



6	RATING LABEL			1		
5	AC INLET			1		
4	LED			1		
3	TERMINAL			3		
2	LOWER CASE			1		
1	UPPER CASE			1		
Sym.	Item or Code No.	Material & Size	Process	qt.	Remark	
					DE-844R*	
					Name	External appearance
Scale	Designed	Drawn	Traced	Checked	Approved	No.
1:1	Yoshida	Yoshida			Tomiki	Z844- A091A

Lithium Ion Battery Charger Specifications	Approved	Checked	Drawn
	<i>Tomiki</i>	<i>S. Suda</i>	<i>Y. Yoshida</i>

<p>1. Product Name and Model Number</p> <p>1-1 Product Name</p> <p>1-2 Model Number</p> <p>2. Scope</p> <p>3. Destinations and safety standards</p> <p>4. Appearance, mass, etc.</p> <p>5-1 Appearance</p> <p>5-2 Mass</p> <p>5-3 Indications</p> <p>5. Applicable batteries</p>	<p>Lithium Ion Battery Charger</p> <p>DE-844RA</p> <p>This product is a battery charger for Lithium-Ion battery pack.</p> <p>USA/Canada : UL1310 (C - UL application) CSA C22.2 No.223</p> <p>Europe : ENG0065 (CB certification) EN55014-1 EN50014-2</p> <p>Japan : DENTORI</p> <p>Refer an attached drawing "External Appearance". Approximately 75g</p> <p>Refer an attached drawing</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Type</th> <th>Model No.</th> <th>Cell</th> <th>Voltage</th> <th>Capacity</th> <th>Manufacturer</th> </tr> </thead> <tbody> <tr> <td>Li-ion</td> <td>CGA-7/102*</td> <td>1 cell</td> <td>3.7V</td> <td>900mAh</td> <td>Matsushita</td> </tr> </tbody> </table> <p>Battery has following terminals.</p> <ol style="list-style-type: none"> 1. Positive Terminal 2. Negative Terminal 3. T Terminal <p>(Thermistor TH05-3H103F is connected between T terminal and Negative terminal)</p>	Type	Model No.	Cell	Voltage	Capacity	Manufacturer	Li-ion	CGA-7/102*	1 cell	3.7V	900mAh	Matsushita
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Mark	Date	Revision	Drawn	Aprvd	Mark	Date	Revision	Drawn	Aprvd
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6. Electrical Characteristics

(Unspecified characteristics are at 100V AC input and $T_a=25\pm 5^\circ\text{C}$)

6-1 Input voltage

Input : 90 - 264V (100V-10% ~ 240V+10%)
 Frequency : 50 - 60Hz

6-2 Input Wattage

Input wattage shall be as follows at 3.9V battery with 100V AC input.

Input Wattage	4.5 ± 2W
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6-3 Battery Detection

Battery connection is detected by connection of thermistor between T terminal and Negative terminal. If positive terminal is open circuit, LED turns off at around 5 seconds after starting.

	Resistance	Detecting
Thermistor resistance	$200 \pm 100 \text{ k } \Omega \sim \infty$	No Battery
	$0 \sim 200 \pm 100 \text{ k } \Omega$	Battery is connected

6-4 Charging current

Charging current at battery voltage 3.7V shall be as follows.

Charging current	630 ± 70 mA
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6-5 Battery temperature protection

According to thermistor resistance, following temperature protections are done.

Low temperature protection (No charging current)

Thermistor	$R_{th} \geq 30.1 \pm 4 \text{ k } \Omega$	About -3°C
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High temperature protection at starting (No charging current)

Thermistor	$R_{th} \leq 4.97 \pm 0.6 \text{ k } \Omega$	About 45°C
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High temperature protection during rapid charging (No charging current)

Thermistor	$R_{th} \leq 3.57 \pm 0.4 \text{ k } \Omega$	About 55°C
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Returned condition after high temperature protection

Thermistor	$R_{th} \geq 4.97 \pm 0.6 \text{ k } \Omega$	About 45°C
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Low temperature protection 2 (Low charging current)

Thermistor	$30.1 \pm 4 \text{ k } \Omega \geq R_{th} \geq 21.2 \pm 3 \text{ k } \Omega$	About 6°C
Charging current	160 ± 50 mA	

At temperature protection, following charging current flow for low voltage battery (over discharged battery)

Over discharge current	80 ± 40 mA
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Mark	Date	Revision	Drawn	Aprvd	Mark	Date	Revision	Drawn	Aprvd
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<p>6-6 Charging control method</p> <p>6-7 Charging timer</p> <p>6-8 Recharge voltage</p> <p>6-9 Charge Indication</p> <p>6-10 Over discharged battery protection (Output short-circuit protection)</p> <p>6-11 Charging Time (for reference)</p> <p>7. Temperature range</p>	<p>Constant voltage and constant current control method.</p> <table border="1" data-bbox="468 210 1149 252"> <tr> <td>Constant voltage</td> <td>4.2 V ± 30 mV</td> </tr> </table> <p>Fully charging detection is at following charging current.</p> <table border="1" data-bbox="468 346 1149 388"> <tr> <td>Fully charged Current</td> <td>80 ± 40 mA</td> </tr> </table> <p>Charging timer ... 240 min ± 30%</p> <p>After fully charging, rapid charging re-starts when battery voltage comes down to following voltage.</p> <table border="1" data-bbox="468 588 1171 640"> <tr> <td>Recharge voltage</td> <td>4.0 ± 0.15 V</td> </tr> </table> <p>Red and green dual color LED shows following charging status.</p> <table data-bbox="430 745 793 871"> <tr> <td>Rapid charging</td> <td>Red</td> </tr> <tr> <td>Fully charging</td> <td>Green</td> </tr> <tr> <td>No battery</td> <td>Off</td> </tr> <tr> <td>NG battery</td> <td>Off</td> </tr> </table> <p>When battery voltage is lower than following voltage, charging current shall be as follows. And there shall be no abnormalities when output is short-circuited.</p> <table border="1" data-bbox="498 997 1202 1081"> <tr> <td>Battery voltage</td> <td>$V_{out} \leq 3.0 \pm 0.3 V$</td> </tr> <tr> <td>Battery charge current</td> <td>80 ± 40 mA</td> </tr> </table> <p>About 120 minutes</p> <p>Temperature range of operation : 0°C ~ 40°C Temperature range of storage : -25°C ~ 65°C</p>	Constant voltage	4.2 V ± 30 mV	Fully charged Current	80 ± 40 mA	Recharge voltage	4.0 ± 0.15 V	Rapid charging	Red	Fully charging	Green	No battery	Off	NG battery	Off	Battery voltage	$V_{out} \leq 3.0 \pm 0.3 V$	Battery charge current	80 ± 40 mA												
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