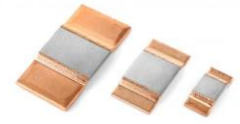


ECS02 / ECS03 / ECS05 Chip Shunt Resistors

ECS02 model exhibit a constant power of Max 3watts and continuous current is 100A at 0.3mΩ.
 ECS03 model exhibit a constant power of Max 5watts and continuous current is 100A at 0.5mΩ.
 ECS05 exhibit a constant power of Max 10watts and continuous current is 220A at 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.

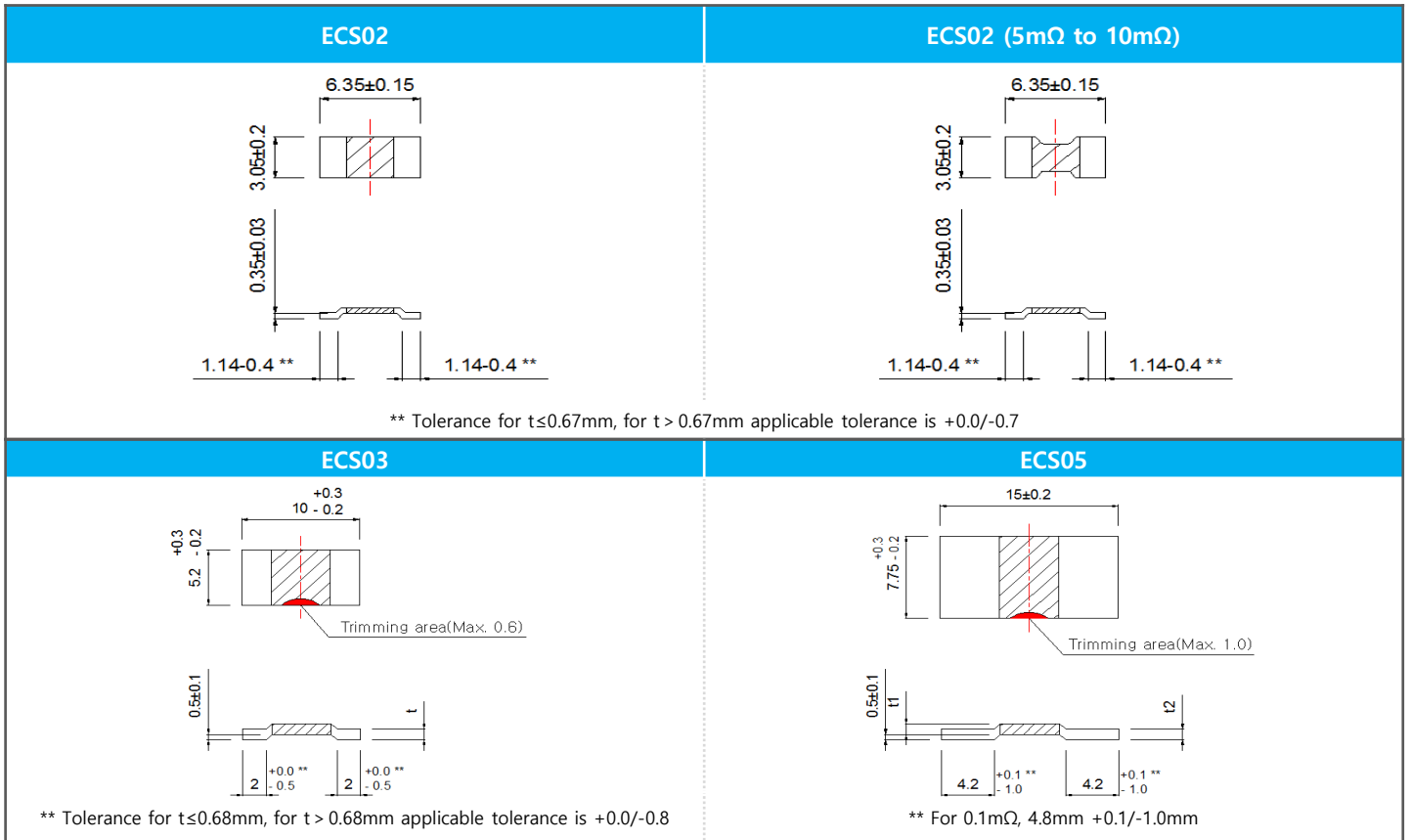


GENERAL SPECIFICATIONS

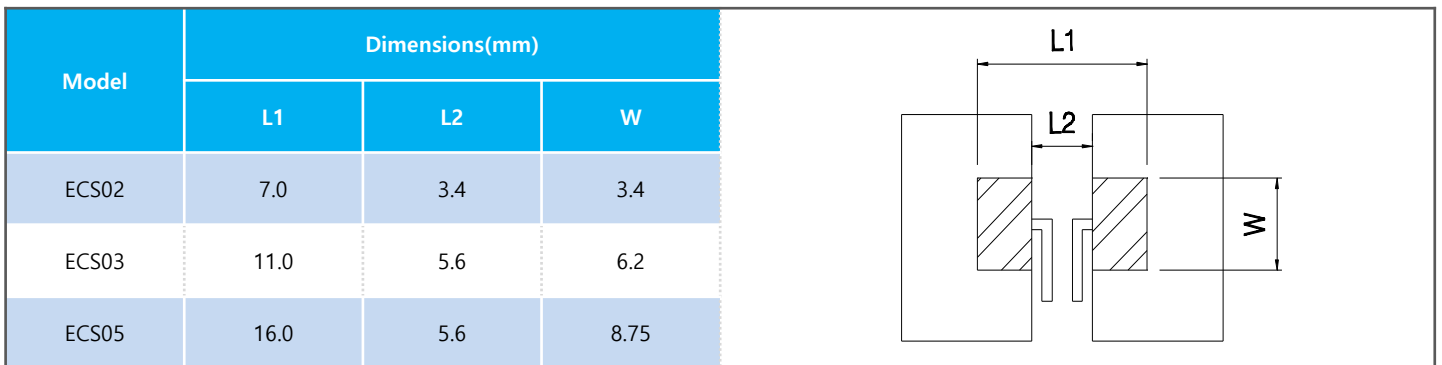
Model	Resistance Value [mΩ]	Power (@100°C) [W]	Power (@70°C) [W]	Material	Thickness (t)	TCR (ppm/°C)	Tolerance
ECS02	0.3	3.0	6.0	CM4	0.95mm±0.1	< 175	F [±1%] G [±2%] J [±5%]
	0.5	3.0	6.0	CM2	0.85mm±0.1	< 120	
	1.0	3.0	5.0	CM2	0.42mm±0.1	< 100	
	1.3	3.0	5.0	CM2	0.33mm±0.1	< 100	
	2.0	3.0	5.0	AC	0.67mm±0.1	< 50	
	3.0	2.0	4.0	AC	0.45mm±0.1	< 50	
	4.0	2.0	3.0	AC	0.33mm±0.1	< 50	
	5.0	1.5	2.5	AC	0.33mm±0.1	< 50	
	6.8	1.5	2.0	AC	0.33mm±0.1	< 50	
10.0	1.0	1.5	AC	0.33mm±0.1	< 50		
ECS03	0.2	5.0	12.0	CM4	1.42mm±0.1	< 100	F [±1%] J [±5%]
	0.3	5.0	10.0	CM2	1.42mm±0.1	< 150	
	0.5	5.0	10.0	CM2	0.84mm±0.1	< 70	
	0.7	5.0	8.0	CM2	0.60mm±0.1	< 60	
	1.0	4.0	7.0	CM2	0.42mm±0.1	< 50	
	1.5	4.5	7.0	AC	0.91mm±0.1	< 50	
	2.0	4.0	6.0	AC	0.68mm±0.1	< 50	
	2.5	3.5	5.0	AC	0.54mm±0.1	< 50	
	3.0	3.0	5.0	AC	0.45mm±0.1	< 50	
	4.0	3.0	5.0	AC	0.34mm±0.1	< 50	
5.0	2.0	3.0	AC	0.27mm±0.1	< 50		
ECS05	0.1	10.0	15.0	CM4	1.42mm±0.1	< 300	F [±1%] J [±5%]
	0.2	10.0	15.0	CM2	1.40mm±0.1	< 200	
	0.25	8.0	10.0	CM2	1.12mm±0.1	< 200	
	0.3	7.0	10.0	CM2	0.93mm±0.1	< 175	
	0.4	6.5	9.0	CM2	0.72mm±0.1	< 175	
	0.5	6.0	8.0	CM2	0.56mm±0.1	< 175	
	0.6	6.0	8.0	CM2	0.47mm±0.1	< 175	
	1.0	6.0	9.0	AC	0.91mm±0.1	< 75	
	2.0	4.0	7.0	AC	t1:0.46mm±0.1 t2:0.70mm±0.1	< 75	
3.0	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

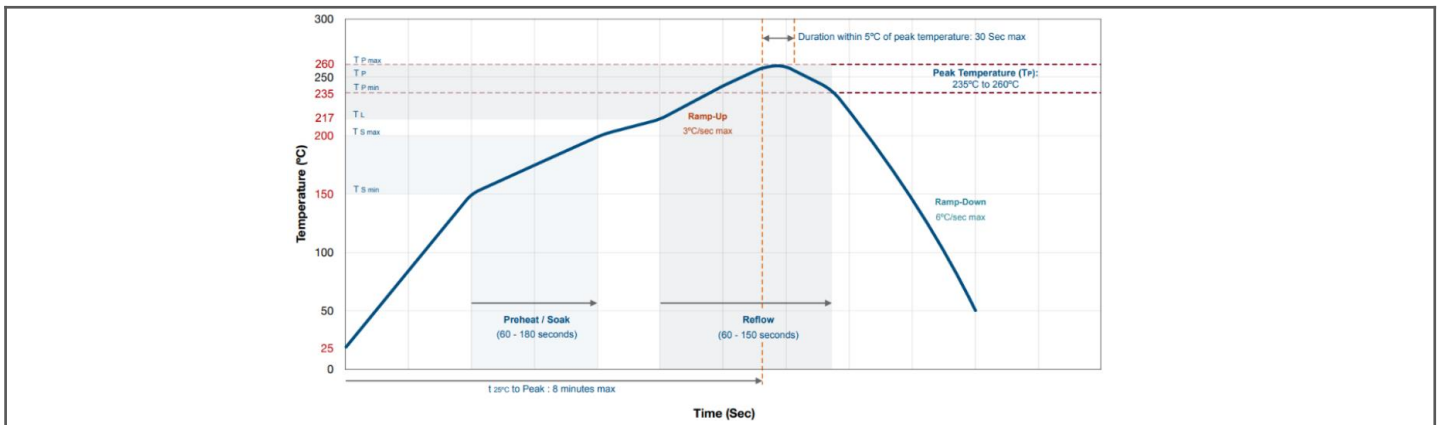
DIMENSIONS [mm]



SOLDER PAD LAYOUT



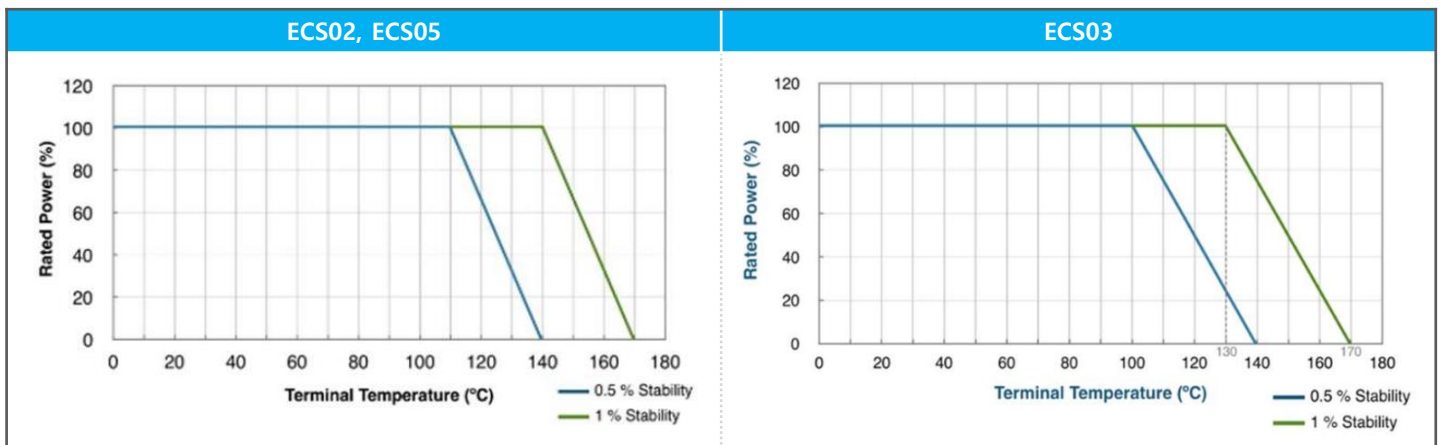
RECOMMENDED SOLDER REFLOW PROFILE



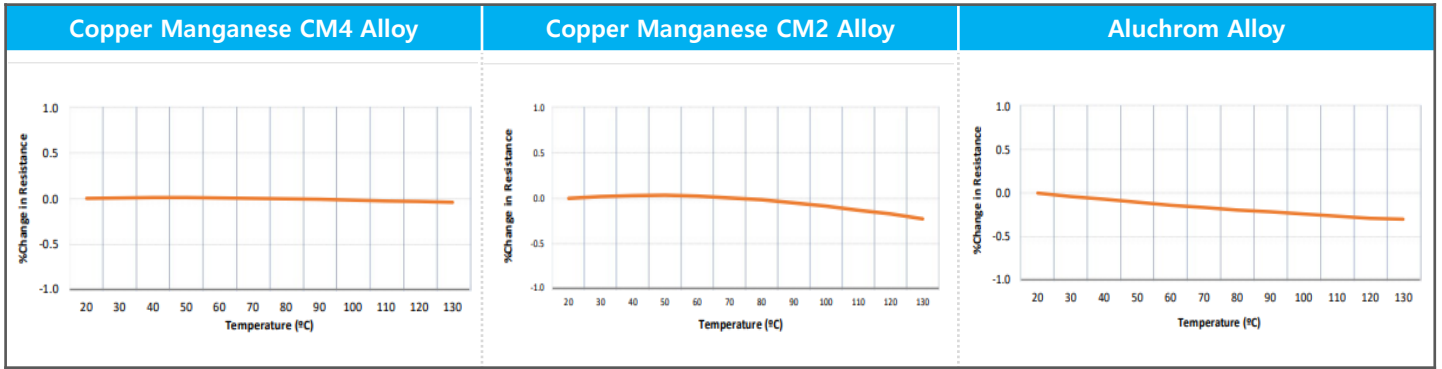
CHARACTERISTICS

Operating Temperature Range	ECS02, ECS03	-55°C ~ +170°C
	ECS05	-65°C ~ +170°C
Inductance	ECS02	< 2nH
	ECS03, ECS05	< 3nH
Stability Deviation	ECS02, ECS05	< 0.5% after 2000hours (Terminal temp. < 110°C) < 1.0% after 2000hours (Terminal temp. < 140°C)
	ECS03	< 0.5% after 2000hours (Terminal temp. < 100°C) < 1.0% after 2000hours (Terminal temp. < 130°C)
High Temperature Exposure	$\Delta R \pm 1.0\%$	1000hours.@T=170°C.Unpowered.
Temperature Cycling	$\Delta R \pm 0.5\%$	-55°C to 150°C, 1000cycles, 30minutes at each extreme.
Biased Humidity	$\Delta R \pm 0.5\%$	85°C & 85RH with 10% operating power, 1000hours.
Operational Life	$\Delta R \pm 1.0\%$	125°C 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	$\Delta R \pm 0.2\%$	100g for 6ms, Half sine.
Vibration	$\Delta R \pm 0.2\%$	5g for 20minutes, 12cycles each of 3orientations. 10-2000Hz.
Resistance to Soldering Heat	$\Delta R \pm 0.5\%$	Solder temperature 260°C, 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	$\Delta R \pm 1.0\%$	5×Rated power for 5seconds.
Low Temperature Storage	$\Delta R \pm 0.2\%$	-65°C for 24hours.

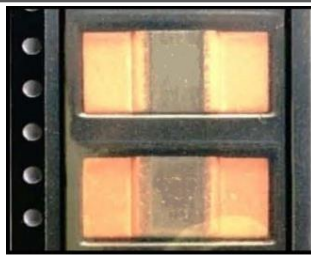
DERATING CURVE



STABILITY CHARACTERISTICS



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

