- **Single-Ended Driver for Request Line With Improved Characteristics**
- **Single-Ended Receiver for ACKNOWLEDGE Line With Improved Characteristics**
- **Controlled Driver Rise and Fall Times 10 ns Typ**
- **High Receiver Input Hysteresis 600 mV Typ**
- **Receiver Input Noise Pulse Filter 2.5 ns Max**
- **Request and Acknowledge Meet ANSI X3.131-1986 (SCSI)**
- **Packaged in Thin Shrink-Small-Outline Package With 25-mil Pin Pitches**
- **Designed to Operate at 5 Million Transfers Per Second**
- **Power Up/Down Glitch Protection**
- **High Impedance With V_{CC} = 0 V**

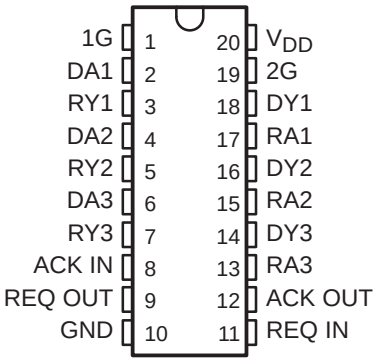
description

The SN75C08 is an input/output SCSI buffer with eight channels. One channel, REQ (request), is an open-drain driver that includes controlled rise and fall times to reduce crosstalk and RF emissions on the SCSI bus. The device also has one channel, ACK (acknowledge), that is a receiver that typically exhibits 600 mV of hysteresis and a 2.5-ns pulse filter to reject noise for bus reflections and/or other sources. The remaining channels offer TTL inputs and 4-mA 3-state outputs.

The enhancement to standard CMOS I/Os provides fewer data errors and higher data throughput with less noise emissions. The switching speeds of the SN75C08 are sufficient to transfer data over the data bus at five million transfers per second. This device is available in the space efficient shrink-small-outline package (SSOP) with 25-mil pin pitch.

The SN75C08 is characterized for operation from 0°C to 70°C.

DB PACKAGE
(TOP VIEW)



Function Tables

DRIVER 1 TO 3

INPUTS 1G	INPUTS DA	OUTPUT DY
H	H	H
H	L	L
L	H	Z
L	L	Z

RECEIVER 1 TO 3

INPUTS 2G	INPUTS DA	OUTPUT RY
H	H	Z
H	L	Z
L	H	H
L	L	L

ACKNOWLEDGE

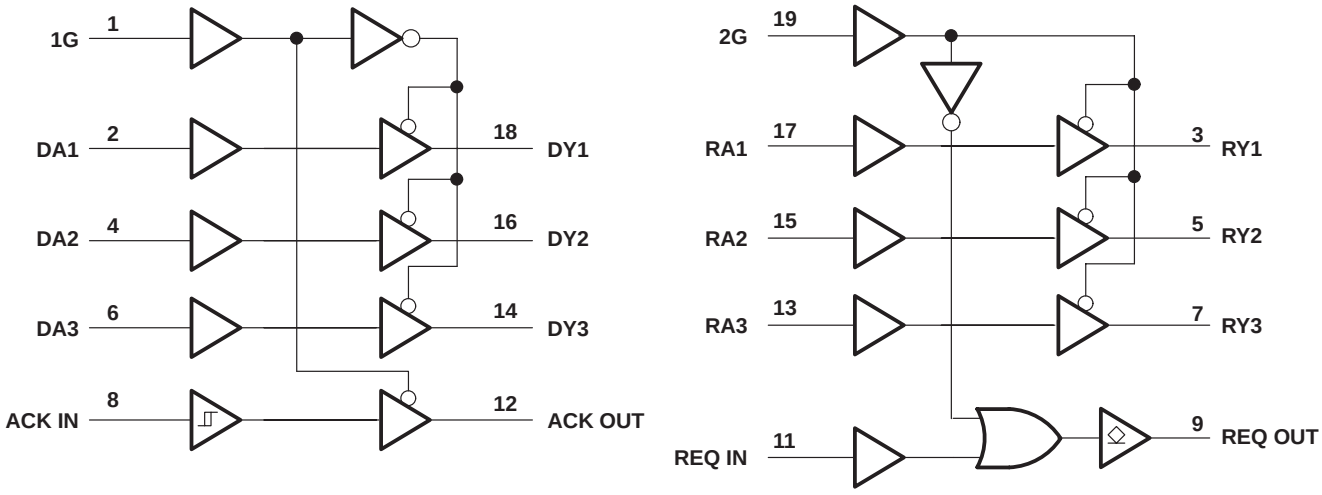
INPUTS 1G	INPUTS ACK IN	OUTPUT ACK OUT
H	H	Z
H	L	Z
L	H	H
L	L	L

REQUEST

INPUTS 2G	INPUTS REQ IN	OUTPUT REQ OUT
H	H	H
H	L	L
L	H	H
L	L	H

H = high level, L = low level,
Z = high impedance

functional block diagram



absolute maximum ratings over operating free-air temperature range (unless otherwise noted)†

Supply voltage range, V_{CC} . . . . . –0.5 V to 6 V
Input voltage range V_I . . . . . –0.5 V to V_{CC} + 0.5 V
Output voltage range, V_O . . . . . –0.5 V to V_{CC} + 0.5 V
Input clamp current, I_I (V_I < 0 or V_I > V_{CC}) . . . . . ±20 mA
Output clamp current, (V_O < 0 or V_O > V_{CC}) . . . . . ±20 mA
Continuous total dissipation . . . . . See Dissipation Rating Table
Operating free-air temperature range . . . . . 0°C to 70°C
Storage temperature range . . . . . –65°C to 150°C
Lead temperature 1,6 mm from case for 10 seconds . . . . . 260°C

† 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 under “recommended operating conditions” is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

DISSIPATION RATING TABLE

PACKAGE	POWER DISSIPATION $T_A \le 25°C$	DERATING FACTOR ABOVE $T_A \ge 25°C$
DB	612 mW	4.9 mW/°C

recommended operating conditions

		MIN	NOM	MAX	UNIT
Supply voltage, V_{CC}		4.75	5	5.25	V
High-level dc input voltage, V_{IH}	1G, 2G, DA, REQ IN, RA	2			V
Low-level dc input voltage, V_{IL}	1G, 2G, DA, REQ IN, RA			0.8	V
Input voltage, V_I	1G, 2G, DA, REQ IN, RA	0		V_{CC}	V
Output voltage, V_O	DY, RY, ACK OUT	0		V_{CC}	V
High-level output current, I_{OH}	DY, RY, ACK OUT			4	mA
	REQ OUT				
Low-level output current, I_{OL}	DY, RY, ACK OUT			4	mA
	REQ OUT			48	mA
Operating free-air temperature, T_A		0		70	°C

ACK electrical characteristics over recommended ranges of supply voltage and operating free-air temperature

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
V_{T+}	Positive-going threshold voltage			1.7		V
V_{T-}	Negative-going threshold voltage			1.1		V
V_{hys}	Input hysteresis ($V_{T+} - V_{T-}$)			0.6		V
V_{OH}	High-level output voltage	I_{OH} = –4 mA, V_I = 2 V	3.7			µA
V_{OL}	Low-level output voltage	I_{OL} = 4 mA, V_I = 0.8 V			0.5	V
I_I	Input current	V_I = 0 V to V_{CC}			±1	µA
I_{OZ}	Output current disabled	V_O = 0 V to V_{CC}			±5	µA

ACK switching characteristics over recommended ranges of supply voltage and operating free-air temperature, C_L = 50 pF (see Figure 1)

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
t_{PHL}	Propagation delay time, high-to-low-level output	S1 and S2 open		13	22	ns
t_{PLH}	Propagation delay time, low-to-high-level output	S1 and S2 open		8	15	ns
t_{PZH}	Enable time (of a 3-state output) to high level	R_L = 1 kΩ, S1 closed		7	14	ns
t_{PZL}	Enable time (of a 3-state output) to low level	R_L = 1 kΩ, S2 closed		10	18	ns
t_{PHZ}	Disable time (of a 3-state output) from high level	R_L = 1 kΩ, S1 closed		7	14	ns
t_{PLZ}	Disable time (of a 3-state output) from low level	R_L = 1 kΩ, S2 closed		7	14	ns

REQ electrical characteristics over recommended operating free-air temperature range

PARAMETER		TEST CONDITIONS	MIN	MAX	UNIT
V_{OL}	Low-level output voltage	I_{OL} = 48 mA		0.5	V
V_T	Input threshold voltage		1.3		V
I_I	Input current	V_I = 0 V to V_{CC}		±1	µA
I_{OZ}	Output current disabled	V_O = 0 V to V_{CC}		±5	µA

REQ switching characteristics over recommended ranges of supply voltage and operating free-air temperature (see Figure 2)

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
t_{PHL}	Propagation delay time, high-to-low-level output	C_L = 15 pF		15	25	ns
t_{PLH}	Propagation delay time, low-to-high-level output			17	30	
t_{PHL}	Propagation delay time, high-to-low-level output	C_L = 200 pF		15	25	ns
t_{PLH}	Propagation delay time, low-to-high-level output			23	30	

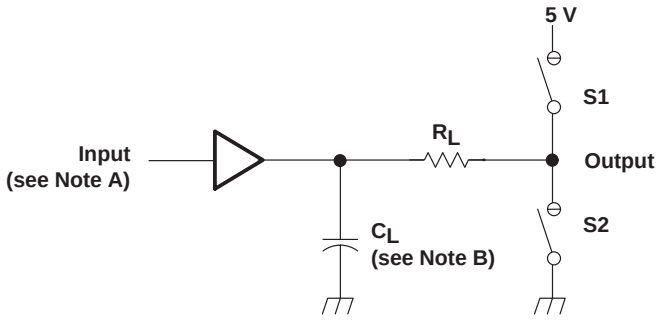
driver 1 to 3 and receiver 1 to 3 electrical characteristics over recommended ranges of supply voltage and operating free-air temperature

PARAMETER		TEST CONDITIONS		MIN	MAX	UNIT
V_{OH}	High-level output voltage	I_{OH} = –4 mA,	V_I = 2 V	3.7		V
V_{OL}	Low-level output voltage	I_{OL} = 4 mA,	V_I = 0.8 V		0.5	V
V_T	Input threshold voltage			1.3		V
I_I	Input current	V_I = 0 V to V_{CC}			±1	µA
I_{OZ}	Output current disabled	V_O = 0 V to V_{CC}			±5	µA

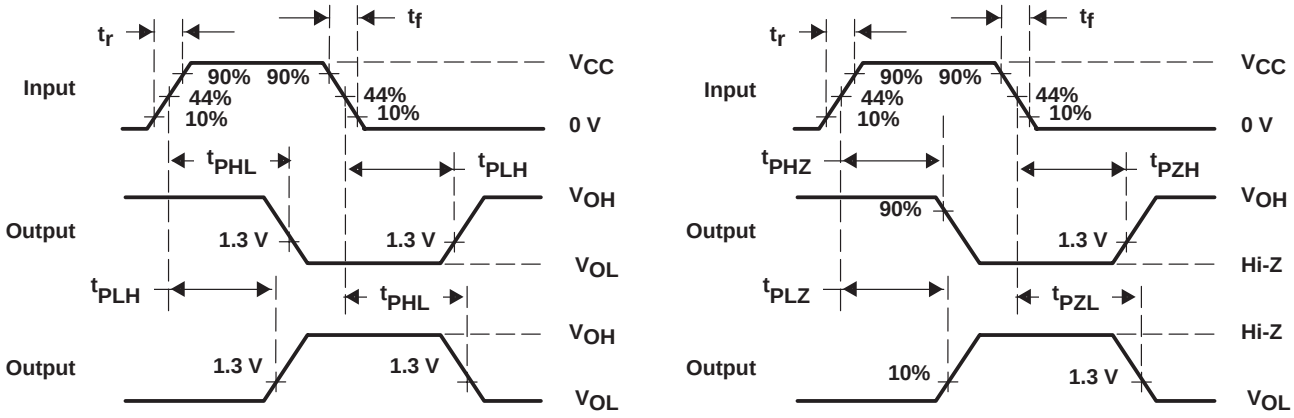
driver 1 to 3 and receiver 1 to 3 switching characteristics over recommended ranges of supply voltage and operating free-air temperature range, C_L = 50 pF (see Figure 1)

PARAMETER		TEST CONDITIONS		MIN	TYP	MAX	UNIT
t_{PHL}	Propagation delay time, high-to-low-level output	S1 and S2 open			13		ns
t_{PLH}	Propagation delay time, low-to-high-level output	S1 and S2 open			8		ns
t_{PZH}	Enable time (of a 3-state output) to high level	R_L = 1 kΩ,	S1 closed		7		ns
t_{PZL}	Enable time (of a 3-state output) to low level	R_L = 1 kΩ,	S2 closed		10		ns
t_{PHZ}	Disable time (of a 3-state output) from high level	R_L = 1 kΩ,	S1 closed		7		ns
t_{PLZ}	Disable time (of a 3-state output) from low level	R_L = 1 kΩ,	S2 closed		7		ns

PARAMETER MEASUREMENT INFORMATION



TEST CIRCUIT

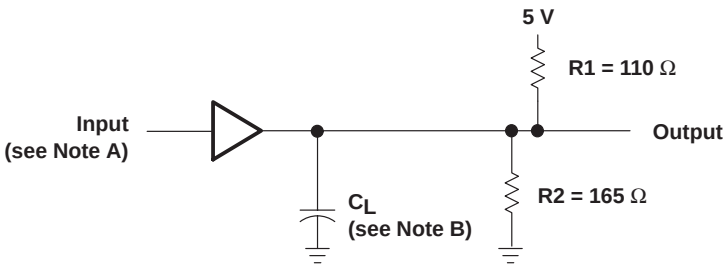


VOLTAGE WAVEFORMS

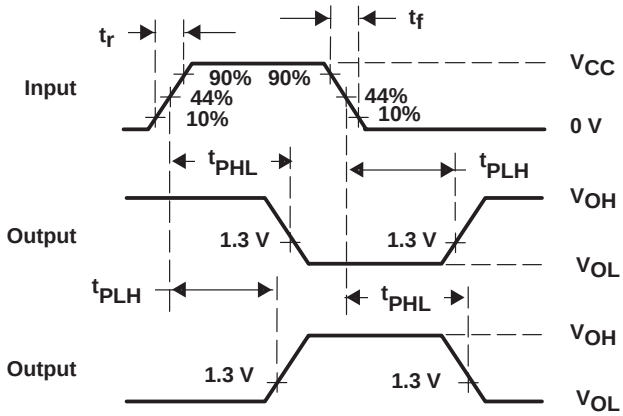
NOTES: A. The input pulse is supplied by a generator having the following characteristics: PRR ≤ 1 MHz, 50% duty cycle, t_r ≤ 6 ns, t_f ≤ ns, Z_O = 50 Ω.
B. C_L includes probe and jig capacitance.

Figure 1. ACK, Driver 1 to 3 and Receiver 1 to 3 Test Circuit and Voltage Waveforms

PARAMETER MEASUREMENT INFORMATION



TEST CIRCUIT



VOLTAGE WAVEFORMS

NOTES: A. The input pulse is supplied by a generator having the following characteristics: PRR ≤ 1 MHz, 50% duty cycle, t_r ≤ 6 ns, t_f ≤ ns, Z_O = 50 Ω.
B. C_L includes probe and jig capacitance.

Figure 2. REQ Output Enable and Disable TIme Test Circuit and Voltage Waveforms

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