

Please read this notice before using the ELNA products.

## REMINDERS

### ■ Product Information in this Catalog

Product information in this catalog is as of December 2021. All of the contents specified herein and production status of the products listed in this catalog are subject to change without notice due to technical improvement of our products, etc. Therefore, please check for the latest information carefully before practical application or use of our products.

Please note that ELNA shall not be in any way responsible for any damages and defects in products or equipment incorporating our products, which are caused under the conditions other than those specified in this catalog or individual product specification sheets.

### ■ Approval of Product Specifications

Please contact ELNA for further details of product specifications as the individual product specification sheets are available. When using our products, please be sure to approve our product specifications or make a written agreement on the product specification with ELNA in advance.

### ■ Pre-Evaluation in the Actual Equipment and Conditions

Please conduct validation and verification of our products in actual conditions of mounting and operating environment before using our products.

### ■ Limited Application

#### 1. Equipment Intended for Use

The products listed in this catalog are intended for general-purpose and standard use in general electronic equipment (e.g., AV equipment, OA equipment, home electric appliances, office equipment, information and communication equipment including, without limitation, mobile phone, and PC) and other equipment specified in this catalog or the individual product specification sheets.

ELNA has the line-up of the products intended for use in automotive electronic equipment, telecommunications infrastructure and industrial equipment, or medical devices classified as GHTF Classes A to C (Japan Classes I to III). Therefore, when using our products for these equipment, please check available applications specified in this catalog or the individual product specification sheets and use the corresponding products.

#### 2. Equipment Requiring Inquiry

Please be sure to contact ELNA for further information before using the products listed in this catalog for the following equipment (excluding intended equipment as specified in this catalog or the individual product specification sheets) which may cause loss of human life, bodily injury, serious property damage and/or serious public impact due to a failure or defect of the products and/or malfunction attributed thereto.

- (1) Transportation equipment (automotive powertrain control system, train control system, and ship control system, etc.)
- (2) Traffic signal equipment
- (3) Disaster prevention equipment, crime prevention equipment
- (4) Medical devices classified as GHTF Class C (Japan Class III)
- (5) Highly public information network equipment, data- processing equipment (telephone exchange, and base station, etc.)
- (6) Any other equipment requiring high levels of quality and/or reliability equal to the equipment listed above

#### 3. Equipment Prohibited for Use

Please do not incorporate our products into the following equipment requiring extremely high levels of safety and/or reliability.

- (1) Aerospace equipment (artificial satellite, rocket, etc.)
- (2) Aviation equipment \*
- (3) Medical devices classified as GHTF Class D (Japan Class IV), implantable medical devices \*\*

- (4) Power generation control equipment (nuclear power, hydroelectric power, thermal power plant control system, etc.)
- (5) Undersea equipment (submarine repeating equipment, underwater work equipment, etc.)
- (6) Military equipment
- (7) Any other equipment requiring extremely high levels of safety and/or reliability equal to the equipment listed above

\*Notes:

1. There is a possibility that our products can be used only for aviation equipment that does not directly affect the safe operation of aircraft (e.g., in-flight entertainment, cabin light, electric seat, cooking equipment) if such use meets requirements specified separately by ELNA. Please be sure to contact ELNA for further information before using our products for such aviation equipment.
2. Implantable medical devices contain not only internal unit which is implanted in a body, but also external unit which is connected to the internal unit.

#### 4. Limitation of Liability

Please note that unless you obtain prior written consent of ELNA, ELNA shall not be in any way responsible for any damages incurred by you or third parties arising from use of the products listed in this catalog for any equipment that is not intended for use by ELNA, or any equipment requiring inquiry to ELNA or prohibited for use by ELNA as described above.

### ■ Safety Design

When using our products for high safety and/or reliability-required equipment or circuits, please fully perform safety and/or reliability evaluation. In addition, please install (i) systems equipped with a protection circuit and a protection device and/or (ii) systems equipped with a redundant circuit or other system to prevent an unsafe status in the event of a single fault for a failsafe design to ensure safety.

### ■ Intellectual Property Rights

Information contained in this catalog is intended to convey examples of typical performances and/or applications of our products and is not intended to make any warranty with respect to the intellectual property rights or any other related rights of ELNA or any third parties nor grant any license under such rights.

### ■ Limited Warranty

Please note that the scope of warranty for our products is limited to the delivered our products themselves and ELNA shall not be in any way responsible for any damages resulting from a failure or defect in our products. Notwithstanding the foregoing, if there is a written agreement (e.g., supply and purchase agreement, quality assurance agreement) signed by ELNA and your company, ELNA will warrant our products in accordance with such agreement.

### ■ ELNA's Official Sales Channel

The contents of this catalog are applicable to our products which are purchased from our sales offices or authorized distributors (hereinafter "ELNA's official sales channel"). Please note that the contents of this catalog are not applicable to our products purchased from any seller other than ELNA's official sales channel.

### ■ Caution for Export

Some of our products listed in this catalog may require specific procedures for export according to "U.S. Export Administration Regulations", "Foreign Exchange and Foreign Trade Control Law" of Japan, and other applicable regulations. Should you have any questions on this matter, please contact our sales staff.

## ■ Product Code System

H, B, P

The Elna product code system is Max.20 digits.

Example) HV1 series 6.3V 220μF φ6.3x5.8L

New product code  
RSHV1221M1JDC8002EOld product code  
HV-6V221MF61E-R2

1 2 R S	3 4 5 H V 1	6 7 8 2 2 1	9 M	10 11 1 J	12 D	13 14 C 8	15 16 17 0 0 2	18 19 20 E
Product category code	Series code	Rated capacitance code	Capacitance tolerance code	Rated voltage code	Case size code		Packing code	Additional code

## 1 Product group

R : Energy devices  
(Electrolytic capacitor)

## 2 Category

S : For general  
 \* A : For automotive (powertrain, safety)  
 \* C : For automotive (body, info)  
 M : For medical  
 (international classification III)  
 L : For medical  
 (international classification I, II)

\* AEC-Q200 Qualified.

## 9 Capacitance tolerance code

Example

Tolerance (%)	Code
±10	K
±20	M
0 to +30	A
-10 to +30	Q
-10 to +50	T

## 12 Diameter code

SMD type

D (mm)	Code
5	C
6.3	D
8	E
10	F
12.5	G

## 13-14 Length code

SMD type

L (mm)	Code
5.7	C7
5.8	C8
7.7	E7
8.7	F7
10	H0
12.5	K5
13.5	L5

## 10-11 Rated voltage code

voltage (V)	Code
2.5	1P
4	1A
6.3	1J
10	1L
16	1E
25	1T
35	1G
50	1U
63	4E
80	1R
100	1H

## 3-5 Series code

old code	New code
HV	HV1
HT	HT1
HVK	HVK
HTK	HTK
HVX	HVX
HTX	HTX
HVQ	HVQ
HTQ	HTQ

## 6-8 Rated capacitance code

The code denoting nominal capacitance shall consist of three numerals.

The first and second numerals shall represent the significant figures of nominal capacitance in the unit of microfarad (μF), And the third numeral shall represent the number of zeros following the significant figures.

Example

Rated capacitance (μF)	Code
0.1	R10
1	010
2.2	2R2
33	330
100	101
2200	222
33000	333
470000	474

## 15-17 Packing code (SMD type: Reel taping)

Old code	New code	Case size φ D (mm)	Reel material
	Hybrid		
R	001	φ 10 or less	Paper
R2	002	φ 10 or less	Polystyrene
R5	005	φ 12.5 or more	Polystyrene

\* Please contact us for special packaging.

## 18-20 Additional code

Example

Code	Contents
T	Sn 100% plated

\* Please contact us for details.

### Conductive Polymer Hybrid Capacitors

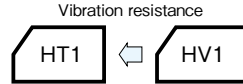
GREEN  
CAP

SMD

Low  
ESR

105°C  
10000hours

- Low ESR and high ripple current are realized.
- HT1 is resist to vibration. (30G guaranteed)
- Equivalent to conductive polymer type Aluminum Electrolytic Capacitor.  
(There are little characteristics change by temperature and frequency)
- Guaranteed 105°C, 10000 hours.



Marking color : Blue print

### Specifications

Item	Performance																																																					
Category temperature range (°C)	-55~+105																																																					
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)																																																					
Leakage current (μA) (max.)	6.3V to 80V : 0.01CV or 3 whichever is larger (after 2 minutes) : Rated capacitance (μF) ; V : Rated voltage (V) (20°C)																																																					
Tangent of loss angle (tanδ)	<table><tr><td>Rated voltage (V)</td><td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td><td>80</td></tr><tr><td>tanδ (max.)</td><td>0.20</td><td>0.18</td><td>0.16</td><td>0.14</td><td>0.12</td><td>0.10</td><td>0.08</td><td>0.08</td></tr></table> (20°C, 120Hz)									Rated voltage (V)	6.3	10	16	25	35	50	63	80	tanδ (max.)	0.20	0.18	0.16	0.14	0.12	0.10	0.08	0.08																											
Rated voltage (V)	6.3	10	16	25	35	50	63	80																																														
tanδ (max.)	0.20	0.18	0.16	0.14	0.12	0.10	0.08	0.08																																														
Characteristics at high and low temperature	<table><tr><td rowspan="2">Impedance ratio (max.)</td><td colspan="2">Z-25°C/Z+20°C</td><td colspan="2">1.5</td></tr><tr><td colspan="2">Z-55°C/Z+20°C</td><td colspan="2">2.0</td></tr></table> (100kHz)									Impedance ratio (max.)	Z-25°C/Z+20°C		1.5		Z-55°C/Z+20°C		2.0																																					
Impedance ratio (max.)	Z-25°C/Z+20°C		1.5																																																			
	Z-55°C/Z+20°C		2.0																																																			
Endurance (105°C) (Applied ripple current)	<table><tr><td>Test time</td><td colspan="8">10000 hours</td></tr><tr><td>Leakage current</td><td colspan="8">The initial specified value or less</td></tr><tr><td>Percentage of capacitance change</td><td colspan="8">Within ±30% of initial value</td></tr><tr><td>Tangent of the loss angle</td><td colspan="8">200% or less of the initial specified value</td></tr><tr><td>ESR change</td><td colspan="8">200% or less of the initial specified value</td></tr></table>									Test time	10000 hours								Leakage current	The initial specified value or less								Percentage of capacitance change	Within ±30% of initial value								Tangent of the loss angle	200% or less of the initial specified value								ESR change	200% or less of the initial specified value							
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Tangent of the loss angle	200% or less of the initial specified value																																																					
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Shelf life (105°C)	Test time : 1000hours ; other items are same as the endurance. Voltage application treatment : According to JIS C5101-4 4.1.																																																					

### Outline Drawing

Unit : mm

HV1 series									HT1 series								
( ) : Reference size									( ) : Reference size								
φD	L	A	B	C	M	W	P	Size code	φD	L	A	B	C	M	W	P	Size code
5	5.8±0.3	5.3	5.3	2.3	0.4±0.2	0.5 to 0.8	1.5	CC8	6.3	5.8±0.3	6.6	6.6	2.7	0.4±0.2	0.5 to 0.8	2.0	DC8
6.3	5.8±0.3	6.6	6.6	2.7	0.4±0.2	0.5 to 0.8	2.0	DC8	6.3	7.7±0.3	6.6	6.6	2.7	0.4±0.2	0.5 to 0.8	2.0	DE7
6.3	7.7±0.3	6.6	6.6	2.7	0.4±0.2	0.5 to 0.8	2.0	DE7	8	10±0.5	8.4	8.4	3.0	0.4±0.2	0.7 to 1.1	3.1	EH0
8	8.7±0.3	8.4	8.4	3.0	0.4±0.2	0.5 to 0.8	3.1	EF7	10	10±0.5	10.4	10.4	3.3	0.4±0.2	0.7 to 1.1	4.7	FF7
8	10±0.5	8.4	8.4	3.0	0.4±0.2	0.7 to 1.1	3.1	EH0	10	12.5±0.5	10.4	10.4	3.3	0.4±0.2	0.7 to 1.1	4.7	FH0
10	8.7±0.3	10.4	10.4	3.3	0.4±0.2	0.7 to 1.1	4.7	FF7	10	12.5±0.5	10.4	10.4	3.3	0.4±0.2	0.7 to 1.1	4.7	FK5
10	10±0.5	10.4	10.4	3.3	0.4±0.2	0.7 to 1.1	4.7	FH0	12.5	13.5±0.5	13.0	13.0	4.9	0.7±0.3	1.0 to 1.4	4.6	GL5
10	12.5±0.5	10.4	10.4	3.3	0.4±0.2	0.7 to 1.1	4.7	FK5									
12.5	13.5±0.5	13.0	13.0	4.9	0.7±0.3	1.0 to 1.4	4.6	GL5									

Refer to individual page (Soldering conditions, Land pattern size, The taping specifications).

### Coefficient of Frequency for Rated Ripple Current

Frequency (Hz)	120	1k	10k	100k or more
Rated voltage (V)	0.10	0.30	0.60	1
6.3 to 80				

### Product code system (\*For general product)

HV1 (example : 35V270μF)

RS*	HV1	271	M	1G	FH0		E
Category code	Series code	capacitance code	Cap tol. code	Voltage code	Size code	Taping and packing code	Additional code

HT1 (example : 35V270μF)

RS*	HT1	271	M	1G	FH0		E
Category code	Series code	capacitance code	Cap tol. code	Voltage code	Size code	Taping and packing code	Additional code

For details, refer to the various "Product Code System" pages.

NOTE : Design, Specifications are subject to change without notice.  
It is recommended that you shall obtain technical specifications from ELNA to ensure that the component is suitable for your use.

### HV1 series Standard Ratings

Rated voltage (V) Case φ D×L (mm)	Item	6.3 (1J)			10 (1L)			16 (1E)			25 (1T)		
		Rated capacitance (μF)	ESR (mΩ max.)	Rated ripple current (mA rms)	Rated capacitance (μF)	ESR (mΩ max.)	Rated ripple current (mA rms)	Rated capacitance (μF)	ESR (mΩ max.)	Rated ripple current (mA rms)	Rated capacitance (μF)	ESR (mΩ max.)	Rated ripple current (mA rms)
5×5.8		—	—	—	—	—	—	47	80	900	33	80	900
6.3×5.8		220	45	1600	100	45	1600	82	45	1600	56	50	1300
6.3×7.7		330	24	2300	220	24	2300	150	27	2200	100	30	2000
8×8.7		—	—	—	—	—	—	—	—	—	150	27	2100
8×10		560	22	2500	330	22	2500	270	22	2500	220	27	2300
10×8.7		—	—	—	—	—	—	—	—	—	270	25	2400
10×10		820	18	2600	470	18	2600	470	18	2600	330	20	2500
10×12.5		—	—	—	—	—	—	—	—	—	560	18	3500
12.5×13.5		—	—	—	—	—	—	—	—	—	820	15	4000

Rated voltage (V) Case φ D×L (mm)	Item	35 (1G)			50 (1U)			63 (4E)		
		Rated capacitance (μF)	ESR (mΩ max.)	Rated ripple current (mA rms)	Rated capacitance (μF)	ESR (mΩ max.)	Rated ripple current (mA rms)	Rated capacitance (μF)	ESR (mΩ max.)	Rated ripple current (mA rms)
5×5.8		22	100	900	10	120	750	—	—	—
6.3×5.8		47	60	1300	22	80	1100	10	120	1000
6.3×7.7		68	35	2000	33	40	1600	22	80	1500
8×8.7		100	30	2100	47	35	1700	27	50	1600
8×10		150	27	2300	68	30	1800	33	40	1600
10×8.7		220	25	2400	82	28	1900	47	35	1700
10×10		270	20	2500	100	28	2000	56	30	1800
10×12.5		390	18	3500	150	24	3000	100	26	2500
12.5×13.5		560	15	4000	330	20	3600	120	22	3000

Rated voltage (V) Case φ D×L (mm)	Item	80 (1R)		
		Rated capacitance (μF)	ESR (mΩ max.)	Rated ripple current (mA rms)
8×10		22	45	1550
10×10		33	36	1700

(Note) Rated ripple current : 105°C , 100kHz ; ESR : 20°C , 100kHz

### HT1 series Standard Ratings

Rated voltage (V) Case φ D×L (mm)	Item	6.3 (1J)			10 (1L)			16 (1E)			25 (1T)		
		Rated capacitance (μF)	ESR (mΩ max.)	Rated ripple current (mA rms)	Rated capacitance (μF)	ESR (mΩ max.)	Rated ripple current (mA rms)	Rated capacitance (μF)	ESR (mΩ max.)	Rated ripple current (mA rms)	Rated capacitance (μF)	ESR (mΩ max.)	Rated ripple current (mA rms)
6.3×5.8		220	45	1600	100	45	1600	82	45	1600	56	50	1300
6.3×7.7		330	24	2300	220	24	2300	150	27	2200	100	30	2000
8×10		560	22	2500	330	22	2500	270	22	2500	220	27	2300
10×10		820	18	2600	470	18	2600	470	18	2600	330	20	2500
10×12.5		—	—	—	—	—	—	—	—	—	560	18	3500
12.5×13.5		—	—	—	—	—	—	—	—	—	820	15	4000

Rated voltage (V) Case φ D×L (mm)	Item	35 (1G)			50 (1U)			63 (4E)		
		Rated capacitance (μF)	ESR (mΩ max.)	Rated ripple current (mA rms)	Rated capacitance (μF)	ESR (mΩ max.)	Rated ripple current (mA rms)	Rated capacitance (μF)	ESR (mΩ max.)	Rated ripple current (mA rms)
6.3×5.8		47	60	1300	22	80	1100	10	120	1000
6.3×7.7		68	35	2000	33	40	1600	22	80	1500
8×10		150	27	2300	68	30	1800	33	40	1600
10×10		270	20	2500	100	28	2000	56	30	1800
10×12.5		390	18	3500	150	24	3000	100	26	2500
12.5×13.5		560	15	4000	330	20	3600	120	22	3000

Rated voltage (V) Case φ D×L (mm)	Item	80 (1R)		
		Rated capacitance (μF)	ESR (mΩ max.)	Rated ripple current (mA rms)
8×10		22	45	1550
10×10		33	36	1700

(Note) Rated ripple current : 105°C , 100kHz ; ESR : 20°C , 100kHz

NOTE : Design, Specifications are subject to change without notice.  
It is recommended that you shall obtain technical specifications from ELNA to ensure that the component is suitable for your use.