



MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

GSA-LL Series

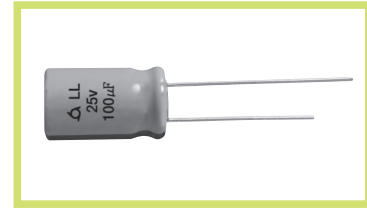
- Non-solvent proof.
- Height 7mm.
- Low leakage current.
- For CAR-Audio.

- 85°C 2,000Hrs assured.
- RoHS compliant.
- Halogen-free capacitors are also available.

GSA

GSA-LL

Low Leakage current



LL Series

- Non-solvent proof.
- Very low leakage current.
- For CAR-Audio.

- 85°C 2,000Hrs assured.
- RoHS compliant.
- Halogen-free capacitors are also available.

MHA

LL

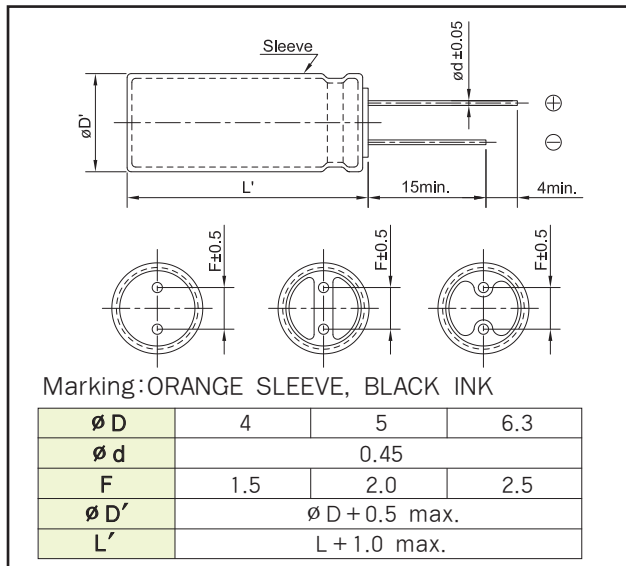
Low Leakage current

SPECIFICATIONS

Item	Characteristics																												
Rated Voltage Range	6.3 ~ 100 V _{DC}																												
Operating Temperature Range	-40 ~ +85°C																												
Capacitance Tolerance	±20% (M) (at 20°C, 120Hz)																												
Leakage Current(Max.)	GSA-LL Series : I=0.004V(μA) or 0.4μA, whichever is greater. LL Series : I=0.002CV(μA) or 0.2μA, whichever is greater. Where, I:Max. leakage current(μA), C:Nominal capacitance(μF), V:Rated voltage(V _{DC}) (at 20°C, 2 minutes)																												
Dissipation Factor(Tanδ)	<table border="1"> <thead> <tr> <th>Rated Voltage(V_{DC})</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50~63</th> <th>100</th> </tr> </thead> <tbody> <tr> <td>Tan δ(Max.)</td> <td>0.24</td> <td>0.20</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.10</td> <td>0.07</td> </tr> </tbody> </table> (at 20°C, 120Hz)	Rated Voltage(V _{DC})	6.3	10	16	25	35	50~63	100	Tan δ(Max.)	0.24	0.20	0.16	0.14	0.12	0.10	0.07												
Rated Voltage(V _{DC})	6.3	10	16	25	35	50~63	100																						
Tan δ(Max.)	0.24	0.20	0.16	0.14	0.12	0.10	0.07																						
Temperature Characteristics (Max. Impedance ratio)	<table border="1"> <thead> <tr> <th rowspan="2">Rated Voltage(V_{DC})</th> <th colspan="2">GSA-LL Series</th> <th colspan="5">LL Series</th> </tr> <tr> <th>—</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35~100</th> </tr> </thead> <tbody> <tr> <td>Z(-25°C)/Z(+20°C)</td> <td>4</td> <td>4</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>Z(-40°C)/Z(+20°C)</td> <td>8</td> <td>8</td> <td>6</td> <td>4</td> <td>3</td> <td>3</td> </tr> </tbody> </table> (at 120Hz)	Rated Voltage(V _{DC})	GSA-LL Series		LL Series					—	6.3	10	16	25	35~100	Z(-25°C)/Z(+20°C)	4	4	3	2	2	2	Z(-40°C)/Z(+20°C)	8	8	6	4	3	3
Rated Voltage(V _{DC})	GSA-LL Series		LL Series																										
	—	6.3	10	16	25	35~100																							
Z(-25°C)/Z(+20°C)	4	4	3	2	2	2																							
Z(-40°C)/Z(+20°C)	8	8	6	4	3	3																							
Load Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 2,000 hours at 85°C. Capacitance change ≤ ±20% of the initial value Tanδ ≤ 200% of the initial specified value Leakage current ≤ The initial specified value																												
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 500 hours at 85°C without voltage applied. The rated voltage shall be applied to the capacitors for a minimum of 30 minutes, at least 24 hours and not more than 48 hours before the measurements. Capacitance change ≤ ±20% of the initial value Tanδ ≤ 200% of the initial specified value Leakage current ≤ The initial specified value																												
Others	Satisfied characteristics KS C IEC 60384-4																												

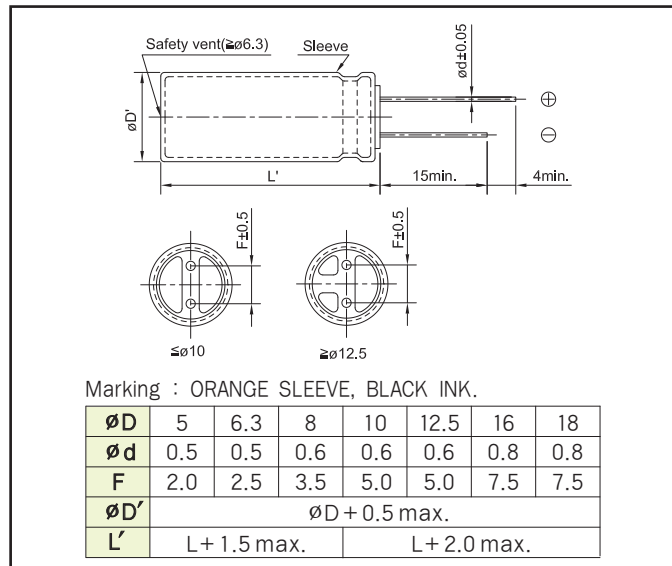
DIMENSIONS OF GSA-LL Series

Unit(mm)



DIMENSIONS OF LL Series

Unit(mm)



RATINGS OF GSA-LL Series

μF \ V _{DC}	6.3		10		16		25		35		50	
	1					4×7	9.2					4×7
1.5					4×7	11					4×7	14
2.2					4×7	12					4×7	17
3.3					4×7	15	4×7	17	4×7	18	5×7	21
4.7					4×7	20	4×7	21	5×7	22	6.3×7	25
6.8					5×7	23	5×7	25	6.3×7	28	6.3×7	31
10			4×7	25	5×7	27	5×7	30	6.3×7	33	6.3×7	40
15	4×7	28	5×7	30	6.3×7	33	6.3×7	37	6.3×7	39		
22	5×7	33	5×7	37	6.3×7	42	6.3×7	45	6.3×7	49		
33	5×7	41	6.3×7	45	6.3×7	52	6.3×7	55				
47	6.3×7	49	6.3×7	55	6.3×7	62						
68	6.3×7	59	6.3×7	65								
100	6.3×7	73										

Case Size $\phi D \times L$ (mm)
 Rated Ripple Current (mA_{rms}/85°C, 120Hz)

RATINGS OF LL Series

μF \ V _{DC}	6.3		10		16		25		35		50		63		100	
	1											5×11	16			5×11
2.2											5×11	23			6.3×11	31
3.3											5×11	28			8×11.5	44
4.7							5×11	28	5×11	31	6.3×11	38			8×11.5	52
10					5×11	39	6.3×11	47	6.3×11	51	8×11.5	64	8×11.5	64	10×16	100
22			5×11	51	6.3×11	66	8×11.5	80	8×11.5	87	10×12.5	112	10×16	124	10×20	160
33			6.3×11	72	6.3×11	80	8×11.5	98	10×12.5	125	10×16	151	10×16	151	12.5×20	217
47			6.3×11	86	8×11.5	110	10×12.5	138	10×12.5	149	10×16	181	10×20	196	12.5×25	282
100			8×11.5	143	10×12.5	189	10×16	223	10×20	260	12.5×20	316	12.5×25	344	16×25	455
220	10×12.5	229	10×16	276	10×20	335	12.5×20	397	12.5×25	466	16×25	564	16×31.5	607	18×35.5	775
330	10×16	309	10×20	367	12.5×20	454	12.5×25	528	12.5×25	631	16×31.5	744	16×35.5	761	18×40	964
470	10×20	399	12.5×20	485	12.5×20	542	16×25	697	16×25	753	16×35.5	908	18×35.5	948		
1,000	12.5×25	702	12.5×25	769	16×25	951	18×35.5	1,120	16×25	1,262	18×40	1,404				
2,200	16×25	1,107	16×31.5	1,295	18×35.5	1,529	18×40	1,647								
3,300	16×35.5	1,438	16×35.5	1,554	18×40	1,804										
4,700	18×35.5	1,676	18×40	1,820												

Case Size $\phi D \times L$ (mm)
 Rated Ripple Current (mA_{rms}/85°C, 120Hz)

GSA-LL/LL Series