Product Brief 2024

Surge Arresters – OBC

Gas discharge tubes for on-board chargers

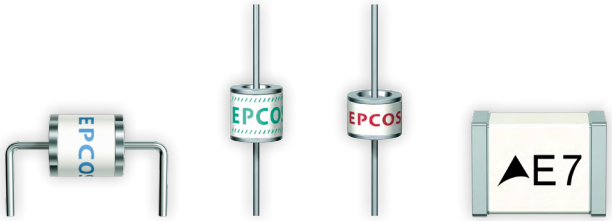
Features

- Built to automotive standard (IATF 16949)
- Fast response time
- High current handling capability
- Low capacitance and insertion loss
- High insulation resistance
- RoHS compatible
- Various wire configurations and packaging upon request

Function of the surge arrester

The batteries of electric and hybrid vehicles can be charged either at public charging stations or at home with home chargers. For this purpose, electric and hybrid vehicles are equipped with an on-board charger (OBC). The electronics of the OBC control and monitor the battery charging process. Overvoltage can occur during charging, damaging or destroying the electronics of the OBC.

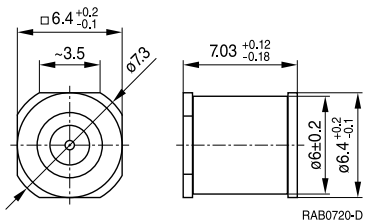
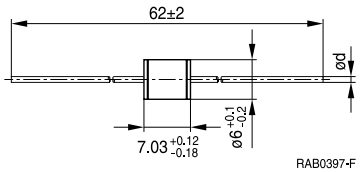
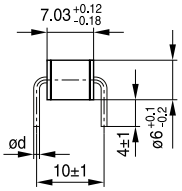
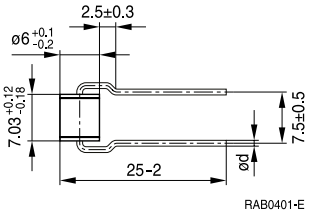
Surge arresters act as voltage-dependent switches to protect the equipment against such overvoltage.



Surge Arresters – OBC

EHV series

Type		EHV60-H30SMD	EHV62-H45	EHV62-H36B1	EHV62-H40B1	EHV62-H25T7
Ordering code		B88069X3323T752	B88069X6943B502	B88069X2213B252	B88069X4973B252	B88069X6593A802
Nom. DC spark over voltage VsdcN	V	3000	4500	3600	4000	2500
Service life						
300 operations 8/20 µs	A	100	100	100	100	100
3 operations 8/20 µs	kA	3	3	3	3	3
1 operation 8/20 µs	kA	5	5	5	5	5
AC withstand voltage	V	1500	2400	1800	2000	1250
Insulation resistance		>1 GΩ	>1 GΩ	>1 GΩ	>1GΩ	>1 GΩ
Capacitance @ 1 MHz		<1 pF	<1 pF	<1 pF	<1 pF	<1 pF

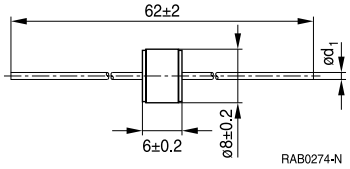
EHV60-H..SMD	EHV62-H..	EHV62-H..B1	EHV62-H..T7
			

Other combinations of voltage level, bending style, and wire diameter are available on request.

EF series

Type		EF270X	EF800X	EF1500X	EF2700X8S	EF3300X8S
Ordering code		B88069X8601*	B88069X2641*	B88069X4301*	B88069X8671*	B88069X3533*
Nom. DC spark over voltage VsdcN	V	270	800	1500	2700	3300
Service life						
10 operations 50 Hz, 1s	A	5	5	5	5	5
10 operations 8/20 µs	kA	5	10	10	5	5
1 operation 8/20 µs	kA	10	12	10	10	10
AC withstand voltage	V	-	-	-	1500	1800
Insulation resistance		>10 GΩ	>10 GΩ	>10 GΩ	>10 GΩ	>10 GΩ
Capacitance @ 1 MHz		<1 pF	<1 pF	<1 pF	<1 pF	<1 pF

EF...X/X8S

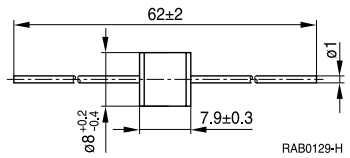


Other combinations of voltage level, bending style, and wire diameter are available on request.

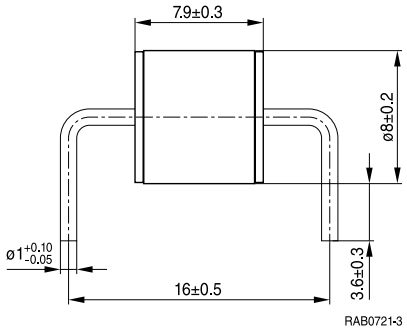
Surge Arresters – OBC

A71 series					
Type		A71-H08X	A71-H10X	A71-H27XB	A71-H45X
Ordering code		B88069X2140*	B88069X3820*	B88069X4503B502	B88069X2590*
Nom. DC spark over voltage VsdcN	V	800	1000	2700	4500
Service life					
10 operations 50 Hz, 1 s	A	10	10	10	10
1 operation 50 Hz, 0.18 s (9 cycles)	A	65	65	20	20
10 operations 8/20 µs	kA	10	10	10	10
1 operation 8/20 µs	kA	15	15	20	15
Insulation resistance		>10 GΩ	>10 GΩ	>10 GΩ	>10 GΩ
Capacitance @ 1 MHz		<1 pF	<1 pF	<1 pF	<1 pF

A71-H..X



A71-H..XB



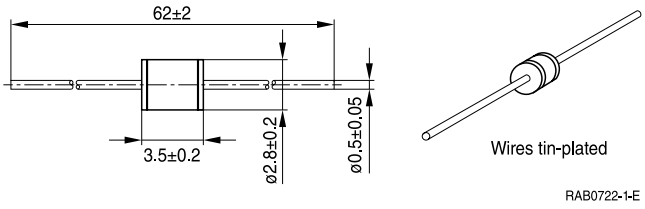
Other combinations of voltage level, bending style, and wire diameter are available on request.

Surge Arresters – OBC for common choke protection

G31 series

Type		G31-A200XS	G31-A300XS	G31-A400X	G31-A500X
Ordering code		B88069X7623K203	B88069X6633K203	B88069X9321K203	B88069X4173K203
Nom. DC spark over voltage VsdcN	V	200	300	400	500
Service life					
300 operations 8/20 µs	kA	100	100	100	100
10 operations 8/20 µs	kA	1	1	1	1
1 operations 8/20 µs	kA	2	2	2	2
400 operations 8/20 µs[1)]	A	500	500	500	500
Insulation resistance		>1 GΩ	>1 GΩ	>1 GΩ	>1 GΩ
Capacitance @ 1 MHz		<0.5 pF	<0.5 pF	<0.5 pF	<0.5 pF

G31

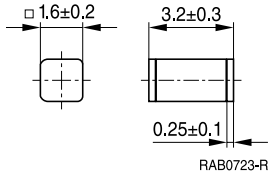


Other combination of voltage level, bending style, and wire diameter are available on request.
[1)] Contact discharge parameters: 1500 pF, 10 kV, 20 Ω.

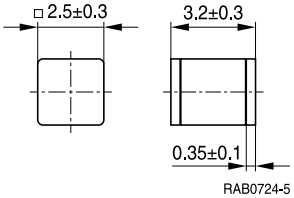
SMD series

Type		S20-A140X	S25-A200X	S30-A300X	S30-A500XS
Ordering code		B88069X3013T603	B88069X2263T253	B88069X6891T253	B88069X1873T253
Nom. DC spark over voltage VsdcN	V	140	200	300	500
Service life					
300 operations 8/20 µs	A	-	-	100	100
10 operations 8/20 µs	kA	0.5	1	1	1
10 operations 5/320 µs	A	150	-	-	150
10 operations 10/700 µs	A	-	150	-	-
100 operations 10/1000 µs	A	-	-	10	10
Insulation resistance		>1 GΩ	>1 GΩ	>1 GΩ	>1 GΩ
Capacitance @ 1 MHz		<0.5 pF	<0.5 pF	<0.5 pF	<0.5 pF

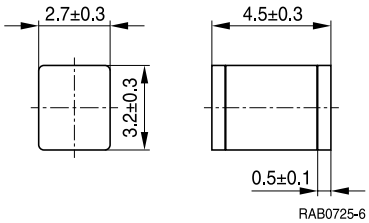
S20



S25



S30



Surge Arresters – OBC

Overvoltage protection in on-board chargers

The function of the OBC is to convert the AC voltage from an external source to a specific DC voltage based on the requirements of the battery management system. Such systems currently range up to 22 kW with operating voltages of up to 800 V. As a result, voltage surges in powered systems caused by lighting or line power faults can affect sensitive electronic circuits. Gas discharge tubes (GDTs)/arresters have long been the solution of choice for overvoltage protection and the protection of AC/DC converters.

With the implementation of on-board circuits as part of the introduction of electric and plug-in hybrid drives, motor vehicles are facing the same hazards as fixed installations or equipment. Arresters offer a high current carrying capacity specifically designed to meet the needs of the automotive industry.

Arresters shunt surge current to ground and limit overvoltage to a harmless level. The advantages of arresters lie in their high current carrying capacity, their high insulation resistance, and their extremely low capacitance. However, arresters are hardly noticed during normal operation.

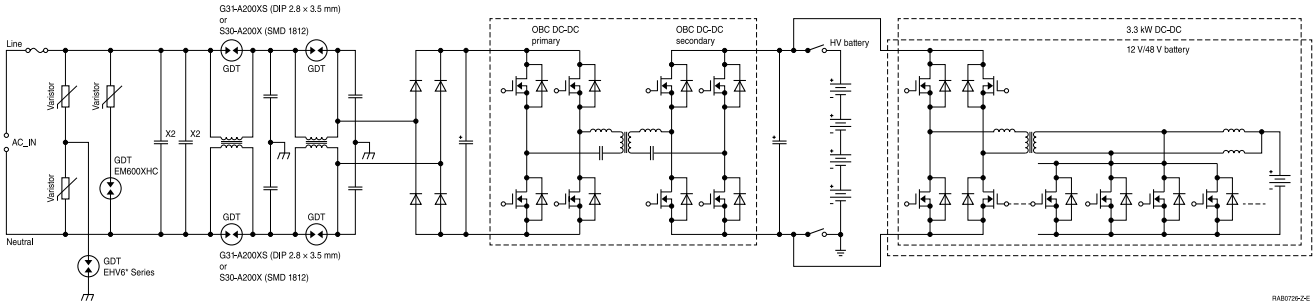
All arresters are manufactured in a factory certified to IATF 16949 standard. The arresters are tested according to automotive standards such as IEC 60068 and can withstand high humidity and heavy vibrations while maintaining full functionality. The arresters can withstand high AC voltages without igniting. EPCOS arresters are fully UL certified (UL1449, E319264) and can be delivered for many different voltage levels and in different wire configurations.

Overvoltage protection of battery chargers in automotive applications

AC/DC OBC charger < 6.6 kW

For OBC input voltage: 90 V to 265 V.

GDT tested according to EMC standards IEC61000-4-5/UL1449 3rd edition and GB/T17626.5.



Surge Arresters – OBC

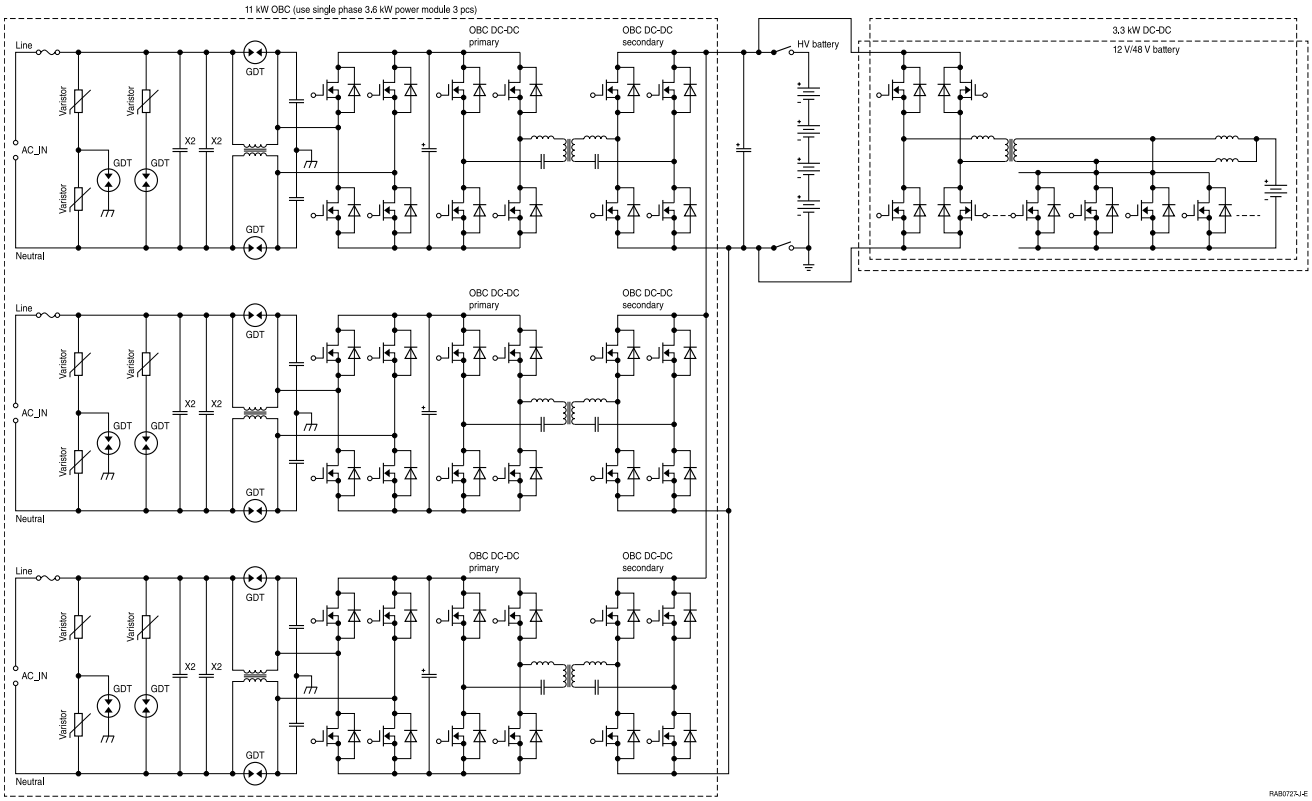
Overvoltage protection of battery chargers in automotive applications

11 kW OBC for 3.6 kW stacked electrical appliances and high-voltage to low-voltage DC/DC converters.

For OBC input voltage: 220 V AC

GDT tested according to EMC standards IEC61000-4-5/UL1449 3rd edition and GB/T 17626.5.

Surge 4 kV for line-to-ground and line-to-line.



L-G protection: EHV/EF/A7/S80 series

Common choke protection: G31/S30/S25/S20 series

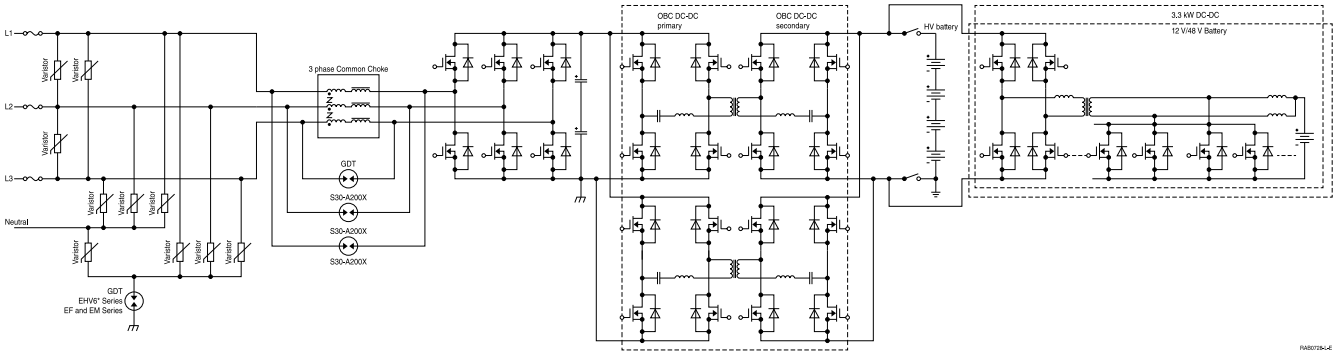
Surge Arresters – OBC

Overvoltage protection of battery chargers in automotive applications

AC/DC 3 Phase OBC charger > 11 kW + 3 kW DC/DC

For OBC AC input voltage: 380 V AC, DC output voltage: 400 to 800 V DC

GDT tested according to EMC standards IEC61000-4-5/UL1449 3rd edition and GB/T 17626.5.



L-G protection: EHV/EF/A7/S80 series

Common choke protection: G31/S30/S25/S20 series

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