Quality Engineering Test Report

SERIES: ESC-120 120W SINGLE OUTPUT CHARGER

SAMPLE: A. ESC-120-13.5 13.5V / 8A B. ESC-120-27 27V /4A C. ESC-120-54 54V / 2A

NO	TEST ITEM	TEST CONDITION / SPECIFICATION	RESULT	VERDICT
1	AC INPUT VOLTAGE RANGE	I/P:TESTING SPEC:176~264VAC O/P:FULL LOAD	A:117VAC~267VAC	P
2	LINE REGULATION	I/P:176~264VAC SPEC: O/P:FULL LOAD A:±0.5% B:±0.5% C:±0.5%	A: -0.09%~+0.04% B: -0.11%~+0.07% C: -0.09%~+0.07%	P
3	LOAD REGULATION	I/P:230VAC SPEC: O/P:MIN. TO FULL LOAD A:±2% B:±1% C:±0.5%	A: -0.23%~+0.18% B: -0.07%~-0.04% C: -0.02%~-0.08%	P
4	OUTPUT VOLTAGE TOLERANCE	I/P:176~264VAC SPEC: O/P:MIN. TO FULL LOAD A:±2% B:±1% C:±1%	A: +0.6%~+1.11% B: -0.19%~+0.02% C: -0.05%~+0.13%	P
5	RIPPLE&NOISE	I/P:230VAC SPEC: O/P:FULL LOAD A:120mVp-p B:150mVp-p C:400mVp-p	A: 61mV B: 37mV C: 105mV	P
6	AC INPUT CURRENT	I/P:230VAC SPEC:1.5A O/P:FULL LOAD	A:1.0A	P
7	MAX. INRUSH CURREN	I/P:230VAC SPEC:35A O/P: FULL LOAD	A:28.6A	P
8	O/P VOLTAGE ADJ.RANGE	I/P:230VAC SPEC: O/P:MIN. LOAD A:12~15V B:24~30V C:48~56V	A: 11.32~16.06V B: 23.84~32.72V C: 44.42~59.31V	P
9	SET UP TIME	I/P:230VAC SPEC:200ms O/P:FULL LOAD	A:21mS	P
10	HOLD UP TIME	I/P:230VAC SPEC:15mS O/P:FULL LOAD	A:42mS	P
11	EFFICIENCY	I/P:230VAC SPEC: O/P:FULL LOAD A:81% B:83% C:84%	A:81.1% B:83.5% C:84.68%	P
12	OVER LOAD PROTECTION	I/P:230VAC SPEC:105%~135% O/P:TESTING CURRENT LIMITING AUTO RECOVERY	A:133.7% B:132.5% C:135.0%	P
13	OVER VOLTAGE PROTECTION	I/P:230VAC SPEC:115%~135% O/P:FULL LOAD	A:127.7% B:128.6% C:124.8%	P
14	OVER TEMPERATURE PROTECTION & FAN ON/OFF TEST	I/P:230VAC SPEC: O/P:FULL LOAD RTH5>=80ºC SHUT DOWN	A:85.6ºC	P
15	GROUND LEAKAGE CURRENT	I/P:240VAC SPEC: L-FG---<3.5mA N-FG---<3.5mA	L-FG:0.94mA N-FG:0.89mA	P

<table>
<tr><th>NO</th><th>TEST ITEM</th><th>TEST CONDITION / SPECIFICATION</th><th>RESULT</th><th>VERDICT</th></tr>
<tr><td>16</td><td>INSULATION RESISTANCE</td><td>SPEC: O/P-FG 500VDC/100M Ohms MIN.
I/P-O/P 500VDC/100M Ohms MIN.
I/P-FG 500VDC/100M Ohms MIN.</td><td>A: O/P-FG >100M Ohms
I/P-O/P >100M Ohms
I/P-FG >100M Ohms</td><td>P</td></tr>
<tr><td>17</td><td>DIELECTRIC / WITHSTAND VOLTAGE</td><td>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)</td><td>A: I/P-O/P :0.003mA
I/P-FG :0.002mA
O/P-FG :0.002mA</td><td>P</td></tr>
<tr><td>18</td><td>INDICATOR</td><td>LED: GREEN STAND BY
YELLOW NORMAL LOAD
RED FULL LOAD</td><td>A: G:0~13.6% LOAD
Y:13.6%~90.62%LOAD
R:90.62%~100% LOAD</td><td>P</td></tr>
<tr><td>19</td><td>BATTERY CHANGE & DISCHANGE</td><td>I/P: 230VAC O/P:NO LOAD
BATTERY UP:18±0.5V
BATTERY LOW :10±0.5V</td><td>A: BATTERY UP:18.4V
BATTERY LOW :10.3V</td><td>P</td></tr>
<tr><td>20</td><td>BURN-IN TEST</td><td>I/P: 230VAC O/P:FULL LOAD
TA:25.6ºC BURN-IN DURATION : 1 hrs</td><td>A: NON BREAK</td><td>P</td></tr>
<tr><td rowspan="3">21</td><td rowspan="3">ENVIRONMENT TEST
(SAMPLE C:)</td><td>1.LOW TEMPERATURE TEST
I/P:170 VAC O/P:FULL LOAD
AMBIENT TEMPERATURE:-10ºC</td><td>A:AFTER 1 hrs
POWER ON OK</td><td rowspan="3">P</td></tr>
<tr><td>2.HIGH AMBIENT TEMPERATURE FULL LOAD TEST
I/P:230VAC O/P:FULL LOAD
AMBIENT TEMPERATURE:31ºC</td><td>A:AFTER 13.5 hrs
NON BREAK</td></tr>
<tr><td>3.ACCELERATED LIFE TEST
I/P:270VAC O/P:FULL LOAD
POWER ON :3 min POWER OFF :5 sec
AMBIENT TEMPERATURE:75ºC
AMBIENT HUMIDITY:95%</td><td>A:AFTER 5 hrs
NON BREAK</td></tr>
<tr><td>22</td><td>TEMPERATURE RISE TEST
T rise OF PARTS</td><td colspan="2">A: I/P :230VAC AFTER 1 hr BURN-IN
O/P :FULL LOAD TA:25.6ºC
<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>65.8ºC</td><td>40.2ºC</td></tr>
<tr><td>Q1</td><td>MAIN TRANSISTOR</td><td>69.2ºC</td><td>43.6ºC</td></tr>
<tr><td>T1</td><td>MAIN TRANSFORMER COIL</td><td>74.4ºC</td><td>48.8ºC</td></tr>
<tr><td>D13</td><td>O/P DIODE</td><td>81.2ºC</td><td>55.6ºC</td></tr>
<tr><td>C34</td><td>O/P FILTER CAPACITOR</td><td>61.0ºC</td><td>35.4ºC</td></tr>
<tr><td>L1</td><td>O/P CHOKE</td><td>90.0ºC</td><td>64.4ºC</td></tr>
<tr><td>T1</td><td>MAIN TRANSFORMER</td><td>69.3ºC</td><td>43.7ºC</td></tr>
<tr><td>RTH</td><td>THERMO</td><td>63.6ºC</td><td>38.0ºC</td></tr>
</table></td><td>P</td></tr>
<tr><td>23</td><td>LIFE CYCLE</td><td colspan="2">C: SUPPOSE C34 IS THE MOST CRITICAL COMPONENT
I/P:230VAC O/P:FULL LOAD Ta:25ºC Tc34:60.4ºC Life: 53297 hrs
I/P:230VAC O/P:FULL LOAD Ta:30ºC Tc34:73.8ºC Life: 21053 hrs</td><td>P</td></tr>
<tr><td>24</td><td>CRITICAL COMPONENT RECORD
(FOR QC INSPECTION REFERENCE ONLY)</td><td colspan="3">C: FUSE :4AL/250VAC
BRIDGE DIODE :LT PBU606
LINE FILTER :LF TF-096D-R1 EE-25
TRANSFOMER :MT TF-370-R2 EER-35
POWER SWITCHER :NT2625N TO-3P
OUTPUT DIODE :ESAD9202 TO-3P
OUTPUT CAPACITOR :(V) 2200uF/35V ,105ºC VENT
INPUT CAPACITOR :RUBYCON 330uF/200V 85ºC USP
P.C.B :ESC-120R-R1 FR-4 2 OZ DS</td></tr>
<tr><th>DATE</th><th>SAMPLE</th><th>TEST RESULT</th><th>TEST</th><th>APPROVAL</th></tr>
<tr><td>980630</td><td>ESC-120</td><td>PASS</td><td>H.C.LIOU</td><td>Max Lin</td></tr>
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