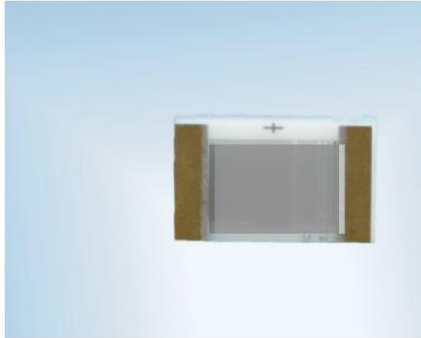


FlipChip Series

Platinum thin film RTD For automated assembly on PCBs



Sensor side up (top view)



Taped on reel sensor side down

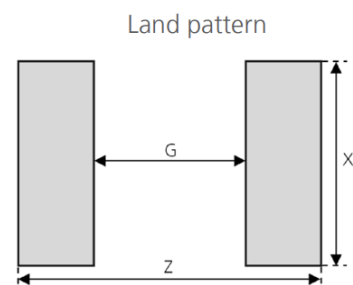
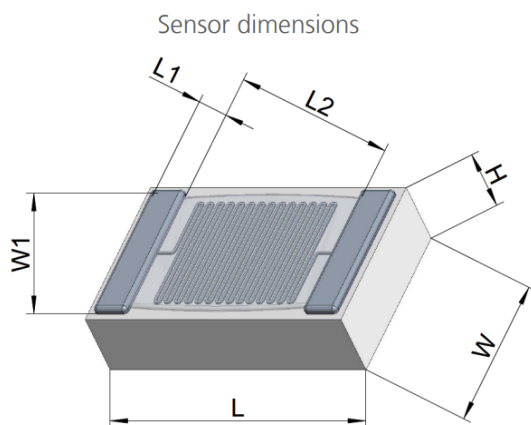


Reel

Benefits & characteristics

- Excellent long-term stability
- Low self-heating
- Fast response time
- Automatic assembly in large-volume applications
- Bondable versions available
- Optimal price-performance ratio

Dimensions



Sensor type	Dimensions in mm						Land pattern in mm		
	$L \pm 0.15$	$L1 \pm 0.1$	$L2 \pm 0.1$	$W \pm 0.15$	$W1 \pm 0.1$	$H \pm 0.15$	Z	G	X
0402 3FC	1.0 ± 0.10	0.20	0.55	0.50 ± 0.10	0.45	0.40 ± 0.10	1.05	0.38	0.55
0603 3FC	1.5	0.25	0.9	0.75	0.7	0.4	1.45	0.85	0.70
0805 3FC	1.9	0.25	1.4	1.15	1.1	0.4	2.70	1.10	1.40
0805 FC2	1.9	0.32	1.2	1.15	1.1	0.4	2.70	1.10	1.40

Technical data

Electrical Specifications

Chip size	0402	0603, 0805
Temperature range: ¹⁾	-50 °C to +150 °C	-50 °C to +250 °C
Nominal resistance:	100 Ω at 0 °C, 1000 Ω at 0 °C	
Temperature coefficient	3850 ppm/K	

Tolerance class: ²⁾ (dependent on temperature range)	iST reference	
IEC 60751 F0.15	A	
IEC 60751 F0.3	B	
IEC 60751 F0.6	C	

Temperature dependence of resistivity According to IEC 60751:

$$-50\text{ °C to }0\text{ °C} \quad R(T) = R_0 \times (1 + A \times T + B \times T^2 + C \times [T - 100] \times T^3)$$

$$0\text{ °C to }+250\text{ °C} \quad R(T) = R_0 \times (1 + A \times T + B \times T^2)$$

$$A = 3.9083 \times 10^{-3} \times \text{°C}^{-1}$$

$$B = -5.775 \times 10^{-7} \times \text{°C}^{-2}$$

$$C = -4.183 \times 10^{-12} \times \text{°C}^{-4}$$

R_0 = resistance value in Ω at 0 °C

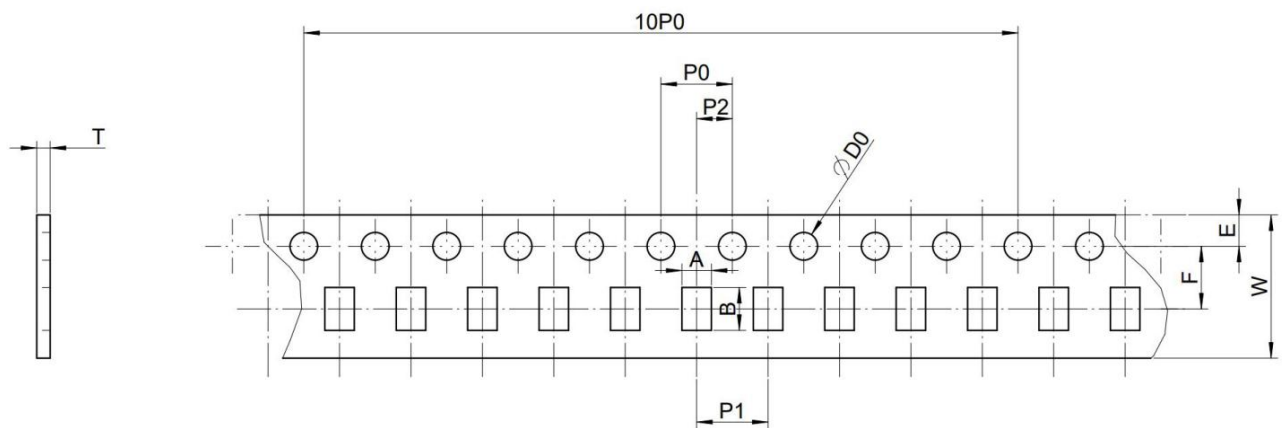
T = temperature in accordance with ITS90

General Specifications

Pads 3FC:	Thin-film Au-pads, bondable, solderable		
Pads FC2:	Thick-film Au-pads, bondable, solderable, sinterable		
(soldering connection)			
Soldering (according to J-STD-002E): see general notes 1.3	1. Solderability: following Test A and A1 in the standard 2. Resistance to soldering heat: following Test A and A1 in the standard		
Measuring current:	Pt 100	Pt 500	Pt 1000
(self-heating must be considered)	1 mA	0.5 mA	0.3 mA
Long-term stability:	Max. 0.4 % after 1000 hrs at +250 °C		
Taping & packaging:	EIA-481 (for dimensions see ³⁾)		
Storage property	12 months (original packaging and dry conditions)		
REACH + RoHS compliance	Yes		

General notes

- ¹⁾ The thermal expansion coefficient of the circuit board has to be considered.
- ²⁾ IEC60751 tolerances (F0.15, F0.3 and F0.6) are classified by one temperature measurement. Temperature coefficient of flip-chip sensor is random sample determined in the measuring bath while the sensors were faced-down soldered on a PCB board. Accuracy, self-heating and response time might vary depending on the mounting method (e.g. face-down soldering or wire bonding), and the measuring conditions. Furthermore, thermal expansion coefficient of the PCB must be considered within the operation temperature range, since it influences the accuracy level.
- ³⁾ Taping and packaging:



FC 0402

Item	A	B	W	E	F	P0	P1	P2	D0	T	10P0
Dimension	0.59	1.09	8.0	1.75	3.5	4.0	4.0	2.0	1.55	0.65	40.0
Min. tolerance	-0.05	-0.05	-0.10	-0.05	-0.05	-0.10	-0.10	-0.05	-0.05	-0.03	-0.10
Max. tolerance	0.05	0.05	0.10	0.05	0.05	0.10	0.10	0.05	0.05	0.03	0.10

FC 0603

Item	A	B	W	E	F	P0	P1	P2	D0	T	10P0
Dimension	1.07	1.78	8.00	1.75	3.50	4.00	4.00	2.00	1.55	0.60	40.00
Min. tolerance	-0.05	-0.05	-0.10	-0.05	-0.05	-0.10	-0.10	-0.05	-0.05	-0.03	-0.10
Max. tolerance	0.05	0.05	0.10	0.05	0.05	0.10	0.10	0.05	0.05	0.03	0.10

FC 0805

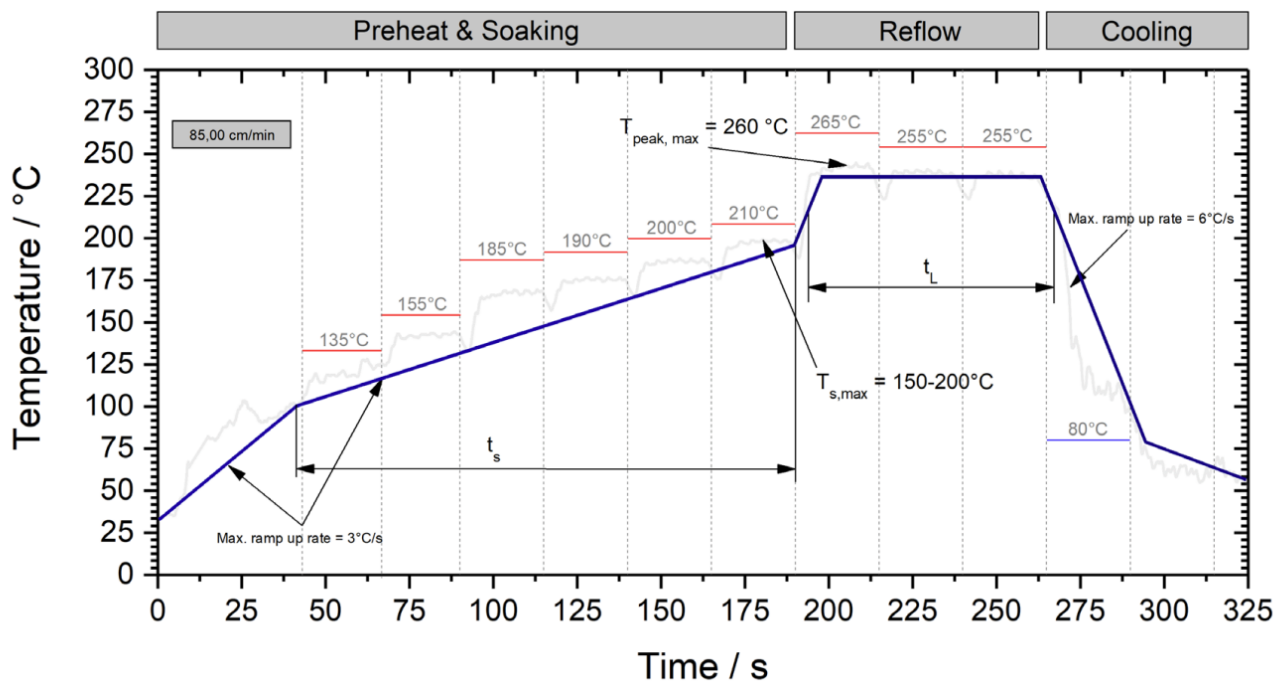
Item	A	B	W	E	F	P0	P1	P2	D0	T	10P0
Dimension	1.65	0.40	8.00	1.75	3.50	4.00	4.00	2.00	1.55	0.75	40.00
Min. tolerance	-0.05	-0.05	-0.10	-0.05	-0.05	-0.10	-0.10	-0.05	-0.05	-0.03	-0.10
Max. tolerance	0.05	0.05	0.10	0.05	0.05	0.10	0.10	0.05	0.05	0.03	0.10

Dimensions in mm. Packaging unit in tape and reel, special variants, small quantities or other packaging unit are available on request.

4) Soldering and reflow profile

For soldering iST recommends lead-free solder paste (Material: SnAgCu 96.5/3.0/0.5) and a temperature characteristic (reflow profile) for reflow soldering according to JEDEC J-STD-002E. The solderability was tested with following assembly conditions:

PCB Material:	FR4 (PCB Layer: 2)
PCB thickness:	1.6 mm
Dimensions:	72 x 32 mm
Solder Paste:	KOKI „S3X58-M406“ (Pb-free assembly)



Profile parameter	Temperature range / °C	Heating rate / °C/s	Time / s
Ramp to preheat	RT to 150	1.9 - 3	
Preaheat /Soak	$T_{s,min} = 100$, $T_{s,max} = 200$	1.9 - 3	$t_{s,min} = 60$, $t_{s,max} = 160$
Ramp to Peak	180 - 255	0.6	
Reflow	250 ± 5 , $T_{peak,max} = 260$		60 to 120, $t_{peak,max} = 30$
Cooling	255 - RT	1.6 - 3	

5) Important notes:

- The solder or additional fluxes should be halogen-free, mild, and non-activated
- After soldering, a thorough cleaning with pH-neutral defluxing material is recommended
- The profile has a significant impact on the solder joint performance, i.e. solderability, wettability and strength
- The soak profile and all other data serve as a guideline and cannot be regarded as binding statements or guaranteed values. They serve as a starting point for process development. Specifically, a high mix of components or large board sizes might require the development of a different soldering profile
- Long-term stability in the application and chemical resistance need to be approved by the customer.
- The customer must test and approve the suitability of IST AG sensors in the customer's application.

Order Information

Nominal Resistance at 0 °C	Size	Class IEC 60751	Description	Packaging type	Sensor side	Order number
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FlipChip 0402 3FC with bondable, solderable Au-Pads, -50°C to +250 °C

1000 Ω	0402	F0.3 (B)	P1K0.0402.3FC.B	tape only, without reel	down	157765
1000 Ω	0402	F0.3 (B)	P1K0.0402.3FC.B	tape on reel	down	157766

FlipChip 0603 3FC with bondable, solderable Au-Pads, -50°C to +250 °C

100 Ω	0603	F0.15 (A)	P0K1.0603.3FC.A.S	tape only, without reel	Down	155609
100 Ω	0603	F0.15 (A)	P0K1.0603.3FC.A.S	tape on reel	Up	155610
100 Ω	0603	F0.15 (A)	P0K1.0603.3FC.A.S	tape on reel	Down	155611
100 Ω	0603	F0.3 (B)	P0K1.0603.3FC.B.S	tape on reel	Up	155613
100 Ω	0603	F0.3 (B)	P0K1.0603.3FC.B.S	tape on reel	down	155614
1000 Ω	0603	F0.15 (A)	P1K0.0603.3FC.A.S	tape only, without reel	Down	155603
1000 Ω	0603	F0.15 (A)	P1K0.0603.3FC.A.S	tape on reel	Up	155601
1000 Ω	0603	F0.15 (A)	P1K0.0603.3FC.A.S	tape on reel	Down	155602
1000 Ω	0603	F0.3 (B)	P1K0.0603.3FC.B.S	tape on reel	Up	154447
1000 Ω	0603	F0.3 (B)	P1K0.0603.3FC.B.S	tape on reel	down	154448

FlipChip 0805 3FC with bondable, solderable Au-Pads, -50°C to +250 °C

100 Ω	0805	F0.15 (A)	P0K1.0805.3FC.A.S	tape only, without reel	Down	155650
100 Ω	0805	F0.15 (A)	P0K1.0805.3FC.A.S	tape on reel	Up	155651
100 Ω	0805	F0.15 (A)	P0K1.0805.3FC.A.S	tape on reel	Down	155652
100 Ω	0805	F0.3 (B)	P0K1.0805.3FC.B.S	tape on reel	Up	155653
100 Ω	0805	F0.3 (B)	P0K1.0805.3FC.B.S	tape on reel	down	101330
1000 Ω	0805	F0.15 (A)	P1K0.0805.3FC.A.S	tape only, without reel	Down	155648
1000 Ω	0805	F0.15 (A)	P1K0.0805.3FC.A.S	tape on reel	Up	101999
1000 Ω	0805	F0.15 (A)	P1K0.0805.3FC.A.S	tape on reel	Down	155647
1000 Ω	0805	F0.3 (B)	P1K0.0805.3FC.B.S	tape on reel	Up	154792
1000 Ω	0805	F0.3 (B)	P1K0.0805.3FC.B.S	tape on reel	down	101976

Nominal Resistance at 0 °C	Size	Class IEC 60751	Description	Packaging type	Sensor side	Order number
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FlipChip 0805 FC2 with solderable, bondable and sinterable Au-Pads, -50°C to +250 °C

100 Ω	0805	F0.15 (A)	P0K1.0805.FC2.A.S	tape only, without reel	Down	155656
100 Ω	0805	F0.15 (A)	P0K1.0805.FC2.A.S	tape on reel	Up	155661
100 Ω	0805	F0.15 (A)	P0K1.0805.FC2.A.S	tape on reel	Down	155662
100 Ω	0805	F0.3 (B)	P0K1.0805.FC2.B.S	tape on reel	Up	155663
100 Ω	0805	F0.3 (B)	P0K1.0805.FC2.B.S	tape on reel	down	155664
1000 Ω	0805	F0.15 (A)	P1K0.0805.FC2.A.S	tape only, without reel	Down	155655
1000 Ω	0805	F0.15 (A)	P1K0.0805.FC2.A.S	tape on reel	Up	155657
1000 Ω	0805	F0.15 (A)	P1K0.0805.FC2.A.S	tape on reel	Down	155658
1000 Ω	0805	F0.3 (B)	P1K0.0805.FC2.B.S	tape on reel	Up	155659
1000 Ω	0805	F0.3 (B)	P1K0.0805.FC2.B.S	tape on reel	down	155660

Additional documents

Application note	Document name	ATP_E
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Innovative Sensor Technology IST AG • Stegrütistrasse 14 • 9642 Ebnat-Kappel • Switzerland
+41 71 992 01 00 • info@ist-ag.com • www.ist-ag.com

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