C28, Cylindrical Plastic Case, Segmented Film, 420 VAC/470 VAC

Overview

C28 is a polypropylene metallized segmented film with cylindrical plastic can-type construction filled with resin and uses faston and plastic deck or cable terminals.

Applications

Typical applications include motor run S3 safety class: single-phase motors, low power electric motors and compressors.

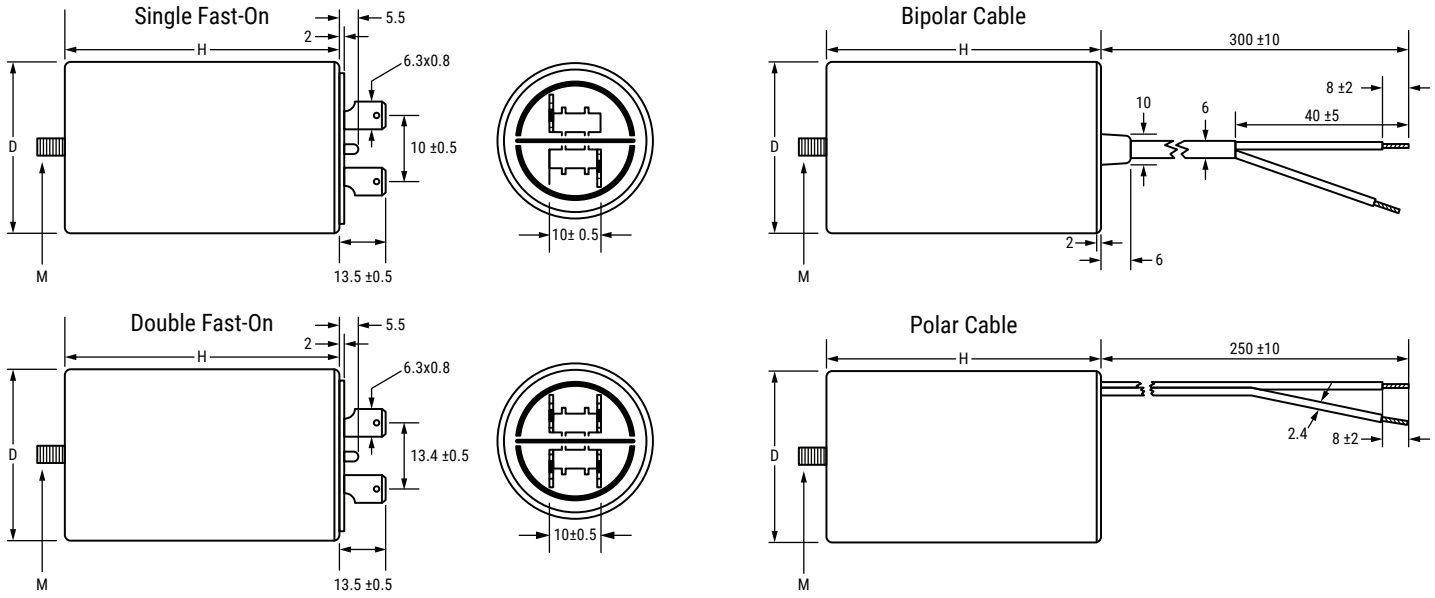
Benefits

- Self-healing
- IMQ approved
- Rated frequency of 50 Hz and 60 Hz
- High capacitance density
- Safety protection

Part Number System

C28	4	A	C	A	4300	AL	0	J
Series		Marking	Case and Fixing Bolt Code	Terminal Style	Capacitance Code (pF)	Packaging	Internal Use	Tolerance
C28 = Motor Run Capacitors	4 = 30,000 hours/420 VAC (Class A) or 10,000 hours/470 VAC (Class B)	C284: A = Standard	A = Without fixing bolt/flat bottom C = Cylindrical plastic case with M8 bolt D = Quick fit"	2 = Single faston 6.3 x 0.8 3 = Double faston 6.3 x 0.8 A = Unipolar flexible cable (tinned end) B = Unipolar flexible cable (untinned end) F = Bipolar cable (tinned end) R = Unipolar rigid cable (tinned end)	Digits two – four indicate the first three digits of the capacitance value. First digit indicates the number of zeros to be added.	**AA** = Fast-on terminals standard **AL** = Unipolar cable, L = 300mm, Stripped 8mm **LF** = Bipolar cable, L= 250mm, unsheathed 40mm, stripped 8mm **LH** = Bipolar cable, L = 350mm, unsheathed 40mm, stripped 8mm	0, 1, 2, 5 = Standard	J = 5%

Dimensions – Millimeters



D +1/-0	H ±2	Mounting Stud (M)
25	56.5	M8 x 10
25	58	M8 x 11
25	55	M8 x 12
25	58.5	M8 x 13
25	57	M8 x 14
30	56.5	M8 x 15
30	55	M8 x 16
30	69.5	M8 x 17
30	58.5	M8 x 18
30	57	M8 x 19
35	56.5	M8 x 20

D +1/-0	H ±2	Mounting Stud (M)
35	73.5	M8 x 21
35	55	M8 x 22
35	57	M8 x 23
35	71.5	M8 x 24
35	74	M8 x 25
35	69.5	M8 x 26
35	58.5	M8 x 27
40	73.5	M8 x 28
40	71.5	M8 x 29
40	74	M8 x 30
40	69.5	M8 x 31

Qualification

Reference Standards	IEC 252, EN 60252-1:2011/A1/2013, IMQ
Vibration Test	IEC 68-2-6

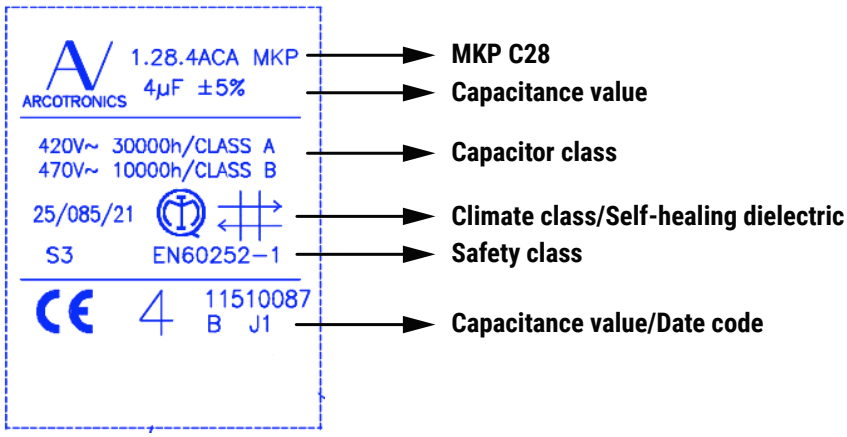
Performance Characteristics

Type of Service	Continuous
Operating Class	
C284	Class A 30,000 hours at 420 VAC or Class B 10,000 hours at 470 VAC
Temperature Range	−25°C to +85°C
Storage Temperature	−40°C to +90°C
Rated Voltage	470 VAC
Rated Frequency	50 – 60 Hz
Voltage Rise/Fall Time (Maximum)	20 V/µs
Maximum Permissible Voltage	1.10 x rated voltage
Maximum Permissible Current	1.30 x rated current
Dissipation Factor (DF)	20 x 10^{-4} at +20°C, 50Hz
Safety Class	S3
Maximum Altitude	2,000 m
Capacitance Tolerance	±5%
Mounting	Any position
Can	Polypropylene with self-extinguishing features V2 (UL 94) Noryl with self-extinguishing features VI (UL 94) for diameters > 50 mm
Disk	Fast-on execution: Nylon PA66 with self-extinguishing features V0
	Cable Execution: PC-A with self-extinguishing features V0
	For diameters > 40 mm cable execution: Noryl PPO with self-extinguishing features VI
Filling Resin	Epoxy
Dielectric	Polypropylene
Plates	Self-healing metal layer
Test Voltage Terminal to Terminal (VTT)	2 V_n for 2 seconds
Test Voltage Terminal to Can (VTC)	2,000 V for 2 seconds
Air Distance Between Live Parts	≥ 5 mm
Air Distance Between Live Parts and Case	≥ 6 mm

Table 1 – Ratings & Part Number Reference

Capacitance Value (µF)	VAC	Maximum Dimensions (mm)		dV/dt (V/µs)	Termination	Packaging Quantity	Part Number
		D	H				
2	470	25	55	20	Unipolar flexible cable (tinned end)	162	C284ACA4200AL0J
2.5	470	25	55	20	Unipolar flexible cable (tinned end)	162	C284ACA4250AL0J
3	470	25	55	20	Unipolar flexible cable (tinned end)	162	C284ACA4300AL0J
4	470	30	55	20	Unipolar flexible cable (tinned end)	110	C284ACA4400AL0J
5	470	30	55	20	Unipolar flexible cable (tinned end)	110	C284ACA4500AL0J
6	470	30	69.5	20	Unipolar flexible cable (tinned end)	110	C284ACA4600AL2J
3	470	25	55	20	Unipolar rigid cable (tinned end)	162	C284ACR4300AL0J
8	470	30	69.5	20	Unipolar rigid cable (tinned end)	110	C284ACR4800AL2J
10	470	35	69.5	20	Unipolar rigid cable (tinned end)	86	C284ACR5100AL0J
Capacitance Value (µF)	**VAC**	**B (mm)**	**H (mm)**	**dV/dt (V/µs)**	**Termination**	**Packaging Quantity**	**Part Number**

Marking



Marking (cont.d)

Manufacturing Date Code (IEC–60062)			
Y = Year, Z = Month			
Year	**Code**	**Month**	**Code**
2010	A	January	1
2011	B	February	2
2012	C	March	3
2013	D	April	4
2014	E	May	5
2015	F	June	6
2016	H	July	7
2017	J	August	8
2018	K	September	9
2019	L	October	O
2020	M	November	N
2021	N	December	D
2022	P		
2023	R		
2024	S		
2025	T		
2026	U		
2027	V		
2028	W		
2029	X		
2030	A		

Environmental Compliance

As an environmentally conscious company, KEMET is working continuously with improvements concerning the environmental effects of both our capacitors and the production of them.

In Europe, due to the RoHS Directive, and in some other geographical areas such as China, legislation has been put in place to prevent the use of some hazardous materials, including lead (Pb) in electronic equipment. All products in this catalog are produced to help our customers' obligations to guarantee their products to fulfill these legislative requirements. The only material of concern in our products has been lead (Pb), which has been removed from all designs to fulfill the requirement of containing less than 0.1% of lead in any homogeneous material.

KEMET will closely follow any changes in legislation world wide and makes any necessary changes in its products, whenever needed.

Some customer segments including medical, defense and automotive electronics may still require the use of lead in electrode coatings. To clarify the situation and distinguish products, the following symbols are used on the packaging labels for RoHS compliant and Pb-free capacitors.

Because of customer requirements, additional markings such as "LF" for lead-free or "LFW" for lead-free wires may appear on the packaging label.

Materials & Environment

The selection of materials used by KEMET for the production of capacitors is the result of extensive experience and constant attention to environmental protection. KEMET selects its suppliers according to ISO 9001 standards and carries out statistical analysis on the materials purchased before acceptance. All materials are, to the company's present knowledge, non-toxic and free from cadmium, mercury, chrome and compounds, polychlorine triphenyl (PCB), bromide and chlorine dioxins bromurate clorurate, CFC and HCFC, and asbestos.

Green Products

All KEMET power film products are ROHS Compliant.

Insulation Resistance

When the capacitor temperature increases, the insulation resistance decreases. This is due to increased electron activity. Low insulation resistance can also be the result of moisture trapped in the windings, caused by a prolonged exposure to excessive humidity.

Dissipation Factor

Dissipation factor is a complex function involved with the inefficiency of the capacitor. The tgδ may change up and down with increased temperature. For more information, please refer to Performance Characteristics.

Sealing

Hermetically Sealed Capacitors
When the temperature increases, the pressure inside the capacitor increases. If the internal pressure is high enough, it can cause a breach in the capacitor which can result in leakage, impregnation, filling fluid or moisture susceptibility.

Resin Encased/Wrap & Fill Capacitors
The resin seals on resin encased and wrap and fill capacitors will withstand short-term exposure to high humidity environments without degradation. Resins and plastic tapes will form a pseudo-impervious barrier to humidity and chemicals. These case materials are somewhat porous and through osmosis can cause contaminants to enter the capacitor. The second area of contaminated absorption is the lead-wire/resin interface. Since resins cannot bond 100% to tinned wires, there can be a path formed up to the lead wire into the capacitor section. Aqueous cleaning of circuit boards can aggravate this condition.

Barometric Pressure
The altitude at which hermetically sealed capacitors are operated controls the voltage rating of the capacitor. As the barometric pressure decreases, the susceptibility to terminal arc-over increases. Non-hermetic capacitors can be affected by internal stresses due to pressure changes. This can be in the form of capacitance changes or dielectric arc-over as well as low insulation resistance. Heat transfer can also be affected by altitude operation. Heat generated in operation cannot be dissipated properly and can result in high RI2 losses and eventual failure.

Radiation
Radiation capabilities of capacitors must be taken into consideration. Electrical degradation in the form of dielectric embitterment can take place causing shorts or opens.

KEMET Electronics Corporation Sales Offices

For a complete list of our global sales offices, please visit www.kemet.com/sales.

Disclaimer

All product specifications, statements, information and data (collectively, the "Information") in this datasheet are subject to change. The customer is responsible for checking and verifying the extent to which the Information contained in this publication is applicable to an order at the time the order is placed.

All Information given herein is believed to be accurate and reliable, but it is presented without guarantee, warranty, or responsibility of any kind, expressed or implied.

Statements of suitability for certain applications are based on KEMET Electronics Corporation's ("KEMET") knowledge of typical operating conditions for such applications, but are not intended to constitute – and KEMET specifically disclaims – any warranty concerning suitability for a specific customer application or use. The Information is intended for use only by customers who have the requisite experience and capability to determine the correct products for their application. Any technical advice inferred from this Information or otherwise provided by KEMET with reference to the use of KEMET's products is given gratis, and KEMET assumes no obligation or liability for the advice given or results obtained.

Although KEMET designs and manufactures its products to the most stringent quality and safety standards, given the current state of the art, isolated component failures may still occur. Accordingly, customer applications which require a high degree of reliability or safety should employ suitable designs or other safeguards (such as installation of protective circuitry or redundancies) in order to ensure that the failure of an electrical component does not result in a risk of personal injury or property damage.

Although all product–related warnings, cautions and notes must be observed, the customer should not assume that all safety measures are indicted or that other measures may not be required.