

A2TPMI 334-L5.5 OAA300

Product Picture:



Description: **A2TPMI with small field of view (D:S = 8:1)**

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

Product Name: A2TPMI 334-L5.5 OAA300	Part Number: 6260
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Sensing range -20 ... 300 ° C	Accuracy: ± 2.5 K @ Tobj = 100 - 300°C , Tamb = 10 ... 80°C
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Rev.No.	Date	Revision Record	Author
0	14.08.2003	Initial Release	V. Sequeira
1	18.09.2003	Accuracy adapted	M. Liess
2	22.09.2003	Accuracy adapted	M. Liess
3	14.10.2003	Part number added, Min / Max values for V _{Tobj} added.	J. Schilz
4	27.11.2003	Internal amplification optimised, VTamb characteristic changed	M. Liess
5	06.02.2004	Accuracy adapted	M. Liess
6	16.02.2004	Accuracy adapted, V _{Tamb} tolerances & polynom added	M. Liess
7	13.05.2004	Maximum ratings, electrical DC and AC characteristics, thermopile and optical characteristics, mechanical and connection information added.	M. Liess
8	13.08.2004	Labeling information added ; V _{Tamb} Table & Accuracy updated	V. Sequeira
Drawn		V. Sequeira	Date 14.08.2003

Absolute Maximum Ratings

Parameter	Min	MAX
Supply Voltage VDD	-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 1)	-0.3 V	VDD +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 $T_A = 25^\circ\text{C}$, $V_{DD} = +5\text{ V}$

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	Ω	$I_{out}: -100\mu\text{A} \dots +100\mu\text{A}$
				100		otherwise
R_L	Resistive Output Load	50			k Ω	
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 $T_A = 25^\circ\text{C}$, $V_{DD} = +5\text{V}$

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 V, V_{Ref} = + 1.225V .

Temperature / °C	Min	Typ	Max	Unit	Gradient V *K ⁻¹
-20	1.106	1.110	1.115	V	0.0019
0	1.147	1.153	1.160	V	0.0024
25	1.217	1.225	1.233	V	0.0033
40	1.269	1.279	1.289	V	0.0039
60	1.353	1.365	1.377	V	0.0048
80	1.456	1.471	1.485	V	0.0058
100	1.580	1.598	1.615	V	0.0069
120	1.728	1.749	1.769	V	0.0082
140	1.902	1.926	1.950	V	0.0096
150	2.000	2.026	2.052	V	0.0104
160	2.106	2.133	2.161	V	0.0111
170	2.219	2.249	2.279	V	0.0120
180	2.341	2.373	2.405	V	0.0128
200	2.612	2.648	2.685	V	0.0147
220	2.920	2.962	3.004	V	0.0167
240	3.271	3.318	3.365	V	0.0189
260	3.666	3.719	3.772	V	0.0212
280	4.108	4.168	4.227	V	0.0237
300	4.602	4.668	4.734	V	0.0264

Note: A temperature gradient over the sensor can result in a reduction of the accuracy.

Polynom to calculate Tobj from V_{Tobj} (optimised between -20°C and 300°C):

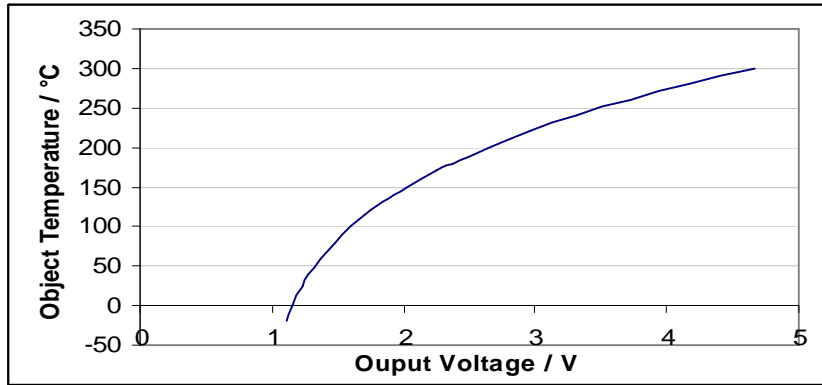
$$\text{Tobj [°C]} = -2.81556x^6 + 51.71967x^5 - 386.8241x^4 + 1510.241x^3 - 3267.076x^2 + 3820.25x - 1792.6$$

x = V_{Tobj} in Volt

Polynom to calculate Tobj from V_{Tobj} (optimised between 60°C and 300°C):

$$\text{Tobj [°C]} = -0.74625x^6 + 14.59148x^5 - 117.6461x^4 + 503.508x^3 - 1223.685x^2 + 1691.02x - 904.6$$

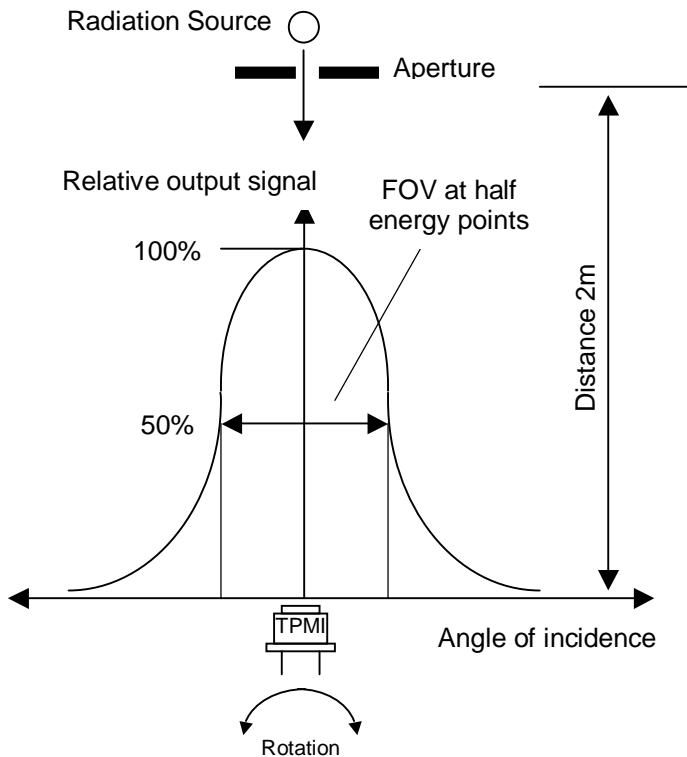
x = V_{Tobj} in Volt



Output voltage / object temperature relation

Optical Characteristics

FIELD OF VIEW



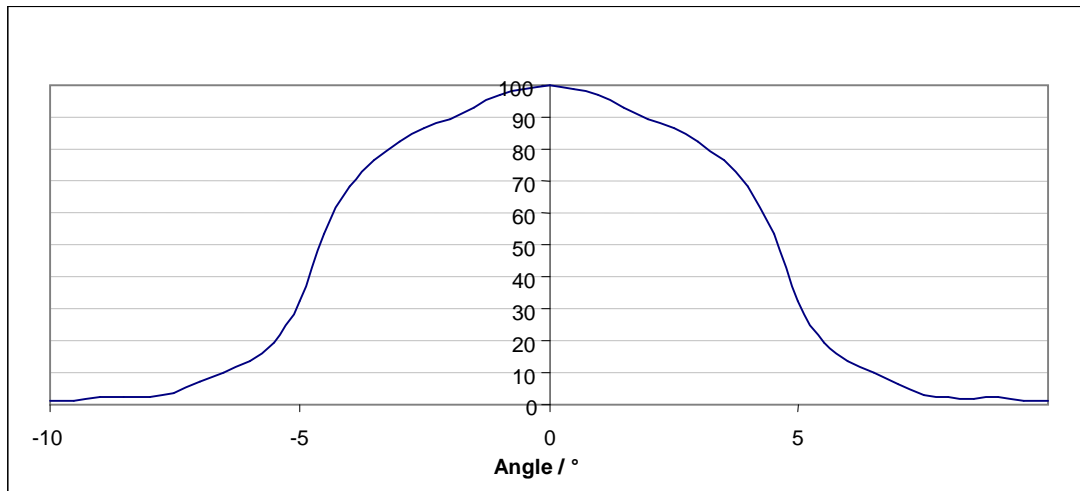
The A2TPMI is available with different standard optical cap assemblies with and without an infrared lens or mirror.

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.

FOV definition

Symbol	Parameter	Min	Typ	Max	Unit	Conditions
Lens Cap Type (L5.5)						
FOV	Field of view		7	12	°	
OA	Optical axis		0	± 3.5	°	
D:S	Distance to spot size ratio		8:1			



Typical angular sensitivity of a2TPMI 334 L5.5 type sensors

V_{TAMB} 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 $\text{V} \cdot \text{K}^{-1}$
-20	0.906	0.906	0.906	V	0.0001
-10	0.916	0.923	0.929	V	0.0032
0	0.958	0.970	0.983	V	0.0063
10	1.039	1.049	1.058	V	0.0094
20	1.146	1.158	1.171	V	0.0125
25	1.211	1.225	1.239	V	0.0141
30	1.284	1.299	1.315	V	0.0156
35	1.364	1.381	1.398	V	0.0172
40	1.452	1.471	1.490	V	0.0187
50	1.652	1.674	1.696	V	0.0218
60	1.858	1.908	1.958	V	0.0250
70	2.117	2.173	2.229	V	0.0281
80	2.407	2.469	2.532	V	0.0312
90	2.728	2.796	2.865	V	0.0343
100	3.080	3.155	3.229	V	0.0374

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

$$T_{obj} [^{\circ}\text{C}] = - 31.118 x^6 + 390.89 x^5 - 1998.5 x^4 + 5321.1 x^3 - 7790.4 x^2 + 6006.5 x - 1895.6$$

$x = V_{Tobj}$ in Volt

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

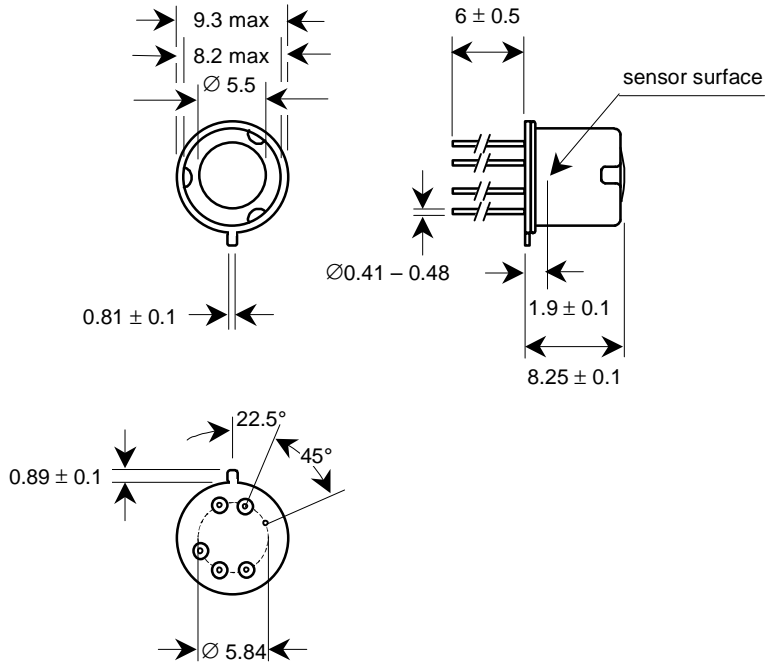
Test Conditions describes the important settings that were used when checking compliance of the product against specified test limits.

Black Body Size	Covers Full Field Of View Of Product
Black Body Emissivity	> 99%
Black Body Temperature Set Point	160°C ± 1°C
Ambient Temperature Condition	25°C ± 1°C
Supply Voltage To Product	5V

These are the specified test limits for the above set testing conditions.

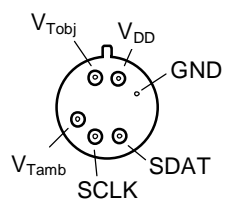
TEST LIMITS							
T_{OBJ} °C	T_{AMB} °C	V_{TOBJ}			V_{TAMB}		
		Minimum V	Typical V	Maximum V	Minimum V	Typical V	Maximum V
160	25	2.106	2.133	2.161	1.205	1.225	1.245

Mechanical Information



Connection Information

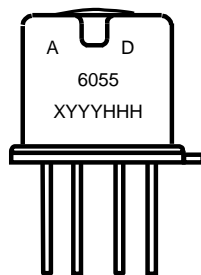
Non PCB Version



Bottom view

Labeling

6055	Last four digits of the device part number
XYY	X = Last digit of the calendar year, YY = Week of the calendar year
HHH	Serial number of the production lot
AD	“AD” Represents the module part number 6260 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.