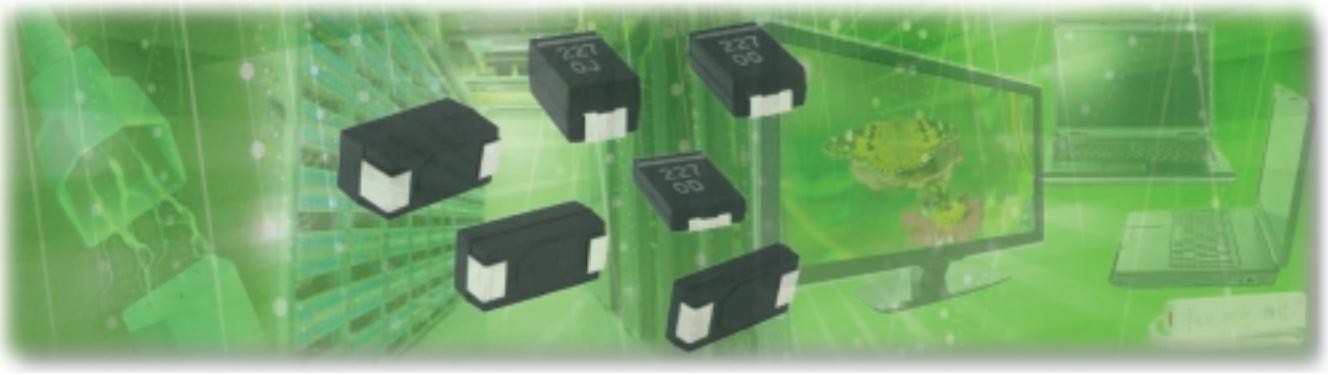
POLYMER
Aluminum Electrolytic Capacitors

Innovator in Electronics

Murata Manufacturing Co., Ltd.

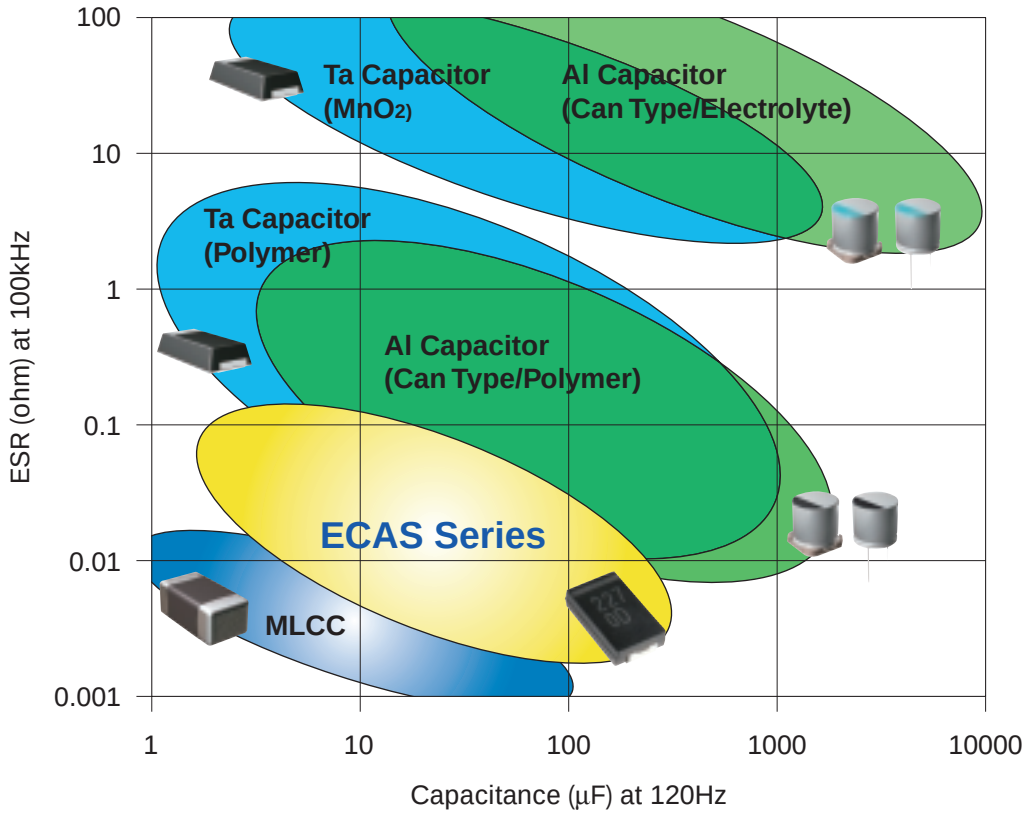


Murata Manufacturing Co., Ltd:s ECAS series of polymer aluminum electrolytic capacitors are ideal for low ESR, high capacitance applications in a variety of commercial and industrial markets. Utilizing innovative design and manufacturing processes, the ECAS series provides a high level of performance allowing circuit designers to achieve excellent noise suppression, ripple absorption, and output smoothing in power management applications.

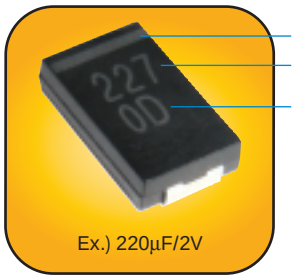
Features

- Resin molded case structure utilizes multilayer aluminum foil for anode and solid conductive polymer for cathode
- High capacitance and Low ESR
- Excellent low impedance characteristics for noise suppression and decoupling.
- Stable capacitance with applied voltage/temperature/high frequencies.
- No voltage derating required
- Polarity bar (positive) noted on product
- Surface mount construction
- RoHS compliant
- Halogen free epoxy
- MSL 3 packaging

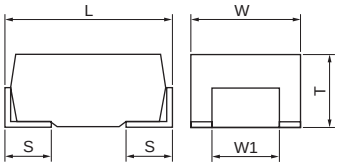
Capacitor Map (Cap & ESR)



Appearance



External Dimensions



(in mm)

Case Size	EIA Metric	L	W	T	W1	S
D4	7343	7.3±0.3	4.3±0.2	1.9±0.1	2.4±0.2	1.3±0.2
D6	7343	7.3±0.3	4.3±0.2	2.8±0.3	2.4±0.2	1.3±0.2
D9	7343	7.3±0.3	4.3±0.3	4.2±0.3	2.4±0.2	1.3±0.2

Specifications

- Capacitance Range: 6.8 to 470µF
- Rated Voltage: 2 to 16Vdc
- ESR: 6 to 70mΩ
- Operating Temperature: -40 to 105°C

Part Numbering

(Part Number)

ECAS	D4	0D	227	M	009	K	00
❶	❷	❸	❹	❺	❻	❼	❽

❶Series

Product ID	
ECAS	Polymer Al Electrolytic Capacitor

❷Dimension (LxWxT) (mm)

Code	L	W	T
D4	7.3±0.3	4.3±0.2	1.9±0.1
D6	7.3±0.3	4.3±0.2	2.8±0.3
D9	7.3±0.3	4.3±0.3	4.2±0.3

❸Rated Voltage

Code	Rated Voltage
0D	DC 2V
0E	DC 2.5V
0G	DC 4V
0J	DC 6.3V
0K	DC 8V
1A	DC 10V
1B	DC 12.5V
1C	DC 16V

❹Capacitance

Expressed by three-digit numeric code.
The unit is pico-farad (pF).
The first and second figures are significant digits, and the third figure expresses the number of zeros which follow the two numbers.

Ex.)

Code	Capacitance
476	47µF
107	100µF
227	220µF
477	470µF

❺Capacitance Tolerance

Code	Capacitance Tolerance
M	±20%

❻ESR

Expressed by three-digit alphanumerics.
The unit is milli-ohm (mΩ).
If there is a decimal point, it is expressed by the capital letter "R".

Ex.)

Code	ESR
4R5	4.5mΩ
009	9mΩ
010	10mΩ

❼Packaging

Code	Packaging
K	ø330mm Embossed Taping

❽Individual Specification Code

Expressed by two figures.

Product Lineup

Capacitance Value (µF)

Voltage (VDC)	6.8	8.2	10	15	22	33	47	56	68	82	100	150	180	220	270	330	470
2			POLYMER & MLCC SOLUTIONS								D4 16	D4 9		D4 9		D4 6 / D6 7	D6 6
4									D4 20	D4 16		D4 16	D6 12	D6 10		D9 8	
6.3			D4 55		D4 45	D4 25	D4 25		D4 15		D4 15	D6 10		D9 10			
10			D4 55		D4 28	D4 25			D6 15		D9 10	D9 10					
12.5			D4 55	D4 45	D4 30	D6 25	D6 20	D9 20			D9 12			POLYMER SOLUTIONS			
16	D4 70		D4 60	D4 40	D6 30												

D4 — Case Size
6 — ESR (mΩ)

Mass Production

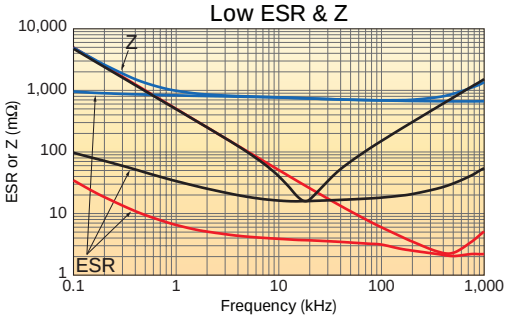
POLYMER & MLCC SOLUTIONS

POLYMER SOLUTIONS

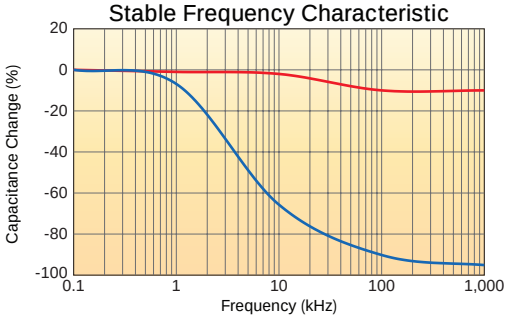
Characteristics

Comparison of impedance frequency and capacitance characteristics of 330µF/2V

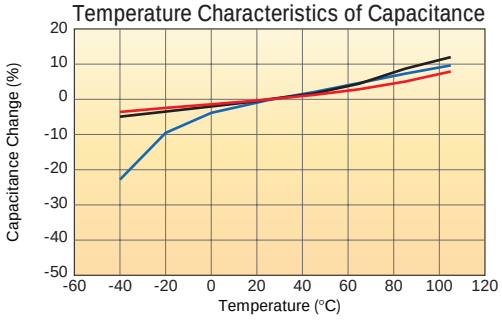
Low ESR & Z



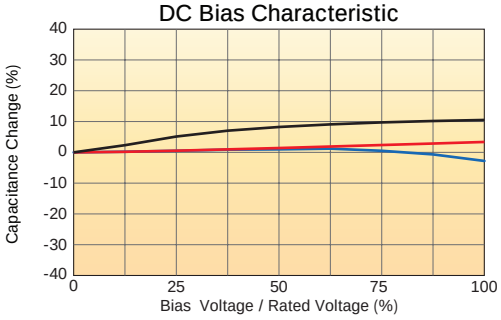
Stable Frequency Characteristic



Temperature Characteristics of Capacitance



DC Bias Characteristic



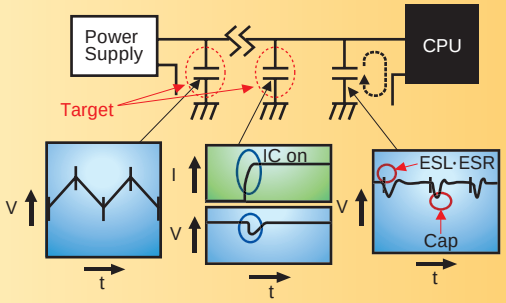
ECAS Series
(Resin-Molded Chip Type / Polymer)

Al Capacitor
(Can Type/Polymer)

Al Capacitor
(Can Type/Electrolyte)

Applications

Market	Application	Circuit Application
Computer 	Notebook/Netbook Server Multi Function Printer	Overall Power Management: ■ Noise Supression ■ Ripple Absorption ■ Decoupling Power supply line around CPU, IC, etc.
Digital AV 	Digital TV (LCD/Plasma) Audio/Video Game Console Set Top Box	
Telecom 	Router Base Station	



■ Eliminates Ripple
■ Smoothes Voltage Source

■ Stabilizes Voltage Source

■ Eliminates High Frequency Noise from IC

Part Number Listing

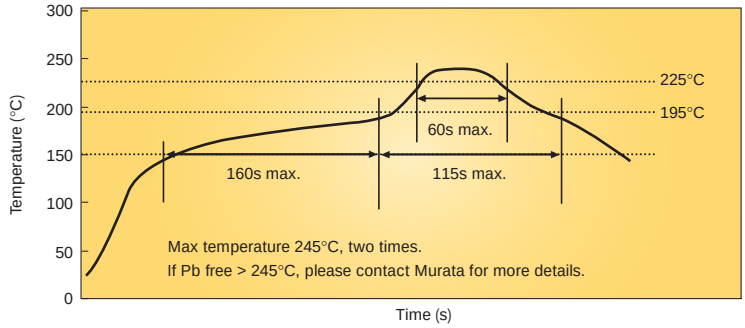
Part Number (Murata)	Rated Voltage	Cap.	Cap. Tolerance	Case Size			ESR Max.	Leakage Current	Ripple Current	Min. Packaging Quantity (pcs)
	(VDC)	(μF) 120Hz /25°C	%	Code	L x W (mm)	T (mm)	(mΩ) 100kHz / +25°C	(CV)	(Arms) 100kHz / +20 to 105°C	
ECASD40D107M016K00	2	100	±20	D4	7343	1.9	16	0.04	2.0	3,000
ECASD40D157M009K00	2	150	±20	D4	7343	1.9	9	0.04	3.0	3,000
ECASD40D227M009K00	2	220	±20	D4	7343	1.9	9	0.04	3.0	3,000
ECASD40D337M006K00	2	330	±20	D4	7343	1.9	6	0.04	3.5	3,000
ECASD60D337M007K00	2	330	±20	D6	7343	2.8	7	0.04	3.5	2,500
ECASD60D477M006K00	2	470	±20	D6	7343	2.8	6	0.04	3.5	2,500
ECASD40G686M020K00	4	68	±20	D4	7343	1.9	20	0.04	1.9	3,000
ECASD40G826M016K00	4	82	±20	D4	7343	1.9	16	0.04	2.1	3,000
ECASD40G157M016K00	4	150	±20	D4	7343	1.9	16	0.04	2.1	3,000
ECASD60G187M012K00	4	180	±20	D6	7343	2.8	12	0.04	2.5	2,500
ECASD60G227M010K00	4	220	±20	D6	7343	2.8	10	0.04	3.0	2,500
ECASD90G337M008K00	4	330	±20	D9	7343	4.2	8	0.04	3.3	2,000
ECASD40J106M055K00	6.3	10	±20	D4	7343	1.9	55	0.04	1.0	3,000
ECASD40J226M045K00	6.3	22	±20	D4	7343	1.9	45	0.04	1.0	3,000
ECASD40J336M025K00	6.3	33	±20	D4	7343	1.9	25	0.04	1.8	3,000
ECASD40J476M025K00	6.3	47	±20	D4	7343	1.9	25	0.04	1.8	3,000
ECASD40J686M015K00	6.3	68	±20	D4	7343	1.9	15	0.04	2.0	3,000
ECASD40J107M015K00	6.3	100	±20	D4	7343	1.9	15	0.04	2.0	3,000
ECASD60J157M010K00	6.3	150	±20	D6	7343	2.8	10	0.04	3.0	2,500
ECASD90J227M010K00	6.3	220	±20	D9	7343	4.2	10	0.04	3.0	2,000
ECASD41A106M055K00	10	10	±20	D4	7343	1.9	55	0.04	1.0	3,000
ECASD41A226M028K00	10	22	±20	D4	7343	1.9	28	0.04	1.6	3,000
ECASD41A336M025K00	10	33	±20	D4	7343	1.9	25	0.04	1.8	3,000
ECASD61A686M015K00	10	68	±20	D6	7343	2.8	15	0.04	2.0	2,500
ECASD91A107M010K00	10	100	±20	D9	7343	4.2	10	0.04	3.0	2,000
ECASD91A157M010K00	10	150	±20	D9	7343	4.2	10	0.04	3.0	2,000
ECASD41B106M055K00	12.5	10	±20	D4	7343	1.9	55	0.1	1.0	3,000
ECASD41B156M045K00	12.5	15	±20	D4	7343	1.9	45	0.1	1.0	3,000
ECASD41B226M030K00	12.5	22	±20	D4	7343	1.9	30	0.1	1.6	3,000
ECASD61B336M025K00	12.5	33	±20	D6	7343	2.8	25	0.1	1.8	2,500
ECASD61B476M020K00	12.5	47	±20	D6	7343	2.8	20	0.1	2.0	2,500
ECASD91B566M020K00	12.5	56	±20	D9	7343	4.2	20	0.1	2.0	2,000
ECASD91B107M012K00	12.5	100	±20	D9	7343	4.2	12	0.1	2.5	2,000
ECASD41C685M070K00	16	6.8	±20	D4	7343	1.9	70	0.1	1.0	3,000
ECASD41C106M060K00	16	10	±20	D4	7343	1.9	60	0.1	1.0	3,000
ECASD41C156M040K00	16	15	±20	D4	7343	1.9	40	0.1	1.0	3,000
ECASD61C226M030K00	16	22	±20	D6	7343	2.8	30	0.1	1.6	2,500

Specifications and Test Methods

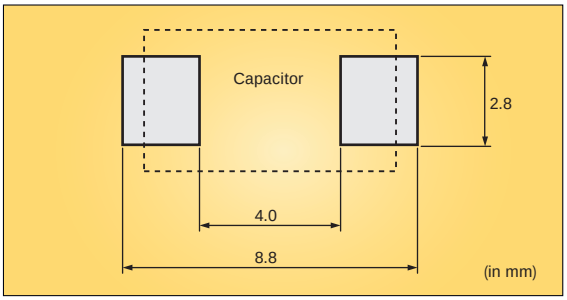
Item	Test Conditions	Characteristics	
Operating Temperature	-	-40 to 105°C	
Rated Voltage	-	2 to 16V	
Leakage Current	Series resistor: 1000 ohm Applied voltage: Rated Voltage Measuring after 2 minutes of application Please conduct pre-conditioning below. *	≦ 0.04CV for 2V to 10V products ≦ 0.1CV for 12.5V to 16V products	
Capacitance Value	120Hz at 25°C	6.8 to 470µF	
Capacitance Tolerance	120Hz at 25°C	±20%	
Dissipation Factor	120Hz at 25°C	≦ 0.06	
ESR	100kHz at 25°C	6 to 70 mΩ	
Allowable Ripple Current	Measuring Frequency: 100kHz ±10% Measuring Temperature: 20 to 105°C	Ranges from 1 to 3.5Arms; part number specific	
Surge	Test Cycle: 1,000 cycles Applied Voltage: Rated Voltage x 1.25 Test Temp.: 85°C for 2V to 10V products Test Temp.: 25°C for 12.5V to 16V products	Leakage Current *	≦ 0.04CV for 2V to 10V products ≦ 0.1CV for 12.5V to 16V products
		Capacitance Change	±10% of initial measured value
		Dissipation Factor	≦ 0.06
Endurance	Test Temperature: 105°C ±2°C Applied Voltage: Rated Voltage Test Time: 1,000hrs +48hrs, -0hrs	Leakage Current *	≦ 0.04CV for 2V to 10V products ≦ 0.1CV for 12.5V to 16V products
		Capacitance Change	±10% of initial measured value
		Dissipation Factor	≦ 0.06
Moisture Resistance Under Load	Test Temperature: 60°C ±2°C Relative Humidity: 90 to 95% Applied Voltage: Rated Voltage Test Time: 1,000hrs +48hrs, -0hrs	Leakage Current *	≦ 0.04CV for 2V to 10V products ≦ 0.1CV for 12.5V to 16V products
		Capacitance Change	-20% and +50% of initial value
		Dissipation Factor	≦ 0.12
Solderability	Solder Temperature: 235°C ±5°C Immersion Time: 5s ±0.5s	Terminal face should be covered 95% by new solder.	

* Please conduct pre-conditioning below, if you have a doubt.
Pre-conditioning: · Temperature: room temp. · Applied voltage: Rated Voltage · Series resistor: 1000 ohm · Charge time: 30 min.

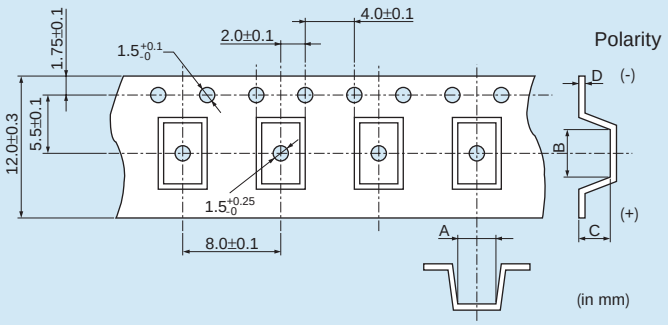
Recommended Pb-Sn Reflow Profile

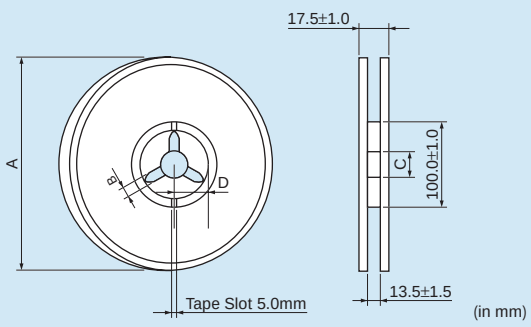


Land Pattern Design



Packaging





Type	Cavity Size (mm)				Minimum Qty. (pcs.)
	A±0.2	B±0.2	C±0.2	D	
D4	4.5	7.6	2.2	0.4max.	3,000
D6	4.5	7.6	3.2	0.4max.	2,500
D9	4.5	7.6	4.6	0.4max.	2,000

Reel Size	Tape Width	A	B±0.5	C±0.5	D±0.5
ø330	12	330max.	3.0	13.0	12.0

Cautions for Use

■ Cautions

<1> Polarity

Polymer aluminum electrolytic capacitor is polarized. Please not to reverse the polarity when using. If reverse voltage is applied, it may damage the oxide film and the capacitor itself.

<2> Allowable Ripple Current

Please not to apply ripple current exceeding the allowable value. If excessive current is applied, it may generate heat and the heat may damage the capacitor. The sum of DC voltage and the peak AC voltage shall not exceed the rated voltage. The sum of the DC voltage and the peak AC voltage shall not allow a voltage reversal.

<3> Reflow Soldering

① Please not to apply excessive force to the capacitor during insertion as well as after soldering. The excessive force may result in damage to electrode terminals and/or degradation of electrical performance.

② Resistance testing to reflow soldering was conducted in accordance with the reflow profile described above. If this profile is adopted, reflow soldering can be repeated no more than two times.

■ Storage Condition

<1> This product meets MSL-3 (Moisture Sensitivity Level).

<2> Term of warranty for this product is two years after packaging in a moisture-proof bag, under the conditions below with sealed packaging.
Recommended storage environment:
Room temperature: 5-30°C
Humidity: no more than 60%RH

<3> Polymer aluminum electrolytic capacitors should be stored in a dry atmosphere, avoiding direct sunlight and condensation. If capacitors are kept at a higher humidity, the following problems may occur:

① Leakage current will increase at the beginning of use and damage the circuit.

② Moisture absorbed in a resin will evaporate and expand with heat of mounting and damage the mold resin.

<4> The capacitors should be kept dry using desiccators or any other methods after unsealing the moisture-proof packaging. If more than two weeks has passed under the recommended storage environment specified above after unsealing the packaging, it is recommended to apply voltage and to bake under the conditions below, as countermeasures against the problems ① and ② in <3> above respectively.

① Recommended voltage conditions:
Applied voltage: rated voltage
Time: 30 minutes
Temperature: room temperature
Current limiting resistance: 1000Ω (series connection)

② Recommended baking conditions:
Temperature: 60(+0, -5)°C
Time: 168 hours

Series Cross Reference

Manufacturer	P/N Prefix / Series	Brand	MuRata	Series Name
Panasonic	EEF	SP-Cap	MuRata	**ECAS**
Kemet	A700	AO-CAP	MuRata	**ECAS**
Showa Denko	A705	SDK-CAP	MuRata	**ECAS**
Rubycon	SXB, SXE, SW	PC-CON	MuRata	**ECAS**
NIC	NSP, NPC	-	MuRata	**ECAS**
Cornell Dublier	ESR, SPA, SPSX, SPCX	-	MuRata	**ECAS**

⚠Note:

1. Export Control
   <For customers outside Japan>
   No Murata products should be used or sold, through any channels, for use in the design, development, production, utilization, maintenance or operation of, or otherwise contribution to (1) any weapons (Weapons of Mass Destruction [nuclear, chemical or biological weapons or missiles] or conventional weapons) or (2) goods or systems specially designed or intended for military end-use or utilization by military end-users.
   <For customers in Japan>
   For products which are controlled items subject to the "Foreign Exchange and Foreign Trade Law" of Japan, the export license specified by the law is required for export.
2. Please contact our sales representatives or product engineers before using the products in this catalog for the applications listed below, which require especially high reliability for the prevention of defects which might directly damage a third party's life, body or property, or when one of our products is intended for use in applications other than those specified in this catalog.
   ① Aircraft equipment ② Aerospace equipment
   ③ Undersea equipment ④ Power plant equipment
   ⑤ Medical equipment ⑥ Transportation equipment (vehicles, trains, ships, etc.)
   ⑦ Traffic signal equipment ⑧ Disaster prevention / crime prevention equipment
   ⑨ Data-processing equipment ⑩ Application of similar complexity and/or reliability requirements to the applications listed above
3. Product specifications in this catalog are as of August 2010. They are subject to change or our products in it may be discontinued without advance notice. Please check with our sales representatives or product engineers before ordering. If there are any questions, please contact our sales representatives or product engineers.
4. This catalog has only typical specifications because there is no space for detailed specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering. Especially, please read rating and ⚠CAUTION (for storage, operating, rating, soldering, mounting and handling) in them to prevent smoking and/or burning, etc.
5. You are able to read a detailed specification in the website of Search Engine (http://search.murata.co.jp/) or catalog library (http://www.murata.com/products/catalog/) before to require our product specification or to transact the approval sheet for product specification.
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7. No ozone depleting substances (ODS) under the Montreal Protocol are used in our manufacturing process.

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