

# Quality Engineering Test Report

**SERIES: QP-200     200W AC-DC QUAD   OUTPUT SWITCHING POWER SUPPLY**

<b>SAMPLE: A:QP-200D</b> V1: 5V / 15A V2: 12V / 4A V3: 24V / 3A V4: -12V / 0.7A	<b>C:QP-2003B</b> V1: 5V / 15A V2: 3.3V / 15A V3: 12V / 6A V4: -12V / 0.7A	<b>E:QP-2003D</b> V1: 5V / 10A V2: 3.3V / 15A V3: 24V / 4A V4: -12V / 0.7A
<b>B:QP-200F</b> V1: 5V / 15A V2: 15V / 3A V3: 24V / 3A V4: -15V / 0.7A	<b>D:QP-2003C</b> V1: 5V / 15A V2: 3.3V / 15A V3: 15V / 5A V4: -15V / 0.7A	<b>F:QP-2003E</b> V1: 5V / 10A V2: 3.3V / 15A V3: 24V / 4A V4: -15V / 0.7A

NO	TEST ITEM	TEST CONDITION / SPECIFICATION	RESULT	VERDICT
1	AC INPUT VOLTAGE RANGE	I/P:TESTING     SPEC90~264VAC O/P:FULL LOAD	C:62VAC~267VAC	P
2	LINE REGULATION	I/P:90~264VAC     SPEC: O/P:FULL LOAD A: V1: ±1% V2: ±1% V3: ±2% V4: ±1% B: V1: ±1% V2: ±1% V3: ±2% V4: ±1% C: V1: ±1% V2: ±1% V3: ±2% V4: ±1% D: V1: ±1% V2: ±1% V3: ±2% V4: ±1% E: V1: ±1% V2: ±1% V3: ±2% V4: ±1% F: V1: ±1% V2: ±1% V3: ±2% V4: ±1%	A: V1:    -0% ~    +0% V2:    -0% ~    +0% V3: -0.024% ~ -0.048% V4:    -0% ~    +0% B: V1:    -0% ~    0% V2:    -0% ~    +0% V3: -0.0246% ~ +0.07% V4:    -0% ~    +0% C: V1:    -0.12% ~ -0.12% V2:    -0.18% ~ +0% V3: -0.052% ~ +0% V4:    -0% ~    +0% D: V1:    -0% ~    +0% V2:    -0% ~    +0% V3: +0.039% ~ +0.039% V4:    -0% ~    +0% E: V1:    -0% ~    +0% V2:    -0.18% ~ +0.18% V3:    -0% ~    +0% V4:    -0% ~    +0% F: V1:    0% ~    0% V2:    -0% ~    +0.18% V3: -0.024% ~ -0.048% V4:    -0% ~    +0%	P

NO	TEST ITEM	TEST CONDITION / SPECIFICATION	RESULT	VERDICT
3	LOAD REGULATION	I/P:230VAC SPEC: O/P:MIN. TO FULL LOAD A: V1: $\pm 2\%$ V2: $\pm 2\%$ V3: $\pm 6\%$ V4: $\pm 2\%$ B: V1: $\pm 2\%$ V2: $\pm 2\%$ V3: $\pm 6\%$ V4: $\pm 2\%$ C: V1: $\pm 2\%$ V2: $\pm 2\%$ V3: $\pm 6\%$ V4: $\pm 2\%$ D: V1: $\pm 2\%$ V2: $\pm 2\%$ V3: $\pm 6\%$ V4: $\pm 2\%$ E: V1: $\pm 2\%$ V2: $\pm 2\%$ V3: $\pm 6\%$ V4: $\pm 2\%$ F: V1: $\pm 2\%$ V2: $\pm 2\%$ V3: $\pm 6\%$ V4: $\pm 2\%$	A: V1: 0% ~ +0.12% V2: -0.1% ~ +0.05% V3: -0.86% ~ +1.9% V4: -0.1% ~ +0.1% B: V1: -0.24% ~ 0.24% V2: -0.04% ~ +0.12% V3: -0.76% ~ +1.5% V4: -0.079% ~ +0.079% C: V1: -0.12% ~ +0.24% V2: -0.36% ~ +0.36% V3: +0.052% ~ +2.61% V4: -0.1% ~ +0.1% D: V1: +0.12% ~ +0.24% V2: -0.18% ~ +0.55% V3: +1.48% ~ +0.118% V4: -0.119% ~ +0.079% E: V1: -0.12% ~ +0.24% V2: -0.18% ~ +0.55% V3: +1.4% ~ +1.66% V4: -0.1% ~ +0% F: V1: -0.36% ~ +0.24% V2: -0.547% ~ +0.547% V3: +0.025% ~ +1.17% V4: -0.119% ~ +0.12%	P
4	OUTPUT VOLTAGE TOLERANCE	I/P:176~264VAC SPEC: O/P:20% TO FULL LOAD A: V1: $\pm 3\%$ V2: $\pm 3\%$ V3: +10%~-6% V4: $\pm 6\%$ B: V1: $\pm 3\%$ V2: $\pm 3\%$ V3: +10%~-6% V4: $\pm 6\%$ C: V1: $\pm 3\%$ V2: $\pm 3\%$ V3: +8%~-10% V4: $\pm 6\%$ D: V1: $\pm 3\%$ V2: $\pm 3\%$ V3: +10%~-6% V4: $\pm 6\%$ E: V1: $\pm 3\%$ V2: $\pm 3\%$ V3: +10%~-6% V4: $\pm 6\%$ F: V1: $\pm 3\%$ V2: $\pm 3\%$ V3: +10%~-6% V4: $\pm 6\%$	A: V1: -0.38% ~ +0.26% V2: -0.158% ~ +0.09% V3: -2.58% ~ +4.9% V4: -0.21% ~ +0.05% B: V1: -0.49% ~ +0.119% V2: -0.166% ~ +0.039% V3: -2.7% ~ +6.87% V4: -0.126% ~ +0.079% C: V1: -0.38% ~ +0.119% V2: -0.756% ~ +0.36% V3: -6.924% ~ +5.359% V4: -2.12% ~ +0.05% D: V1: -0.38% ~ +0.62% V2: -0.76% ~ +0.36% V3: -4.14% ~ +5.37% V4: -0.16% ~ +2% E: V1: -0.38% ~ +0.5% V2: -0.93% ~ +2% V3: +4.46% ~ +5.2% V4: -1.57% ~ +0.05% F: V1: -0.499% ~ +0.119% V2: -0.94% ~ +0.18% V3: -4.35% ~ -2.78% V4: -0.21% ~ +0.086%	P

NO	TEST ITEM	TEST CONDITION / SPECIFICATION	RESULT	VERDICT
5	RIPPLE&NOISE	I/P:230VAC O/P:FULL LOAD SPEC: A: V1: 100mV V2: 150mV V3: 150mV V4: 150mV B: V1: 100mV V2: 150mV V3: 150mV V4: 150mV C: V1: 100mV V2: 100mV V3: 150mV V4: 150mV D: V1: 100mV V2: 100mV V3: 150mV V4: 150mV E: V1: 100mV V2: 100mV V3: 150mV V4: 150mV F: V1: 100mV V2: 100mV V3: 150mV V4: 150mV	A: V1: 34mV V2: 50mV V3: 18mV V4: 17mV B: V1: 50mV V2: 63mV V3: 26mV V4: 29mV C: V1: 49mV V2: 43mV V3: 37mV V4: 43mV D: V1: 35mV V2: 55mV V3: 10mV V4: 10mV E: V1: 37mV V2: 48mV V3: 27mV V4: 20mV F: V1: 40mV V2: 45mV V3: 24mV V4: 15mV	P
6	AC INPUT CURRENT	I/P:230VAC O/P:FULL LOAD SPEC:2A	C:1.232A	P
7	MAX. INRUSH CURREN	I/P:230VAC O/P: FULL LOAD SPEC:45A	C:36.5A	P
8	O/P VOLTAGE ADJ.RANGE	I/P:230VAC O/P:MIN. LOAD SPEC:CH1,2:+10,-5%	A: CH1:4.359V~5.601V CH2:10.36V~16.135V B: CH1:4.375V~5.54V CH2:12.368V~17.568V C: CH1:4.11V~5.76V CH2:3.11V~3.76V D: CH1:4.42V~5.67V CH2:3.09V~3.75V E: CH1:4.373V~5.658V CH2:3.158V~3.803V F: CH1:4.51V~5.68V CH2:3.14V~7.16V	P
9	SET UP TIME	I/P:230VAC O/P:FULL LOAD SPEC:800mS	C: 19mS	P
10	HOLD UP TIME	I/P:230VAC O/P:FULL LOAD SPEC:16mS	C: 41mS	P
11	EFFICIENCY	I/P:230VAC O/P:FULL LOAD SPEC: A:75% B:75% C:72% D:72% E:74% F:74%	A:75% B:78% C:73% D:75% E:76% F:76%	P
12	OVER LOAD PROTECTION	I/P:230VAC O/P:TESTING SPEC:105%~135%	A:121% B:113% C:117% D:120.9% E:123.7% F:121%	P

NO	TEST ITEM	TEST CONDITION / SPECIFICATION	RESULT	VERDICT																																								
13	OVER VOLTAGE PROTECTION	I/P:230VAC SPEC:CH1:5.75-6.75V O/P:FULL LOAD CH2:3.6-4.3V	A : CH1:6.38V CH2:3.9V B : CH1:6.23V CH2:4.0V C : CH1:6.27V CH2:3.9V D : CH1:6.28V CH2:4.1V E : CH1:6.21V CH2:3.8V F : CH1:6.32V CH2:4.0V	P																																								
14	GROUND LEAKAGE CURRENT	I/P:240VAC SPEC: L-FG-<2mA N-FG-<2mA	C: L-FG:0.8mA N-FG:0.8mA	P																																								
15	INSULATION RESISTANCE	SPEC: I/P-O/P: 500VDC/100M Ohms MIN. I/P-FG: 500VDC/100M Ohms MIN. O/P-FG: 500VDC/100M Ohms MIN.	C: O/P-FG >100M Ohms I/P-O/P >100M Ohms I/P-FG >100M Ohms	P																																								
16	DIELECTRIC / WITHSTAND VOLTAGE	SPEC: I/P- O/P: 3KVAC/ 1 min.(10mA CUT-OFF) I/P - FG: 1.5VAC/ 1 min.(10mA CUT-OFF) O/P - FG: 0.5KVAC/ 1 min.(10mA CUT-OFF)	C: I/P-O/P :6.53mA I/P-FG :5.34mA O/P-FG :7.51mA	P																																								
17	BURN-IN TEST	I/P: 230VAC O/P: FULL LOAD TA:24.7°C BURN-IN DURATION : 16 hrs	C:NON BREAK	P																																								
18	ENVIRONMENT TEST ( SAMPLE A:)	HIGH AMBIENT TEMPERATURE FULL LOAD TEST I/P:230VAC O/P:FULL LOAD AMBIENT TEMPERATURE:49.9°C	AFTER 3_hrs NON BREAK	P																																								
19	TEMPERATURE RISE TEST T rise OF PARTS	C: I/P :230VAC AFTER 16 hr BURN-IN O/P :FULL LOAD TA:24.7°C	<table border="1"> <thead> <tr> <th>POSITION</th> <th>P/N</th> <th>TEMP</th> <th>T rise</th> </tr> </thead> <tbody> <tr> <td>BD1</td> <td>BRIDGE DIODE</td> <td>49.2°C</td> <td>24.5°C</td> </tr> <tr> <td>Q2</td> <td>MAIN TRANSISTOR</td> <td>52.0°C</td> <td>27.3°C</td> </tr> <tr> <td>T1</td> <td>MAIN TRANSFORMER WIRE</td> <td>57.7°C</td> <td>33.0°C</td> </tr> <tr> <td>D81</td> <td>O/P DIODE</td> <td>57.9°C</td> <td>33.2°C</td> </tr> <tr> <td>D51</td> <td>O/P DIODE</td> <td>70.2°C</td> <td>45.5°C</td> </tr> <tr> <td>C57</td> <td>O/P FILTER CAPACITOR</td> <td>46.0°C</td> <td>21.3°C</td> </tr> <tr> <td>L1</td> <td>O/P CHOCK</td> <td>52.0°C</td> <td>27.3°C</td> </tr> <tr> <td>C5</td> <td>I/P FILTER CAPACITOR</td> <td>40.7°C</td> <td>16.0°C</td> </tr> <tr> <td>LF2</td> <td>LIME FILTER TRANSFORMER</td> <td>40.5°C</td> <td>15.8°C</td> </tr> </tbody> </table>	POSITION	P/N	TEMP	T rise	BD1	BRIDGE DIODE	49.2°C	24.5°C	Q2	MAIN TRANSISTOR	52.0°C	27.3°C	T1	MAIN TRANSFORMER WIRE	57.7°C	33.0°C	D81	O/P DIODE	57.9°C	33.2°C	D51	O/P DIODE	70.2°C	45.5°C	C57	O/P FILTER CAPACITOR	46.0°C	21.3°C	L1	O/P CHOCK	52.0°C	27.3°C	C5	I/P FILTER CAPACITOR	40.7°C	16.0°C	LF2	LIME FILTER TRANSFORMER	40.5°C	15.8°C	P
POSITION	P/N	TEMP	T rise																																									
BD1	BRIDGE DIODE	49.2°C	24.5°C																																									
Q2	MAIN TRANSISTOR	52.0°C	27.3°C																																									
T1	MAIN TRANSFORMER WIRE	57.7°C	33.0°C																																									
D81	O/P DIODE	57.9°C	33.2°C																																									
D51	O/P DIODE	70.2°C	45.5°C																																									
C57	O/P FILTER CAPACITOR	46.0°C	21.3°C																																									
L1	O/P CHOCK	52.0°C	27.3°C																																									
C5	I/P FILTER CAPACITOR	40.7°C	16.0°C																																									
LF2	LIME FILTER TRANSFORMER	40.5°C	15.8°C																																									
20	LIFE CYCLE	A: SUPPOSE C57 IS THE MOST CRITICAL COMPONENT I/P:230VAC O/P:FULL LOAD Ta:25°C Tc57:46.3°C Life: 355034hrs I/P:230VAC O/P:FULL LOAD Ta:50°C Tc57:70.4°C Life: 66770hrs		P																																								
21	CRITICAL COMPONENT RECORD ( FOR QC INSPECTION REFERENCE ONLY )	C: FUSE :5A/250V BRIDGE DIODE :KBJ608G LINE FILTER :TF-730 EI-33 TRANSFORMER TF726 EER-35 POWER SWITCHER :2SK2850 5A/900V OUTPUT DIODE :PA806C03 30A/30V OUTPUT CAPACITOR :RUBYCON 2200uF/10V YXL 105°C INPUT CAPACITOR :220uF/400V HITACH 85°C P.C.B :QP-200 FR-4 20Z-DS																																										
DATE	SAMPLE	TEST RESULT	TEST	APPROVAL																																								
20010205	RD SAMPLE QP-200-3B QP-200-3C QP-200-3D QP-200D QP-200F	PASS	VINCENT	Max Lin																																								
20010308	PRODUCTION SAMPLE A102D29 QP-200-3B QP-200-3C QP-200-3D QP-200D QP-200F	PASS	VINCENT	Max Lin																																								
20010709	PRODUCTION SAMPLE A106B21 QP-200D QP-200F	PASS	VINCENT	Max Lin																																								