

MODEL : PM-20-5

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1: 80 mVp-p (Max)	I/P: 230VAC O/P:FULL LOAD Ta:25°C	V1: 12 mVp-p (Max)	P
2	OUTPUT VOLTAGE TOLERANCE	V1: 2 %~ -2 % (Max)	I/P:115 VAC / 264 VAC O/P:FULL/ MIN LOAD Ta:25°C	V1: 0.6 %~ -0.6 %	P
3	LINE REGULATION	V1: 1 %~ -1 % (Max)	I/P:115 VAC ~ 264 VAC O/P:FULL LOAD Ta:25°C	V1: 0 %~ 0 %	P
4	LOAD REGULATION	V1: 1.5 %~ -1.5 % (Max)	I/P: 230 VAC O/P:FULL ~MIN LOAD Ta:25°C	V1: 0.5 %~ -0.5 %	P
5	SET UP TIME	230VAC: 500 ms (Max) 115 VAC: 500 ms (Max)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	230VAC/ 165 ms 115VAC/ 158 ms	P
6	RISE TIME	230VAC: 20 ms (Max) 115VAC: 20 ms (Max)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	230VAC/ 1.3 ms 115VAC/ 1.2 ms	P
7	HOLD UP TIME	230VAC: 50 ms (TYP) 115VAC: 16 ms (TYP)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	230VAC/ 82 ms 115VAC/ 16.1 ms	P
8	OVER/UNDERSHOOT TEST	< ±5%	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	TEST: <5 %	P
9	DYNAMIC LOAD	V1: 1000 mVp-p	I/P: 230 VAC O/P:FULL /Min LOAD 90%DUTY/1KHZ Ta:25°C	681 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	58 V~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 ~440 HZ NO DAMAGE OSC	I/P: 85 VAC ~ 264 VAC O/P: FULL~MIN LOAD Ta: 25°C	TEST: OK	P
3	EFFICIENCY	75 % (TYP)	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	77.1 %	P
4	INPUT CURRENT	230V/ 0.4 A (TYP) 115V/ 0.6 A (TYP)	I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C	I = 0.33 A/ 230 VAC I = 0.48 A/ 115 VAC	P
5	INRUSH CURRENT	230V/ 65 A (TYP) 115V/ 30 A (TYP) COLD START	I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C	I = 53 A/ 230 VAC I = 26 A/ 115 VAC	P
6	LEAKAGE CURRENT	< 300 uA/ 264 VAC for earth leakage current	I/P: 264 VAC O/P: Min LOAD Ta: 25°C	L-FG: 285 uA N-FG: 285 uA	P
		< 100 uA/264 VAC for touch leakage current	I/P: 264 VAC O/P: Min LOAD Ta: 25°C	L-V+ : 82 uA L-V-: 82 uA N-V+: 82 uA N-V-: 82 uA	

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	Above 105 %	I/P: 230 VAC I/P: 115 VAC O/P: TESTING Ta: 25°C	331 %/ 230 VAC 238 %/ 115 VAC Hiccup Mode	P
2	OVER VOLTAGE PROTECTION	CH1: 5.75V~ 6.75V	O/P: MIN LOAD Ta: 25°C	6.3V/ 70mA Shut off	P
3	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	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	No load power consumption	<0.75W	I/P: 240 VAC O/P: NO LOAD	0.61W/ 240 VAC	p

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT																																																												
1	TEMPERATURE RISE TEST	MODEL : PM-20-5 1. ROOM AMBIENT BURN-IN : 2 HRS I/P: 230VAC O/P: FULL LOAD Ta= 26.2 °C 2. HIGH AMBIENT BURN-IN : 2 HRS I/P: 230VAC O/P: FULL LOAD Ta= 52 °C <table><tr><th>NO</th><th>Position</th><th>P/N</th><th>ROOM AMBIENT Ta= 26.2 °C</th><th>HIGH AMBIENT Ta= 52 °C</th></tr><tr><td>1</td><td>LF1</td><td>LF-179 LS</td><td>55.4°C</td><td>78.3°C</td></tr><tr><td>2</td><td>BD1</td><td>D2SB20 1.5A/500V SHI</td><td>54.5°C</td><td>77.1°C</td></tr><tr><td>3</td><td>C5</td><td>47U/400V NI 105°C PT</td><td>53.3°C</td><td>75.6°C</td></tr><tr><td>4</td><td>C36</td><td>47U/50V RUB 105°C YXF</td><td>58.1°C</td><td>80.5°C</td></tr><tr><td>5</td><td>ZD1</td><td>P6KE200A PAN</td><td>63.5°C</td><td>86.2°C</td></tr><tr><td>6</td><td>D1</td><td>IN4007 1A/1KV LT</td><td>65.1°C</td><td>87.8°C</td></tr><tr><td>7</td><td>D4</td><td>1N4002 1A/100V LT</td><td>61.6°C</td><td>84.1°C</td></tr><tr><td>8</td><td>T1coil</td><td>TF-1403 JSI</td><td>67.6°C</td><td>89.4°C</td></tr><tr><td>9</td><td>U1</td><td>VIPER53 ST</td><td>69.7°C</td><td>91.0°C</td></tr><tr><td>10</td><td>D100</td><td>MBR1545CT 15A/45VON</td><td>73.4°C</td><td>94.6°C</td></tr><tr><td>11</td><td>C105</td><td>470U/16V NCC 105°C KY</td><td>63.4°C</td><td>84.5°C</td></tr></table>			NO	Position	P/N	ROOM AMBIENT Ta= 26.2 °C	HIGH AMBIENT Ta= 52 °C	1	LF1	LF-179 LS	55.4°C	78.3°C	2	BD1	D2SB20 1.5A/500V SHI	54.5°C	77.1°C	3	C5	47U/400V NI 105°C PT	53.3°C	75.6°C	4	C36	47U/50V RUB 105°C YXF	58.1°C	80.5°C	5	ZD1	P6KE200A PAN	63.5°C	86.2°C	6	D1	IN4007 1A/1KV LT	65.1°C	87.8°C	7	D4	1N4002 1A/100V LT	61.6°C	84.1°C	8	T1coil	TF-1403 JSI	67.6°C	89.4°C	9	U1	VIPER53 ST	69.7°C	91.0°C	10	D100	MBR1545CT 15A/45VON	73.4°C	94.6°C	11	C105	470U/16V NCC 105°C KY	63.4°C	84.5°C	P
NO	Position	P/N	ROOM AMBIENT Ta= 26.2 °C	HIGH AMBIENT Ta= 52 °C																																																													
1	LF1	LF-179 LS	55.4°C	78.3°C																																																													
2	BD1	D2SB20 1.5A/500V SHI	54.5°C	77.1°C																																																													
3	C5	47U/400V NI 105°C PT	53.3°C	75.6°C																																																													
4	C36	47U/50V RUB 105°C YXF	58.1°C	80.5°C																																																													
5	ZD1	P6KE200A PAN	63.5°C	86.2°C																																																													
6	D1	IN4007 1A/1KV LT	65.1°C	87.8°C																																																													
7	D4	1N4002 1A/100V LT	61.6°C	84.1°C																																																													
8	T1coil	TF-1403 JSI	67.6°C	89.4°C																																																													
9	U1	VIPER53 ST	69.7°C	91.0°C																																																													
10	D100	MBR1545CT 15A/45VON	73.4°C	94.6°C																																																													
11	C105	470U/16V NCC 105°C KY	63.4°C	84.5°C																																																													
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P: 230 VAC O/P: 200% LOAD Ta:25°C	TEST : OK	P																																																												
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P: 230 VAC O/P: 100% 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	± 0.03 %(0~50°C)	I/P: 230 VAC O/P:FULL LOAD	± 0.01 %(0~50°C)	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°C		TEST : OK	P																																																												

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	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°C	I/P-O/P: 0.82 mA I/P-FG: 0.06 mA O/P-FG: 0.06 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: 30 GΩ I/P-FG: 30 GΩ O/P-FG: 29 GΩ NO DAMAGE	P
3	APPROVAL	TUV: Certificate NO : TA50083713 UL: File NO : E227340			P

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	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 MEDICAL AIR:8KV / Contact:6KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25°C	CRITERIA A	P
5	E.F.T	EN61000-4-4 MEDICAL INPUT: 2KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25°C	CRITERIA A	P
6	SURGE	IEC61000-4-5 MEDICAL L-N :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	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	CAPACITOR LIFE CYCLE	SUPPOSE C105 IS THE MOST CRITICAL COMPONENT I/P: 230VAC O/P:FULL LOAD Ta= 25 °C LIFE TIME= 122681 HRS I/P: 230VAC O/P:FULL LOAD Ta= 50 °C LIFE TIME= 30054 HRS			P
2	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE: 487.8KHRS			P

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) Peak Voltage	U1 Rated VIPER53 : 620 V 2.3A	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on (2) Full Load (3)Output Short Ta:25°C	(1) 586 V (2) 530 V (3) 612 V	P
2	Diode Peak Voltage	D100 Rated MBR1545CT : 45V 15 A	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on (2) Full Load (3)Output Short Ta:25°C	(1) 40 V (2) 33.4 V (3) 33.8 V	P
3	Clamp Diode Peak Voltage	D1 Rated IN4007 : 1KV 1 A	I/P:High-Line +3V = 267 V O/P: (1)Full Load (2) Dynamic Load 90%Duty/1KHz Ta:25°C	(1) 502 V (2) 530 V	P
4	Input Capacitor Voltage	C5 Rated :47u / 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 (4)Burn in 1hour Ta:25°C	(1) 377 V (2) 383 V (3) 383 V (4) 377 V	P
5	Control IC Voltage Test	U1 Rated VIPER53 : 19V	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) 13.4 V (2) 10.5 V (3) 13.4 V	P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2006/4/3	RD SAMPLE	PASS	VINCENT TSENG	MAX LIN
2006/6/29	PRODUCT SAMPLE W0604C12	PASS	VINCENT TSENG	MAX LIN

2003/12/12 A50-F023