



Figure 1. Physical Photos of AT8605ART

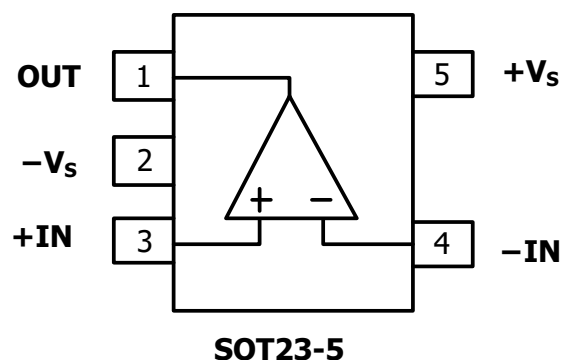


Figure 2. Pin Configurations

ORDERING GUIDE

Online Stores		Commission Fee	Unit Price (June 2024)	Buy Now
	shop.analogtechnologies Our own online store	Zero sale commission	\$0.70/100PCs	 *
	SMTZone Our own online store	Zero sale commission	\$0.70/100PCs	 *
	Digikey	≈24% sale commission	\$0.86/100PCs	 *

FEATURES

- Single-Supply Operation from 2.2V to 5.5V
- Rail-to-Rail Input and Output
- Gain-Bandwidth Product: 10MHz (Typ.)
- Low Input Bias Current: 10pA (Typ.)
- Low Offset Voltage: 5mV (Max.)
- Quiescent Current: 800μA per Amplifier (Typ.)
- Operating Temperature: -40°C to +125°C
- Available in SOT23-5 Packages

APPLICATIONS

- Portable Equipment
- Mobile Communications
- Smoke Detector
- Sensor Interface
- Medical Instrumentation

DESCRIPTION

This AT8506ARTZ is wideband, low noise, low distortion dual operation amplifier, that offer rail to rail input/output and single supply operation down to 0.2V. They draw 1.6mA of quiescent supply current while featuring ultra-low distortion (0.0002% THD+N), as well as low input voltage noise density(15Nv/Hz) and low input current noise density(0.5Fa/hZ). These features make the devices an ideal choice for applications that require low distortion and/or low noise. These amplifiers have inputs and outputs which swing rail-to-rail and their input common mode voltage range includes ground. The maximum input offset of these amplifiers is less than 5mV.

The AT8605ARTZ are unity gain stable with a gain bandwidth of 10MHz. The AT8605ARTZ is available in SOT23-5 packages. The extended temperature range of -40°C to +125°C over all supply voltages offers additional design flexibility.



ABSOLUTE MAXIMUM RATINGS

Table 1.

Parameter	Min.	Max.
Power Supply Voltage (V _{DD} to V _{SS})	−0.5V	+7V
Analog Input Voltage (IN+ or IN−)	V _{SS} − 0.5V	V _{SS} + 0.5V
PDB Input Voltage	V _{SS} − 0.5V	+7V
Operating Temperature Range	−40°C	+125°C
Junction Temperature	150°C	
Storage Temperature Range	−65°C	+150°C
Lead Temperature (Soldering, 10s)	+300°C	
Package Thermal Resistance @ T _A = +25°C		
SOP-8, θ _{JA}	130°C	
MSOP-8, θ _{JA}	210°C	

ELECTRICAL CHARACTERISTICS

($V_{DD} = +5V$, $V_{SS} = 0V$, $V_{CM} = 0V$, $V_{OUT} = V_{DD}/2$, $R_L = 100k\Omega$ tied to $V_{DD}/2$, $SHDNB = V_{DD}$, $T_A = -40^\circ\text{C}$ to $+125^\circ\text{C}$, unless otherwise noted. Typical values are at $T_A = +25^\circ\text{C}$.)

Table 2.

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Power Supply Voltage Range	V_{DD}	Guaranteed by the PSRR test	2.2	-	5.5	V
Quiescent Supply Current per Amplifier	V_{OS}	$V_{DD} = 3V$	-	0.8	-	mA
		$V_{DD} = 5V$	-	0.8	1.2	
Input Offset Voltage	V_{OS}	$T_A = +25^\circ\text{C}$	-	-	± 5	mV
		$T_A = -40^\circ\text{C}$ to $+85^\circ\text{C}$	-	-	-	
		$T_A = -40^\circ\text{C}$ to $+125^\circ\text{C}$	-	-	± 1.5	
Input Offset Voltage Tempco	$\Delta V_{OS}/\Delta T$			± 0.3	± 6	$\mu\text{V}/^\circ\text{C}$



Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Input Bias Current	I_B			± 1	± 100	pA
Input Offset Current	I_{OS}			± 1	± 100	pA
Input Common Mode Voltage Range	V_{CM}	Guaranteed by the $T_A = +25^\circ\text{C}$	-0.2		$V_{DD} + 0.2$	V
		CMRR test $T_A = -40^\circ\text{C}$ to $+125^\circ\text{C}$	0		V_{DD}	
Common-Mode Rejection Ratio	CMRR	$V_{SS} - 0.2\text{V} \leq V_{CM} \leq V_{DD} + 0.2\text{V}$ $T_A = +25^\circ\text{C}$		75		dB
		$V_{SS} < V_{CM} < 5\text{V}$ $T_A = +25^\circ\text{C}$	65	80		
		$V_{SS} - 0.2\text{V} \leq V_{CM} \leq V_{DD} + 0.2\text{V}$ $T_A = -40^\circ\text{C}$ to $+125^\circ\text{C}$		65		
Power Supply Rejection Ratio	PSRR	$V_{DD} = +2.2\text{V}$ to $+5.5\text{V}$	75	90		dB
Open-Loop Voltage Gain	A_v	$R_L = 100\text{k}\Omega$ to $V_{DD}/2$, $100\text{mV} \leq V_O \leq V_{DD} - 125\text{mV}$	90	100		dB
		$R_L = 1\text{k}\Omega$ to $V_{DD}/2$, $200\text{mV} \leq V_O \leq V_{DD} - 250\text{mV}$	75	85		
		$R_L = 500\Omega$ to $V_{DD}/2$, $350\text{mV} \leq V_O \leq V_{DD} - 500\text{mV}$	55	65		
Output Voltage Swing	V_{OUT}	$ V_{IN+} - V_{IN-} \geq 10\text{mV}$ $V_{DD} - V_{OH}$		10	35	mV
		$R_L = 10\text{k}\Omega$ to $V_{DD}/2$ $V_{OL} - V_{SS}$		10	30	
		$ V_{IN+} - V_{IN-} \geq 10\text{mV}$ $V_{DD} - V_{OH}$		80	200	
		$R_L = 1\text{k}\Omega$ to $V_{DD}/2$ $V_{OL} - V_{SS}$		50	150	
		$ V_{IN+} - V_{IN-} \geq 10\text{mV}$ $V_{DD} - V_{OH}$		100	350	
		$R_L = 500\Omega$ to $V_{DD}/2$ $V_{OL} - V_{SS}$		80	260	
Output Short Circuit Current	I_{SC}	Sinking or Sourcing		± 50		mA
PDB Logic Low	V_{IL}				0.8	V

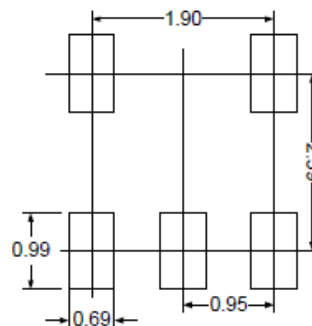
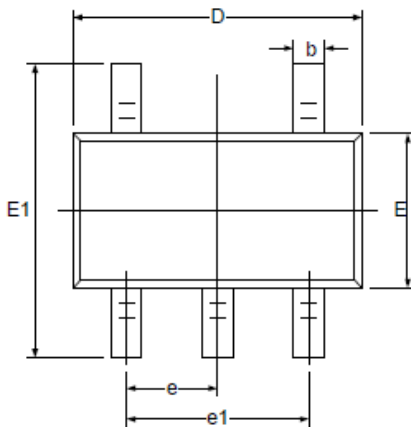


Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
PDB Logic High	V_{IH}		2			V
Turn On Time	T_{ON}			2.2		μs
Turn Off Time	T_{OFF}			0.8		μs
Output Leakage Current	I_{LEAK}	Shutdown Mode($PDB = V_{SS}$), $V_{OUT} = V_{SS}$ to V_{DD}		± 0.001	± 1.0	μA
Input Capacitance	C_{IN}			10		pF
Gain Bandwidth Product	GBW	$A_V = +1V/V$		10		MHz
Slew Rate	SR	$A_V = +1V/V$		4.5		V/ μs
Full Power Bandwidth		$A_V = +1V/V$		0.4		MHz
Phase Margin	ϕ_m	$A_V = +1V/V$		55		Deg
Gain Margin	G_m	$A_V = +1V/V$		12		dB
Setting Time	t_s	To 0.01%, $V_{OUT} = 2V$ step $A_V = +1V/V$		1		μs
Capacitive Load Stability	C_{LOAD}	No sustained oscillations. $A_V = +1V/V$		200		pF
Peak to Peak Input Density	e_n	$f = 10Hz$		60		nV/ $\sqrt{Hz}$
		$f = 1kHz$		30		
		$f = 30kHz$		15		

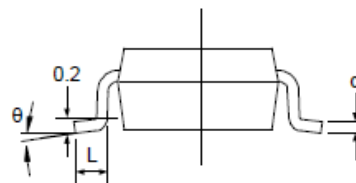
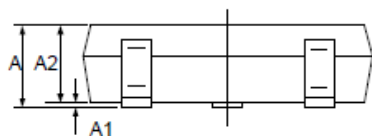


OUTLINE DIMENSIONS

SOT23-5



RECOMMENDED LAND PATTERN (Unit: mm)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

ORDERING INFORMATION

Table 3. Ordering Information

Part Number	Buy Now
AT8605ARTZ	 * 

*: both  and  are our online store icons. Our products can be ordered from either one of them with the same pricing and delivery time.

NOTICE

1. It is important to carefully read and follow the warnings, cautions, and product-specific notes provided with electronic components. These instructions are designed to ensure the safe and proper use of the component and to prevent damage to the component or surrounding equipment. Failure to follow these instructions could result in malfunction or failure of the component, damage to surrounding equipment, or even injury or harm to individuals. Always take the necessary precautions and seek professional assistance if unsure about proper use or handling of electronic components.
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10. Despite operating the electronic modules as specified, malfunctions or failures may occur before the end of their usual service life due to the current state of technology. Therefore, it is crucial for customer applications that require a high level of operational safety, especially in accident prevention or life-saving systems where the malfunction or failure of electronic modules could pose a risk to human life or health, to ensure that suitable measures are taken. The customer should design their application or implement protective circuitry or redundancy to prevent injury or damage to third parties in the event of an electronic module malfunction or failure.