

MODEL : MDR-20-12

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1: 120 mVp-p (Max)	I/P: 230VAC O/P:FULL LOAD Ta:25°C	V1: 19 mVp-p (Max)	p
2	OUTPUT VOLTAGE ADJUST RANGE	CH1: 10.8 V- 13.2 V	I/P: 230 VAC I/P: 115 VAC O/P:MIN LOAD Ta:25°C	10.21 V- 13.85 V/ 230 VAC 10.21 V- 13.85 V/ 115 VAC	p
3	OUTPUT VOLTAGE TOLERANCE	V1: 1 %- -1 % (Max)	I/P: 100 VAC / 264 VAC O/P:FULL/ MIN LOAD Ta:25°C	V1: 0.2 %- -0.2 %	p
4	LINE REGULATION	V1: 1 %- -1 % (Max)	I/P: 100 VAC ~ 264 VAC O/P:FULL LOAD Ta:25°C	V1: 0 %- 0 %	p
5	LOAD REGULATION	V1: 1 %- -1 % (Max)	I/P: 230 VAC O/P:FULL ~MIN LOAD Ta:25°C	V1: 0.15 %- -0.15 %	p
6	SET UP TIME	230VAC: 500 ms (Max) 115 VAC: 1000 ms (Max)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	230VAC/ 241 ms 115VAC/ 275 ms	p
7	RISE TIME	230VAC: 30 ms (Max) 115VAC: 30 ms (Max)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	230VAC/ 7 ms 115VAC/ 6 ms	p
8	HOLD UP TIME	230VAC: 50 ms (TYP) 115VAC: 20 ms (TYP)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	230VAC/ 133 ms 115VAC/ 29 ms	p
9	OVER/UNDERSHOOT TEST	< ±5%	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	TEST: <5 %	p
10	DYNAMIC LOAD	V1: 1200 mVp-p	I/P: 230 VAC O/P:FULL /Min LOAD 90%DUTY/1KHZ Ta:25°C	312 mVp-p	p

INPUT FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	85VAC~264 VAC	I/P:TESTING O/P:FULL LOAD Ta:25°C	46V~264V	p
			I/P: LOW-LINE-3V= 82 V HIGH-LINE+15%=300 V O/P:FULL/MIN LOAD ON: 30 Sec . OFF: 30 Sec 10MIN (AC POWER ON/OFF NO DAMAGE)	TEST: OK	
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE OSC	I/P: 85 VAC ~ 264 VAC O/P:FULL~MIN LOAD Ta:25°C	TEST: OK	p
3	EFFICIENCY	80 % (TYP)	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	81.2%	p
4	INPUT CURRENT	230V/ 0.35 A (TYP) 115V/ 0.55 A (TYP)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	I = 0.25 A/ 230 VAC I = 0.38 A/ 115 VAC	p
5	INRUSH CURRENT	230V/ 40 A (TYP) 115V/ 20 A (TYP) COLD START	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	I = 22 A/ 230 VAC I = 11 A/ 115 VAC	p
6	LEAKAGE CURRENT	< 1 mA / 240 VAC	I/P: 254 VAC O/P:Min LOAD Ta:25°C	L-FG: 0.64 mA N-FG: 0.64 mA	p

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	105 %~ 160 %	I/P: 230 VAC I/P: 115 VAC O/P:TESTING Ta:25°C	128 %/ 230 VAC 127 %/ 115 VAC Constant Current Limiting	p
2	OVER VOLTAGE PROTECTION	CH1: 13.8 V~ 16.2 V	I/P: 230 VAC I/P: 115 VAC O/P:MIN LOAD Ta:25°C	15.3 V/ 230 VAC 15.3 V/ 115 VAC Shunt down Re- power ON	p
3	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 264 VAC O/P:FULL LOAD Ta:25°C	NO DAMAGE Constant Current Limiting	p

CONTROL FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	NO LOAD POWER CON SUMPTION	<0.75W	I/P: 230 VAC I/P: 115 VAC O/P:NO LOAD Ta:25°C	230 VAC/ 0.71W 115 VAC/ 0.62W	p
2	DC OK ACTIVE SIGNAL (max)	9V~13.5V / 40mA	I/P: 230 VAC I/P: 115 VAC O/P: 40mA Ta:25°C	230 VAC/ 11.93V 115 VAC/ 11.97V	p

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	TEMPERATURE RISE TEST	MODEL : MDR-20-24 1. ROOM AMBIENT BURN-IN : 1.5HRS I/P: 230VAC O/P: FULL LOAD Ta= 31.4℃ 2. HIGH AMBIENT BURN-IN : 45HRS I/P: 230VAC O/P: FULL LOAD Ta= 44.6℃			p
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P: 230 VAC O/P: 132% LOAD Ta:25℃	TEST : OK	p
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P: 230 VAC O/P: 100% LOAD Ta= -20℃	TEST : OK	p
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 50℃ NO DAMAGE	I/P: 272 VAC O/P:FULL LOAD Ta= 50℃ HUMIDITY= 95 %R.H	TEST : OK	p
5	TEMPERATURE COEFFICIENT	± 0.03 %(0-50℃)	I/P: 230 VAC O/P:FULL LOAD	± 0.004 %(0-50℃)	p
6	VIBRATION TEST	1 Carton & 1 Set (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) (6) Ta:25℃		TEST : OK	p

SAFETY TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	I/P-O/P: 3 KVAC/min I/P-FG: 1.5 KVAC/min O/P-FG: 0.5 KVAC/min	I/P-O/P: 3.6 KVAC/min I/P-FG: 1.8 KVAC/min O/P-FG: 0.6 KVAC/min Ta:25°C	I/P-O/P: 3.9 mA I/P-FG: 4.46 mA O/P-FG: 2.08 mA NO DAMAGE	p
2	ISOLATION RESISTANCE	I/P-O/P:500VDC>100MΩ I/P-FG: 500VDC>100MΩ O/P-FG:500VDC>100MΩ	I/P-O/P: 500 VDC I/P-FG: 500 VDC O/P-FG: 500 VDC Ta:25°C	I/P-O/P: 18 GΩ I/P-FG: 9 GΩ O/P-FG: 30 GΩ NO DAMAGE	p
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40 A / 2min Ta:25°C	13 mΩ	p
4	APPROVAL	TUV: Certificate NO : R50093954 UL: File NO : E215312			p

E.M.C TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	HARMONIC	EN61000-3-2 CLASS A	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25°C	PASS	p
2	CONDUCTION	EN55022 EN55011 CLASS B	I/P: 230 VAC (50HZ) O/P:FULL/50% LOAD Ta:25°C	PASS Test by certified Lab	p
3	RADIATION	EN55022 EN55011 CLASS B	I/P: 230 VAC (50HZ) O/P:FULL LOAD Ta:25°C	PASS Test by certified Lab	p
4	E.S.D	EN61000-4-2 LIGHT INDUSTRY AIR:8KV / Contact:4KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25°C	CRITERIA A	p
5	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT: 1KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25°C	CRITERIA A	p
6	SURGE	IEC61000-4-5 LIGHT INDUSTRY L-N :1KV L,N-PE:2KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25°C	CRITERIA A	p
7	Test by certified Lab & Test Report Prepare				

M.T.B.F & LIFE CYCLE CALCULATION

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	CAPACITOR LIFE CYCLE	MDR-20-24 : SUPPOSE C105 IS THE MOST CRITICAL COMPONENT I/P: 230VAC O/P:FULL LOAD Ta= 25°C LIFE TIME= 219673 HRS I/P: 230VAC O/P:FULL LOAD Ta= 50°C LIFE TIME= 45198 HRS			p
2	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE: 236.9KHRS			p

COMPONENT STRESS TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) Peak Voltage	Q1 Rated K3562 : 600V / 6 A	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on (2) Output Short Ta:25°C	(1) 574 V (2) 580 V	p
2	Diode Peak Voltage	D100 Rated BYQ28X-200 : 200V/ 10 A	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on (2)Output Short Ta:25°C	(1) 129 V (2) 108 VV	p
3	Clamp Diode Peak Voltage	D1 Rated EGP20J : 600V/ 2A	I/P:High-Line +3V = 267 V O/P: (1) Dynamic Load 90%Duty/1KHz Ta:25°C	(1) 550 V	p
4	Input Capacitor Voltage	C5 Rated :33u / 400V/ 105°C	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change Ta:25°C	(1) 382 V (2) 386 V (3) 386 V	p
5	Control IC Voltage Test	U1 Rated NCP1200 : 16V	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change Ta:25°C	(1) 12.7 V (2) 11 V (3) 11 V	p

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2006/8/24	RD SAMPLE	PASS	VINCENT TSENG	MAX LIN
2006/10/3	PRODUCT SAMPLE W0609B03	PASS	VINCENT TSENG	MAX LIN
2006/11/15	PRODUCT SAMPLE W0611A07	PASS	VINCENT TSENG	MAX LIN
2007/1/11	PRODUCT SAMPLE W0612C10	PASS	VINCENT TSENG	MAX LIN

2003/12/12 A50-F023