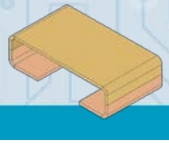


CSM Series Datasheet

SMD power shunt resistor
Current sensor Open Frame

APPLICATIONS

- Automotive
- Charger
- Alternative Energy
- Power Supply

ORDERING CODE-Example

CSM	452	F	K	-	13	R002	AA
Type	Size	Tol.	Pack-Code	TC	Reel diam.	R Value	
	381=3812 452=4524	F = ±1% H = ±3% J = ±5%	Blister tape	Base on spec.	13 inch		AA = Standard

FEATURES

- Solid Metal Construction
- High Conductivity Copper Connectors
- 2 Watts Permanent Power (3.0mΩ)
- Constant Current up to 26 amps (3.0mΩ)
- AEC-Q200 available
- Excellent Long-term Stability
- RoHs & REACH Compliant

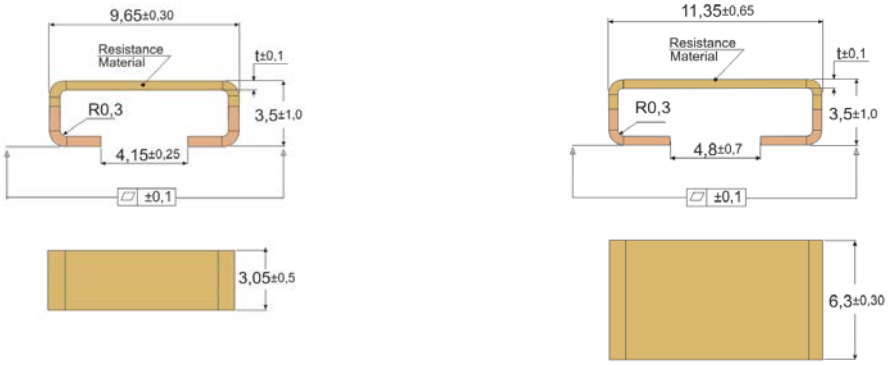
TECHNICAL DATA

Type / Size		CSM381	CSM452
Nominal Power Rating P_{70}	[W]	2	5
Resistance Range (Preferred values)	[Ω]	R001 , R002 , R003 , R004 , R005 , R01 , R015 , R02 , R025	R001 , R002 , R0025 , R003 , R005 , R01 , R015
Tolerances	±[%]	F = 1% [R> R002] , H = 3% , J = 5%	
Temperature Coefficient	[ppm/ºC]	See table	
Operating Temperature Range	[ºC]	-55 … +170	
Inductance	[nH]	< 10	
Max. working voltage	$[V]_{RMS}$	$\sqrt{P_{70} \times R}$	

DIMENSIONS [mm]

Type: CSM381 CSM452

Resistor Dim.:



See table next page for **t**=thickness

PCB Layout (Solder pad):

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CSM Series Datasheet

PERFORMANCE DATE

Type		CSM381	CSM452
Short Time Overload *IEC60115-1 clause 4.13* *(U=5 * $\sqrt{P_{70} \times R}$, 5[s]*	±[%]	1,0	
Endurance *IEC60115-1 clause 4.25* *(P_{70}, @ 70[°C], 1000[h])*	±[%]	1,0	
Resistance to Soldering Heat *IEC60115-1 clause 4.18 and Mil-STD-202 Method 210* *(260[°C], 10[s])*	±[%]	0,5	
Low Temperature Exposure *-65[ºC] 24[H]*	±[%]	0,2	
High Temperature Exposure *Mil-STD-202 Method 108* *+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* *(100 [G] for 6[ms], Half sine)*	±[%]	0,2	
Solderability *IEC60068-2-20* *(245^{+5}[ºC] $3^{\pm0,5}$[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	
Marking *IEC60062*		Printed value	

ELECTRICAL CHARACTERISTICS

Type	Value [mΩ]	Resistance values	Thickness t	TCR [ppm]	P [W]	Material	Resistive alloy TCR [ppm]
CSM381	2	R002	0,74	< 100	2	Copper Manganese Alloy	<±10
	3	R003	0,49				
	4	R004	0,60			Copper Manganese Nickel Alloy	<±20
	5	R005	0,48				
	10	R01	0,24				
	15	R015	0,46			Aluchrom Alloy	<-25
	20	R02	0,35				
	25	R025	0,28				

Size	Value [mΩ]	Resistance values	Thickness t	TCR [ppm]	P [W]	Material	Resistive alloy TCR [ppm]
CSM452	1	R001	0,74	< 100	5	Copper Manganese Alloy	<±10
	2	R002	0,60			Copper Manganese Nickel Alloy	<±20
	2L5	R0025	0,48				
	3	R003	0,40				
	5	R005	0,24				
	10	R01	0,35			Aluchrom Alloy	<-25
	15	R015	0,23				

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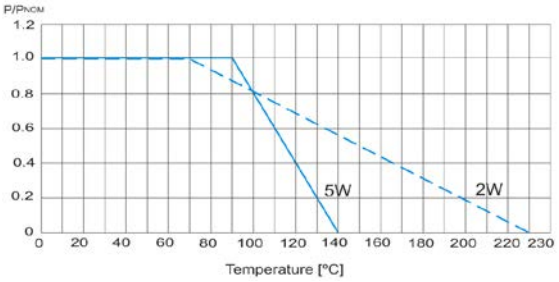
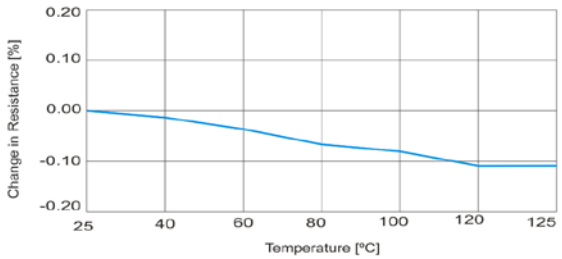
PERFORMANCE GRAPHS

Power Derating Curve



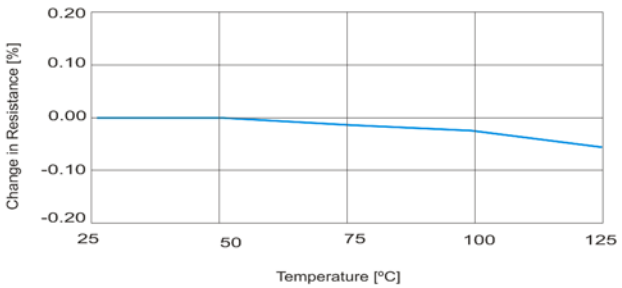
Resistance Change vs Temperature

Typical Resistance Drift (Aluchrom Alloy)



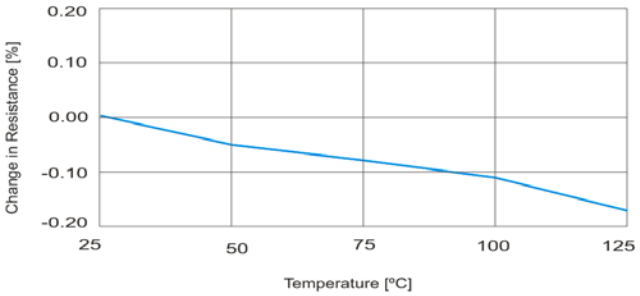
Resistance Change vs Temperature

Typical Resistance Drift (Copper Manganese Alloy)



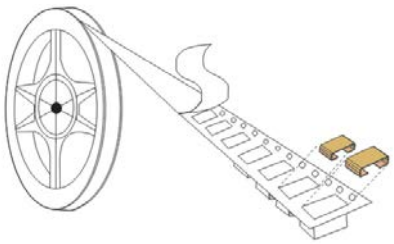
Resistance Change vs Temperature

Typical Resistance Drift (Copper Manganese Nickel Alloy)



PACKAGING - Blister tape [mm]

The standard packaging for CSM dimensions below.



Tape and reel information		
Specification : IEC60286-3		
Tape width [mm]	**Reel size [inch]**	**Parts per reel [inch]**
24	13	1600

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