18.6 x 18.6 x 32.6	12.45	4.71	0.013
APR21-21-12CB	6 x 6	20.6 x 20.6 x 11.6	14.96	6.41	0.015
APR21-21-15CB	6 x 6	20.6 x 20.6 x 14.6	14.57	6.09	0.015
APR21-21-18CB	6 x 6	20.6 x 20.6 x 17.6	14.17	5.74	0.015
APR21-21-21CB	6 x 6	20.6 x 20.6 x 20.6	13.83	5.42	0.015
APR21-21-23CB	6 x 6	20.6 x 20.6 x 22.6	13.47	5.10	0.015
APR21-21-28CB	6 x 6	20.6 x 20.6 x 27.6	12.48	4.74	0.015
APR21-21-33CB	6 x 6	20.6 x 20.6 x 32.6	11.83	4.35	0.015
APR23-23-12CB	7 x 7	22.6 x 22.6 x 11.6	14.30	5.96	0.018
APR23-23-15CB	7 x 7	22.6 x 22.6 x 14.6	13.93	5.62	0.018
APR23-23-18CB	7 x 7	22.6 x 22.6 x 17.6	13.54	5.26	0.018
APR23-23-21CB	7 x 7	22.6 x 22.6 x 20.6	13.20	4.94	0.018
APR23-23-23CB	7 x 7	22.6 x 22.6 x 22.6	12.81	4.62	0.018
APR23-23-28CB	7 x 7	22.6 x 22.6 x 27.6	11.88	4.26	0.018
APR23-23-33CB	7 x 7	22.6 x 22.6 x 32.6	11.29	3.99	0.018
APR25-25-12CB	7 x 7	24.6 x 24.6 x 11.6	13.70	5.50	0.020

Part Number	Fin Matrix (Rows x Columns)	Length x Width x Height (mm)	Thermal Resistance (°C/Watt)		Pressure Drop (inches of water)
			NATURAL CONVECTION	FORCED CONVECTION @ 200 LFPM	
APR25-25-15CB	7 x 7	24.6 x 24.6 x 14.6	13.35	5.14	0.020
APR25-25-18CB	7 x 7	24.6 x 24.6 x 17.6	12.97	4.78	0.020
APR25-25-21CB	7 x 7	24.6 x 24.6 x 20.6	12.61	4.46	0.020
APR25-25-23CB	7 x 7	24.6 x 24.6 x 22.6	12.21	4.14	0.020
APR25-25-28CB	7 x 7	24.6 x 24.6 x 27.6	11.32	3.77	0.020
APR25-25-33CB	7 x 7	24.6 x 24.6 x 32.6	10.78	3.46	0.020
APR27-27-12CB	8 x 8	26.6 x 26.6 x 11.6	13.17	5.04	0.022
APR27-27-15CB	8 x 8	26.6 x 26.6 x 14.6	12.77	4.67	0.022
APR27-27-18CB	8 x 8	26.6 x 26.6 x 17.6	12.43	4.30	0.022
APR27-27-21CB	8 x 8	26.6 x 26.6 x 20.6	12.05	3.98	0.022
APR27-27-23CB	8 x 8	26.6 x 26.6 x 22.6	11.63	3.66	0.022
APR27-27-28CB	8 x 8	26.6 x 26.6 x 27.6	10.79	3.40	0.022
APR27-27-33CB	8 x 8	26.6 x 26.6 x 32.6	10.31	3.20	0.022
APR29-29-12CB	8 x 8	28.6 x 28.6 x 11.6	12.58	4.25	0.025
APR29-29-15CB	8 x 8	28.6 x 28.6 x 14.6	12.28	3.98	0.025
APR29-29-18CB	8 x 8	28.6 x 28.6 x 17.6	11.91	3.73	0.025
APR29-29-21CB	8 x 8	28.6 x 28.6 x 20.6	11.63	3.47	0.025
APR29-29-23CB	8 x 8	28.6 x 28.6 x 22.6	11.21	3.26	0.025
APR29-29-28CB	8 x 8	28.6 x 28.6 x 27.6	10.43	2.94	0.025
APR29-29-33CB	8 x 8	28.6 x 28.6 x 32.6	9.87	2.70	0.025
APR31-31-12CB	8 x 8	30.6 x 30.6 x 11.6	12.37	3.79	0.027
APR31-31-15CB	8 x 8	30.6 x 30.6 x 14.6	11.86	3.53	0.027
APR31-31-18CB	8 x 8	30.6 x 30.6 x 17.6	11.47	3.26	0.027
APR31-31-21CB	8 x 8	30.6 x 30.6 x 20.6	11.10	3.03	0.027
APR31-31-23CB	8 x 8	30.6 x 30.6 x 22.6	10.71	2.78	0.027
APR31-31-28CB	8 x 8	30.6 x 30.6 x 27.6	9.87	2.52	0.027
APR31-31-33CB	8 x 8	30.6 x 30.6 x 32.6	9.43	2.33	0.027
APR33-33-12CB	9 x 9	32.6 x 32.6 x 11.6	11.85	3.46	0.029
APR33-33-15CB	9 x 9	32.6 x 32.6 x 14.6	11.35	3.27	0.029
APR33-33-18CB	9 x 9	32.6 x 32.6 x 17.6	10.96	3.01	0.029
APR33-33-21CB	9 x 9	32.6 x 32.6 x 20.6	10.54	2.78	0.029
APR33-33-23CB	9 x 9	32.6 x 32.6 x 22.6	10.24	2.56	0.029
APR33-33-28CB	9 x 9	32.6 x 32.6 x 27.6	9.40	2.33	0.029
APR33-33-33CB	9 x 9	32.6 x 32.6 x 32.6	8.89	2.12	0.029
APR35-35-12CB	10 x 10	34.7 x 34.7 x 11.6	10.90	3.19	0.036
APR35-35-15CB	10 x 10	34.7 x 34.7 x 14.6	10.60	2.97	0.036
APR35-35-18CB	10 x 10	34.7 x 34.7 x 19.6	10.20	2.70	0.036
APR35-35-21CB	10 x 10	34.7 x 34.7 x 20.6	9.85	2.51	0.036
APR35-35-23CB	10 x 10	34.7 x 34.7 x 22.6	9.49	2.28	0.036
APR35-35-28CB	10 x 10	34.7 x 34.7 x 27.6	8.87	2.06	0.036
APR35-35-33CB	10 x 10	34.7 x 34.7 x 32.6	8.22	1.90	0.036
APR38-38-12CB	11 x 11	37.5 x 37.5 x 11.6	10.13	3.04	0.04
APR38-38-15CB	11 x 11	37.5 x 37.5 x 14.6	9.73	2.85	0.04
APR38-38-18CB	11 x 11	37.5 x 37.5 x 19.6	9.43	2.66	0.04
APR38-38-21CB	11 x 11	37.5 x 37.5 x 20.6	9.13	2.41	0.04
APR38-38-23CB	11 x 11	37.5 x 37.5 x 22.6	8.23	2.21	0.04
APR38-38-28CB	11 x 11	37.5 x 37.5 x 27.6	7.73	2.00	0.04
APR38-38-33CB	11 x 11	37.5 x 37.5 x 32.6	7.13	1.80	0.04
APR40-40-12CB	11 x 11	39.6 x 39.6 x 11.6	9.51	2.96	0.05
APR40-40-15CB	11 x 11	39.6 x 39.6 x 14.6	9.21	2.76	0.05

Part Number	Fin Matrix (Rows x Columns)	Length x Width x Height (mm)	Thermal Resistance (°C/Watt)		Pressure Drop (inches of water)
			NATURAL CONVECTION	FORCED CONVECTION @ 200 LFPM	
APR40-40-18CB	11 x 11	39.6 x 39.6 x 17.6	8.65	2.50	0.05
APR40-40-21CB	11 x 11	39.6 x 39.6 x 20.6	8.43	2.30	0.05
APR40-40-23CB	11 x 11	39.6 x 39.6 x 22.6	7.99	2.09	0.05
APR40-40-28CB	11 x 11	39.6 x 39.6 x 27.6	7.41	1.85	0.05
APR40-40-33CB	11 x 11	39.6 x 39.6 x 32.6	7.00	1.65	0.05
APR43-43-12CB	11 x 11	42.1 x 42.1 x 11.6	8.97	2.85	0.068
APR43-43-15CB	11 x 11	42.1 x 42.1 x 14.6	8.57	2.62	0.068
APR43-43-18CB	11 x 11	42.1 x 42.1 x 17.6	8.18	2.38	0.068
APR43-43-21CB	11 x 11	42.1 x 42.1 x 20.6	7.87	2.19	0.068
APR43-43-23CB	11 x 11	42.1 x 42.1 x 22.6	7.55	1.99	0.068
APR43-43-28CB	11 x 11	42.1 x 42.1 x 27.6	6.76	1.80	0.068
APR43-43-33CB	11 x 11	42.1 x 42.1 x 32.6	6.41	1.48	0.068
APR45-45-12CB	11 x 11	44.6 x 44.6 x 11.6	8.73	2.73	0.08
APR45-45-15CB	11 x 11	44.6 x 44.6 x 14.6	8.36	2.48	0.08
APR45-45-18CB	11 x 11	44.6 x 44.6 x 17.6	7.99	2.27	0.08
APR45-45-21CB	11 x 11	44.6 x 44.6 x 20.6	7.69	2.09	0.08
APR45-45-23CB	11 x 11	44.6 x 44.6 x 22.6	7.37	1.88	0.08
APR45-45-28CB	11 x 11	44.6 x 44.6 x 27.6	6.60	1.65	0.08
APR45-45-33CB	11 x 11	44.6 x 44.6 x 32.6	6.26	1.41	0.08
APR48-48-12CB	13 x 13	47.1 x 47.1 x 11.6	8.29	2.83	0.085
APR48-48-15CB	13 x 13	47.1 x 47.1 x 14.6	7.83	2.60	0.085
APR48-48-18CB	13 x 13	47.1 x 47.1 x 17.6	7.44	2.36	0.085
APR48-48-21CB	13 x 13	47.1 x 47.1 x 20.6	7.18	2.18	0.085
APR48-48-23CB	13 x 13	47.1 x 47.1 x 22.6	6.94	1.98	0.085
APR48-48-28CB	13 x 13	47.1 x 47.1 x 27.6	6.42	1.79	0.085
APR48-48-33CB	13 x 13	47.1 x 47.1 x 32.6	5.87	1.47	0.085
APR50-50-12CB	13 x 13	49.6 x 49.6 x 11.6	8.16	2.78	0.088
APR50-50-15CB	13 x 13	49.6 x 49.6 x 14.6	7.70	2.54	0.088
APR50-50-18CB	13 x 13	49.6 x 49.6 x 17.6	7.31	2.32	0.088
APR50-50-21CB	13 x 13	49.6 x 49.6 x 20.6	7.04	2.14	0.088
APR50-50-23CB	13 x 13	49.6 x 49.6 x 22.6	6.79	1.93	0.088
APR50-50-28CB	13 x 13	49.6 x 49.6 x 27.6	6.27	1.73	0.088
APR50-50-33CB	13 x 13	49.6 x 49.6 x 32.6	5.70	1.44	0.088
APR53-53-12CB	13 x 13	52.1 x 52.1 x 11.6	7.84	2.74	0.086
APR53-53-15CB	13 x 13	52.1 x 52.1 x 14.6	7.39	2.50	0.086
APR53-53-18CB	13 x 13	52.1 x 52.1 x 17.6	7.00	2.28	0.086
APR53-53-21CB	13 x 13	52.1 x 52.1 x 20.6	6.74	2.10	0.086
APR53-53-23CB	13 x 13	52.1 x 52.1 x 22.6	6.49	1.90	0.086
APR53-53-28CB	13 x 13	52.1 x 52.1 x 27.6	5.98	1.69	0.086
APR53-53-33CB	13 x 13	52.1 x 52.1 x 32.6	5.42	1.42	0.086
APR55-55-12CB	14 x 14	54.6 x 54.6 x 11.6	7.60	2.68	0.09
APR55-55-15CB	14 x 14	54.6 x 54.6 x 14.6	7.15	2.43	0.09
APR55-55-18CB	14 x 14	54.6 x 54.6 x 17.6	6.75	2.22	0.09
APR55-55-21CB	14 x 14	54.6 x 54.6 x 20.6	6.49	2.05	0.09
APR55-55-23CB	14 x 14	54.6 x 54.6 x 22.6	6.24	1.84	0.09
APR55-55-28CB	14 x 14	54.6 x 54.6 x 27.6	5.72	1.62	0.09
APR55-55-33CB	14 x 14	54.6 x 54.6 x 32.6	5.16	1.38	0.09

**MATERIAL:** 6063 Aluminum Alloy, Black Anodized