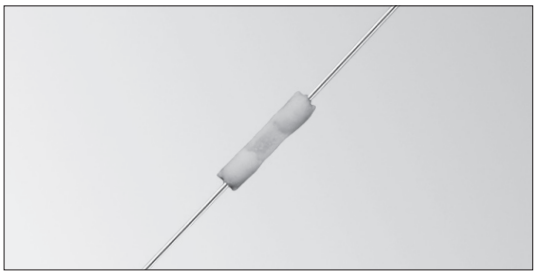
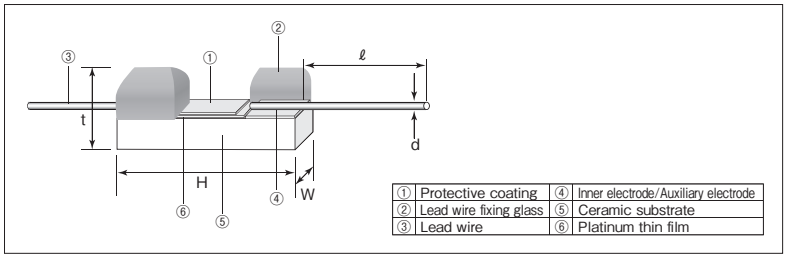
NEW EU RoHS

SDT310VASP2 Small type Platinum Thin Film Thermal Sensors (Small Heater Element)



Coating color：White

■Construction



①	Protective coating	④	Inner electrode/Auxiliary electrode
②	Lead wire fixing glass	⑤	Ceramic substrate
③	Lead wire	⑥	Platinum thin film

■Features

- Achieves a thermal time constant of 2.8-seconds due to volume reduction.
- Excellent heat-resistance.
- Applies axial lead type suitable to use as heater element.
- AEC-Q200 Tested.
- Products meet EU-RoHS requirements.

■Applications

- Heater elements for thermal flowmeters of Industrial equipment, measuring instruments and automotive.
- Ultra-small thermal sensor of industrial equipment and measuring instrument.

■Reference Standards

IEC 60751 -2008
JIS C 1604 -2013

■Dimensions

Type	Dimensions (mm)					Weight (g) (1000pcs)
	$W^{+0.15}_{-0.1}$	H±0.1	t max.	l±2.0	d±0.05	
SDT310VASP2	0.4	2.0	0.65	10.0	0.12	4.3

■Type Designation

Example

SDT310V	AS	P	2	K	20	F	40
Product Code	Style	Terminal Surface Material	Generation	Packaging	Nomonal Resistance	Resistance Tolerance	T.C.R Tolerance
		P：Pt clad		K：Chip Tray B：Bulk	20：20Ω	F：±1%	40：±40×10⁻⁶/K

■Ratings

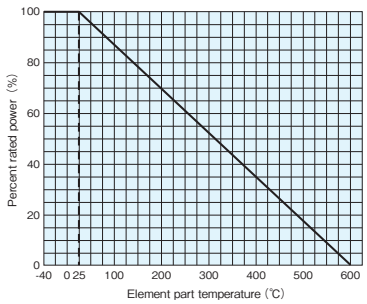
Resistance (Ω at 0℃)	Resistance Tolerance (%)	T.C.R※1 (×10⁻⁶/K)	Thermal Time Constant※2 (s)	Maximum Current (mA)	Power Rating (W)	Temperature Range※3 (℃)	Tray (pcs)
20	±1	3850±40	2.8	76	0.336	−55～+600	50

※1 T.C.R. Measuring Temperature:0℃/+100℃
※2 Thermal time constant is value measured in stationary air and is typical value ,which are values of elements and vary with connecting or fixing methods.
※3 Temperature of the device including a self-heating.

■Precautions for Use

- It is difficult to solder SDT310VASP2 because of using heat-resistant leads. Make use of welding to connect the leads wire.
- The sense warm part be careful of the treatment because there is fear to damage when giving a strong mechanical impact because it is using the glass courting.
- If SDT310VASP2 is used by being molded or placed in a metal protection tube filled with resin, the resistance value may occasionally vary slightly depending on the resin used.
- When forming a lead line, fix a lead line root and the load make not depend on the lead line root part.
- Part is intended to measure Air Flow Only - Not intended for Liquid Measurement.

■Derating Curve



For sensors operated at an element part temperature of 25℃ or higher, the power shall be derated in accordance with derating curve on the left.

■Performance

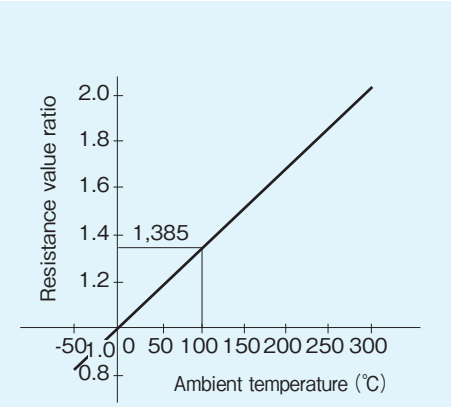
Test Items	Performance Requirements ΔR± (%+0.05Ω)		Test Methods
	Limit	Typical	
Resistance	Within specified tolerance	—	0℃
T.C.R.	Within specified T.C.R.	—	0℃/+100℃
Rapid change of temperature	0.5	−0.15	−55℃ (30min) /+200℃ (30min) 1000 cycles
Moisture resistance	0.5	−0.12	85℃±2℃、85%RH、1000h、10mA 1.5h ON/0.5h OFF cycles
Normal temperature load life	0.5	0.10	25℃±10℃、1000h、76mA 1.5h ON/0.5h OFF cycles
High temperature load life	0.5	0.11	125℃、1000h 73mA Continuous turning on electricity
Mechanical Shock	0.5	0.04	100g's maximum, 6Dms (Standard), 12.3ft/s
Vibration	0.5	−0.03	Test from 10-1900hz 30g's for 20min. 12cycles each of 3 orientations.
Component Strength	400g and more	—	Pull test

■Pt20 Resistance-Temperature Characteristic

20Ω at 0℃

Temperature (℃)	0	−1	−2	−3	−4	−5	−6	−7	−8	−9
−50	16.06	15.98	15.90	15.82	15.74	15.66	—	—	—	—
−40	16.85	16.77	16.70	16.62	16.54	16.46	16.38	16.30	16.22	16.14
−30	17.64	17.57	17.49	17.41	17.33	17.25	17.17	17.09	17.01	16.93
−20	18.43	18.35	18.27	18.20	18.12	18.04	17.96	17.88	17.80	17.72
−10	19.22	19.14	19.06	18.98	18.90	18.82	18.75	18.67	18.59	18.51
0	20.00	19.92	19.84	19.77	19.69	19.61	19.53	19.45	19.37	19.30
	0	1	2	3	4	5	6	7	8	9
0	20.00	20.08	20.16	20.23	20.31	20.39	20.47	20.55	20.62	20.70
10	20.78	20.86	20.94	21.01	21.09	21.17	21.25	21.33	21.40	21.48
20	21.56	21.64	21.71	21.79	21.87	21.95	22.02	22.10	22.18	22.26
30	22.33	22.41	22.49	22.57	22.64	22.72	22.80	22.88	22.95	23.03
40	23.11	23.19	23.26	23.34	23.42	23.49	23.57	23.65	23.73	23.80
50	23.88	23.96	24.03	24.11	24.19	24.26	24.34	24.42	24.49	24.57
60	24.65	24.73	24.80	24.88	24.96	25.03	25.11	25.19	25.26	25.34
70	25.42	25.49	25.57	25.64	25.72	25.80	25.87	25.95	26.03	26.10
80	26.18	26.26	26.33	26.41	26.48	26.56	26.64	26.71	26.79	26.87
90	26.94	27.02	27.09	27.17	27.25	27.32	27.40	27.47	27.55	27.63
100	27.70	27.78	27.85	27.93	28.00	28.08	28.16	28.23	28.31	28.38
110	28.46	28.53	28.61	28.69	28.76	28.84	28.91	28.99	29.06	29.14
120	29.21	29.29	29.36	29.44	29.51	29.59	29.67	29.74	29.82	29.89
130	29.97	30.04	30.12	30.19	30.27	30.34	30.42	30.49	30.57	30.64
140	30.72	30.79	30.87	30.94	31.02	31.09	31.17	31.24	31.32	31.39
150	31.47	31.54	31.61	31.69	31.76	31.84	31.91	31.99	32.06	32.14
160	32.21	32.29	32.36	32.43	32.51	32.58	32.66	32.73	32.81	32.88
170	32.95	33.03	33.10	33.18	33.25	33.33	33.40	33.47	33.55	33.62
180	33.70	33.77	33.84	33.92	33.99	34.07	34.14	34.21	34.29	34.36
190	34.43	34.51	34.58	34.66	34.73	34.80	34.88	34.95	35.02	35.10
200	35.17	35.24	35.32	35.39	35.47	35.54	35.61	35.69	35.76	35.83
210	35.91	35.98	36.05	36.13	36.20	36.27	36.34	36.42	3649	36.56
220	36.64	36.71	36.78	36.86	36.93	37.00	37.08	37.15	37.22	37.29
230	37.37	37.44	37.51	37.59	37.66	37.73	37.80	37.88	37.95	38.02
240	38.19	38.17	38.24	38.31	38.38	38.46	38.53	38.60	38.67	38.75
250	38.82	38.89	38.96	39.04	39.11	39.18	39.25	39.33	39.40	39.47
260	39.54	39.61	39.69	39.76	39.83	39.90	39.97	40.05	40.12	40.19
270	40.26	40.33	40.41	40.48	40.55	40.62	40.69	40.77	40.84	40.91
280	40.98	41.05	41.12	41.20	41.27	41.34	41.41	41.48	41.55	41.63
290	41.70	41.77	41.84	41.91	41.98	42.05	42.13	42.20	42.27	42.34
300	42.41	42.48	42.55	42.62	42.70	42.77	42.84	42.91	42.98	43.05
310	43.12	43.19	43.26	43.33	43.41	43.48	43.55	43.62	43.69	43.76
320	43.83	43.90	43.97	44.04	44.11	44.18	44.25	44.33	44.40	44.47
330	44.54	44.61	44.68	44.75	44.82	44.89	44.96	45.03	45.10	45.17
340	45.24	45.31	45.38	45.45	45.52	45.59	45.66	45.73	45.80	45.87
350	45.94	46.01	46.08	46.15	46.22	46.29	46.36	46.43	46.50	46.57
360	46.64	46.71	46.78	46.85	46.92	46.99	47.06	47.13	47.20	47.27
370	47.34	47.41	47.48	47.55	47.62	47.69	47.76	47.83	47.90	47.97
380	48.04	48.10	48.17	48.24	48.31	48.38	48.45	48.52	48.59	48.66
390	48.73	48.80	48.87	48.94	49.00	49.07	49.14	49.21	49.28	49.35
400	49.42	49.49	49.56	49.63	49.69	49.76	49.83	49.90	49.97	50.04
410	50.11	50.18	50.24	50.31	50.38	50.45	50.52	50.59	50.66	50.72
420	50.79	50.86	50.93	51.00	51.07	51.13	51.20	51.27	51.34	51.41
430	51.48	51.54	51.61	51.68	51.75	51.82	51.88	51.95	52.02	52.09
440	52.16	52.22	52.29	52.36	52.43	52.50	52.56	5263	52.70	52.77
450	52.84	52.90	52.97	53.04	53.11	53.17	53.24	53.31	53.38	53.44
460	53.51	53.58	53.65	53.71	53.78	53.85	53.92	53.98	54.05	54.12
470	54.19	54.25	54.32	54.39	54.46	54.52	54.59	54.66	54.72	54.79
480	54.86	54.93	54.99	55.06	55.13	55.19	55.26	55.33	55.39	55.46
490	55.53	55.60	55.66	55.73	55.80	55.86	55.93	56.00	56.06	56.13
500	56.20	56.26	56.33	56.40	56.46	56.53	56.59	56.66	56.73	56.79
510	56.86	56.93	56.99	57.06	57.13	57.19	57.26	57.32	57.39	57.46
520	57.52	57.59	57.66	57.72	57.79	57.85	57.92	57.99	58.05	5812
530	58.18	58.25	58.32	58.38	58.45	58.51	58.58	58.64	58.71	58.78
540	58.84	58.91	58.97	59.04	59.10	59.17	59.24	59.30	59.37	59.43
550	59.50	59.56	59.63	59.69	59.76	59.82	59.89	59.96	60.02	60.09
560	60.15	60.22	60.28	60.35	60.41	60.48	60.54	60.61	60.67	60.74
570	60.80	60.87	60.93	61.00	61.06	61.13	61.19	61.26	61.32	61.39
580	61.45	61.52	61.58	61.65	61.71	61.77	61.84	61.90	61.97	62.03
590	62.10	62.16	62.23	62.29	62.36	62.42	62.48	62.55	62.61	62.68
600	62.74	—	—	—	—	—	—	—	—	—

■Temperature Characteristics



Approximate Expression for Resistance-Temperature Characteristics

−55℃～0℃ : $R_T=R_0\{1+C_1T+C_2T^2+C_3(T-100)T^3\}$

0℃～+400℃ : $R_T=R_0(1+C_1T+C_2T^2)$

RT : Resistance value at T℃

R0 : Resistance value at 0℃

T : Ambient temperature (℃)

Constants C_1, C_2, C_3 : $C_1=3.908\times10^{-3}℃^{-1}$

$C_2=-5.775\times10^{-7}℃^{-2}$

$C_3=-4.183\times10^{-12}℃^{-4}$

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 28.08Ω.