

# Quality Engineering Test Report

SERIES: ESC-240 216W SINGLE OUTPUT CHARGER

SAMPLE: A. ESC-240-13.5  
13.5V / 16A

B. ESC-240-27  
27V / 8A

C. ESC-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 .>=85°C SHUT DOWN >=60°C FAN ON <=50°C FAN OFF	C: OTP:85.0°C FAN ON:57.3°C FAN OFF:43.8°C	P

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15	INSULATION RESISTANCE	SPEC: O/P-FG 500VDC/100M Ohms MIN. I/P-O/P 500VDC/100M Ohms MIN. I/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: 1.5KVAC/ 1 min. (10mA CUT-OFF) O/P - FG: 0.5KVAC/ 1 min. (10mA CUT-OFF)	C: I/P-O/P :3mA I/P-FG :6mA O/P-FG :2.6mA	P																																
17	EMS TEST	EFT TEST: EN50082-1 IEC1000-4-4	A: CRITERIA A OK	P																																
		SURGE TEST: EN50082-1 IEC1000-4-5	A: CRITERIA A OK	P																																
18	INDICATOR	LED: GREEN STAND BY YELLOW NORMAL LOAD RED FULL LOAD	C: 0~12.5% LOAD 12.5%~91% LOAD 91%~100% LOAD	P																																
19	BATTERY CHANGE & DISCHARGE	I/P: 230VAC O/P:FULL LOAD BATTERY HIGH/UP:58.8V BATTERY LOW :42V	REVERS / RESET :OK	P																																
20	BURN-IN TEST	I/P: 230VAC O/P:FULL LOAD TA:20.6°C BURN-IN DURATION : 1 hrs	C: NO BREAK	P																																
21	ENVIRONMENT TEST ( SAMPLE C:)	1.LOW TEMPERATURE TEST I/P:158 VAC O/P:FULL LOAD AMBIENT TEMPERATURE:-10°C	AFTER 3 hrs POWER ON OK	P																																
		2.HIGH AMBIENT TEMPERATURE FULL LOAD TEST I/P:230VAC O/P:FULL LOAD AMBIENT TEMPERATURE:40°C	AFTER 14.5 hrs NON BREAK																																	
		3.ACCELERATED LIFE TEST I/P:270VAC O/P:FULL LOAD POWER ON :3 min POWER OFF :5 sec AMBIENT TEMPERATURE:70°C AMBIENT HUMIDITY:95%	AFTER 3 hrs NON BREAK																																	
22	TEMPERATURE RISE TEST T rise OF PARTS	C: I/P :230VAC AFTER 1 hr BURN-IN O/P :FULL LOAD TA:20.6°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>49.3°C</td> <td>28.7°C</td> </tr> <tr> <td>Q1</td> <td>MAIN TRANSISTOR</td> <td>57°C</td> <td>34.6°C</td> </tr> <tr> <td>T1</td> <td>MAIN TRANSFORMER</td> <td>49.9°C</td> <td>29.3°C</td> </tr> <tr> <td>D13</td> <td>O/P DIODE</td> <td>37.8°C</td> <td>17.2°C</td> </tr> <tr> <td>C35</td> <td>O/P FILTER CAPACITOR</td> <td>35.6°C</td> <td>15.0°C</td> </tr> <tr> <td>L1</td> <td>O/P CHOCK</td> <td>43.4°C</td> <td>22.8°C</td> </tr> <tr> <td>RTH</td> <td>THERMO</td> <td>46.3°C</td> <td>25.7°C</td> </tr> </tbody> </table>	POSITION	P/N	TEMP	T rise	BD1	BRIDGE DIODE	49.3°C	28.7°C	Q1	MAIN TRANSISTOR	57°C	34.6°C	T1	MAIN TRANSFORMER	49.9°C	29.3°C	D13	O/P DIODE	37.8°C	17.2°C	C35	O/P FILTER CAPACITOR	35.6°C	15.0°C	L1	O/P CHOCK	43.4°C	22.8°C	RTH	THERMO	46.3°C	25.7°C	P
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23	LIFE CYCLE	C: SUPPOSE C35 IS THE MOST CRITICAL COMPONENT I/P:230VAC O/P:FULL LOAD Ta:20.6°C Tc35:35.6°C Life: 173645 hrs I/P:230VAC O/P:FULL LOAD Ta:40.0°C Tc35:47°C Life: 111430 hrs		P																																
24	CRITICAL COMPONENT RECORD ( FOR QC INSPECTION REFERENCE ONLY )	C: FUSE :T6.3AL/250VAC BRIDGE DIODE :D10XB60 LINE FILTER :LF TF-349-R1 ET-28 TRANSFOMER :MT TF-372-R2 EER-35 POWER SWITCHER :3306 10A/400V TO-3P OUTPUT DIODE :C16P40F 16A/400V OUTPUT CAPACITOR :330uF/ 100V ,SL 2Kh INPUT CAPACITOR :680uF/200V 85°C P.C.B :ESC-240N-R2,FR-4 2 OZ DS																																		
DATE	SAMPLE	TEST RESULT	TEST	APPROVAL																																
19980417	ESC-240	PASS	H.C.LIOU	Max Lin																																
19990528	ESC-240-13.5	PASS	H.C.LIOU	Max Lin																																