Quality Engineering Test Report

SERIES: ESP-240 216W SINGLE OUTPUT CHARGER

SAMPLE: A. ESP-240-13.5 13.5V / 16A B. ESP-240-27 27V / 8A C. ESP-240-54 54V / 4A

NO	TEST ITEM	TEST CONDITION / SPECIFICATION	RESULT	VERDICT
1	AC INPUT VOLTAGE RANGE	I/P:TESTING SPEC:176~264VAC O/P:FULL LOAD	C:128VAC~264VAC	P
2	LINE REGULATION	I/P:176~264VAC SPEC: O/P:FULL LOAD A:±1% B:±0.5% C:±0.5%	A: -0.1%~+0.1% B: -0.1%~+0.1% C: -0.1%~+0.05%	P
3	LOAD REGULATION	I/P:230VAC SPEC: O/P:MIN. TO FULL LOAD A:±2% B:±1% C:±0.5%	A: -0.1%~+0.1% B: -0.14%~+0.03% C: -0.05%~+0%	P
4	OUTPUT VOLTAGE TOLERANCE	I/P:176~264VAC SPEC: O/P:MIN. TO FULL LOAD A:±2% B:±1% C:±1%	A: -0.1%~+1.2% B: -0.1%~+0.21% C: -0.1%~+0.14%	P
5	RIPPLE&NOISE	I/P:230VAC SPEC: O/P:FULL LOAD A:120mVp-p B:150mVp-p C:400mVp-p	A: 67mV B: 60mV C: 135mV	P
6	AC INPUT CURRENT	I/P:230VAC SPEC:2.5A O/P:FULL LOAD	C:1.7A	P
7	MAX. INRUSH CURREN	I/P:230VAC SPEC:35A O/P: FULL LOAD	C:23A	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: 12.04~16.01V B: 22.68~32.36V C: 44.9~61V	P
9	SET UP TIME	I/P:230VAC SPEC:200ms O/P:FULL LOAD	C:20.5mS	P
10	HOLD UP TIME	I/P:230VAC SPEC:10mS O/P:FULL LOAD	C:48.9mS	P
11	EFFICIENCY	I/P:230VAC SPEC: O/P:FULL LOAD A:81% B:84% C:85%	A:80.8% B:84.6% C:86.4%	P
12	OVER LOAD PROTECTION	I/P:230VAC SPEC:105%~135% O/P:TESTING CURRENT LIMITING AUTO RECOVERY	A:105.6% B:125% C:130.5%	P
13	OVER VOLTAGE PROTECTION	I/P:230VAC SPEC:115%~135% O/P:FULL LOAD	A:124.6% B:125.8% C:118.7%	P
14	OVER TEMPERATURE PROTECTION & FAN ON/OFF TEST	I/P:230VAC SPEC: RTH5 O/P:FULL LOAD .>=85ºC SHUT DOWN >=60ºC FAN ON <=50ºC FAN OFF	C: OTP:85.0ºC FAN ON:57.3ºC FAN OFF:43.8ºC	P

<table>
<tr><th>NO</th><th>TEST ITEM</th><th>TEST CONDITION / SPECIFICATION</th><th>RESULT</th><th>VERDICT</th></tr>
<tr><td>15</td><td>GROUND LEAKAGE CURRENT</td><td>I/P:240VAC SPEC: L-FG--<3.5mA
N-FG--<3.5mA</td><td>A: L-FG:1.19mA
N-FG:1.19mA</td><td>P</td></tr>
<tr><td>16</td><td>INSULATION RESISTANCE</td><td>SPEC: I/P-O/P: 500VDC/100MOhms MIN.
I/P-FG: 500VDC/100MOhms MIN.
O/P-FG: 500VDC/100MOhms MIN.</td><td>A: O/P-FG >100MOhms
I/P-O/P >100MOhms
I/P-FG >100MOhms</td><td>P</td></tr>
<tr><td>17</td><td>DIELECTRIC / WITHSTAND VOLTAGE</td><td>SPEC: I/P- O/P: 1600VAC/ 1 min. (10mA CUT-OFF)
I/P - FG: 1600VAC/ 1 min. (10mA CUT-OFF)
O/P -FG: 600VAC/ 1 min. (10mA CUT-OFF)</td><td>A: I/P-O/P :3mA
I/P-FG :6.8mA
O/P-FG :2.4mA</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: 0%~10.2% LOAD
10.2%~90.8%LOAD
90.8%~100% LOAD</td><td>P</td></tr>
<tr><td>19</td><td>BURN-IN TEST</td><td>I/P: 230VAC O/P:FULL LOAD
TA:25ºC BURN-IN DURATION : 4 hrs</td><td>NO BREAK</td><td>P</td></tr>
<tr><td>20</td><td>ENVIRONMENT TEST (SAMPLE A:)</td><td>HIGH AMBIENT TEMPERATURE FULL LOAD TEST
I/P:230VAC O/P:FULL LOAD
AMBIENT TEMPERATURE:40ºC</td><td>AFTER 4 hrs
NON BREAK</td><td>P</td></tr>
<tr><td>21</td><td>TEMPERATURE RISE TEST Trise OF PARTS</td><td>A: I/P :230VAC AFTER 4 hrs BURN-IN
O/P :FULL LOAD TA:25ºC
<table>
<tr><th>POSITION</th><th>P/N</th><th>TEMP</th><th>Trise</th></tr>
<tr><td>BD1</td><td>BRIDGE DIODE</td><td>70.9ºC</td><td>45.9ºC</td></tr>
<tr><td>Q2</td><td>MAIN TRANSISTOR</td><td>44.1ºC</td><td>19.1ºC</td></tr>
<tr><td>T1</td><td>MAIN TRANSFORMER</td><td>45.7ºC</td><td>20.7ºC</td></tr>
<tr><td>D13</td><td>O/P DIODE</td><td>57.1ºC</td><td>32.1ºC</td></tr>
<tr><td>C37</td><td>O/P FILTER CAPACITOR</td><td>38.8ºC</td><td>13.8ºC</td></tr>
<tr><td>L1</td><td>O/P CHOCK</td><td>56.3ºC</td><td>31.3ºC</td></tr>
<tr><td>C5</td><td>I/P FILTER CAPACITOR</td><td>38.2ºC</td><td>13.2ºC</td></tr>
<tr><td>RT</td><td>THERMO</td><td>47.7ºC</td><td>22.7ºC</td></tr>
</table></td><td></td><td>P</td></tr>
<tr><td>22</td><td>LIFE CYCLE</td><td>A: SUPPOSE C37 IS THE MOST CRITICAL COMPONENT
I/P:230VAC O/P:FULL LOAD Ta:25ºC Tc37:38.8ºC Life: 195224 hrs
I/P:230VAC O/P:FULL LOAD Ta:40ºC Tc37:63.8ºC Life: 34511 hrs</td><td></td><td>P</td></tr>
<tr><td>23</td><td>CRITICAL COMPONENT RECORD (FOR QC INSPECTION REFERENCE ONLY)</td><td colspan="3">A: FUSE :T6.3AL/250V G UL
BRIDGE DIODE :D10B60
LINE FILTER :LF TF-349-R1 ET-28
TRANSFOMER :MT TF-370-R2 EER-35
POWER SWITCHER :3306 TO-3P
OUTPUT DIODE :C25P20F TO-3P
OUTPUT CAPACITOR :(V) 2200uF/ 35V 105
INPUT CAPACITOR :NITSUKO 680uF/200V
P.C.B :ESC-240N-R2,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>980429</td><td>ESP-240</td><td>PASS</td><td>H.C.LIOU</td><td>Max Lin</td></tr>
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