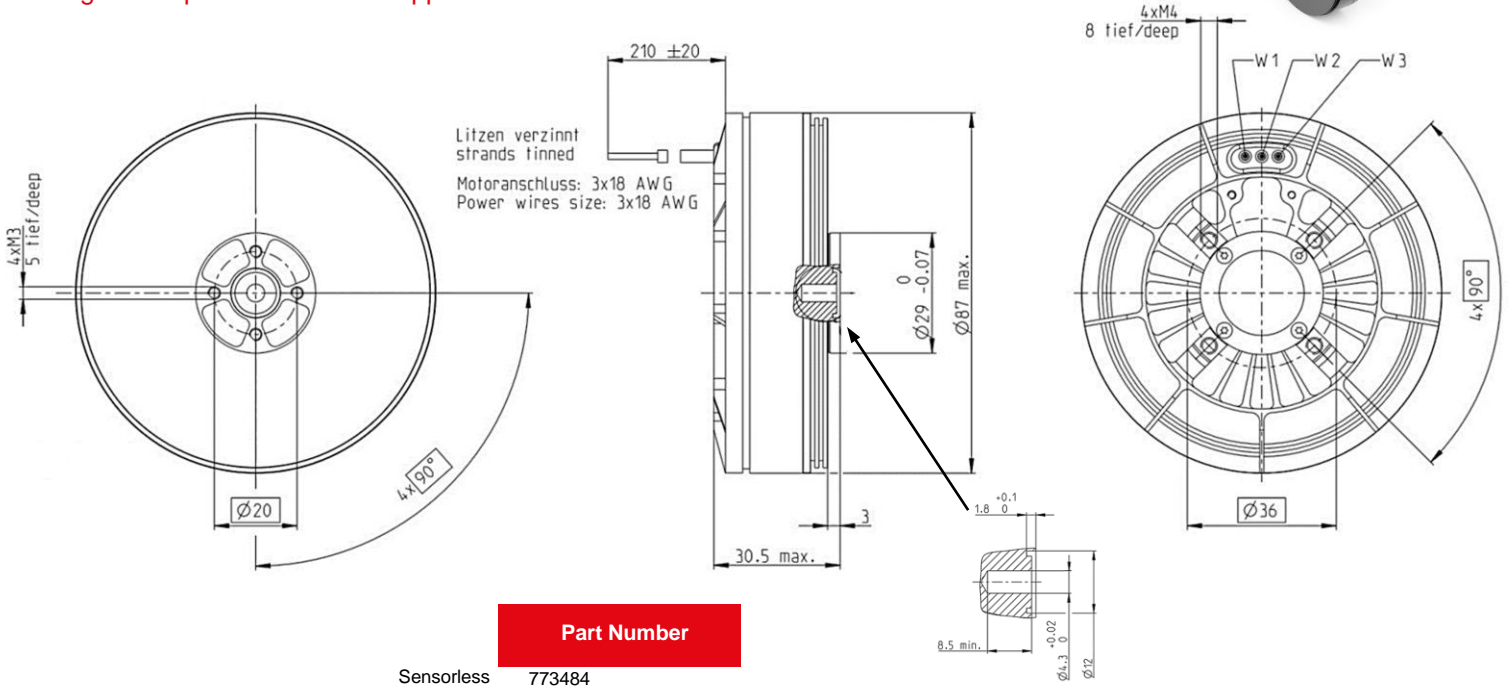


EC 87 flat UAV

designed for professional UAV applications

Ø87 mm, brushless

NEW



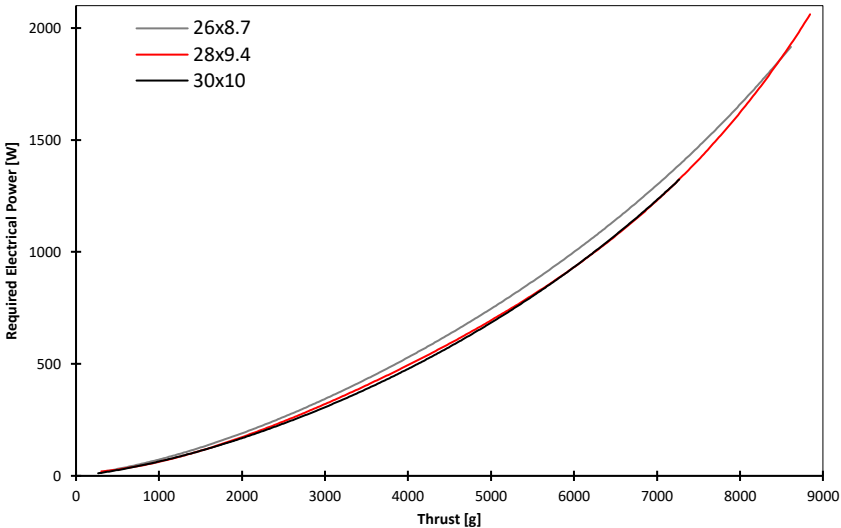
Part Number

Sensorless 773484

Motor Data Propeller Selection

Values at nominal voltage		
1 Nominal voltage	V	24
2 No load speed	rpm	3500
3 No load current	mA	895
4 Nominal speed	rpm	2690
5 Nominal torque (max. continuous torque)	mNm	1610
6 Nominal current (max. continuous current)	A	22.3
7 Stall torque	mNm	5440
8 Stall current	A	234
9 Max. efficiency	%	88

Characteristics		
12 Terminal resistance phase to phase	Ω	0.103
13 Terminal inductance phase to phase	mH	0.048
14 Torque constant	mNm/A	64.9
15 Speed constant	rpm/V	147
16 Speed/torque gradient	rpm/mNm	0.233
17 Mechanical time constant	ms	3.17
18 Rotor inertia	Gcm ²	1300
19 Thermal resistance housing-ambient ¹	K/W	0.471
20 Thermal resistance winding-housing ¹	K/W	0.553
21 Thermal time constant winding	s	10.7
22 Thermal time constant motor	s	72.9



Motor Specifications

Thermal data	
23 Ambient temperature	-20 ... +100°C
24 Max. winding temperature	+155°C
Absolute max. winding temperature	+180°C

Mechanical data (preloaded ball bearings)	
25 Max. speed	6500 rpm

Other specifications	
26 Number of pole pairs	21
27 Number of phases	3
28 Weight of motor (incl. 210 mm cable)	309 g
29 Recommended propeller sizes	26" ... 30"

Values listed in the tables are nominal.

Connection

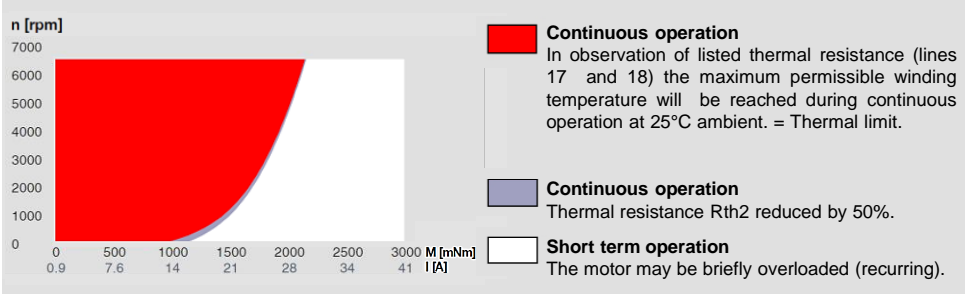
- Pin 1 Motor winding 1
- Pin 2 Motor winding 2
- Pin 3 Motor winding 3

Cable

Insulated winding wires, L = 210 mm

¹At nominal working point

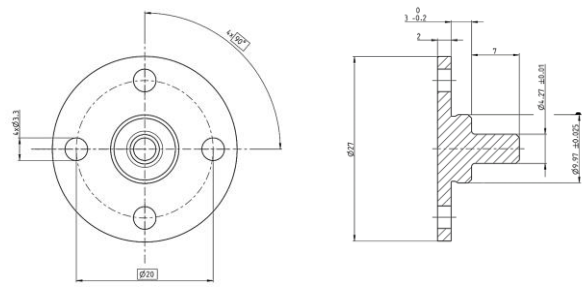
Operating Range



maxon Accessories

propeller adapter: 718087

The adapter is designed for mounting the maxon recommended propellers.



Notes

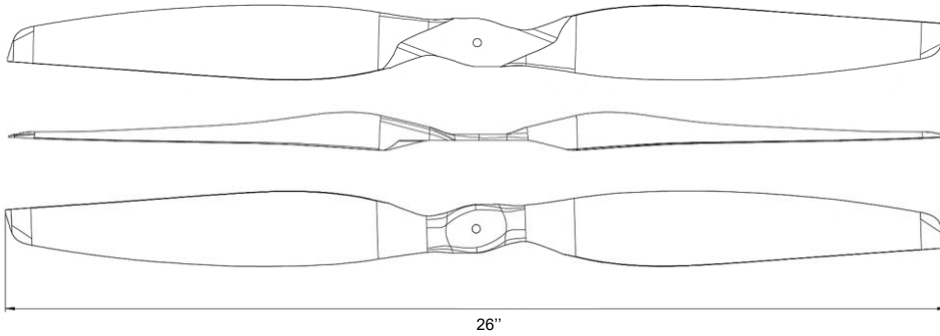
Please contact aerospace@maxongroup.com

Propeller 26x8.7

propeller recommendation



maxon recommended propeller for EC 87 flat



Supplier Propeller Specification

1	Diameter	26" (660.4 mm)
2	Pitch	8.7" (223.0 mm)
3	Interface thickness	tbd
4	Drill pattern	maxon specific
5	Weight of Propeller	66g
6	Max. recommended speed	6900 rpm
7	Material	carbon/glass fiber

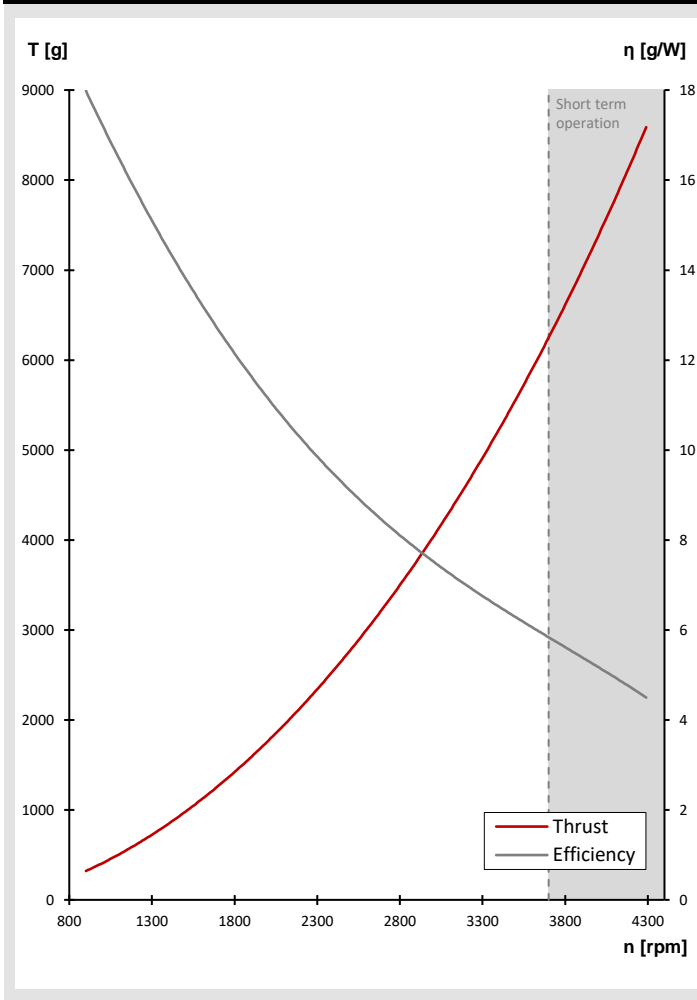
Motor Propeller Combination

Motor Operational Data

Adjusted motor data for use with specified propeller (active cooling)

8	Nominal speed	rpm	3700
9	Nominal torque (max. continuous torque)	mNm	2080
10	Nominal current (max. continuous current)	A	36.75
11	Max. continuous power output	W	1170
12	Max. peak power output	W	2040
13	Thermal time constant winding	s	27.5

Propulsion System Efficiency



Propulsion System Performance Table

ESC supply voltage: 52.2V
 Ambient temperature: 21.5°C
 Elevation (AMSL): 475m

Speed [rpm]	Current [A]	Torque [mNm]	Thrust [g]	el. Power [W]	Efficiency [g/W]	
continuous operation ($T_w < 155^\circ\text{C}$)						
900	0.3	136	324	18	18.0	
1000	0.5	163	408	24	17.3	
1200	0.7	230	607	39	15.6	
1300	0.9	266	724	48	15.2	
1400	1.1	303	840	58	14.4	
1600	1.6	390	1112	84	13.3	
1700	1.9	441	1270	100	12.7	
1800	2.3	494	1437	118	12.2	
1900	2.6	550	1608	138	11.7	
2100	3.5	661	1946	182	10.7	
2200	4.0	724	2146	209	10.3	
2300	4.5	786	2339	236	9.9	
2500	5.9	932	2775	306	9.1	
6S (22.2V) 2690 rpm	2600	6.6	1005	3000	343	8.7
	2700	7.3	1062	3172	379	8.4
	2900	9.3	1257	3777	484	7.8
	3000	10.3	1351	4048	538	7.5
	3100	11.4	1436	4312	595	7.2
8S (29.6V) 3380 rpm	3200	12.5	1524	4610	654	7.0
	3400	15.4	1739	5243	805	6.5
	3500	17.0	1856	5608	890	6.3
	3600	18.8	1974	5954	984	6.1
short term operation						
	3800	22.4	2171	6560	1168	5.6
10S (37.0V) 3925 rpm	3900	24.6	2305	6937	1285	5.4
	4000	27.3	2448	7374	1423	5.2
	4200	33.3	2736	8207	1737	4.7
12S (44.4V) 4290 rpm	4290	36.8	2849	8612	1919	4.5

Bench test data for reference only. Direct comparison with datasheets from other manufacturers can be misleading.

Notes

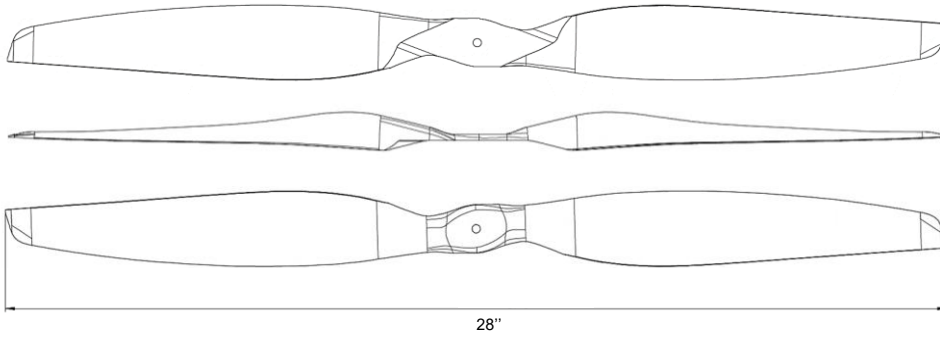
Please contact aerospace@maxongroup.com

Propeller 28x9.4

propeller recommendation



maxon recommended propeller for EC 87 flat



Supplier Propeller Specification

1	Diameter	28" (711.2 mm)
2	Pitch	9.4" (238.8 mm)
3	Interface thickness	tbd
4	Drill pattern	maxon specific
5	Weight of Propeller	76g
6	Max. recommended speed	6400 rpm
7	Material	carbon/glass fiber

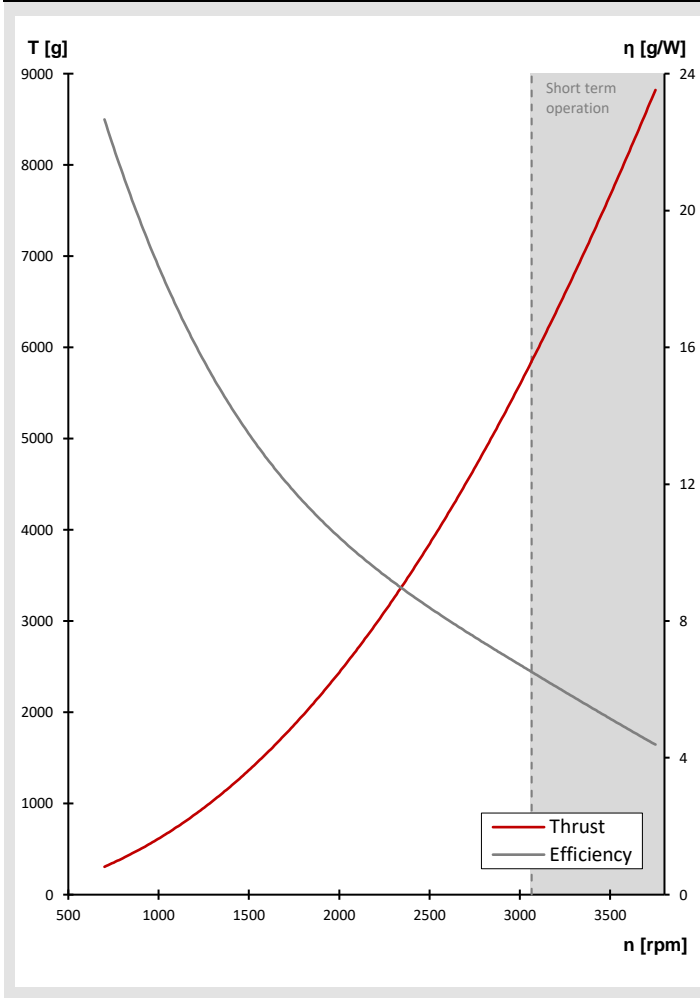
Motor Propeller Combination

Motor Operational Data

Adjusted motor data for use with specified propeller (active cooling)

8	Nominal speed	rpm	3065	
9	Nominal torque (max. continuous torque)	mNm	2060	
10	Nominal current (max. continuous current)	A	34.75	
11	Max. continuous power output	W	970	
12	Max. peak power output	W	1805	< 15s
13	Thermal time constant winding	s	27.5	

Propulsion System Efficiency



Propulsion System Performance Table

ESC supply voltage: **52.2V**
 Ambient temperature: **21.5°C**
 Elevation (AMSL): **475m**

Speed [rpm]	Current [A]	Torque [mNm]	Thrust [g]	el. Power [W]	Efficiency [g/W]	
continuous operation ($T_w < 155^\circ\text{C}$)						
700	0.3	113	306	14	22.6	
850	0.4	164	448	22	20.5	
950	0.6	202	555	29	19.2	
1100	0.8	287	733	43	16.9	
1200	1.0	335	870	54	16.0	
1300	1.3	394	1037	69	15.1	
1400	1.6	446	1184	83	14.3	
1500	2.0	515	1380	102	13.5	
1600	2.3	577	1564	122	12.8	
1800	3.3	722	1981	171	11.6	
1900	3.8	790	2179	198	11.0	
2000	4.4	881	2449	232	10.5	
2100	5.1	960	2663	266	10.0	
2200	5.9	1057	2944	310	9.5	
2300	6.8	1151	3236	354	9.1	
6S (22.2V)	2500	8.8	1363	459	8.4	
2570 rpm	2600	10.0	1479	520	8.0	
	2700	11.3	1608	591	7.7	
	2800	12.8	1733	670	7.3	
	2900	14.3	1859	748	7.0	
	3000	15.9	1962	829	6.7	
8S (29.6V)	short term operation					
3180 rpm	3200	20.2	2294	6436	1058	6.1
	3300	22.5	2423	6846	1177	5.8
	3400	24.9	2546	7158	1299	5.5
10S (37.0V)	3500	28.2	2727	7675	1473	5.2
3570 rpm	3600	31.5	2875	8099	1645	4.9
12S (44.4V)	3750	39.7	3142	8845	2075	4.3
3750 rpm						

Bench test data for reference only. Direct comparison with datasheets from other manufacturers can be misleading.

Notes

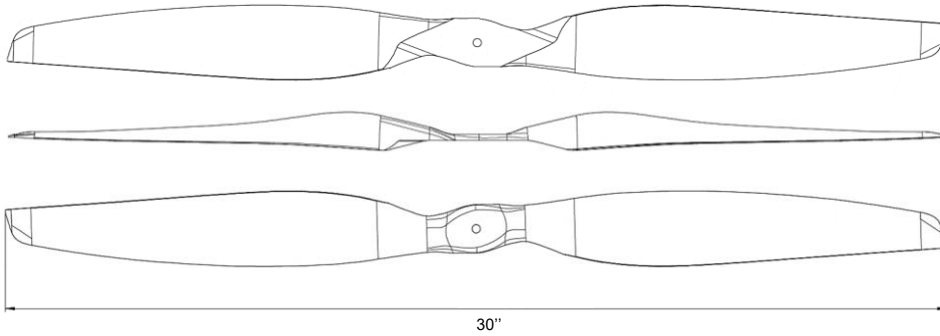
Please contact aerospace@maxongroup.com

Propeller 30x10

propeller recommendation



maxon recommended propeller for EC 87 flat



Supplier Propeller Specification

1	Diameter	30" (762.0 mm)
2	Pitch	10" (254.0 mm)
3	Interface thickness	tbd
4	Drill pattern	maxon specific
5	Weight of Propeller	71g
6	Max. recommended speed	6000 rpm
7	Material	carbon/glass fiber

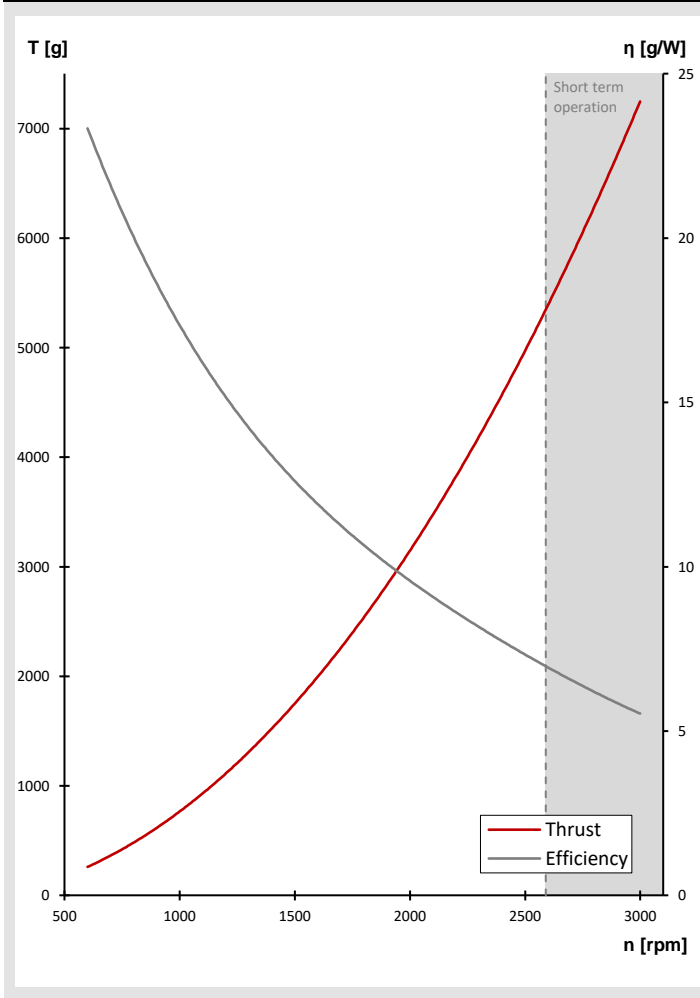
Motor Propeller Combination

Motor Operational Data

Adjusted motor data for use with specified propeller (active cooling)

8	Nominal speed	rpm	2590	
9	Nominal torque (max. continuous torque)	mNm	2005	
10	Nominal current (max. continuous current)	A	33.25	
11	Max. continuous power output	W	820	
12	Max. peak power output	W	1555	<15s
13	Thermal time constant winding	s	23.5	

Propulsion System Efficiency



Propulsion System Performance Table

ESC supply voltage: **52.2V**
 Ambient temperature: **21.5°C**
 Elevation (AMSL): **475m**

Speed [rpm]	Current [A]	Torque [mNm]	Thrust [g]	el. Power [W]	Efficiency [g/W]	
continuous operation ($T_w < 155^\circ\text{C}$)						
600	0.2	132	267	11	23.5	
700	0.3	170	363	17	21.5	
800	0.5	213	478	24	20.0	
900	0.6	263	609	33	18.5	
1000	0.8	318	757	44	17.4	
1100	1.1	384	932	57	16.3	
1200	1.4	455	1120	74	15.2	
1200	1.4	455	1120	74	15.2	
1300	1.8	537	1330	94	14.2	
1400	2.2	604	1518	113	13.4	
1500	2.7	692	1759	139	12.6	
1600	3.2	781	1996	168	11.9	
1700	3.8	871	2245	198	11.3	
1800	4.6	978	2524	238	10.6	
1900	5.4	1093	2836	282	10.0	
2000	6.3	1213	3154	331	9.5	
2100	7.3	1328	3468	383	9.1	
2200	8.6	1468	3855	447	8.6	
2300	9.8	1594	4164	511	8.1	
6S (22.2V)	2400	11.3	1748	4578	591	7.7
2450 rpm	2500	13.0	1898	4994	680	7.3
short term operation						
2600	14.7	2041	5346	770	6.9	
2700	17.0	2223	5854	886	6.6	
2800	19.5	2397	6315	1019	6.2	
8S (29.6V)	2900	21.9	2548	6703	1144	5.9
2965 rpm	3000	25.3	2736	7269	1321	5.5
10S (37.0V)	3000 rpm					

Bench test data for reference only. Direct comparison with datasheets from other manufacturers can be misleading.

Notes

Please contact aerospace@maxongroup.com