

MODEL: MPD-200B

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1: 80 mVp-p (Max) V2: 180 mVp-p (Max)	I/P: 230VAC O/P:FULL LOAD Ta:25℃	V1: 22 mVp-p (Max) V2: 58 mVp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1: 4.75 V~ 5.5 V	I/P: 230 VAC I/P: 115 VAC O/P:MIN LOAD Ta:25℃	4.53 V~ 5.62 V/ 230 VAC 4.53 V~ 5.62 V/ 115 VAC	P
3	OUTPUT VOLTAGE TOLERANCE	V1: 2 %~ -2 % (Max) V2: 6.5 %~ -6.5 % (Max)	I/P: 115 VAC / 264 VAC O/P:FULL/ MIN LOAD Ta:25℃	V1: 0.3 %~ -0.3 % V2: 3 %~ -3 %	P
4	LINE REGULATION	V1: 0.5 %~ -0.5 % (Max) V2: 1 %~ -1 % (Max)	I/P: 115 VAC ~ 264 VAC O/P:FULL LOAD Ta:25℃	V1: 0 %~ 0 % V2: 0 %~ 0 %	P
5	LOAD REGULATION	V1: 1 %~ -1 % (Max) V2: 4 %~ -6 % (Max)	I/P: 230 VAC O/P:FULL ~MIN LOAD Ta:25℃	V1: 0.25 %~ -0.25 % V2: 2.1 %~ -2.1 %	P
6	CROSS REGULATION	V1: 1 %~ -1 % (Max) V2: 4 %~ -6 % (Max)	I/P: 230 VAC O/P: Testing O/P 60%LOAD Other O/P 40%LOAD Change Ta:25℃	V1: 0.12 %~ -0.12 % V2: 3 %~ -3 %	P
7	SET UP TIME	230VAC: 1000 ms (Max) 115 VAC: 3000 ms (Max)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃	230VAC/ 686 ms 115VAC/ 1929 ms	P
8	RISE TIME	230VAC: 20 ms (Max) 115VAC: 20 ms (Max)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃	230VAC/ 15 ms 115VAC/ 15 ms	P
9	HOLD UP TIME	230VAC: 16 ms(TYP) 115VAC: 16 ms (TYP)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃	230VAC/ 19 ms 115VAC/ 19 ms	P
10	OVER/UNDERSHOOT TEST	< ±5%	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	TEST: <5 %	P
11	DYNAMIC LOAD	V1: 1000 mVp-p	I/P: 230 VAC O/P:FULL /Min LOAD 90%DUTY/1KHZ Ta:25℃	343 mVp-p	P

INPUT FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	90VAC~264 VAC	I/P:TESTING O/P:FULL LOAD Ta:25℃	71V~264V	P
			I/P: LOW-LINE-3V= 87 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 ~440HZ NO DAMAGE OSC	I/P: 90 VAC ~ 264 VAC O/P:FULL~MIN LOAD Ta:25℃	TEST: OK	P
3	POWER FACTOR	0.95/ 230 VAC(TYP) 0.98/1150 VAC(TYP)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃	PF= 0.97 /230 VAC. PF= 0.99 /115 VAC	P
4	EFFICIENCY	83 % (TYP)	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	85.2 %	P
5	INPUT CURRENT	230V/ 1.6 A (TYP) 115V/ 3.5 A (TYP)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃	I = 1.1 A/ 230 VAC I = 2.2 A/ 115 VAC	P
6	INRUSH CURRENT	230V/ 40 A(TYP) 115V/ 25 A(TYP) COLD START	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃	I = 28 A/ 230 VAC I = 15 A/ 115 VAC	P
7	LEAKAGE CURRENT a. For earth leakage current b. For patient leakage current	a. <180 uA / 264 VAC b. <100 uA / 264 VAC	I/P: 264 VAC O/P:Min LOAD Ta:25℃	a. 127 uA b. 69 uA	P

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	120 %~ 160 %	I/P: 230 VAC I/P: 115 VAC O/P: TESTING Ta: 25°C	154 %/ 230 VAC 141 %/ 115 VAC Hiccup Mode	P
2	OVER VOLTAGE PROTECTION	CH1: 5.75 V~ 6.75 V	I/P: 230 VAC I/P: 115 VAC O/P: MIN LOAD Ta: 25°C	6.1 V/ 230 VAC 6.1 V/ 115 VAC Shunt down Re- power ON	P
3	OVER TEMPERATURE PROTECTION	SPEC: TSW1: 95 ± 5°C O.T.P. NO DAMAGE	I/P: 230 VAC O/P: FULL LOAD	O.T.P. Active Shut down o/p voltage , recovers automatically after temperature goes down	P
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 264 VAC O/P: FULL LOAD Ta: 25°C	NO DAMAGE Hiccup Mode	P

CONTROL FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	REMOTE CONTROL	Rc+ / Rc- 0V~ 0.8V POWER ON 4V~ 10V POWER OFF	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	0V ~2.6 V POWER ON 2.7 V ~ 10 V POWER OFF	P
2	POWER GOOD SIGNAL	DELAY 10ms ~ 500ms	I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C	284 ms/ 230 VAC 284 ms/ 115 VAC	P
3	POWER FAIL SIGNAL	> 1ms	I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C	5.5 ms/ 230 VAC 5.5 ms/ 115 VAC	P
4	REMOTE SENSE	>0.25V	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	>0.25V	P

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT																																																																																
1	TEMPERATURE RISE TEST	MODEL : MPD-200A WITH FAN 1. ROOM AMBIENT BURN-IN : 1.5HRS I/P: 230VAC O/P: FULL LOAD Ta= 27.5 °C 2. HIGH AMBIENT BURN-IN : 2HRS I/P: 230VAC O/P: FULL LOAD Ta= 54.6 °C <table><tr><th>NO</th><th>Position</th><th>P/N</th><th>ROOM AMBIENT Ta= 27.5 °C</th><th>HIGH AMBIENT Ta= 54.6 °C</th></tr><tr><td>1</td><td>LF2</td><td>LF-104</td><td>46.7°C</td><td>72.4°C</td></tr><tr><td>2</td><td>D23</td><td>31DF6 3A/600V</td><td>35.1°C</td><td>62.3°C</td></tr><tr><td>3</td><td>Q20</td><td>IRFP450 14A/500V</td><td>40.4°C</td><td>68.0°C</td></tr><tr><td>4</td><td>T1 COIL</td><td>TF-1165</td><td>45.4°C</td><td>72.4°C</td></tr><tr><td>5</td><td>D101</td><td>SBL3040PT 30A/40V LT</td><td>67.6°C</td><td>93.8°C</td></tr><tr><td>6</td><td>D200</td><td>S20LC20U 20A/200V SHI</td><td>53.3°C</td><td>79.1°C</td></tr><tr><td>7</td><td>L100</td><td>TR-517</td><td>64.8°C</td><td>91.4°C</td></tr><tr><td>8</td><td>BD1</td><td>D3SB60 4A/600V SHI</td><td>46.9°C</td><td>72.5°C</td></tr><tr><td>9</td><td>C5</td><td>150U/400V RUB 105°C</td><td>34.7°C</td><td>62.1°C</td></tr><tr><td>10</td><td>L2</td><td>TR-570</td><td>63.4°C</td><td>90.3°C</td></tr><tr><td>11</td><td>Q1</td><td>IRFP460A 20A/500V</td><td>57.9°C</td><td>86.9°C</td></tr><tr><td>12</td><td>TSW1</td><td>ST-95</td><td>46.4°C</td><td>76.4°C</td></tr><tr><td>13</td><td>U1</td><td>ML4800CP</td><td>40.9°C</td><td>69.8°C</td></tr><tr><td>14</td><td>D2</td><td>BYC10-600 10A/600V PH</td><td>49.8°C</td><td>79.5°C</td></tr><tr><td>15</td><td>C110</td><td>2200U/6.3V RUB 105°C</td><td>52.9°C</td><td>78.7°C</td></tr></table>			NO	Position	P/N	ROOM AMBIENT Ta= 27.5 °C	HIGH AMBIENT Ta= 54.6 °C	1	LF2	LF-104	46.7°C	72.4°C	2	D23	31DF6 3A/600V	35.1°C	62.3°C	3	Q20	IRFP450 14A/500V	40.4°C	68.0°C	4	T1 COIL	TF-1165	45.4°C	72.4°C	5	D101	SBL3040PT 30A/40V LT	67.6°C	93.8°C	6	D200	S20LC20U 20A/200V SHI	53.3°C	79.1°C	7	L100	TR-517	64.8°C	91.4°C	8	BD1	D3SB60 4A/600V SHI	46.9°C	72.5°C	9	C5	150U/400V RUB 105°C	34.7°C	62.1°C	10	L2	TR-570	63.4°C	90.3°C	11	Q1	IRFP460A 20A/500V	57.9°C	86.9°C	12	TSW1	ST-95	46.4°C	76.4°C	13	U1	ML4800CP	40.9°C	69.8°C	14	D2	BYC10-600 10A/600V PH	49.8°C	79.5°C	15	C110	2200U/6.3V RUB 105°C	52.9°C	78.7°C	P
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2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P: 230 VAC O/P: V1@27A LOAD V2@10A LOAD Ta:25°C	TEST : OK	P																																																																																
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P: 230 VAC O/P: 80 % LOAD Ta= -20 °C	TEST : OK	P																																																																																
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 50 °C NO DAMAGE	I/P: 272 VAC O/P:FULL LOAD Ta= 50 °C HUMIDITY= 95 %R.H	TEST : OK	P																																																																																
5	TEMPERATURE COEFFICIENT	± 0.04 %(0~50°C)	I/P: 230 VAC O/P:FULL LOAD	± 0.02 %(0~50°C)	P																																																																																
6	VIBRATION TEST	1 Carton & 1 Set Operating (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°C		TEST : OK	P																																																																																

SAFETY TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	I/P-O/P: 4 KVAC/min I/P-FG: 1.5 KVAC/min O/P-FG: 1.5 KVAC/min	I/P-O/P: 4.2 KVAC/min I/P-FG: 1.8 KVAC/min O/P-FG: 1.8 KVAC/min Ta:25℃	I/P-O/P: 2.14 mA I/P-FG: 1.18 mA O/P-FG: 0.86 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℃	I/P-O/P: 30 GΩ I/P-FG: 10 GΩ O/P-FG: 4 GΩ NO DAMAGE	P
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40 A / 2min Ta:25℃	17 mΩ	P
4	APPROVAL	TUV: Certificate NO : TA50069957 UL: File NO : E227340			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℃	PASS	P
2	CONDUCTION	EN55022 CLASS B	I/P: 230 VAC (50HZ) O/P:FULL/50% LOAD Ta:25℃	PASS Test by certified Lab	P
3	RADIATION	EN55022 CLASS B	I/P: 230 VAC (50HZ) O/P:FULL LOAD Ta:25℃	PASS Test by certified Lab	P
4	E.S.D	EN61000-4-2 INDUSTRY AIR:8KV / Contact:4KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25℃	CRITERIA A	P
5	E.F.T	EN61000-4-4 INDUSTRY INPUT: 2KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25℃	CRITERIA A	P
6	SURGE	IEC61000-4-5 INDUSTRY L-N :2KV L,N-PE:4KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25℃	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	SUPPOSE C110 IS THE MOST CRITICAL COMPONENT I/P: 230VAC O/P:FULL LOAD Ta= 25 ℃ LIFE TIME= 261919 HRS I/P: 230VAC O/P:FULL LOAD Ta= 50 ℃ LIFE TIME= 50634 HRS			P
2	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE: 262.1k HRS			P

COMPONENT STRESS TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) Peak Voltage	Q20 Rated IRFP450 : 500 V 14A	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on (2) Full Load (3)Output Short Ta:25℃	(1) 386 V (2) 394 V (3) 400 V	P
2	Diode Peak Voltage	D100 Rated SBL3040PT : 40 V 30 A D200 Rated S20LC20U : 200 V 20 A	I/P:High-Line +3V = 267 V O/P: (1) Full Load Turn on (2) Full Load (3)Output Short Ta:25℃	(1) 25.3 V (2) 22.8 V (3) 25.5 V (1) 95.6 V (2) 98.8 V (3) 122 V	P
3	Input Capacitor Voltage	C 5 Rated : 150u / 400V/ 105℃	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℃ (4)Burn in 1hr	(1) 390 V (2) 386 V (3) 398 V (4) 392 V	P
4	Control IC Voltage Test	U1 Rated ML4800 : 18 V	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℃	(1) 15 V (2) 15.2 V (3) 15.6 V	P
5	Power Transistor (D to S) or (C to E) Peak Voltage	Q1 Rated IRFP460A : 500 V 20A	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on (2) Full Load (3)Output Short Ta:25℃	(1) 394 V (2) 406 V (3) 402 V	P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2005/5/17	RD SAMPLE	PASS	VINCENT TSENG	MAX LIN
2005/9/3	PRODUCT SAMPLE W0507B20	PASS	VINCENT TSENG	MAX LIN
2006/3/1	PRODUCT SAMPLE W062B26	PASS	VINCENT TSENG	MAX LIN

2003/12/12 A50-F023