

Motor Mojo: Design made intuitive



INPUT



Data Input

Conventional Tools

Radial

Axial

3D

Slot Type:

Parallel Tooth

Rotor Type:

Interior Flat (simple)

Stator Ducts:

None

Rotor Ducts:

Circular Ducts

Stator Dimensions	Value	Rotor Dimensions	Value
Slot Number	12	Pole Number	10
Stator Lam Dia	125.25	Notch Depth	4.1
Stator Bore	83.6	Notch Arc Outer [ED]	23.25
Tooth Width	10	Notch Arc Inner [ED]	7.25
Slot Depth	15.7	Magnet Thickness	5
Slot Corner Radius	0.67	Magnet Width	20
Tooth Tip Depth	0.66	Magnet Segments	1
Slot Opening	3	Magnet Clearance	0.2
Tooth Tip Angle	18	Bridge Thickness	1
Sleeve Thickness	0	Web Thickness	0
		Magnet Post	0
		Pole Arc [ED]	150
		Airgap	0.5
		Banding Thickness	0
		Shaft Dia	16
		Shaft Hole Diameter	0
		Rotor Duct Layers	2
		L1 RDuct Rad Dia	60
		L1 RDuct Channel	10
		L1 RDuct Dia	4.2
		L1 RDuct Angle	54
		L2 RDuct Rad Dia	54
		L2 RDuct Channel	5
		L2 RDuct Dia	4.2
		L2 RDuct Angle	72

Motor Mojo

Vehicle Dynamics

Project

Project Name

Nexon

Voltage Input

Voltage Limit (DC)(V)

320

Vehicle Parameters

Gross Vehicle Weight (Kg)

2000

Wheel radius (m)

0.332

Frontal Area (m^2)

2.05

Drag Coefficient

0.45

Rolling Resistance coeff.

0.015

Gear ratio

9

Gear Efficiency (%)

90

Vehicle Specification

Rated speed at 5 deg (Kmph)

60

Max speed on level road (Kmph)

140

Gradeability (deg)

12.4

Length of grade (m)

17.5

Time to cross grade from rest (s)

11

Acceleration from rest to speed (Kmph)

100

Time to accelerate (s)

8.9

RUN VEHICLE DYNAMICS

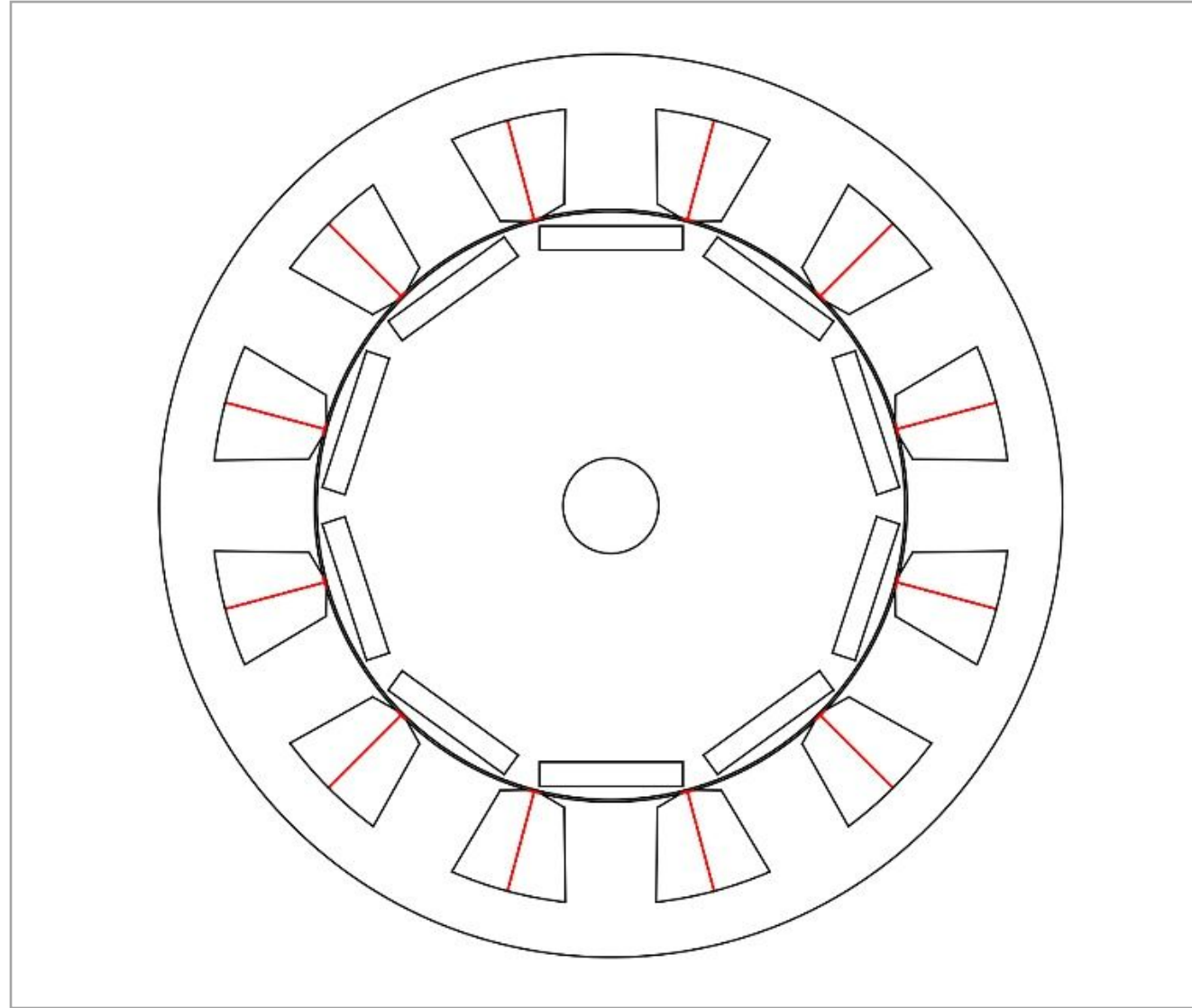
DEFAULT VALUES

MOTOR WIZ

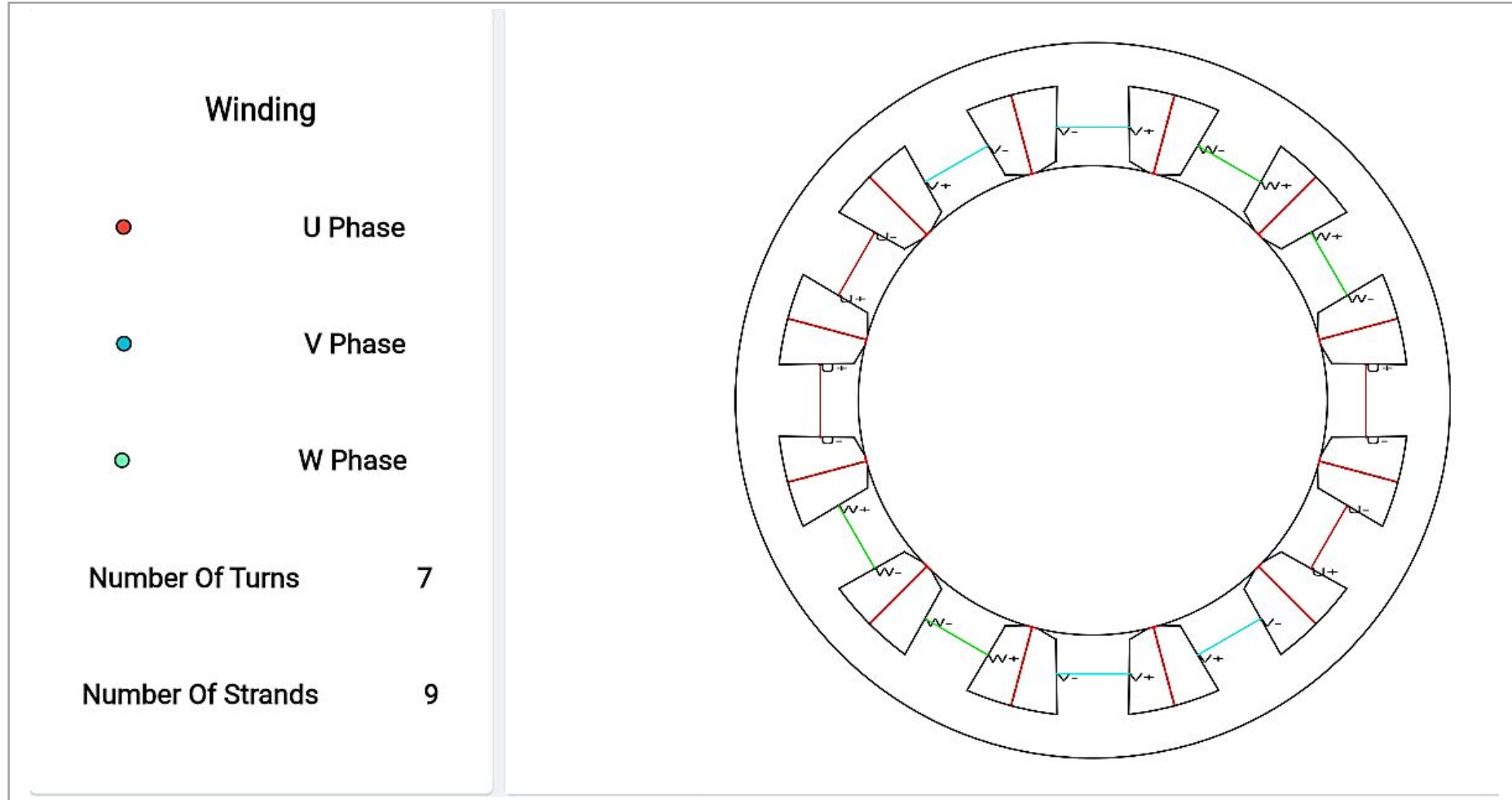
OUTPUT



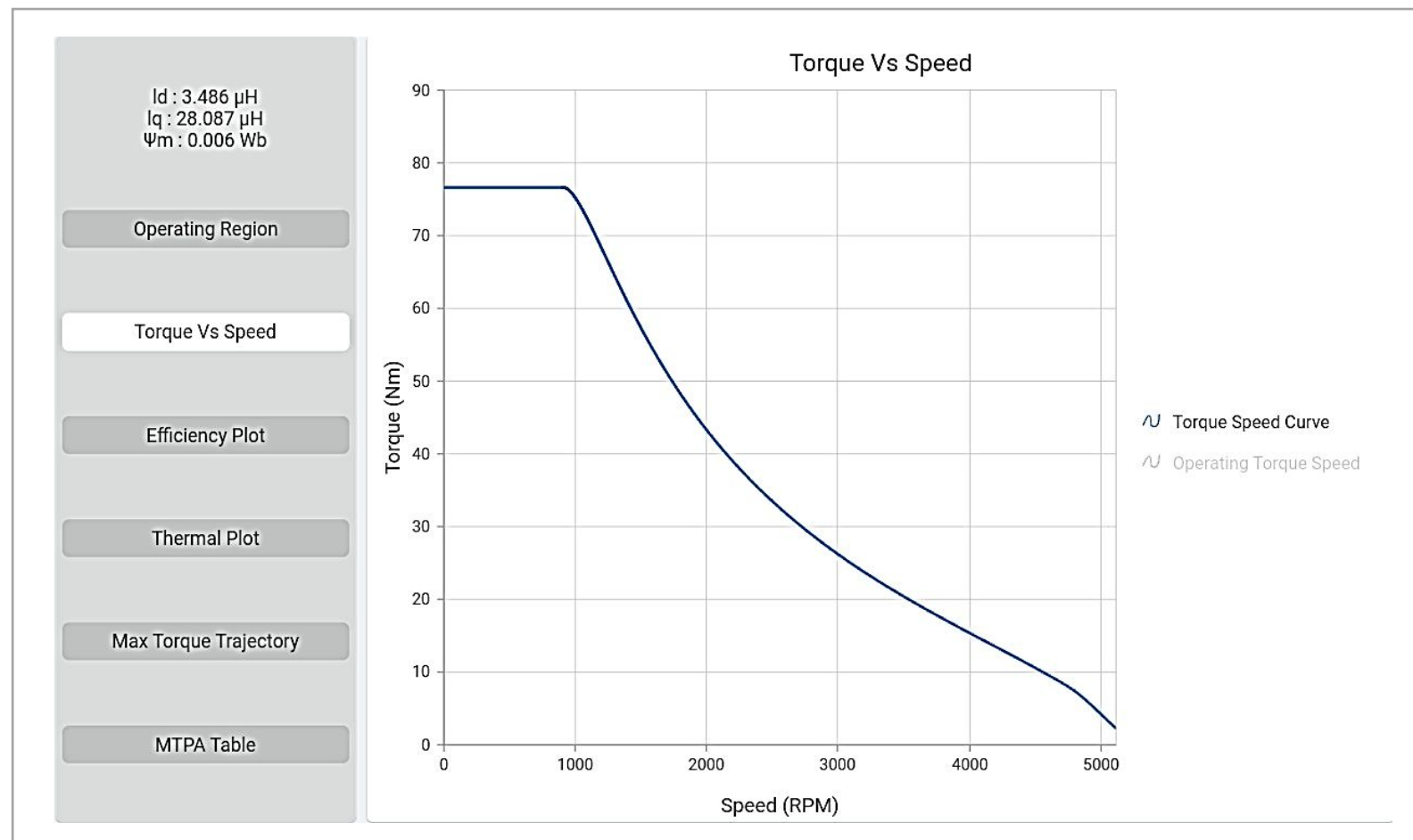
Design



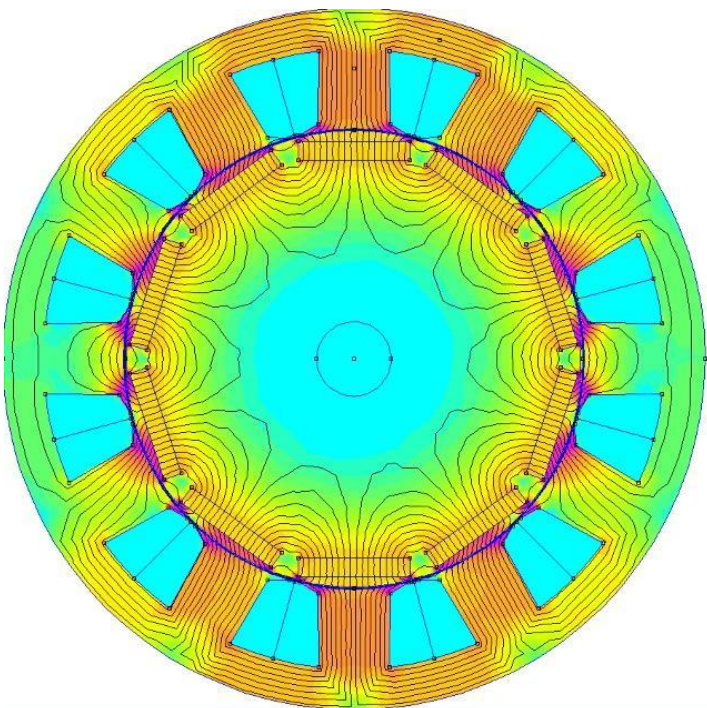
Winding Diagram



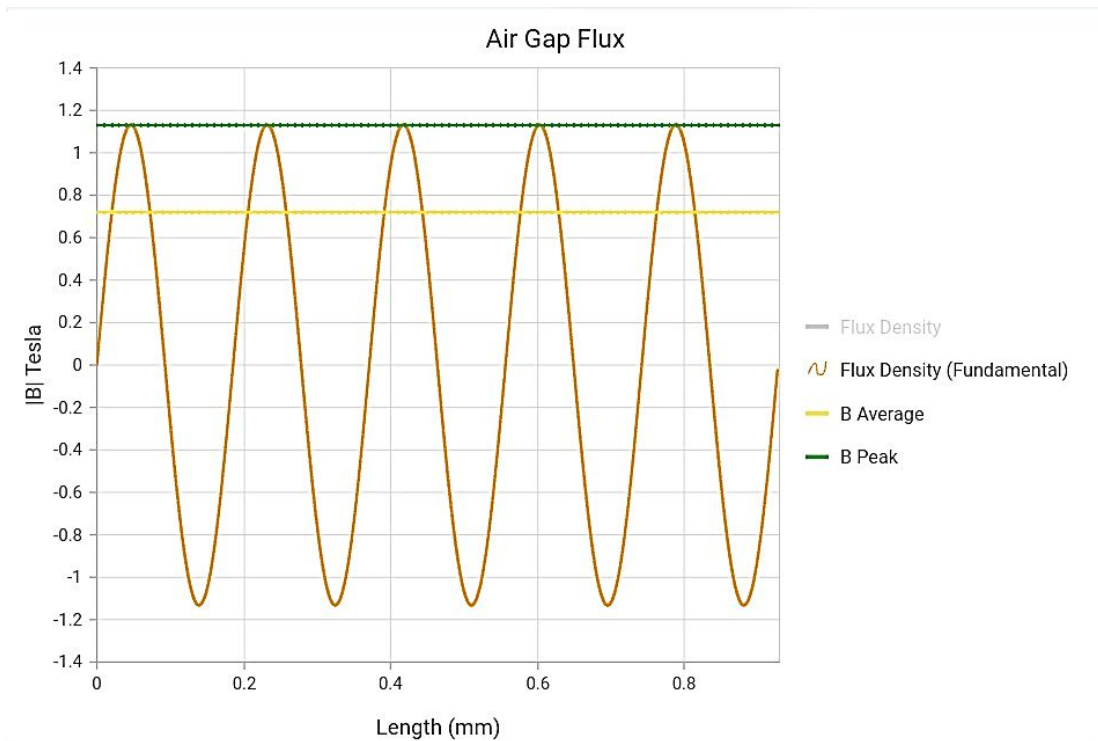
Torque-Speed Curve



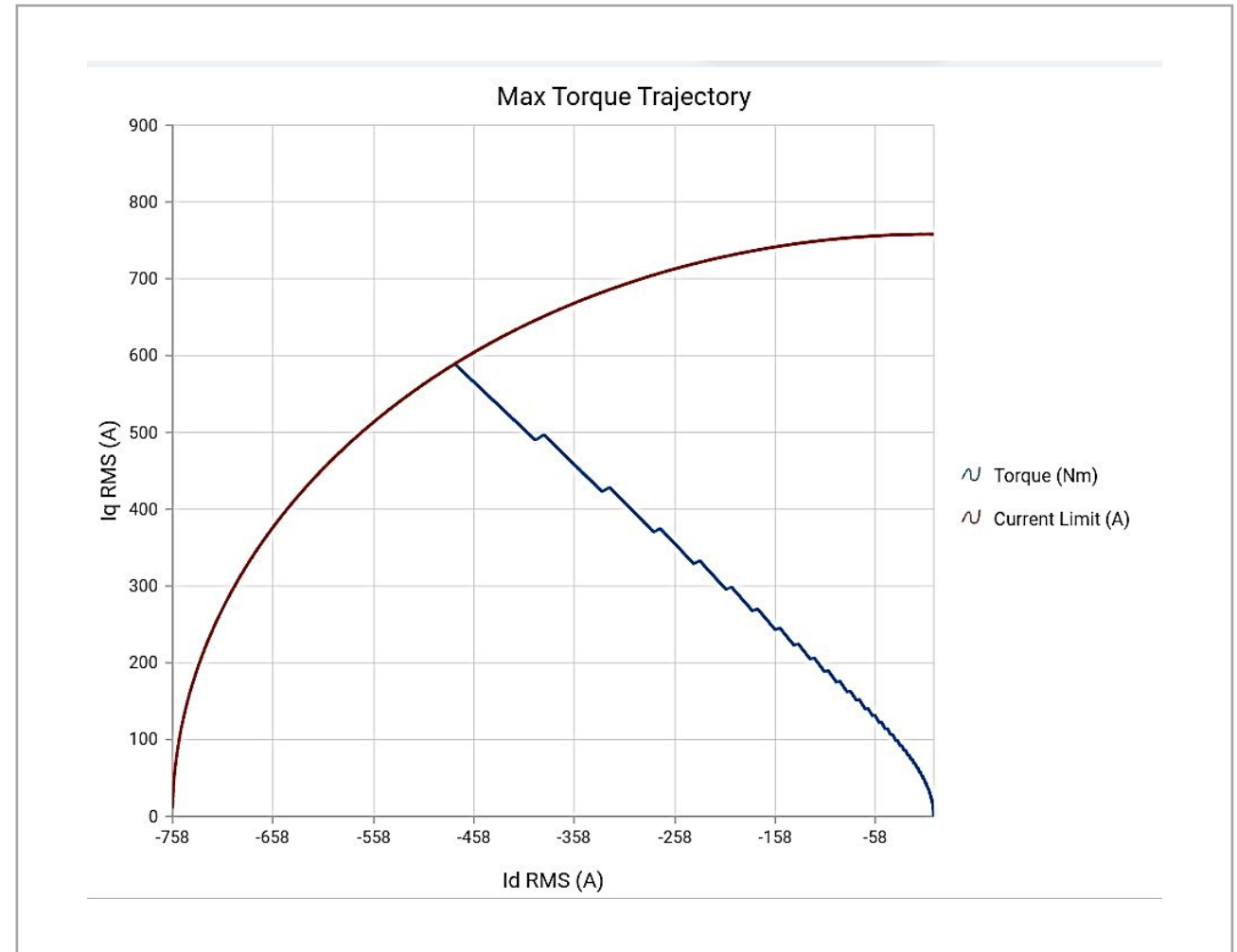
Flux Density Diagram



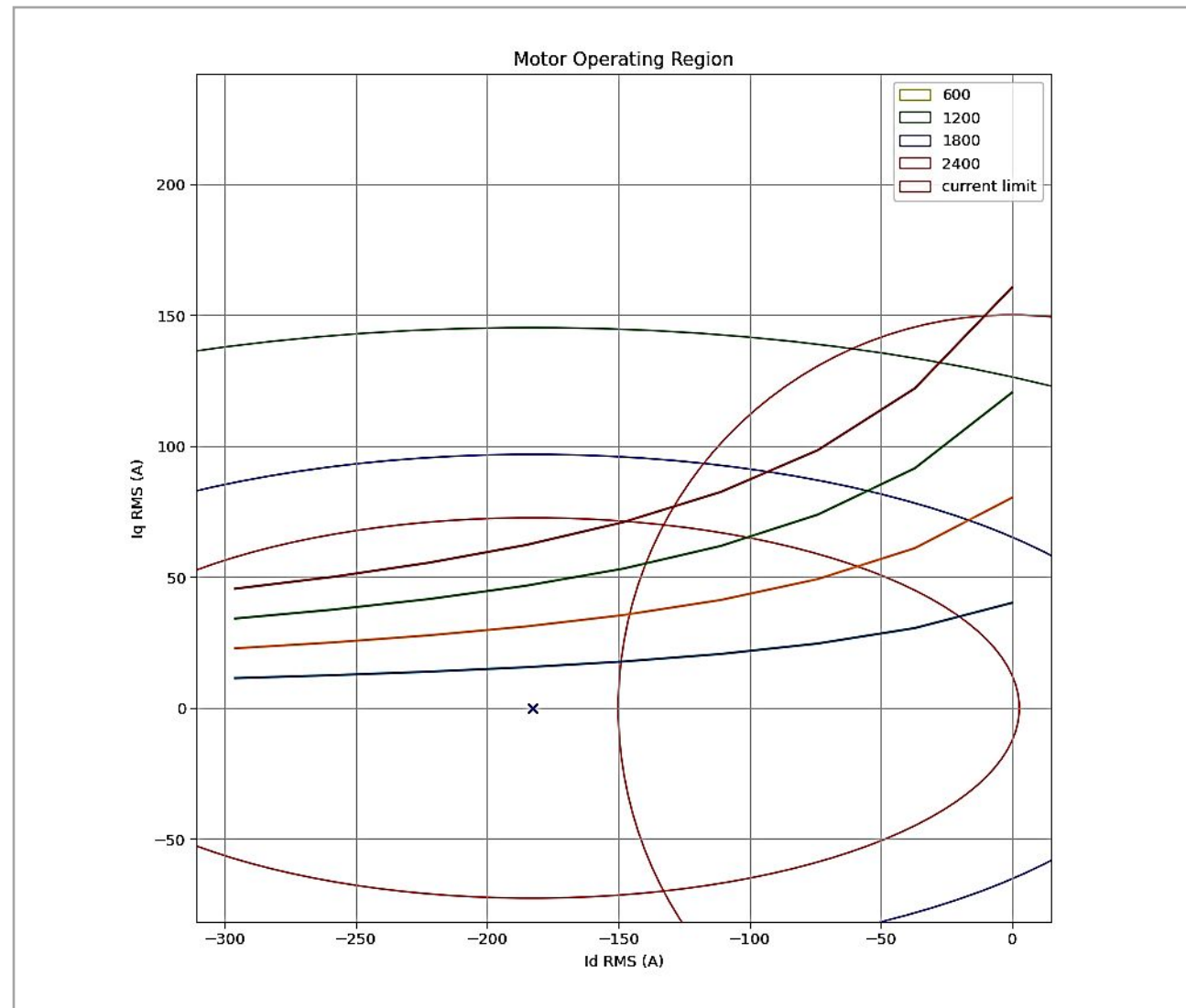
Air Gap Flux



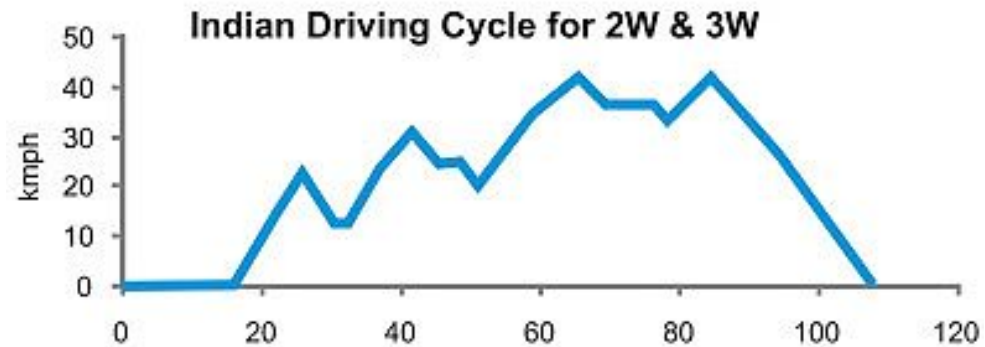
MTPA – Maximum Torque Per Ampere



Flux Weakening



Drive Cycle And Range



Cold Start with 40 Sec Idling
 4 warm cycles (108 sec each) (only for SI Engine)
 6 sample cycles (108 sec each)
 Total Test Time: 648 sec
 Total Test Distance: 3.948 km
 Max speed: 42 kmph

Parameters	Value
DC Voltage (V)	320
DC Current max (A)	1074
Back-EMF Constant (V/Krpm)	12.05
Torque Constant (Nm/A)	0.20
RMS Current Max (A)	1044
Energy Consumption (Wh/Km)	140
Range (Km)	308

Thank you

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