Notice for ELNA products

Please read this notice before using the ELNA products.

🕂 REMINDERS

Product Information in this Catalog

Product information in this catalog is as of December 2020. 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 generalpurpose 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 *1
- (3) Medical devices classified as GHTF Class D (Japan Class IV), implantable medical devices *²

- (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:

- 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.
- 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.

V FINA

Product Code System

The Elna product code system is Max.20 digits.

Example) VVD series 10V 470 μ F ϕ 8x10L





1-2 Product classification code

- RS : For general
- RA : For automotive (powertrain, safety)
- RC : For automotive (entertainment, audio)
- RM : For medical
- (international classification III) RL : For medical

(international classification I, II)

3-5 Series code

old code	New code
RVR	VVR
RVC	VVC
RVZ	VVZ
RVD	VVD
RZD	VZD
RMD	VMD
RVT	VVT
RZJ	VZJ
RMJ	VMJ
RZF	VZF
RMF	VMF
RZE	VZE
RVX	VVX
RTX	VTX
RTZ	VTZ
RTD	VTD
RTT	VTT

For Audio								
RVO		VV0						
RVF		VVF						
RVM		VVM						
RVG		VVG						

* Change alphabet "O" into zero "0". Change alphabet "I" into nine "9".

New product code

: RSVVD471M1LEH0002U

Old product code RVD-10V471MG10U-R2



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 (μ F), And the third numeral shall represent the number of zeros following the significant figures. Example

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

12	Diamet	er code
	D(mm)	Code
	4	В
	5	С
	6.3	D
	8	Е
	10	F
	12.5	G
	16	J
	18	Κ

13-14	Length	code
	L(mm)	Code
	4.5	B5
	5.3	C3
	5.7	C7
	5.8	C8
	6.5	D5
	7.7	E7
	10	H0
	10.5	H5
	12.5	K5
	13.5	L5
	16.5	P5
	21.5	U5

9 Capacitance tolerance code

Example							
Tolerance(%) Code							
± 10	K						
±20	М						
0 to +30	А						
-10 to +30	Q						
—10 to +50	Т						

10-11 Rated voltage code

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

15-17 Packing code (Reel taping)

Old code	New code	Case size øD (mm)	Reel material				
R	001	$\phi 10$ or less	Paper				
R2	002	$\phi 10$ or less	Polystyrene				
R5 005 ϕ 12.5 or more Polystyrene							
* Please contact us for special packaging.							

18-20 Additional code

Example						
Code	Contents					
U	Sn-Bi plated					
Т	Sn 100% plated					

* Please contact us for details.

* 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.



ELNA



· Audio grade surface mount product with completely new components using synthetic mica paper for the separator.

- · Both quality sense and sound field that could not be realized
- by the surface mount products are reproducible.





Marking color : Black print (\$\phi4\$ to \$\phi10\$)

Specifications			-								
Item	Performance										
Category temperature range (°C)	-40 to +85										
Tolerance at rated capacitance (%)				±20				(20°C	,120Hz)		
Leakage current (µA) (max.)	0.01	CV or 3 whichever is larg	ger (after 2 minu	utes) C : Rated	capacitance (µ	F); V: Rated v	oltage (V)		(20°C)		
Tangent of loss angle	Rated vol	tage (V)	6.3	10	16	25	35	50			
(tanδ)	tanδ (r	nax.)	0.28	0.24	0.20	0.14	0.12	0.10			
((((((((((((((((((((((((((((((((((((((((20°C	,120Hz)		
	Rated vol	Rated voltage (V)		10	16	25	35	50	ר		
Characteristics at high		Z-25°C/Z+20°C	3	3	2	2	2	2			
and low temperature	Impedance ratio (max.)	Z-40°C/Z+20°C	8	5	4	3	3	3			
									(120Hz)		
	Test t	ime		2000) hours				7		
Endurance (85°C)	Leakage	current	The initial specified value or less								
(Applied ripple current)	Percentage of cap	acitance change	Within ±20% of initial value								
	Tangent of the	200% or less of the initial specified value									
Shelf life (85°C)	Test time : 1000hours ; other items are same as the endurance. Voltage application treatment : According to JIS C5101-4 4.1										
Applicable standards		JI	IS C5101 - 1,	- 18 (IEC 6038	4 - 1, - 18 <u>)</u>						

Outline Drawing



Refer to individual page.

(Soldering conditions, Land pattern size, The taping specifications)

Standard Ratings

Rated voltage (V)	6	.3	1	0	1	6	2	25	3	5	5	60
Bated Item	Case	Rated ripple current	Case	Rated ripple current	Case	Rated ripple current	Case	Rated ripple current	Case	Rated ripple current	Case	Rated ripple current
capacitance (µF)	φD×L (mm)	(mArms)	φD×L (mm)	(mArms)	ϕ D×L (mm)	(mArms)	ϕ D×L (mm)	(mArms)	ϕ D×L (mm)	(mArms)	φD×L (mm)	(mArms)
0.33	—	—	—	—	—	—	—	-	_	_	4×5.3	6
0.47	_	_	_	—	_	—	_	-		_	4×5.3	7
1	_	_	_	—	_	—	_	—	_	—	4×5.3	10
2.2	—	—	_	—	—	—	_	—		—	4×5.3	15
3.3	_	_	_	—	_	—	_	-	4×5.3	17	4×5.3	19
4.7	_	_	_	—	4×5.3	18	4×5.3	19	4×5.3	20	5×5.3	26
10	—	—	4×5.3	23	4×5.3	26	5×5.3	32	5×5.3	34	6.3×5.3	44
22	4×5.3	31	5×5.3	40	5×5.3	44	6.3×5.3	55	6.3×5.3	59	8×6.5	124
33	5×5.3	44	5×5.3	49	6.3×5.3	63	6.3×5.3	67	8×6.5	124	8×6.5	124
47	5×5.3	53	6.3×5.3	68	6.3×5.3	76	8×6.5	124	8×6.5	124	8×10	200
100	6.3×5.3	90	6.3×5.3	99	8×6.5	124	8×6.5	137	8×10	200	10×10	366
220	8×6.5	149	8×6.5	149	8×10	200	8×10	235	10×10	366	—	-
330	8×6.5	160	8×10	226	8×10	245	10×10	366		—	—	—
470	8×10	251	10×10	366	10×10	366	_	-		—	—	—
1000	10×10	423	_	—	_	_	_	_		_	_	_

(Note) Rated ripple current : 85°C, 120Hz.

Coefficient of Frequency for Rated Ripple Current

Frequency (Hz) Rated voltage (V)	50	120	1k	10k•100k
6.3 to 16	0.80	1	1.15	1.25
25 to 35	0.80	1	1.25	1.40
50	0.80	1	1.35	1.50