

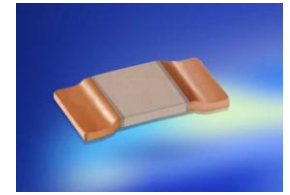


## ECS02 / ECS03 / ECS05 Chip Shunt Resistors

ECS03 Model exhibit a constant power of Max 5watts and continuous current is 100A at 0.5mΩ.  
ECS05 Model exhibit a constant power of Max 10watts and continuous current is 220A at 0.2mΩ.  
ECS02-A1 Model exhibit a constant power of Max 3watts and continuous current is 38.7A at 2mΩ.  
ECS02-CM(MC)2 Model exhibit a constant power of Max 3watts and continuous current is 100A at 0.3mΩ.

These models have high conductive heavy copper connectors, excellent long term stability and low inductance. Maximum soldering temperatures is up to 350°C 30 sec.

Applications include : Current sensors for hybrid power sources, frequency converters and high current automotive applications.



### ■ GENERAL SPECIFICATIONS

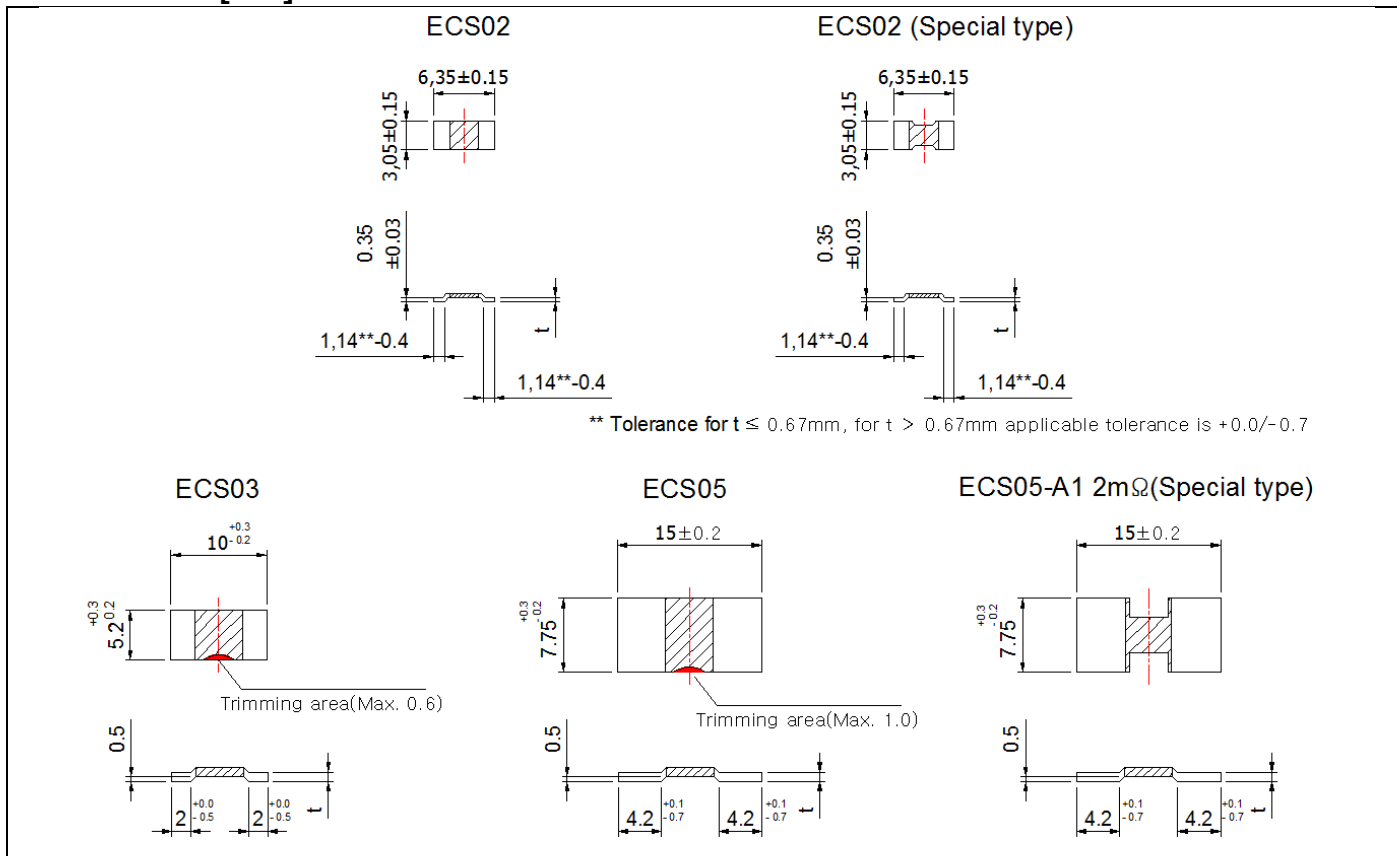
Model	*Power rating(W)	Resistance[mΩ]	Tolerance (%)	*TCR (+20°C to +60°C)	Operating temperature range
ECS02	3	0.3, 0.5, 1.0, 1.3, 2.0, 3.0, 4.0, 5.0, 6.8, 10	±1%(F) ±2%(G) ±5(J)	Max. ±100ppm	-55°C ~ +170°C
ECS03	5	0.2, 0.3, 0.5, 0.6, 0.7, 1, 1.5, 2, 2.5, 3, 4, 5	±1%(F) ±5(J)	Max. ±50ppm	
ECS05	10				

\* See the blow table

### ■ MATERIAL, POWER RATING & TCR

Model	Value	Power[W]	Material	Thickness(t)	TCR(ppm/°C)
ECS02-A1 *Special fig	10 mΩ	1.0	Aluchrom Alloy	0.33 mm±0.1	<50
ECS02-A1 *Special fig	6.8 mΩ	1.5	Aluchrom Alloy	0.33 mm±0.1	<50
ECS02-A1 *Special fig	5.0 mΩ	1.5	Aluchrom Alloy	0.33 mm±0.1	<50
ECS02-A1	4.0 mΩ	2.0	Aluchrom Alloy	0.33 mm±0.1	<50
ECS02-A1	3.0 mΩ	2.0	Aluchrom Alloy	0.45 mm±0.1	<50
ECS02-A1	2.0 mΩ	3.0	Aluchrom Alloy	0.67 mm±0.1	<50
ECS02-CM2	1.3 mΩ	3.0	Copper Manganese 43 Alloy	0.33 mm±0.1	<50
ECS02-CM2	1.0 mΩ	3.0	Copper Manganese 43 Alloy	0.42 mm±0.1	<50
ECS02-CM2	0.5 mΩ	3.0	Copper Manganese 43 Alloy	0.85 mm±0.1	<75
ECS02-MC2	0.3 mΩ	3.0	Copper Manganese MC-2 Alloy	0.95 mm±0.1	<100
ECS03-C	0.2 mΩ	5.0	Copper Manganese 38 Alloy	1.42 mm±0.1	200
ECS03-MC2	0.2 mΩ	5.0	Copper Manganese MC-2 Alloy	1.42 mm±0.1	150
ECS03-CM	0.3 mΩ	5.0	Copper Manganese 43 Alloy	1.42 mm±0.1	150
ECS03-CM	0.5 mΩ	5.0	Copper Manganese 43 Alloy	0.84 mm±0.1	70
ECS03-CM	0.7 mΩ	5.0	Copper Manganese 43 Alloy	0.60 mm±0.1	60
ECS03-CM	1.0 mΩ	4.0	Copper Manganese 43 Alloy	0.42 mm±0.1	<50
ECS03-A1	1.0 mΩ	5.0	Aluchrom Alloy	1.34 mm±0.1	<50
ECS03-A1	1.5 mΩ	4.5	Aluchrom Alloy	0.89 mm±0.1	<50
ECS03-A1	2.0 mΩ	4.0	Aluchrom Alloy	0.67 mm±0.1	<50
ECS03-A1	2.5 mΩ	3.5	Aluchrom Alloy	0.53 mm±0.1	<50
ECS03-A1	3.0 mΩ	3.0	Aluchrom Alloy	0.44 mm±0.1	<50
ECS03-A1	4.0 mΩ	2.5	Aluchrom Alloy	0.33 mm±0.1	<50
ECS03-A1	5.0 mΩ	2.0	Aluchrom Alloy	0.27 mm±0.1	<50
ECS05-CM	0.2 mΩ	10	Copper Manganese 43 Alloy	1.37 mm±0.1	<100
ECS05-CM	0.3 mΩ	7	Copper Manganese 43 Alloy	0.91 mm±0.1	<100
ECS05-CM	0.5 mΩ	6	Copper Manganese 43 Alloy	0.55 mm±0.1	<75
ECS05-CM	0.6 mΩ	5	Copper Manganese 43 Alloy	0.46 mm±0.1	<75
ECS05-A1	1.0 mΩ	6	Aluchrom Alloy	0.91 mm±0.1	<50
ECS05-A1 *Special fig	2.0 mΩ	6	Aluchrom Alloy	0.88 mm±0.1	<50
ECS05-A1	2.0 mΩ	4	Aluchrom Alloy	0.46 mm±0.1	<50

■ DIMENSIONS[mm]



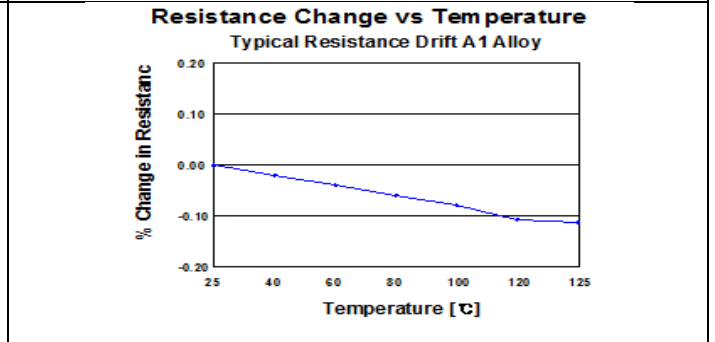
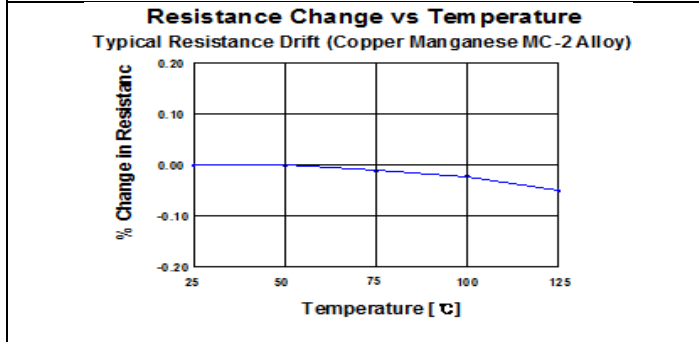
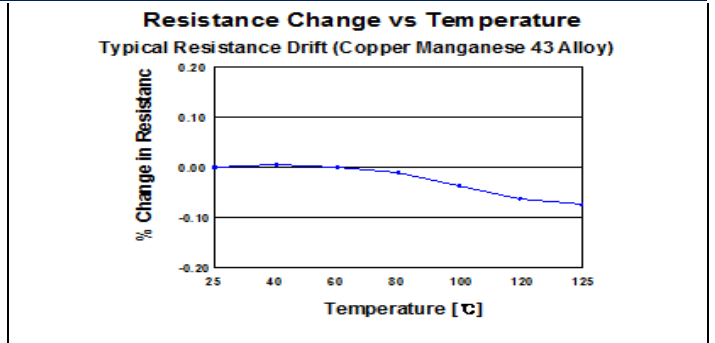
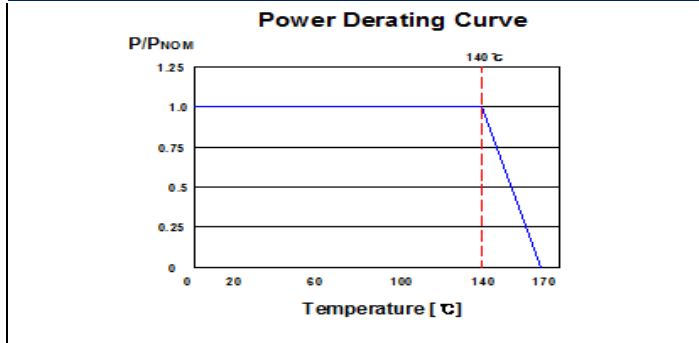
■ CHARACTERISTICS

Temperature Coefficient[ppm/°C]	<b>*See material, power rating &amp; TCR Table</b>	
Operating Temperature Range	-55°C ~ +170°C	
Load Capacity	<b>*See material, power rating &amp; TCR Table</b>	
Inductance	ECS02	<2nH
Inductance	ECS03, ECS05	<3nH
Stability Deviation	ECS03	< 0.5% after 2000Hours (Terminal temp. <100°C) < 1.0% after 2000Hours (Terminal temp. <130°C)
Stability Deviation	ECS02, ECS05	< 0.5% after 2000Hours (Terminal temp. <110°C) < 1.0% after 2000Hours (Terminal temp. <140°C)

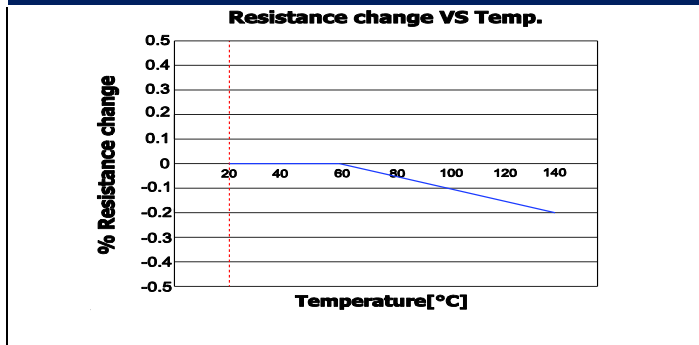


**DERATING CURVE & STABILITY CHARACTERISTICS**

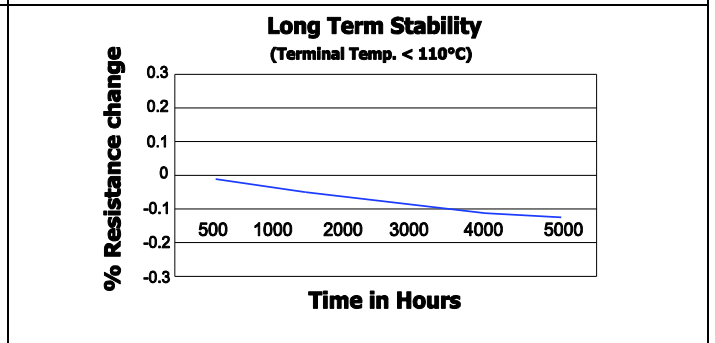
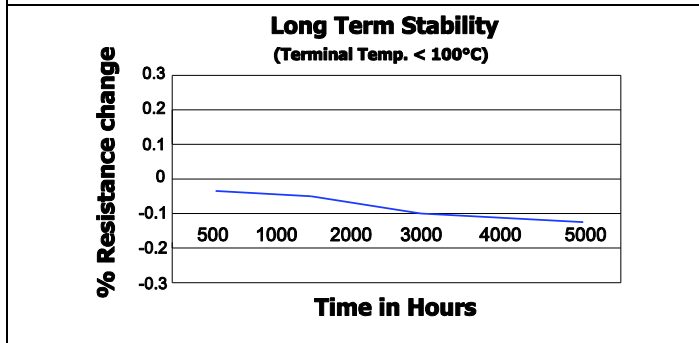
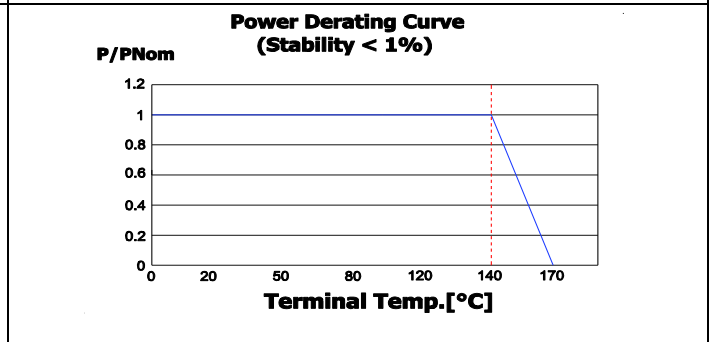
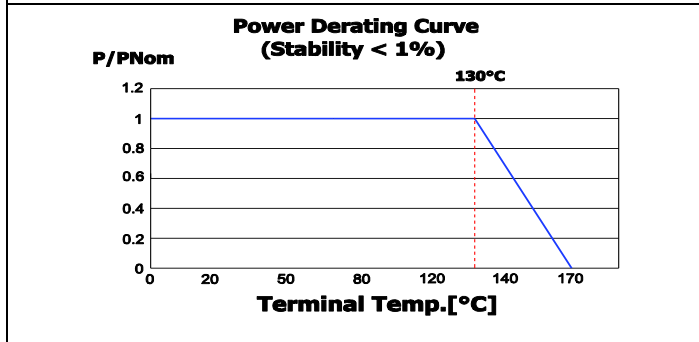
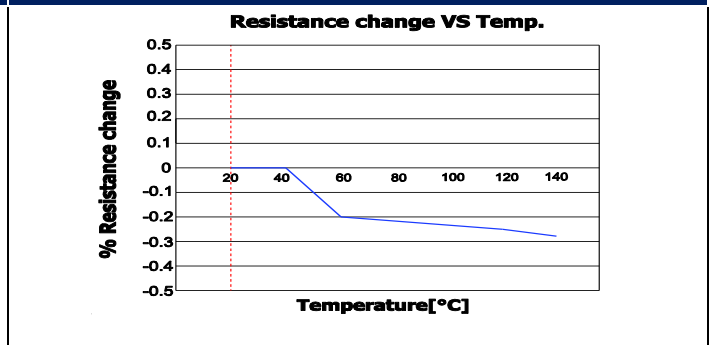
**ECS02**



**ECS03**



**ECS05**



■ PROPOSAL FOR PCB -LAYOUT

Model	Dimensions(mm)		
	L1	L2	W
ECS02	7	3.4	3.4
ECS03	11	5.6	6.2
ESC05	16	5.6	8.75

■ PACKING SPECIFICATIONS

Model	Reference Standard	Width of Reel[mm]	Number of pcs per Reel
ECS02	DIN EN 60286-3	12	5,000
ECS03		21.5	3,000
ESC05		29.5	2,000

■ ORDERING PROCEDURE EXAMPLE

ECS02	CM2	0.5mΩ	①	TR	Special fig
↓	↓	↓	↓	↓	↓
<b>Model #</b>	<b>Material</b>	<b>Resistance Value</b>	<b>Tolerance</b>	<b>Packing type</b>	<b>Option Special fig</b>
ECS02 ECS03 ECS05	A1 = Aluchrom Alloy C = Copper Manganese 38 Alloy CM(2) = Copper Manganese 43 Alloy MC2 = Copper Manganese MC-2 Alloy		1 = ±1% 2 = ±2% 5 = ±5%	TR = Tape & Reel BK = Bulk Packing	(Only ECS02-A1*Special fig 5.0mΩ,6.8mΩ,10mΩ / ECS05-A1*Special fig 2.0mΩ)