

SPECIFICATIONS

Model : NC-MQN04E20-S

Customer : SANYO COMPONENT EUROPE CORPORATE GmbH

Date : SEP . 21 , 2006

APPROVED SIGNETURES

SANYO ELECTRIC CO., LTD
MOBILE ENERGY COMPANY

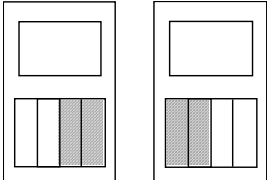
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<p>1.Scope of application</p> <p>2.Name</p> <p>3.Model No.</p> <p>4.Applicable safety standard</p> <p>5.Rating</p>	<p>This specification applies to the Battery charger manufactured by Sanyo Electric Co.,Ltd. Mobile Energy Company for supply to SANYO COMPONENT EUROPE CORPORATE GmbH.</p> <p>Battery Charger</p> <p>NC-MQN04E20-S</p> <ul style="list-style-type: none"> • EN60335-1,EN60335-2-29 • IEC60335-1,IEC60335-2-29 <table border="1" data-bbox="533 913 1457 1196"> <tr> <td>Input</td> <td>AC230V ~ 50Hz 5W</td> </tr> <tr> <td>Output</td> <td>DC2.4V --- 250mA × 2 / 120mA × 2</td> </tr> <tr> <td>Operating temperature and humidity ranges</td> <td>5 ~ 35 / 45 ~ 85%RH *1 0 ~ 35 / 45 ~ 85%RH *2</td> </tr> <tr> <td>Storage temperature and humidity ranges</td> <td>-20 ~ 60 / 45 ~ 85%RH</td> </tr> </table> <p>*1 Guarantee of the electrical performances.</p> <p>*2 Guarantee of the operation the following electric performances can ' t be applicable.</p> <p style="margin-left: 40px;">8-1 : d. Charging time : e. Discharge capacity</p>	Input	AC230V ~ 50Hz 5W	Output	DC2.4V --- 250mA × 2 / 120mA × 2	Operating temperature and humidity ranges	5 ~ 35 / 45 ~ 85%RH *1 0 ~ 35 / 45 ~ 85%RH *2	Storage temperature and humidity ranges	-20 ~ 60 / 45 ~ 85%RH	
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6.Appearance, dimensions and mass	<table border="1" data-bbox="533 1603 1457 1744"> <tr> <td>Appearance</td> <td>Refer to the overall view drawing</td> </tr> <tr> <td>Dimensions</td> <td>75(W) × 118(L) × 40(Include the plug = 79) (H) mm</td> </tr> <tr> <td>Mass</td> <td>230g ± 10%</td> </tr> </table>	Appearance	Refer to the overall view drawing	Dimensions	75(W) × 118(L) × 40(Include the plug = 79) (H) mm	Mass	230g ± 10%			
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7. Specification			
a	Battery type	Ni-MH battery	
b	Applicable batteries	HR-3U(typ.2700mAh,min.2500mAh) / HR-3U(typ.2500mAh,min.2300mAh) / HR-3U(typ.1700mAh,min.1600mAh) / HR-4U(typ.1000mAh,min.930mAh) / HR-4U(typ.900mAh,min.840mAh) eneloop HR-3UTG(typ.2000mAh,min.1900mAh) / HR-4UTG (typ.800mAh,min.750mAh)	
c	Protection timer (reference)	Approx.16hours(at 25 ±5)	
d	Charging control method	Timer cut	
e	Output function	<ul style="list-style-type: none"> • 2 or 4 batteries can be charged with the following currents. AA type : Approx.250mA(at DC2.4V) AAA type : Approx.120mA(at DC2.4V) • Charging current is half-wave rectification current. • Electrical performances are not guaranteed when both AA type and AAA type are charged. • 2 batteries must be placed like the right figure. 	
f	Rechargeable terminal	+ : Rechargeable terminal - : Grounding terminal (4 Slots)	
g	LED display	LED display of charging conditions • During charge : On(Green) • After full charge : Off(Timer cut)	
h	Protection system	•Protection timer	
8. Performance		<ul style="list-style-type: none"> • Standard conditions Unless otherwise specified, measurement should be carried out at temperature 5~35 , humidity 45~85%, and atmospheric pressure 860~1060hPa. If there are doubts about results, condition should be performed at 20 ±2 , 60~70%, and 860~1060hPa. • Standard battery The battery shall be fully activated and discharged for 2.5 hours at constant current of 0.2It rate after full charge. • Discharge battery The battery shall be fully activated and discharged to the end voltage of 0.8V/cell at constant current of 0.2It rate. $It[A] = C_5[Ah] / [h]$ C_5 : Rated capacity 	


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8-1 Electrical performance			
	Item	Condition	Standard
a	Input voltage range	AC230V \pm 10% 45 ~ 55Hz	No miss-operation
b	Input power	4 standard batteries should be charged under the rated input voltage and then input power should be measured after 5 minutes from start.	Less than 5W
c	Charging current	4 standard batteries should be charged under the rated input voltage and then charging current should be measured after 5 minutes from start at 25 \pm 5 .	AA : DC250mA \pm 25% AAA: DC120mA \pm 25%
d	Charging time	4 discharged batteries should be charged at 25 \pm 5 .	16hours \pm 20%
e	Discharge capacity	Discharged batteries shall be fully charged and then discharged at 0.2It constant current at 25 \pm 5 . Discharging time to 1V/cell shall be measured.	More than 80% (VS minimum capacity) (Minimum capacity = Rated capacity)
f	Leakage current	It depends on EN 60335-1.	Less than 0.25mA
g	Insulation withstand voltage	AC3750V is input for 1minutes across primary-secondary and primary-dead-metal part.	Not to damage the insulator.
h	Insulation resistance	Primary-secondary and primary-dead-metal part 's resistance are measured with DC500V insulating meter.	More than 20M
i	Conducting and radiated emissions	It depends on EN55014.	Shall satisfy the standard.
j	Temperature rise	The maximum temperature of parts shall be measured when the discharged battery is charged under the rated input voltage and ambient temperature at 35 .	It shall satisfy the safety regulation, and composition parts shall not exceed the maximum rated temperature .
		Battery surface temperature shall be measured when the discharged battery is charged under the rated input voltage and ambient temperature at 5 ~ 35 .	The battery surface temperature shall be under 65 .
k	Electrostatic discharge	During charging/standby, the specified amount of positive and negative static electricity shall be input from 150 pF capacitor through 330 resistor for 10 times respectively (EN61000-4-2). The discharge probe shall be shortened gradually. The residual electricity of the parts shall be discharged through 50 resistor after each test.	No miss-operation with \pm 5KV. No deterioration with \pm 10KV.
l	Interrupting of input voltage	The rated input voltage should be interrupted for 20ms with 100% dip every 10 seconds for 1 minute.	No miss-operation


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m	Lightning surge	1.2×50μs、1kV of positive and negative voltage shall be input for 3times respectively(EN61000-4-5)	No emitting smoke or flame
n	AC line noise	Impulse width : 1μs Impulse voltage : ±1kV	No miss-operation.

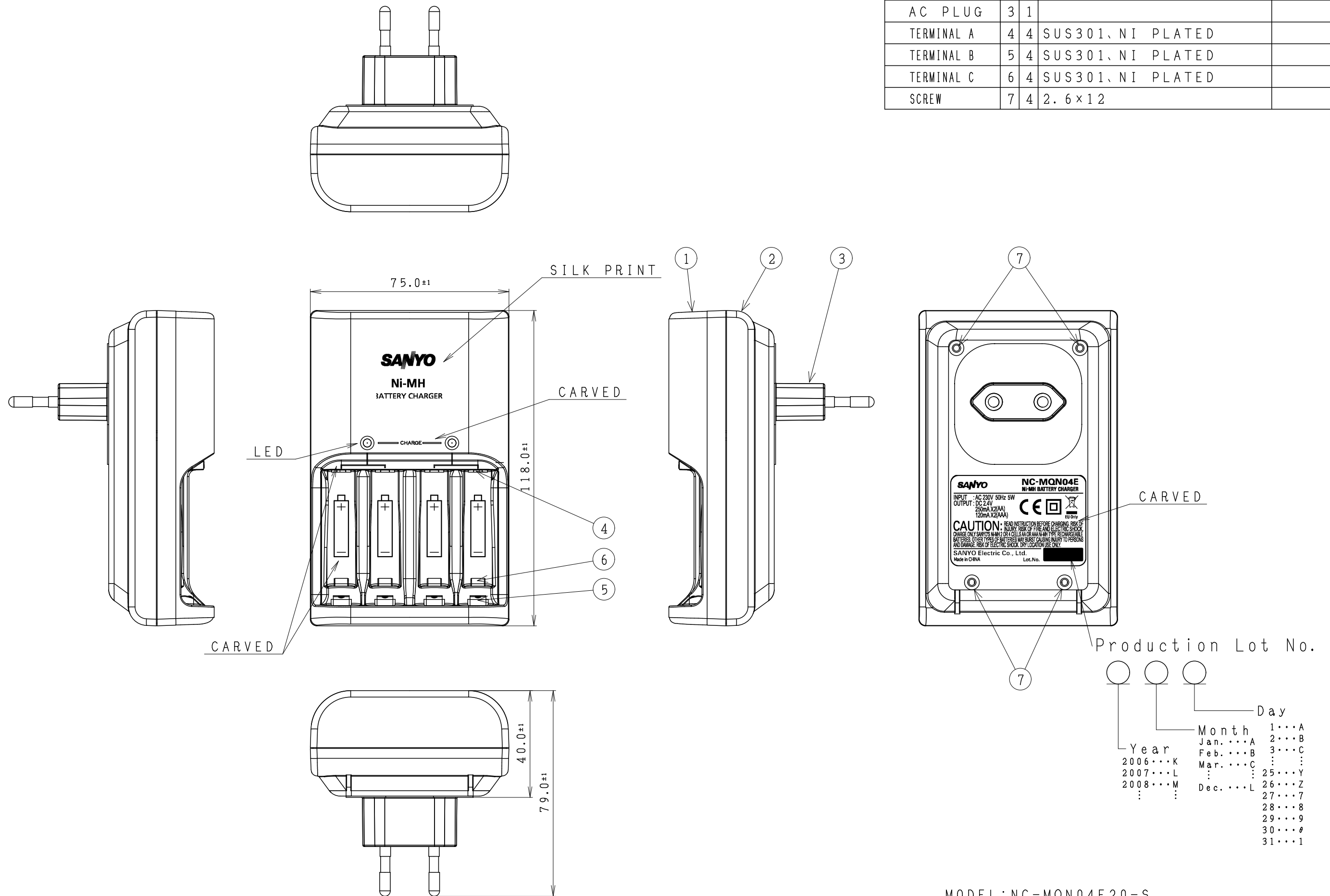
8-2 Mechanical performance

	Item	Condition	Standard
a	Insertion and removal of the battery.	The battery shall be inserted and removed for 2000 times.	The product shall operate properly after the test.
b	Vibration test	Frequency : 10~55Hz Accretion : 19.6m/s ² Vibration shall be applied in each X, Y and Z directions for 2 hours. (20min./cycle)	After the test, the components should not be damaged or dislodged, screws should not be loose, and product should satisfy the electrical performance in this specification.
c	Drop test	The product shall be dropped 1 time each on 6 directions from a height of 70cm on the wooden board.	After the test, the components shall not be damaged or dislodged by electric shock and flame. Product shall satisfy the electrical performance in this specification.

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8-3 Environmental performance			
	Item	Condition	Standard
a	High temperature, high humidity storage	The product shall be stored at 40 °C, humidity 90% for 96 hours, and it shall be left under the standard conditions for more than 1 hour.	The product shall operate properly and satisfy electrical performances, withstand voltage and insulation resistance voltage.
b	Heat Shock	<p>The product shall be stored without applying power, in the condition of following; Temperature of -20 °C / +60 °C, 10 cycles, every 60 minutes.(drawing below)</p>  <p>The graph shows a temperature profile over 240 minutes. The y-axis represents temperature in degrees Celsius, with marked values at -20, 0, and 60. The x-axis represents time in minutes, with marked values at 0, 60, 120, 180, and 240. The profile consists of two identical cycles. Each cycle starts at -20°C for 60 minutes, then rises sharply to 60°C and remains constant for 60 minutes, then falls sharply back to -20°C and remains constant for 60 minutes. This sequence repeats once more, ending at 240 minutes.</p>	The product shall satisfy electrical performances.
c	High temperature operation	The discharged battery shall be charged under the rated input voltage at 40 °C ambient temperature.	The product shall operate properly No abnormal heat rising. (Temperature protection shall work normally.)
d	Low temperature operation	The discharged battery shall be charged with applying rated input voltage at 0 °C ambient.	The product shall operate properly.
e	High temperature storage	The product shall be stored at 60 °C for 48hours without applying input voltage, and then it shall be left in the standard condition for 1 hour.	The product shall operate properly and satisfy specifications and electric performances.
f	Low temperature storage	The product shall be stored at -20 °C for 48 hours without applying input voltage, and then it shall be left in the standard conditions for 1 hour.	The product shall operate properly and satisfy specifications and electric performances

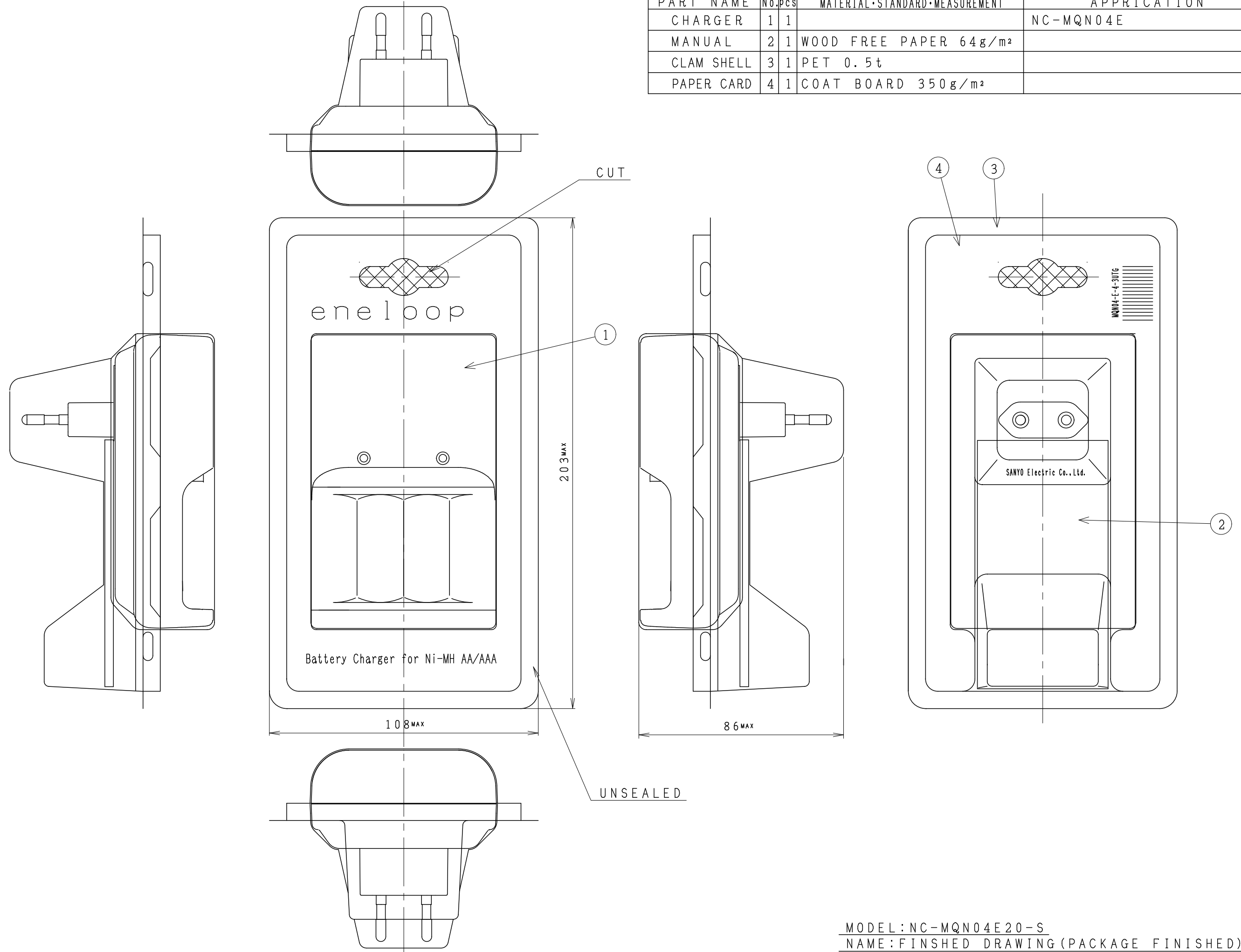
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9. Marking	<ul style="list-style-type: none"> Rating and Caution (carved on the bottom case)  <ul style="list-style-type: none"> Product lot No. marking <table border="0" style="margin-left: 200px;"> <tr> <td></td> <td></td> <td style="text-align: right;">Day</td> </tr> <tr> <td></td> <td style="text-align: center;">Month</td> <td style="text-align: right;">1 - A</td> </tr> <tr> <td style="text-align: center;">Year</td> <td style="text-align: center;">Jan. - A</td> <td style="text-align: right;">2 - B</td> </tr> <tr> <td style="text-align: center;">2006 - K</td> <td style="text-align: center;">Feb. - B</td> <td style="text-align: right;">⋮</td> </tr> <tr> <td style="text-align: center;">2007 - L</td> <td style="text-align: center;">⋮</td> <td style="text-align: right;">26 - Z</td> </tr> <tr> <td style="text-align: center;">2008 - M</td> <td style="text-align: center;">Dec. - L</td> <td style="text-align: right;">27 - 7</td> </tr> <tr> <td style="text-align: center;">⋮</td> <td></td> <td style="text-align: right;">28 - 8</td> </tr> <tr> <td></td> <td></td> <td style="text-align: right;">29 - 9</td> </tr> <tr> <td></td> <td></td> <td style="text-align: right;">30 -</td> </tr> <tr> <td></td> <td></td> <td style="text-align: right;">31 - 1</td> </tr> </table>			Day		Month	1 - A	Year	Jan. - A	2 - B	2006 - K	Feb. - B	⋮	2007 - L	⋮	26 - Z	2008 - M	Dec. - L	27 - 7	⋮		28 - 8			29 - 9			30 -			31 - 1	
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10. Packaging	<ol style="list-style-type: none"> Package specification: Refer to the packaging drawing Package performance: Refer to following; <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Item</th> <th style="width: 60%;">Method</th> <th style="width: 25%;">Rating</th> </tr> </thead> <tbody> <tr> <td rowspan="3">Package Drop Test</td> <td><Drop Point> 2 corner, 2 different edges, and 4 planes (one time each)</td> <td rowspan="3">After the test, there shall be no problem of appearance.</td> </tr> <tr> <td><Drop Area> Onto concrete</td> </tr> <tr> <td><Drop Height> 2 corner : 64 cm 2 different edges : 64 cm 4 planes : 80 cm</td> </tr> <tr> <td rowspan="3">Package Vibration Test</td> <td><Times of Vibration> Three different direction</td> <td rowspan="3"></td> </tr> <tr> <td><Vibration Condition> Acceleration 9.8m/s² Frequency 5 ~ 50Hz</td> </tr> <tr> <td><Duration of Vibration> For 20min. per each Cycle</td> </tr> </tbody> </table>	Item	Method	Rating	Package Drop Test	<Drop Point> 2 corner, 2 different edges, and 4 planes (one time each)	After the test, there shall be no problem of appearance.	<Drop Area> Onto concrete	<Drop Height> 2 corner : 64 cm 2 different edges : 64 cm 4 planes : 80 cm	Package Vibration Test	<Times of Vibration> Three different direction		<Vibration Condition> Acceleration 9.8m/s ² Frequency 5 ~ 50Hz	<Duration of Vibration> For 20min. per each Cycle																		
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11. Incidental items	<p>In case of the subject which is not covered with this specification, Sanyo Electric Co., Ltd., and SANYO COMPONENT EUROPE CORPORATE GmbH shall discuss and cooperate to solve the issue.</p>																															
12. Attached drawings and others	<ul style="list-style-type: none"> Overall view drawing Packaging drawing Finished drawing(packing finished) 																															

PART NAME	No.	pcs	MATERIAL·STANDARD·MEASUREMENT	APPRICATION
TOP CASE	1	1	PC (V2)	COLOR:WHITE
BOTTOM CASE	2	1	PC (V2)	COLOR:WHITE
AC PLUG	3	1		
TERMINAL A	4	4	SUS301、NI PLATED	
TERMINAL B	5	4	SUS301、NI PLATED	
TERMINAL C	6	4	SUS301、NI PLATED	
SCREW	7	4	2.6×12	



MODEL: NC-MQN04E20-S
 NAME: OVERALL VIEW DRAWING (CHARGER)

PART NAME	No.	pcs	MATERIAL·STANDARD·MEASUREMENT	APPRICATION
CHARGER	1	1		NC-MQN04E
MANUAL	2	1	WOOD FREE PAPER 64 g/m ²	
CLAM SHELL	3	1	PET 0.5 t	
PAPER CARD	4	1	COAT BOARD 350 g/m ²	



MODEL: NC-MQN04E20-S
NAME: FINISHED DRAWING (PACKAGE FINISHED)

NC-MQN04E20-S PACKAGE DRAWING

