

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 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	ECS02	ECS03	ECS05
*Power rating [W]	3	5	10
Resistance [mΩ]	0.3 / 0.5 / 1.0 / 1.3 / 2.0 / 3.0 / 4.0 / 5.0 / 6.8 / 10.0	0.2 / 0.3 / 0.5 / 0.7 / 1.0 / 1.5 / 2.0 / 2.5 / 3.0 / 4.0 / 5.0	0.1 / 0.2 / 0.25 / 0.3 / 0.5 / 0.6 / 1.0 / 2.0 / 3.0
Tolerance	±1% [F] / ±2% [G] / ±5% [J]	±1% [F] / ±5% [J]	±1% [F] / ±5% [J]
*T.C.R	Max. ±100 ppm/°C	Max. ±150 ppm/°C	Max. ±100 ppm/°C
Operating Temperature Range	-55°C ~ +170°C	-55°C ~ +170°C	-55°C ~ +170°C

* See the blow table

■ MATERIAL, POWER RATING & TCR

Model	Resistance Value [mΩ]	Power ^(100°C) [W]	Power ^(70°C) [W]	Material	Thickness (t)	TCR(ppm/ °C)
ECS02-CM4	0.3	3.0	6.0	Copper Manganese Alloy	0.95 mm±0.1	<100
ECS02-CM2	0.5	3.0	6.0	Copper Manganese Alloy	0.85 mm±0.1	<75
ECS02-CM2	1.0	3.0	5.0	Copper Manganese Alloy	0.42 mm±0.1	<50
ECS02-CM2	1.3	3.0	5.0	Copper Manganese Alloy	0.33 mm±0.1	<50
ECS02-AC	2.0	3.0	5.0	Aluchrom Alloy	0.67 mm±0.1	<50
ECS02-AC	3.0	2.0	4.0	Aluchrom Alloy	0.45 mm±0.1	<50
ECS02-AC	4.0	2.0	3.0	Aluchrom Alloy	0.33 mm±0.1	<50
ECS02-AC	5.0	1.5	2.5	Aluchrom Alloy	0.33 mm±0.1	<50
ECS02-AC	6.8	1.5	2.0	Aluchrom Alloy	0.33 mm±0.1	<50
ECS02-AC	10	1.0	1.5	Aluchrom Alloy	0.33 mm±0.1	<50
ECS03-CM4	0.2	5.0	12.0	Copper Manganese Alloy	1.42 mm±0.1	150
ECS03-CM2	0.3	5.0	10.0	Copper Manganese Alloy	1.42 mm±0.1	100
ECS03-CM2	0.5	5.0	9.0	Copper Manganese Alloy	0.84 mm±0.1	70
ECS03-CM2	0.7	5.0	8.0	Copper Manganese Alloy	0.60 mm±0.1	60
ECS03-CM2	1.0	4.0	7.0	Copper Manganese Alloy	0.42 mm±0.1	<50
ECS03-AC	1.5	4.5	7.0	Aluchrom Alloy	0.91 mm±0.1	<50
ECS03-AC	2.0	4.0	6.0	Aluchrom Alloy	0.68 mm±0.1	<50
ECS03-AC	2.5	3.5	5.0	Aluchrom Alloy	0.54 mm±0.1	<50
ECS03-AC	3.0	3.0	5.0	Aluchrom Alloy	0.45 mm±0.1	<50
ECS03-AC	4.0	2.5	4.0	Aluchrom Alloy	0.34 mm±0.1	<50
ECS03-AC	5.0	2.0	3.0	Aluchrom Alloy	0.27 mm±0.1	<50
ECS05-CM4	0.1	10	15	Copper Manganese Alloy	1.42 mm±0.1	<100
ECS05-CM2	0.2	10	15	Copper Manganese Alloy	1.40 mm±0.1	<100
ECS05-CM2	0.25	8	10	Copper Manganese Alloy	1.12 mm±0.1	<100
ECS05-CM2	0.3	7	10	Copper Manganese Alloy	0.93 mm±0.1	<100
ECS05-CM2	0.5	6	8	Copper Manganese Alloy	0.56 mm±0.1	<75
ECS05-CM2	0.6	6	8	Copper Manganese Alloy	0.47 mm±0.1	<75
ECS05-AC	1.0	6	9	Aluchrom Alloy	0.91 mm±0.1	<50
ECS05-AC	2.0	4	7	Aluchrom Alloy	t1 : 0.46 mm±0.1 (A1) t2 : 0.70 mm±0.1 (Cu)	<50
ECS05-AC	3.0	3	5	Aluchrom Alloy	t1 : 0.31 mm±0.1 (A1) t2 : 0.50 mm±0.1 (Cu)	<50

■ DIMENSIONS[mm]

ECS02	ECS02 (5mΩ to 10mΩ)
<p>** Tolerance for t ≤ 0.67mm, for t > 0.67mm applicable tolerance is +0.0/-0.7</p>	
ECS03	ECS05
<p>** Tolerance for t ≤ 0.68mm, for t > 0.68mm applicable tolerance is +0.0/-0.8</p>	<p>** For 0.1mΩ, 4.8mm +0.1/-1.0mm</p>

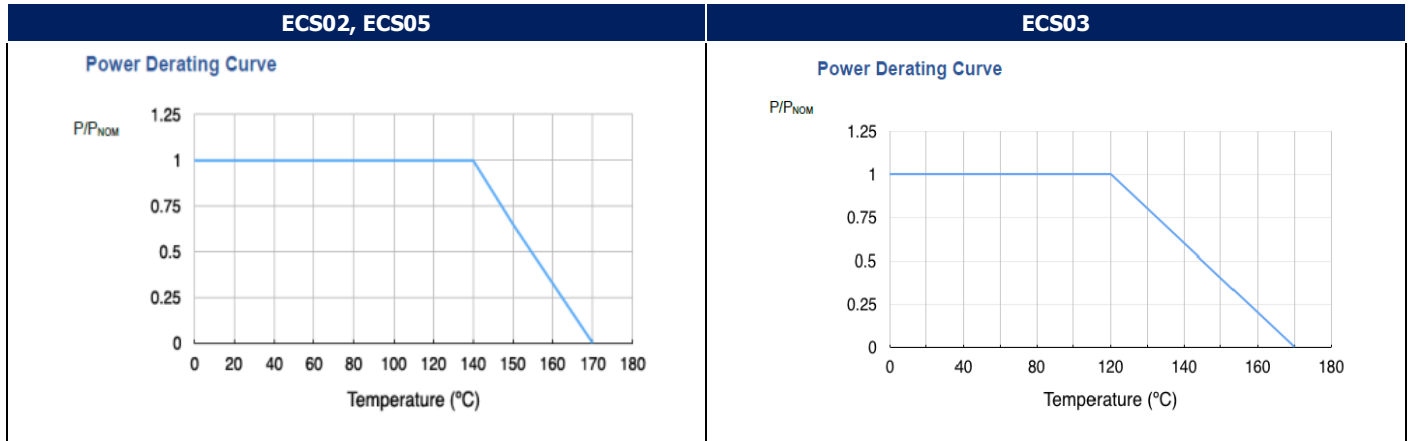
■ PROPOSAL FOR PCB -LAYOUT

Model	Dimensions(mm)		
	L1	L2	W
ECS02	7	3.4	3.4
ECS03	11	5.6	6.2
ECS05	16	5.6	8.75

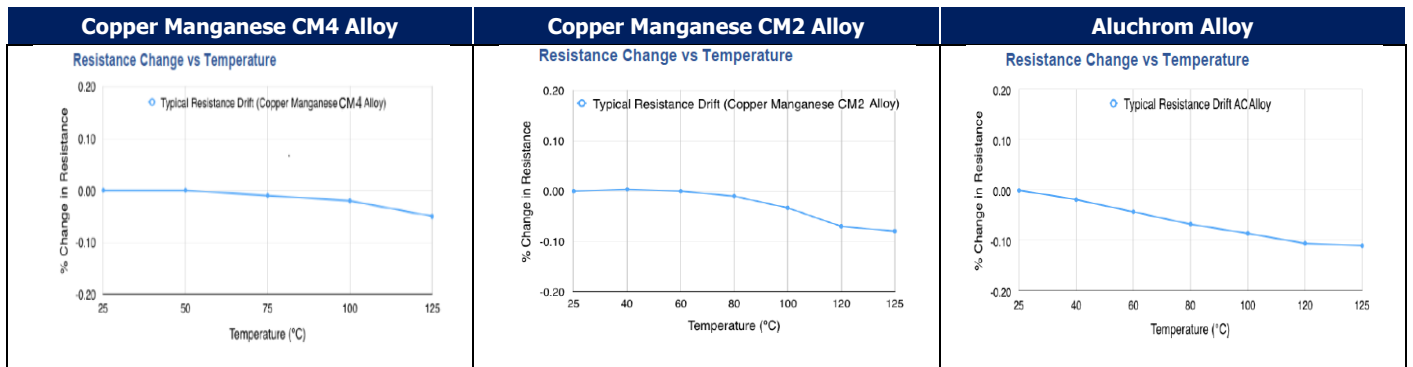
■ CHARACTERISTICS

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

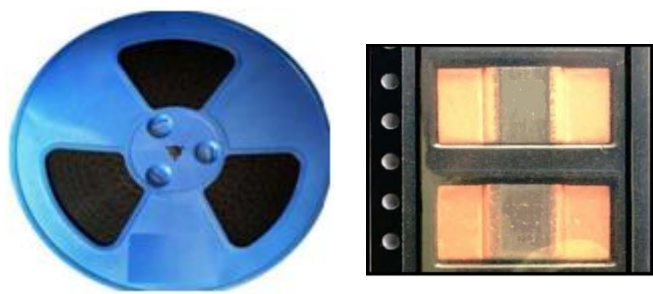
DERATING CURVE



STABILITY CHARACTERISTICS



PACKING SPECIFICATIONS



Model	Reference Standard	Width of Reel [mm]	Number of pcs per Reel
ECS02	DIN EN 60286-3	12	5,000
ECS03		16	3,000
ESC05		24	2,000

*Reference Image

ORDERING PROCEDURE EXAMPLE

