

## **Glass-encapsulated sensors**



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## **Temperature measurement**

## **Glass-encapsulated sensors**

B57540

## Applications

- Automotive electronics
- Industrial electronics
- Home appliances

## Features

- Glass-encapsulated, heat-resistive and highly stable
- For temperature measurement up to 250 °C
- Fast response
- Small dimensions
- Leads: dumet wires (copper-clad FeNi)

## Options

Leads: nickel-plated dumet wires. Alternative dimensions available on request.

## **Delivery mode**

Bulk

## General technical data

Climatic category	(IEC 60068-1)		55/250/56	
Max. power	(at 25 °C)	P <sub>25</sub>	18	mW
Resistance tolerance		$\Delta R_R/R_R$	±1, ±2, ±3, ±5	%
Rated temperature		T <sub>R</sub>	25	°C
Dissipation factor	(in air)	$\delta_{\text{th}}$	approx. 0.4	mW/K
Thermal cooling time constant	(in air)	$\tau_{c}$	approx. 3	s
Heat capacity		C <sub>th</sub>	approx. 1.3	mJ/K

## Electrical specification and ordering codes

R <sub>25</sub>	No. of R/T	B <sub>25/85</sub>	B <sub>0/100</sub>	B <sub>25/100</sub>	Ordering code
Ω	characteristic	К	К	К	
5 k	8402	3480	3450 ±1%	3497	B57540G0502+00*
10 k	8407	3480	3450 ±1%	3497	B57540G0103+00*
20 k	8415	3992	3970 ±1%	4006	B57540G0203+00*
30 k	8415	3992	3970 ±1%	4006	B57540G0303+00*
50 k	8403	3992	3970 ±1%	4006	B57540G0503+00*
100 k	8404	4066	4036 ±1%	4085	B57540G0104+00*

+ = Resistance tolerance

- F = ±1%
- $G = \pm 2\%$
- H = ±3%
- $J = \pm 5\%$

\* = Leads

0 = dumet wires

2 = nickel-plated wires

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## **Dimensional drawing**



Dimensions in mm



**Glass-encapsulated sensors** 

B57540 G540

R <sub>25</sub>	No. of R/T	B <sub>25/85</sub>	B <sub>0/100</sub>	B <sub>25/100</sub>	Ordering code
Ω	characteristic	К	К	К	
230 k	8405	4240	4537 ±21)%	4264	B57540G0234+00*
1400 k	8406	4557	5133 ±2²)%	4581	B57540G0145+00*

+ = Resistance tolerance

- F = ±1%
- $G = \pm 2\%$
- $H = \pm 3\%$
- $J = \pm 5\%$

## **Reliability data**

\* = Leads

0 = dumet wires

2 = nickel-plated wires

Test	Standard	Test conditions	$\frac{\Delta R_{25}}{R_{25}}$ (typical)	Remarks
Storage in dry heat	IEC 60068-2-2	Storage at upper category temperature T: 250 °C t: 1000 h	< 3%	No visible damage
Storage in damp heat, steady state	IEC 60068-2-67	Temperature of air: 85 °C Relative humidity of air: 85% Duration: 56 days	< 2%	No visible damage
Rapid temperature cycling	IEC 60068-2-14	Lower test temperature: -55 °C Upper test temperature: 200 °C Number of cycles: 1000	< 2%	No visible damage

2) B<sub>200/300</sub>

Please read Important notes on page 2 and Cautions and warnings on page 227.

## **Temperature measurement**

## **Glass-encapsulated sensors**

**B57550** G550

## **Applications**

- Automotive electronics
- Industrial electronics
- Home appliances

## Features

- Glass-encapsulated, heat-resistive and highly stable
- For temperature measurement up to 300 °C
- Fast response
- Small dimensions
- Leads: dumet wires (copper-clad FeNi)

## Options

Leads: nickel-plated dumet wires. Alternative dimensions available on request.

#### **Delivery mode**

Bulk

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General technical data							
Climatic category	(IEC 60068-1)		55/300/56				
Max. power	(at 25 °C)	P <sub>25</sub>	32	mW			
Resistance tolerance		$\Delta R_{R}/R_{R}$	±1, ±2, ±3, ±5	%			
Rated temperature		T <sub>R</sub>	25	°C			
Dissipation factor	(in air)	$\delta_{th}$	approx. 0.75	mW/K			
Thermal cooling time constant	(in air)	$\tau_{c}$	approx. 7	s			
Heat capacity		C <sub>th</sub>	approx. 5	mJ/K			

## Electrical specification and ordering codes

R <sub>25</sub>	No. of R/T	B <sub>25/85</sub>	B <sub>0/100</sub>	B <sub>25/100</sub>	Ordering code
Ω	characteristic	К	К	К	
2 k	8401	3420	3390 ±1%	3436	B57550G0202+00*
5 k	8402	3480	3450 ±1%	3497	B57550G0502+00*
10 k	8407	3480	3450 ±1%	3497	B57550G0103+00*
20 k	8415	3992	3970 ±1%	4006	B57550G0203+00*
30 k	8415	3992	3970 ±1%	4006	B57550G0303+00*
50 k	8403	3992	3970 ±1%	4006	B57550G0503+00*
100 k	8404	4066	4036 ±1%	4085	B57550G0104+00*

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+ = Resistance tolerance

- $F = \pm 1\%$
- $G = \pm 2\%$
- $H = \pm 3\%$
- $J = \pm 5\%$

\* = Leads

03/06

0 = dumet wires

2 = nickel-plated wires

Please read Important notes on page 2 and Cautions and warnings on page 227.

**Dimensional drawing** 



Dimensions in mm



**Glass-encapsulated sensors** 

B57550 G550

R <sub>25</sub>	No. of R/T	B <sub>25/85</sub>	B <sub>0/100</sub>	B <sub>25/100</sub>	Ordering code
Ω	characteristic	К	К	К	
230 k	8405	4240	4537 ±1 <sup>1</sup> %	4264	B57550G0234+00*
1400 k	8406	4557	5133 ±2²)%	4581	B57550G0145+00*

+ = Resistance tolerance

- F = ±1%
- $G = \pm 2\%$
- $H = \pm 3\%$
- $J = \pm 5\%$

## **Reliability data**

\* = Leads

0 = dumet wires

2 = nickel-plated wires

Test	Standard	Test conditions	$\Delta R_{25}/R_{25}$ (typical)	Remarks
Storage in dry heat	IEC 60068-2-2	Storage at upper category temperature T: 300 °C t: 1000 h	< 3%	No visible damage
Storage in damp heat, steady state	IEC 60068-2-67	Temperature of air: 85 °C Relative humidity of air: 85% Duration: 56 days	< 2%	No visible damage
Rapid temperature cycling	IEC 60068-2-14	Lower test temperature: -55 °C Upper test temperature: 200 °C Number of cycles: 1000	< 2%	No visible damage

2) B<sub>200/300</sub>

Please read Important notes on page 2 and Cautions and warnings on page 227.

## **Temperature measurement**

## **Glass-encapsulated sensors**

B57560 G560

## Applications

- Automotive electronics
- Industrial electronics
- Home appliances

## Features

- Glass-encapsulated, heat-resistive and highly stable
- For temperature measurement up to 300 °C
- Fast response
- Leads: dumet wires (copper-clad FeNi)

## Options

Leads: nickel-plated dumet wires. Alternative dimensions available on request.

## **Delivery mode**

Bulk

## General technical data

Climatic category	(IEC 60068-1)		55/300/56	
Max. power	(at 25 °C)	P <sub>25</sub>	50	mW
Resistance tolerance		$\Delta R_R/R_R$	±1, ±2, ±3, ±5	%
Rated temperature		T <sub>R</sub>	25	°C
Dissipation factor	(in air)	$\delta_{th}$	approx. 1.3	mW/K
Thermal cooling time constant	(in air)	$\tau_{c}$	approx. 15	S
Heat capacity		C <sub>th</sub>	approx. 20	mJ/K

## Electrical specification and ordering codes

R <sub>25</sub>	No. of R/T	B <sub>25/85</sub>	B <sub>0/100</sub>	B <sub>25/100</sub>	Ordering code
Ω	characteristic	К	К	К	
2 k	8401	3420	3390 ±1%	3436	B57560G0202+00*
5 k	8402	3480	3450 ±1%	3497	B57560G0502+00*
10 k	8407	3480	3450 ±1%	3497	B57560G0103+00*
20 k	8415	3992	3970 ±1%	4006	B57560G0203+00*
30 k	8415	3992	3970 ±1%	4006	B57560G0303+00*
50 k	8403	3992	3970 ±1%	4006	B57560G0503+00*
100 k	8404	4066	4036 ±1%	4085	B57560G0104+00*
230 k	8405	4240	4537 ±1¹)%	4264	B57560G0234+00*

+ = Resistance tolerance

- F = ±1%
- $G = \pm 2\%$
- $H = \pm 3\%$
- $J = \pm 5\%$

\* = Leads

- 0 = dumet wires
- 2 = nickel-plated wires

Please read *Important notes* on page 2 and *Cautions and warnings* on page 227.

**Dimensional drawing** 



Dimensions in mm



**Glass-encapsulated sensors** 

B57560

G560

R <sub>25</sub>	No. of R/T	B <sub>25/85</sub>	B <sub>0/100</sub>	B <sub>25/100</sub>	Ordering code
Ω	characteristic	К	К	К	
1400 k	8406	4557	5133 ±2 <sup>2</sup> )%	4581	B57560G0145+00*

\* = Leads

0 = dumet wires

2 = nickel-plated wires

+ = Resistance tolerance

- F = ±1%
- $G = \pm 2\%$
- $H = \pm 3\%$
- $J = \pm 5\%$

## **Reliability data**

Test	Standard	Test conditions	$\Delta R_{25}/R_{25}$ (typical)	Remarks
Storage in dry heat	IEC 60068-2-2	Storage at upper category temperature T: 300 °C t: 1000 h	< 3%	No visible damage
Storage in damp heat, steady state	IEC 60068-2-67	Temperature of air: 85 °C Relative humidity of air: 85% Duration: 56 days	< 2%	No visible damage
Rapid temperature cycling	IEC 60068-2-14	Lower test temperature: -55 °C Upper test temperature: 200 °C Number of cycles: 1000	< 2%	No visible damage

## 1) B<sub>100/200</sub>

2) B<sub>200/300</sub>

## **Temperature measurement**

## **Glass-encapsulated sensors with insulation**

## **Applications**

- Automotive electronics
- Industrial electronics
- Home appliances

## Features

- Glass-encapsulated NTC thermistor, heat-resistant and highly stable
- Coating of glass body and leads for electrical insulation
- For temperature measurement up to 250 °C
- Fast response
- Small dimensions
- Leads: dumet wires (copper-clad FeNi)

## Options

Leads: nickel-plated dumet wires. Alternative dimensions available on request.

## **Delivery mode**

Bulk

## General technical data

1) Medium: NaCl-solution; Temperature: Room temperature

**Dimensional drawing** ø1.4 max.



TNT0465-A-E

Dimensions in mm

Climatic category	(IEC 60068-1)		55/250/56	
Max. power	(at 25 °C)	P <sub>25</sub>	18	mW
Resistance tolerance		$\Delta R_{R}/R_{R}$	±1, ±2, ±3, ±5	%
Rated temperature		T <sub>R</sub>	25	°C
Dissipation factor	(in air)	$\delta_{th}$	approx. 0.5	mW/K
Thermal cooling time constant	(in air)	$\tau_{c}$	approx. 4	s
Heat capacity		C <sub>th</sub>	approx. 2	mJ/K
Insulation resistance <sup>1)</sup>	(V = 100 VDC)	R <sub>ins</sub>	≥100	MΩ
Test voltage <sup>1)</sup>	(t = 1 s)	V <sub>test</sub>	500	VDC

B57541



#### **Glass-encapsulated sensors with insulation**

B57541

G541

## Electrical specification and ordering codes

R <sub>25</sub>	No. of R/T	B <sub>25/85</sub>	B <sub>0/100</sub>	B <sub>25/100</sub>	Ordering code
Ω	characteristic	К	К	К	
10 k	8407	3480	3450 ±1%	3497	B57541G0103+00*

\* = Leads

0 = dumet wires

2 = nickel-plated wires

+ = Resistance tolerance

 $F = \pm 1\%$ 

 $G = \pm 2\%$ 

 $H = \pm 3\%$ 

 $J = \pm 5\%$ 

## **Reliability data**

Test	Standard	Test conditions	$\Delta R_{25}/R_{25}$ (typical)	Remarks
Storage in	IEC	Storage at upper	< 3%	No visible
dry heat	60068-2-2	category temperature		damage
		T: 250 °C		
		t: 1000 h		
Storage in damp	IEC	Temperature of air: 85 °C	< 2%	No visible
heat, steady state	60068-2-67	Relative humidity of air: 85%		damage
		Duration: 56 days		
Rapid temperature	IEC	Lower test temperature: -55 °C	< 2%	No visible
cycling	60068-2-14	Upper test temperature: 200 °C		damage
		Number of cycles: 1000		



## **Glass-encapsulated sensors with insulation**

## Applications

- Automotive electronics
- Industrial electronics
- Home appliances

## Features

- Glass-encapsulated NTC thermistor, heat-resistant and highly stable
- Coating of glass body and leads for electrical insulation
- For temperature measurement up to 260 °C
- Fast response
- Small dimensions
- Leads: dumet wires (copper-clad FeNi)

## Options

Leads: nickel-plated dumet wires. Alternative dimensions available on request.

## **Delivery mode**

Bulk

## General technical data

## 

Dimensions in mm

Climatic category	(IEC 60068-1)		55/260/56	
Max. power	(at 25 °C)	P <sub>25</sub>	32	mW
Resistance tolerance		$\Delta R_R/R_R$	±1, ±2, ±3, ±5	%
Rated temperature		T <sub>R</sub>	25	°C
Dissipation factor	(in air)	$\delta_{\text{th}}$	approx. 0.8	mW/K
Thermal cooling time constant	(in air)	$\tau_{c}$	approx. 9	s
Heat capacity		C <sub>th</sub>	approx. 7.2	mJ/K
Insulation resistance <sup>1)</sup>	(V = 100 VDC)	R <sub>ins</sub>	≥100	MΩ
Test voltage <sup>1)</sup>	(t = 1 s)	V <sub>test</sub>	500	VDC

1) Medium: NaCl-solution; Temperature: Room temperature

Dimensional drawing

B57551



#### Glass-encapsulated sensors with insulation

B57551

G551

## **Electrical specification and ordering codes**

R <sub>25</sub>	No. of R/T	B <sub>25/85</sub>	B <sub>0/100</sub>	B <sub>25/100</sub>	Ordering code
Ω	characteristic	К	К	К	
10 k	8407	3480	3450 ±1%	3497	B57551G0103+00*

\* = Leads

0 = dumet wires

2 = nickel-plated wires

+ = Resistance tolerance

 $F = \pm 1\%$ 

- $G = \pm 2\%$
- $H = \pm 3\%$

 $J = \pm 5\%$ 

## **Reliability data**

Test	Standard	Test conditions	$\Delta R_{25}/R_{25}$ (typical)	Remarks
Storage in	IEC	Storage at upper	< 3%	No visible
dry heat	60068-2-2	category temperature		damage
		T: 260 °C		
		t: 1000 h		
Storage in damp	IEC	Temperature of air: 85 °C	< 2%	No visible
heat, steady state	60068-2-67	Relative humidity of air: 85%		damage
		Duration: 56 days		
Rapid temperature	IEC	Lower test temperature: -55 °C	< 2%	No visible
cycling	60068-2-14	Upper test temperature: 200 °C		damage
		Number of cycles: 1000		



## Glass-encapsulated sensors with insulation

## Applications

- Automotive electronics
- Industrial electronics
- Home appliances

## Features

- Glass-encapsulated NTC thermistor, heat-resistant and highly stable
- Coating of glass body and leads for electrical insulation
- For temperature measurement up to 260 °C
- Fast response
- Leads: dumet wires (copper-clad FeNi)

## Options

Leads: nickel-plated dumet wires. Alternative dimensions available on request.

## **Delivery mode**

Bulk

## General technical data

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Dimensions in mm

General lechnical data				
Climatic category	(IEC 60068-1)		55/260/56	
Max. power	(at 25 °C)	P <sub>25</sub>	50	mW
Resistance tolerance		$\Delta R_{R}/R_{R}$	±1, ±2, ±3, ±5	%
Rated temperature		T <sub>R</sub>	25	°C
Dissipation factor	(in air)	$\delta_{th}$	approx. 1.5	mW/K
Thermal cooling time constant	(in air)	$\tau_{c}$	approx. 18	s
Heat capacity		C <sub>th</sub>	approx. 27	mJ/K
Insulation resistance <sup>1)</sup>	(V = 100 VDC)	R <sub>ins</sub>	≥100	MΩ
Test voltage <sup>1)</sup>	(t = 1 s)	V <sub>test</sub>	500	VDC

1) Medium: NaCl-solution; Temperature: Room temperature

B57561



#### Glass-encapsulated sensors with insulation

B57561

G561

## Electrical specification and ordering codes

R <sub>25</sub>	No. of R/T	B <sub>25/85</sub>	B <sub>0/100</sub>	B <sub>25/100</sub>	Ordering code
Ω	characteristic	К	К	К	
10 k	8407	3480	3450 ±1%	3497	B57561G0103+00*

\* = Leads

0 = dumet wires

2 = nickel-plated wires

+ = Resistance tolerance

 $F = \pm 1\%$ 

- $G = \pm 2\%$
- $H = \pm 3\%$

 $J = \pm 5\%$ 

## **Reliability data**

Test	Standard	Test conditions	$\Delta R_{25}/R_{25}$ (typical)	Remarks
Storage in	IEC	Storage at upper	< 3%	No visible
dry heat	60068-2-2	category temperature		damage
		T: 260 °C		
		t: 1000 h		
Storage in damp	IEC	Temperature of air: 85 °C	< 2%	No visible
heat, steady state	60068-2-67	Relative humidity of air: 85%		damage
		Duration: 56 days		
Rapid temperature	IEC	Lower test temperature: -55 °C	< 2%	No visible
cycling	60068-2-14	Upper test temperature: 200 °C		damage
		Number of cycles: 1000		