

PRODUCT SPECIFICATION
DESCRIPTION

The AAHS298B is part of Microsemi's new family of Radiation Tolerant products aimed at the military and aerospace markets. The AAHS298B is a Radiation-Tolerant source driver with eight non-inverting channels, with internal thermal shutdown.

Capable of providing an interface from TTL, 5V or 12V logic systems to relays, motors, solenoids, and other loads, this device adds the additional benefit of an internal thermal shutdown and output transient protection/clamp diodes with sustaining voltages to 75V.

Each output is capable of sourcing 700mA with a withstand voltage of 75V over the full military temperature range. The thermal shutdown is intended to protect against over-current and soft-start occurrences.

The AAHS298B is offered in a 20-pin ceramic SOIC. The AAHS298B has demonstrated tolerance to 100kRad (Si) total dose, as well as immunity to latch-up and SEE tolerance. Available standard screening includes Level "S" or Level "B." Other screening or processing in line with our capabilities can be supported to meet customers' requirements.

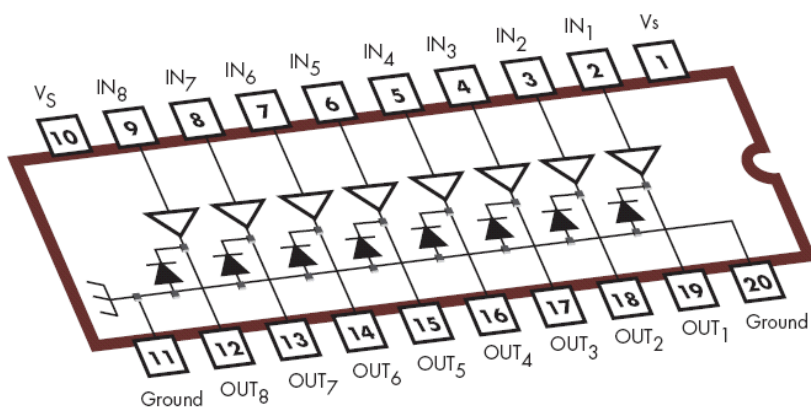
IMPORTANT: For the most current data, consult MICROSEMI's website: <http://www.microsemi.com>

KEY FEATURES

- 700mA Output Source Current
- Low Quiescent Current Consumption
- Full Channel Isolation to Prevent Fault Propagation
- Internal Ground Clamp Diodes
- 75V Output Breakdown Voltage
- TTL, 5V and 12V Logic Compatible
- Internal Thermal Shutdown
- Radiation tolerant to 100kRad(Si) Total Dose
- -55°C to +125°C Temperature Range
- Available 20-pin Ceramic Package

APPLICATIONS

- Relay/Solenoid Drivers
- Lamp/LED Drivers
- Stepper and/or Servo Motor Drivers
- Redundant Power Distribution

PRODUCT HIGHLIGHT

PACKAGE ORDER INFO
THERMAL DATA

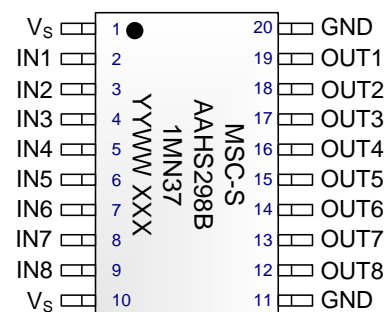
T _A (°C)	S20 20-Pin Ceramic SOIC		θ _{J-L} = 15°C/W
			THERMAL RESISTANCE-JUNCTION TO LEAD
-55 to +125	AAHS298B-S-S20B-S	Class S	Junction Temperature Calculation: T _J = T _A + (P _D × θ _{J-L}). The θ _{J-L} numbers are guidelines for the thermal performance of the device/pc-board system.
	AAHS298B-S-S20B-B	Class B	
0 to 70	AAHS298B-S-S20B-ENGR	Commercial	

Note SOIC packing is in a tray.

ABSOLUTE MAXIMUM RATINGS

Supply Voltage (V_S , Max voltage between V_S and GND).....	-0.5V to 75V
Digital Inputs (IN[1:8], Max voltage between INPUT & GND).....	-0.5V to 15V
Output Voltage (OUT[1:8], Maximum voltage between OUT[1:8] and GND).....	75V
Single Output Continuous Current (OUT[1:8])	-700mA
Multiple Output Simultaneously Continuous Current (OUT[1:8])	-2800mA
ESD (all pins, HBM)	2000V
Thermal Resistance Junction to Lead	15°C/W
Junction Temperature Range	-55°C to 150°C
Storage Temperature Range.....	-65°C to 150°C
Peak Package Solder Reflow Temperature (40 seconds maximum exposure).....	260°C
Lead Temperature. (Soldering 10 seconds).....	300°C

Notes: Exceeding these ratings could cause damage to the device. All voltages are with respect to GND. Currents are positive into, negative out of specified terminal. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated under "Recommended Operating Conditions" are not implied. Exposure to "Absolute Maximum Ratings" for extended periods may affect device reliability.

PACKAGE PIN OUT

S20 PACKAGE

(Top View)

YYWW XXX = Year/Week/Serial Number
Class S marking shown i.e. MSC-S

ELECTRICAL CHARACTERISTICS

Unless otherwise stated the following specifications apply over operating junction temperature of $-55^{\circ}\text{C} < \text{Temp} < 125^{\circ}\text{C}$, $V_S = 50\text{V}$, up to 100kRad(Si) TID

Parameters	Symbol	Test Conditions/Comments	MIN	TYP	MAX	Units
Operating Supply Current						
Standby Supply Current	I_{SLEEP}	IN[1:8] = 0.0V, No Output Load		1	20	μA
Active Supply Current	$I_{\text{VS}2.5}$	IN[1:8] = 2.5V, No Output Load		5	25	mA
Active Supply Current	$I_{\text{VS}5}$	IN[1:8] = 5.0V, No Output Load		7	25	
AC Characteristics						
Output Turn On Delay Time	t_{on}	Load = 470 Ω , 100pF, $V_S = 45\text{V}$ $V_{\text{IL}} = 0.8$; $V_{\text{IH}} = 2.5\text{V}$			2	μs
Output Turn Off Delay Time	t_{off}				10	
Output Rise Time (10% to 90%)	t_{R}				2	
Output Fall Time (90% to 10%)	t_{F}				10	
DC Characteristics						
Supply Voltage Range	V_S		10		50	V
Thermal Shutdown Trip Temperature	THSD _{TRIP}		135	155	175	$^{\circ}\text{C}$
Thermal Shutdown Reset Temperature	THSD _{RST}	Restarts at 125°C	125			
Input High Level	V_{IH}		2.5			V
Input Low Level	V_{IL}				0.8	
Output Saturation at 350mA	$V_{\text{CE SAT}}$	IN[1:8] = 2.5V		1.7	2.2	
Output Saturation at 500mA	$V_{\text{CE SAT}}$			1.8	2.3	
Output Saturation at 700mA	$V_{\text{CE SAT}}$			2.1	2.7	

ELECTRICAL CHARACTERISTICS

 Unless otherwise stated the following specifications apply over operating junction temperature of $-55^{\circ}\text{C} < \text{Temp} < 125^{\circ}\text{C}$, $V_S = 50\text{V}$, up to 100kRad(Si) TID

Parameters	Symbol	Test Conditions/Comments	MIN	TYP	MAX	Units
Input High Leakage	I_{IH}	$IN[1:8] = 5.0\text{V}$		60	100	μA
Input Low Leakage	I_{IL}	$IN[1:8] = 0.0\text{V}$		0.1	10	μA
Output Low Leakage	I_{oL}	Output OFF, $V_{OUTX} = 0.0\text{V}$.		2	50	μA
Clamp Diode Forward Voltage	V_F	$I_F = 200\text{mA}$ $I_F = 700\text{mA}$			2.5 3.0	V
Clamp Diode Leakage Current	I_R	$V_R = 50\text{V}$			50	μA

FUNCTIONAL PIN DESCRIPTION

Pin Number	Pin Name	Function
2-9	INPUT[1:8]	8 LOGIC Inputs
1, 10	V_S	Supply Voltage
11, 20	GND	Ground
12-19	OUTPUT[1:8]	700mA Output

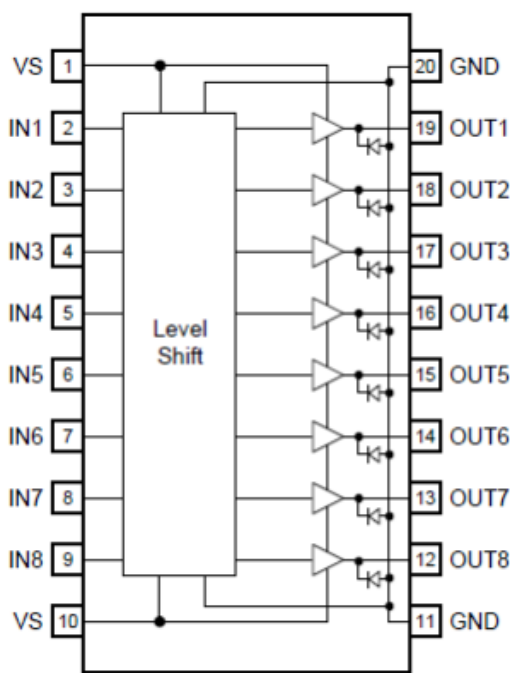
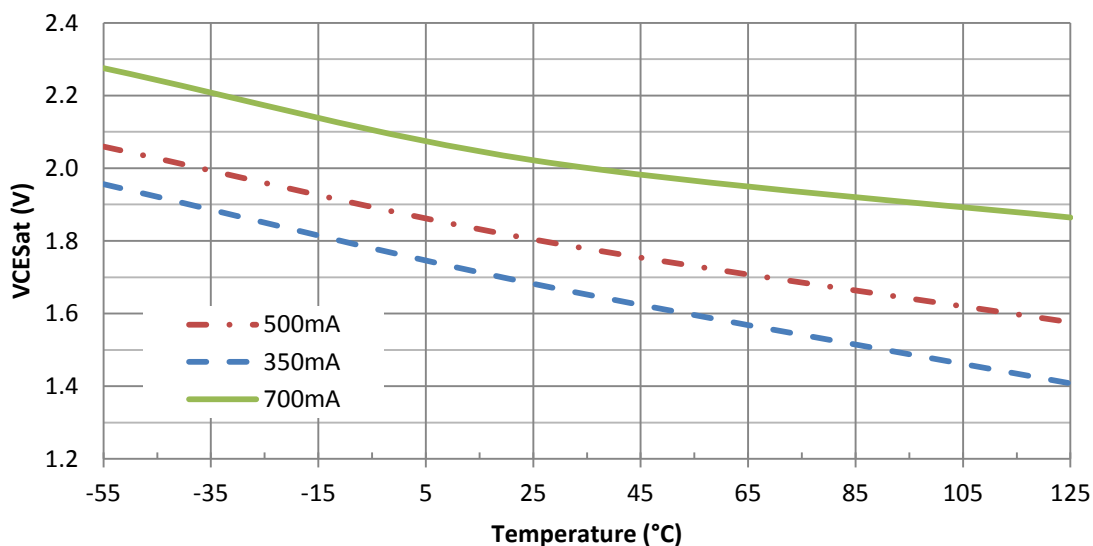
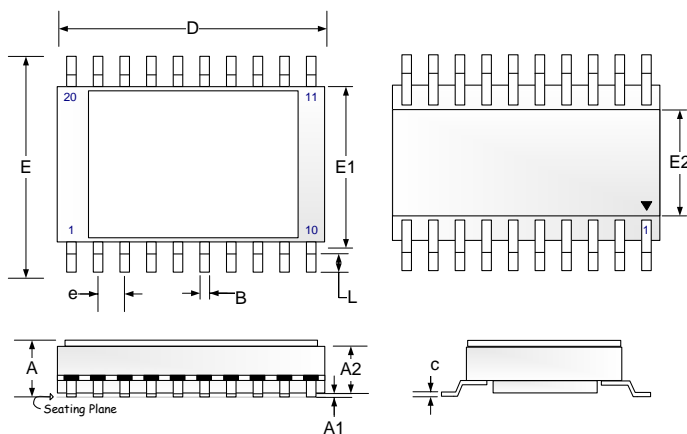
FUNCTIONAL BLOCK DIAGRAM


Figure 1. Functional Block Diagram.

TYPICAL CHARACTERISTIC CHART
AAHS298B OUTPUT V_{CE} SATURATION VOLTAGE VS TEMPERATURE

PACKAGE DIMENSIONS
S 20 Lead Ceramic SOIC


Dim	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.16	2.92	0.085	0.115
A1		0.38		0.015
A2	1.78	2.41	0.070	0.095
b	0.36	0.48	0.015	0.020
c	0.15	0.30	0.006	0.012
D	12.45	13.08	0.490	0.515
E	10.16	11.18	0.400	0.440
E1	7.11	7.87	0.280	0.310
E2	4.70 BSC		0.185 BSC	
e	1.27 BSC		0.050 BSC	

Note:

1. Dimensions are in inches, mm for reference only



NOTES

PRODUCTION DATA – Information contained in this document is proprietary to Microsemi and is current as of publication date. This document may not be modified in any way without the express written consent of Microsemi. Product processing does not necessarily include testing of all parameters. Microsemi reserves the right to change the configuration and performance of the product and to discontinue product at any time.