CSB Series Datasheet

Shunt Open Frame Surface Mount Resistor

ORDERING CODE-Example

CSB	251	F	K	-	13-	R002	AA
Type	Size	Tol.	Pack-Code	TC	Reel diam.	*R Value	
	251=2512 392=3921 593=5931	F = ±1% J = ±5%	Blister tape	Base on spec.	13 inch		AA = Standard

*0.2 mΩ to 4 mΩ there are 3~4 digits indicated the resistance value. Letter R/ L is decimal point
(L2 = 0.0002Ω, 0R001 =1mΩ)

APPLICATIONS

- Automotive
- Charger
- Alternative Energy
- Power Supply

FEATURES

- High Conductivity Copper Terminals
- Excellent Long-term Stability
- Flame Resistance
- Solid Metal Construction
- RoHs e REACH Compliant
- AEC-Q200 Qualified available

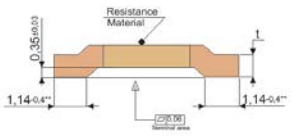
TECHNICAL DATA

Type / Size		CSB251	CSB392	CSB593
Nominal Power Rating P_{70}	[W]	Up to 4.3	Up to 12	Up to 15
Resistance Range (Preferred values)	[Ω]	R0003,R0005,R001,R0013,R002, R003,R004,R005,R0068,R01	R0002,R0003,R0005,R0007,R001, R0015,R002,R0025,R003,R004,R005	R0001,R0002,R0003,R0005, R0006,R001,R002
Tolerances	±[%]	F = 1%, J = 5%		
Temperature Coefficient	[ppm/ºC]	See table		
Operating Temperature Range	[ºC]	-55 ... +170		
Inductance	[nH]	< 2	< 3	< 3
Max. working voltage	$[V]_{RMS}$	$\sqrt{P_{70} \times R}$		

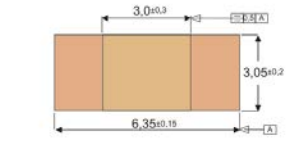
DIMENSIONS [mm]

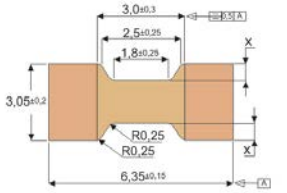
Type

CSB251



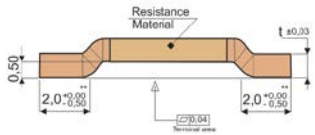
Resistor Dim.

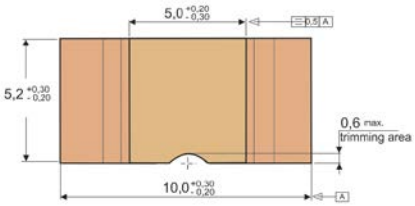




**Tol. for t≤0,67mm , for t>0,67 applicable tol. Is +0/-0,7

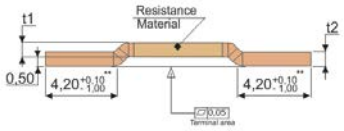
CSB392

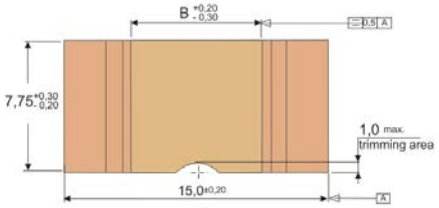


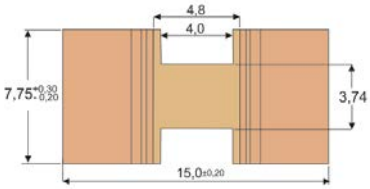


**Tol. for t≤0,68mm , for t>0,68 applicable tol. Is +0/-0,8

CSB593

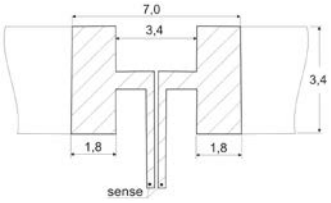


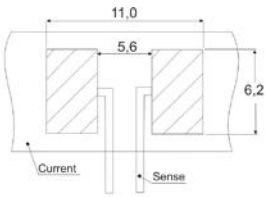


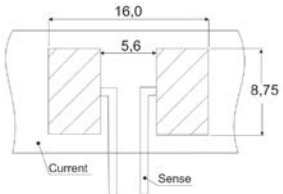


**For 0,1mΩ , 4,8mm +0,1/-1,0mm Dim. (B) see table next page

PCB Layout (Solder pad)







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CSB Series Datasheet

PERFORMANCE DATE

Type		CSB251	CSB392	CSB593
Derating Linear	[ºC]	70...170 (0W)		
Endurance *IEC60115-1 clause 4.25* *(P_{70} @ 70[°C], 1000[h])*	±[%]	1,0		
Resistance to Soldering Heat *IEC60115-1 clause 4.18* *(260^{+5}[°C], $3,5^{+1}$[s])*	±[%]	N.A.		
Low Temperature Exposure *-65[ºC] 24[H]*	±[%]	0,1		
High Temperature Exposure *+170[ºC] 1000[H]*	±[%]	1		
Rapid change of temperature *IEC60115-1 clause 4.19 and IEC60068-2-14* *(30 [min] -55 [ºC] and 30 [min] +150 [ºC])*	±[%]	0,5		
Biased Humidity *MIL-STD-202 Method 103* *(85[ºC], 85[%RH] 1.000[h])*	±[%]	0,5		
Vibrations *Mil-STD-202 Method 204* *(10 to 2000 [Hz], 5 [G] for 20 [min], 12 cycles, each of 3 orientation*	±[%]	0,2		
Mechanical Shock *Mil-STD-202 Method 213* *(Method C, peak value 100 [G], Half sine)*	±[%]	0,2		
Solderability *IEC60068-2-20* *(245^{+5}[ºC] $3^{+0,5}$[s])*		Solder bath method (> 95% coverage)		
Stability deviation ** Tt = Terminal Temperature*	±[%]	< 0.5 after 2000 Hours * T_t = 110ºC		
		< 1.0 after 2000 Hours * T_t = 140ºC		

ELECTRICAL CHARACTERISTICS

Type	Value [mΩ]	Resistance values	Thickness t [mm]	TCR [ppm]	P_{70} [W]	P_{100} [W]	Material	Resistive alloy TCR [ppm]
CSB251	0.3	L3	0,95	< 100	4.3	3.0	Copper Manganese MC2Alloy	<±10
	0.5	L5	0,85	< 75	4.3	3.0	Copper Manganese 43 Alloy	
	1.0	R001	0,42	< 50	4.3	3.0		
	1.3	1L3	0,33		4.3	3.0		
	2.0	R002	0,67		4.3	3.0	Aluchrom Alloy	<-25
	3.0	R003	0,45		2.9	2.0		
	4.0	R004	0,33		2.9	2.0		
	5.0	R005	0,33		2.1	1.5		
	6.8	6L8	0,33		2.1	1.5		
	10	R01	0,33		1.4	1.0		

Type	Value [mΩ]	Resistance values	Thickness t [mm]	TCR [ppm]	P_{70} [W]	P_{100} [W]	Material	Resistive alloy TCR [ppm]
CSB392	0.2	L2	1,42	< 150	12	5	Copper Manganese MC2Alloy	<±10
	0.3	L3	1,42	< 100	10	5		
	0.5	L5	0,84	< 70	9	5	Copper Manganese 43 Alloy	
	0.7	L7	0,60	< 60	8	5		
	1.0	R001	0,42	< 50	7	4		
	1.0	R001	1,36		8	5	Aluchrom Alloy	<-25
	1.5	1L5	0,91		7	4.5		
	2.0	R002	0,68		6	4		
	2.5	2L5	0,54		5	3.5		
	3.0	R003	0,45		5	3		
	4.0	R004	0,34		4	2,5		
	5.0	R005	0,27		3	2		

Type	Value [mΩ]	Resistance values	Thickness t1	Thickness t2	TCR [ppm]	P_{70} [W]	P_{100} [W]	B [mm]	Material	Resistive alloy TCR [ppm]
CSB593	0.1	L1	1,42	1,42	< 100	15	10	3,7	Copper Manganese MC2Alloy	<±10
	0.2	L2	1,40	1,40		15	10	5,0	Copper Manganese 43 Alloy	
	0.3	L3	0,93	0,93		10	7	5,0		
	0.5	L5	0,56	0,56	< 75	8	6	5,0		
	0.5	L5	1,62	1,42		10	7	4,4	Aluchrom Alloy	<-25
	0.6	L6	0,47	0,47		8	6	5,0	Copper Manganese 43 Alloy	<±10
	1.0	R001	0,91	0,91	< 50	9	6	5,0	Aluchrom Alloy	<-25
	2.0	R002	0,46	0,70		7	4	5,0		

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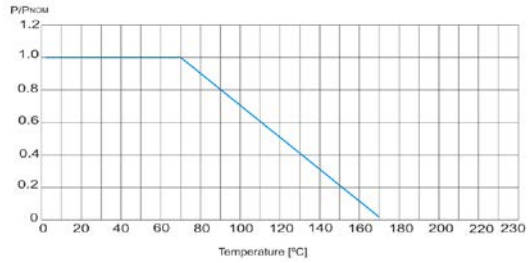
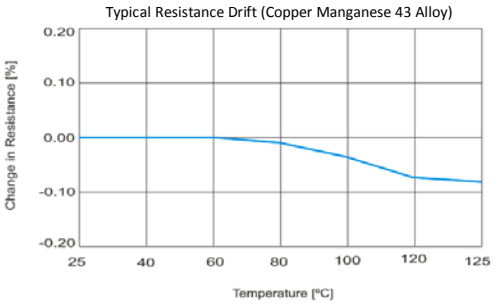
PERFORMANCE GRAPHS

Power Derating Curve



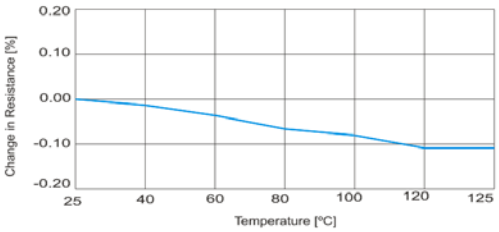
Resistance Change vs Temperature

Typical Resistance Drift (Copper Manganese 43 Alloy)



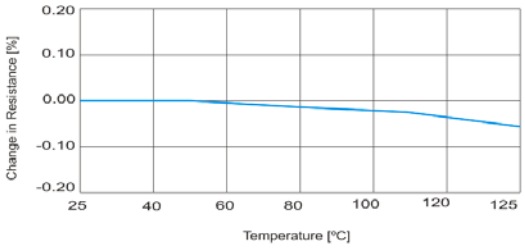
Resistance Change vs Temperature

Typical Resistance Drift (A1 Alloy)



Resistance Change vs Temperature

Typical Resistance Drift (Copper Manganese MC-2 Alloy)



MARKING

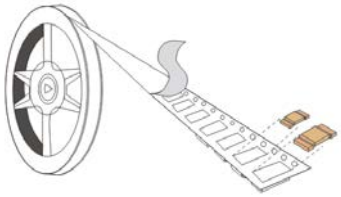
The resistors marking will follow below concept:

4 digits where ”R” designates the decimal location in ohms, e.g. 1mΩ the product marking is R001.
4 digits where ”m” designates the decimal location in milli-ohms, e.g. 0.2mΩ the product marking is 0m2, 0.5mΩ the product marking is 0m50.

0.2mΩ , 0.3mΩ , 0.5mΩ	1 ~ 4mΩ
	
The "m" is used as a decimal point ; the other 3 digits are significant and the unit is milliohm 0.2mΩ to 0.5mΩ	The "R" is used as a decimal point ; the other 3 digits are significant 1mΩ to 4mΩ

PACKAGING - Blister tape [mm]

The standard packaging for CSB dimensions below.



	Tape and reel information		
	Specification : IEC60286-3		
	Tape width [mm]	Reel size [inch]	Parts per reel [inch]
CSB251	12	13	5000
CSB392	16		3000
CSB593	24		2000

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