

# Quality Engineering Test Report

**SERIES: QP-150      150W AC-DC QUAD    OUTPUT SWITCHING POWER SUPPLY**

<b>SAMPLE:</b>	<b>A : QP-150-3A</b>	V1: 5 V / 10 A			E : QP-150D	V1: 5 V / 10 A
		V2: 3.3 V / 10 A				V2: 12 V / 4 A
		V3: 12 V / 5 A				V3: 24 V / 2 A
		V4: -5 V / 0.6 A				V4: -12 V / 0.6 A
<b>SAMPLE:</b>	<b>B : QP-150-3B</b>	V1: 5 V / 10 A			<b>F : QP-150F</b>	V1: 5 V / 10 A
		V2: 3.3 V / 10 A				V2: 15 V / 3 A
		V3: 12 V / 5 A				V3: 24 V / 2 A
		V4: -12 V / 0.6 A				V4: -15 V / 0.6 A
<b>SAMPLE:</b>	<b>C : QP-150-3C</b>	V1: 5 V / 10 A			<b>G : QP-150B</b>	V1: 5 V / 15 A
		V2: 3.3 V / 10 A				V2: 12 V / 4 A
		V3: 15 V / 4 A				V3: -12 V / 2 A
		V4: -15 V / 0.6 A				V4: -5 V / 0.6 A
<b>SAMPLE:</b>	<b>D : QP-150-3D</b>	V1: 5 V / 10 A			<b>H : QP-150C</b>	V1: 5 V / 15 A
		V2: 3.3 V / 10 A				V2: 15 V / 3 A
		V3: 24 V / 2.5 A				V3: -15 V / 2 A
		V4: -12 V / 0.6 A				V4: -5 V / 0.6 A

NO	TEST ITEM	TEST CONDITION / SPECIFICATION	RESULT	VERDICT
1	AC INPUT VOLTAGE RANGE	I/P:TESTING      SPEC:90~264VAC O/P:FULL LOAD	B:63.137VAC~267VAC	P
2	LINE REGULATION	I/P:100~264VAC      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%  G: V1: ±1% V2: ±2% V3: ±2% V4: ±1%  H: V1: ±1% V2: ±2% V3: ±2% V4: ±1%	A: V1: 0.00% ~ 0.00% V2: 0.00% ~ 0.00% V3: 0.00% ~ -0.049% V4: 0.00% ~ 0.00% B: V1: 0.00% ~ 0.00% V2: 0.00% ~ 0.00% V3: -0.049% ~ 0.00% V4: 0.00% ~ 0.00% C: V1: 0.00% ~ 0.00% V2: 0.00% ~ 0.00% V3: 0.00% ~ 0.00% V4: -0.04% ~ 0.00% D: V1: 0.00% ~ 0.00% V2: 0.00% ~ 0.00% V3: -0.03% ~ 0.00% V4: -0.05% ~ 0.00% E: V1: -0.12% ~ 0.00% V2: 0.00% ~ 0.00% V3: -0.03% ~ 0.00% V4: 0.00% ~ 0.00% F: V1: 0.00% ~ 0.00% V2: 0.00% ~ 0.00% V3: -0.03% ~ 0.00% V4: 0.00% ~ 0.00% G: V1: -0.118% ~ +0.118% V2: -1.124% ~ +1.124% V3: -1.64% ~ +2.685% V4: 0.00% ~ 0.00% H: V1: 0.00% ~ 0.00% V2: 0.00% ~ 0.00% V3: -0.038% ~ 0.00% V4: 0.00% ~ +0.118%	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: $\pm 2\%$ G: V1: $\pm 2\%$ V2: $\pm 6\%$ V3: $\pm 6\%$ V4: $\pm 2\%$ H: V1: $\pm 2\%$ V2: $\pm 6\%$ V3: $\pm 6\%$ V4: $\pm 2\%$	A: V1: -0.355% ~ +0.256% V2: -0.38% ~ +0.355% V3: +0.414% ~ +1.4% V4: -0.119% ~ +0.259% B: V1: -0.36% ~ +0.12% V2: -0.18% ~ +0.00% V3: +0.36% ~ +1.00% V4: -0.05% ~ +0.099% C: V1: -0.36% ~ +0.24% V2: -0.36% ~ +0.18% V3: +0.12% ~ +0.12% V4: +0.00% ~ +0.04% D: V1: -0.35% ~ +0.24% V2: -0.67% ~ +0.36% V3: -0.67% ~ +2.06% V4: +0.00% ~ +0.05% E: V1: -0.24% ~ +0.24% V2: -0.15% ~ +0.31% V3: -0.57% ~ +1.56% V4: -0.05% ~ +0.05% F: V1: -0.24% ~ +0.24% V2: -0.12% ~ +0.25% V3: -0.62% ~ +1.66% V4: -0.04% ~ +0.00% G: V1: -0.118% ~ +0.118% V2: -1.124% ~ +1.124% V3: -1.64% ~ +2.685% V4: 0.00% ~ 0.00% H: V1: -0.356% ~ +0.118% V2: -1.05% ~ +1.8% V3: -2.21% ~ +3.297% V4: 0.00% ~ 0.00%	P
4	OUTPUT VOLTAGE TOLERANCE	I/P:90~264VAC SPEC: O/P:20% TO FULL LOAD A: V1: $\pm 3\%$ V2: $\pm 3\%$ V3: $\pm 6\%$ V4: $\pm 5\%$ B: V1: $\pm 3\%$ V2: $\pm 3\%$ V3: $\pm 6\%$ V4: $\pm 5\%$ C: V1: $\pm 3\%$ V2: $\pm 3\%$ V3: -6%~+8% V4: $\pm 5\%$ D: V1: $\pm 3\%$ V2: $\pm 3\%$ V3: $\pm 6\%$ V4: $\pm 5\%$ E: V1: $\pm 3\%$ V2: $\pm 3\%$ V3: $\pm 6\%$ V4: $\pm 5\%$ F: V1: $\pm 3\%$ V2: $\pm 3\%$ V3: $\pm 6\%$ V4: $\pm 5\%$ G: V1: $\pm 3\%$ V2: $\pm 6\%$ V3: -6%~+10% V4: $\pm 5\%$ H: V1: $\pm 3\%$ V2: -10%~+6% V3: $\pm 8\%$ V4: $\pm 5\%$	A: V1: -0.61%~ +0.00% V2: -0.56%~ +0.35% V3: -4.39%~ +2.59% V4: -0.49%~ +0.00% B: V1: -0.5%~ +0.12% V2: -0.36%~ +0.4% V3: -3.74%~ +3.54% V4: -2.6%~ +0.05% C: V1: -0.74%~ +0.00% V2: -0.56%~ +0.35% V3: -2.72%~ +4.36% V4: -1.35%~ +0.12% D: V1: -0.49%~ +0.35% V2: -0.56%~ +0.36% V3: -1.75%~ +4.88% V4: -0.05%~ +0.16% E: V1: -0.49%~ +0.26% V2: -0.413%~ +0.1% V3: -1.73%~ +3.79% V4: -1.85%~ +0.11% F: V1: -0.49%~ +0.24% V2: -0.38%~ +0.08% V3: -1.60%~ +3.8% V4: -0.03%~ +0.13% G: V1: -0.237%~ +0.11% V2: -1.8%~ 3.183% V3: -6%~ +7.36% V4: +0.23%~ +0.23% H: V1: -0.49%~ +0.18% V2: -1.66%~ +3.24% V3: -2.8%~ +5.47% V4: -0.138%~ +0.27%	P

NO	TEST ITEM	TEST CONDITION / SPECIFICATION	RESULT	VERDICT
5	RIPPLE&NOISE	I/P:230VAC O/P:FULL LOAD SPEC: A: V1: 100mV V2: 100mV V3: 150mV V4: 150mV B: V1: 100mV V2: 100mV V3: 150mV V4: 150mV C: V1: 100mV V2: 100mV V3: 150mV V4: 150mV D: V1: 100mV V2: 100mV V3: 150mV V4: 150mV E: V1: 120mV V2: 150mV V3: 200mV V4: 150mV F: V1: 120mV V2: 150mV V3: 200mV V4: 150mV G: V1: 100mV V2: 150mV V3: 150mV V4: 100mV H: V1: 100mV V2: 150mV V3: 150mV V4: 100mV	A:V1:58mV V2:14mV V3:77mV V4:5mV B:V1:80mV V2:21mV V3:52mV V4:17mV C:V1:61mV V2:26mV V3:60mV V4:50mV D:V1:65mV V2:20mV V3:66mV V4:50mV E:V1:71mV V2:87mV V3:79mV V4:50mV F:V1:67mV V2:101mV V3:85mV V4:50mV G:V1:32mV V2:17mV V3:28mV V4:9mV H:V1:35mV V2:17mV V3:42mV V4:11mV	P
6	AC INPUT CURRENT	I/P:230VAC O/P:FULL LOAD SPEC:1.2A	B:0.887A	P
7	MAX. INRUSH CURREN	I/P:230VAC O/P: FULL LOAD SPEC: A-F:45A G.H:40A	B:36.984A	P
8	O/P VOLTAGE ADJ.RANGE	I/P:230VAC O/P:MIN. LOAD SPEC: A~F:CH1,CH2:-5%~+10% G.H:CH1:-5%~+10%	A: V1 4.57V~5.82V : V2 3.07V~3.8V B: V1 4.455V~5.85V V2 3.046V~3.774V C: V1 4.413V~5.803V V2 3.030V~3.733V D: V1 4.46V~5.81V V2 3.03V~3.79V E: V1 4.47V~5.834V V2 10.28V~13.745V F: V1 4.447V~5.8V V2 12.308V~17.379V G: V1 4.48V~5.77V H: V1 4.5V~5.833V	P
9	SET UP TIME	I/P:230VAC O/P:FULL LOAD SPEC: A-F:800mS G.H:1S	B: 331mS	P
10	HOLD UP TIME	I/P:230VAC O/P:FULL LOAD SPEC:16mS	B: 22.67mS	P
11	EFFICIENCY	I/P:230VAC O/P:FULL LOAD SPEC: A:73% B:75% C:74% D:76% E:78% F:78% G:76% H:77%	A:76.13% B:79.913% C:75.681% D:77.455% E:79.842% F:79.885% G:76.408% H:78.248%	P

12	OVER LOAD PROTECTION	I/P:230VAC O/P:TESTING	SPEC: A~F:105%~150% G.H :105%~135%	A:134.6% B:133.02% C:130.33% D:128.3% E:128.2% F:121.7% G:118% H:122%	P																																				
13	OVER VOLTAGE PROTECTION	I/P:230VAC O/P:FULL LOAD	SPEC: A~D: CH1:5.75~6.75V CH2:3.8V~4.4V E: CH1:5.75~6.75V CH2:13.8V~16.2V F: CH1:5.75~6.75V CH2:17.25V~20.25V G.H: CH1:5.75~6.75V	A : CH1:5.96V CH2:3.95V B : CH1:6.16V CH2:4.05V C : CH1:6.05V CH2:4.12V D : CH1:6.07V CH2:3.9V E : CH1:6.07V CH2:4.2V F : CH1:5.98V CH2:3.9V G : 6.24V H : 6.246V	P																																				
14	GROUND LEAKAGE CURRENT	I/P:240VAC	SPEC: L-FG--<3.5mA N-FG--<3.5mA	F: L-FG:0.7mA N-FG:0.7mA	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.		B: 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: 1.5KVAC/ 1 min.(10mA CUT-OFF) O/P - FG: 0.5KVAC/ 1 min.(10mA CUT-OFF)		B: I/P-O/P :5.18mA I/P-FG :4.15mA O/P-FG :8.05mA	P																																				
17	BURN-IN TEST	I/P: 230VAC O/P: FULL LOAD TA:22.2°C BURN-IN DURATION : 5.5 hrs		B:NON BREAK	P																																				
18	ENVIRONMENT TEST ( SAMPLE B:)	HIGH AMBIENT TEMPERATURE FULL LOAD TEST I/P:230VAC O/P:FULL LOAD AMBIENT TEMPERATURE:53.7°C		AFTER 14 hrs NON BREAK	P																																				
19	TEMPERATURE RISE TEST T rise OF PARTS	<p style="text-align: center;">B: I/P :230VAC AFTER 5.5 hr BURN-IN O/P :FULL LOAD TA:22.2°C</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <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>29.2°C</td> <td>7°C</td> </tr> <tr> <td>Q1</td> <td>MAIN TRANSISTOR</td> <td>39.5°C</td> <td>17.3°C</td> </tr> <tr> <td>T1</td> <td>MAIN TRANSFORMER WIRE</td> <td>50.5°C</td> <td>28.3°C</td> </tr> <tr> <td>D51</td> <td>O/P DIODE</td> <td>47.3°C</td> <td>25.1°C</td> </tr> <tr> <td>C57</td> <td>O/P FILTER CAPACITOR</td> <td>30.6°C</td> <td>8.4°C</td> </tr> <tr> <td>L51</td> <td>O/P CHOCK</td> <td>55.3°C</td> <td>33.1°C</td> </tr> <tr> <td>C5</td> <td>I/P FILTER CAPACITOR</td> <td>33.3°C</td> <td>11.1°C</td> </tr> <tr> <td>LF2</td> <td>LIME FILTER TRANSFORMER</td> <td>27.8°C</td> <td>5.6°C</td> </tr> </tbody> </table>			POSITION	P/N	TEMP	T rise	BD1	BRIDGE DIODE	29.2°C	7°C	Q1	MAIN TRANSISTOR	39.5°C	17.3°C	T1	MAIN TRANSFORMER WIRE	50.5°C	28.3°C	D51	O/P DIODE	47.3°C	25.1°C	C57	O/P FILTER CAPACITOR	30.6°C	8.4°C	L51	O/P CHOCK	55.3°C	33.1°C	C5	I/P FILTER CAPACITOR	33.3°C	11.1°C	LF2	LIME FILTER TRANSFORMER	27.8°C	5.6°C	P
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20	LIFE CYCLE	<p>B: SUPPOSE C57 IS THE MOST CRITICAL COMPONENT</p> <p>I/P:230VAC O/P:FULL LOAD Ta:25°C Tc57:30.6°C Life: 868070hrs</p> <p>I/P:230VAC O/P:FULL LOAD Ta:50°C Tc57:63.4°C Life: 140217hrs</p>			P																																				
21	CRITICAL COMPONENT RECORD ( FOR QC INSPECTION REFERENCE ONLY )	<p>B: FUSE :4A/250V</p> <p>BRIDGE DIODE :D4SB80</p> <p>LINE FILTER :LF-201 EF-28</p> <p>TRANSFOMER TF-741</p> <p>POWER SWITCHER :IRFP450 14A/500V</p> <p>OUTPUT DIODE :BYQ28X-200</p> <p>OUTPUT CAPACITOR :2200u/10V RUBYCON YXG</p> <p>INPUT CAPACITOR :150uF/400V 85°C</p> <p>P.C.B :QTP-150-R2</p>																																							

DATE	SAMPLE	TEST RESULT	TEST	APPROVAL
20000205	RD SAMPLE QP-150-3A QP-150-3B QP-150-3C QP-150-3D QP-150D QP-150E	PASS	VINCENT	Max Lin
20000408	PRODUCTION SAMPLE A203A32 QP-150-3A QP-150-3B QP-150-3C QP-150-3D QP-150D QP-150E	PASS	VINCENT	Max Lin
20000905	PRODUCTION SAMPLE A209C29 QP-150F	PASS	VINCENT	Max Lin
20010301	PRODUCTION SAMPLE A211C35A QP-150D QP-150F	PASS	VINCENT	Max Lin