

HD75232/GD75323

EIA RS-232-D INTERFACE 1 CHIP IC

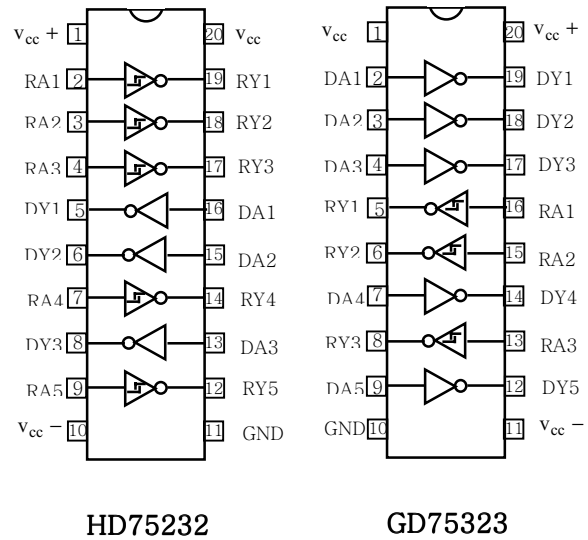
Description

The HD75232 is a monolithic device containing 3 independent drivers and 5 receivers, and the GD75323 is a monolithic device containing 5 independent drivers and 3 receivers. These are designed to interface between data terminal equipment and data communication equipment as designed by EIA-232-D.

Features

- Meets standard EIA-232-D (Revision of RS-232-C)
- Drivers
 - Current Limited Output ... 10 mA Typical
 - Power-off Output Impedance ... 300 Ω Min
 - Slew Rate Control by Load Capacitor
 - Flexible Supply Voltage Range
 - Input Compatible with Most TTL and DTL Circuits
- Receivers
 - Input Resistance3 KΩ to 7 KΩ
 - Input Signal Range± 30V
 - Built-in Input Hysteresis (Double Threshold)
- 20 DIP/SOP/SSOP/TSSOP

Block Diagram



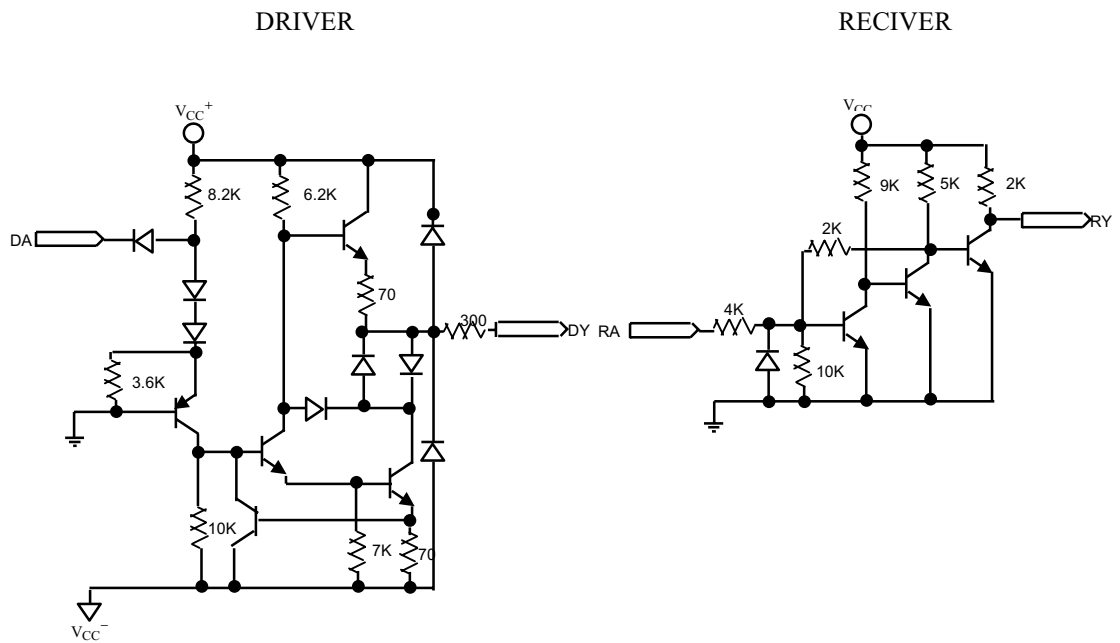
Pin Description

NAME	Pin No.		Function	NAME	Pin No.		Function
	HD75232	GD75323			HD75232	GD75323	
V _{CC} +	1	20	Driver Section Supply +	V _{CC} -	10	11	Driver Section Supply -
DA1	16	2	Driver Input	DY1	5	19	Driver Output
DA2	15	3		DY2	6	18	
DA3	13	4		DY3	8	17	
DA4	-	7		DY4	-	14	
DA5	-	9		DY5	-	12	
V _{CC}	20	1	Receiver Section Supply	GND	11	10	Ground
RA1	2	16	Receiver Input	RY1	19	5	Receiver Output
RA2	3	15		RY2	18	6	
RA3	4	13		RY3	17	8	
RA4	7	-		RY4	14	-	
RA5	9	-		RY5	12	-	

Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
V_{CC+}	Supply Voltage	15	V
V_{CC-}	Supply Voltage	-15	V
V_{CC}	Supply Voltage	10	V
$V_I(\text{Driver})$	Input Voltage	-15 ~ +7	V
$V_I(\text{Receiver})$	Input Voltage	± 30	V
$V_O(\text{Driver})$	Output Voltage	-15 ~ +15	V
PT	Continuous Power Dissipation (Below 25°C)	1.0	W
T_{STG}	Storage Temperature	-65 ~ +75	°C
T_{OP}	Operating Temperature	0 ~ +75	°C

Schematic



Electrical Characteristics

Supply Current

$V_{CC} = 5V$ $T_a = 25^\circ C$

Symbol	Parameter	Test Conditions		HD75232			GD75323			Unit
				Min	Typ	Max	Min	Typ	Max	
I_{CC+}	Supply Current From V_{CC+}	$V_{CC+} = 9V$	$V_{IN} = 1.9V$		11.3	15		18.8	25	mA
		No Load	$V_{IN} = 0.8V$		3.4	4.5		5.6	7.5	
		$V_{CC+} = 12V$	$V_{IN} = 1.9V$		14.3	19		23.8	31.3	
		No Load	$V_{IN} = 0.8V$		4.1	5.5		6.9	8.8	
I_{CC-}	Supply Current From V_{CC-}	$V_{CC-} = -9V$	$V_{IN} = 1.9V$		-12	-15		-20	-24	mA
		No Load	$V_{IN} = 0.8V$			-3.2			-2.5	
		$V_{CC-} = -12V$	$V_{IN} = 1.9V$		-16	-19		-26.7	-32	
		No Load	$V_{IN} = 0.8V$			-3.2			-2.5	
I_{CC}	Supply Current From V_{CC}	$V_{CC} = 5V$	$V_{IN} = 5.0V$		20	30		15	19.5	mA
		$V_{CC} = 5V$ O/P Open								

Driver Section

Symbol	Parameter	Test Conditions		Min	Typ	Max	Unit
V_{IH}	High Level Input Voltage	$V_{CC+} = +9V$ $V_{CC-} = -9V$		1.9			V
V_{IL}	Low Level Input Voltage					0.8	V
V_{OH}	High Level Output Voltage	$V_{IL} = 0.8V$ $R_L = 3K\Omega$	$V_{CC+} = +9V$ $V_{CC-} = -9V$	6	7		V
			$V_{CC+} = +13.2V$ $V_{CC-} = -13.2V$	9	10.5		
V_{OL}	Low Level Output Voltage	$V_{IH} = 1.9V$ $R_L = 3K\Omega$	$V_{CC+} = +9V$ $V_{CC-} = -9V$		-7	-6	V
			$V_{CC+} = +13.2V$ $V_{CC-} = -13.2V$		-10.5	-9	
I_{IH}	High Level Input Current	$V_I = 5V$				10	μA
I_{IL}	Low Level Input Current	$V_I = 0$			-1	-1.6	MA
$I_{OS(H)}$	Short Circuit Output Current at High Level	$V_I = 0.8V$ $V_O = 0$		-6	-10	-12	MA
$I_{OS(L)}$	Short Circuit Output Current at Low Level	$V_I = 1.9V$ $V_O = 0$		6	10	12	mA
R_O	Output Resistance, Power Off	$V_{CC+} = 0, V_{CC-} = 0$ $V_O = -2V$ to $2V$		300			Ω

Driver Switching Characteristics**V_{cc+}=9V, V_{cc-}=-9V, T_A=25°C**

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
t _{PLH}	Propagation Delay Time, Low-To-High-Level Output	R _L = 3kΩ C _L = 15pF		400	500	ns
t _{PHL}	Propagation Delay Time, High-To-Low-Level Output			100	175	ns
t _{TLH}	Transition Time, Low-To-High-Level Output†	See Figure 1		55	100	ns
t _{THL}	Transition Time, High-To-Low-Level Output†			45	75	ns
t _{TLH}	Transition Time, Low-To-High-Level Output‡	R _L = 3kΩ to 7 kΩ C _L = 2500pF		2.5		μs
t _{THL}	Transition Time, High-To-Low-Level Output‡	See Figure 1		3.0		μs

† Measured between 10% and 70% Points of Output Waveform

‡ Measured between +3V and -3V Points on the Output Waveform (EIA-232-D Condition)

Receiver Section

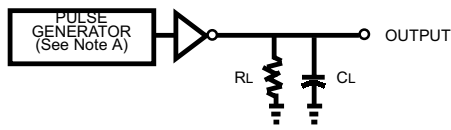
Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V _{T+}	Positive-Going Threshold Voltage		1.75	1.9	2.25	V
V _{T-}	Negative-Going Threshold Voltage		0.75	0.97	1.25	V
V _{OH}	High Level Output Voltage	V _I = 0.75V , I _{OL} = -0.5mA	2.6	4	5	V
		Input Open , I _{OL} = -0.5mA	2.6	4	5	
V _{OL}	Low Level Output Voltage	V _I = 3V , I _{OL} = 10mA		0.2	0.45	V
I _{IH}	High-Level Input Current	V _I = 25V	3.6		8.3	mA
		V _I = 3V	0.43			
I _{IL}	Low-Level Input Current	V _I = -25V	-3.6		-8.3	mA
		V _I = -3V	-0.43			
I _{OS}	Short-Circuit Output Current			-3		mA

Receiver Switching Characteristics

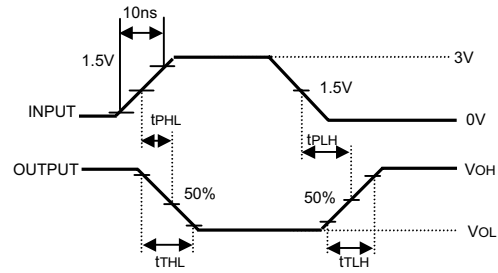
Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
t _{PLH}	Propagation Delay Time, Low-To-High Level Output	C _L = 15pF R _L = 3.9kΩ		100	150	ns
t _{PHL}	Propagation Delay Time, High-To-Low Level Output	C _L = 15pF R _L = 390kΩ		25	50	ns
t _{TLH}	Transition Time, Low-To-High Level Output	C _L = 15pF R _L = 3.9kΩ		120	175	ns
t _{THL}	Transition Time, High-To-Low Level Output	C _L = 15pF R _L = 390kΩ		10	20	ns

Parameter Measurement Information

• DRIVER

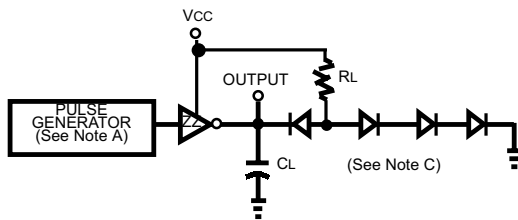


Test Circuit

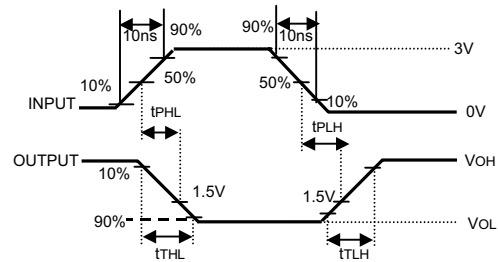


Voltage Wave form

• RECEIVER



Test Circuit

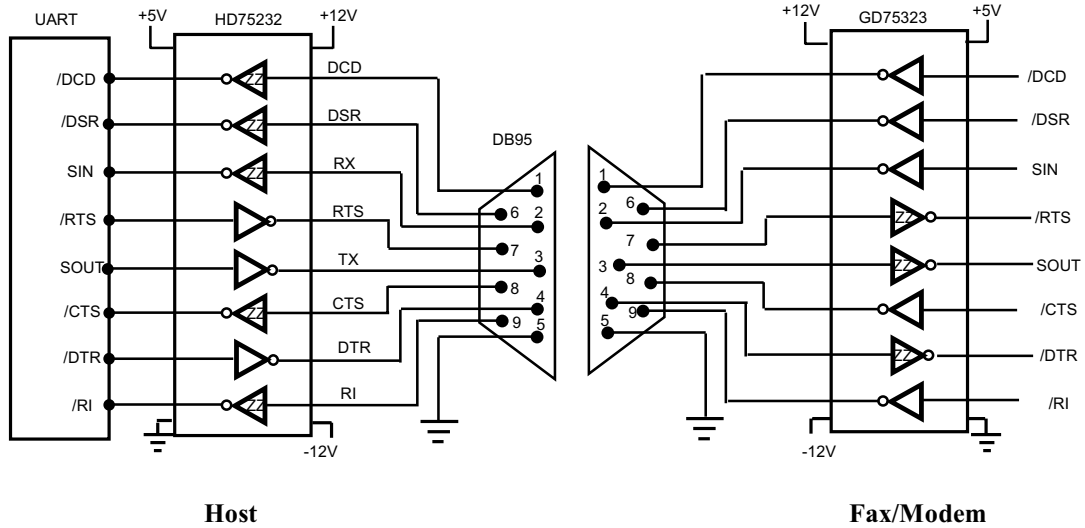


Voltage Waveform

- NOTE A. The pulse generator has the following characteristics. $t_w = 25\mu s$, $f = 200KHz$, $Z_0 = 50\Omega$
 B. C includes probe and jig capacitance
 C. All diodes are 1N3064 or equivalent.

Fig 1. Propagation and Transition Times

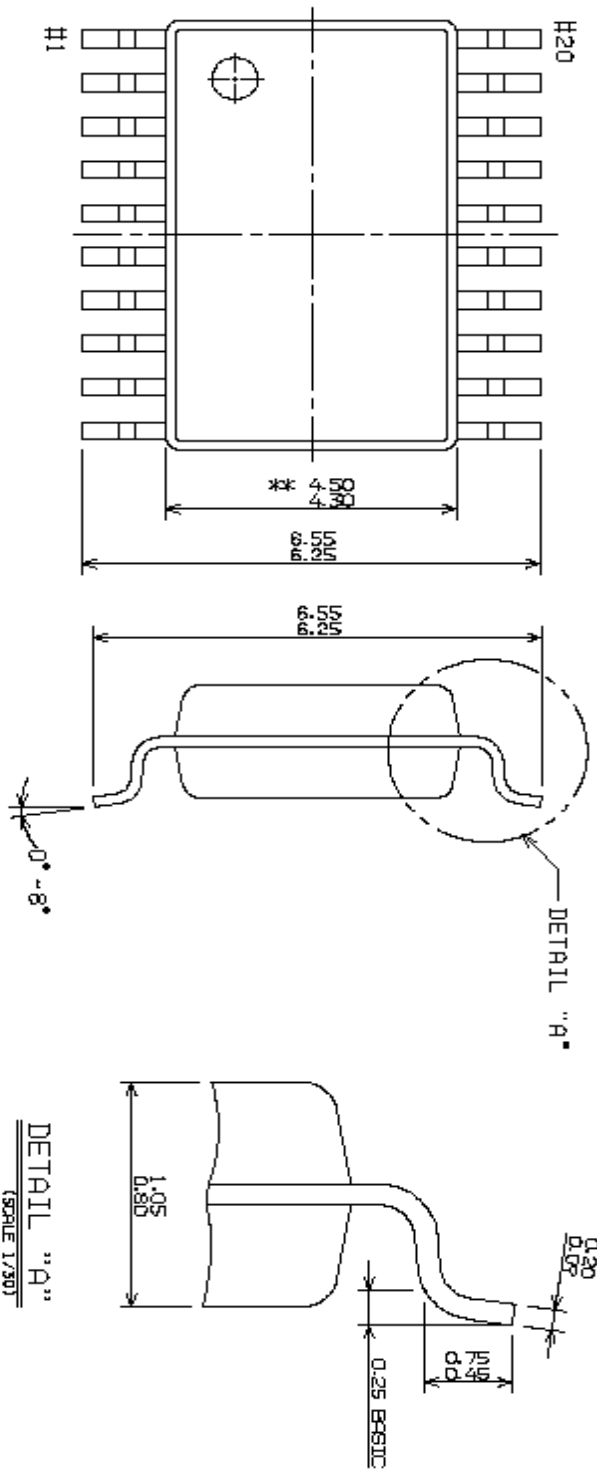
Typical Application



Host

Fax/Modem

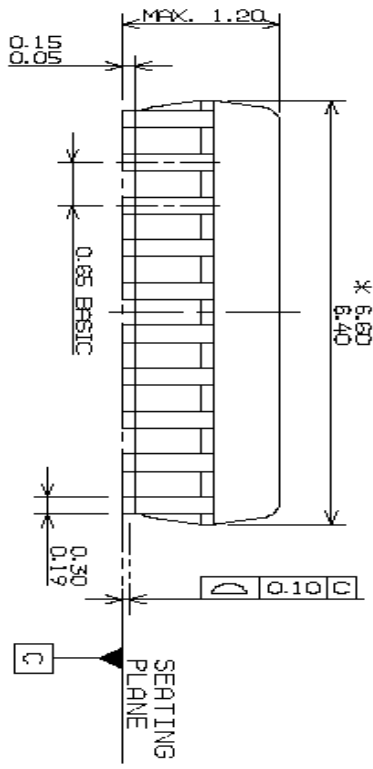
•20SOP(300MIL)



-NOTE-

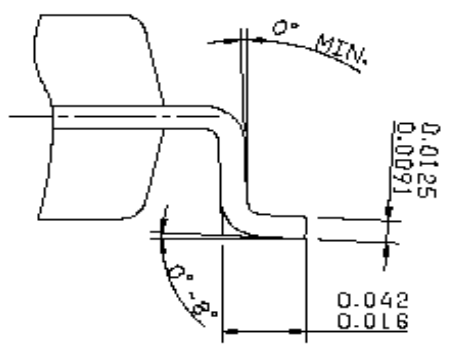
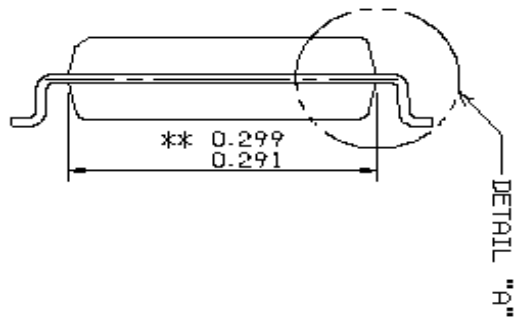
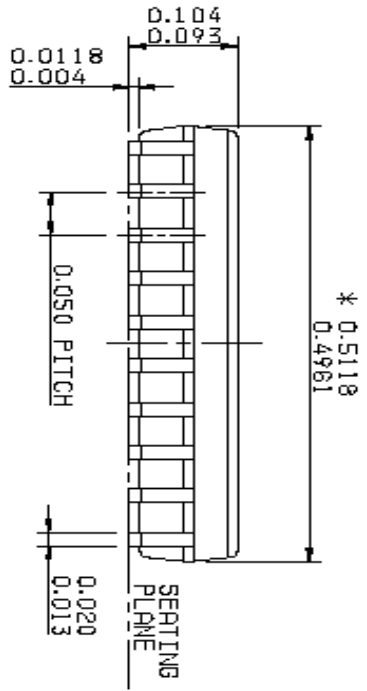
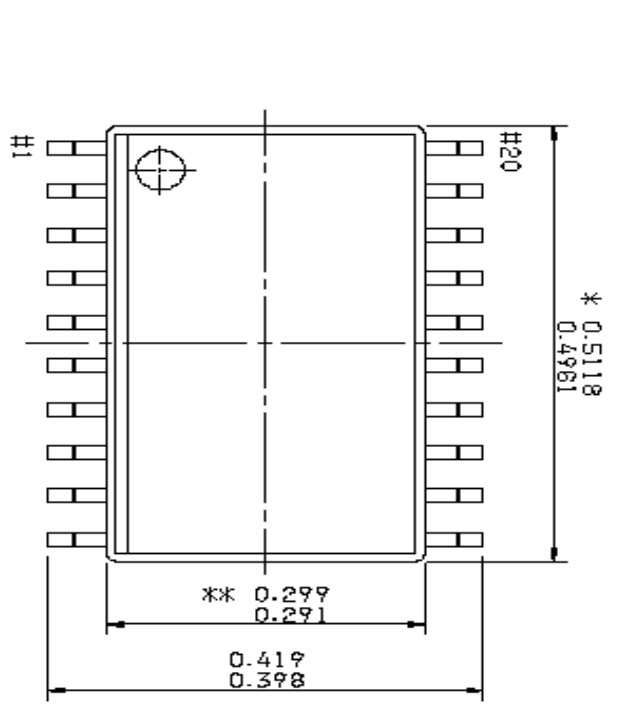
1. DIMENSION * MARK DOES NOT INCLUDE MOLD PROTRUSION. MAXIMUM ALLOWABLE PROTRUSION IS 0.15 MM PER SIDE.
2. DIMENSION ** MARK DOES NOT INCLUDE MOLD PROTRUSION. MAXIMUM ALLOWABLE PROTRUSION IS 0.25 MM PER SIDE.
3. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M-1982.
4. UNSPECIFIED IS ACCORDING TO JEDEC MO-153, VARIATION "A".

DETAIL "A"
(SCALE 1/30)



TOLERANCES	
UNLESS OTHERWISE SPECIFIED	
ANGULAR: 10.5°	
X : ±0.25	
XX : ±0.1	
XXX : ±0.05	

•20TSSOP(4.4mm)



-NOTE-

1. DIMENSION * MARK DOES NOT INCLUDE MOLD PROTRUSION. MAXIMUM ALLOWABLE PROTRUSION IS 0.008 INCH PER SIDE.
2. DIMENSION ** MARK DOES NOT INCLUDE MOLD PROTRUSION. MAXIMUM ALLOWABLE PROTRUSION IS 0.010 INCH PER SIDE.
3. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M-1982.
4. UNSPECIFIED IS ACCORDING TO JEDEC MS-013, VARIATION "NC".

DETAIL "A"
(SCALE 1/20)

TOLERANCES
UNLESS OTHERWISE SPECIFIED
ANGULAR: ±0.5°
X : ±0.25
XX : ±0.1
XXX : ±0.05