



thin gap

LS SERIES FRAMELESS MOTOR KIT

**HIGH TORQUE-TO-WEIGHT RATIO | LIGHT-WEIGHT AND LOW-INERTIA | HIGHLY EFFICIENT
RING ARCHITECTURE | ZERO COGGING FOR PRECISION MOVEMENT | SCALABLE IN SIZE AND POWER**

Data Sheet Model Number:

LSI 105-21

ThinGap's LS Line includes numerous high performance brushless permanent magnet motors. The LS line targets lower speed, high precision applications such as gimbals, optics, and precision robotics. The highest torque density with high power capability and low thermal resistance.

Motor Parameter Table

Continuous Parameters	Units	Value
Continuous Torque @ Max Speed	N-m	1.2
Max Continuous Speed	RPM	3000
Max Continuous Power	W	378
Required Motor Voltage @ Max Speed	V_{pk-l}	139.6
Max Continuous Phase Current @ Max Speed	A_{RMS}	2.60
Peak Parameters@Max Speed		
	Units	Value
Peak Torque (1 sec)*	N-m	13.5
Peak Phase Current (1 sec)	A_{RMS}	27.4
Peak Power (1 sec)*	W	4241
Motor Constants		
	Units	Value
Voltage Constant (I-I)	$V_{pk-l}/rad/s$	0.403
Voltage Constant (I-I)	$V_{pk-l}/kRPM$	42.171
Torque Constant	N-m/ A_{RMS}	0.493
Motor Constant	N-m/ \sqrt{W}	0.198
Electrical Parameters		
	Units	Value
Terminal Resistance @ 20°C	Ω	4.120
Terminal Resistance @ Max Temperature	Ω	5.781
Terminal Inductance	μH	161.25 \pm 20%
Number of Magnetic Poles	ea	30
Electrical Frequency @ Max Speed	Hz	750
Mechanical Parameters		
	Units	Value
Rotor Inertia	$kg\cdot m^2$	4.470E-04
Outer Diameter	mm	104.78
Through Hole Diameter	mm	77.94
Axial Height	mm	21.08
Rotor Mass	kg	0.24
Stator Mass	kg	0.175
Part Set Mass	kg	0.414
Temperature Parameters		
	Units	Value
Max Stator Temperature	$^{\circ}C$	130
Max Rotor Temperature	$^{\circ}C$	85
Thermal Resistance	$^{\circ}C/W$	2.04

All motor parameters calculated assuming 20° C ambient temperature and the motor kit not being installed into a housing. Thermal resistance can drop by 30% when mounted.

*Includes temperature effects and losses from speed



ThinGap's LS Line of Brushless Motors
For low speed, high precision applications such as gimbals, optics, and precision robotics. Highest torque density with high power capability. Available in sizes 25mm to 267mm.

Torque and Mechanical Speed:

Continuous rated torque of up to 1.2 N-m and rated speed of up to 3000 RPM.

Motor Controller Recommendation:

Standard 3-Phase Controller
High frequency PWM recommended

Custom Variants Available Upon Request:

Alternative winding design options
Higher speed options
High temperature option
Two Phase Winding

