

A2TPMI 334-L5.5 OAA060

Product Picture:



Description: **Integrated (pre-amplified, calibrated & compensated) remote temperature sensor with small field of view (D:S = 8:1)**

Referenced Document(s): **Datasheet A2TPMI, Rev. 4**

Product Name:

A2TPMI 334-L5.5 OAA060

Part Number:

6266

Sensing range

-20 ... 60 ° C

Accuracy:

**± 1.5 K @ calibration point (Tobj = 40 °C, Tamb = 25°C)
± 2.5 K @ (20 °C ≤ Tobj ≤ 60 °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	-40°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, 1.5k Ω 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 $T_{amb} = 25^{\circ}\text{C}$, $V_{DD} = +5\text{ V}$

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	$R_L > 1\text{ M}\Omega$
Outputs $V_{Tobj} / V_{TambESD}$						
V_O	Output Voltage Swing	0.25		$V_{DD} - 0.25\text{V}$	V	$I_{out}: -100\mu\text{A} \dots +100\mu\text{A}$
R_O	Output Resistance			10 100	Ω	$I_{out}: -100\mu\text{A} \dots +100\mu\text{A}$ otherwise
R_L	Resistive Output Load	50			$\text{k}\Omega$	
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 $\leq 2\text{mA}$
V_{OH}	High level output voltage	$V_{DD} - 0.6\text{V}$			V	output current $\geq -2\text{mA}$
Reference Voltage						
V_{Ref}	Reference voltage	1.223	1.225	1.227	V	$R_L > 1\text{ M}\Omega$, $T_A = 25^{\circ}\text{C}$
TC_{VRef}	Temperature coefficient of reference voltage		± 30	± 100	ppm K^{-1}	

AC Characteristics

Unless otherwise indicated, all limits specified for $T_{amb} = 25^{\circ}\text{C}$, $V_{DD} = +5\text{V}$

Symbol	Parameter	Min	Typ	Max	Unit	Conditions
I_{N}	V1 Input referred voltage noise			120	nV/ $\sqrt{\text{Hz}}$	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/ $\sqrt{\text{Hz}}$	
τ	Time constant		25		ms	

V_{TOBJ} Characteristics

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

Temperature / °C	Min	Typ	Max	Unit	Gradient $V \cdot K^{-1}$
-20	0.435	0.508	0.581	V	0.029
-15	0.581	0.660	0.739	V	0.031
-10	0.738	0.823	0.907	V	0.034
-5	0.907	0.996	1.086	V	0.036
0	1.086	1.182	1.277	V	0.038
5	1.277	1.379	1.481	V	0.041
10	1.481	1.589	1.698	V	0.043
15	1.697	1.812	1.927	V	0.046
20	1.927	2.049	2.171	V	0.049
25	2.171	2.300	2.429	V	0.052
30	2.429	2.565	2.702	V	0.055
35	2.702	2.846	2.990	V	0.058
40	3.051	3.142	3.234	V	0.061
45	3.294	3.455	3.615	V	0.064
50	3.615	3.784	3.953	V	0.068
60	4.309	4.495	4.682	V	0.075

Polynom to calculate T_{obj} from V_{Tobj} :

$$T_{obj} [^{\circ}\text{C}] = -0.005686 x^6 + 0.10375 x^5 - 0.81405 x^4 + 3.7370 x^3 - 12.313 x^2 + 44.01 x - 39.62$$

$x = V_{Tobj}$ in Volt

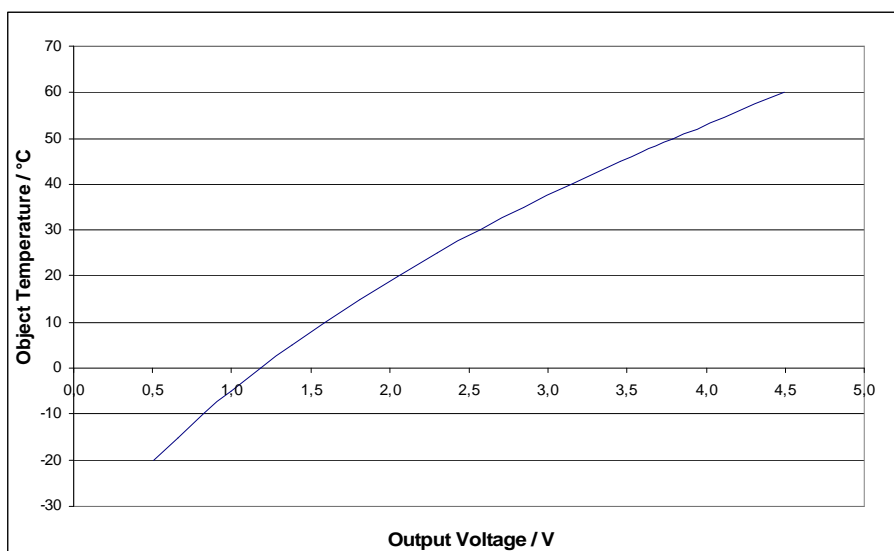


Figure 1: Output voltage / object temperature relation

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

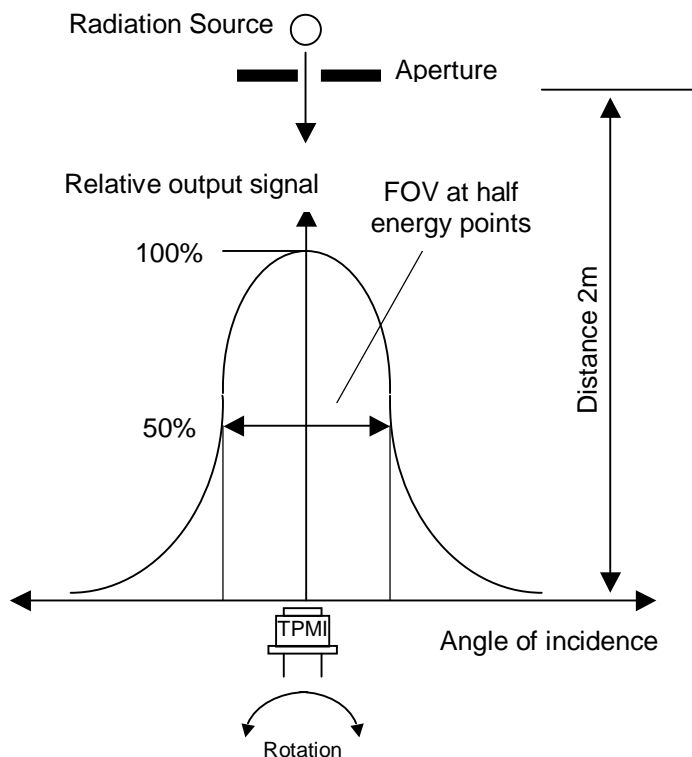
Polynom to calculate T_{amb} from V_{TAmb} :

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

x = V_{TAmb} in Volt

Optical Characteristics

FIELD OF VIEW



The A2TPMI is available with different standard optical cap assemblies with and without an infrared lens or mirror.

The optics defines the view angle or field of view (FOV) of the sensor.

The FOV is defined as the incidence angle difference, where the sensor shows 50% relative output signal according to the setup shown.

Figure 2: FOV Definition

Symbol	Parameter	Min	Typ	Max	Unit	Conditions
Lens Cap Type (L5.5)						
FOV	Field of view		7	12	°	50% rel. output signal
OA	Optical axis		0	± 3.5	°	in reference to symmetrical axis of cap
D:S	Distance to Spot size ratio		8:1			

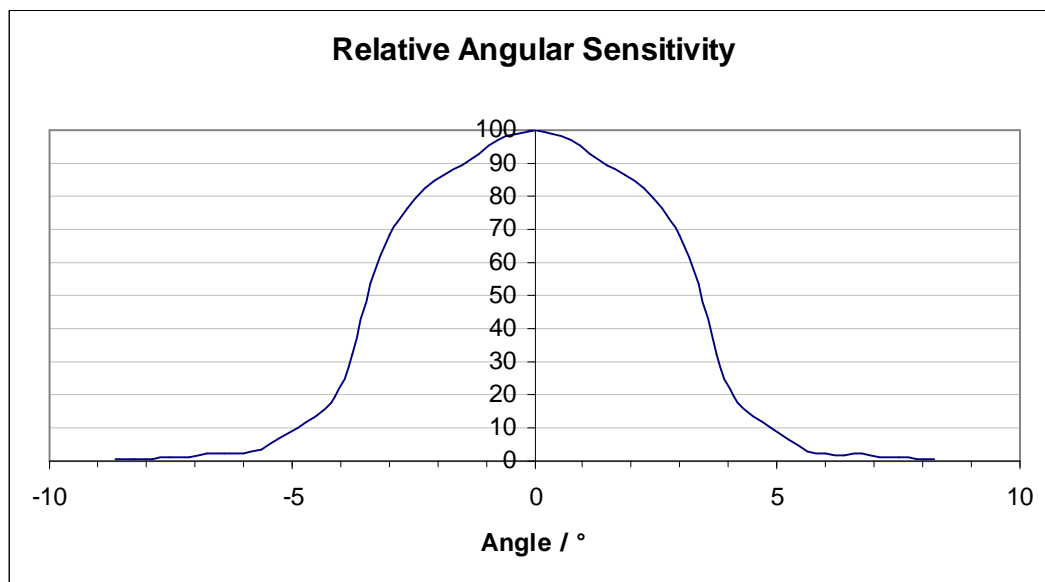


Figure 3: Typical angular sensitivity of A2TPMI 334-L5.5 type sensors

IR-FILTER CHARACTERISTICS

The following picture shows a typical transmission curve of a uncoated 5.5mm-lens (G12) in a wavelength range from 2 μ m to 22 μ m.

The average transmission for a G12-filter is at least 52% in a range from 5.5 μ m to 13.5 μ m.

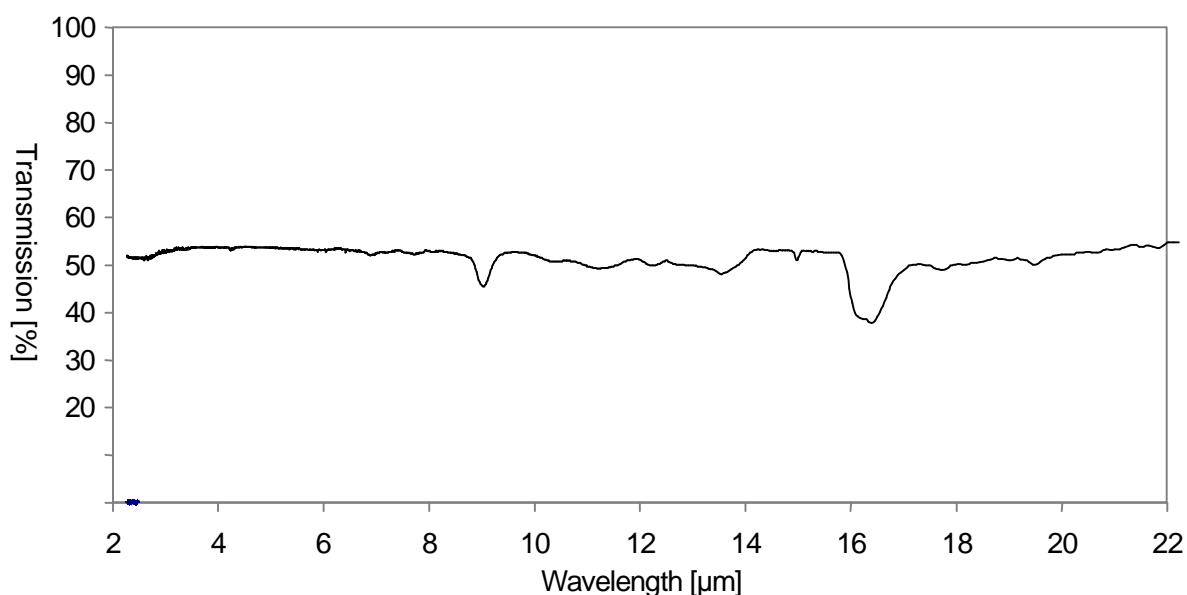


Figure 4: IR-Filter Characteristic

Configuration

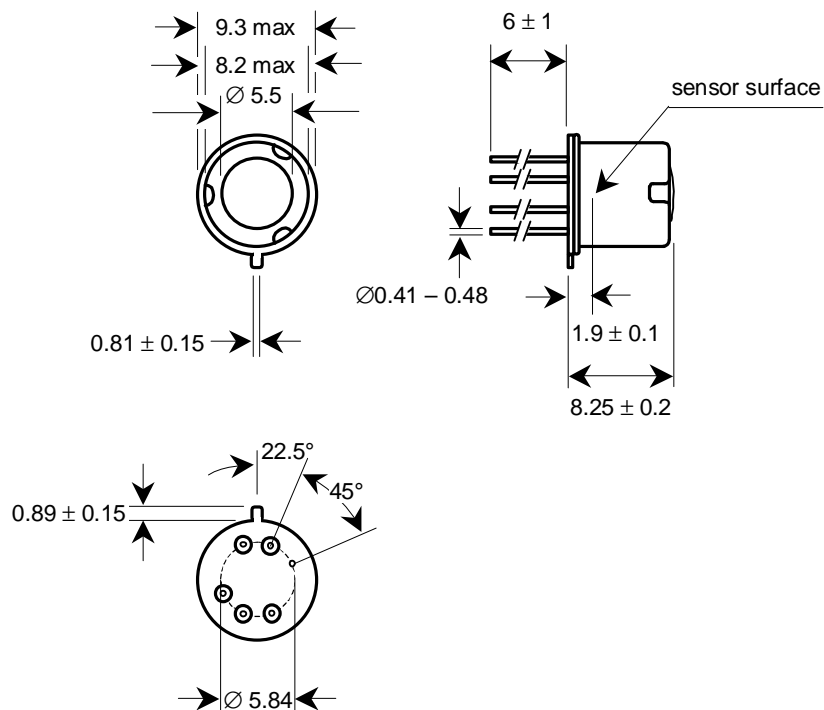
Feature	Adjustment	
Ambient Temperature Compensation	Enabled	✓
	Disabled	
V_{Tamb} / V_{Ref} Output Signal	Reference Voltage V_{Ref}	
	V_{Tamb} Signal	✓
V_{Tobj} Output Configuration	Analog Mode	✓
	Comparator Mode	
V_{Tamb} Output Configuration	Analog Mode	✓
	Comparator Mode	

Test Conditions

Object Size	> Ø50mm
Object Emissivity	> 99%
Object Temperature	40°C ± 0.3°C
Ambient Temperature	25°C ± 1°C
Viewing angle to the object	> 50°
Supply Voltage	5V

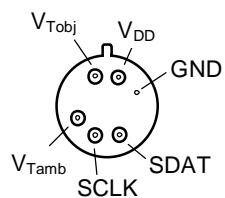
TEST PARAMETER:							
Tobj °C	Tamb °C	V_{Tobj}			V_{Tamb}		
		Minimum V	Typical V	Maximum V	Minimum V	Typical V	Maximum V
40	25	3.051	3.142	3.234	1.205	1.225	1.245

Mechanical Information



Connection Information

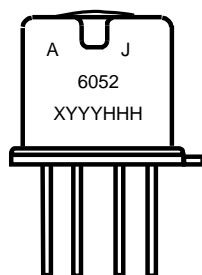
Non PCB Version



Bottom view

Labeling

6052	Last four digits of the device part number
XYX	X = Last digit of the calendar year, YY = Week of the calendar year
HHH	Serial number of the production lot
AJ	“AJ” Represents the module part number 6266 and will be applied after object calibration in mass production



Quality System

PerkinElmer is an ISO 9001 / IQS 9000 certified manufacturer with established SPC and TQM. All materials are checked according to specifications and final goods meet the specified tests.

The here specified components are of lead-free type, compliant to RoHS regulations.