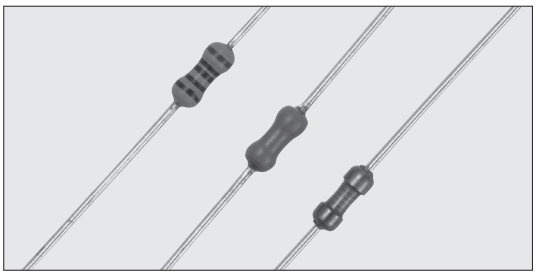
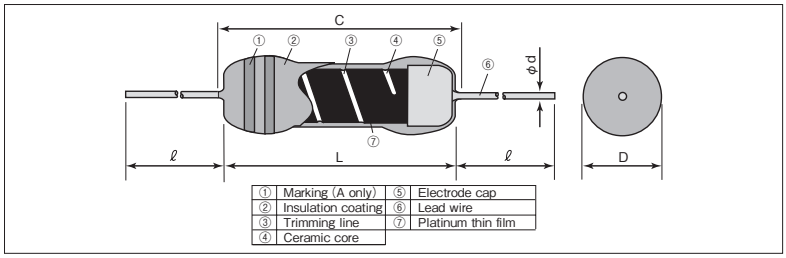
EU RoHS

SDT101 Platinum Thin Film Thermal Sensors



Coating color : Ivory (SDT101A,SDT101SA), Transparent Brown (SDT101B)
Marking : Color code (SDT101A), No Marking (SDT101SA,SDT101B)

■Construction



①	Marking (A only)	⑤	Electrode cap
②	Insulation coating	⑥	Lead wire
③	Trimming line	⑦	Platinum thin film
④	Ceramic core		

■Features

- SDT101SA is ultra-compact sensor element and offers 1kΩ.
- Simple structure for lead forming.
- SDT101A and SDT101SA can be easily soldered.
- Ideal for low directivity heat flow sensor elements.
- AEC-Q200 Tested. (SDT101B 500Ω, SDT101SA)
- Products meet EU-RoHS requirements.

■Applications

- Temperature compensation of load cells for Electronic Weighing Instruments.
- Detections of outer air and cooling water temperatures and filter clogging of Air Conditioners.
- Measurement of flow rate of electronic fuel injection systems, correction of intake air temperature of Automobiles.
  Contact our sales representatives before you use the products for automotives.
- Cold point compensation and temperature detection probe of Thermocouple Temperature Controllers.
- Temperature compensations of various kinds of Measuring Instruments and Analyzers, Hot wires of Anemeters.

■Dimensions

Type	Dimensions (mm)					Weight (g) (1000pcs)
	L±0.8	C±0.8	D±0.2	d±0.08	ℓ±3	
SDT101A	4.0	—	1.6	0.4	30	150
SDT101SA	—	4.0				
SDT101B	4.0	—	1.5			

■Type Designation

Example

SDT101	A	X	C	T26	A	100	D	F
Product Code	Operating Temperature	Reference Temperature※1	Terminal Surface Material	Taping	Packaging	Nominal Resistance	Resistance Tolerance	T.C.R. Tolerance
SDT101 SDT101S	A : −55℃~+150℃ B : −55℃~+300℃	X : 0℃	C:SnCu (A, SA) N:Ni (B only)	Nil:Bulk T26:26mm Taping (A only) T52:52mm Taping	Nil:Bulk A:AMMO (A only) R:REEL (B only)	10 : 10Ω 100 : 100Ω 500 : 500Ω 1K : 1000Ω (SA only)	D : ±0.5% F : ±1.0% G : ±2.0% (SA only)	F : ±1.0% G : ±2.0%

※1 There is also a product that has a standard temperature of 25℃ (symbol: Y) for custom support. (However, the temperature coefficient of resistance is measured at 0℃/100℃.) Please contact us.
Contact us when you have control request for environmental hazardous material other than the substance specified by EU-RoHS.
For further information on taping, please refer to APPENDIX C on the back pages.

■Ratings

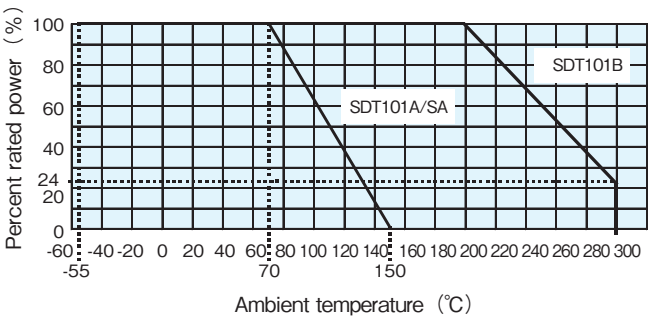
Type	Power Rating (W)	Thermal Time Constant※2 (s)	Thermal Dissipation Constant※2 (mW/℃)	Resistance Range (Ω)	Resistance Tolerance (%)	T.C.R.※3 (×10⁻⁶/K)	T.C.R. Tolerance (%)	Rated Ambient Temperature (℃)	Operating Temperature Range (℃)	Taping&Q'ty/AMMO(pcs)/REEL(pcs)		
										T26A	T52A	T52R
SDT101A	0.125	6	2.8	10、100、500	D:±0.5、F:±1.0	3500	F:±1.0、G:±2.0	+70	−55~+150	2,000	2,000	—
NEW SDT101SA				1000	G:±2.0		G:±2.0			—	—	—
SDT101B		9	1.8	10、100、500	D:±0.5、F:±1.0		F:±1.0、G:±2.0	+200	−55~+300	—	—	2,000

※2 Thermal time constant and thermal dissipation constant are reference values, which are values of elements and vary with connecting or fixing methods.
※3 T.C.R. Measuring Temperature : 0℃/+100℃

■Precautions for Use

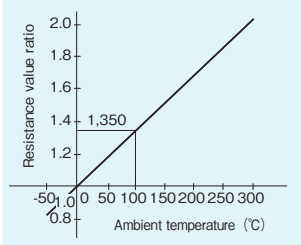
- It is difficult to solder SDT101B because of using heat-resistant leads. Make use of welding to connect the lead wires.
- When an operating current is 1mA or more, calculate a rise in temperature by self-heating to confirm an error.
- If SDT101, SDT101SA is used by being molded or placed in a metal protection tube filling with resin, the resistance value may occasionally vary slightly depending on the resin used.
- Ionic impurities such as flux etc. that are attached to these products or those mounted onto a PCB, negatively affect their moisture resistance, corrosion resistance, etc. The flux may contain ionic substances like chlorine, acid, etc. Please wash them to get rid of these ionic substances especially when using lead-free solder that may contain much of the said substances for improving a wetting characteristic. Using RMA solder or RMA flux, or well-washing is needed. Also, attaching ionic substances such as perspiration, salt etc. by storage environments or mounting conditions/environments negatively affects their moisture resistance, corrosion resistance etc. Please wash them to remove the ionic substances when they are polluted.
- When the components are polluted by ionic impurities like sodium(Na+), chlorine(Cl−) etc. included in perspiration and saliva, resistance may be changed. Avoid the pollution when storage, mounting and using. Consider not to remain ionic substances on the components. Wash by pure water etc. and dry them when you find pollution.

■Derating Curve



For sensors operated at an ambient temperature or higher, the power shall be derated in accordance with the above derating curve.

■Example of Temperature Characteristics of Resistance



Approximate Expression for Resistance-Temperatuer Characteristics
(Values are not guaranteed values but typical ones.)

$R_T=R_0\ (1+C_1T+C_2T^2)$

R_T: Resistance value at T℃

R_0: Resistance value at 0℃

T: Ambient temperature (℃)

C_1, C_2:Constants $C_1=0.356297\times10^{-2}$ $C_2=-0.617945\times10^{-6}$

■Performance

Test Items	Performance Requirements ΔR± (%+0.05Ω)		Test Methods
	Limit	Typical	
Resistance	Within specified tolerance	—	0℃
T.C.R.	Within specified T.C.R.	—	0℃/+100℃
Overload (Short time)	0.5	0.2	Rated voltage×2.5 for 5s
Resistance to soldering heat	0.3	0.1	350℃、1s(SDT101A/SA)
Rapid change of temperature	0.5	0.2	−55℃ (30min.)/+25℃ (10min.)/ +150℃ (30min.)/+25℃ (10min.) 、5 cycles
Moisture resistance	1	0.3	80℃±2℃、90%~95%RH、1000h 1.5h ON/0.5h OFF cycle
Endurance at 70℃	1	0.2	70℃±3℃ (SDT101A/SA) 、200℃±3℃ (SDT101B) 、1000h 1.5h ON/0.5h OFF cycle
High temperature exposure	1	0.7	+150℃ (SDT101A/SA) 、+300℃ (SDT101B) 、1000h
Shelf Life	0.3	0.1	Left for 1year on shelf in natural condition

■Resistance-Temperature Characteristic Table (Typical Value)

100Ω at 0℃

Temperature (℃)	0	−1	−2	−3	−4	−5	−6	−7	−8	−9
−50	82.04	81.67	81.31	80.94	80.58	80.22	—	—	—	—
−40	85.66	85.29	84.93	84.57	84.21	83.85	83.49	83.12	82.76	82.40
−30	89.26	88.90	88.54	88.18	87.82	87.46	87.10	86.74	86.38	86.02
−20	92.85	92.49	92.13	91.78	91.42	91.06	90.70	90.34	89.98	89.62
−10	96.43	96.07	95.72	95.36	95.00	94.64	94.29	93.93	93.57	93.21
0	100.00	99.64	99.29	98.93	98.57	98.22	97.86	97.50	97.15	96.79
	0	1	2	3	4	5	6	7	8	9
0	100.00	100.36	100.71	101.07	101.42	101.78	102.13	102.49	102.85	103.20
10	103.56	103.91	104.26	104.62	104.97	105.33	105.68	106.04	106.39	106.74
20	107.10	107.45	107.81	108.16	108.51	108.87	109.22	109.57	109.92	110.28
30	110.63	110.98	111.33	111.69	112.04	112.39	112.74	113.09	113.44	113.80
40	114.15	114.50	114.85	115.20	115.55	115.90	116.25	116.60	116.95	117.30
50	117.65	118.00	118.35	118.70	119.05	119.40	119.75	120.10	120.45	120.80
60	121.15	121.50	121.84	122.19	122.54	122.89	123.24	123.59	123.93	124.28
70	124.63	124.98	125.32	125.67	126.02	126.37	126.71	127.06	127.41	127.75
80	128.10	128.44	128.79	129.14	129.48	129.83	130.17	130.52	130.86	131.21
90	131.56	131.90	132.25	132.59	132.93	133.28	133.62	133.97	134.31	134.66
100	135.00	135.34	135.69	136.03	136.37	136.72	137.06	137.40	137.75	138.09
110	138.43	138.77	139.12	139.46	139.80	140.14	140.49	140.83	141.17	141.51
120	141.85	142.19	142.53	142.88	143.22	143.56	143.90	144.24	144.58	144.92
130	145.26	145.60	145.94	146.28	146.62	146.96	147.30	147.64	147.98	148.32
140	148.65	148.99	149.33	149.67	150.01	150.35	150.69	151.02	151.36	151.70
150	152.04	152.38	152.71	153.05	153.39	153.72	154.06	154.40	154.74	155.07
160	155.41	155.74	156.08	156.42	156.75	157.09	157.43	157.76	158.10	158.43
170	158.77	159.10	159.44	159.77	160.11	160.44	160.78	161.11	161.44	161.78
180	162.11	162.45	162.78	163.11	163.45	163.78	164.11	164.45	164.78	165.11
190	165.45	165.78	166.11	166.44	166.78	167.11	167.44	167.77	168.10	168.44
200	168.77	169.10	169.43	169.76	170.09	170.42	170.76	171.09	171.42	171.75
210	172.08	172.41	172.74	173.07	173.40	173.73	174.06	174.39	174.72	175.04
220	175.37	175.70	176.03	176.36	176.69	177.02	177.35	177.67	178.00	178.33
230	178.66	178.99	179.31	179.64	179.97	180.30	180.62	180.95	181.28	181.60
240	181.93	182.26	182.58	182.91	183.24	183.56	183.89	184.21	184.54	184.87
250	185.19	185.52	185.84	186.17	186.49	186.82	187.14	187.47	187.79	188.11
260	188.44	188.76	189.09	189.41	189.73	190.06	190.38	190.70	191.03	191.35
270	191.67	192.00	192.32	192.64	192.96	193.29	193.61	193.93	194.25	194.57
280	194.90	195.22	195.54	195.86	196.18	196.50	196.82	197.14	197.47	197.79
290	198.11	198.43	198.75	199.07	199.39	199.71	200.03	200.35	200.67	200.99
300	201.31	—	—	—	—	—	—	—	—	—

Note :
Desired temperature values are obtained by adding temperatures in the vertical and horizontal axes.When calculating a resistance value of 105℃, read the value in the column where 100℃ in the vertical axis and 5℃ in the horizontal axis cross. The value will be 136.72Ω.
The value for 500Ω at 0℃ will be the value obtained by multiplying resistance value in this table by 5. Similarly,the value for 10Ω at 0℃ will be the value obtained by dividing the resistance value by 10.