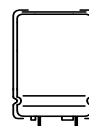


105°C



GSH



DIN SERIES

ULTRA COMPACT DESIGN

LONG LIFETIME

PCB SOLDER PINS

■ FEATURES

- All internal contacts welded
- High CV product
- High reliability
- Ultra compact

■ APPLICATIONS

- HiFi
- Computer
- Industrial
- Tube amplifier

RoHS compliant
REACH compliant

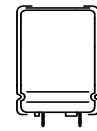
■ GENERAL SPECIFICATIONS

Items	Characteristics
Rated capacitance range C_R	68... 150.000 μF
Capacitance tolerance	$\pm 20\%$
Rated voltage range U	16 ... 450 V
Surge voltage U_S	$U_R \leq 315 \text{ V}: U_S = 1,15 U_R$; $U_R > 315 \text{ V}: U_S = 1,10 U_R$
Max. reverse voltage	2 V
Category temperature range	- 40°C ... + 105 °C
Leakage current I_L after 5 min @ U_R	$\leq 0,008 * C_R [\mu\text{F}] * U_R [\text{V}] + 6 \mu\text{A} [\mu\text{A}]$
Useful life 5000 h @ 105 °C ; U_R ; I_R	Requirements $\Delta C/C \leq 30\%$ of initial value ; ESR $\leq 300\%$ of specified ; limit $I_L \leq$ specified limit
Endurance test 2000 h @ 105 °C , U_R	Requirements $\Delta C/C \leq 20\%$ of initial value ; ESR $\leq 130\%$ of specified ; limit $I_L \leq$ specified limit
Climatic category IEC 60068	40/105/56
Voltage proof of the external insulation	$\geq 2500 \text{ V AC}$
Sectional specification	IEC 60384-4

Different voltages and capacitance combinations are available on request. Also in small lots.

Stand: 12/2019





■ DRAWING AND MOUNTING PIN LAYOUT OF THE SERIES GSH CAPACITORS

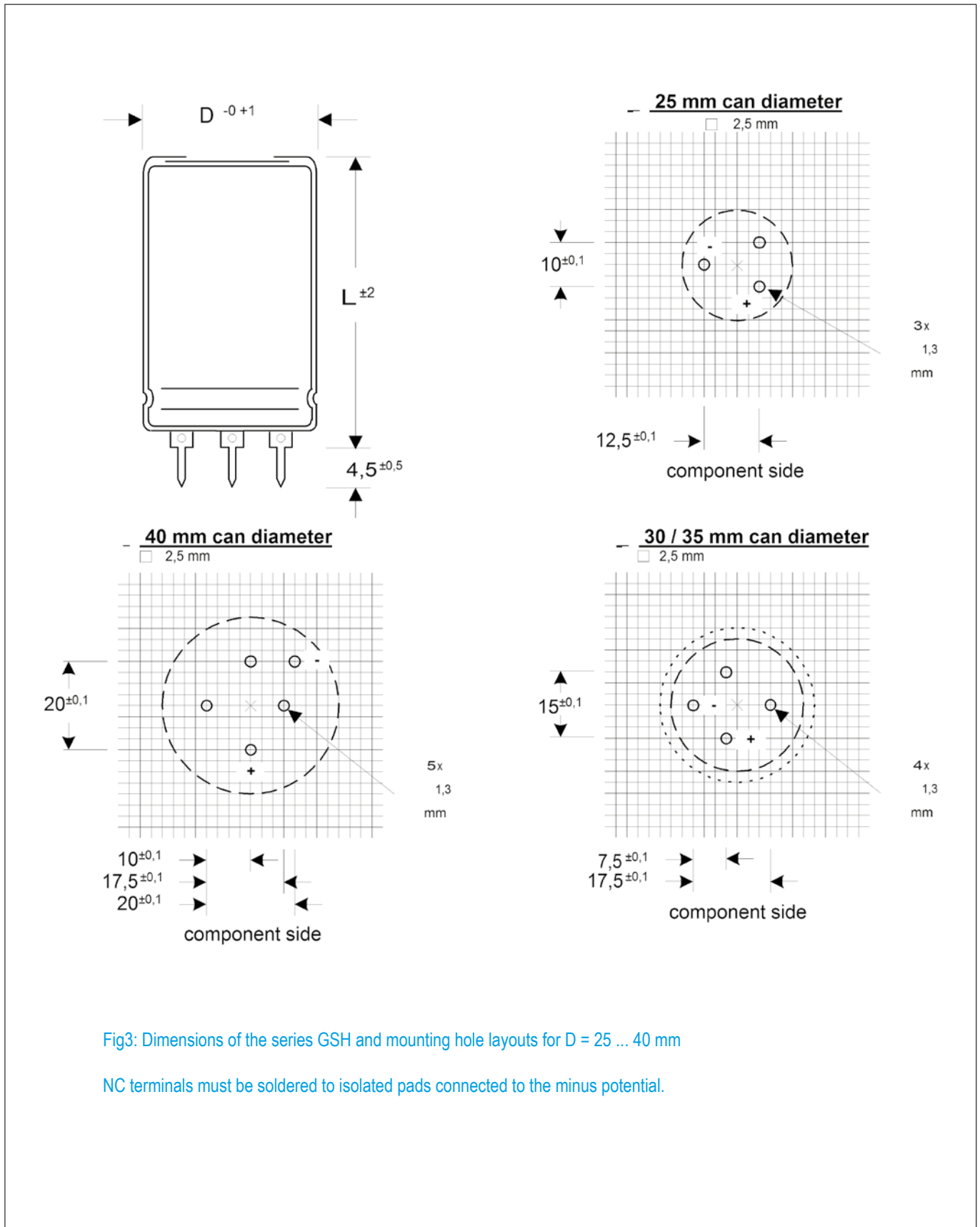
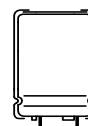


Fig3: Dimensions of the series GSH and mounting hole layouts for D = 25 ... 40 mm

NC terminals must be soldered to isolated pads connected to the minus potential.

105°C



GSH

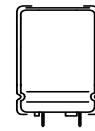
ELECTRICAL DATA AND ORDERING CODE FOR SERIES GSH

Rated voltage U_R [V]	Rated cap. C_R [μF]	Case size D x L [mm]	Typ. ESR 100 Hz, 20°C [mΩ]	Ripple current IR~ 100 Hz, 105°C [A]	Order code GSH...
16	10000	25x30	48	2,4	10301625030
	12000	25x35	40	2,8	12301625035
	15000	25x40	32	3,3	15301625040
	15000	30x30	32	3,3	15301630030
	18000	25x45	27	3,8	18301625045
	18000	25x50	27	4,0	18301625050
	18000	30x35	27	3,8	18301630035
	18000	35x30	27	4,0	18301635030
	22000	30x40	22	4,4	22301630040
	22000	35x35	22	4,6	22301635035
	27000	30x45	18	5,1	27301630045
	27000	30x50	18	5,3	27301630050
	27000	35x40	18	5,3	27301635040
	33000	35x45	14	6,2	33301635045
	39000	30x70	12	7,2	39301630070
	39000	35x50	12	7,0	39301635050
	47000	40x50	10	8,1	47301640050
	56000	35x80	9	10,0	56301635080
	56000	40x50	9	8,8	56301640050
	68000	40x60	7	10,4	68301640060
82000	35x100	6	13,3	82301635100	
82000	40x80	6	12,7	82301640080	
82000	45x60	6	11,4	82301645060	
100000	45x80	5	14,0	10401645080	
120000	40x100	4	16,9	12401640100	
150000	45x100	3	18,8	15401645100	
25	6800	25x30	66	2,1	68202525030
	8200	25x35	54	2,4	82202525035
	10000	25x40	45	2,8	10302525040
	10000	30x30	45	2,8	10302530030
	12000	25x45	37	3,2	12302525045
	12000	30x35	37	3,2	12302530035
	15000	25x50	30	3,7	15302525050
	15000	30x40	30	3,7	15302530040
	15000	35x30	30	3,7	15302535030
	18000	30x45	26	4,2	18302530045
	18000	30x50	26	4,4	18302530050
	18000	35x35	26	4,2	18302535035
	22000	35x40	21	4,9	22302535040
	22000	35x45	21	5,1	22302535045
	27000	30x70	17	6,1	27302530070
	27000	35x50	17	5,9	27302535050
	33000	35x60	14	7,0	33302535060
	39000	40x50	12	7,5	39302540050
	47000	35x80	10	9,3	47302535080
	47000	40x60	10	8,8	47302540060
	56000	35x100	8	11,2	56302535100
	56000	45x60	8	9,6	56302545060

Rated voltage U_R [V]	Rated cap. C_R [μF]	Case size D x L [mm]	Typ. ESR 100 Hz, 20°C [mΩ]	Ripple current IR~ 100 Hz, 105°C [A]	Order code GSH...	
25	68000	40x80	7	11,8	68302540080	
	68000	40x100	7	12,9	68302540100	
	82000	45x80	6	12,9	82302545080	
	100000	45x100	5	15,6	10402545100	
	2700	25x30	142	1,4	27204025030	
40	3300	25x35	116	1,7	33204025035	
	3900	25x40	98	1,9	39204025040	
	3900	30x30	98	1,9	39204030030	
	4700	25x45	81	2,2	47204025045	
	4700	30x35	81	2,2	47204030035	
	5600	25x50	68	2,5	56204025050	
	5600	30x40	68	2,5	56204030040	
	5600	35x30	68	2,5	56204035030	
	6800	30x45	56	2,8	68204030045	
	6800	35x35	56	2,9	68204035035	
	8200	30x50	47	3,2	82204030050	
	8200	35x40	47	3,3	82204035040	
	8200	35x45	47	3,4	82204035045	
	10000	35x50	38	3,9	10304035050	
	12000	30x70	32	4,5	12304030070	
	12000	35x60	32	4,6	12304035060	
	15000	40x50	25	5,1	15304040050	
	18000	35x80	21	6,4	18304035080	
	18000	40x60	21	6,0	18304040060	
	22000	35x100	17	7,7	22304035100	
	22000	40x80	17	7,4	22304040080	
	22000	45x60	17	6,6	22304045060	
	27000	40x100	14	8,9	27304040100	
	27000	45x80	14	8,2	27304045080	
	39000	45x100	10	10,7	39304045100	
	63	1800	25x30	159	1,3	18206325030
		2200	25x35	130	1,6	22206325035
		2700	25x40	106	1,8	27206325040
		2700	30x30	106	1,8	27206330030
		3300	25x45	87	2,1	33206325045
3300		30x35	87	2,1	33206330035	
3900		25x50	73	2,4	39206325050	
3900		30x40	73	2,4	39206330040	
3900		35x30	73	2,4	39206335030	
4700		30x45	61	2,7	47206330045	
4700		35x35	61	2,8	47206335035	
5600		30x50	51	3,1	56206330050	
6800		35x45	42	3,6	68206335045	
8200		30x70	35	4,3	82206330070	
10000		35x60	29	4,9	10306335060	
10000		40x50	29	4,8	10306340050	
12000		35x80	24	6,0	12306335080	
12000		40x60	24	5,6	12306340060	

Stand: 12/2019

105°C



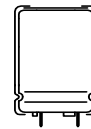
GSH

Rated voltage U_R [V]	Rated cap. C_R [μF]	Case size D x L [mm]	Typ. ESR 100 Hz, 20°C [mΩ]	Ripple current IR~ 100 Hz, 105°C [A]	Order code GSH...
63	15000	45x60	19	6,3	15306345060
	18000	35x100	16	8,1	18306335100
	18000	40x80	16	7,7	18306340080
	22000	40x100	13	9,3	22306340100
	22000	45x80	13	8,5	22306345080
	27000	45x100	11	10,3	27306345100
80	1200	25x30	265	1,0	12208025030
	1500	25x35	212	1,2	15208025035
	1800	25x40	177	1,4	18208025040
	1800	30x30	177	1,4	18208030030
	2200	25x45	145	1,6	22208025045
	2200	25x50	145	1,7	22208025050
	2200	30x35	145	1,6	22208030035
	2200	35x30	145	1,7	22208035030
	2700	30x40	118	1,9	27208030040
	2700	30x45	118	2,0	27208030045
	2700	35x35	118	2,0	27208035035
	3300	30x50	97	2,3	33208030050
	3300	35x40	97	2,3	33208035040
	3900	35x45	82	2,6	39208035045
	4700	35x50	68	3,0	47208035050
	5600	30x70	57	3,4	56208030070
	5600	35x60	57	3,5	56208035060
	5600	40x50	57	3,4	56208040050
	6800	35x80	47	4,3	68208035080
	6800	40x60	47	4,0	68208040060
	10000	35x100	32	5,7	10308035100
	10000	45x60	32	4,9	10308045060
	12000	40x80	27	6,0	12308040080
	12000	45x80	27	6,0	12308045080
	15000	40x100	21	7,3	15308040100
	18000	45x100	18	8,0	18308045100
100	1000	25x30	159	1,3	10210025030
	1200	25x35	133	1,5	12210025035
	1500	25x40	106	1,8	15210025040
	1500	30x30	106	1,8	15210030030
	1800	25x45	88	2,1	18210025045
	1800	25x50	88	2,2	18210025050
	1800	35x30	88	2,2	18210035030
	2200	30x40	72	2,4	22210030040
	2200	30x45	72	2,5	22210030045
	2200	35x35	72	2,5	22210035035
	2700	30x50	59	2,9	27210030050
	2700	35x40	59	2,9	27210035040
	3300	35x45	48	3,4	33210035045
	3900	30x70	41	4,0	39210030070
	3900	35x50	41	3,8	39210035050
	4700	35x60	34	4,5	47210035060
	4700	40x50	34	4,4	47210040050
	5600	35x80	28	5,5	56210035080

Rated voltage U_R [V]	Rated cap. C_R [μF]	Case size D x L [mm]	Typ. ESR 100 Hz, 20°C [mΩ]	Ripple current IR~ 100 Hz, 105°C [A]	Order code GSH...
100	5600	40x60	28	5,1	56210040060
	8200	35x100	19	7,3	82210035100
	8200	40x80	19	7,0	82210040080
	8200	45x60	19	6,2	82210045060
	10000	45x80	16	7,7	10310045080
	12000	40x100	13	9,2	12310040100
	15000	45x100	11	10,3	15310045100
160	470	25x30	237	1,1	47116025030
	560	25x35	199	1,3	56116025035
	680	25x40	164	1,5	68116025040
	680	30x30	164	1,4	68116030030
	820	25x45	136	1,6	82116025045
	820	30x35	136	1,7	82116030035
	1000	25x50	111	1,9	10216025050
	1000	30x40	111	1,9	10216030040
	1000	35x30	111	1,9	10216035030
	1200	30x45	93	2,2	12216030045
	1200	35x35	93	2,2	12216035035
	1500	30x50	74	2,6	15216030050
	1500	35x40	74	2,6	15216035040
	1800	35x45	62	3,0	18216035045
	1800	35x50	62	3,1	18216035050
	2200	30x70	51	3,6	22216030070
	2200	35x60	51	3,7	22216035060
	2700	40x50	41	4,0	27216040050
	3300	35x80	34	5,0	33216035080
	3300	40x60	34	4,7	33216040060
	3900	35x100	29	6,2	39216035100
	3900	45x60	29	5,2	39216045060
	4700	40x80	24	6,3	47216040080
	5600	40x100	20	7,5	56216040100
	5600	45x80	20	6,9	56216045080
	6800	45x100	16	8,3	68216045100
200	330	25x30	290	1,0	33125025030
	390	25x35	245	1,1	39125025035
	470	25x40	203	1,3	47125025040
	470	30x30	203	1,3	47125030030
	560	25x45	171	1,5	56125025045
	560	30x35	171	1,5	56125030035
	560	35x30	171	1,6	56125035030
	680	25x50	141	1,7	68125025050
	680	30x40	141	1,7	68125030040
	820	30x45	117	2,0	82125030045
	820	30x50	117	2,1	82125030050
	820	35x35	117	2,0	82125035035
	1000	35x40	96	2,3	10225035040
	1200	35x45	80	2,6	12225035045
	1200	35x50	80	2,7	12225035050
	1500	30x70	64	3,2	15225030070
	1500	35x60	64	3,3	15225035060

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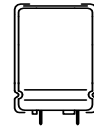
105°C



GSH

Rated voltage U_R [V]	Rated cap. C_R [μF]	Case size D x L [mm]	Typ. ESR 100 Hz, 20°C [mΩ]	Ripple current IR~ 100 Hz, 105°C [A]	Order code GSH...
250	1800	35x80	53	4,0	18225035080
	1800	40x50	53	3,5	18225040050
	1800	40x60	53	3,8	18225040060
	2700	35x100	35	5,4	27225035100
	2700	40x80	35	5,2	27225040080
	2700	45x60	35	4,6	27225045060
	3300	40x100	29	6,3	33225040100
	3300	45x80	29	5,7	33225045080
	4700	45x100	20	7,4	47225045100
350	180	25x30	531	0,7	18135025030
	220	25x35	434	0,9	22135025035
	270	25x40	354	1,0	27135025040
	270	30x30	354	1,0	27135030030
	330	25x45	290	1,2	33135025045
	330	30x35	290	1,1	33135030035
	330	35x30	290	1,2	33135035030
	390	25x50	245	1,3	39135025050
	390	30x40	245	1,3	39135030040
	470	30x45	203	1,5	47135030045
	470	35x35	203	1,5	47135035035
	560	30x50	171	1,7	56135030050
	560	35x40	171	1,7	56135035040
	560	35x45	171	1,8	56135035045
	680	35x50	141	2,1	68135035050
	820	30x70	117	2,3	82135030070
	820	35x60	117	2,4	82135035060
	820	40x50	117	2,4	82135040050
	1200	35x80	80	3,3	12235035080
	1200	40x60	80	3,1	12235040060
1500	35x100	64	4,0	15235035100	
1500	45x60	64	3,4	15235045060	
1800	40x80	53	4,2	18235040080	
1800	40x100	53	4,6	18235040100	
1800	45x80	53	4,2	18235045080	
2700	45x100	35	5,6	27235045100	
400	150	25x30	849	0,6	15140025030
	180	25x35	708	0,7	18140025035
	220	25x40	579	0,8	22140025040
	220	30x30	579	0,8	22140030030
	270	25x45	472	0,9	27140025045
	270	25x50	472	0,9	27140025050
	270	30x35	472	0,9	27140030035
	270	35x30	472	0,9	27140035030

Rated voltage U_R [V]	Rated cap. C_R [μF]	Case size D x L [mm]	Typ. ESR 100 Hz, 20°C [mΩ]	Ripple current IR~ 100 Hz, 105°C [A]	Order code GSH...	
400	330	30x40	386	1,0	33140030040	
	330	35x35	386	1,1	33140035035	
	390	30x45	327	1,2	39140030045	
	390	30x50	327	1,2	39140030050	
	470	35x45	271	1,4	47140035045	
	560	30x70	227	1,7	56140030070	
	560	35x50	227	1,6	56140035050	
	680	35x60	187	1,9	68140035060	
	680	40x50	187	1,9	68140040050	
	820	35x80	155	2,3	82140035080	
	820	40x60	155	2,2	82140040060	
	1200	35x100	106	3,1	12240035100	
	1200	40x80	106	3,0	12240040080	
	1200	45x60	106	2,7	12240045060	
	1500	40x100	85	3,6	15240040100	
	1500	45x80	85	3,3	15240045080	
	2200	45x100	58	4,4	22240045100	
	450	120	25x30	929	0,6	12145025030
		150	25x35	743	0,7	15145025035
		150	25x40	743	0,7	15145025040
180		25x45	619	0,8	18145025045	
180		30x30	619	0,7	18145030030	
180		30x35	619	0,8	18145030035	
220		25x50	507	0,9	22145025050	
220		30x40	507	0,9	22145030040	
220		35x30	507	0,9	22145035030	
270		30x45	413	1,0	27145030045	
270		35x35	413	1,1	27145035035	
330		30x50	338	1,2	33145030050	
330		35x40	338	1,2	33145035040	
390		35x45	286	1,4	39145035045	
470		30x70	237	1,6	47145030070	
470		35x50	237	1,6	47145035050	
560		35x60	199	1,9	56145035060	
560		40x50	199	1,8	56145040050	
680		35x80	164	2,3	68145035080	
680		40x60	164	2,1	68145040060	
820	35x100	136	2,8	82145035100		
820	45x60	136	2,4	82145045060		
1000	40x80	111	2,9	10245040080		
1200	40x100	93	3,5	12245040100		
1200	45x80	93	3,2	12245045080		
1500	45x100	74	3,9	15245045100		



USEFUL LIFE AS A FUNCTION OF AMBIENT TEMPERATURE AND ACTUAL RIPPLE CURRENT

