

# FUNCTIONAL DESCRIPTION

## RECEIVER

Figure 1 shows the general architecture of the ARINC 429 receiver. The receiver operates off the VCC supply only. The inputs RINA and RINB each require 35K $\Omega$  of resistance of which 25K $\Omega$  is internal to the chip. The series resistance is connected to level translators whose resistance to Ground is typically 10K $\Omega$ . In order for the voltage translation not to be adversely affected, an external 10K $\Omega$  series resistor must be added to each ARINC input. The HI-8588-10 device is typically chosen for applications where external series resistors are required in its lightning protection circuitry.

After level translation, the inputs are buffered and become inputs to a differential amplifier. The amplitude of the differential signal is compared to levels derived from a divider

between VCC and Ground. The nominal settings correspond to a One/Zero amplitude of 6.0V and a Null amplitude of 3.3V.

The status of the ARINC receiver input is latched. A Null input resets the latches and a One or Zero input sets the latches.

The logic at the output is controlled by the test signal which is generated by the logical OR of the TESTA and TESTB pins. Unlike the HI-8588, if TESTA and TESTB are both One, the HI-8588-10 outputs are pulled low instead of being tri-stated. This allows the digital outputs of a transmitter to be connected to the test inputs through control logic for self-test purposes.

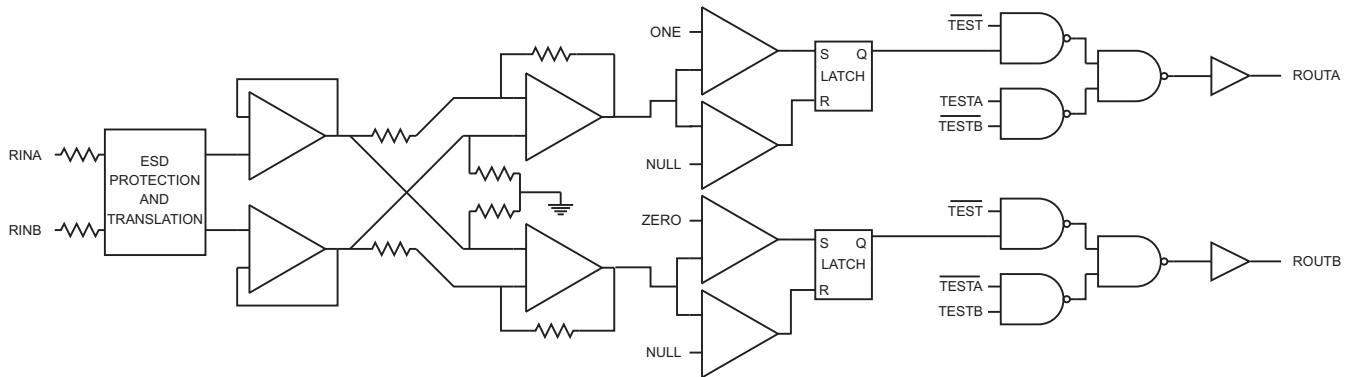


FIGURE 1 - RECEIVER BLOCK DIAGRAM

## APPLICATION INFORMATION

Figure 2 shows a possible application of the HI-8588-10 interfacing an ARINC receive channel to the HI-6010 which in turn interfaces to an 8-bit bus.

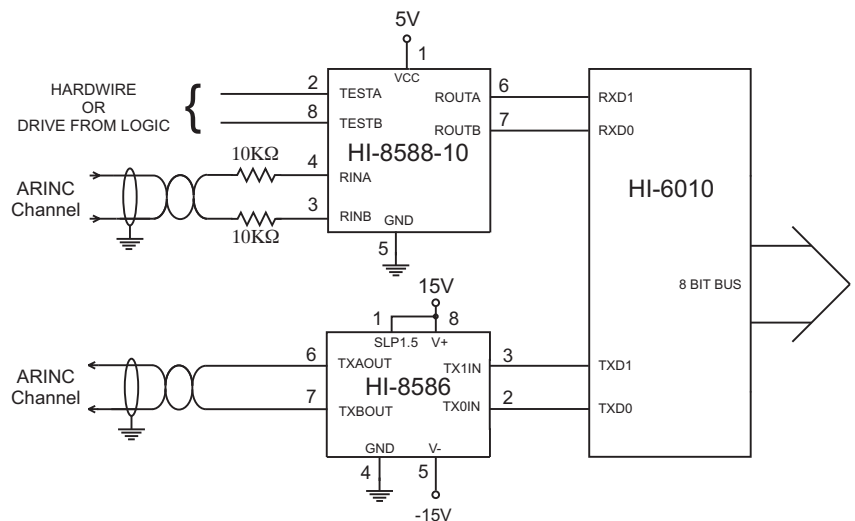


FIGURE 2 - APPLICATION DIAGRAM

## ABSOLUTE MAXIMUM RATINGS

Voltages referenced to Ground

Supply voltages VCC.....7V
ARINC input - pins 3 & 4 Voltage at either pin.....+120V to -120V
DC current per input pin..... $\pm 10$ mA
Power dissipation at 25°C plastic DIP.....0.7W ceramic DIP.....0.5W
Solder Temperature (reflow) .....260°C
Storage Temperature.....-65°C to +150°C

## RECOMMENDED OPERATING CONDITIONS

Supply Voltages VCC.....5V $\pm 5\%$
Temperature Range Industrial Screening.....-40°C to +85°C Hi-Temp Screening.....-55°C to +125°C

*NOTE: Stresses above absolute maximum ratings or outside recommended operating conditions may cause permanent damage to the device. These are stress ratings only. Operation at the limits is not recommended.*

## DC ELECTRICAL CHARACTERISTICS

OPERATING TEMPERATURE RANGE, VCC = 5.0V UNLESS OTHERWISE STATED

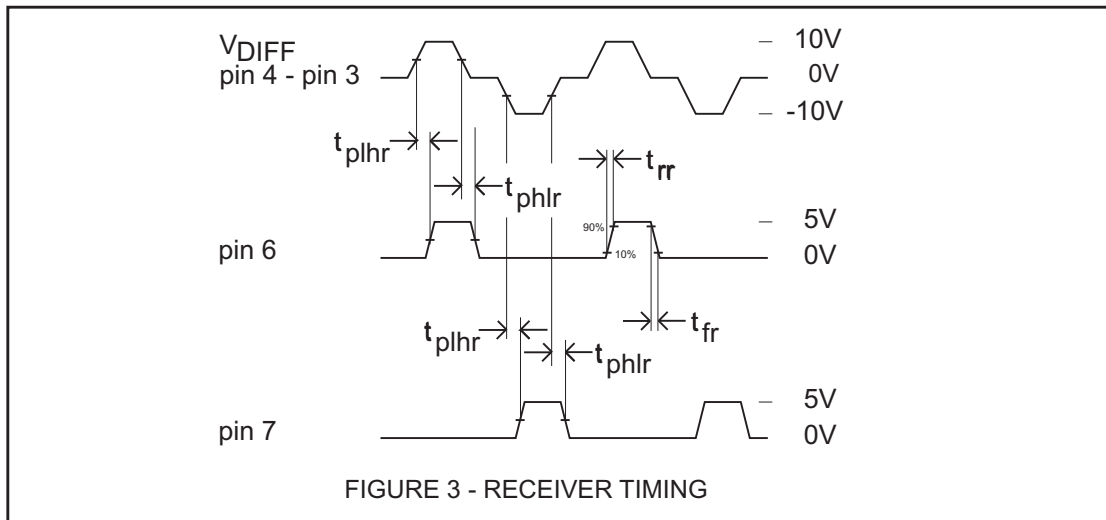
PARAMETERS	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNITS
ARINC input voltage one or zero null common mode	$V_{DIN}$ $V_{NIN}$ $V_{COM}$	diff. volt. thru 10K $\Omega$ , pins 3 & 4 " " " with respect to Ground	6.5 - -	10 - -	13 2.5 5.0	volts volts volts
logic input voltage high low	$V_{IH}$ $V_{IL}$		3.5 -	- -	- 1.5	volts volts
ARINC input resistance RINA to RINB RINA or RINB to Gnd or VCC	$R_{DIFF}$ $R_{SUP}$	supplies floating & series 10K $\Omega$ " " "	30 19	75 40	- -	Kohm Kohm
logic input current source sink	$I_{IH}$ $I_{IL}$	$V_{IN} = 0$ V $V_{IN} = 5$ V	- -	- -	0.1 0.1	$\mu$ A $\mu$ A
logic output drive current one zero	$I_{OH}$ $I_{OL}$	$V_{OH} = 4.6$ V $V_{OL} = 0.4$ V	- 3.6	-1.6 5.6	-0.8 -	mA mA
Current drain operating	$I_{CC1}$	pins 2, 8 = 0V; pins 3, 4 open	-	2.3	6.3	mA

## AC ELECTRICAL CHARACTERISTICS

OPERATING TEMPERATURE RANGE, VCC = 5.0V UNLESS OTHERWISE STATED

PARAMETERS	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNITS
Receiver propagation delay		defined in Figure 3, C <sub>L</sub> = 50pF				
Output high to low	t <sub>phlr</sub>		-	600	-	ns
Output low to high	t <sub>plhr</sub>		-	600	-	ns
Receiver output transition times						
Output high to low	t <sub>fr</sub>		-	50	80	ns
Output low to high	t <sub>rr</sub>		-	50	80	ns
Input capacitance (1)						
ARINC differential	C <sub>AD</sub>		-	5	10	pF
ARINC single ended to Ground	C <sub>AS</sub>		-	-	10	pF
Logic	C <sub>IN</sub>		-	-	10	pF

Notes: 1. Guaranteed but not tested



## ORDERING INFORMATION

HI - 8588 xx x x - 10

PART NUMBER	LEAD FINISH
Blank	Tin / Lead (Sn / Pb) Solder
F	100% Matte Tin (Pb-free, RoHS compliant)

PART NUMBER	TEMPERATURE RANGE	FLOW	BURN IN
I	-40°C TO +85°C	I	No
T	-55°C TO +125°C	T	No
M	-55°C TO +125°C	M	Yes

PART NUMBER	PACKAGE DESCRIPTION
PD	8 PIN PLASTIC DIP (8P) not available with "M" flow
PS	8 PIN PLASTIC NARROW BODY SOIC (8HN)
CR	8 PIN Cerdip (8D) not available Pb-free

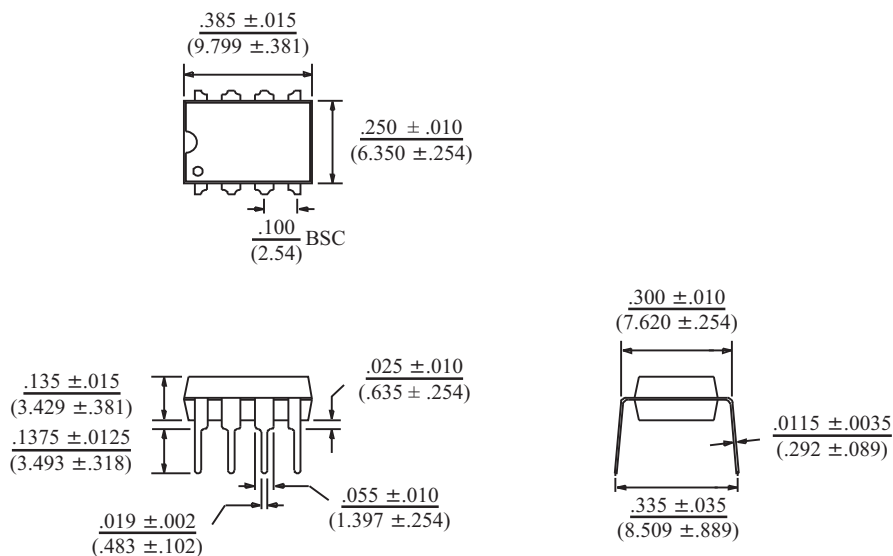
## REVISION HISTORY

P/N	Rev	Date	Description of Change
DS8488-10	E	08/05/14	Update ARINC input pins 3 & 4 Absolute Maximum Rating to +/-120V. Update solder reflow temperature. Remove Mil. temperature rating. Update SOIC-8 (8HN) package drawing.

## 8-PIN PLASTIC DIP

*inches (millimeters)*

Package Type: 8P

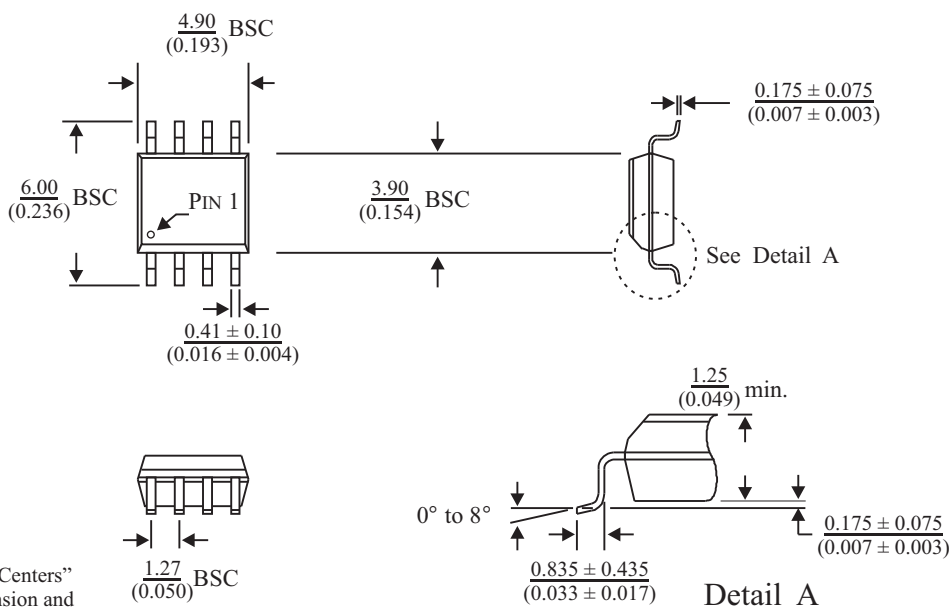


BSC = "Basic Spacing between Centers" is theoretical true position dimension and has no tolerance. (JEDEC Standard 95)

## 8-PIN PLASTIC SMALL OUTLINE (SOIC) - NB (Narrow Body)

*millimeters (inches)*

Package Type: 8HN

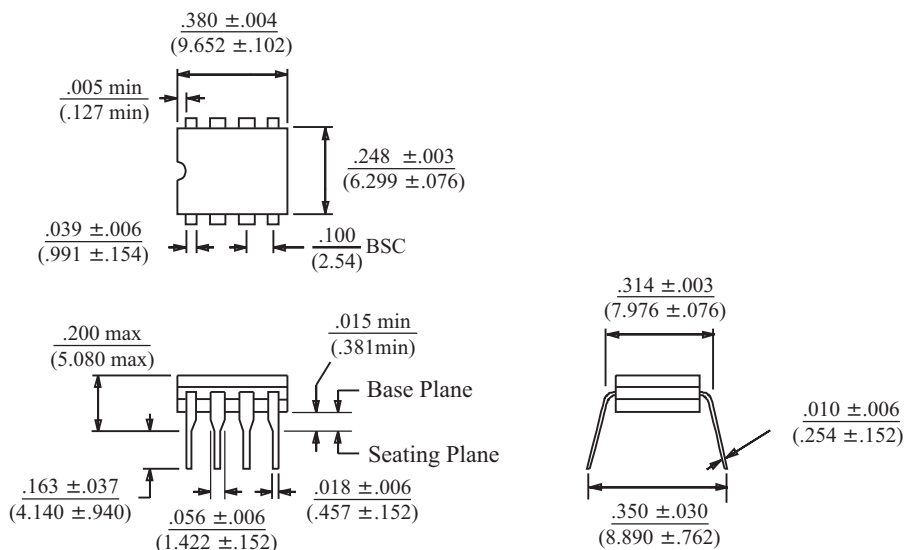


BSC = "Basic Spacing between Centers" is theoretical true position dimension and has no tolerance. (JEDEC Standard 95)

## 8-PIN CERDIP

*inches (millimeters)*

Package Type: 8D



BSC = "Basic Spacing between Centers"  
is theoretical true position dimension and  
has no tolerance. (JEDEC Standard 95)