



DOCUMENT CHANGE REQUEST

DCR number 137 Changes required for: N/A

Date: 2004/08/06

Date sent: 2004/08/06

Originator: S Thacker

Organisation: ESA/ESTEC

Status: IMPLEMENTED

Title: CMOS Quad Bilateral Switch, based on type 4066B

Number: 9408/005

Issue:

1

Other documents affected:

Page:

Electrical Test table Table 2 page 22 & Test Circuits Fig 4(p) page 41, Fig 4(q) page 42 - parameters: Propagation times tPLH1, tPLH2, tPHL.

Paragraph:

Electrical Test table Table 2 page 22 & Test Circuits Fig 4(p) page 41, Fig 4(q) page 42 - parameters: Propagation times tPLH1, tPLH2, tPHL.

Original wording:

Proposed wording:

In addition to general changes to the specification format/layout/content for the 4000B series as summarised in ESCC approved DCR90, there are some additional specific technical changes to this specification as follows :

Electrical Test table & circuit (Table 2/Fig 4(p & q) (para 2.3.1/2.3.3 note 8)) - parameters: Propagation times.

Test conditions for channel inputs for tPLH1 (=tPLH), tPHL, tPLH2 (=tPZH) have been amended/clarified for correct switching including definition of load resistance and capacitance RL & CL.

The switching waveforms have been corrected for tPLH2 (=tPZH) in Fig 4(q)(para 2.3.3 note 8).

- see attached sheets for current and new table & fig/note.

Justification:

The current specification is incomplete, unclear or incorrect for these requirements.

Attachments:

9408005_original_pages.pdf, 9408005_new_pages.pdf, null

Modifications:

N/A

Approval signature:

A handwritten signature in black ink, appearing to read "J. L. Kelle". The signature is written in a cursive style with a horizontal line underneath the name.

Date signed:

2004-08-06

Characteristics	Symbols	MIL-STD-883 Test Method	Test Conditions Note 1	Limits		Units
				Min	Max	
Propagation Delay Low to High, 1A to 1B	t_{PLH}	3003	V_{IN} (Under Test)=Pulse Generator V_{IN} (Remaining Inputs)=Truth Table $V_{IL}=0V, V_{IH}=5V,$ $R_L=200k\Omega$ $V_{DD}=5V, V_{SS}=0V$ Note 8	-	40	ns
Propagation Delay High to Low, 1A to 1B	t_{PHL}	3003	V_{IN} (Under Test)=Pulse Generator V_{IN} (Remaining Inputs)=Truth Table $V_{IL}=0V, V_{IH}=5V,$ $R_L=200k\Omega$ $V_{DD}=5V, V_{SS}=0V$ Note 8	-	40	ns
Output Enable Time High Impedance to High Output, 1C to 1B	t_{PZH}	3003	V_{IN} (Under Test)=Pulse Generator V_{IN} (Remaining Inputs)=Truth Table $V_{IL}=0V, V_{IH}=5V,$ $V_{IN}(1A)=5V,$ $R_L=1k\Omega$ $V_{DD}=5V, V_{SS}=0V$ Note 8	-	70	ns

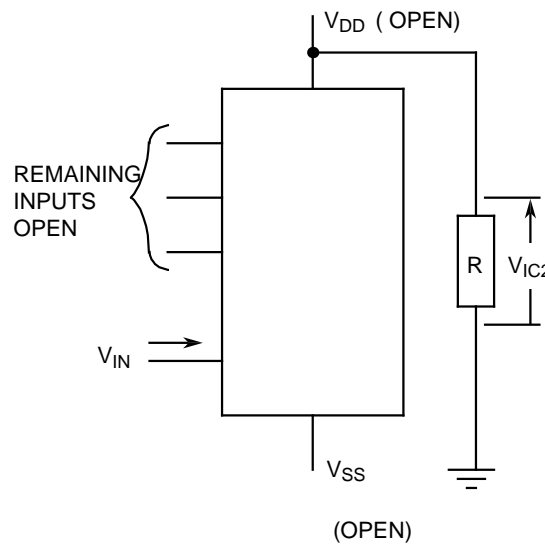
2.3.2 High and Low Temperatures Electrical Measurements

The measurements shall be performed at $T_{amb}=+125 (+0 -5) ^\circ C$ and $T_{amb}=- 55(+5-0)^\circ C$.

Characteristics	Symbols	MIL-STD-883 Test Method	Test Conditions Note 1	Limits		Units
				Min	Max	
Functional Test 1	-	3014	Verify Truth Table $V_{IL}=0V, V_{IH}=3V$ $V_{DD}=3V, V_{SS}=0V$ Note 2	-	-	-
Functional Test 2	-	3014	Verify Truth Table $V_{IL}=0V, V_{IH}=15V$ $V_{DD}=15V, V_{SS}=0V$ Note 2	-	-	-
Quiescent Current	I_{DD}	3005	$V_{IL}=0V, V_{IH}=15V$ $V_{DD}=15V, V_{SS}=0V$ Note 3 $T_{amb}=+125^\circ C$ $T_{amb}=- 55^\circ C$	-	1 0.1	μA

Characteristic	Input Conditions	Limit	Remark
	$V_{IN}(A)$	$V_{OUT}(B)$	
V_{IL2}	15V	$\leq 0.1V$ $\leq 1V$	$T_{amb} = +22^{\circ}C, -55^{\circ}C$ $T_{amb} = +125^{\circ}C$ Channel OFF
V_{IH1}	5V	$\geq 4V$	Channel ON
V_{IH2}	15V	$\geq 12.5V$	Channel ON

6. Input Clamp Voltage 2 to V_{DD} , V_{IC2} , shall be tested on each input as follows:

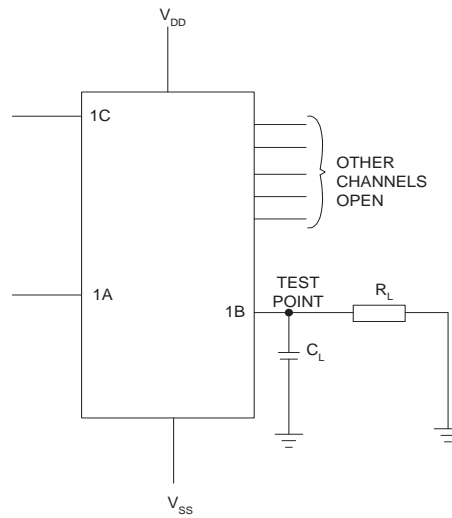


- 7. Guaranteed but not tested.
- 8. Read and record measurements shall be performed on a sample of 32 components with 0 failures permitted.

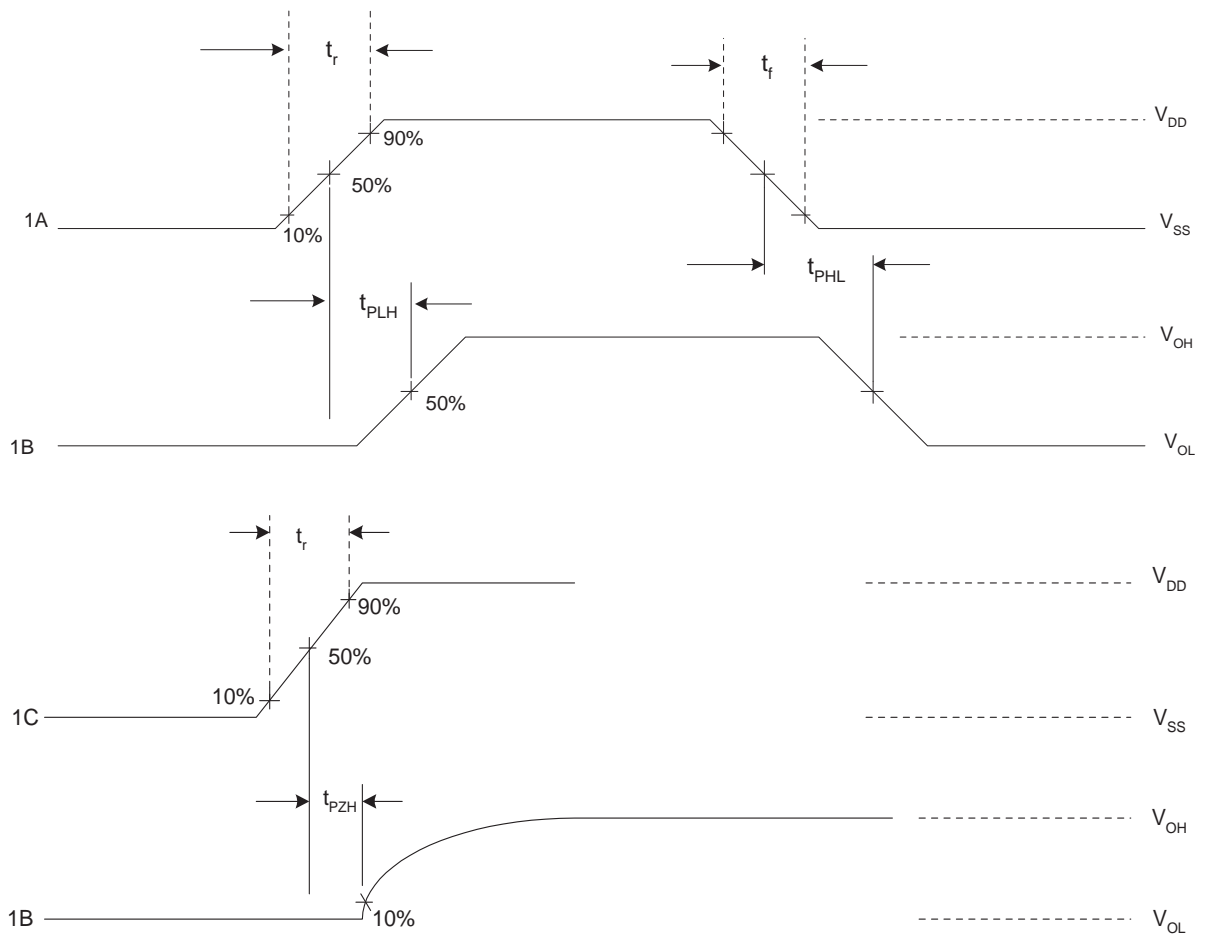
The pulse generator shall have the following characteristics:

$V_{GEN} = 0$ to V_{DD} ; $f = 500kHz$; t_r and $t_f \leq 15$ ns (10% to 90%); duty cycle = 50%. Output load capacitance $C_L = 50pF \pm 5\%$ including scope probe, wiring and stray capacitance without component in the test fixture. Channel bias resistance $R_L =$ as specified.

Propagation delay times shall be measured as follows:



VOLTAGE WAVEFORMS



**TABLE 2 - ELECTRICAL MEASUREMENTS AT ROOM TEMPERATURE - a.c. PARAMETERS**

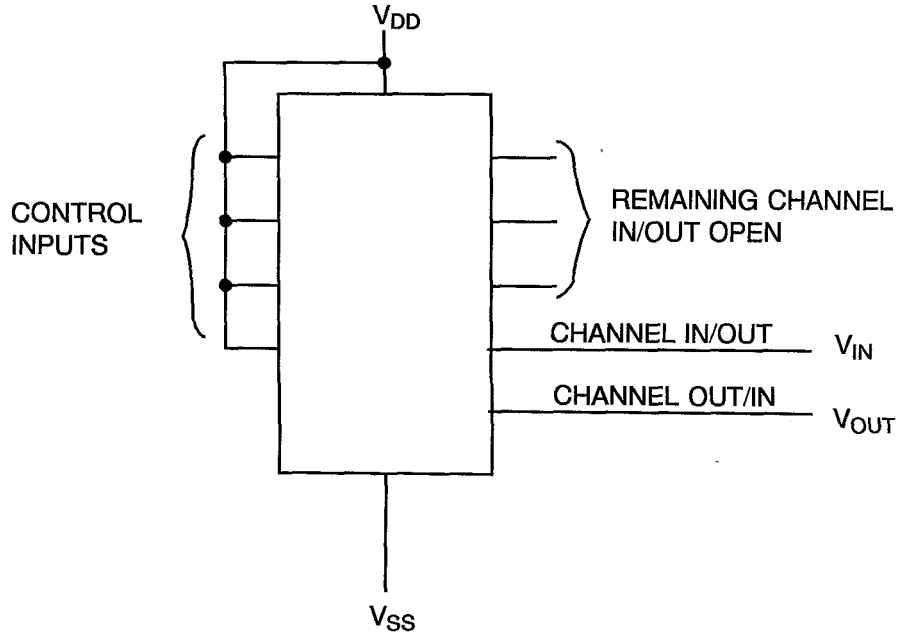
NO.	CHARACTERISTICS	SYMBOL	TEST METHOD MIL-STD 883	TEST FIG.	TEST CONDITIONS (PINS UNDER TEST D/F = DIP AND FP C = CCP)	LIMITS		UNIT
						MIN	MAX	
104 to 107	Input Capacitance (Control)	C_{IN}	3012	4(m)	V_{IN} (Not Under Test) = 0Vdc $V_{DD} = V_{SS} = 0Vdc$ Note 5 (Pins D/F 5-6-12-13) (Pins C 7-9-17-19)	-	7.5	pF
108 to 111	Channel Capacitance (Input)	C_{INC}	3012	4(n)	$V_{DD} = V_{SS} = 0Vdc$ Note 5 (Pins D/F 1-4-8-11) (Pins C 2-6-12-16)	-	15	pF
112 to 115	Channel Capacitance (Output)	C_{OC}	3012	4(o)	$V_{DD} = V_{SS} = 0Vdc$ Note 5 (Pins D/F 2-3-9-10) (Pins C 4-5-14-15)	-	15	pF
116	Propagation Delay Signal IN to Signal OUT (Channel turned ON)	t_{PLH1}	3003	4(p)	V_{IN} (Under Test) = Pulse Generator $V_{DD} = 5Vdc, V_{SS} = 0Vdc$ Note 6 <u>Pins D/F</u> <u>Pins C</u> 1 to 2 2 to 4	-	40	ns
117	Propagation Delay Signal IN to Signal OUT (Channel turned ON)	t_{PHL}	3003	4(p)	V_{IN} (Under Test) = Pulse Generator $V_{DD} = 5Vdc, V_{SS} = 0Vdc$ Note 6 <u>Pins D/F</u> <u>Pins C</u> 1 to 2 2 to 4	-	40	ns
118	Propagation Delay Time Control to Switch On	t_{PLH2}	3003	4(q)	V_{IN} (Under Test) = Pulse Generator $V_{DD} = 5Vdc, V_{SS} = 0Vdc$ Note 6 <u>Pins D/F</u> <u>Pins C</u> 13 to 2 19 to 4	-	70	ns

NOTES: See Page 23.

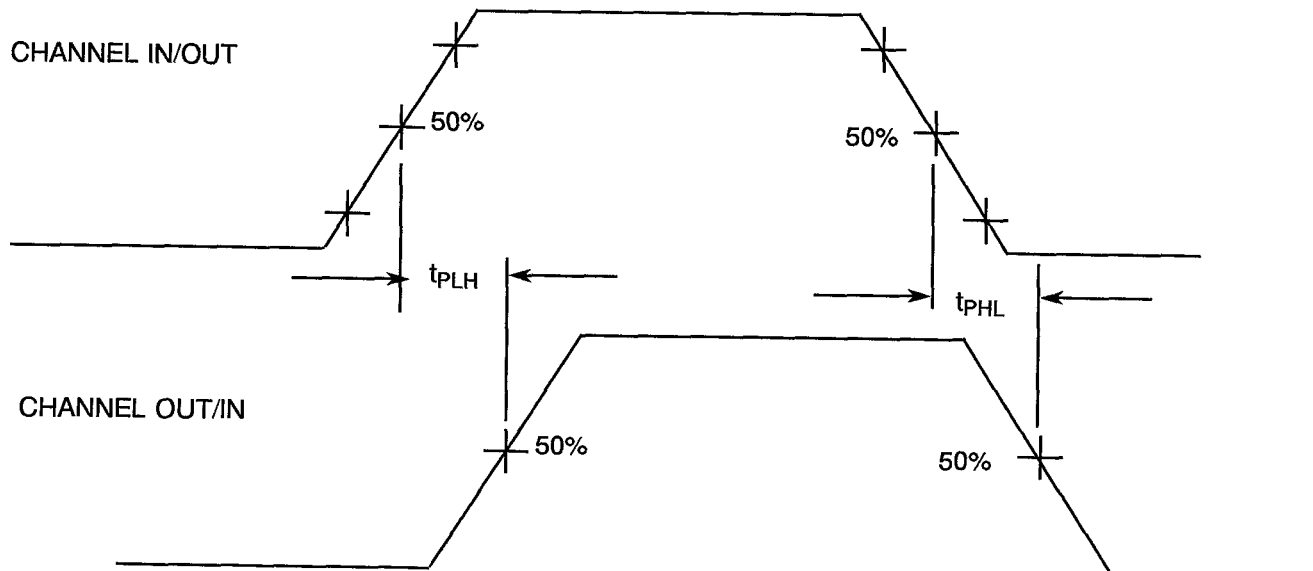


FIGURE 4 - CIRCUITS FOR ELECTRICAL MEASUREMENTS (CONTINUED)

FIGURE 4(p) - PROPAGATION DELAY SIGNAL IN TO SIGNAL OUT



VOLTAGE WAVEFORMS



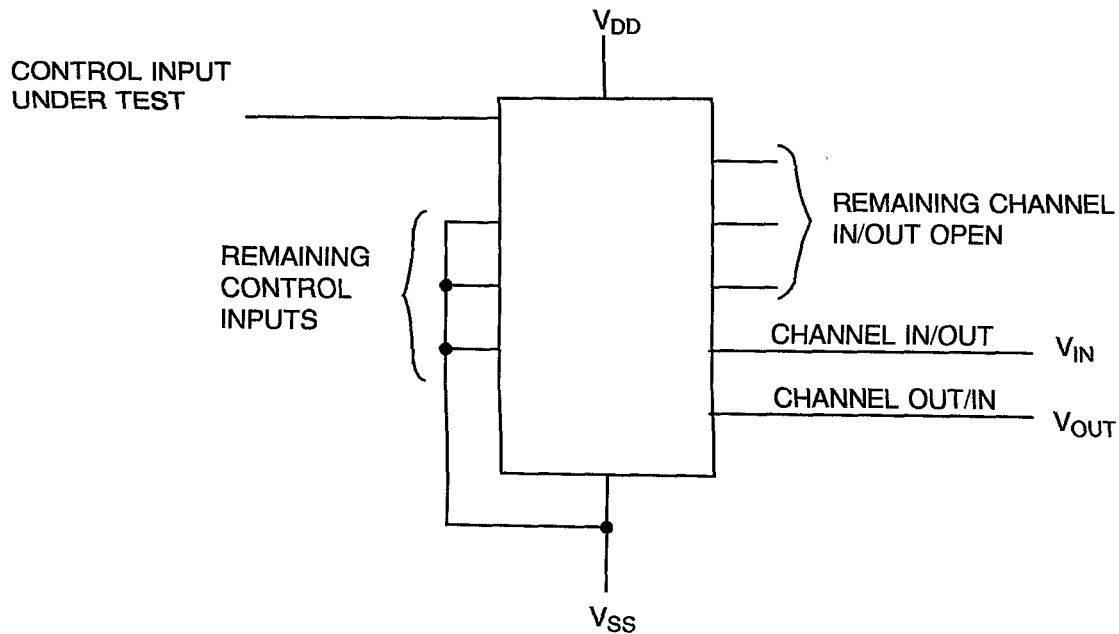
NOTES

- 1. Pulse Generator - $V_P = 0$ to V_{DD} , t_r and $t_f \leq 15ns$, $f = 500kHz$.

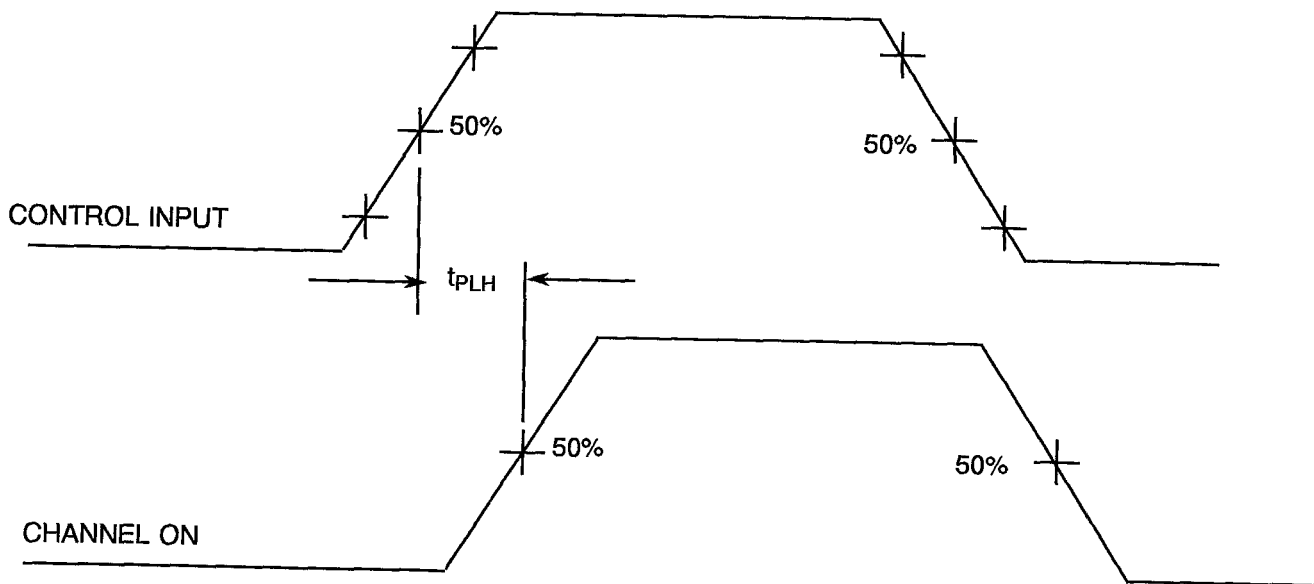


FIGURE 4 - CIRCUITS FOR ELECTRICAL MEASUREMENTS (CONTINUED)

FIGURE 4(q) - PROPAGATION DELAY, CONTROL TO SWITCH ON



VOLTAGE WAVEFORMS



NOTES

- 1. Pulse Generator - $V_P = 0$ to V_{DD} , t_r and $t_f \leq 15$ ns, $f = 500$ kHz.