

Size 23, Resolver Feedback, Specifications

Parameter	Symbol	Units	SM231A	SM231B	SM232A	SM232B	SM233A	SM233B
Stall Torque Continuous ¹	T_{cs}	lb-in	4.3	3.8	7.4	7.8	11.3	10.9
		oz-in	68	60	118	125	180	174
		Nm	0.48	0.42	0.83	0.88	1.26	1.22
Stall Current Continuous ^{1,4,7}	$I_{cs}(\text{sine})$	Amps Peak	3.3	6.2	3.1	6.0	3.0	5.9
Peak Torque ⁶	T_{pk}	lb-in	12.7	11.2	22.1	23.3	33.8	32.7
		oz-in	203	179	354	373	540	523
		Nm	1.42	1.25	2.48	2.61	3.78	3.66
Peak Current ^{4,6,7}	$I_{pk}(\text{sine})$	Amps Peak	9.8	18.5	9.3	18.0	9.1	17.6
Rated Speed ²	ω_r	rpm	7500	7500	7500	7500	6000	6000
Current@Rated Speed	$I_r(\text{sine})$	Amps	2.9	5.5	2.7	5.3	2.7	5.3
Current@Rated Speed	$I_r(\text{trap})$	Amps	2.5	4.8	2.4	4.6	2.4	4.6
Torque@Rated Speed	T_r	lb-in	3.4	3.1	6.0	6.1	9.0	8.8
		oz-in	54	50	96	98	144	140
		Nm	0.38	0.35	0.67	0.69	1.01	0.98
Shaft Power@Rated Speed	P_o	watts	300	277	533	544	639	621
Voltage Constant ^{3,4}	K_b	Volts/rad/s	0.169	0.079	0.310	0.169	0.484	0.242
Voltage Constant ^{3,4}	K_e	Volts/KRPM	17.70	8.27	32.46	17.70	50.68	25.34
Torque Constant ⁸	$K_t(\text{sine})$	oz-in/Amp Peak	20.72	9.69	38.02	20.72	59.35	29.68
		Nm/Amp Peak	0.145	0.068	0.266	0.145	0.415	0.208
Resistance ³	R	Ohms	5.22	1.46	7.50	2.00	9.65	2.58
Inductance ⁵	L	mH	1.64	0.44	2.90	0.78	4.08	1.06
Maximum Bus Voltage	V_m	Volts DC	170	170	340	170	340	170
Therm. Resistance Wind-Amb	$R_{in} w-a$	°C/watt	2.00	2.00	1.54	1.54	1.25	1.25
Motor Constant	K_m	oz-in/ $\sqrt{\text{watt}}$	10.47	9.26	16.03	16.92	22.06	21.33
		Nm/ $\sqrt{\text{watt}}$	0.073	0.065	0.112	0.118	0.154	0.149
Viscous Damping	B	oz-in/Krpm	0.25	0.25	0.36	0.36	0.54	0.54
		Nm/Krpm	1.75 E-3	1.75 E-3	2.52 E-3	2.52 E-3	3.78 E-3	3.78 E-3
Static Friction	T_f	oz-in	0.30	0.30	0.70	0.70	1.00	1.00
		Nm	2.10 E-3	2.10 E-3	4.90 E-3	4.90 E-3	7.00 E-3	7.00 E-3
Motor Thermal Time Constant	τ_{th}	minutes	20	20	21.6	21.6	23.3	23.3
Electrical Time Constant	τ_{elec}	milliseconds	0.31	0.30	0.39	0.39	0.42	0.41
Mechanical Time Constant	τ_{mch}	milliseconds	9.5	12.2	7.2	6.5	5.4	5.8
Intermittent Torque Duration ⁹	T_{2x}	seconds	11	11	18	18	20	20
Peak Torque Duration ¹⁰	T_{3x}	seconds	4	4	6	6	7	7
Rotor Inertia	J	lb-in-sec ²	4.8 E-4	4.8 E-4	8.4 E-4	8.4 E-4	1.2 E-3	1.2 E-3
		kg-m ²	5.4 E-5	5.4 E-5	9.5 E-5	9.5 E-5	1.3 E-4	1.3 E-4
Number of Poles	N_p		4	4	4	4	4	4
Weight	#	lbs	2.1	2.1	3.0	3.0	3.9	3.9
		kg	1.0	1.0	1.4	1.4	1.8	1.8
Winding Class			H	H	H	H	H	H

¹ @ 25°C ambient, 150°C winding temperature, motor connected to a 10"x10"x1/4" aluminum mounting plate, @40°C ambient derate phase currents and torques by 12%.

² Maximum speed is 7500RPM with 500 line Encoder. For 1000 line encoders, derate to 6000RPM. For higher speed operation please call the factory.

³ Measured Line to Line, ±10% line-to-line

⁴ Value is measured peak of sine wave.

⁵ ±30%, Line-to-Line, inductance bridge measurement @ 1 kHz

⁶ Initial winding temperature must be 60°C or less before peak current is applied.

⁷ Peak of the sinusoidal current in any phase for a sinusoidally commutated motor.

⁸ Total motor torque per peak of the sinusoidal amps measured in any phase, +/-10%.

⁹ Maximum Time duration with 2 times rated applied with initial winding temp at 60°C.

¹⁰ Maximum Time duration with 3 times rated applied with initial winding temp at 60°C.

Note: These specifications are based on theoretical motor performance and are not specific to any amplifier.

Servo Motors

