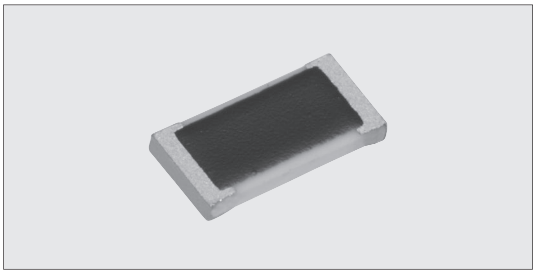
THERMAL SENSORS

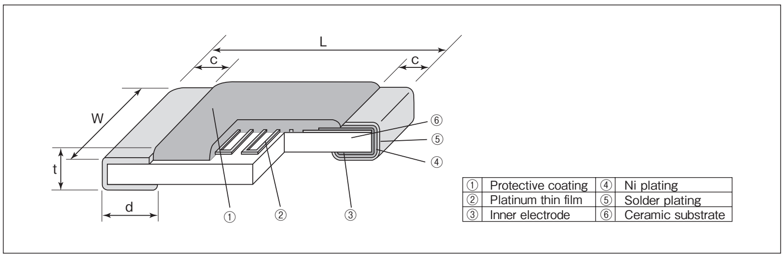
EU RoHS

SDT73V Platinum Thin Film Thermal Chip Sensors (For Automotive)



Coating color : Black

Construction



Features

- SMD platinum thin film thermal sensors for automotive.
- T.C.R. is equivalent to JIS・IEC standards.
- Suitable for both flow and reflow solderings.
- AEC-Q200 Tested.
- Products meet EU-RoHS requirements.

Applications

- Temperature compensation of the electronic component for automotive.
- Temperature compensation for various kinds of sensor drive circuits.
- Temperature compensation for telecommunication and measuring equipment.

Reference Standards

IEC 60751-1995 JIS C 1604-1997

Dimensions

Type (Inch Size Code)	Dimensions (mm)					Weight (g) (1000pcs)
	L±0.2	W±0.2	c±0.3	d±0.3	t±0.15	
2B (1206)	3.2	1.6	0.5	0.5	0.5	9.0

Type Designation

Example

SDT73V	2B	T	TE	100	F	385
Product Code	Size	Terminal Surface Material	Taping	Nominal Resistance	Resistance Tolerance	T.C.R. (×10⁻⁶/K)
	2B : 3.2×1.6mm	T : Sn	TEK : 4mm pitch plastic embossed TE : 4mm pitch plastic embossed BK : Bulk	100 : 100Ω 500 : 500Ω	C : ±0.2% F : ±1%	385 : +3850

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	Resistance (Ω at 0℃)	Resistance Tolerance (%)	Thermal Time※1 Constant (s)	Thermal Dissipation※1 Constant (mW/℃)	T.C.R.※2 (×10⁻⁶/K)	T.C.R. Tolerance (×10⁻⁶/K)	Operating Temperature Range (℃)	Specified※3 Current (mA) max.	Taping & Q'ty/Reel (pcs)	
									TEK	TE
SDT73V 2B	100 500	C : ±0.2 F : ±1	6.5	2.4	3850	±50	−55～+155	100Ω : 1 500Ω : 0.1	1,000	5,000

※1 Thermal time constant and thermal dissipation constant are reference values, which are values of elements and vary with connecting or fixing methods.
Thermal dissipation constant is approx. 4mW/℃ under the surface mounting condition.
※2 T.C.R. Measuring Temperature:0℃/+100℃
※3 The electricity which it is charged with in the element is moved to the range that rise in temperature due to a self-heat generation can be ignored.
Oridinarily recommended measuring currents are 1mA for 100Ω and 0.1mA for 500Ω.

Precautions for Use

- When measuring current higher than rated current (100Ω : 1mA, 500Ω : 0.1mA) is used, calculate a rise in temperature by self-heating and confirm the error range.
- 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, it leads to electrolytic corrosion. 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.
- Please pay attention that the top of an iron does not direct touch to the components. There is a risk that may cause a change in resistance. Take care that another risk may happen that the protecting coat is carbonized in an instant when touched directly by the top of the iron, also climatic-proof for electrolytic corrosion or insulation of protecting coat may be dropped down. Be sure not to give high temperature on the top of the iron as it will degrade the protecting coat.
- Avoid storing components under direct sun rays, high temperature/humidity. Direct sun rays will cause quality change of taping and difficulty of keeping appropriate peeling strength. 5～35℃/35～75%RH, there is no deterioration of solderability for 12 months, but take special care for storing, because condensation, dust, and toxic gas like hydrogen sulfide, sulfurous acid gas, hydrogen chloride, etc. may drop solderability.

Specifications given herein may be changed at any time without prior notice. Please confirm technical specifications before you order and/or use.
Contact our sales representatives before you use our products for applications including automotives, medical equipment and aerospace equipment.
Malfunction or failure of the products in such applications may cause loss of human life or serious damage.

■Performance

Test Items	Performance Requirements ΔR±(%+0.05Ω)		Test Methods (According to AEC-Q200 specification)
	Limit	Typical	
Resistance	Within specified tolerance	—	0℃
T.C.R.	3850±50 (×10⁻⁶/K)	—	0℃/+100℃
Resistance to Soldering heat	0.5	−0.004	260℃、10s
Solderability	95% coverage min.	—	235±5℃、3±0.5s
Teminal Strengh	0.5	−0.011	1.8kg force is kept on the samples for 60 seconds.
Rapid change of temperature	0.5	−0.058	−55℃ (30min) /+25℃ (2～3min) /+155℃ (30min) /+25℃ (2～3min) 1000cycles
Termal Shock	0.5	−0.032	−55℃ (15min) /+155℃ (15min) 300cycles
Moisture resistance	0.5	−0.041	25℃-65℃ (90%～100%RH) t=24 hours/cycle. Unpowered. It is carried out 10 times.
Biased Humidity	0.5	−0.016	85℃、85%RH、1000h、1mA 1.5h ON/0.5h OFF cycles
High temperature exposure	0.5	−0.022	+155℃、1000h
High temperature load life	0.5	−0.017	+155℃、1000h、1mA Continuous turning on electricity
Mechanical Shock	0.5	−0.001	100gs maximum, 6Dms(Standard),12.3ft/s
Vibration	0.5	−0.009	Test from 10-2000Hz 5g's for 20 min. 12 cycles each of 3 orientations

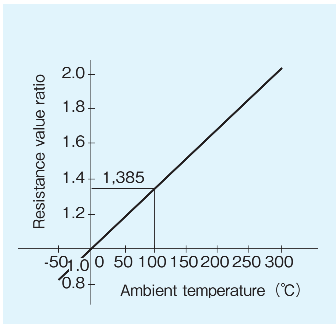
■Pt100 Resistance-Temperature Characteristic (IEC 60751-1995)

100Ω at 0℃

Temperature (℃)	0	−1	−2	−3	−4	−5	−6	−7	−8	−9
−50	80.31	79.91	79.51	79.11	78.72	78.32	—	—	—	—
−40	84.27	83.87	83.48	83.08	82.69	82.29	81.89	81.50	81.10	80.70
−30	88.22	87.83	87.43	87.04	86.64	86.25	85.85	85.46	85.06	84.67
−20	92.16	91.77	91.37	90.98	90.59	90.19	89.80	89.40	89.01	88.62
−10	96.09	95.69	95.30	94.91	94.52	94.12	93.73	93.34	92.95	92.55
0	100.00	99.61	99.22	98.83	98.44	98.04	97.65	97.26	96.87	96.48
	0	1	2	3	4	5	6	7	8	9
0	100.00	100.39	100.78	101.17	101.56	101.95	102.34	102.73	103.12	103.51
10	103.90	104.29	104.68	105.07	105.46	105.85	106.24	106.63	107.02	107.40
20	107.79	108.18	108.57	108.96	109.35	109.73	110.12	110.51	110.90	111.29
30	111.67	112.06	112.45	112.83	113.22	113.61	114.00	114.38	114.77	115.15
40	115.54	115.93	116.31	116.70	117.08	117.47	117.86	118.24	118.63	119.01
50	119.40	119.78	120.17	120.55	120.94	121.32	121.71	122.09	122.47	122.86
60	123.24	123.63	124.01	124.39	124.78	125.16	125.54	125.93	126.31	126.69
70	127.08	127.46	127.84	128.22	128.61	128.99	129.37	129.75	130.13	130.52
80	130.90	131.28	131.66	132.04	132.42	132.80	133.18	133.57	133.95	134.33
90	134.71	135.09	135.47	135.85	136.23	136.61	136.99	137.37	137.75	138.13
100	138.51	138.88	139.26	139.64	140.02	140.40	140.78	141.16	141.54	141.91
110	142.29	142.67	143.05	143.43	143.80	144.18	144.56	144.94	145.31	145.69
120	146.07	146.44	146.82	147.20	147.57	147.95	148.33	148.70	149.08	149.46
130	149.83	150.21	150.58	150.96	151.33	151.71	152.08	152.46	152.83	153.21
140	153.58	153.96	154.33	154.71	155.08	155.46	155.83	156.20	156.58	156.95
150	157.33	157.70	158.07	158.45	158.82	159.19	—	—	—	—

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 140.40Ω. The value for 500Ω at 0℃ will be the value obtained by multiplying the resistance value in this table by 5.

■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℃～+155℃ : $R_T=R_0(1+C_1T+C_2T^2)$
R_T : Resistance value at T℃
R_0 : Resistance value at 0℃
T : Ambient temperature (℃)
Constants C_1, C_2, C_3 : $C_1=3.9083\times10^{-3}$℃$^{-1}$
$C_2=-5.775\times10^{-7}$℃$^{-2}$
$C_3=-4.183\times10^{-12}$℃$^{-4}$

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