Quality Engineering Test Report

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

SAMPLE:	**A:QP-200D**	**V1: 5V / 15A**	**C:QP-2003B**	**V1: 5V / 15A**	**E:QP-2003D**	**V1: 5V / 10A**		
		V2: 12V / 4A		**V2: 3.3V / 15A**		**V2: 3.3V / 15A**		
		V3: 24V / 3A		**V3: 12V / 6A**		**V3: 24V / 4A**		
		V4: -12V / 0.7A		**V4: -12V / 0.7A**		**V4: -12V / 0.7A**		
	B:QP-200F	**V1: 5V / 15A**	**D:QP-2003C**	**V1: 5V / 15A**	**F:QP-2003E**	**V1: 5V / 10A**		
		V2: 15V / 3A		**V2: 3.3V / 15A**		**V2: 3.3V / 15A**		
		V3: 24V / 3A		**V3: 15V / 5A**		**V3: 24V / 4A**		
		V4: -15V / 0.7A		**V4: -15V / 0.7A**		**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: ±2% V2: ±2% V3: ±6% V4: ±2% B: V1: ±2% V2: ±2% V3: ±6% V4: ±2% C: V1: ±2% V2: ±2% V3: ±6% V4: ±2% D: V1: ±2% V2: ±2% V3: ±6% V4: ±2% E: V1: ±2% V2: ±2% V3: ±6% V4: ±2% F: V1: ±2% V2: ±2% V3: ±6% V4: ±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: ±3% V2: ±3% V3: +10%~-6% V4: ±6% B: V1: ±3% V2: ±3% V3: +10%~-6% V4: ±6% C: V1: ±3% V2: ±3% V3: +8%~-10% V4: ±6% D: V1: ±3% V2: ±3% V3: +10%~-6% V4: ±6% E: V1: ±3% V2: ±3% V3: +10%~-6% V4: ±6% F: V1: ±3% V2: ±3% V3: +10%~-6% V4: ±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 O/P:FULL LOAD 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

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