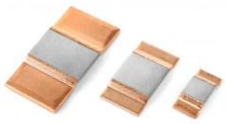
ECS02 / ECS03 / ECS05 Chip Shunt Resistors

ECS02 model exhibit a constant power of Max 6watts and continuous current is 173A for 0.2mΩ.
ECS03 model exhibit a constant power of Max 12watts and continuous current is 245A for 0.2mΩ.
ECS05 exhibit a constant power of Max 15watts and continuous current is 274A for 0.2mΩ.
These models have high conductive heavy copper connectors, excellent long term stability and low inductance.
Applications include : Current sensors for hybrid power sources, frequency converters and high current automotive applications.



GENERAL SPECIFICATIONS

Model	Resistance Value [mΩ]	Power (@70℃) [W]	Material	Thickness (t)	TCR (ppm/℃)	Tolerance
ECS02	0.2	6.0	CM4	1.00mm±0.1	< 225	F [±1%] G [±2%] J [±5%]
	0.3	6.0	CM4	0.95mm±0.1	< 175	
	0.5	6.0	CM2	0.85mm±0.1	< 120	
	1.0	5.0	CM2	0.42mm±0.1	< 100	
	1.3	5.0	CM2	0.33mm±0.1	< 100	
	2.0	5.0	AC	0.67mm±0.1	< 50	
	3.0	4.0	AC	0.45mm±0.1	< 50	
	4.0	3.0	AC	0.33mm±0.1	< 50	
	5.0	2.5	AC	0.33mm±0.1	< 50	
	6.8	2.0	AC	0.33mm±0.1	< 50	
	10.0	1.5	AC	0.33mm±0.1	< 50	

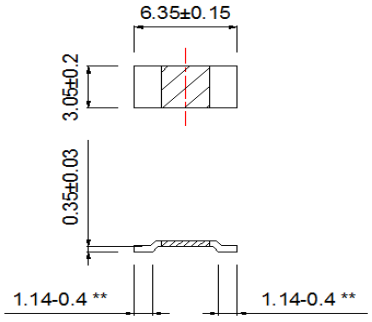
Model	Resistance Value [mΩ]	Power (@70℃) [W]	Material	Thickness (t)	TCR (ppm/℃)	Tolerance
ECS03	0.1	12.0	CM4	1.42mm±0.1	< 350	F [±1%] J [±5%]
	0.2	12.0	CM4	1.42mm±0.1	< 100	
	0.3	10.0	CM2	1.42mm±0.1	< 150	
	0.5	10.0	CM2	0.84mm±0.1	< 70	
	0.7	8.0	CM2	0.60mm±0.1	< 60	
	1.0	7.0	CM2	0.42mm±0.1	< 50	
	1.5	7.0	AC	0.91mm±0.1	< 50	
	2.0	6.0	AC	0.68mm±0.1	< 50	
	2.5	5.0	AC	0.54mm±0.1	< 50	
	3.0	5.0	AC	0.45mm±0.1	< 50	
	4.0	5.0	AC	0.34mm±0.1	< 50	
	5.0	3.0	AC	0.27mm±0.1	< 50	

Model	Resistance Value [mΩ]	Power (@70℃) [W]	Material	Thickness (t)	TCR (ppm/℃)	Tolerance
ECS05	0.1	15.0	CM4	1.42mm±0.1	< 300	F [±1%] J [±5%]
	0.2	15.0	CM2	1.40mm±0.1	< 200	
	0.25	10.0	CM2	1.12mm±0.1	< 200	
	0.3	10.0	CM2	0.93mm±0.1	< 175	
	0.4	9.0	CM2	0.72mm±0.1	< 175	
	0.5	8.0	CM2	0.56mm±0.1	< 175	
	0.6	8.0	CM2	0.47mm±0.1	< 175	
	1.0	9.0	AC	0.91mm±0.1	< 75	
	2.0	7.0	AC	t1:0.46mm±0.1 t2:0.70mm±0.1	< 75	
	3.0	5.0	AC	t1:0.31mm±0.1 t2:0.50mm±0.1	< 75	

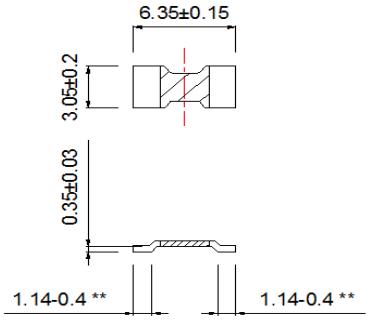
※ AC : Aluchrom Alloy, CM2 : Copper Manganese Alloy, CM4 : Copper Manganese Tin Alloy

DIMENSIONS [mm]

ECS02

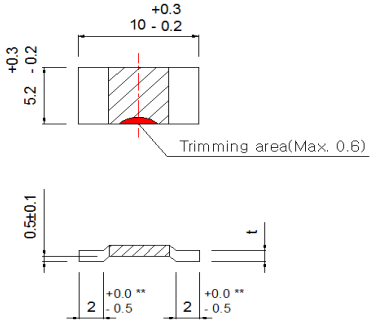


ECS02 (5mΩ to 10mΩ)



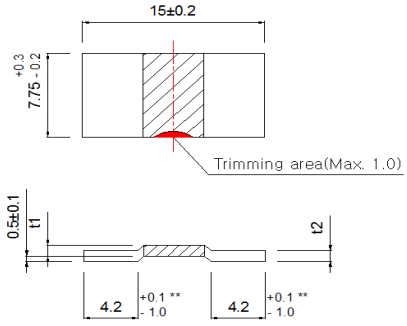
** Tolerance for t≤0.67mm, for t > 0.67mm applicable tolerance is +0.0/-0.7

ECS03



** This tolerance applies to t≤0.68mm, for t > 0.68mm applicable tolerance is 2.0, +0.0/-0.8mm and for ECS03 0.1mΩ 2.8±0.25mm

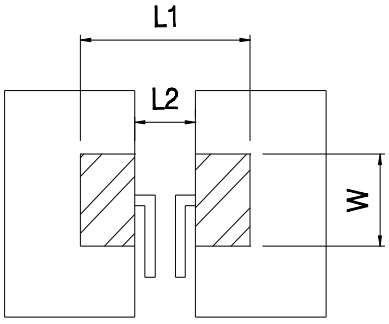
ECS05



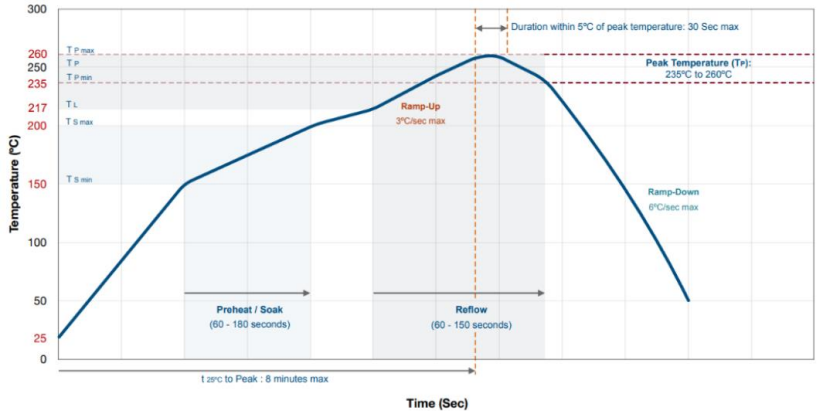
** For 0.1mΩ, 4.8mm +0.1/-1.0mm

SOLDER PAD LAYOUT

Model	Dimensions(mm)		
	L1	L2	W
ECS02	7.0	3.4	3.4
ECS03	11.0	5.6	6.2
ECS05	16.0	5.6	8.75



RECOMMENDED SOLDER REFLOW PROFILE

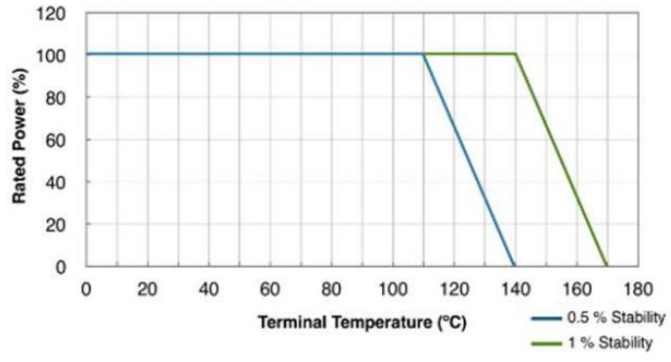


CHARACTERISTICS

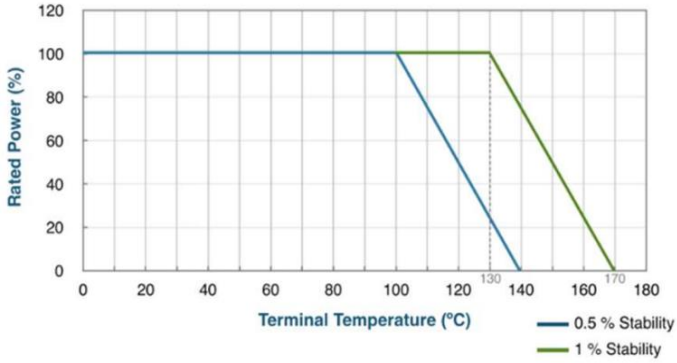
Operating Temperature Range	ECS02, ECS03	-55℃ ~ +170℃
	ECS05	-65℃ ~ +170℃
Inductance	ECS02	< 2nH
	ECS03, ECS05	< 3nH
Stability Deviation	ECS02, ECS05	< 0.5% after 2000hours (Terminal temp. < 110℃) < 1.0% after 2000hours (Terminal temp. < 140℃)
	ECS03	< 0.5% after 2000hours (Terminal temp. < 100℃) < 1.0% after 2000hours (Terminal temp. < 130℃)
High Temperature Exposure	△R ±1.0%	1000hours.@T=170℃.Unpowered.
Temperature Cycling	△R ±0.5%	-55℃ to 150℃, 1000cycles, 30minutes at each extreme.
Biased Humidity	△R ±0.5%	85℃ & 85RH with 10% operating power, 1000hours.
Operational Life	△R ±1.0%	125℃ at rated power, 1000hours.
External Visual	Visual	Visual inspection.
Physical Dimension	Shall confirm within tolerance limits	Dimensional inspection as per SBCL Specifications.
Resistance to Solvents	Marking shall be legible	Clean with Aqueous chemical.
Mechanical Shock	△R ±0.2%	100g for 6ms, Half sine.
Vibration	△R ±0.2%	5g for 20minutes, 12cycles each of 3orientations. 10-2000Hz.
Resistance to Soldering Heat	△R ±0.5%	Solder temperature 260℃, time 10seconds.
Solderability	> 95% Coverage in 10×Magnification	As per J-STD-002.
Electrical Characterization	Shall confirm within tolerance limits	Resistance as defined.
Short Time Overload	△R ±1.0%	5×Rated power for 5seconds.
Low Temperature Storage	△R ±0.2%	-65℃ for 24hours.

DERATING CURVE

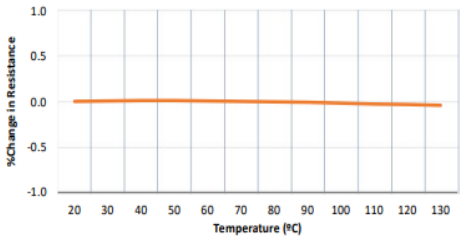
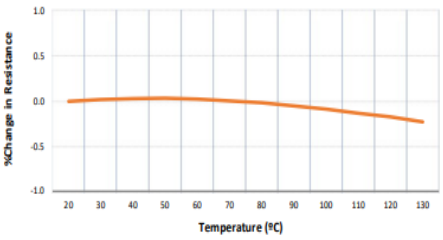
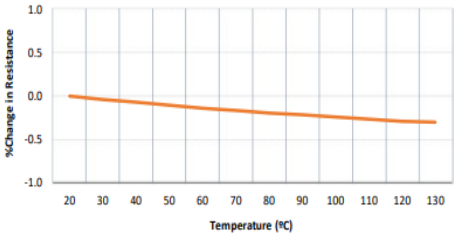
ECS02, ECS05



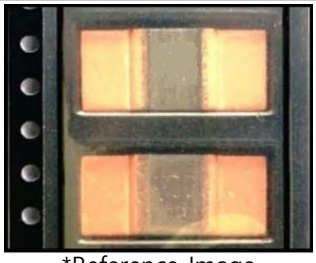
ECS03



STABILITY CHARACTERISTICS

Copper Manganese CM4 Alloy	Copper Manganese CM2 Alloy	Aluchrom Alloy
		

PACKING SPECIFICATIONS



*Reference Image

Model	Reference Standard	Width of Reel [mm]	Number of Pcs per Reel
ECS02	DIN EN 60286-3	12	5,000
ECS03		16	3,000
ECS05		24	2,000

ORDERING PROCEDURE EXAMPLE

ECS02	0.3mΩ	±1%	TR
Model#	Resistance Value	Tolerance	TR : Tape & Reel BK : Bulk Packing