A2TPMI 334 OAA180

Product Picture:

Description:	**Integrated (pre-amplified, calibrated & compensated) remote temperature sensor with wide field of view**
Referenced Document(s):	**A2TPMI Datasheet, Rev. June 2006**
Product Name: **A2TPMI 334 OAA180**	Part Number: **6268**
Sensing range **-20 … 180° C**	Accuracy: **± 1.5 K @ calibration point (Tobj = 100 °C, Tamb = 25°C)** **± 2.5 K @ (80°C £ Tobj £ 180 °C, Tamb = 10 … 80°C)**

Absolute Maximum Ratings

Parameter	Min	MAX
Supply Voltage V_{DD}	-0.3 V	+6.5 V
Storage Temperature Range Note 1)	-40 °C	100°C
Operating Temperature Range	-25°C	100°C
Voltage at all inputs and outputs Note 2)	-0.3 V	V_{DD} +0.3 V
Current at input pins Note 2)		+/- 5mA
Lead temperature (Soldering, 10sec)		+300°C
ESD Tolerance Note 3)		2.5 kV

Note 1: Extension to 120°C for limited periods of several minutes possible

Note 2: Limiting input pin current is only necessary for input voltages that exceed absolute maximum input voltage ratings

Note 3: Human body model, 1.5kΩ in series with 100pF. All pins rated per method 3015.7 of MIL-STD-883.

Static-sensitive device. Unused devices must be stored in conductive material. Protect devices from static discharge and static fields. Stresses above those listed under “Absolute maximum ratings” may cause permanent damage to the device. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Precautions should be taken to avoid reverse polarity of power supply. Reversed polarity of power supply results in a destroyed unit.

Do not expose the sensors to aggressive detergents such as freon, trichlorethylen, etc. Optical windows (e.g. filter, lens) may be cleaned with alcohol and cotton swab.

Electrical Characteristics

Unless otherwise indicated, all limits specified for Tamb = 25°C, V_{DD} = +5 V

Symbol	Parameter	Min	Typ	Max	Unit	Conditions
Power Supply						
V_{DD}	Supply Voltage	4.5	5	5.5	V	
I_{DD}	Supply Current		1.5	2	mA	R_L > 1MΩ
Outputs V_{Tobj} / V_{Tamb}						
V_O	Output Voltage Swing	0.25		V_{DD} – 0.25V	V	I_{out}: -100µA … +100µA
R_O	Output Resistance			10	Ω	I_{out}: -100µA … +100µA
				100		otherwise
R_L	Resistive Output Load	50			kΩ	
C_L	Capacitive Output Load		100	500	pF	
I_{SC}	Output short circuit current		6		mA	Sourcing
			13		mA	Sinking
V_{oL}	Low level output voltage			0.5	V	output current ≤ 2mA
V_{oH}	High level output voltage	V_{DD}-0.6V			V	output current ≥ -2mA
Reference Voltage						
V_{Ref}	Reference voltage	1.223	1.225	1.227	V	R_L > 1MΩ, T_{amb} = 25°C
TC_{VRef}	Temperature coefficient of reference voltage		±30	±100	ppm K^{-1}	

AC Characteristics

Unless otherwise indicated, all limits specified for Tamb = 25°C, V_{DD} = +5V

Symbol	Parameter	Min	Typ	Max	Unit	Conditions
In_N	V1 Input referred voltage noise			120	nV/√Hz	rms value
t_{Strt}	Response Time after Power On			1	s	
t_{lat}	Latency time for V_{Tobj}			75	ms	
t_{resp}	Response Time		90	150	ms	

Thermopile Characteristics

Symbol	Parameter	Min	Typ	Max	Unit	Conditions
3-type chip (TPS 33x)						
S	Sensitive (absorber) area		0.7x0.7		mm^2	
N	Noise voltage		38		nV/√Hz	
τ	Time constant		25		ms	

V_{TOBJ} Characteristics

Unless otherwise specified, all limits specified for V_{DD} = +5 V, V_{Ref} = +1.225V.

Object temperature / °C	Min	Typ	Max	Unit	Gradient / V/K
-20	0.834	0.850	0.865	V	0.006
-10	0.898	0.915	0.932	V	0.007
0	0.969	0.989	1.008	V	0.008
10	1.051	1.073	1.096	V	0.009
20	1.144	1.170	1.196	V	0.010
25	1.197	1.225	1.253	V	0.011
30	1.251	1.281	1.310	V	0.012
40	1.372	1.405	1.438	V	0.013
50	1.507	1.543	1.580	V	0.015
60	1.656	1.695	1.735	V	0.016
70	1.818	1.861	1.904	V	0.017
80	1.994	2.040	2.087	V	0.019
90	2.183	2.233	2.283	V	0.020
100	2.408	2.440	2.471	V	0.021
110	2.602	2.659	2.716	V	0.023
120	2.833	2.894	2.955	V	0.024
130	3.079	3.144	3.208	V	0.026
140	3.341	3.409	3.478	V	0.027
150	3.619	3.691	3.764	V	0.029
160	3.913	3.990	4.067	V	0.031
180	4.556	4.642	4.728	V	0.034

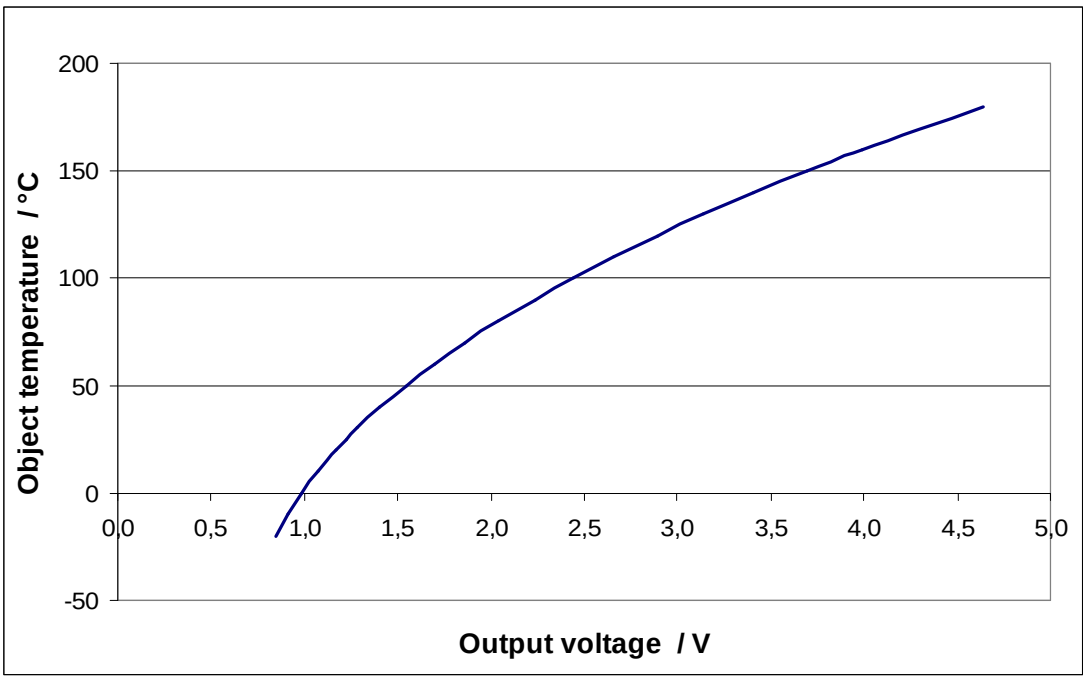


Figure 1: Output Characteristic

Polynomial to calculate Tobj from V_{Tobj}:

Tobj [°C] = - 0.477130 x^6 + 8.48270 x^5 - 61.41728 x^4 + 232.9302 x^3 - 496.803 x^2 + 624.76 x - 306.35

x = V_{Tobj} in Volt

V_{TAMB} Characteristics

Unless otherwise specified, all limits specified for V_{DD} = +5 V, V_{Ref} = +1.225V

Temperature		Min	Typ	Max	Unit	Gradient
-20	°C		0.621		V	6.9 mV K^{-1}
-10	°C	0.684	0.704	0.724	V	9.8 mV K^{-1}
0	°C	0.791	0.816	0.842	V	12.7 mV K^{-1}
10	°C	0.942	0.958	0.974	V	15.6 mV K^{-1}
15	°C	1.023	1.040	1.057	V	17.1 mV K^{-1}
20	°C	1.110	1.129	1.147	V	18.5 mV K^{-1}
25	°C	1.205	1.225	1.245	V	20.0 mV K^{-1}
30	°C	1.307	1.329	1.350	V	21.4 mV K^{-1}
35	°C	1.417	1.439	1.462	V	22.9 mV K^{-1}
40	°C	1.533	1.558	1.582	V	24.4 mV K^{-1}
50	°C	1.789	1.816	1.843	V	27.3 mV K^{-1}
60	°C	2.043	2.103	2.163	V	30.2 mV K^{-1}
70	°C	2.353	2.420	2.486	V	33.1 mV K^{-1}
80	°C	2.693	2.765	2.837	V	36.0 mV K^{-1}
90	°C	3.062	3.140	3.218	V	38.9 mV K^{-1}
100	°C	3.460	3.544	3.628	V	41.9 mV K^{-1}

Polynomial to calculate T_{amb} from V_{TAmb} :

$$T_{Amb}\,[°C] = -1.523563\,x^6 + 20.52003\,x^5 - 112.09588\,x^4 + 319.2295\,x^3 - 508.327\,x^2 + 475.52\,x - 180.50$$

x = V_{TAmb} in Volt

Optical Characteristics

FIELD OF VIEW

Symbol	Parameter	Min	Typ	Max	Unit	Conditions
Standard Cap Type (C4)						
FOV	Field of view		60	70	°	50% rel. output signal
OA	Optical axis		0	± 10	°	in reference to symmetrical axis of cap

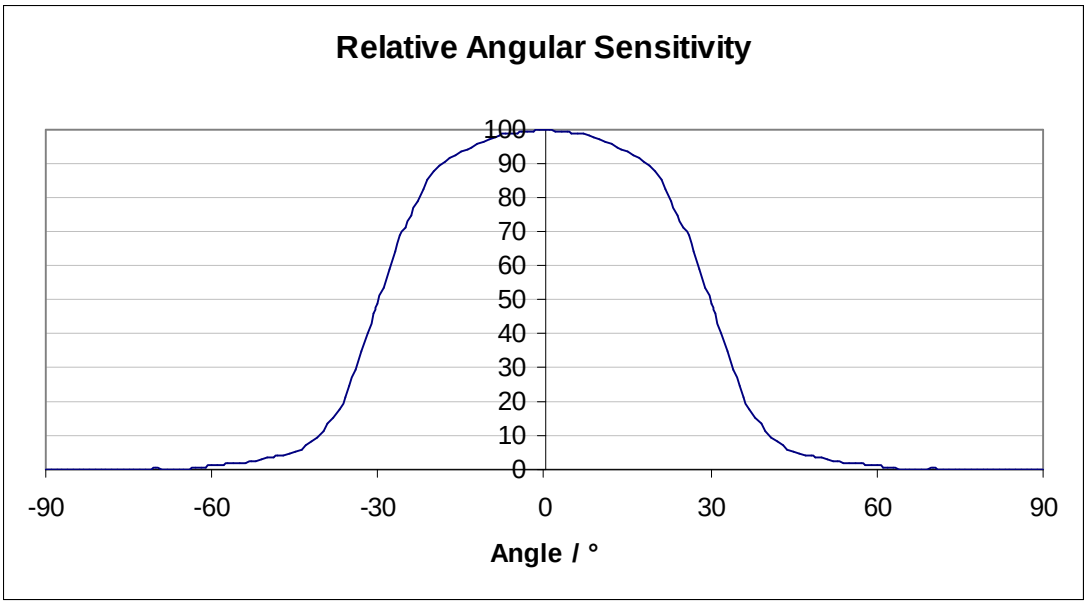


Figure 2: Typical angular sensitivity of A2TPMI 334 - type sensors

Filter Characteristics

The following picture shows typical transmission curves for a standard Filter in a wavelength range from 2µm to 22µm.

The average transmission for a standard filter is at least 70% in a range from 7.5µm to 13.5µm.

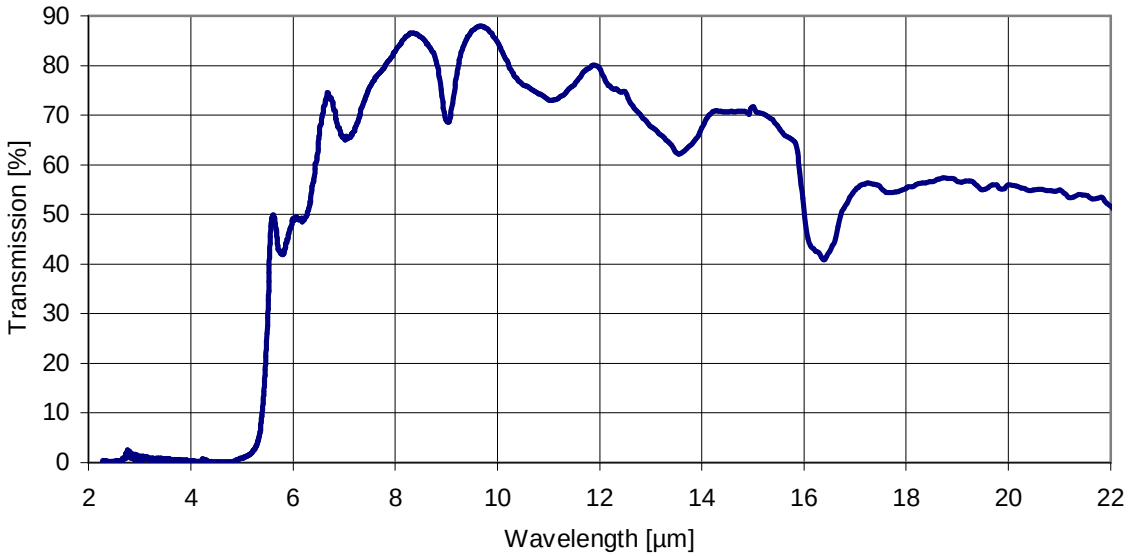


Figure 3: IR-Filter Characteristic

Configuration

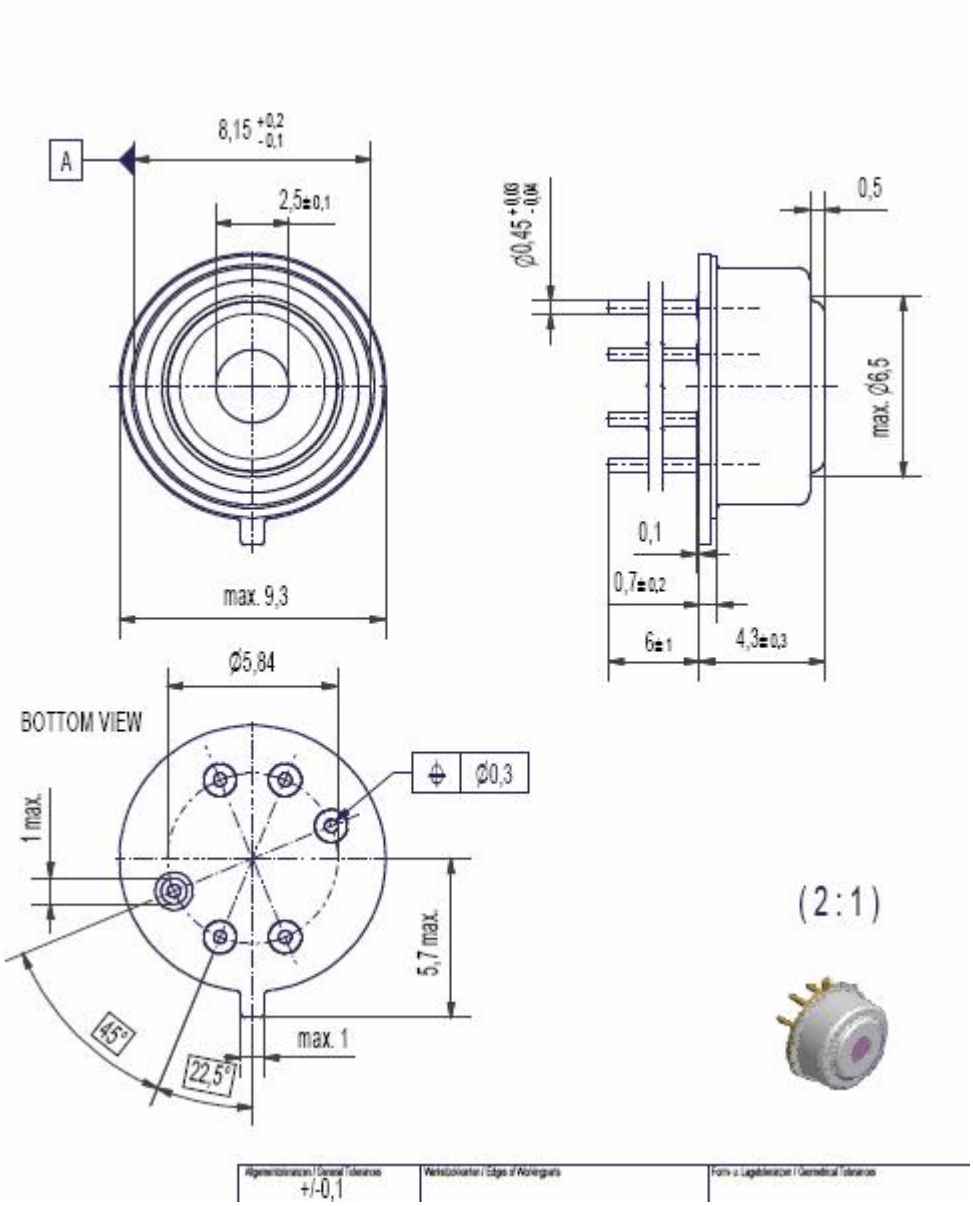
Feature	**Adjustment**	
Ambient Temperature Compensation	Enabled	√
	Disabled	
V_{Tamb} / V_{Ref} Output Signal	Reference Voltage V_{Ref}	
	V_{Tamb} Signal	√
V_{Tobj} Output Configuration	Analog Mode	√
	Comparator Mode	
V_{Tamb} Output Configuration	Analog Mode	√
	Comparator Mode	

Test Conditions

Object Size	Full field of view coverage
Object Emissivity	> 99%
Object Temperature	100°C ± 0.5°C
Ambient Temperature	25°C ± 1°C
Supply Voltage	5V

TEST PARAMETER:							
		V_{Tobj}			V_{Tamb}		
Tobj	**Tamb**	**Minimum**	**Typical**	**Maximum**	**Minimum**	**Typical**	**Maximum**
°C	**°C**	**V**	**V**	**V**	**V**	**V**	**V**
100	**25**	**2.408**	**2.440**	**2.471**	**1.205**	**1.225**	**1.245**

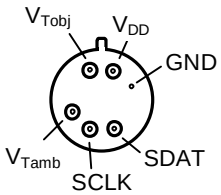
Mechanical Information (preliminary)



Drawing number : 2 / 71503

Connection Information

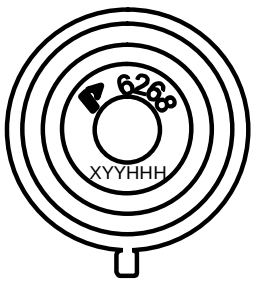
Non PCB Version



Bottom view

Labeling

XYY	Manufacturing date: X = Last digit of the calendar year, YY = Week of the calendar year
HHH	Serial number of the production lot



Quality System

PerkinElmer Optoelectronics is an ISO 9001:2002 and ISO/TS 16949:2002 certified manufacturer. All devices employing PCB assemblies are manufactured according IPC-A-610 guidelines.

The pcb assembly and components are of lead-free type, compliant to RoHS.

Liability Policy

The contents of this document are subject to change without notice and customers should consult with PerkinElmer Optoelectronics sales representatives before ordering. Customers considering the use of PerkinElmer Optoelectronics thermopile devices in applications where failure may cause personal injury or property damage, or where extremely high levels of reliability are demanded, are requested to discuss their concerns with PerkinElmer Optoelectronics sales representatives before such use. The Company's responsibility for damages will be limited to the repair or replacement of defective product. As with any semiconductor device, thermopile sensors or modules have a certain inherent rate of failure. To protect against injury, damage or loss from such failures, customers are advised to incorporate appropriate safety design measures into their product.

PerkinElmer® precisely.

PerkinElmer Optoelectronics GmbH & Co. KG
PO Box 3007
65020 Wiesbaden • Germany
Tel.: +49 (0)611 492 430
Fax: +49 (0)611 492 177
http://www.optoelectronics.perkinelmer.com