

Comprehensive DC Brushless Motor Test Scheme AN8355(F)

Product Introduction //

This product is suitable for testing of dynamic performance of various types of DC brushless motors with/without load, widely used in household brushless motors, electric vehicle motors, fan motors, drone motors, brushless power tools and other industries.

Features //

- Broadband: signal detection of 0.5Hz~100KHz ultra-wideband.
- High accuracy: measurement accuracy of voltage/current up to 0.2%.
- Efficient: One-time wiring to complete all testing items such as static, no load, Hall signal, etc., high efficiency.
- One-stop: self-developed AC/DC power supply, convenient and unified before/after sale.
- Module: Module test unit to avoid interference, and customize single/multi-station, serial/parallel test system as required.
- Multi ports: USB, RS232, LAN and other ports, PLC simulation, TCP/IP network protocol, etc., to facilitate data interaction and instrument control.

Test items //

- Stator: withstand voltage, insulation, resistance, resistance balance, interturn, inductance, rotation
- Motor: withstand voltage, insulation, resistance, back electromotive force, no load, speed, Hall, rotation.

Test cases //

Test Name	Parameter	Set Value	Test Value	Result
1 Run	V Test Voltage	13.600~13.610	13.510 V	PASS
	V Test Voltage	13.600~13.690	13.590 V	PASS
	V Test Voltage	13.610~13.610	13.510 V	PASS
	I Test Ampere RMS	7.400~7.400	7.480 V	PASS
	V Test Ampere RMS	7.400~7.400	7.480 V	PASS
	A Volts RMS	7.400~7.400	7.480 V	PASS
	V Test Current	0.400~0.610	0.410 A	PASS
	V Test Current	0.400~0.600	0.400 A	PASS
	B Test Current	0.400~0.700	0.700 A	PASS
	B Test Current	0.200~0.700	0.720 A	PASS
	I Current RMS	0.400~0.920	0.820 A	PASS
	V Current RMS	0.400~1.000	0.790 A	PASS
	A Current RMS	0.400~0.310	0.310 A	PASS
	Input Voltage	11.900~11.990	11.990 V	PASS
	Input Current	0.400~0.950	0.450 A	PASS
	Total Power	7.740~7.740	7.740 W	PASS
	Brake Power Absolute Deviation	1.000~1.200	1.250 W	PASS
	Input Power Absolute Deviation	0.200~0.200	0.230 W	PASS
	Output Power	5.400~5.400	5.450 W	PASS
	Output Power Absolute Deviation	0.200~0.500	0.450 W	PASS
	Efficiency	80.000~90.000	88.000 %	PASS
	Efficiency Absolute Deviation	8.000~9.000	8.600 %	PASS
	Efficiency Relative Deviation	2.000~2.900	0.900 %	PASS
	Rotam in Speed	1000.00~1500.00	1710.00 rpm	PASS
	Direction of Rotation	CW	CW	PASS





Specifications //

General parameters of AN8355S(F)/AN8355M(F) series			
Application industries		Household brushless motors, electric vehicle motors, fan motors, drone motors, brushless power tools, etc.	
Model of product		AN8355S(F)	AN8355M(F)
Withstand voltage test	Output voltage	Range: 300 ~ 3000 VAC, step: 10V	5000 VAC
		Allowable error: $\pm (2.5\% \times \text{setting} + 10V)$	
	Break down current	Range: 0.10~20.00 mA	100 mA
		Allowable error: $\pm (2.5\% \times \text{reading} + 5 \text{ words})$	
Insulation test	Duration	Range: 1.0~99.9s, allowable error: $\pm (1\% \times \text{setting} + 0.1s)$	
	Output voltage	Range: 200 ~ 1000 VDC, step: 5V	
		Allowable error: $\pm (3\% \times \text{setting} + 5V)$	
	Ripple coefficient	< 5%	
	Resistance measurement	Range: 1.0~500MΩ	
		Allowable error: $\leq 200M\Omega, \pm (3\% \times \text{reading} + 5 \text{ words})$	
		>200MΩ, $\pm (5\% \times \text{reading} + 8 \text{ words})$	
Resistance test	Duration	Range: 1.0~99.9s, allowable error: $\pm (1\% \times \text{setting} + 0.1s)$	
	Test and measurement	Range: 0.1~20k Ω, unit: Ω	1mΩ~400KΩ
		Allowable error: $\pm (0.3\% \times \text{reading} + 3 \text{ words})$	
Resistance balance	Temperature measurement	(0.0~60.0) °C, allowable error: $\pm 0.5°C$	
	Calculation formula	Resistance - Resistance average /Resistance average * 100%	
Interturn test	Display range	0.0%~99.9%	
	Pulse voltage	Range: 300~3000 V, step: 100V	5000 V
		Allowable error: $\pm (3\% \times \text{setting} + 10V)$	
	Wavefront time	$\leq 0.5\mu s$	
Inductance test	Acquisition frequency	5kHz~40MHz	
	Wave parameters	Area, difference area, (1~10) consecutive impacts; range: 0~99%	
	Test range	0.0001μH-99.99kH	
	Allowable error	0.5%	
	Test frequency	100Hz, 120Hz, 1kHz, 10kHz	
Back electromotive force	Test level	0.1, 0.3, 1.0 (V)	
	Voltage range	(1.0- 300.0) V;	Level-0.02
	Allowable error	$\pm (0.5\% \times \text{reading} + 4 \text{ words})$	
No-load test	Range of speed	100-3000rpm	
	Voltage range	(50.0- 300.0) V;	Level-0.02
	Allowable error	$\pm (0.3\% \times \text{reading} + 0.2\% \times \text{range})$	
	Current	(0.05- 20.00) A;	
	Allowable error	$\pm (0.3\% \times \text{reading} + 0.2\% \times \text{range})$	
	Range of power	(1.0-6.0k) W; (1.0-6.0k) W;	
Load test	Allowable error	$\pm (0.8\% \times \text{reading} + 0.2\% \times \text{range})$	
	Load range	(0.20-0.75) Nm 0.20-0.75 Nm	
Hall test	Voltage range	(0.5- 10.0) V	
	Allowable error	$\pm (0.5\% \times \text{reading value} + 2)$	
	Frequency	(10- 1000) Hz	
	Allowable error	$\pm (0.1\% \times \text{reading value} + 1)$	
	Duty cycle	20-80%; allowable error $\pm 1\%$	
Rotation test	Decision parameter	CW/CCW/None	