Features
- 1-channel H-bridge driver built-in power PMOS and NMOS.
- The driver with forward, reverse, stop and brake function.
- Low stand-by and operating current.
- Low on-resistance. ($1.0\,\Omega$)
- Low voltage operation.
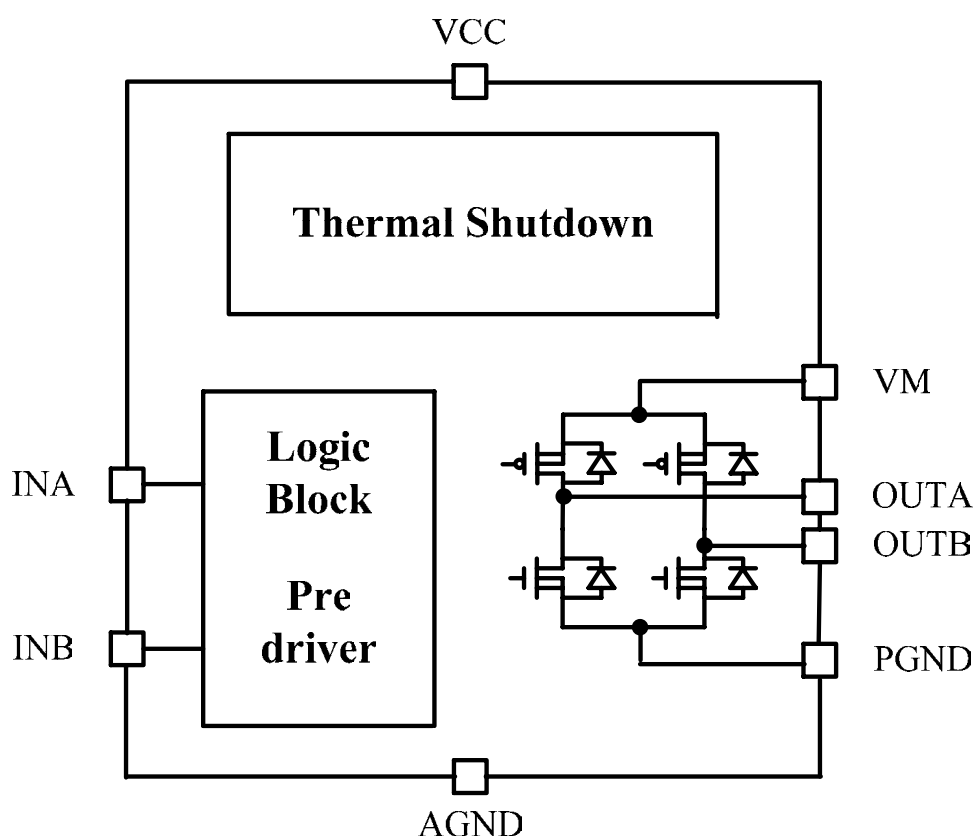- Built-in thermal shutdown function.
- Package DIP-8 & SOP-8

General Description
The AT5561 is a 1-channel H-bridge driver IC for DC motor application. It has the features of low stand-by current, low operating current, large current output and low RDSON. Those features make it suitable for toy.
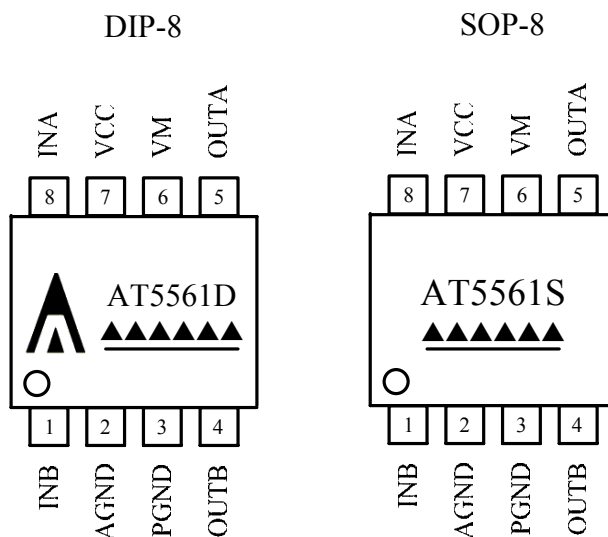
Applications
- Toy motor Driver

Block Diagram

Aimtron reserves the right without notice to change this circuitry and specifications.

Pin Configuration

DIP-8   SOP-8

Ordering Information

Part number	Package	Marking
AT5561D_PBF	**PDIP-8,PB-Free**	▲▲▲▲▲▲, Date Code with one bottom line
AT5561S_GRE	**SOP-8, Green**	▲▲▲▲▲▲, Date Code with one bottom line

*For more marking information, contact out sales representative directly

Pin Description

Pin NO.	Symbol	I/O	Description
1	INB	I	It combines INA to decide the state of the driver
2	AGND	G	GND
3	PGND	G	GND
4	OUTB	O	H-bridge output terminal B of the driver
5	OUTA	O	H-bridge output terminal A of the driver
6	VM	P	Power supply for driver
7	VCC	P	Power supply
8	INA	I	It combines INB to decide the state of the driver

Absolute Maximum Ratings [1]

Item	Symbol	Ratings	Unit
Supply voltage VCC	VCC	+5.5	V
Supply voltage VM	VM	+10.5	V
Control input voltage	VIN	VCC	V
Power dissipation, Pd [2]	DIP-8	1	W
	SOP-8	0.96	
Thermal Resistance from Junction to Ambient θ_{JA} [2]	DIP-8	125	^{0}C/W
	SOP-8	130	
Operating temperature	Topr	-20 ~ +85	$^\circ$ C
Junction temperature	Tj	~ +150	$^\circ$ C
Storage temperature range	Tstg	-55 ~ +150	$^\circ$ C
Peak output current	Iop	1.5	A
Maximum continuous output current [3]	Ioc	0.8	A
ESD Susceptibility [4]	HBM	2	KV
	MM	200	V

1. Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.
2. The accuracy of θ_{JA} or power dissipation will be based on PC board layout.
3. The maximum continuous output current should be set due to be corresponding with the power dissipation.
4. Device are ESD sensitive. Handling precaution recommended. The Human Body model is a 100pF capacitor discharged through a 1.5KΩ resistor into each pin.

Recommended Operating Conditions

(Ta=25°C)

Parameter	Symbol	Ratings	Unit
Supply voltage VCC	VCC	+2.2 ~ +5.0	V
Supply voltage VM	VM	+1.8 ~ +9	V
Control input voltage	VIN	0 ~ VCC	V
H Bridge output current	Iout	-400 ~ +400	mA

Electrical Characteristic

(Ta=25 $^\circ$C , VCC=3V, VM=3V, ,R_L=15Ω , unless otherwise noted.)

Parameter	Symbol	Condition	Values			Unit
			Min.	Typ.	Max.	
Whole circuits						
Circuit current at standby	ICCST	INA=INB=L	-	0	10	uA
VM current at standby	IVMST	INA=INB=L	-	0	10	uA
Circuit current	ICC	INA=H, INB=L or INA=L, INB=H or INA=H, INB=H	-	0.3	1	mA
VM current	IVM	INA=H, INB=L or INA=L, INB=H or INA=H, INB=H No load	-	0.1	0.5	mA
Control input						
H level input voltage	VINH		2.0	-	-	V
L level input voltage	VINL		-	-	0.8	V
H level input voltage	IINH	VIN=3V	-	5	20	uA
L level input voltage	IINL	VIN=0V	-1	0	-	uA
Pull-down resistance	RIN		-	1.5	-	MΩ
Driver						
Output ON Resistance	RON	Io=+-200mA, Sum of on-resistance		1.00	1.60	Ω
Thermal Protection Circuit						
Protection Temperature	TSD			150		$^\circ$C

Input-output logic table

Input		Output		Mode
INA	**INB**	**OUTA**	**OUTB**	
L	L	Hi-Z	Hi-Z	Standby
H	L	H	L	Forward
L	H	L	H	Reverse
H	H	L	L	Brake

Input-output waveforms
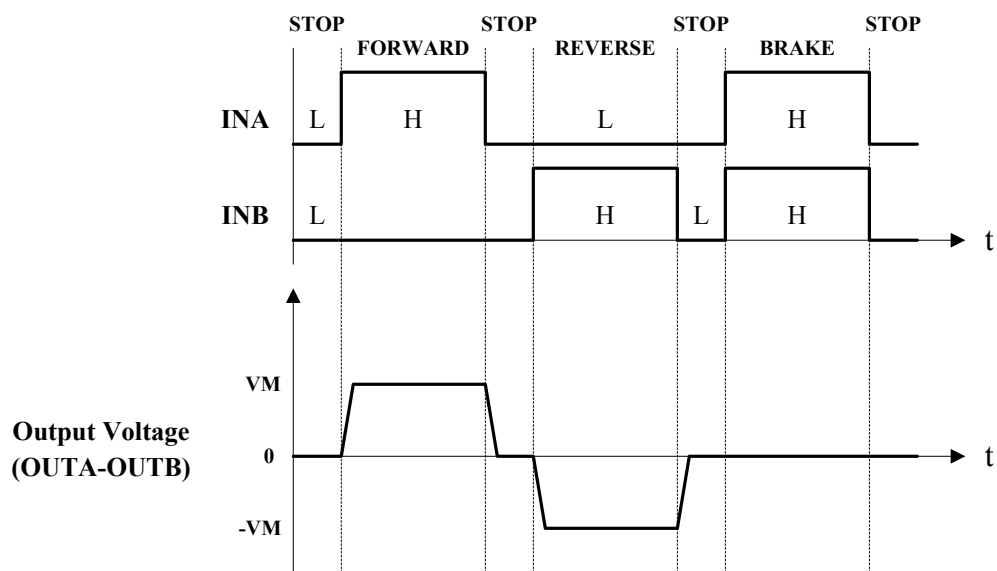
Application reference
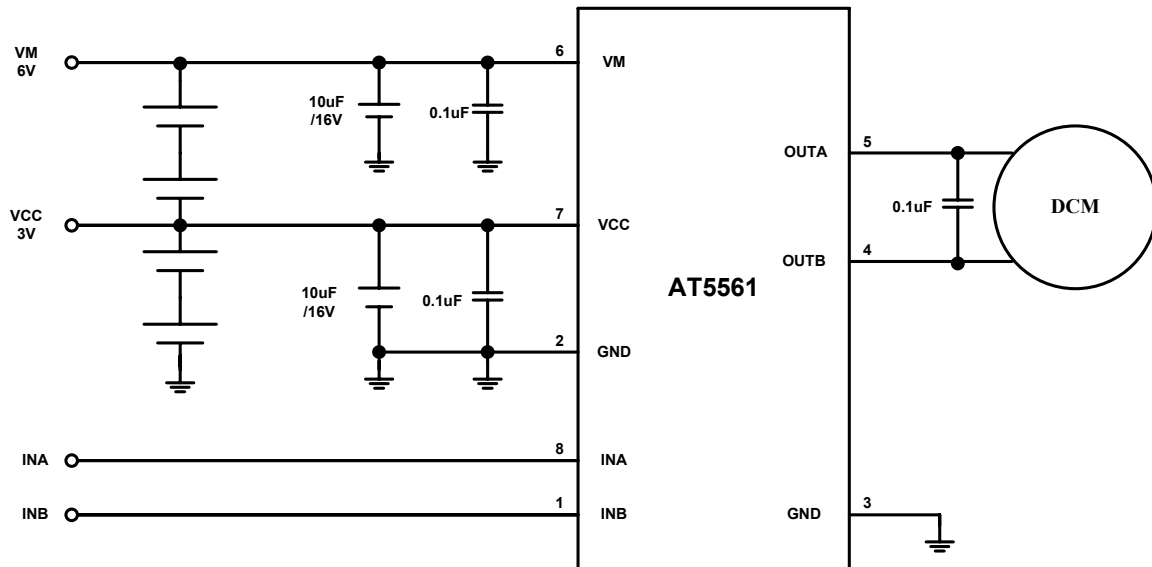
FIG. 1: AT5561 for typical application.

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Package Description: DIP-8
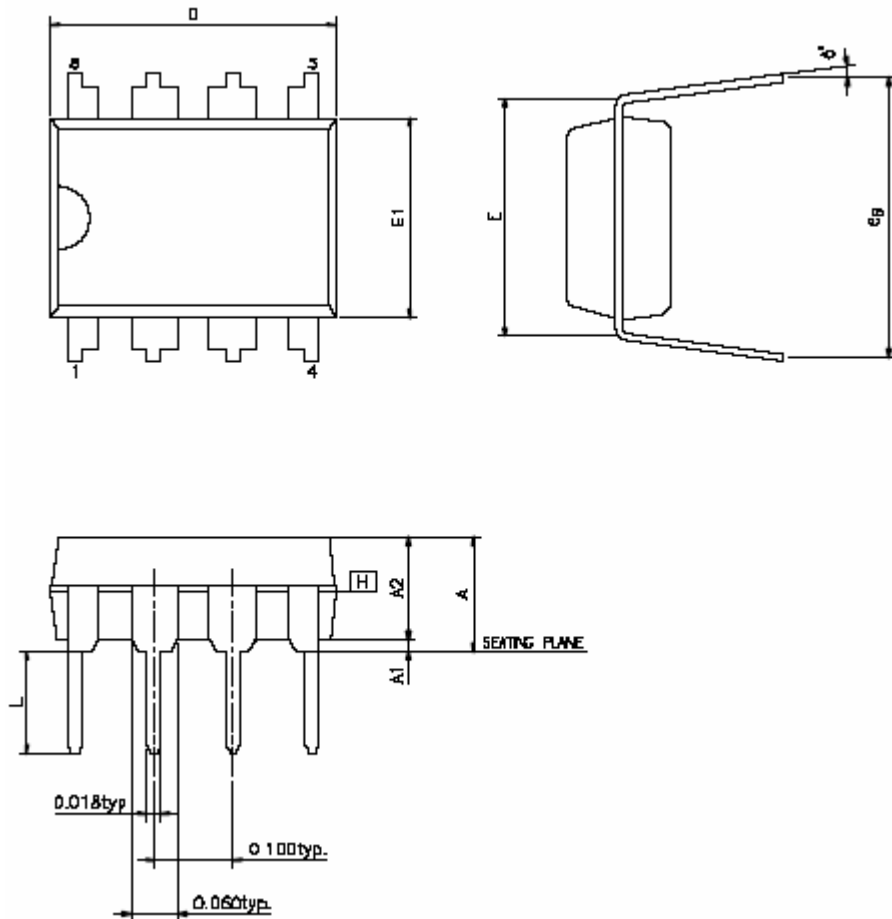
SYMBOLS	MIN.	NOR.	MAX.
A	—	—	0.210
A1	0.015	—	—
A2	0.125	0.130	0.135
D	0.355	0.365	0.400
E	0.300 BSC.		
E1	0.245	0.250	0.255
L	0.115	0.130	0.150
e_B	0.335	0.355	0.375
θ°	0	7	15

UNIT : INCH

Package Description: SOP-8
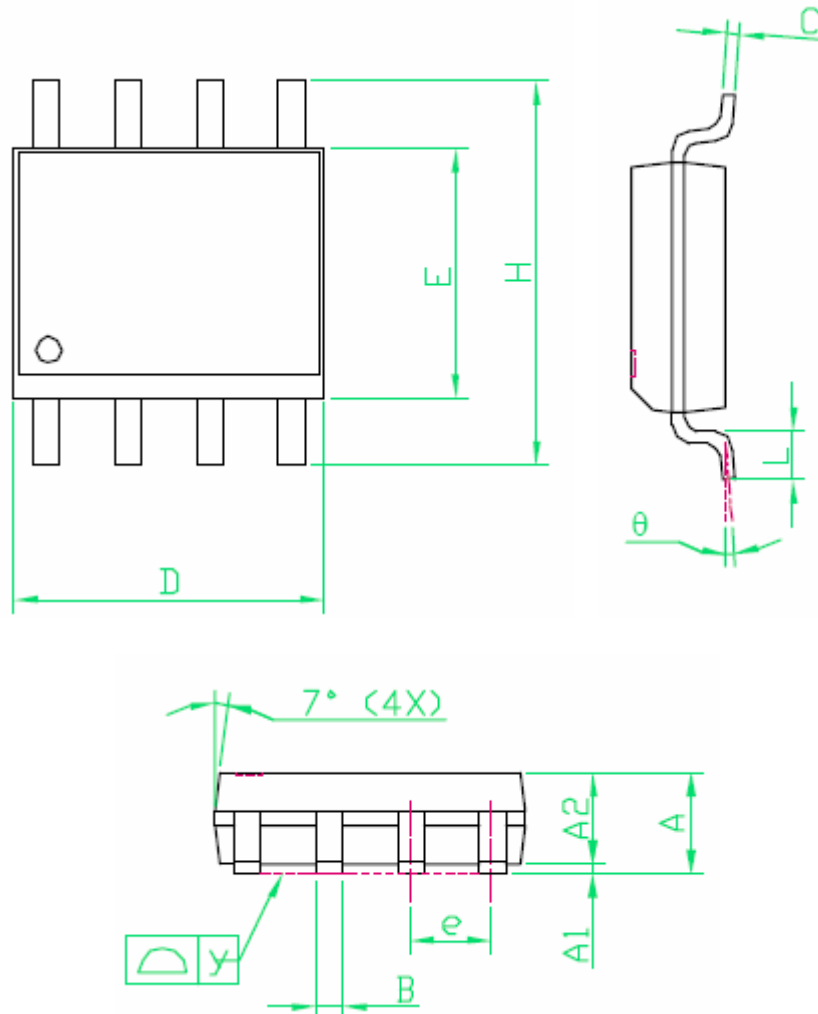
SYMBOLS	DIMENSIONS IN MILLIMETER			DIMENSIONS IN INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.35	1.60	1.75	0.053	0.063	0.069
A1	0.10	----	0.25	0.004	----	0.010
A2	----	1.45	----	----	0.057	----
B	0.33	----	0.51	0.013	----	0.020
C	0.19	----	0.25	0.007	----	0.010
D	4.80	----	5.00	0.189	----	0.197
E	3.80	----	4.00	0.150	----	0.157
e	----	1.27	----	----	0.050	----
H	5.80	----	6.20	0.228	----	0.244
L	0.40	----	1.27	0.016	----	0.050
y	----	----	0.10	----	----	0.004
θ	0°	----	8°	0°	----	8°

Reflow Profiles
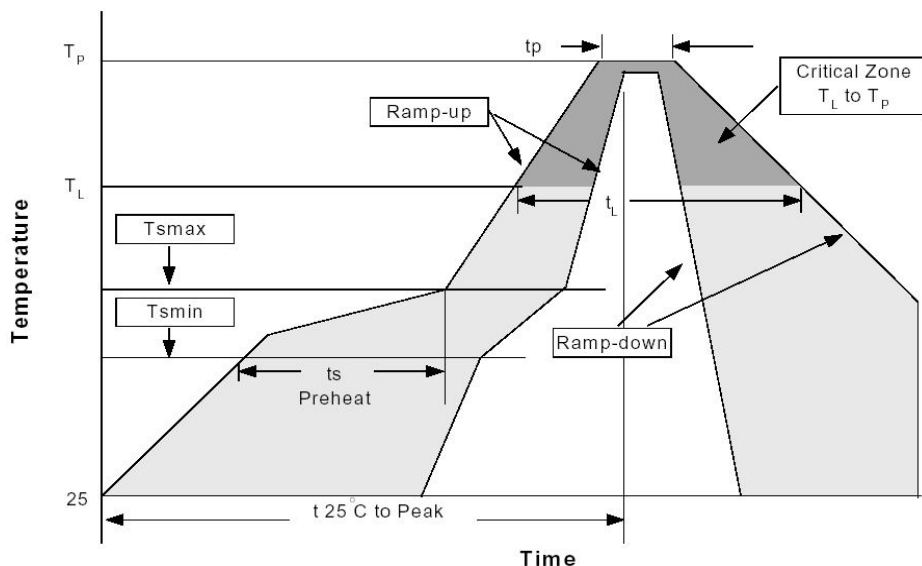
Profile Feature	Sn-Pb Eutectic Assembly		Pb-Free Assembly	
	Large Body Pkg. thickness ≥2.5mm or Pkg. volume ≥350mm^3	**Small Body Pkg. thickness <2.5mm or Pkg. volume <350mm^3**	**Large Body Pkg. thickness ≥2.5mm or Pkg. volume ≥350mm^3**	**Small Body Pkg. thickness <2.5mm or Pkg. volume <350mm^3**
Average ramp-up rate (T_L to T_P)	3°C/second max.		3°C/second max.	
Preheat -Temperature Min(Tsmin) -Temperature Max (Tsmax) -Time (min to max)(ts)	100°C 150°C 60-120 seconds		150°C 200°C 60-180 seconds	
Tsmax to T_L -Ramp-up Rate			3°C/second max.	
Time maintained above: -Temperature (T_L) -Time (t_L)	183°C 60-150 seconds		217°C 60-150 seconds	
Peak Temperature(T_P)	225+0/-5°C	240+0/-5°C	245+0/-5°C	250+0/-5°C
Time within 5°C of actual Peak Temperature (t_P)	10-30 seconds	10-30 seconds	10-30 seconds	20-40 seconds
Ramp-down Rate	6°C/second max.		6°C/second max.	
Time 25°C to Peak Temperature	6 minutes max.		8 minutes max.	

*All temperatures refer to topside of the package, measured on the package body surface.