



Test report:M3DN40-12

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Output function test

NO.	Test item	Specication	Test condition	Result	Verdict
1	Rated current	0-40A continuous	I/P:12VDC O/P:Full load Ta:25°C	OK	P
2	Peak current	60A 5 Sec No damage	I/P:12VDC O/P:60A Ta:25°C	OK	P
3	Capacitance	320uF	I/P:12VDC O/P:320uF Ta:25°C	OK	P
4	Standby power losses(Typ.)	1.5W	I/P:12VDC O/P:空載 Ta:25°C	0.23W	P

Input function test

NO.	Test item	Specication	Test condition	Result	Verdict
1	Input voltage range	9-14VDC	I/P:Testing O/P:Full load Ta:25°C	8.7~14.62VDC	P
2	Rated current	0~20Ax2 input, 0~40Ax1 input Continuous	I/P:12VDC O/P:0~20Ax2 input, 0~40Ax1 Ta:25°C	ok	P
3	Voltage drop(Vin-Vout)(max.)	0.3V	I/P:12VDC O/P:Full load Ta:25°C	0.26V	P
4	Peak current	0~30Ax2 input, 0~60Ax1 5 Sec No damage	I/P:12VDC O/P:60A Ta:25°C	OK	P
5	Input reverse current(max.)	1mA	I/P:40VDC O/P:Full load Ta:25°C	2.16uA	P
6	Input reverse voltage(max.)	40VDC No damage	I/P:40VDC O/P:Full load Ta:25°C	OK	P
7	Efficiency	98%	I/P:12VDC O/P:Full load Ta:25°C	98.50%	P

Protection function test

NO.	Test item	Specication	Test condition	Result	Verdict
1	Over load protection	<60A No damage 5 Sec (max.)	I/P:12VDC O/P:Testing Ta:25°C	No damage	P
2	Short protection	<60A No damage 5 Sec (max.)	I/P:14VDC O/P:Full load Ta:25°C	No damage	P

Environment test

NO.	Test item	Specication	Test condition	Result	Verdict	
1	Temperature rise test	Model:M3DN40-12			P	
		1.Room ambient burn-in: 2HS				
		I/P:12VDC O/P:Full load Ta=22.7°C				
		2.High ambient burn-in: 2HS				
		I/P:12VDC O/P:Full load Ta=59.3°C				
				Room ambient		High ambient
				Ta=22.7°C		Ta=59.3°C
		1	ZNR2	59.3		99.2
		2	Q1	56.3		95.6
		3	Q2	58.2		98.5
		4	Q3	71.5		116.6
		5	Q4	67.5		110.2
		5	C17	65.8		106.6
		6	C15	44.6		86.2
		7	C16	41.5		83.1
		8	RY1	53.6		90.5
9	RY2	53.9	91.2			
10	PCB	73.2	115.5			
11	U4	48.9	88.5			
12	D3	53.8	92.6			
13	R54	50.8	89.9			
14	R56	57.4	92.9			
15	R48	54.6	93.5			
2	Over load burn-in test	NO damage 1 Hours(min)	I/P:24VDC O/P:115%load Ta:25°C	OK	P	
3	Low temperature turn on test	Turn-in after 2 hour	I/P:19VDC/29VDC O/P:100%load Ta:-45°C	OK		
4	Vibration test	(1) Waveform: Sine wave (2) Frequency:10~500Hz (3) Sweep time:10min/sweep cycle (4) Acceleration:2G (5) Test time:1 hour in each axis (X.Y.Z) Ta:25°C		OK	P	

Safety test

NO.	Test item	Specication	Test condition	Result	Verdict
1	Withstand voltage	I/PO/P-FG:0.5KVAC/min I/P/FG-RELAY:0.5KVAC/min FG-RELAY:0.5KVAC/min	I/PO/P-FG:0.6KVAC/min I/P/FG-RELAY:0.6KVAC/min O/P-FG:0.6KVAC/min Ta:25°C	I/P/O/P-FG:7.5mA I/P/FG-RELAY:0.29mA FG-RELAY:0.273mA NO damage	P
2	Isolation resistance	I/P/O/P-FG:500VDC>100M Ω I/P/FG-RELAY:500VDC>100M Ω FG-RELAY:500VDC>100M Ω	I/P/O/P-FG:500VDC I/P/FG-RELAY:500VDC FG-RELAY:500VDC Ta:25°C	I/P/O/P-FG:9999M Ω I/P/FG-RELAY:9999M Ω FG-RELAY:8740M Ω NO damage	P

Componment stress tset

NO.	Test item	Specication	Test condition	Result	Verdict
1	Transistor peak voltage	Q1 VGS Rated: $\pm 20V$ Q3 VGS Rated: $\pm 20V$	I/P:14VDC DC ON/OFF O/P:Full load Ta:25°C	Q1 VGS:12.2V Q3 VGS:12.4V	P

E.M.C test

NO.	Test item	Specication	Test condition	Result	Verdict
1	HARMONIC	EN IEC 61000-3-2	I/P: 12VDC O/P:Full/50% load Ta:25°C	/	P
2	CONDUCTION	EN 55032 CLASS B	I/P: 12VDC O/P:Full load Ta:25°C	PASS	P
3	RADIATION	EN 55032 CLASS B	I/P: 12VDC O/P:Full load Ta:25°C	PASS	P
4	E.S.D	EN61000-4-2 AIR: 15KV / Contact: 8KV	I/P: 12VDC O/P:Full load Ta:25°C	Criteria A	P
5	E.F.T	EN 61000-4-4 Input:2KV	I/P: 12VDC O/P:Full load Ta:25°C	Criteria A	P
6	SURGE	EN 61000-4-5 INDUSTRY L-N:1KV L,N-FG :2KV	I/P: 12VDC O/P:Full load Ta:25°C	Criteria A	P

测试时间	测试	审核	批准	结果
2023-9-6	JH HUANG	GL YAO	YX CHEN	PASS