

pmsm_36s6p_inset - Machine Report

Topology: PMSM
Generated: 2026-08-22 01:04:59 by Nabla

Operating point

Mechanical speed: 1500 RPM
Electrical frequency: 75.00 Hz
Simulated steps: 109 (field step 109)

All values are read from the selected completed simulation. Missing or non-finite quantities are shown as "-".

Machine Parameters

Operating Point

Parameter	Value	Unit	Comments
Mechanical Speed	1500.00	RPM	
Electrical Frequency	75.0000	Hz	

DQ Quantities

Parameter	Value	Unit	Comments
D-axis Inductance (Ld)	1616.53	uH	
Q-axis Inductance (Lq)	2597.48	uH	
Saliency Ratio	0.622343	-	Ld/Lq

Flux and Voltage / Back-EMF

Parameter	Value	Unit	Comments
PM Flux Linkage 1st Harmonic Peak	0.207516	Wb	
Back-EMF 1st Harmonic Peak	99.6951	V	peak of the fundamental
Back-EMF RMS	71.5125	V	fundamental + harmonics
Back-EMF THD	17.0509	%	percent of the fundamental
Phase Voltage 1st Harmonic Peak	103.684	V	peak of the fundamental
Phase Voltage RMS	74.1428	V	fundamental + harmonics

Torque and Mechanical Performance

Parameter	Value	Unit	Comments
Average Torque	31.5344	N.m	
Torque Ripple (Peak-to-Peak)	11.7518	N.m	
Torque Ripple	37.2667	%	percent of average torque
Cogging Torque (Peak-to-Peak)	3.28187	N.m	
Torque Constant (Kt)	0.912213	N.m/A	

Power and Efficiency

Parameter	Value	Unit	Comments
Apparent Power	5.44189	kVA	$S = V * I$ (RMS)
Active Power	5.21740	kW	$P = V * I * \cos(\phi)$
Reactive Power	1.54690	kVA	$Q = V * I * \sin(\phi)$
Mechanical Power	4.95341	kW	from average torque
Efficiency	95.5129	%	
Power Factor	0.958748	-	
Back-EMF Constant (Ke)	0.660074	V.s/rad	
Back-EMF Constant (Ke krpm)	69.1228	V/krpm	

Losses

Parameter	Value	Unit	Comments
Joule Losses (Winding)	194.675	W	
Current Density	2.75341	A/mm^2	
Phase Resistance	105.946	mOhm	

Parameter	Value	Unit	Comments
Slot Fill Factor	0.450000	-	
Iron Losses (Stator)	38.0318	W	
Iron Losses (Rotor)	0.000288021	W	
Total Losses	232.707	W	

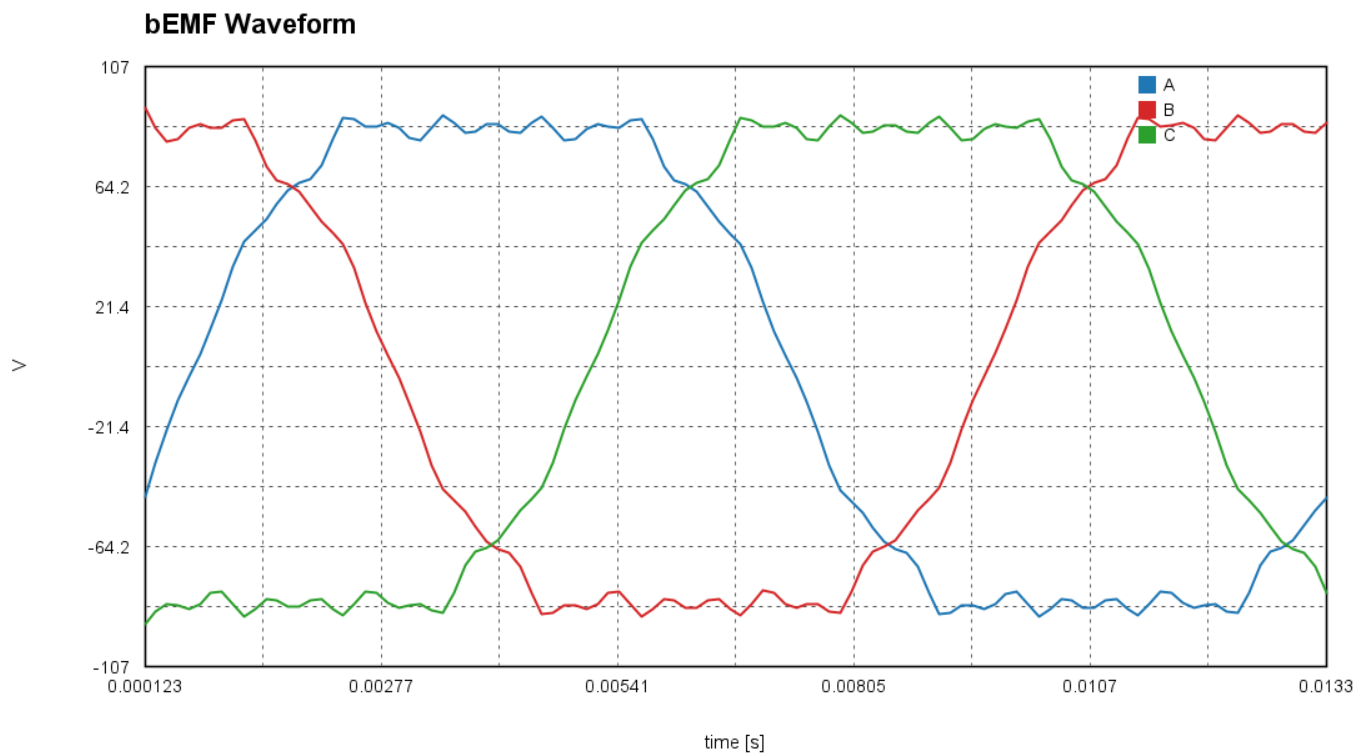
Flux Density Values

Parameter	Value	Unit	Comments
Max Flux Density (Stator Core)	1.42368	T	
Max Flux Density (Stator Tooth)	1.73253	T	
Max Flux Density (Rotor Core)	0.181446	T	

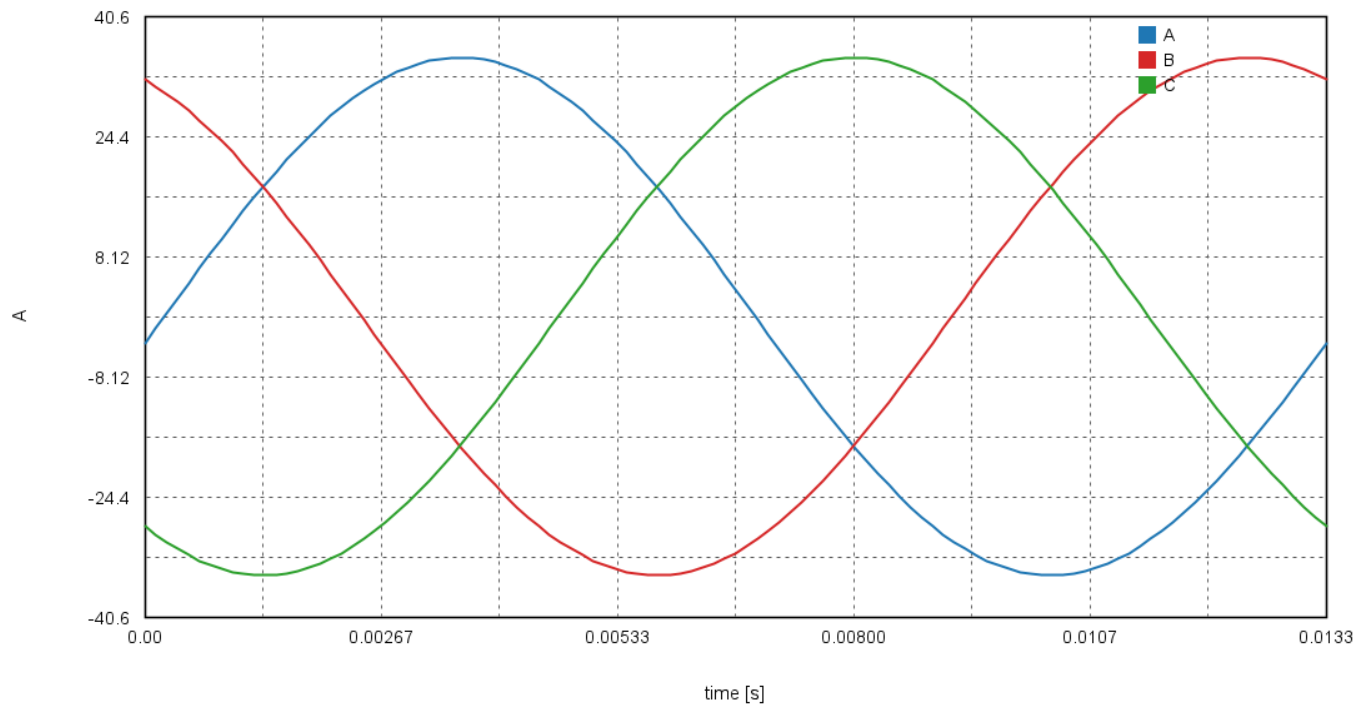
Mass Estimation

Parameter	Value	Unit	Comments
Stator Core Mass	8.57684	kg	area x axial length x density
Rotor Core Mass	0.720898	kg	
Winding Mass (In-Slot)	1.30212	kg	slot area x fill factor
End-Winding Mass	1.50509	kg	analytical, both axial ends
Magnet Mass	0.647107	kg	
Shaft Mass	0.591824	kg	
Sleeves / Wedges / Spacers Mass	3.65927	kg	
Total Mass	17.0032	kg	sector scaled to full machine

Key Waveforms

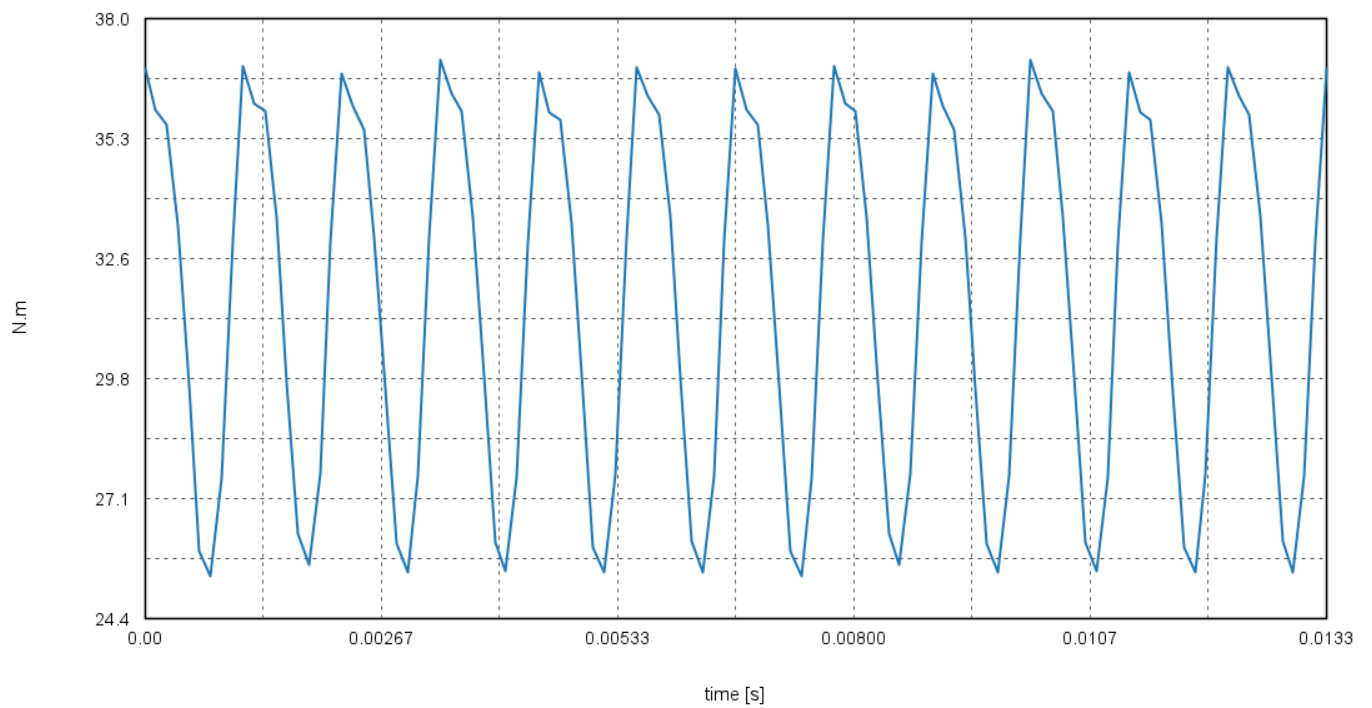


Phase Current



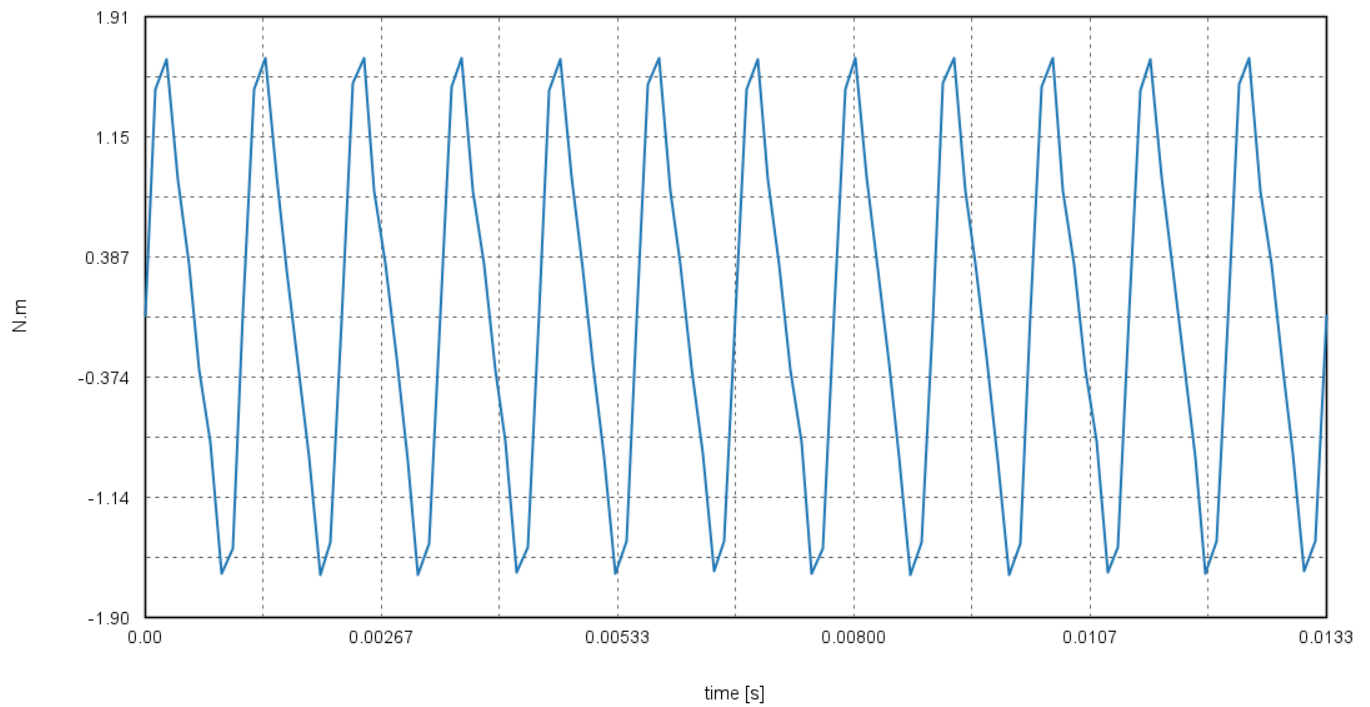
Full simulated range (109 samples). y-axis: A.

Torque



Full simulated range (109 samples). y-axis: N.m.

Cogging Torque

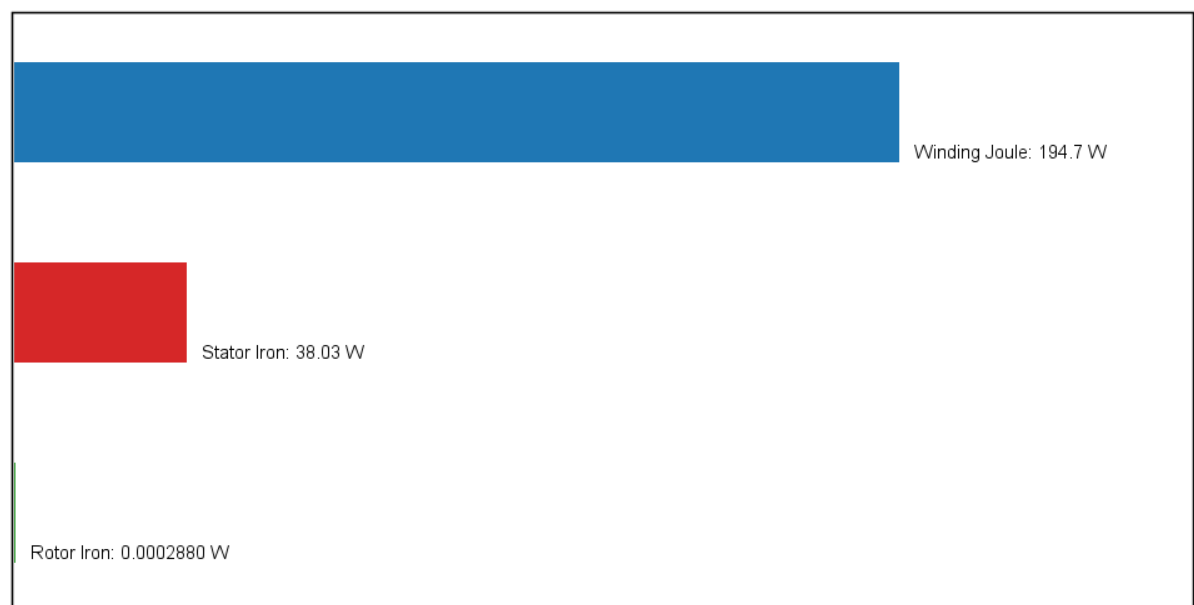


Full simulated range (109 samples). y-axis: N.m.

Loss Summary

Parameter	Value	Unit	Comments
Winding Joule	194.675	W	
Stator Iron	38.0318	W	
Rotor Iron	0.000288021	W	
Total Losses	232.707	W	
Efficiency	95.5129	%	
Power Factor	0.958748	-	

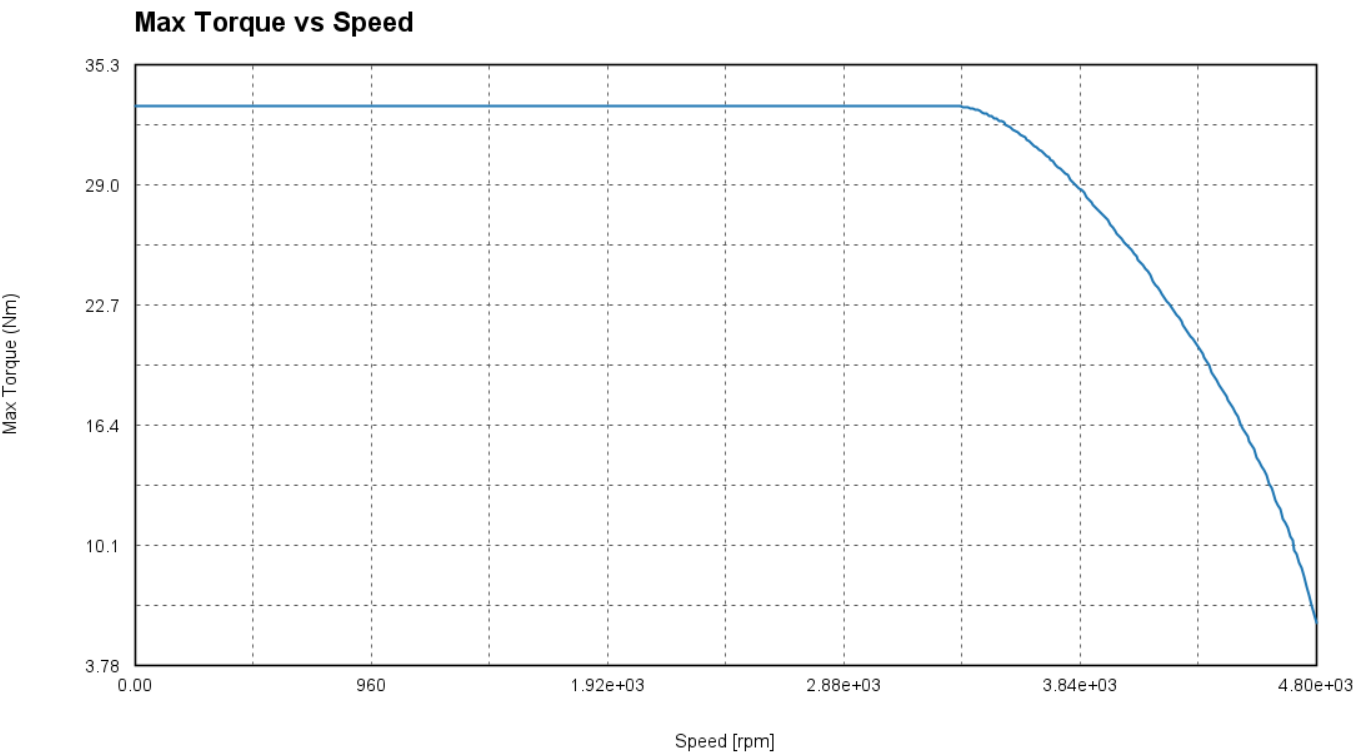
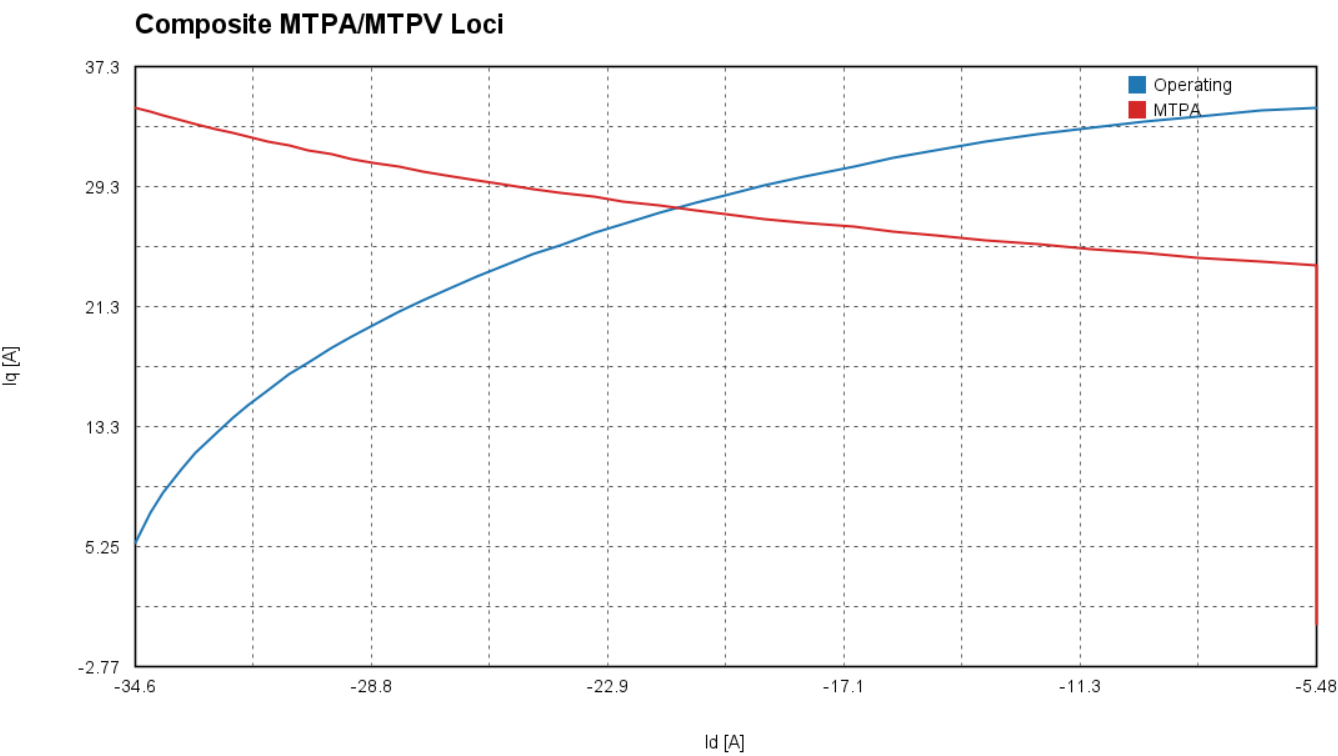
Loss Breakdown



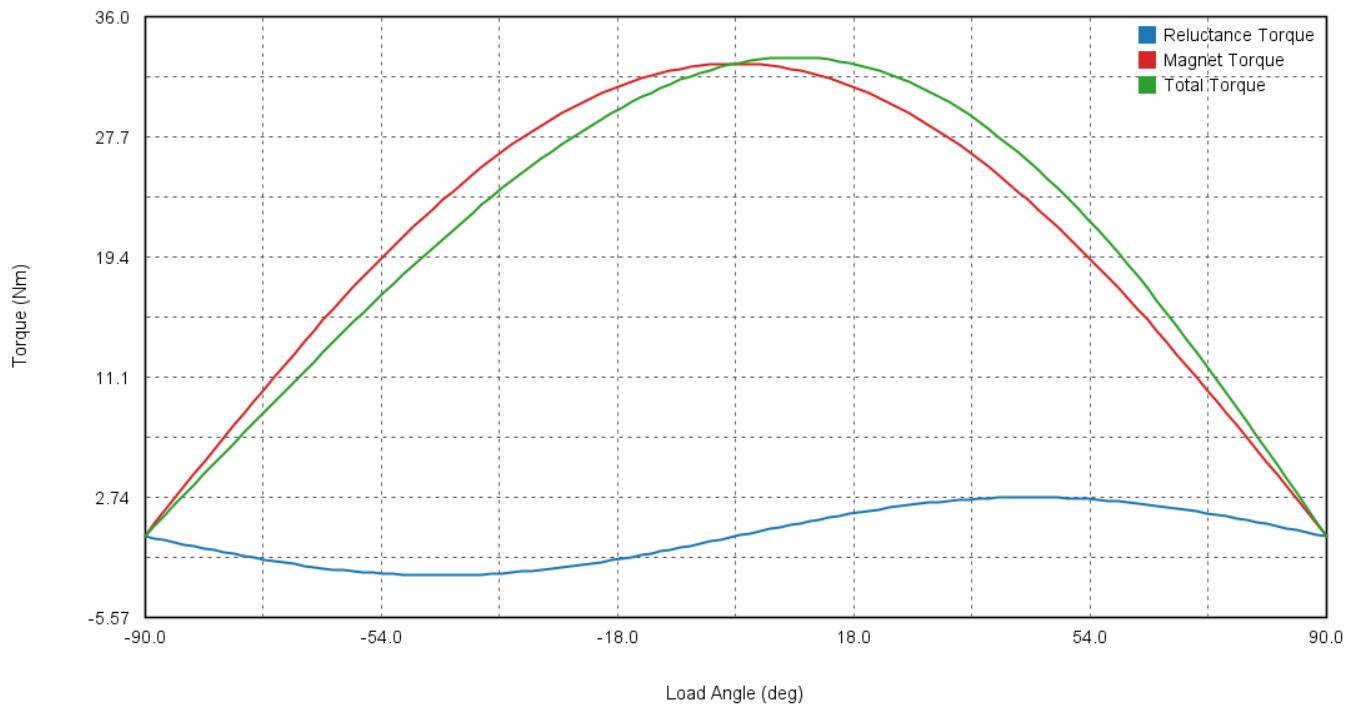
Total losses: 232.71 W

Performance Analysis

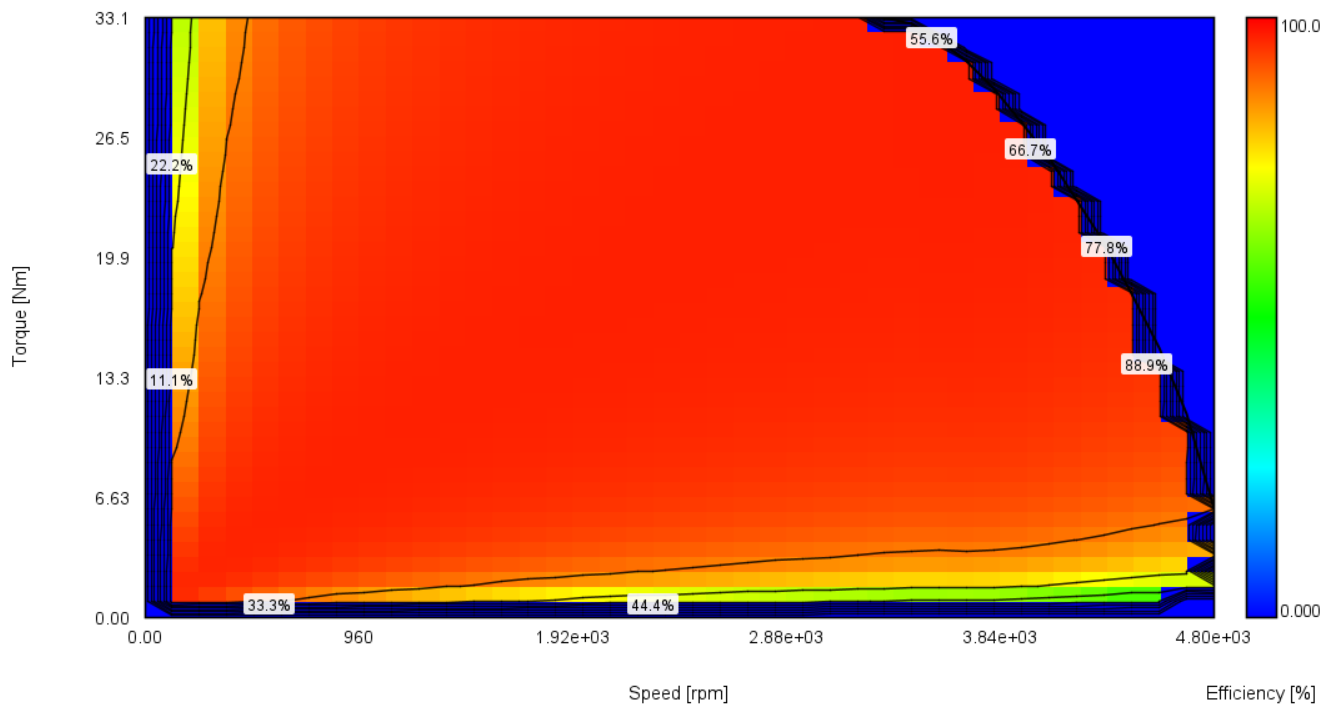
Computed from the performance-analysis parameters as currently set in the Graphs panel.



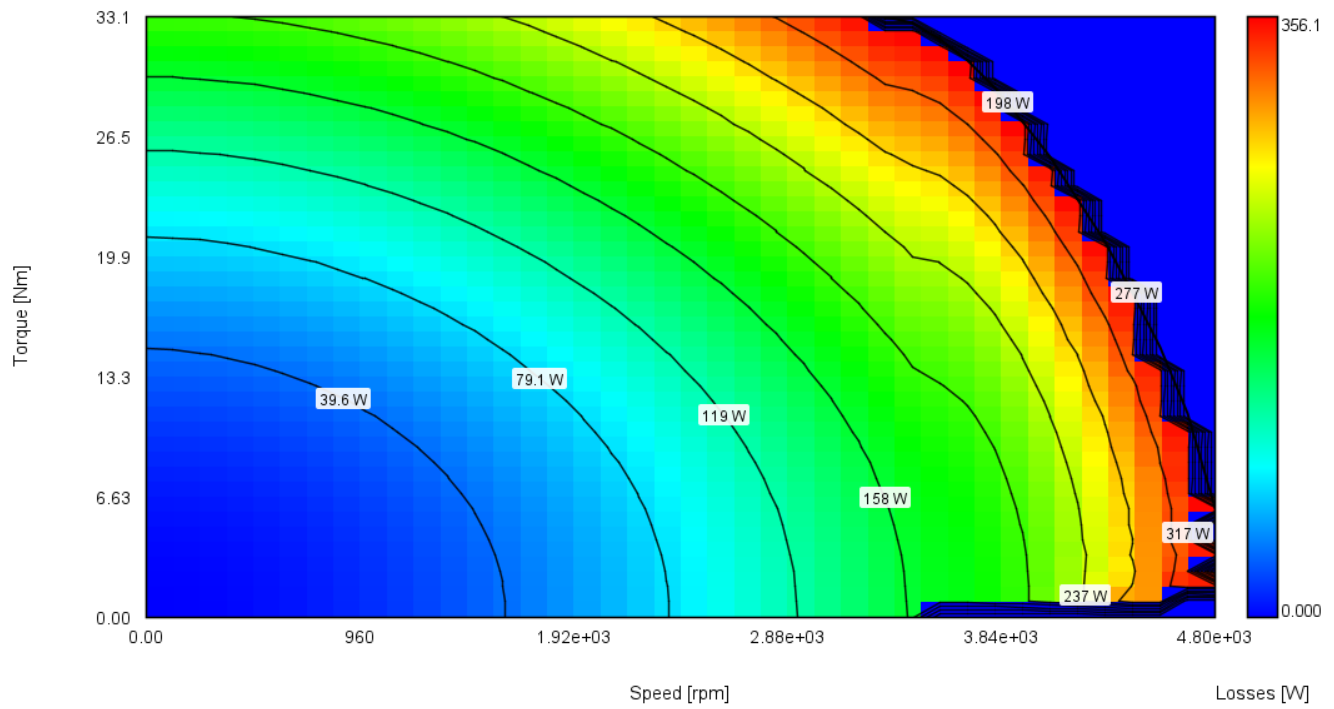
Torque vs Load Angle



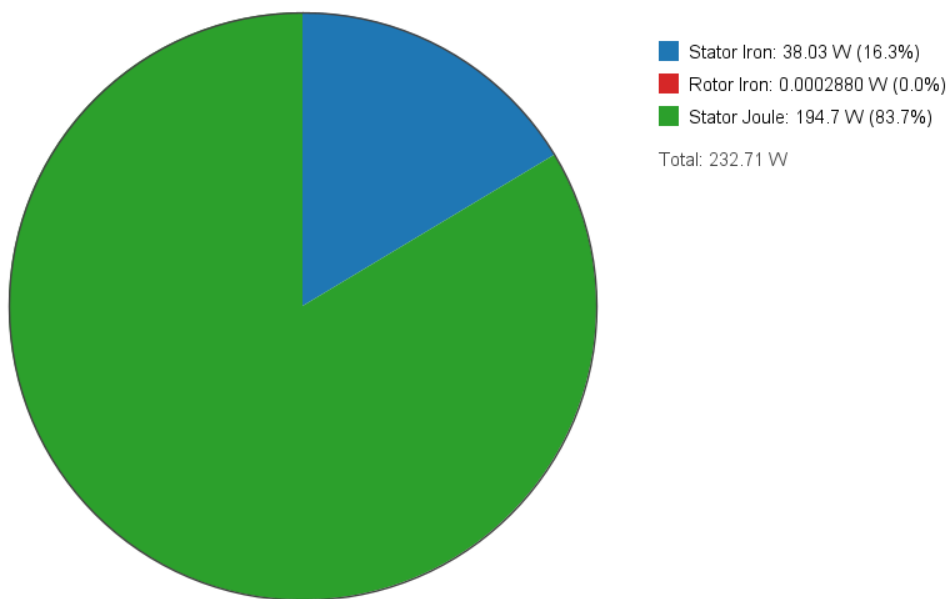
Efficiency Map



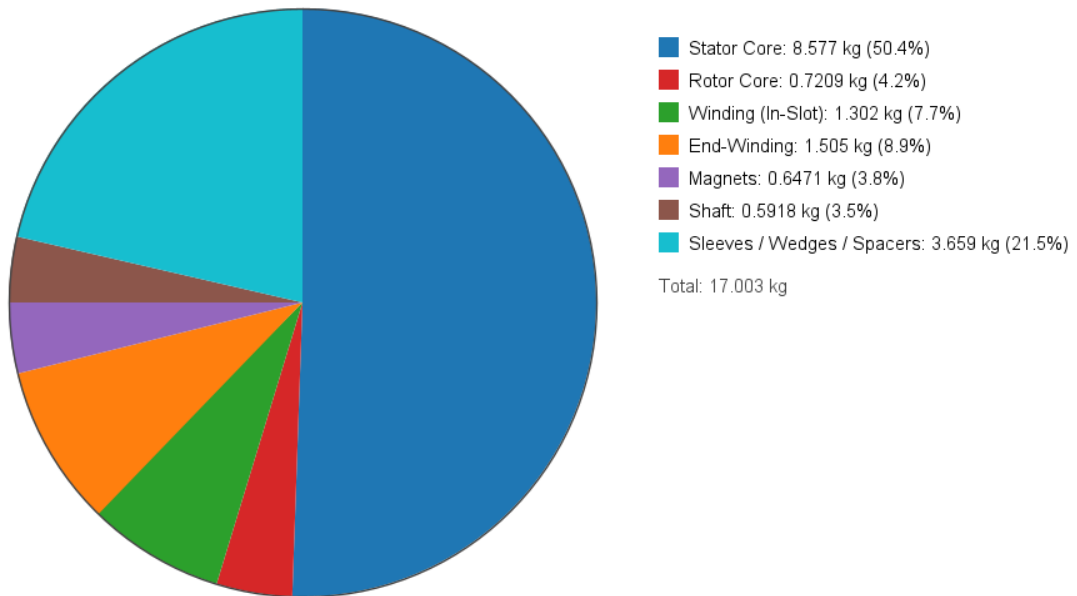
Loss Map



Loss Breakdown

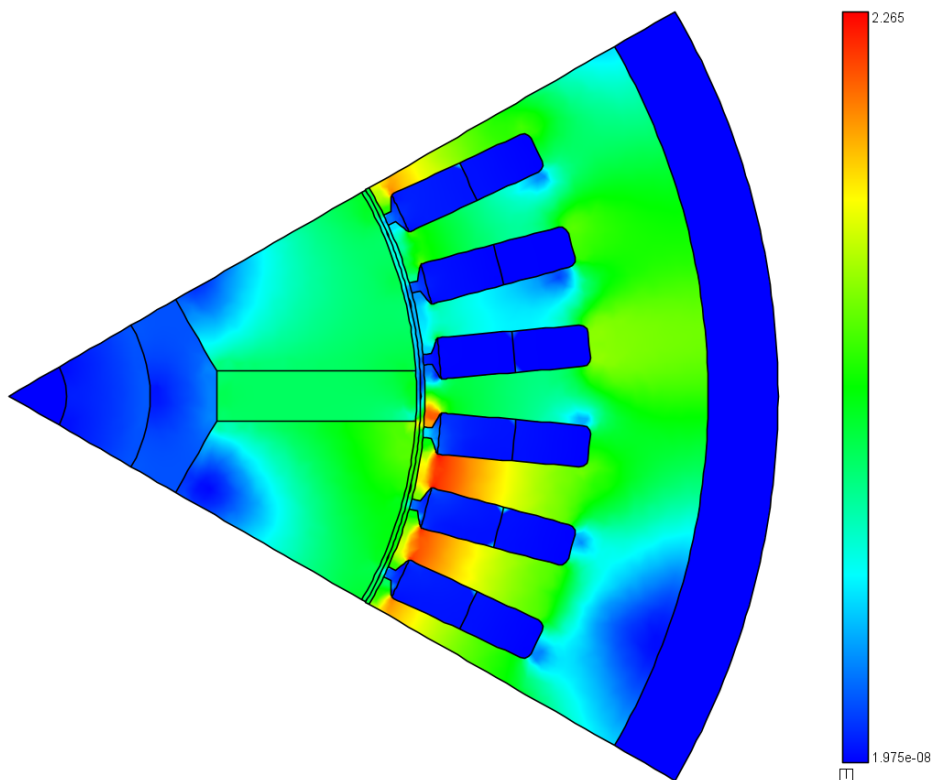


Machine Mass



Field Images

Flux Density Magnitude |B|



step 109/109 | t = 0.0133333 s | rotor position = 0.00 deg