

High speed rail to rail output comparator

General Description

HT8051A is a high speed, low power dissipation comparator. It applies 140ns Propagation Delay at 100mV Overdrive voltage. HT8051A is DC coupled normally, and It includes internal hysteresis(5mV) to ensure clean output switch, the HYS voltage has a ultra-low temperature drift 5uV/°C. HT8051A consists of a high speed Class AB structure, which supports rail to rail output.

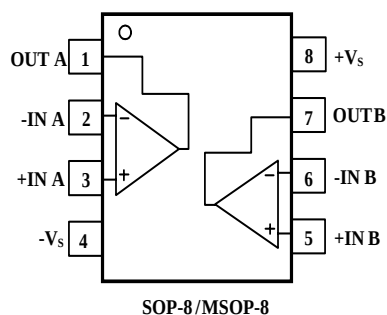
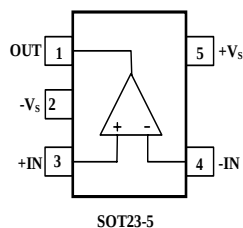
Feature

- 140ns propagation delay (@100mV Overdrive)
- Rail to Rail output, CMOS/TTL Compatible
- Internal Hysteresis to ensure clean switching
- DC coupled Input
- Offset voltage: +/-5mV Max.
- Low HYS voltage Temperature Drift: 5uV/°C.
- 2.7~5.5V power supply Voltage.
- Low quiescent current: 200uA
- Chip available in SOT23-5 Package

Applications

- High speed Line Receivers;
- Threshold Detector /Discriminators;
- Sampling Circuits;
- IR Receivers.

PIN CONFIGURATIONS (Top View)



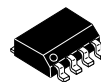
ORDERING INFORMATION



SOT23-5 T SUFFIX
HT8051ARTZ



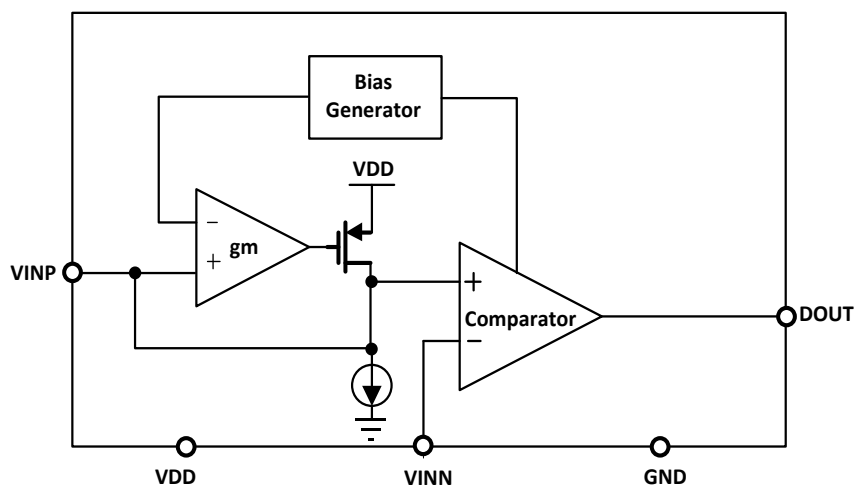
MSOP8 M SUFFIX
HT8052ARMZ



SOP-8 R SUFFIX
HT8052ARZ

T_A = -40° to 125°C for all packages.

Block Diagram



Absolute Maximum Ratings

(If out of these ratings, the filter may be fail or damaged)

Table 1

Symbol	Parameter	Rating	Units
VDD	Power supply	5.5	V
T _A	Operating ambient Temperature Range	-40~+85	°C
T _{STG}	Storage Temperature	-65~+150	°C

Recommended Operating Conditions

Table 2

Symbol	Parameter	Rating	Units
VDD	Power supply	2.7~5.5	V
T _A	Operating ambient Temperature Range	-40~+85	°C

Electrical Characteristics

Table 3

Specifications are at VDD=+2.7V ~ +5.5V Vin+=VDD, Vin-=1.2V RL=10Kohm CL=15pF Vin-=1.2V tt corner & T=30 °C)

Symbol	Parameter		Spec			Units
			Min	Typ	Max	
VCC	Operating Supply Voltage		2.7	3.3	5.5	V
VOS	Input Offset Voltage		-5	+/-0.15	+5	mV
VOS_TC	Input Offset voltage Temp Drift		0.64	1.96	4.7	uV/°C
Vhyst	Input Hysteresis Voltage		4	5	10.8	mV
Vhyst_TC	Input Hysteresis Voltage Temp Drift			4.8	5.4	uV/°C
CIN	Input Capacitance	Differential		1.8		pF
		Common Mode		3.6		
RIN	Input Resistance			>100		GΩ
IQ	Quiescent Current			200		uA
ISC	Output short to VDD			25		mA
Vin_cm	Common mode Input voltage		GND+0.2	-	VDD-0.2	V
VOH	Output Voltage High Swing		VDD-0.3			V
VOL	Output Voltage Low Swing				GND+0.3	mV
CMRR	Common Mode Rejection Ratio			70		dB
PSRR	Power supply rejection ratio			63		dB
tR	Rising time			35		ns
tF	Falling time			28		ns
TPD+	Propagation Delay(Low to High)			140		ns
TPD-	Propagation Delay(High to Low)			135		ns

*Note1: The input offset voltage is the average of the input-referred trip points. The input hysteresis is the difference between the input-referred trip points.

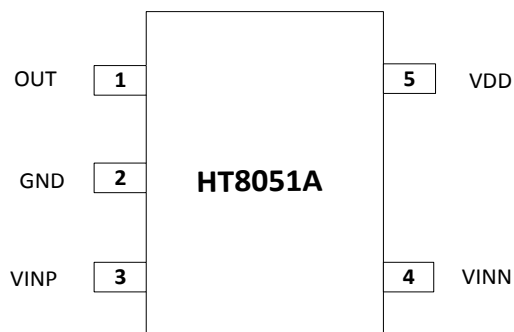
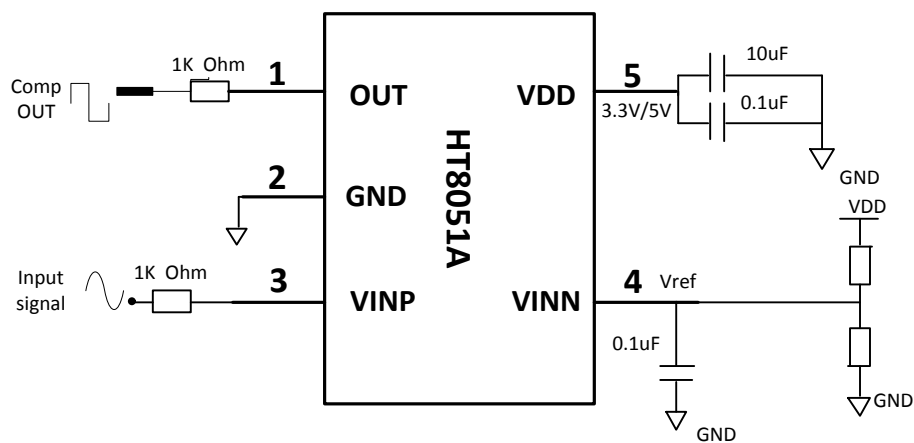
PAD Definition


Table 4 Pad definition

Pad	Name	I/O	Analog/Digital	Description
1	OUT	O	A	Comparator Output PAD, High Voltage level is Pulled to VDD, Low Voltage is GND.
2	GND	GROUND	GROUND	Ground pin. Connect to the most negative supply, ALL GND pads are connected on die.
3	VINP	I	A	Video signal input PAD, DC coupled.
4	VINN	I	A	DC Reference voltage input PAD.
5	VDD	POWER	POWER	Power supply (3.3V/5V), connect to positive voltage supply.

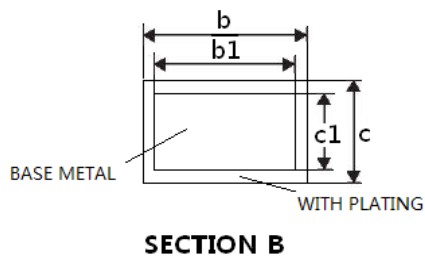
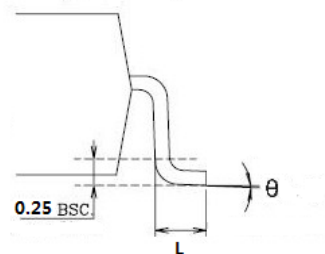
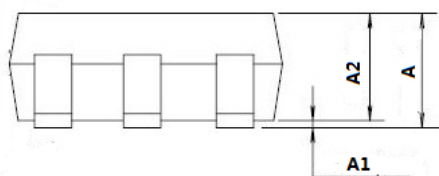
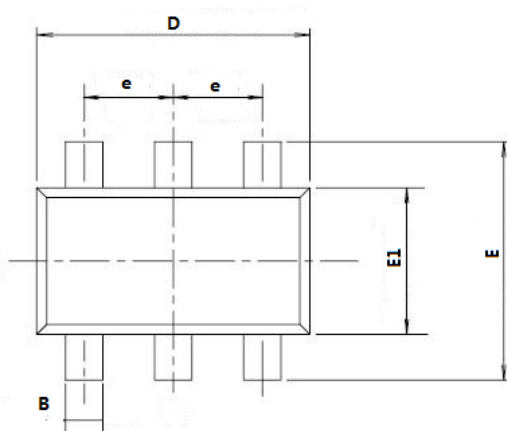
Application Circuits



Package

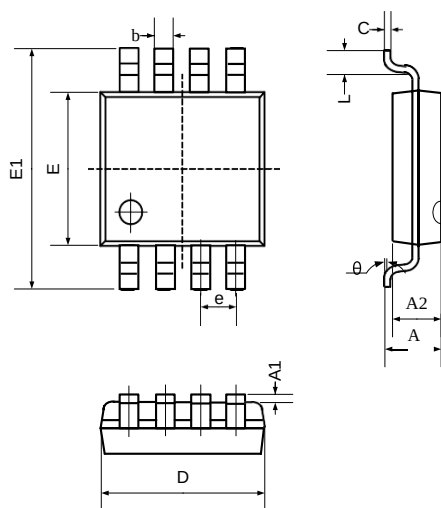
SOT23-5

Symbol	Unit(mm)		
	Min	Typ	Max
A	-	-	1.35
A1	0.04	-	0.15
A2	1.00	1.10	1.20
b	0.38	-	0.48
b1	0.37	0.40	0.43
c	0.11	-	0.21
c1	0.10	0.13	0.16
D	2.72	2.92	3.12
E	2.60	2.80	3.00
E1	1.40	1.60	1.80
e	0.95BSC		
θ	0°	-	8°
L	0.30	-	0.60



PACKAGE OUTLINE DIMENSIONS

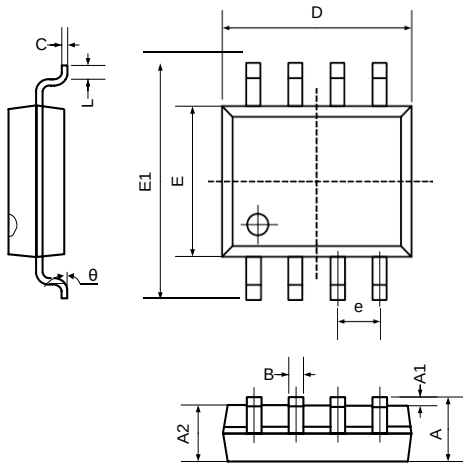
MSOP-8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.800	1.200	0.031	0.047
A1	0.000	0.200	0.000	0.008
A2	0.760	0.970	0.030	0.038
b	0.30 TYP		0.012 TYP	
c	0.15 TYP		0.006 TYP	
D	2.900	3.100	0.114	0.122
e	0.65 TYP		0.026 TYP	
E	2.900	3.100	0.114	0.122
E1	4.700	5.100	0.185	0.201
L	0.410	0.650	0.016	0.026
θ	0°	6°	0°	6°

PACKAGE OUTLINE DIMENSIONS

SO-8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
B	0.330	0.510	0.013	0.020
C	0.190	0.250	0.007	0.010
D	4.780	5.000	0.188	0.197
E	3.800	4.000	0.150	0.157
E1	5.800	6.300	0.228	0.248
e	1.270TYP		0.050TYP	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°