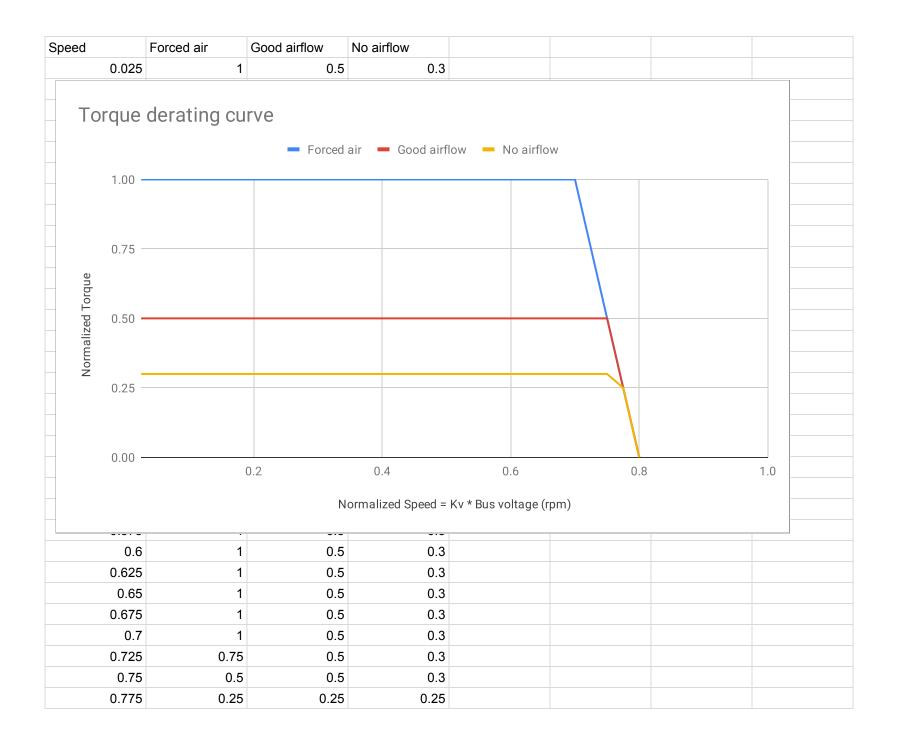
Copy this spreadsheet to customize your analysis!	Speed Constant (Kv)	Max Current*	Max voltage	Phase Resistance	Price (qty e 1pc)	Mass	Link	Torque	No-l	load speed		ower at se speed	Motor size constant (Km)	Force	Linear Velocity	Linear Acceleration	Time to base speed	Distance to base speed	Base speed kinetic energy	Encoder freq. (base speed)	
(feilds highlighted in blue are inputs)	rpm/V	Α	V	mOhm	USD	g		Nm	RPM	Rad	l/s	W	Nm/sqrt(W)	N	m/s	m/s^2	ms	mm	J	kHz	
ODrive Robotics D5065 - 270kv	270					42	0 https://odr	<u>iv</u> 1.99			04.78	1801	0.13	208.49	8.64	69.57					
ODrive Robotics D6374 - 150kv	150		48			89	0 https://odr	3.86	57	760 60	03.19	2328	0.23	404.15	5.76	134.87	42.71	123.00	31.52	196.608	
Tarot 4008 330kv	330	25	24	1	32	8	0 https://www	0.63	79	920 82	29.38	520		65.61	7.92	21.89	361.74	1,432.50	59.59	270.336	
Turnigy Aerodrive SK3 - 4250-350kv	350		20		36	26	6 https://hobb	<u>y</u> 1.18	70		33.04	866		123.72	7.00	41.29		5 593.42	2 46.55	238.9333333	
ACK 5312CP - 330KV	330		30		41	23	0 https://hobb	<u>y</u> 1.25	99	900 1,03	36.73	1299		131.22	9.90	43.79	226.09	1,119.14	93.11	337.92	
Turnigy Aerodrive SK3 - 5065-275kv	275	60	40)	66	53	0 https://hobb	1.80	105	560 1,10	05.84	1995		188.95	10.56	63.05	167.47	7 884.26	105.94	360.448	
KEDA 63-64 190KV	190	50	40)	49	67	0 https://hobb	2.18	72		64.04	1663		227.90	7.30	76.05	95.93	349.97	50.57	249.0368	
Turnigy Aerodrive SK3 - 6374-149kv	149	68	48	3	90	84	0 https://hobb	<u>y</u> 3.77	57	722 59	99.16	2261		395.23	5.72	131.89	43.38	124.10	31.10	195.29728	
9235-100KV Turnigy Multistar	100	57	48	3	103	67	4 https://hobb	*		340 40	02.12	1896		493.63	3.84	164.73	23.31	1 44.76	14.01	131.072	
Hoverboard Hub-motor	16	25 [1]	48	3	40	a lo	https://www	12.92	6	614 6	64.34	831		1,353.16	0.61	451.56	1.36	0.42	0.36	20.97152	
		*Note that to	orque and c	urrent rating	gs are with Ext	remely god	od forced air	cooling													
		See Torque																			
Parameter	Value	1/									_			250)						
Bus voltage	48		5								_ _										
Max modulation	0.8		-							•	_								1995	•	_
Load mass	1.9	_	-						3.77	7 3.86	3.86			200	0					301	1896
Rotor inertia [2]	1.00E-04	_	4						•	•)			1663		•	•
Pulley circumference or screw pitch		mm/rev	-								- -										
Radius	0.009549296		-											150			1299				
Reflected inertia	1.10		E °											E ()						
Peak brake power	1200		e e			2.	.18	1.99			- -			ē							
Brake resistor resistance	1.92	ohm	Torque (Nm)					.80			_			§ 100			866				
Conversion constants					1	.18 ^{1.25}					_					ŧ	520				
by kv to Nm	8.269933431	1	_ 1		0.63	• •								500)		•				
			'		0.03																
Encoder											_										
Encoder resolution	2048	ppr	0								_ _			()						
inear resolution	7.32	um)	25		50	75		100					0	25		50	75		00
Max speed	15000	RPM					Price (\$)											Price (\$)			
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nere are more tabs:			3																		
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			H	,	200			000		000	_										
							Weight (g)														



0.8	0	0	0		
0.825					
0.85					
0.875					
0.9					
0.925					
0.95					
0.975					
1					

	Rotor mass	Rotor diameter	Shaft length	Shaft diameter	Shaft density	Shaft mass	Shaft Mol	End Face thickness	End face density	End face mass	End Face Mol	casing	Rotor casing Mol	Total Mol
	g	mm	mm	mm	kg/m^3	g	kg*m^2	mm	kg/m^3	g	kg*m^2	g	kg*m^2	kg*m^2
Red 5065	190	50	83	8	7850	32.750475	5.24E-07	7.5	1350	19.8803910	6.21E-06	137.369133	8.59E-05	9.26E-05

	Price (qty 1pc)	Base speed	Force	Linear Acceleration		Distance to base speed			Travel ti	me as a funct	ion of tavel dis	tance, trapez	oidal motion p	orofile		ms		
Motor	USD	m/s	N	m/s^2	ms	mm		50	77	118	181	277	425	652	1000	mm		
urnigy Aerodrive SK3 - 4250-350kv	36	7.00	123.72	41.29	169.55	593.42	Turn	69.60	86.37	106.92	132.42	163.82	202.92	251.34	311.26			
CK 5312CP - 330KV	41	9.90	131.22	43.79	226.09	1,119.14	ACK	67.58	83.87	103.82	128.59	159.07	197.04	244.05	302.24			
Drive Robotics D5065 - 270kv	79	8.64	208.49	69.57	124.18	536.47	ODri	53.62	66.54	82.37	102.01	126.20	156.31	193.61	239.78			
EDA 63-64 190KV	49	7.30	227.90	76.05	95.93	349.97	KED	51.28	63.64	78.78	97.57	120.70	149.51	185.18	232.99			
Drive Robotics D6374 - 150kv	109	5.76	404.15	134.87	42.71	123.00	ODri	38.51	47.79	59.16	73.27	90.80	116.49	155.90	216.32			
235-100KV Turnigy Multistar	103	3.84	493.63	164.73	23.31	44.76	9235	34.84	43.24	54.04	70.45	95.45	133.99	193.10	283.73			
overboard Hub-motor	40	0.61	1,353.16	451.56	1.36	0.42	Hove	82.74	126.69	193.42	295.96	452.21	693.09	1,062.56	1,628.96			
				idal moti														_
arameter Ill travel distance) mm	100													_ 0	CK 5312CP - 330KV	
inimum travel distance	50) mm	0														5065 - 270kv	
																	EDA 63-64 190KV	-
																	Drive Robotics 6374 - 150kv	
			500														235-100KV Turnigy	
																	Multistar	
																	loverboard Hub- notor	
																	10101	
			(S)															
			ш) e															
			Travel time (ms)									_						
			ave															
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																		1

Travel distance (mm)

	Speed Constant (Kv)	Max Current*			ad [4]	Optimal loss ratio		Optimal gearing	efficiency	Optimal s	speed at rated	current				
(feilds highlighted in blue are inputs)	rpm/v	Α	mOhm	Α	V	A/V	A/V	Ncm/krpm		V	rpm	W	24	36	48	V
Turnigy Aerodrive SK3 - 4250-350kv	350	50				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
Turnigy Aerodrive SK3 - 5065-275kv	275	60				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
ODrive Robotics D5065 - 270kv	270	65	39			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
ODrive Robotics D6374 - 150kv	150	70	39			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
Turnigy Aerodrive SK3 - 6374-149kv	149	68	3			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
KEDA 63-64 190KV	190	50				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
9235-100KV Turnigy Multistar	100	57				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
Hoverboard Hub-motor	16	25	5			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	

- [1] Assuming improved cooling mod
- [2] Note: We should measure inertia of each individual motor. This is an estimate of 5065 size motors.
- [3] Data from https://www.ecalc.ch/motorcalc.php, high accuracy not guaranteed
- [4] Data from https://www.ecalc.ch/motorcalc.php, high accuracy not guaranteed