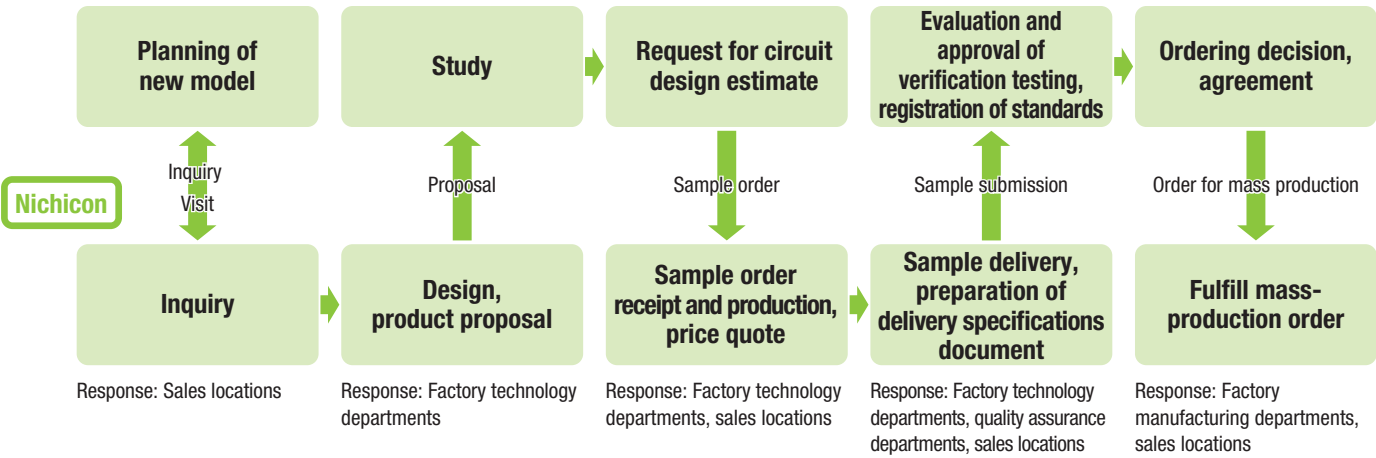


■ Standard Process for Developing Custom Products

We propose the best products for our customers, based on application, size and a variety of other design needs.

Customer



■ Please contact your local Nichicon sales office if you require qualification data based on AEC-Q200.

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# Automotive Application





Recommended Series for Automotive Applications

**ECUs**

UBT High reliability

UBX Ultra-high temperature (150°C)

UBW High reliability (135°C)

UBY High reliability (135°C)

TBE Axial lead type of high temperature (125°C)

**Automotive Electric Pumps (EWP and EOPs)**

UBC Vibration resistance, high temperature (150°C)

UCX Vibration resistance, high temperature (135°C)

UCZ Chip type, high reliability low temperature ESR specification

UCH Chip type, high reliability low temperature ESR specification

**Power Steering EPS**

UPW Miniature sized, low impedance

UCD Low impedance

UCL Low impedance

UBT High reliability

PCR Conductive polymer with high capacitance and long life

**Airbag Controls**

UCV Low impedance

UCM Low impedance

**Instruments, Lighting, Power Seats, Meters**

**Navigation, Drive Recorders, e-Latches**

UCD Low impedance

JUM Electrical double layer, high voltage

JUK Electrical double layer, low resistance

UUD Chip type, Low impedance

**Door Locks Door Mirrors**

UST 7mmL, wide temperature range

ZPC For overcurrent protection

**Audio**

UKA 105°C high grade

UCD Low impedance

USP 7mmL, bi-polarized

UVP Bi-polarized

**Wipers**

**HLB Primary and Secondary Lights, HID Lights**

ULT High voltage, ballast response

UUB Chip type, high reliability

UBT High reliability

UCZ Chip type, high reliability, low temperature ESR specification

PCV Conductive polymer products with high voltage and long life

PCX High reliability conductive polymer products with high voltage

PCR Conductive polymer products with high capacitance and long life

**Heaters**

High reliability products for ZPDs and ZPS EVs/PHVs

**ECUs, DC-DC Converter/Inverter Controls Inverters for EV Motors**

PLV Conductive polymer products with high voltage and long life

PLX Conductive polymers that have high reliability and high voltage

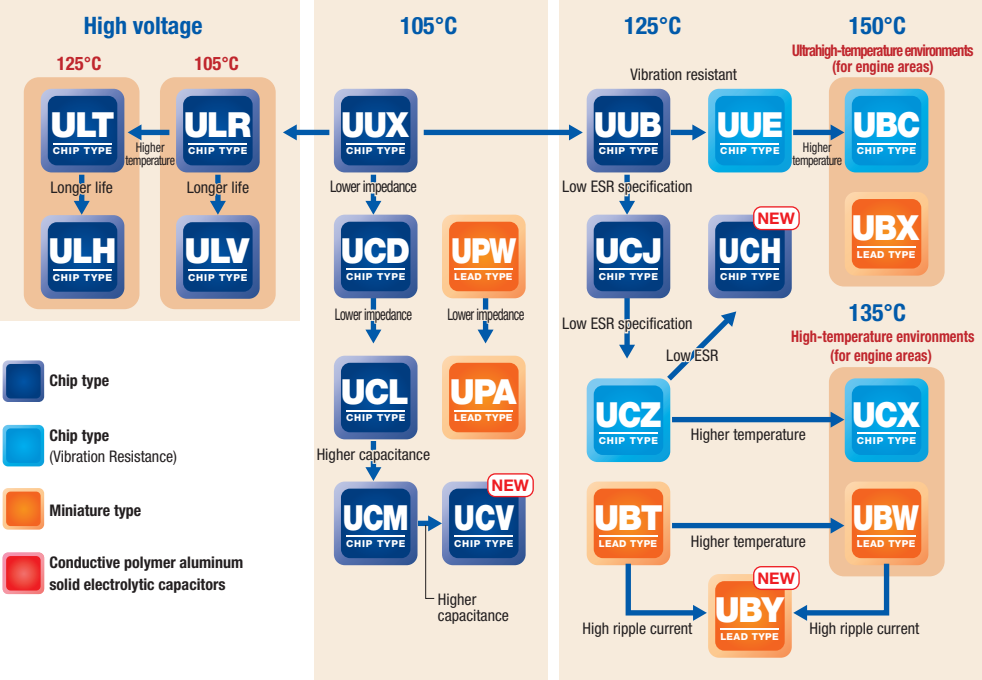
**EV/HV Batteries/ Battery Unit Controls/ Monitoring**

UUX Larger case sizes with high voltage

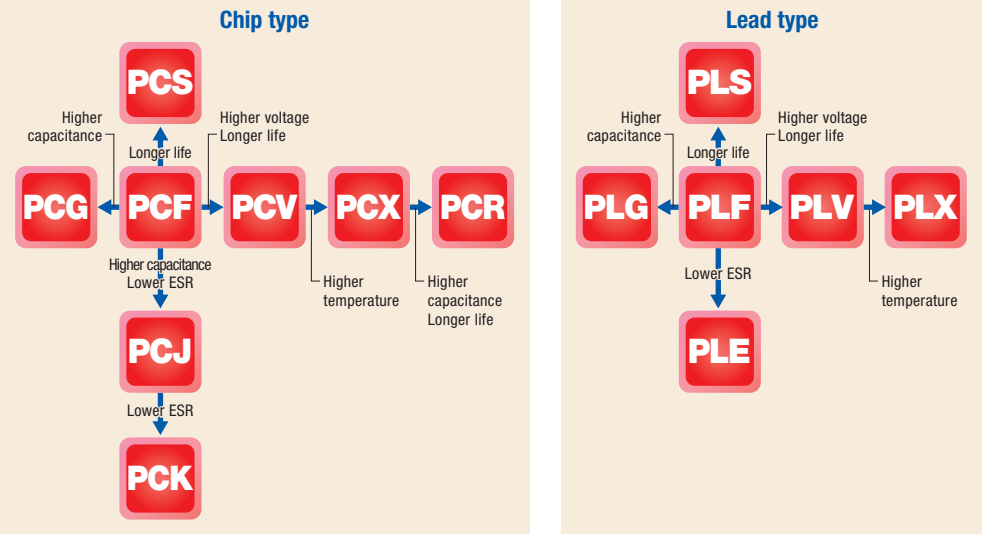
ULV High voltage

ULR High voltage

Series of Automotive Aluminum Electrolytic Capacitors



Series of Automotive Conductive Polymer Aluminum Solid Electrolytic Capacitors



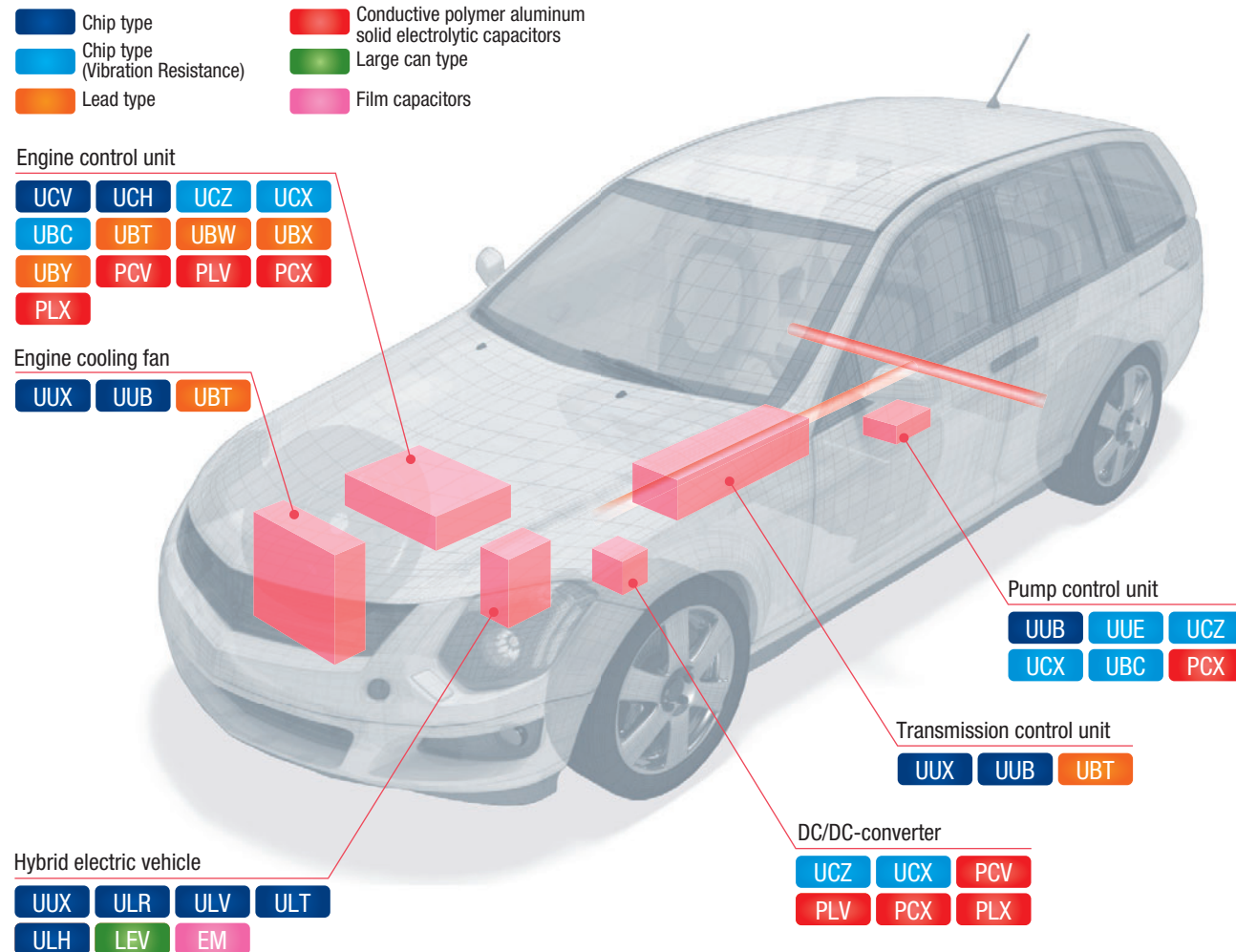
ISO/TS16949 Certification Numbers

Factory Name	Certification number	Date	Scope of Registration	Auditing Organization
NICHICON (OHNO) CORPORATION	JQA-AU0031	April 2004	The design, development and manufacture of aluminum electrolytic capacitors	JQA
	JQA-AU0031-2	February 2013	The design, development and manufacture of conductive polymer aluminum solid electrolytic capacitors (Site II)	
	JQA-AU0013	January 2004	The design and manufacture of aluminum electrolytic capacitors (Site III)	
NICHICON (IWATE) CORPORATION	JQA-AU0037	May 2004	The design, development and manufacture of aluminum electrolytic capacitors	JQA
NICHICON (MALAYSIA) SDN. BHD.	AR3641	May 2005	The design and manufacture of aluminum electrolytic capacitors	SIRIM
NICHICON ELECTRONICS (WUXI) CO., LTD	No.161012148	October 2012	The design, development and manufacture of aluminum electrolytic capacitors	DEKRA

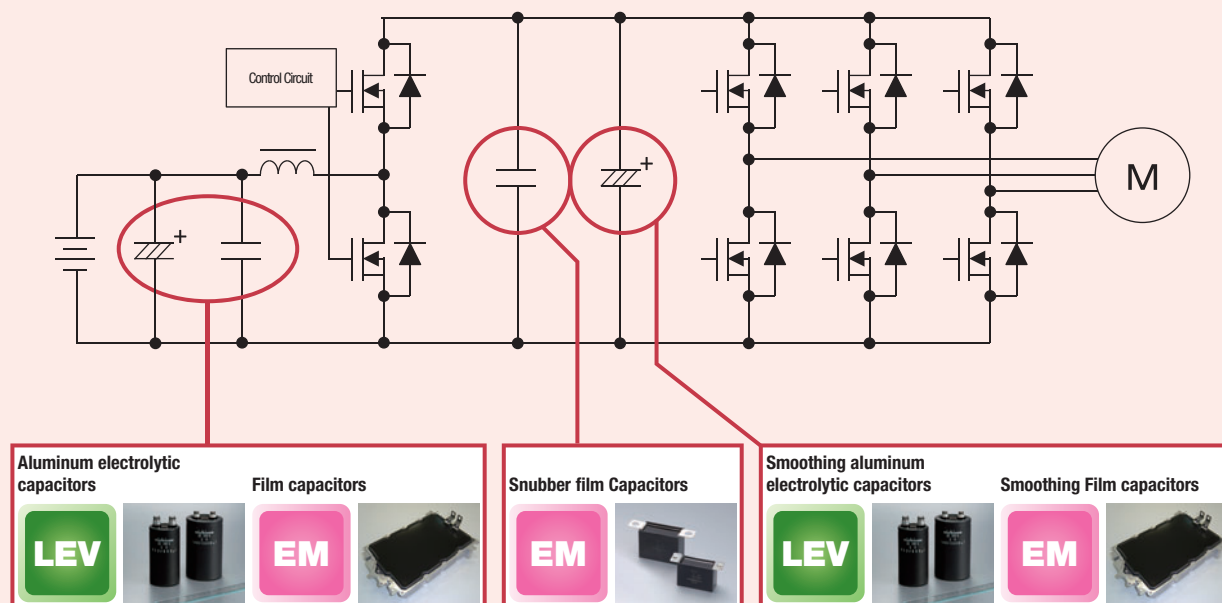
**Capacitor module equivalence circuit**

**HV, PHV and EV Products**

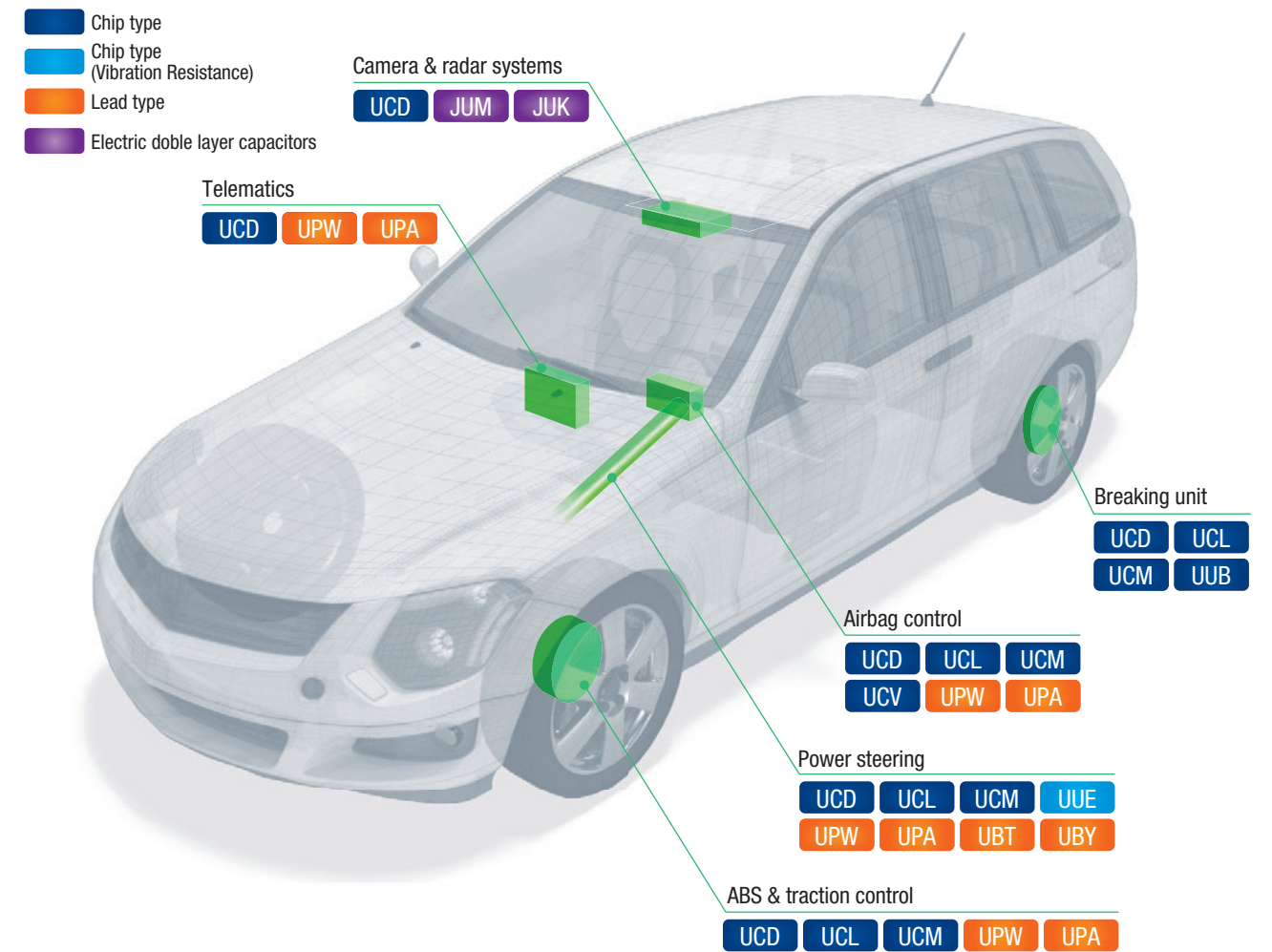
# Powertrain Solution



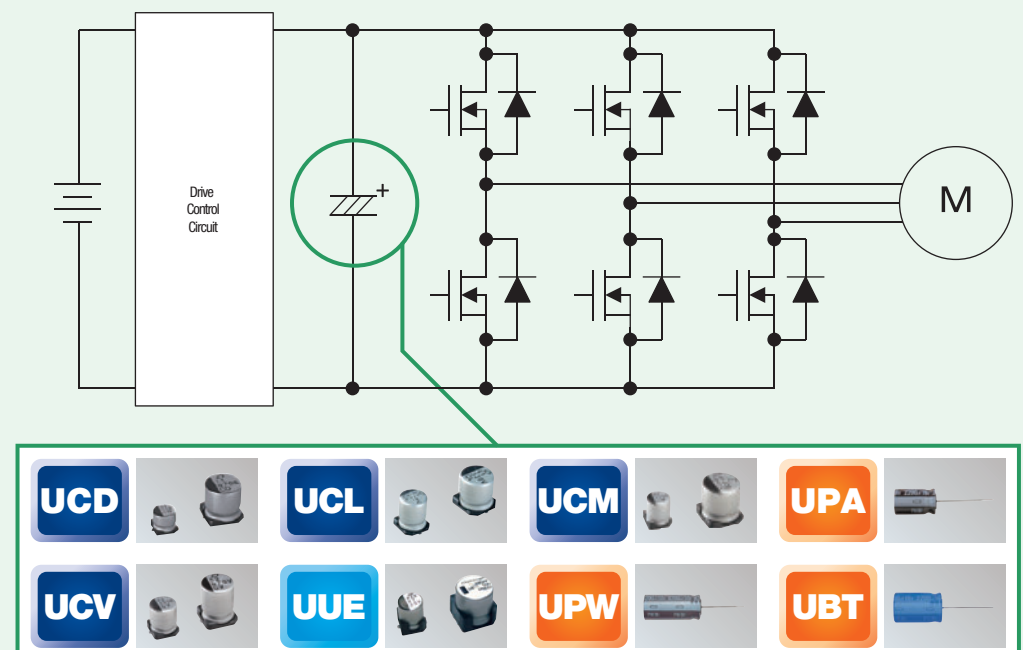
Recommended series for motor drive inverter circuits.



# Chassis & Safety Solution

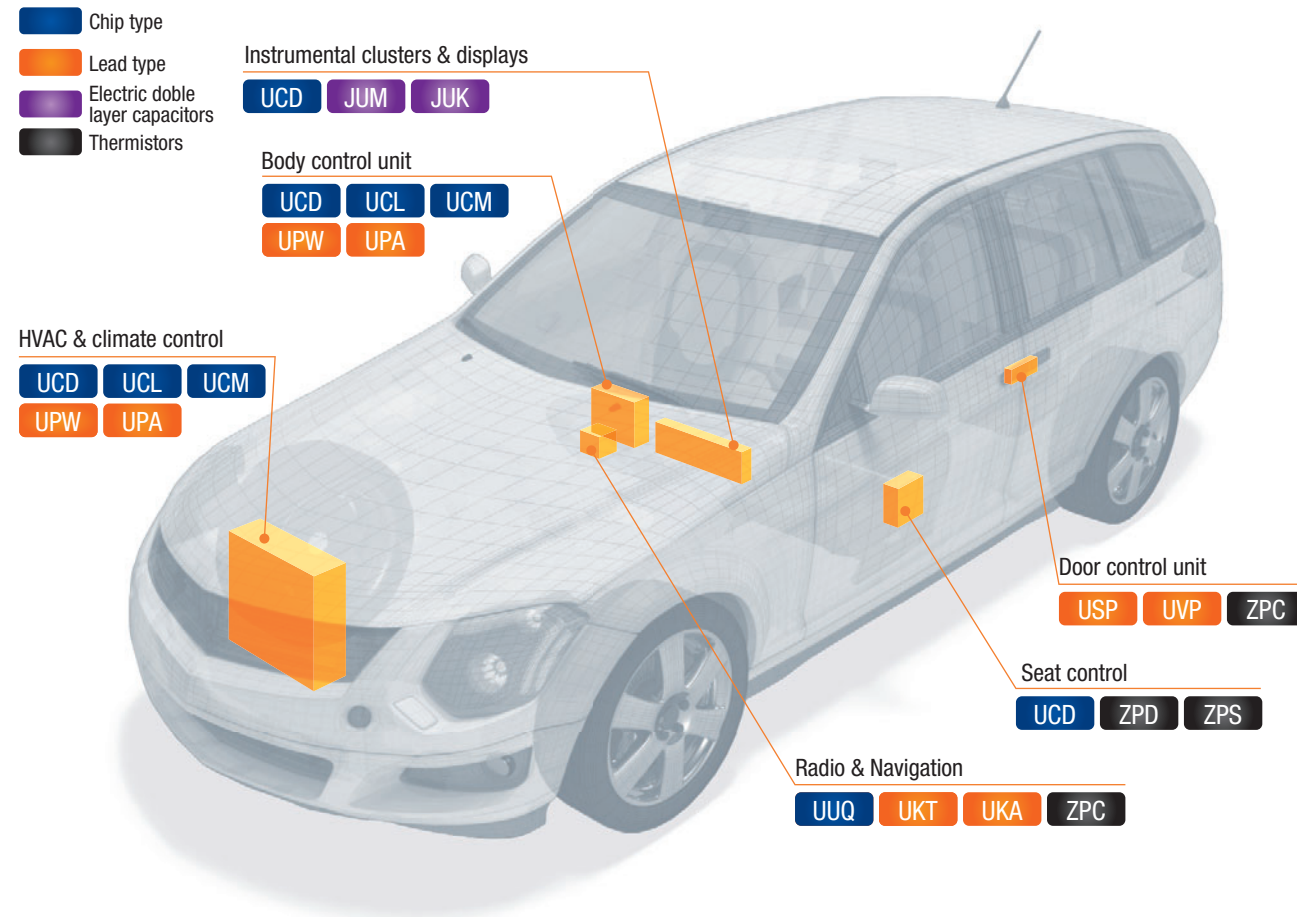


Recommended series for electric power steering circuits.

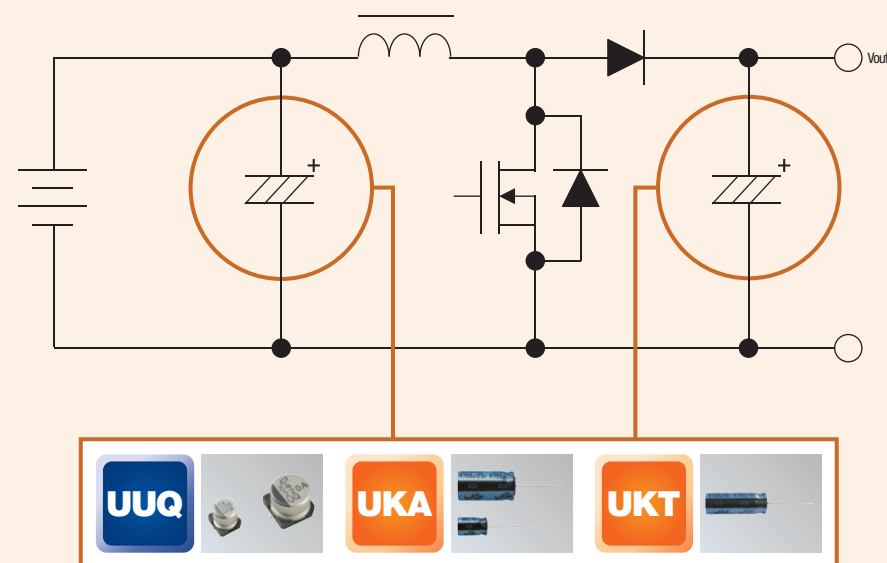




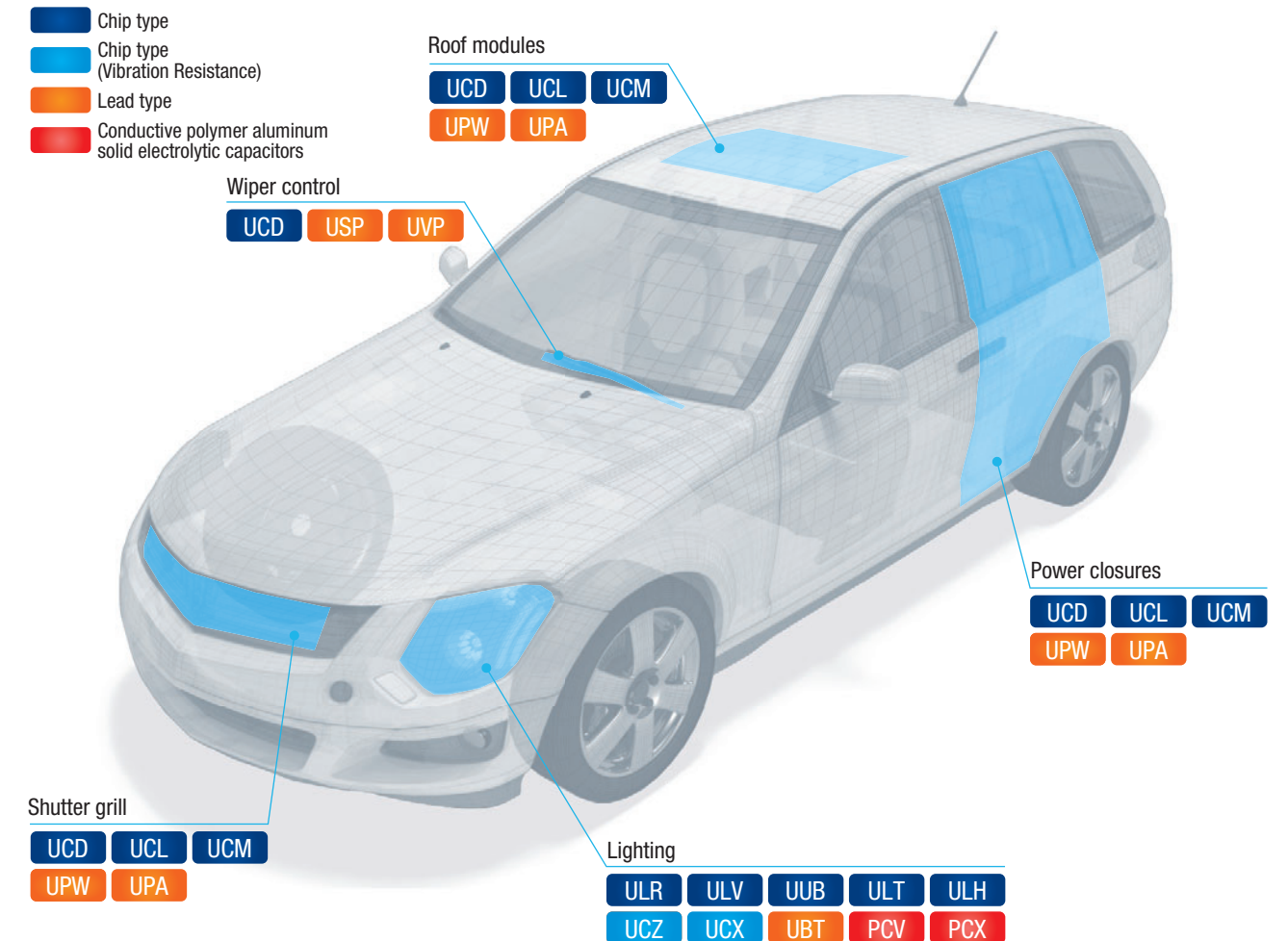
# Interior Solution



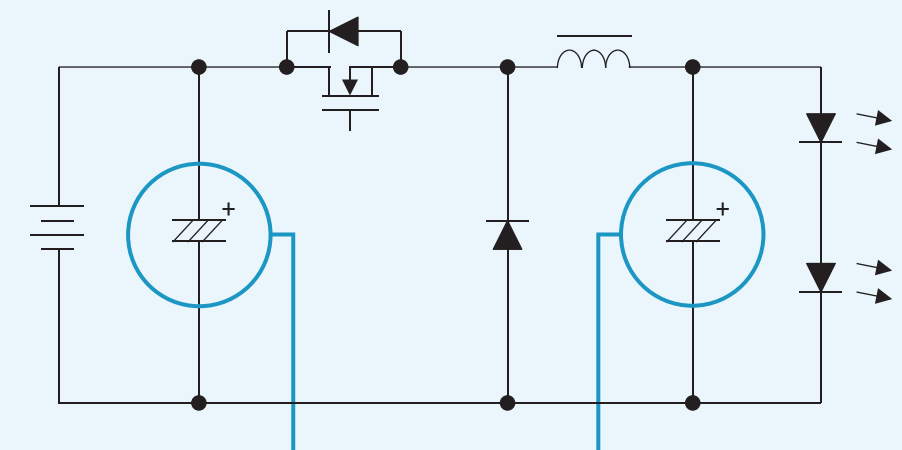
Recommended series for audio DC-DC converters circuits.



# Exterior Solution



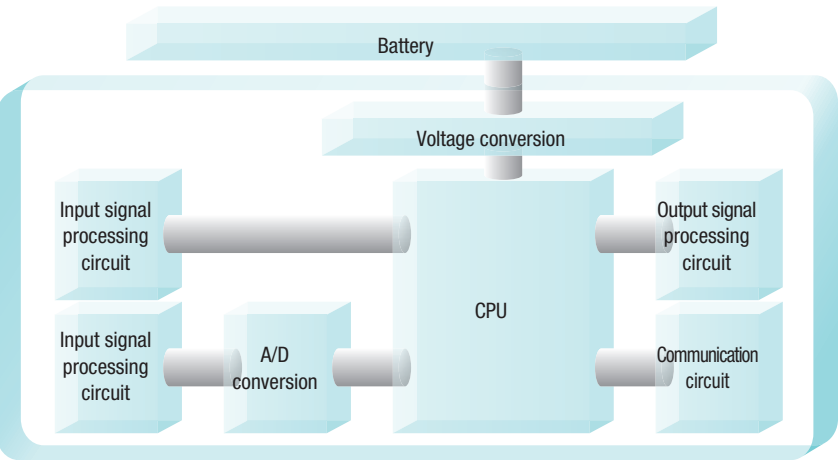
Recommended series for LED headlight circuits.





# Electronic Control Solutions

Engine ECU Pattern Diagram

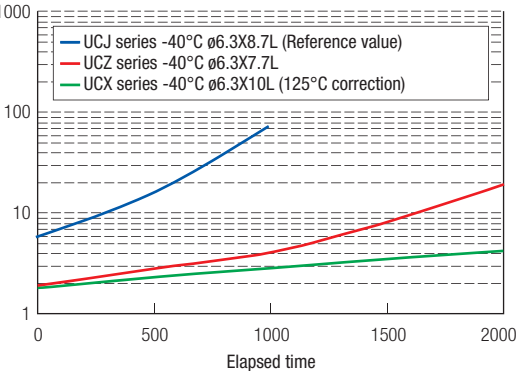


Low temperature ESR

Vibration resistance

High temperature

ESR Time Degradation Ratio (125°C Durability Test)



- Point 1 Use of a Thin, Low-ESR-Function Separator**
- Employs low-ESR-function electrolysis paper
  - Increases electrode foil capacitance area through the use of electrolysis paper
- Point 2 Use of Low-Transpiration Solvent (Optimized Solvent Composition)**
- Ensures stable performance in high-temperature environments
- Point 3 Optimization of Product Configuration**
- Optimized element configuration
    - ⇒ Expands facing area and optimizes sealing cuff
  - Addition of ø6.3×10L (new size)(UCX series only)
    - ⇒ Use of a thicker sealing cuff to control degradation over time

UCZ

High reliability, low ESR specification  
Vibration-resistant



- Added ESR specification after the test at -40°C
- Endurance 125°C 1,000 to 4,000 hours
- Capacitance 10 to 3,300μF
- Category temperature -40 to 125°C
- Compliant to the RoHS directive(2011/65/EU)

**Applications** ECUs, DC-DC converters, inverters, headlight ballast secondary, automotive water pumps, automotive oil pumps

ESR (Ω) MAX.at-40°C, 100kHz

Product size φ×L	Rated voltage 10 to 35V			Rated voltage 50V			Rated voltage 63V			Rated voltage 80V			Rated voltage 100V		
	Initial	Guaranteed time		Initial	Guaranteed time		Initial	Guaranteed time		Initial	Guaranteed time		Initial	Guaranteed time	
		2000h	3000h		2000h	3000h		2000h	3000h		2000h	3000h		2000h	3000h
6.3×5.8	24	—	—	42	—	—	—	—	—	—	—	—	—	—	—
6.3×7.7	5	40	—	5	40	—	100	—	—	—	—	—	—	—	—
8×10	3	4.5	—	3.5	6	—	35	—	—	50	—	—	50	—	—
10×10	2	3.5	—	2.5	4.5	—	25	—	—	35	—	—	35	—	—
12.5×13.5	0.40	3.0	—	0.44	4.0	—	1.3	14	—	1.9	14	—	1.9	22	—
16×16.5	0.28	1.4	—	0.34	2.6	—	0.9	4.8	—	1.4	4.8	—	1.4	4.8	—
18×16.5	0.23	1.3	—	0.32	2.6	—	0.82	3.9	—	1.1	3.9	—	1.1	3.9	—
	(35V:0.28)	(35V:1.4)													
16×21.5	0.20	—	0.60	0.22	—	1.5	0.46	—	2.0	0.8	—	2.6	0.8	—	2.6
18×21.5	0.16	—	0.50	0.20	—	1.5	0.44	—	1.8	0.7	—	2.4	0.7	—	2.4

UCX

135°C-guaranteed low ESR specification  
Vibration-resistant



- Added ESR specification after the test at -40°C
- Endurance 135°C 2,000 hours
- Capacitance 47 to 3,300μF
- Category temperature -40 to 135°C
- Compliant to the RoHS directive(2011/65/EU)

**Applications** ECUs, DC-DC converters, inverters, headlight ballast secondary, automotive water pumps, automotive oil pumps

ESR (Ω) MAX.at-40°C, 100kHz

Product size φ×L	Rated voltage 10 to 35V		Rated voltage 50V	
	Initial	Guaranteed time 1000h	Initial	Guaranteed time 1000h
6.3×10	4	15	—	—
8×10	3	12	3.5	15
10×10	2	10	2.5	12
12.5×13.5	1.0	5.0	1.3	6.5
16×16.5	0.50	2.5	0.70	3.5
18×16.5	0.50	2.5	0.70	3.5
16×21.5	0.32	1.6	0.40	2.0
18×21.5	0.28	1.4	0.32	1.6

UCH

High reliability, low ESR specification

NEW



- Added ESR specification after the test at -40°C 400kHz
- Compliant to the RoHS directive(2011/65/EU)

**Applications** ECUs, DC-DC converters, inverters, headlight ballast secondary, automotive water pumps, automotive oil pumps

Product size	φ6.3×7.7L
Endurance	2,000hours at 125°C
Rated voltage	35V
Capacitance	47 to 100μF
Category temperature	-40 to +125°C
ESR	Initial:3 Guaranteed time 2,000h:6

## Miniature Type Aluminum Electrolytic Capacitors Suited for Engine Areas (High-Temperature Environments)

UBY

High reliability

NEW



- Application suggestion high temperature, electric power steering.
- Compliant to the RoHS directive(2011/65/EU)

High temperature

**Applications**

ECUs, power steering

Product size	φ12.5×20L to φ18×40L
Endurance	3,000hours at 125°C or 135°C
Rated voltage	25 to 50V
Capacitance	620 to 12,000μF
Category temperature	-40 to +135°C

UBW

High temperature, High reliability  
(135°C)



- Products with high-temperature stability, guaranteed for 1,000 to 3,000 hours at 135°C
- Suited for automobile electronics where heavy duty services are indispensable
- Compliant to the RoHS directive (2011/65/EU)

High temperature

**Applications** ECUs

Product size	φ8×11.5L to φ16×31.5L
Endurance	1,000 to 3,000 hours at 135°C
Rated voltage	10 to 100V
Capacitance	1 to 4,700 μF

UBX

Ultra-high temperature suited for  
automotive electronics (150°C)



- Laminated case series
- Products suited for ultra-high temperatures (150°C)
- Suited for automobile electronics where heavy duty services are indispensable
- Compliant to the RoHS directive (2011/65/EU)

Ultra-high temperature

**Applications** ECUs

Product size	φ10×12.5L to φ18×40L
Endurance	1,000 to 2,000 hours at 150°C
Rated voltage	10 to 400V
Capacitance	1 to 4,700 μF



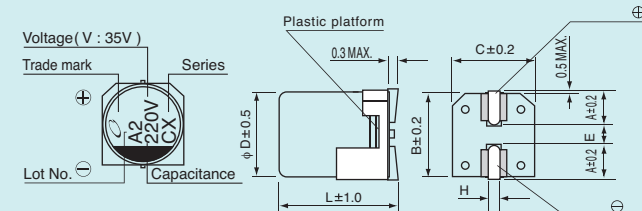
# Control Solutions

## Chip Type, Vibration Resistance, Suited for Engine Areas (High-Temperature Environments, Vibrations)

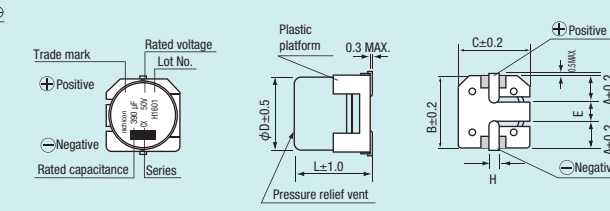
Smaller, high reliability : Surface mounting technology, anti-vibration capabilities: 30G (10 to 2,000Hz)

**Anti-Vibration Points** ● Adjust height of resin seating plate collar, control vibration of capacitor itself ● Improved adhesion of auxiliary electrode to resin seating plate

( $\phi 8 \times 10L$ ,  $\phi 10 \times 10L$ ) [vibration resistant]



( $\phi 12.5$  to  $\phi 18$ ) [vibration resistant]



Dimensions

$\phi D$	8	10	12.5	16	18
A	2.9	3.2	4.8	5.4	6.4
B	8.3	10.3	13.6	17.1	19.1
C	8.3	10.3	13.6	17.1	19.1
E	3.1	4.5	4.0	6.3	6.3
L	10	10	13.5	16.5, 21.5	21.5
H	1.1 to 1.5	1.1 to 1.5	1.0 to 1.4	1.0 to 1.4	1.0 to 1.4

(mm)

■ Aid electrode

### UBC

Vibration resistance, high temperature



- Highly dependable reliability withstanding load life of 1,000 hours at +150°C
- Suited for automobile electronics where heavy duty services are indispensable
- Compliant to the RoHS directive (2011/65/EU)

**Durability**

**Applications**

ECUs, automotive water pumps, automotive oil pumps

Product size	$\phi 8 \times 10L$ to $\phi 18 \times 21.5L$
Endurance	1,000 hours at 150°C
Rated voltage	10 to 50V
Capacitance	33 to 3,300 $\mu F$
Category temperature	-55 (-40) to +150°C

### UUE

Vibration Resistance



- SMD type guaranteed for 2,000 to 5,000 hours at 125°C
- Ideal for automotive electrical components
- Compliant to the RoHS directive (2011/65/EU)

**Applications** Power steering, automotive water pumps, automotive oil pumps

Product size	$\phi 8 \times 10L$ to $\phi 20 \times 21.5L$
Endurance	5,000 hours at 125°C ( $\phi 8$ , $\phi 10$ : 2,000 hours)
Rated voltage	10 to 50V
Capacitance	33 to 4,700 $\mu F$
Category temperature	-55 to +125°C ( $\phi 12.5$ to 20), -40 to +125°C ( $\phi 8$ , $\phi 10$ )

Note: UUE series also applies to control solution specifications.

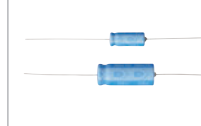
### Mounting Examples

ECUs, hybrid vehicle ECUs, "idling stop," automotive water pumps, electric oil pumps

Note: For detailed specifications, please refer to Nichicon's general catalog of electronics.

### TBE

High temperature range(02 type)

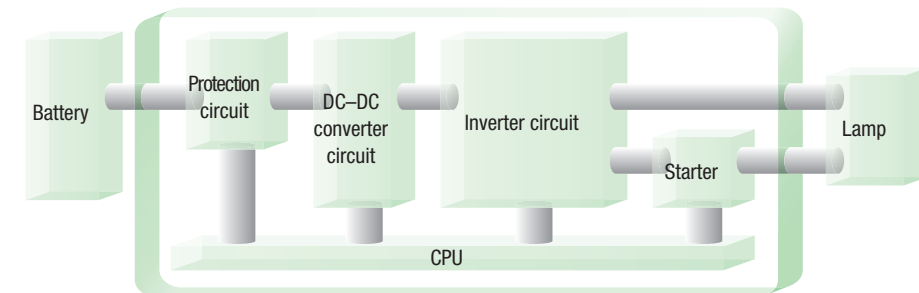


- High reliability withstanding load life of 2,000 hours at 125°C
- Optimal for automotive electrical components
- Compliant to the RoHS directive (2011/65/EU)

**Applications** ECUs

Product size	$\phi 6.3 \times 16L$ to $\phi 16 \times 31.5L$
Endurance	2,000 hours at 125°C
Rated voltage	10 to 50V
Capacitance	0.47 to 470 $\mu F$
Category temperature	-40 to +125°C ( $\phi 8$ , $\phi 10$ )

## Headlight Ballast Pattern Diagram



Suited for high temperature

Large-surface mounting

Suited for high voltage

## Automotive Aluminum Electrolytic Capacitors

### UUX

SMD type, larger size

- SMD type, larger size
- Compliant to the RoHS directive (2011/65/EU)

**Applications**

[High voltage] Batteries in EVs and HVs/battery unit control/monitoring  
[Low voltage] Electrical systems, measurement systems

Product size	$\phi 8 \times 6.2L$ to $\phi 10 \times 10L$
Endurance	2,000 hours at 105°C (160 to 400V: 3,000 hours)
Rated voltage	6.3 to 400V
Capacitance	1 to 1,000 $\mu F$
Category temperature	-55 to +105°C (6.3 to 100V), -40 to +105°C (160 to 400V)

### UBT

High reliability (125°C)



- Stable high-temperature products guaranteed for 2,000 to 10,000 hours at 125°C
- Suited for automobile electronics where heavy duty services are indispensable
- Compliant to the RoHS directive (2011/65/EU)

**Applications** Automotive compressors, HID lights, power steering, EPSs, ECUs

Product size	$\phi 8 \times 11.5L$ to $\phi 18 \times 35.5L$
Endurance	2,000 to 10,000 hours at 125°C (50V or less, $\phi 8$ : 2,000 hours, $\phi 10$ : 5,000 hours, $\phi 12.5$ above: 10,000 hours), (63 to 100V, $\phi 8$ : 2,000 hours, $\phi 10$ : 3,000 hours, $\phi 12.5$ : 5,000 hours), (160V or more: 2,000 hours)
Rated voltage	10 to 450V
Capacitance	1 to 4,700 $\mu F$
Category temperature	-40 to +125°C (10 to 250V), -25 to +125°C (350 to 450V)

### PCV

High voltage, long life



- High voltage (to 125V), low ESR, high ripple current
- Long life of 3,000 hours at 105°C
- SMD type : Lead free reflow soldering condition at 260°C peak correspondence
- Compliant to the RoHS directive (2011/65/EU)

Product size	$\phi 6.3 \times 6L$ to $\phi 10 \times 12.7L$
Endurance	3,000 hours at 105°C ( $\phi 6.3$ : 1,500 hours)
Rated voltage	16 to 125V
Capacitance	5.6 to 680 $\mu F$
Category temperature	-55 to +105°C

**Applications**

ECUs, DC-DC converters, lights

### UUB

High reliability

- 125°C
- Compliant to the RoHS directive (2011/65/EU)

**Applications**

[High voltage] HLB primary  
[Low voltage] Engine control, automotive electric water pumps (EWPs), electric oil pumps (EOP)

Product size	$\phi 8 \times 6.2L$ to $\phi 10 \times 10L$
Endurance	2,000 hours at 125°C ( $\phi 8 \times 6.2L$ : 1,000 hours)
Rated voltage	10 to 400V
Capacitance	1 to 330 $\mu F$
Category temperature	-40 to +125°C

### UKA

Wide temperature range, for audio equipment  
High-grade type



- 105°C high quality capacitors for audio equipment
- Selected materials to create superior acoustic sound
- Compliant to the RoHS directive (2011/65/EU)

**Applications** For automotive audio

Product size	$\phi 5 \times 11L$ to $\phi 18 \times 40L$
Endurance	2,000 hours at 105°C
Rated voltage	6.3 to 50V
Capacitance	22 to 22,000 $\mu F$
Category temperature	-55 to +105°C

### PCX

High reliability



- High reliability, low ESR, high ripple current
- Long life of 1,500 to 3,000 hours at 125°C
- SMD type : Lead free reflow soldering condition at 260°C peak correspondence
- Compliant to the RoHS directive (2011/65/EU)

Product size	$\phi 6.3 \times 6L$ to $\phi 10 \times 12.7L$
Endurance	3,000 hours at 125°C ( $\phi 6.3$ : 1,500 hours)
Rated voltage	16 to 50V
Capacitance	5.6 to 390 $\mu F$
Category temperature	-55 to +125°C

**Applications**

DC-DC converters, lights, electric water pumps (EWPs), electric oil pumps (EOPs), inverters for EV motors, ECUs





# Safety Solutions

## Automotive Aluminum Electrolytic Capacitors

### PLV

High voltage, long life

- High voltage (to 100V), low ESR, high ripple current
- Long life of 3,000 hours at 105°C
- Radial lead type : Lead free flow soldering condition correspondence
- Compliant to the RoHS directive (2011/65/EU)

Product size	φ8×9L to φ10×13L
Endurance	3,000 hours at 105°C
Rated voltage	16 to 100V
Capacitance	6.8 to 470 μF
Category temperature	-55 to +105°C

**Applications** ECUs, DC-DC converters

### PLX

High reliability

- High reliability, low ESR, high ripple current
- Long life of 3,000 hours at 125°C
- Radial lead type : Lead free flow soldering condition correspondence
- Compliant to the RoHS directive (2011/65/EU)

Product size	φ8×9L to φ10×13L
Endurance	3,000 hours at 125°C
Rated voltage	16 to 50V
Capacitance	22 to 390 μF
Category temperature	-55 to +125°C

**Applications** ECUs, DC-DC converters, motor inverters

### PCR

High reliability

- High reliability with high voltage (to 80V), low ESR, high ripple current
- Long life of 4,000 hours at 125°C
- SMD type: Lead free reflow soldering condition at 260°C peak correspondence
- ESR after endurance at -40°C
- Compliant to the RoHS directive (2011/65/EU)

Product size	φ8×7L to φ10×12.7L
Endurance	4,000 hours at 125°C
Rated voltage	16 to 80V
Capacitance	22 to 1,000 μF
Category temperature	-55 to +125°C

## “EverCAP®” Automotive Electric Double-Layer Capacitors

### JUM

High voltage

- High voltage (2.7V)
- Suitable for quick charge and discharge
- Wide temperature range(-25 to +70°C)
- Compliant to the RoHS directive (2011/65/EU)

Product size	φ8×11.5L to φ18×40L
Endurance	1,000 hours at 70°C
Rated voltage	2.7V
Capacitance	1 to 47F
Category temperature	-25 to +70°C

**Applications** Navigation systems, Drive Recorders, e-latches

### JUK

Lower resistance

- Lower resistance type of JUM series
- Lower temperature range(-40 to +70°C)
- Compliant to the RoHS directive (2011/65/EU)

Product size	φ12.5×31.5L to φ18×40L
Endurance	1,000 hours at 70°C
Rated voltage	2.5V
Capacitance	6.8 to 27F
Category temperature	-40 to +70°C

**Applications** Navigation systems, Drive Recorders, e-latches

## “Posi-R” Automotive Positive Thermistors

### ZPD/ZPS

High reliability

**Applications** HV/EV/PHV heaters

### ZPC

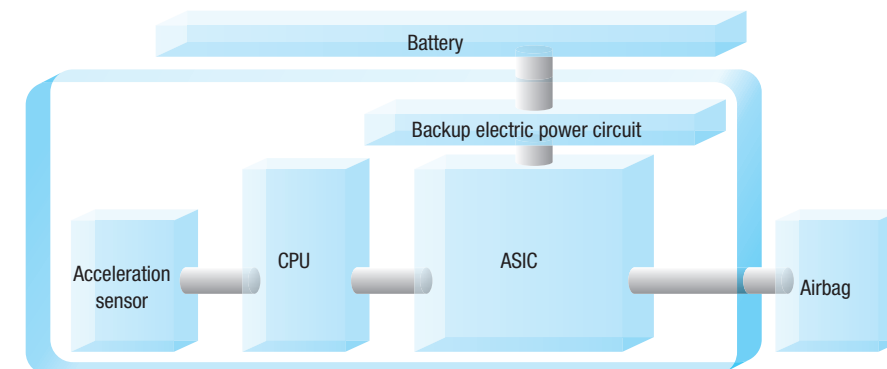
High reliability

**Applications** Door locks, door mirrors, optical leveling, car audio

**Mounting Examples** Motor inverters, hybrid automotive DC-DC converters, power steering, navigation systems

Note: For detailed specifications on the product numbers above, please refer to Nichicon's general catalog of electronics.

## Airbag ECU Pattern Diagram



High voltage

High reliability

Long life

### UCL

Low impedance

- SMD type, low impedance
- Compliant to the RoHS directive (2011/65/EU)

**Applications** ECUs, PSDs, PBDs, collating ECUs, blower motors, gateway ECUs, DCMs, airbag controls

Product size	φ4×5.8L to φ10×13.5L
Endurance	2,000 hours at 105°C
Rated voltage	6.3 to 50V
Capacitance	10 to 2,200 μF
Category temperature	-55 to +105°C

### UCV

Low impedance

**NEW**

- SMD type, low impedance
- Compliant to the RoHS directive (2011/65/EU)

**Applications** ECUs, PSDs, PBDs, collating ECUs, blower motors, gateway ECUs, DCMs, airbag controls

Product size	φ6.3×7.7L to φ10×10L
Endurance	2,000 hours at 105°C
Rated voltage	25 to 35V
Capacitance	220 to 1,000 μF
Category temperature	-55 to +105°C

### UCD

Low impedance

- SMD type, low impedance
- Compliant to the RoHS directive (2011/65/EU)

**Applications** Navigation, car audio, wipers, airbag controls, electrical leak detection, collating ECUs, gateway ECUs, instruments, EPSs, DCMs, lighting, compact drive trains, power seat meters

Note: The same product number also meets ECU solution specifications.

Product size	φ4×5.8L to φ18×16.5L
Endurance	2,000 to 5,000 hours at 105°C (50V or less and less than 10L: 2,000 hours, 63V or more and 10L or less: 2,000 hours)
Rated voltage	6.3 to 100V
Capacitance	1 to 3,300 μF
Category temperature	-55 to +105°C

### UPW

Miniature sized, low impedance for switching power supplies

- Miniature sized, low impedance
- Capacitance ranges available based on the numerical values in E-12
- High reliability withstanding 2,000 to 8,000 hours at 105°C
- Compliant to the RoHS directive (2011/65/EU)

**Applications** Power steering, turn signals, airbag controls

Note: The same product numbers also apply to control solution specifications.

Product size	φ4×7L to φ25×50L
Endurance	2,000 to 8,000 hours at 105°C (φ4, 5, 6.3: 2,000 hours, φ8: 3,000 hours, φ10: 5,000 hours, φ12.5: 7,000 hours)
Rated voltage	6.3 to 450V
Capacitance	0.47 to 15,000 μF
Category temperature	-55 to +105°C (6.3 to 100V), -40 to +105°C (160 to 400V), -25 to +105°C (450V)

**Mounting Examples** Airbags, automotive cameras, Drive Recorders, ABS systems

Note: For detailed specifications, please refer to Nichicon's general catalog of electronics.




# Eco-Car Solutions

## Aluminum Electrolytic Capacitors for Battery Management

**ULR**

High Voltage




- SMD type, high voltage
- Load life of 3,000 hours at 105°C
- Compliant to the RoHS directive (2011/65/EU)

**Applications** EV/HV batteries, battery unit control, and monitoring

**ULV**

High voltage, long life




- SMD type, high voltage and long life
- Load life of 10,000 hours at 105°C
- Compliant to the RoHS directive (2011/65/EU)

**Applications** EV/HV batteries, battery unit control, monitoring

**ULT**

SMD type, high voltage, high temperature




- SMD type, high voltage and high temperature
- Load life of 2,000 hours at 125°C
- Compliant to the RoHS directive (2011/65/EU)

**Applications** Headlight ballast primary

**ULH**

SMD type, high voltage and high reliability



- SMD type, high voltage and high reliability
- Load life of 4,000 hours at 125°C
- Compliant to the RoHS directive (2011/65/EU)

**Applications** Headlight ballast primary

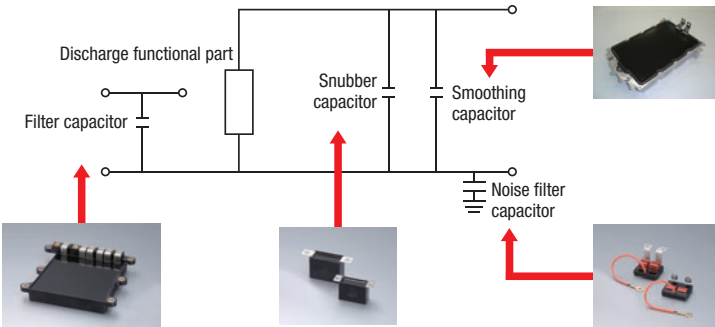
- ULR** Surface-mount standard, mid- to high voltage guaranteed for 3,000 hours at 105°C
- ULV** Long life surface-mount mid- to high voltage guaranteed for 10,000 hours at 105°C
- ULT** High-temperature surface-mount mid- to high voltage guaranteed for 2,000 hours at 125°C
- ULH** Highly reliable surface-mount mid- to high voltage guaranteed for 4,000 hours at 125°C

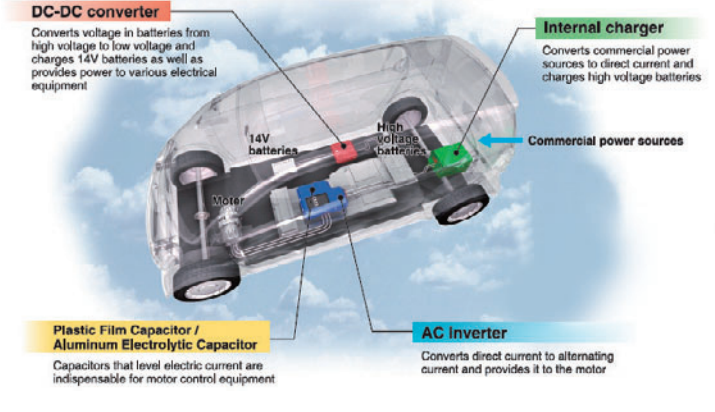
		Lineup											
		ULR			ULV			ULT			ULH		
Size (mm)	Diameter	8	10		8	10		8	10		8	10	
	Height	10	10	13.5	10	10	13.5	10	10	13.5	10	10	13.5
Rated voltage	160V	15	27	39	15	22	33	15	22	33	12	18	27
	200V	12	22	33	12	18	27	12	18	27	10	15	22
	250V	10	15	22	8.2	15	18	8.2	15	18	7.5	12	15
	400V	4.7	8.2	12	3.9	6.8	10	3.9	6.8	10	3.3	5.6	7.5
	450V	3.9	6.8	10	3.3	5.6	7.5	3.3	5.6	7.5	2.2	3.9	5.6
	500V	2.7	3.9	5.6	1.8	3.3	4.7	1.8	3.3	4.7	—	—	—

(μF)

## Film Capacitors for EVs/HVs/PHVs

**Sample Uses for Inverter with Booster Function**

**Capacitor Module Equivalence Circuit**



**DC-DC converter**  
Converts voltage in batteries from high voltage to low voltage and charges 14V batteries as well as provides power to various electrical equipment

**Internal charger**  
Converts commercial power sources to direct current and charges high voltage batteries

**Commercial power sources**

**Plastic Film Capacitor / Aluminum Electrolytic Capacitor**  
Capacitors that level electric current are indispensable for motor control equipment

**AC inverter**  
Converts direct current to alternating current and provides it to the motor

**Film Capacitors**

Providing Film Capacitors with Superior Electrical Characteristics and Flexible Exterior and Electrode Configurations for Use in Automobiles, trains and other vehicles

**High-Frequency Characteristics**

- Sharp high-frequency characteristics (excellent filtering effects)
- Lower loss, energy-saving

**Stable Characteristics**

- Steady changes in capacitance in response to temperature variations

**Withstand Current Characteristics**

- High ripple current withstand volume (high current density per unit volume)

**High Reliability, Safety Performance**

- Self-healing type
- With automatic shutoff security mechanism

**Long Life**

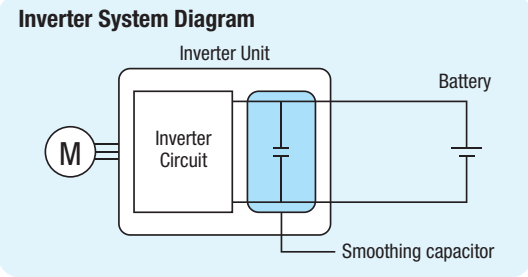
- Maintenance-free for 10 years or more even in challenging temperature conditions

**Shape Freedom**



- Flexible exterior shapes (square, cylindrical)
- Flexible terminal shapes

**Integrated Design**

- Integrated design enables use for smoothing and filtering

**Inverter System Diagram**

## DC-DC Converter with integrated charger for EVs



**Features**

- Compatible with power sources worldwide
- Operates using CAN communications, transmits various types of information
- Compatible with IEC61851-1 mode 2, mode 3
- CE mark compliant

**Specifications**

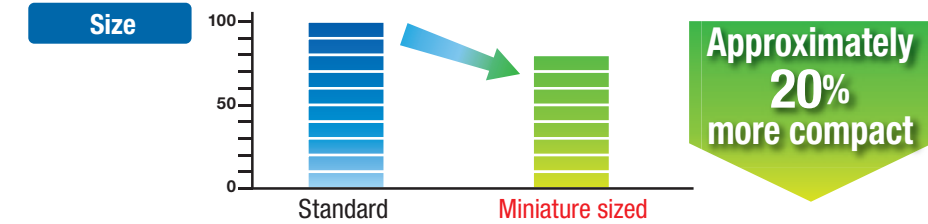
**Charger**

- Input voltage: AC100 to 264V
- Output power: Max. 3.3kW
- Output voltage: 200 to 410V
- Efficiency: MAX. 90%
- Cooling system: Water cooled

**Charging DC-DC converter**

- Input voltage: 200 to 410V
- Output voltage: 14V
- Output current: 80 to 120A
- Cooling system: water cooled

### More Compact and Lightweight While Meeting Standard Specifications



13 Nichicon Automotive Application Catalog

Nichicon Automotive Application Catalog 14