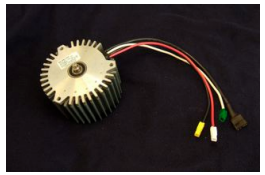
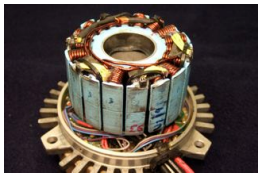
MAC-BMC 600-watt Motor

Motor: M1
Hall sensors tuned for CW rotation
Winding: Delta (stock)
Infineon Controller (Current limit: 55A)





24-volt supply
Full Throttle

Power (CycleAnalyst)	Power (PowerTap)	Efficiency
51	0	0.0%
105	50	47.6%
168	103	61.3%
216	150	69.4%
276	203	73.6%
330	250	75.8%
390	305	78.2%
456	365	80.0%
516	413	80.0%
576	458	79.5%
642	505	78.7%
780	600	76.9%
960	710	74.0%
1188	800	67.3%
1260	800	63.5%

24-volt supply
Half Throttle

Power (CycleAnalyst)	Power (PowerTap)	Efficiency
25	0	0.0%
87	50	57.5%
138	97	70.3%
204	152	74.5%
270	205	75.9%
348	267	76.7%
420	317	75.5%
492	357	72.6%
606	412	68.0%
750	470	62.7%
972	523	53.8%
1176	550	46.8%

36-volt supply
Full Throttle

Power (CycleAnalyst)	Power (PowerTap)	Efficiency
90	0	0.0%
141	50	35.5%
204	103	50.5%
264	167	63.3%
318	215	67.6%
366	257	70.2%
432	317	73.4%
474	355	74.9%
528	400	75.8%
588	450	76.5%
648	500	77.2%
732	572	78.1%
768	603	78.5%
840	664	79.0%
924	733	79.3%
1032	810	78.5%
1200	925	77.1%
1428	1060	74.2%
1560	1130	72.4%
1896	1300	68.6%

36-volt supply
Half Throttle

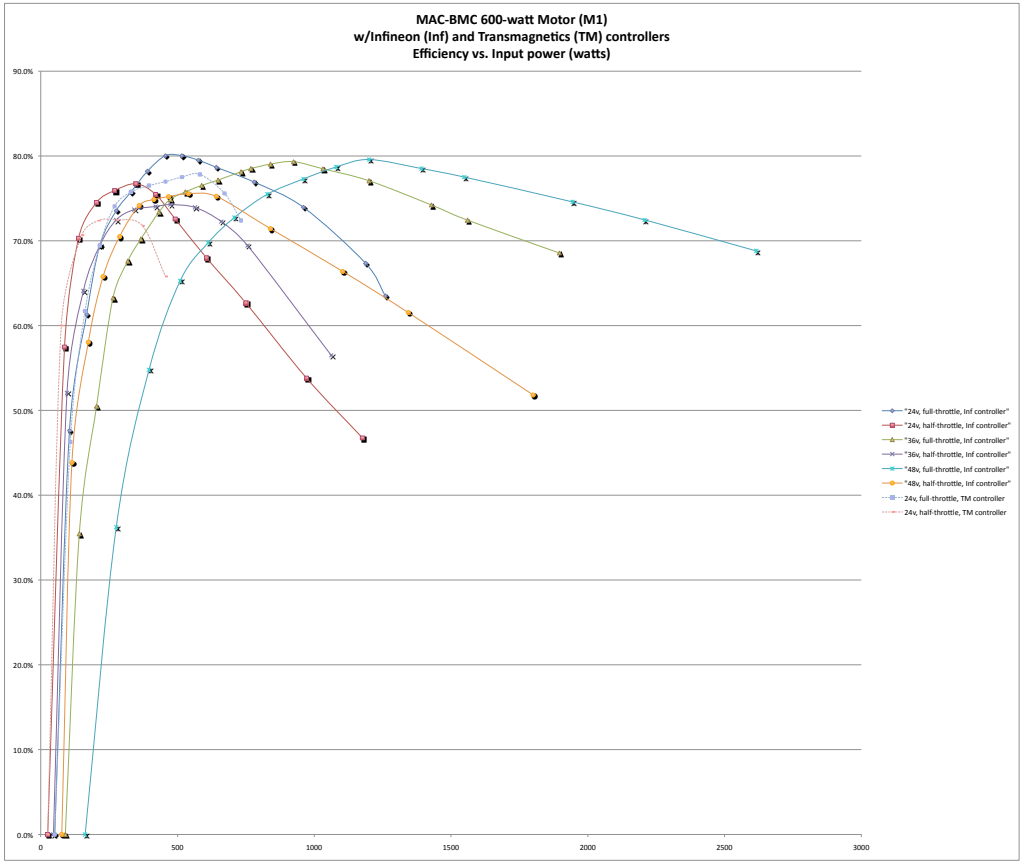
Power (CycleAnalyst)	Power (PowerTap)	Efficiency
46	0	0.0%
96	50	52.1%
156	100	64.1%
216	150	69.4%
276	200	72.5%
342	252	73.7%
420	311	74.0%
474	352	74.3%
564	417	73.9%
660	477	72.3%
756	525	69.4%
1062	600	56.5%

48-volt supply
Full Throttle

Power (CycleAnalyst)	Power (PowerTap)	Efficiency
162	0	0.0%
276	100	36.2%
396	217	54.8%
510	333	65.3%
612	427	69.8%
708	515	72.7%
828	625	75.5%
960	742	77.3%
1080	850	78.7%
1200	955	79.6%
1392	1093	78.5%
1548	1200	77.5%
1944	1450	74.6%
2208	1600	72.5%
2616	1800	68.8%

48-volt supply
Half Throttle

Power (CycleAnalyst)	Power (PowerTap)	Efficiency
77	0	0.0%
114	50	43.9%
174	101	58.0%
228	150	65.8%
288	203	70.5%
360	267	74.2%
414	310	74.9%
468	352	75.2%
540	408	75.6%
642	483	75.2%
840	600	71.4%
1104	733	66.4%
1344	827	61.5%
1800	933	51.8%



Notes: Efficiency was measured by comparing energy drawn from the battery according to a Cycle Analyst and comparing that to energy sent to the rear wheel of the bicycle as read from a PowerTap hub.
Motor power passes through a chain and sprocket (#25 chain; 11t - 90t) to a mid-drive, which is then passed to the rear wheel using normal bicycle chain (15t - 34t).
Efficiency of the two-stage chain and sprocket drive is probably around 93%-95%, so actual motor/controller efficiency is about 6.5% greater.
This motor exhibited good efficiency across a wide range of input power, with a gradual peak near 80%, falling off gradually above and below.