

INFRARED SENSOR

OTI- 302 series

Digital Infrared Temperature Sensor OTI-302 T420

Revision Date: 2022/08/31 (Rev.06)



The OTI-302 series products combine an object temperature detection sensor, an ambient temperature detection sensor and an application-specific circuit in a compact TO-5 package. The OTI-302 series products are factory calibrated sensors with digital I2C output so the users can develop their own non-contact thermometer to accelerate time to market.

Features and Benefit

- Easy to integrate
- Output reading in $^{\circ}\text{C}$ unit directly
- Customizable PWM output

Application Examples

- High precision non-contact temperature measurement
- Home appliance with temperature control

Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit	Remarks / Conditions
Storage temperature	T_{Storage}	-40		100	$^{\circ}\text{C}$	
Operation temperature	$T_{\text{Operation}}$	-20		85	$^{\circ}\text{C}$	
Power supply	V_{Max}			6.5	V	
I/O pin	V_{SCL} V_{SDA}	-0.3		6.5	V	
ESD (Human Body Mode)	ESD_{H}			2	kV	
ESD (Machine Mode)	ESD_{M}			200	V	

Electrical and Mechanical Characteristic

Parameter	Symbol	Min	Typ	Max	Unit	Remarks / Conditions
Operating Conditions						
Operating voltage	V_{D}	3.2	3.3	3.4	V	
Supply current (operation)	I_{D}	-	2.0	-	mA	$V_{\text{DD}} = 3.3\text{ V}$
Supply current (sleep)	I_{Sleep}	-	0.7	-	μA	$V_{\text{DD}} = 3.3\text{ V}$
Wake up time	T_{Wake}		1		Sec.	
Data Communication						
Electrical interface			I2C			
Interface speed			100		KHz	
Data refresh rate			2		Hz	
Slave address			10		hex	7 bits addressing

Thermometer Sensing Characteristics

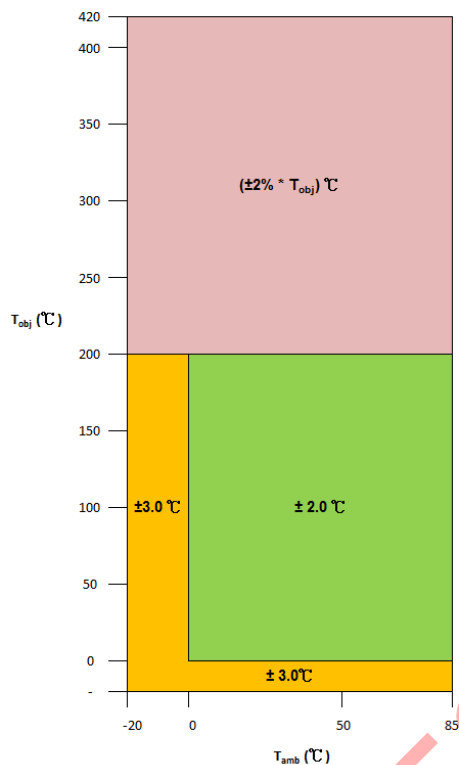
Parameter	Symbol	Min	Typ	Max	Unit	Remarks / Conditions
T420						
Ambient temperature range	T_{Amb}	-20		85	$^{\circ}\text{C}$	
Object temperature range	T_{Obj}	-20		420	$^{\circ}\text{C}$	
Resolution of T_{Amb} reading	$T_{\text{Res_amb}}$	-	0.01	-	$^{\circ}\text{C}$	$T_{\text{Amb}} = 25^{\circ}\text{C}$
Resolution of T_{Obj} reading	$T_{\text{Res_obj}}$	-	0.01	-	$^{\circ}\text{C}$	$T_{\text{Amb}} = 25^{\circ}\text{C}$

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Accuracy of T_{Obj} reading **1	T_{Acc}	--	± 2.0	$\pm 2\% * T_{Obj}$	$^{\circ}C$	Please see performance graph below.
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Performance Graph of T420 model



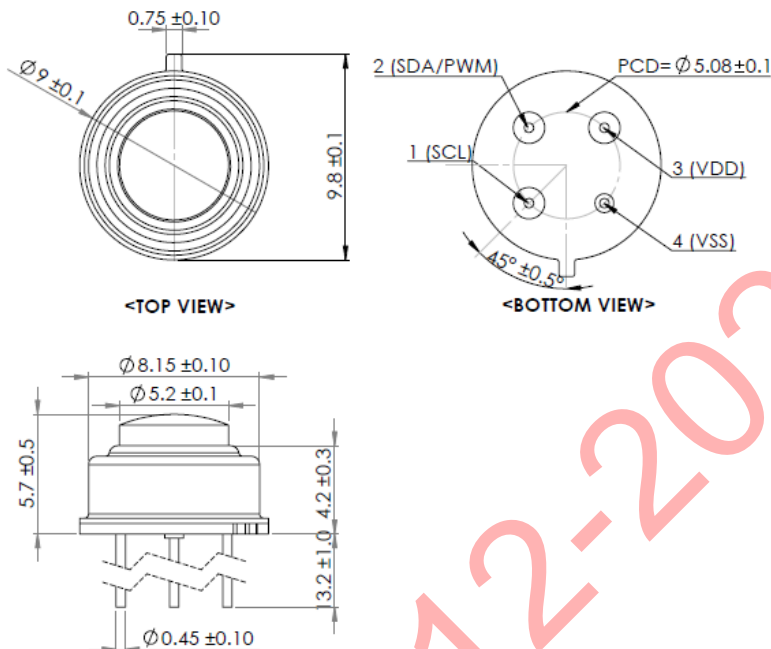
Note:

- All accuracy specifications apply under settled isothermal conditions only. Furthermore, the accuracy is only valid if the object fills the FOV of the sensor completely
- Test condition
 - Distance from sensor to blackbody: 5 cm (K05 type)
15 cm (K15 type)
25 cm (K25 type)
 - Blackbody size: 15 cm in diameter
 - Blackbody emissivity: 0.95

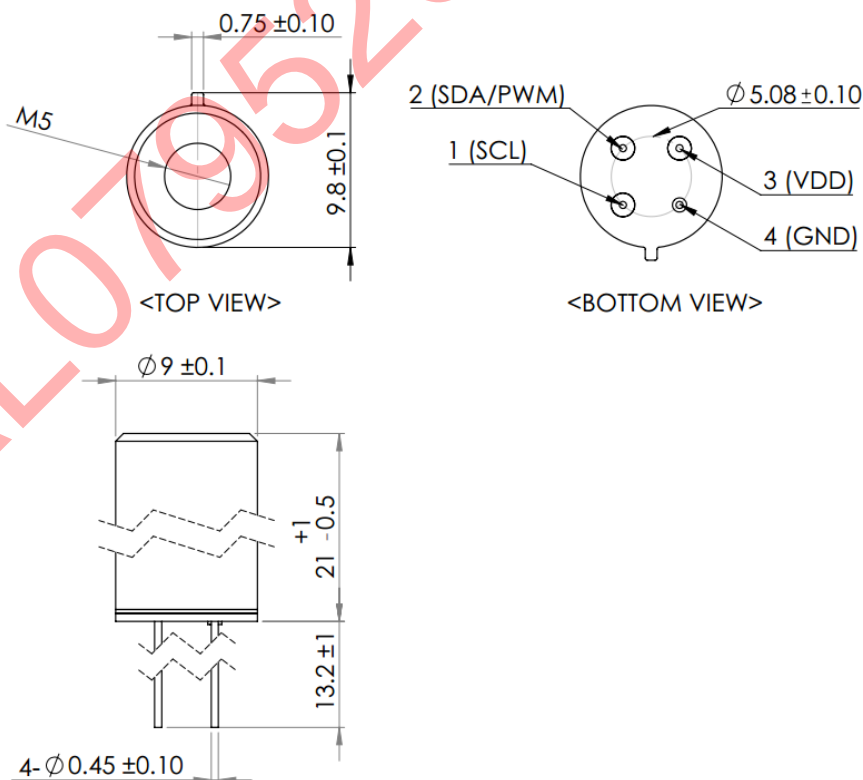
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- D10 model



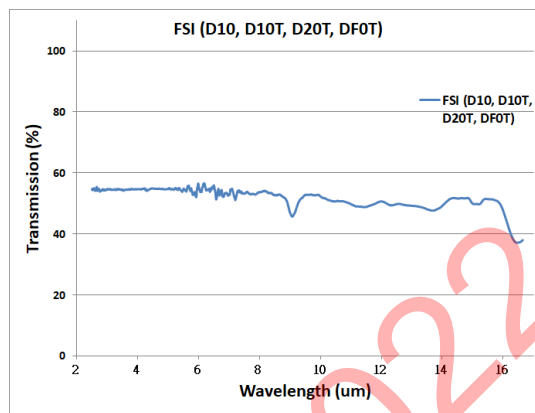
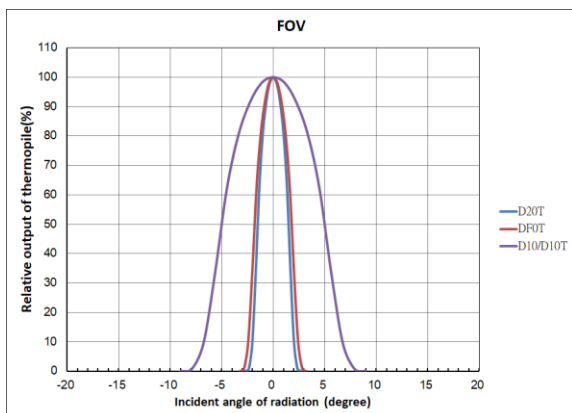
- D10T model



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Optical Characteristics



Ordering Information

- OTI-302 T420 D10 Kxx^{*1,2} FOV 10±3°
- OTI-302 T420 D10T Kxx^{*1,2} FOV 10±3°

Note *1: K05, K15, or K25
 *2: K05 is the typical type.



Liability Policy

The contents of this document are subject to change without notice. Customers are advised to consult with Oriental System Technology sales representatives before ordering.

Customers considering the use of Oriental System Technology thermopile devices in special applications where failure or abnormal operation may directly affect human lives or cause physical injury or property damage, or where extremely high levels of reliability are demanded, are requested to consult with Oriental System Technology sales representatives before such use. The company will not be responsible for damage arising from such use without prior approval.