



Aluminum Capacitors SMD (Chip), High Temperature

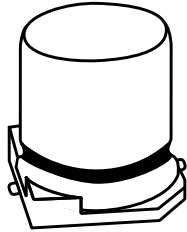
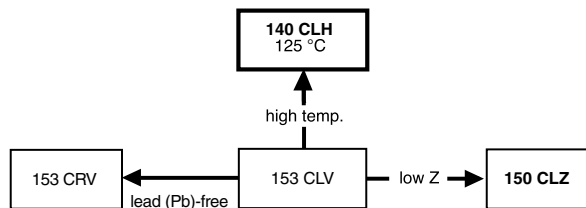


Fig.1 Component outline



FEATURES

- Polarized aluminum electrolytic capacitors, non-solid electrolyte, self healing
- SMD-version with base plate, reflow solderable
- High temperature, 1500 hours at 125 °C
- High capacitance values
- Charge and discharge proof, no peak current limitation
- Lead (Pb)-free
- ATTENTION: for maximum safe soldering conditions refer to Fig.4

APPLICATIONS

- SMD technology, for high mounting density
- Industrial and professional applications
- Automotive, general industrial
- Smoothing, filtering, buffering

MARKING

- Rated capacitance (in μF)
- Rated voltage (in V)
- Date code, in accordance with IEC 60062
- Black mark or '-' sign indicating the cathode (the anode is identified by bevelled edges)
- Code indicating group number (H)

PACKAGING

- Supplied in blister tape on reel

QUICK REFERENCE DATA	
DESCRIPTION	VALUE
Nominal case sizes (L x W x H in mm)	8 x 8 x 10 to 10 x 10 x 14
Rated capacitance range, C_R	10 μF to 680 μF
Tolerance on C_R	$\pm 20\%$
Rated voltage range, U_R	6.3 V to 63 V
Category temperature range	- 55 °C to + 125 °C
Endurance test at 125 °C	1000 hours
Useful life at 125 °C	1500 hours
Useful life at 40 °C; 1.8 x I_R applied	150 000 hours
Shelf life at 0 V, 125 °C	1000 hours
Based on sectional specification	IEC 60384-18/CECC 32300
Climatic category IEC 60068	55/125/56

SELECTION CHART FOR C_R , U_R AND RELEVANT NOMINAL CASE SIZES (L x W x H in mm)							
C_R (μF)	U_R (V)						
	6.3	10	16	25	35	50	63
10	-	-	-	-	-	-	8 x 8 x 10
22	-	-	-	-	-	-	8 x 8 x 10
33	-	-	-	-	-	-	8 x 8 x 10
47	-	-	-	-	-	8 x 8 x 10	10 x 10 x 10
68	-	-	-	-	8 x 8 x 10	10 x 10 x 10	10 x 10 x 14
100	-	-	-	8 x 8 x 10	10 x 10 x 10	10 x 10 x 14	-
150	-	-	8 x 8 x 10	-	10 x 10 x 14	-	-
220	-	8 x 8 x 10	-	10 x 10 x 10	-	-	-
330	8 x 8 x 10	10 x 10 x 10	10 x 10 x 14	-	-	-	-
470	10 x 10 x 10	10 x 10 x 14	-	-	-	-	-
680	10 x 10 x 14	-	-	-	-	-	-

140 CLH

Vishay BCcomponents

Aluminum Capacitors
SMD (Chip), High Temperature



Table 1

DIMENSIONS in millimeters AND MASS									
NOMINAL CASE SIZE L x W x H	CASE CODE	L _{max.}	W _{max.}	H _{max.}	Ø D	B _{max.}	S	L _{1 max.}	MASS (g)
8 x 8 x 10	0810	8.5	8.5	10.5	8.0	1.0	3.1	9.9	≈ 1.0
10 x 10 x 10	1010	10.5	10.5	10.5	10.0	1.0	4.5	11.8	≈ 1.3
10 x 10 x 14	1014	10.5	10.5	14.3	10.0	1.0	4.5	11.8	≈ 1.5

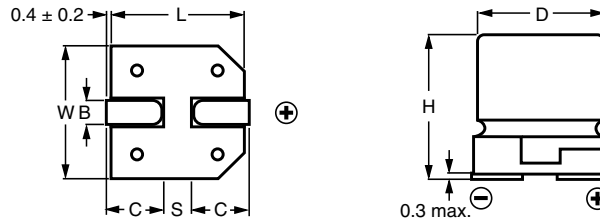


Fig.2 Dimensional outline

Table 2

TAPE AND REEL DIMENSIONS in millimeters, PACKAGING QUANTITIES						
NOMINAL CASE SIZE L x W x H	CASE CODE	PITCH P ₁	TAPE WIDTH W	TAPE THICKNESS T ₂	REEL DIA.	PACKAGING QUANTITY PER REEL
8 x 8 x 10	0810	16	24	11.3	380	500
10 x 10 x 10	1010	16	24	11.3	380	500
10 x 10 x 14	1014	16	24	14.8	330	250

Note

1. Detailed tape dimensions see section "PACKAGING".

MOUNTING

The capacitors are designed for automatic placement on to printed-circuit boards.

Optimum dimensions of soldering pads depend amongst others on soldering method, mounting accuracy, print lay-out and/or adjacent components.

For recommended soldering pad dimensions, refer to Fig.3 and Table 3.

SOLDERING

Soldering conditions are defined by the curve, temperature versus time, where the temperature is that measured on the soldering pad during processing.

For maximum conditions refer to Fig.4.

Any temperature versus time curve which does not exceed the specified maximum curves may be applied.

Table 3

RECOMMENDED SOLDERING PAD DIMENSIONS in millimeters			
CASE CODE	a	b	c
0810	3.5	2.5	3.0
1010	4.3	2.5	4.0
1014	4.3	2.5	4.0

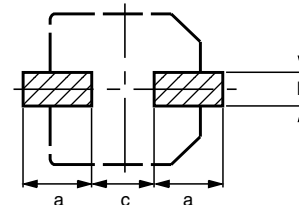


Fig. 3 Recommended solder pad dimensions

AS A GENERAL PRINCIPLE, TEMPERATURE AND DURATION SHALL BE THE **MINIMUM** NECESSARY REQUIRED TO ENSURE GOOD SOLDERING CONNECTIONS. HOWEVER, THE SPECIFIED MAXIMUM CURVES SHOULD NEVER BE EXCEEDED.

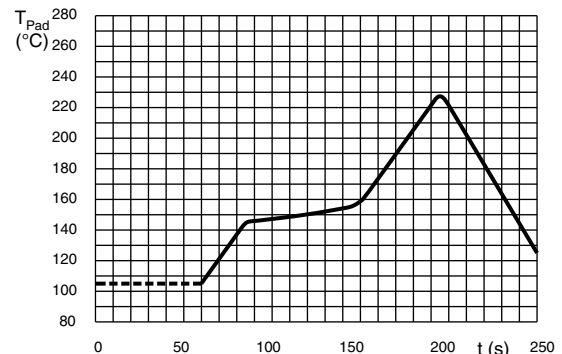


Fig. 4 Maximum temperature load during infrared reflow soldering measured on the soldering pad



Aluminum Capacitors
SMD (Chip), High Temperature

Vishay BCcomponents

ELECTRICAL DATA	
SYMBOL	DESCRIPTION
C_R	rated capacitance at 100 Hz, tolerance $\pm 20\%$
I_R	rated RMS ripple current at 100 kHz, 125 °C
I_{L2}	max. leakage current after 2 minutes at U_R
$\tan \delta$	max. dissipation factor at 100 Hz
Z	max. impedance at 100 kHz

Note

Unless otherwise specified, all electrical values in Table 4 apply at $T_{amb} = 20\text{ °C}$, $P = 86\text{ kPa}$ to 106 kPa , $RH = 45\%$ to 75% .

ORDERING EXAMPLE

Electrolytic capacitor 140 CLH series

100 $\mu\text{F}/50\text{ V}$; $\pm 20\%$

Nominal case size:

10 mm x 10 mm x 14 mm; taped on reel

Ordering code: MAL214095102E3

Former 12NC: 2222 140 95102

Table 4

ELECTRICAL DATA AND ORDERING INFORMATION							
U_R (V)	C_R (μF)	NOMINAL CASE SIZE L x W x H (mm)	I_R 100 kHz 125 °C (mA)	I_{L2} 2 min (μA)	$\tan \delta$	Z 100 kHz + 20 °C (Ω)	ORDERING CODE MAL2140.....
6.3	330	8 x 8 x 10	180	21	0.30	0.65	95303E3
	470	10 x 10 x 10	300	30	0.30	0.17	95301E3
	680	10 x 10 x 14	430	43	0.30	0.12	95302E3
10	220	8 x 8 x 10	180	22	0.26	0.65	95403E3
	330	10 x 10 x 10	300	33	0.26	0.17	95401E3
	470	10 x 10 x 14	430	47	0.26	0.12	95402E3
16	150	8 x 8 x 10	180	24	0.22	0.65	95502E3
	330	10 x 10 x 14	430	53	0.22	0.12	95501E3
25	100	8 x 8 x 10	180	25	0.18	0.65	95602E3
	220	10 x 10 x 10	300	55	0.18	0.19	95601E3
35	68	8 x 8 x 10	180	24	0.14	0.65	95003E3
	100	10 x 10 x 10	255	35	0.14	0.40	95001E3
	150	10 x 10 x 14	317	53	0.14	0.30	95002E3
50	47	8 x 8 x 10	145	24	0.12	1.00	95103E3
	68	10 x 10 x 10	205	34	0.12	0.56	95101E3
	100	10 x 10 x 14	255	50	0.12	0.42	95102E3
63	10	8 x 8 x 10	145	6.3	0.12	1.00	95805E3
	22	8 x 8 x 10	145	14	0.12	1.00	95803E3
	33	8 x 8 x 10	145	21	0.12	1.00	95804E3
	47	10 x 10 x 10	205	30	0.12	0.56	95801E3
	68	10 x 10 x 14	255	43	0.12	0.42	95802E3

ADDITIONAL ELECTRICAL DATA		
PARAMETER	CONDITIONS	VALUE
Voltage		
Surge voltage for short periods	IEC 60384-18, subclause 4.14	$U_s \leq 1.15 \times U_R$
Reverse voltage for short periods	IEC 60384-18, subclause 4.16	$U_{rev} \leq 0.5\text{ V}$
Current		
Leakage current	after 2 minutes at U_R	$I_{L2} \leq 0.01 \times C_R \times U_R$
Inductance		
Equivalent series inductance (ESL)		typ. 16 nH
Resistance		
Equivalent series resistance (ESR) at 100 Hz	calculated from $\tan \delta_{max.}$ and C_R (see Table 4)	$ESR = \tan \delta / 2 \pi f C_R$

140 CLH

Vishay BCcomponents

Aluminum Capacitors
SMD (Chip), High Temperature



CAPACITANCE (C)

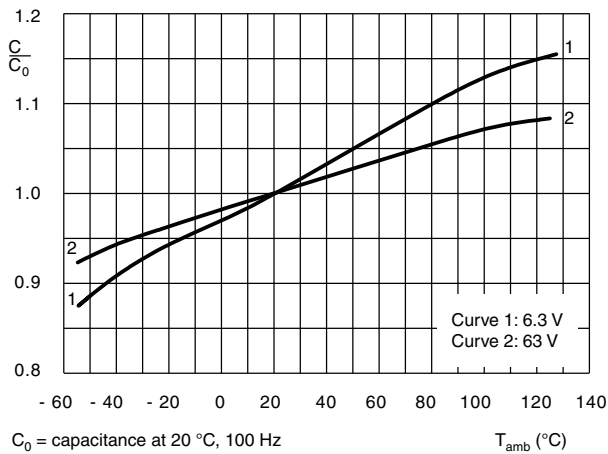


Fig.5 Typical multiplier of capacitance as a function of frequency of ambient temperature

DISSIPATION FACTOR ($\tan \delta$)

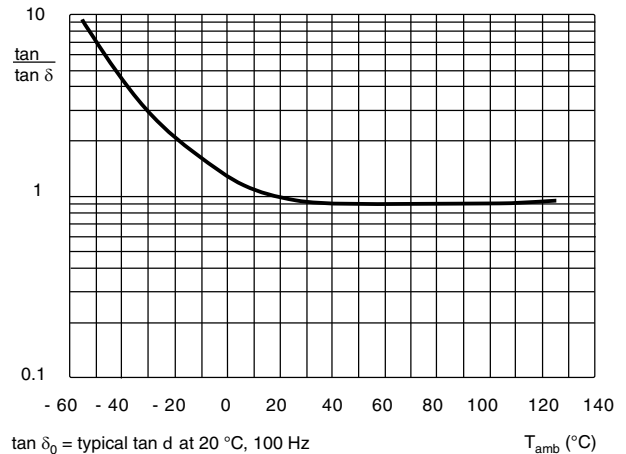


Fig.6 Typical multiplier of dissipation factor ($\tan \delta$) as a function of ambient temperature

EQUIVALENT SERIES RESISTANCE (ESR)

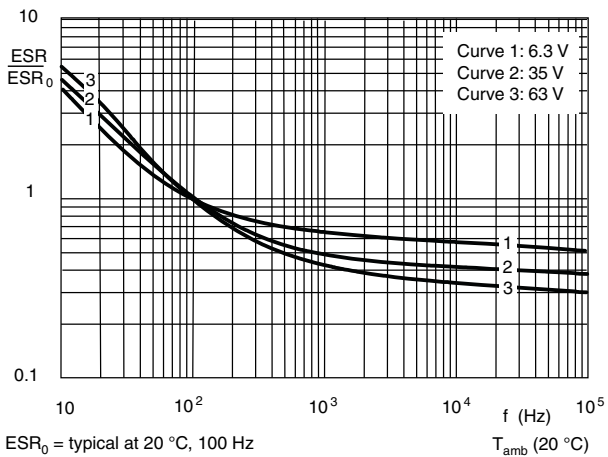


Fig.7 Typical multiplier of ESR as a function of frequency

IMPEDANCE (Z)

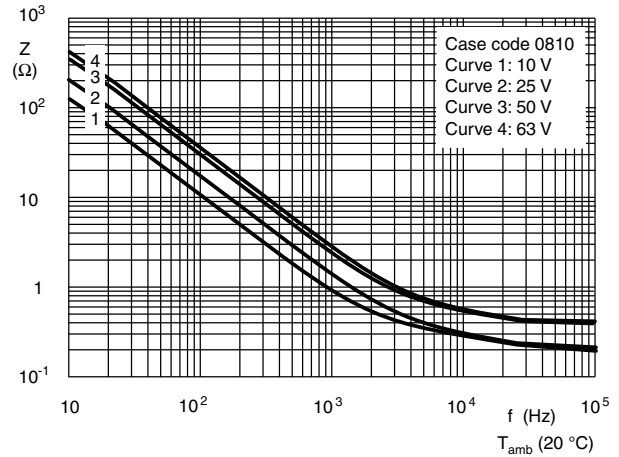


Fig.8 Typical multiplier of ESR as a function of frequency

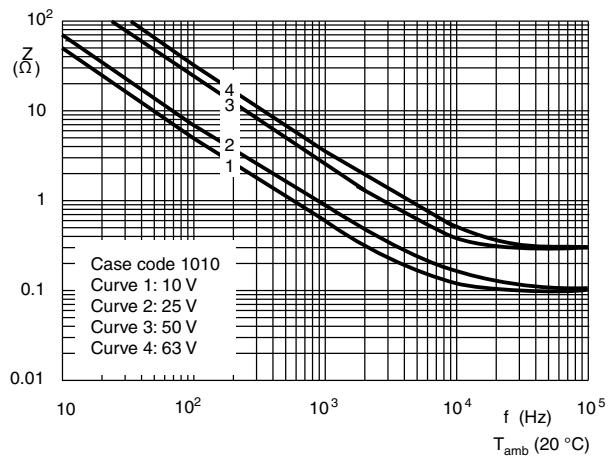


Fig.9 Typical impedance as a function of frequency

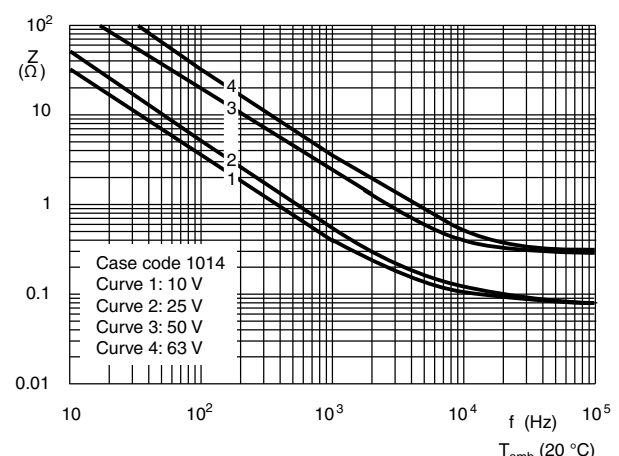


Fig.10 Typical impedance as a function of frequency



RIPPLE CURRENT AND USEFUL LIFE

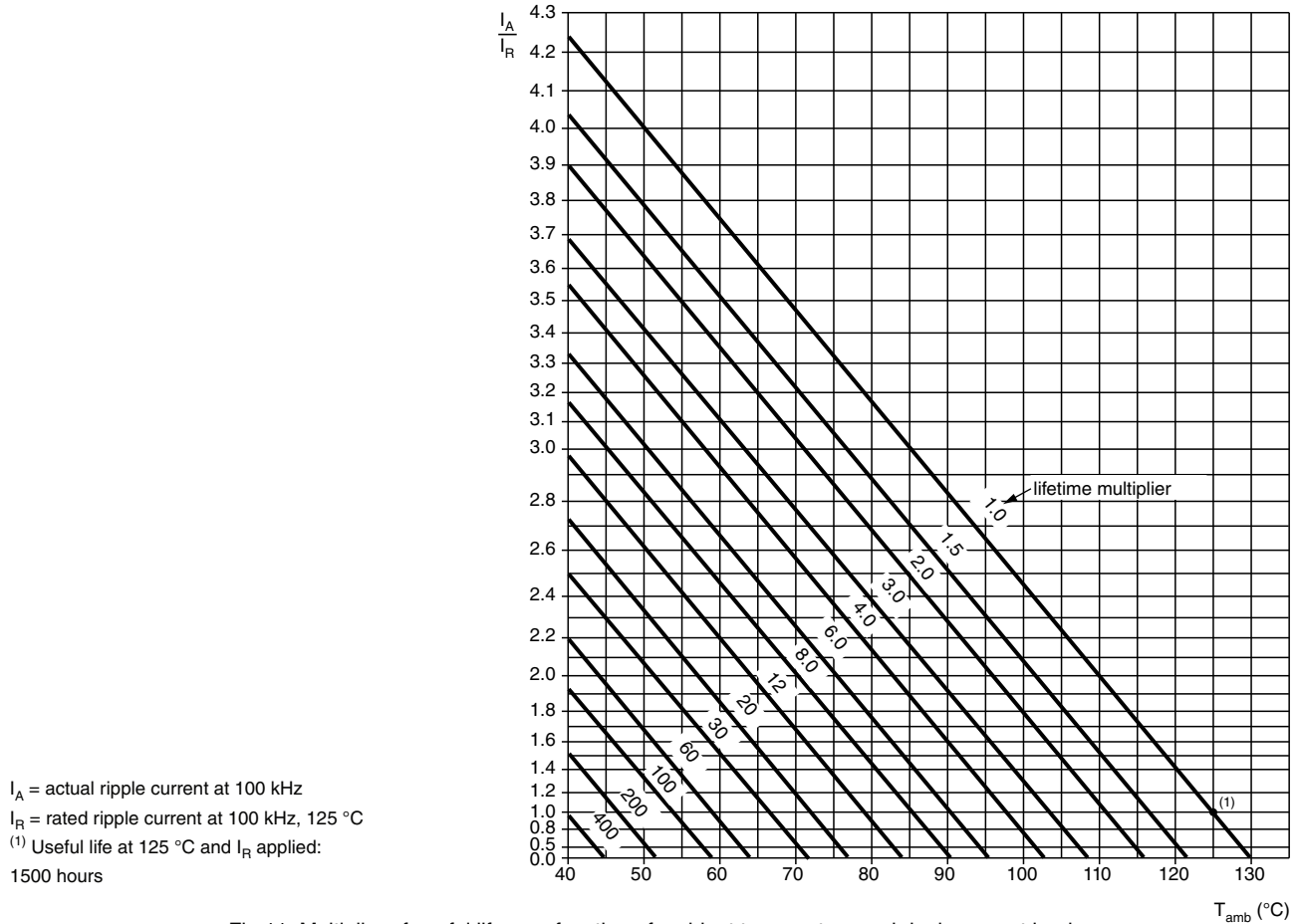


Fig.11 Multiplier of useful life as a function of ambient temperature and ripple current load

Table 5

MULTIPLIER OF RIPPLE CURRENT (I_R) AS A FUNCTION OF FREQUENCY			
FREQUENCY (Hz)	I_R MULTIPLIER		
	$U_R = 6.3 \text{ V to } 25 \text{ V}$	$U_R = 35 \text{ V and } 50 \text{ V}$	$U_R = 63 \text{ V}$
50	0.60	0.45	0.40
100	0.70	0.60	0.55
300	0.80	0.75	0.70
1000	0.85	0.85	0.85
3000	0.90	0.90	0.90
10 000	0.95	0.95	0.95
30 000	0.97	0.97	0.97
100 000	1.00	1.00	1.00



Table 6

TEST PROCEDURES AND REQUIREMENTS			
TEST		PROCEDURE (quick reference)	REQUIREMENTS
NAME OF TEST	REFERENCE		
Mounting	IEC 60384-18, subclause 4.3	shall be performed prior to tests mentioned below; reflow soldering; for maximum temperature load refer to chapter "Mounting"	$\Delta C/C: \pm 5 \%$ $\tan \delta \leq \text{spec. limit}$ $I_{L2} \leq \text{spec. limit}$
Endurance	IEC 60384-18/ CECC 32 300, subclause 4.15	$T_{\text{amb}} = 125 \text{ }^\circ\text{C}$; U_R applied; 1000 hours	$U_R = 6.3 \text{ V}$; $\Delta C/C: \pm 25 \%$ $U_R \geq 10 \text{ V}$; $\Delta C/C: \pm 20 \%$ $\tan \delta \leq 2 \times \text{spec. limit}$ $I_{L2} \leq \text{spec. limit}$
Useful life	CECC 30301, subclause 1.8.1	$T_{\text{amb}} = 125 \text{ }^\circ\text{C}$; U_R and I_R applied; 1500 hours	$\Delta C/C: \pm 50 \%$ $\tan \delta \leq 3 \times \text{spec. limit}$ $I_{L2} \leq \text{spec. limit}$ no short or open circuit total failure percentage: $\leq 1 \%$
Shelf life (storage at high temperature)	IEC 60384-18/ CECC 32 300, subclause 4.17	$T_{\text{amb}} = 125 \text{ }^\circ\text{C}$; no voltage applied; 1000 hours after test: U_R to be applied for 30 minutes, 24 hours to 48 hours before measurement	for requirements see 'Endurance test' above
Reverse voltage	IEC 60384-18/ CECC 32 300, subclause 4.16	$T_{\text{amb}} = 125 \text{ }^\circ\text{C}$: 125 hours at $U = -0.5 \text{ V}$, followed by 125 hours at U_R	$\Delta C/C: \pm 15 \%$ $\tan \delta \leq 1.5 \times \text{spec. limit}$ $I_{L2} \leq \text{spec. limit}$



Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.

Material Category Policy

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.

Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.

Компания «Life Electronics» занимается поставками электронных компонентов импортного и отечественного производства от производителей и со складов крупных дистрибьюторов Европы, Америки и Азии.

С конца 2013 года компания активно расширяет линейку поставок компонентов по направлению коаксиальный кабель, кварцевые генераторы и конденсаторы (керамические, пленочные, электролитические), за счёт заключения дистрибьюторских договоров

Мы предлагаем:

- Конкуренспособные цены и скидки постоянным клиентам.
- Специальные условия для постоянных клиентов.
- Подбор аналогов.
- Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.
- Приемлемые сроки поставки, возможна ускоренная поставка.
- Доставку товара в любую точку России и стран СНГ.
- Комплексную поставку.
- Работу по проектам и поставку образцов.
- Формирование склада под заказчика.
- Сертификаты соответствия на поставляемую продукцию (по желанию клиента).
- Тестирование поставляемой продукции.
- Поставку компонентов, требующих военную и космическую приемку.
- Входной контроль качества.
- Наличие сертификата ISO.

В составе нашей компании организован Конструкторский отдел, призванный помогать разработчикам, и инженерам.

Конструкторский отдел помогает осуществить:

- Регистрацию проекта у производителя компонентов.
- Техническую поддержку проекта.
- Защиту от снятия компонента с производства.
- Оценку стоимости проекта по компонентам.
- Изготовление тестовой платы монтаж и пусконаладочные работы.



Тел: +7 (812) 336 43 04 (многоканальный)

Email: org@lifeelectronics.ru