DOCUMENT CHANGE REQUEST

DCR number 120	Changes required for: N/A	Originator: S Thacker
Date: 2004/06/04	Date sent: 2004/06/04	Organisation: ESA/ESTEC
Status: IMPLEMENTED		

Title:	CMOS Analogue Multiplexer/Demultiplexer, based on type 4052B		
Number:	9202/048	Issue:	1

Other documents affected:

Page:

1) Maximum Ratings Table - Table 1(b) page 6

2) Electrical test table - Table 2 page 23 & Test Circuits Fig 4(h) page 39 (also Table 3(a)&(b)) - parameter: Input Voltage tests VIL1, VIL2, VIH1, VIH2.

3) Electrical Test table Table 2 page 24 & 25 & Test

Paragraph:

1) Maximum Ratings Table - Table 1(b) page 6

2) Electrical test table - Table 2 page 23 & Test Circuits Fig 4(h) page 39 (also Table 3(a)&(b)) - parameter: Input Voltage tests VIL1, VIL2, VIH1, VIH2.

3) Electrical Test table Table 2 page 24 & 25 & Test

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 :

1) Maximum Ratings Table (Table1(b)(para 1.5))
Changes to take into account VEE as well as VDD - see attached sheets for current and new table.

Addition of application note as follows:
"Note 3. To avoid draining VDD supply current into the ON Channel when current flows from CH to COM the voltage drop across the ON Channel shall not exceed 0.4V."

2) Electrical test table (Table 2 note 5/Fig 4(h)(para 2.3.1/2.3.3 note 5)) - parameter: Input Voltage tests VIL & VIH.
Addition & clarification of the functional test condition to check for OFF channel current: IOFF<2uA.
- see attached sheets for current and new table & note.
(same change applies to Table 3(a)&(b)(para 2.3.2))

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3) Electrical Test table & circuit (Table 2/Fig 4(p) (para 2.3.1/2.3.3 note 8)) - parameters: Propagation times.
Test conditions for channel inputs for tPLH2(=tPZH1), tPLH3(=tPZH2),tPHL2 (=tPHZ1),tPHL3(=tPHZ2) have been amended/clarifed for correct switching. The switching waveforms have also been corrected for in Fig 4(p)(para 2.3.3 note 8).
- see attached sheets for current and new table & fig/note.

Justification:

1), 2), 3) - The current specification is incomplete, unclear or incorrect for these requirements.

Note : Manufacturer ST has agreed these changes

Attachments:

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Modifications:

N/A

Approval signature:



Date signed:

2004-06-04

TABLE 1(a) - TYPE VARIANTS

VARIANT	CASE	FIGURE	LEAD MATERIAL AND/OR FINISH
01	FLAT	2(a)	G2 or G8
02	FLAT	2(a)	G4
03	D.I.L.	2(b)	G2 or G8
04	D.I.L.	2(b)	G4
07	CHIP CARRIER	2(c)	2
08	D.I.L.	2(d)	G2
09	D.I.L.	2(d)	G4
10	SO CERAMIC	2(e)	G2
11	SO CERAMIC	2(e)	G4

TABLE 1(b) - MAXIMUM RATINGS

NO.	CHARACTERISTICS	SYMBOL	MAXIMUM RATINGS	UNITS	REMARKS
1	Supply Voltage	V_{DD}	-0.5 to +18	V	Note 1
2	Input Voltage	V_{IN}	-0.5 to V_{DD} + 0.5	V	Note 2 Power on
3	D.C. Input Current	$\pm I_{IN}$	10	mA	-
4	D.C. Output Current	$\pm I_O$	10	mA	Note 3
5	Device Dissipation	P_D	200	mWdc	Per Package
6	Output Dissipation	P_{DSO}	100	mWdc	Note 4
7	Operating Temperature Range	T_{op}	-55 to +125	°C	-
8	Storage Temperature Range	T_{stg}	-65 to +150	°C	-
9	Soldering Temperature For FP and DIP For CCP	T_{sol}	 +300 +245	°C	 Note 5 Note 6

NOTES

1. Device is functional from +3V to +15V with reference to V_{SS}.
2. V_{DD} +0.5V should not exceed +18V.
3. The maximum output current of any single output.
4. The maximum power dissipation of any single output.
5. Duration 10 seconds maximum at a distance of not less than 1.5mm from the device body and the same lead shall not be resoldered until 3 minutes have elapsed.
6. Duration 30 seconds maximum and the same terminal shall not be resoldered until 3 minutes have elapsed.

TABLE 2 - ELECTRICAL MEASUREMENTS AT ROOM TEMPERATURE - d.c. PARAMETERS (CONT'D)

NO.	CHARACTERISTICS	SYMBOL	TEST METHOD MIL-STD 883	TEST FIG.	TEST CONDITIONS (PINS UNDER TEST D/F = DIP AND FP C = CCP)	LIMITS MIN	LIMITS MAX	UNIT
274	Input Voltage Low Level (Noise Immunity) (Functional Test)	V_{IL1}	-	4(h)	Address and Inhibit Inputs: V_{IL} = 1.5Vdc, V_{IH} = 3.5Vdc Channel Input: V_{IL} = 0Vdc, V_{IH} = 5Vdc V_{DD} = 5Vdc, V_{SS} = V_{EE} = 0Vdc Note 5 (Pins D/F 1-2-4-5-11-12-14-15) (Pins C 1-2-5-6-14-15-17-19)	-	0.5	V
	Input Voltage High Level (Noise Immunity) (Functional Test)	V_{IH1}				4.5	-	
275	Input Voltage Low Level (Noise Immunity) (Functional Test)	V_{IL2}	-	4(h)	Address and Inhibit Inputs: V_{IL} = 4Vdc, V_{IH} = 11Vdc Channel Input: V_{IL} = 0Vdc, V_{IH} = 15Vdc V_{DD} = 15Vdc, V_{SS} = V_{EE} = 0Vdc Note 5 (Pins D/F 1-2-4-5-11-12-14-15) (Pins C 1-2-5-6-14-15-17-19)	-	1.5	V
	Input Voltage High Level (Noise Immunity) (Functional Test)	V_{IH2}				13.5	-	
276	Threshold Voltage N-Channel	V_{THN}	-	4(i)	Inhibit and V_{EE} at Ground. All Other Inputs: V_{IN} = 5Vdc V_{DD} = 5Vdc, I_{SS} = -10µA (Pin D/F 8) (Pin C 10)	-0.7	-3.0	V
277	Threshold Voltage P-Channel	V_{THP}	-	4(j)	Inhibit at Ground. All Other Inputs: V_{IN} = -5Vdc V_{SS} = V_{EE} = -5Vdc, I_{DD} = 3.5µA (Pin D/F 16) (Pin C 20)	0.7	3.0	V
278 to 280	Input Clamp Voltage (to V_{SS})	V_{IC1}	-	4(k)	I_{IN} (Under Test) = -100µA V_{DD} = Open, V_{SS} = 0Vdc All Other Pins Open (Pins D/F 6-9-10) (Pins C 7-11-12)	-	-2.0	V
281 to 283	Input ClampVoltage (to V_{DD})	V_{IC2}	-	4(l)	V_{IN} (Under Test) = 6Vdc V_{SS} = Open, R = 30kΩ; (Pins D/F 6-9-10) (Pins C 7-11-12)	3.0	-	V

NOTES: See Page 25.

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	
284 to 286	Input Capacitance Address or Inhibit	C_{IN}	3012	4(m)	V_{IN} (Not Under Test) = 0Vdc V_{DD} = V_{SS} = V_{EE} = 0Vdc Note 6 (Pins D/F 6-9-10) (Pins C 7-11-12)	-	7.5	pF
287 to 294	Channel Capacitance (Input)	C_{INC}	3012	4(n)	V_{DD} = V_{SS} = V_{EE} = 0Vdc Note 6 (Pins D/F 1-2-4-5-11-12-14-15) (Pins C 1-2-5-6-14-15-17-19)	-	7.5	pF
295 to 296	Channel Capacitance (Output)	C_{OC}	3012	4(o)	V_{DD} = V_{SS} = V_{EE} = 0Vdc Note 6 (Pins D/F 3-13) (Pins C 4-16)	-	30	pF
297	Propagation Delay Channel Input to Channel Output	t_{PLH1}	3003	4(q)	V_{IN} (Under Test) = Pulse Generator V_{IL} = 0Vdc, V_{IH} = 5Vdc R_L = 200kΩ V_{DD} = 5Vdc, V_{SS} = V_{EE} = 0Vdc Note 7 Pins D/F: 13 to 12 Pins C: 16 to 15	-	40	ns
298	Propagation Delay Address to Signal OUT (Channel turning ON)	t_{PLH2}	3003	4(p)	V_{IN} (Under Test) = Pulse Generator V_{IL} = 0Vdc, V_{IH} = 5Vdc R_L = 10kΩ V_{DD} = 5Vdc, V_{SS} = V_{EE} = 0Vdc Note 7 Pins D/F: 10 to 3 Pins C: 12 to 4	-	720	ns
299	Propagation Delay Inhibit to Signal OUT (Channel turning ON)	t_{PLH3}	3003	4(p)	V_{IN} (Under Test) = Pulse Generator V_{IL} = 0Vdc, V_{IH} = 5Vdc R_L = 10kΩ V_{DD} = 5Vdc, V_{SS} = V_{EE} = 0Vdc Note 7 Pins D/F: 6 to 3 Pins C: 7 to 4	-	400	ns

NOTES: See Page 25.

TABLE 2 - ELECTRICAL MEASUREMENTS AT ROOM TEMPERATURE - a.c. PARAMETERS (CONT'D)

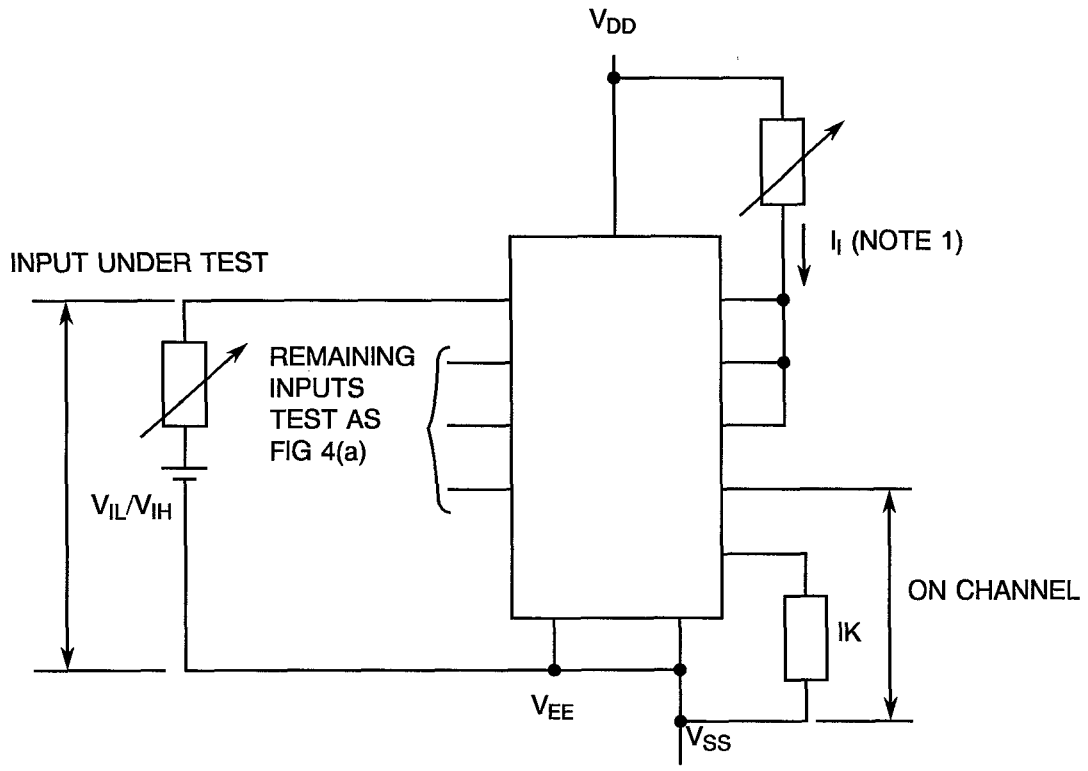
NO.	CHARACTERISTICS	SYMBOL	TEST METHOD MIL-STD 883	TEST FIG.	TEST CONDITIONS (PINS UNDER TEST D/F = DIP AND FP C = CCP)	LIMITS		UNIT
						MIN	MAX	
300	Propagation Delay Channel Input to Channel Output	t_{PHL1}	3003	4(q)	V_{IN} (Under Test) = Pulse Generator V_{IL} = 0Vdc, V_{IH} = 5Vdc R_L = 200kΩ V_{DD} = 5Vdc, V_{SS} = V_{EE} = 0Vdc Note 7 Pins D/F: 13 to 12 Pins C: 16 to 15	-	40	ns
301	Propagation Delay Address to Signal OUT (Channel turning OFF)	t_{PHL2}	3003	4(p)	V_{IN} (Under Test) = Pulse Generator V_{IL} = 0Vdc, V_{IH} = 5Vdc, R_L = 300Ω V_{DD} = 5Vdc, V_{SS} = V_{EE} = 0Vdc Note 7 Pins D/F: 10 to 3 Pins C: 12 to 4	-	720	ns
302	Propagation Delay Inhibit to Signal OUT (Channel turning OFF)	t_{PHL3}	3003	4(p)	V_{IN} (Under Test) = Pulse Generator V_{IL} = 0Vdc, V_{IH} = 5Vdc R_L = 300Ω V_{DD} = 5Vdc, V_{SS} = V_{EE} = 0Vdc Note 7 Pins D/F: 6 to 3 Pins C: 7 to 4	-	400	ns

NOTES

1. GO-NO-GO Test, each pattern of Test Table 4(a).
   $V_{OH} \geq V_{DD}$ - 0.5Vdc $V_{OL} \leq$ 0.5Vdc
2. Maximum time to output comparator strobe 300µsec.
3. Measure each value of I_{DD} for the input conditions given in Table 4(b).
4. For characterisation during qualification, the incremental method or the method shown in Figure 4(g)(ii), which incorporates a plotter, shall apply. For procurement, the Orderer may accept that the devices are tested go-no-go to the maximum limits of Table 2. In the case that go-no-go testing is performed, it is necessary that at least one discrete value shall be measured and recorded in order that drift values may be applied. Figure 4(g)(iii) shall be used for the discrete value measurement.
5. This is performed as a Functional Test in which extreme V_{IN} conditions are applied and channel selection is monitored.
6. Measurement performed on a sample basis, LTPD 7 or less, with a Capacitance Bridge connected between each input or output under test and V_{SS}, only for Lots where LAT Level 2 is to be performed. (For LTPD sampling plan, see Annexe I of ESA/SCC 9000).
7. Measurement performed on a sample basis LTPD 7, or less (see Annexe I of ESA/SCC 9000).

FIGURE 4 - CIRCUITS FOR ELECTRICAL MEASUREMENTS (CONTINUED)

FIGURE 4(h) - INPUT VOLTAGE HIGH AND LOW LEVEL

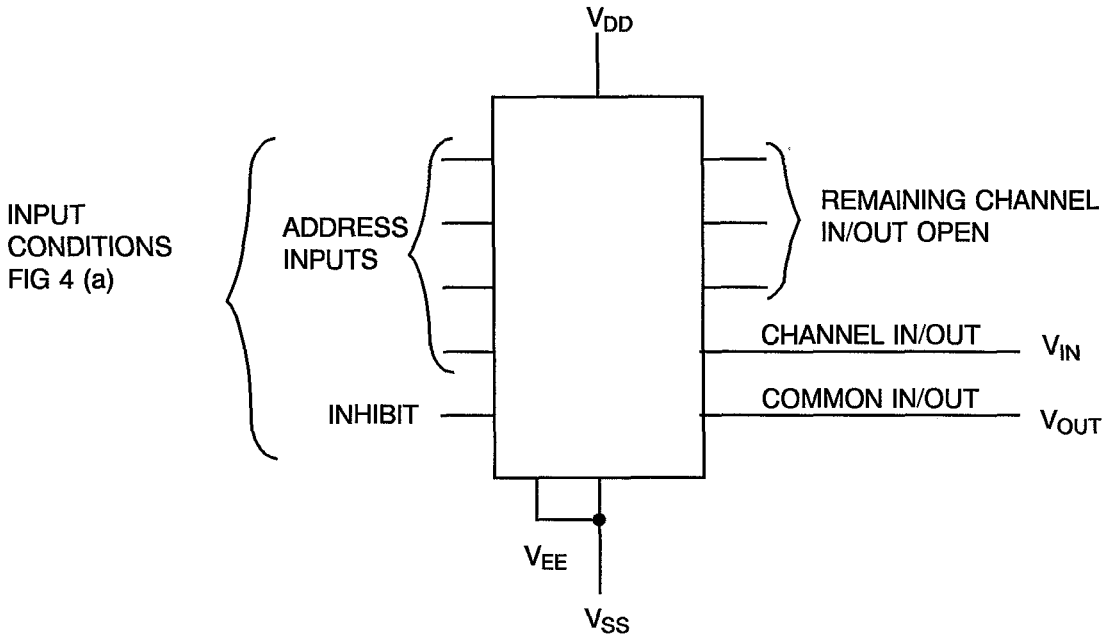


NOTES:

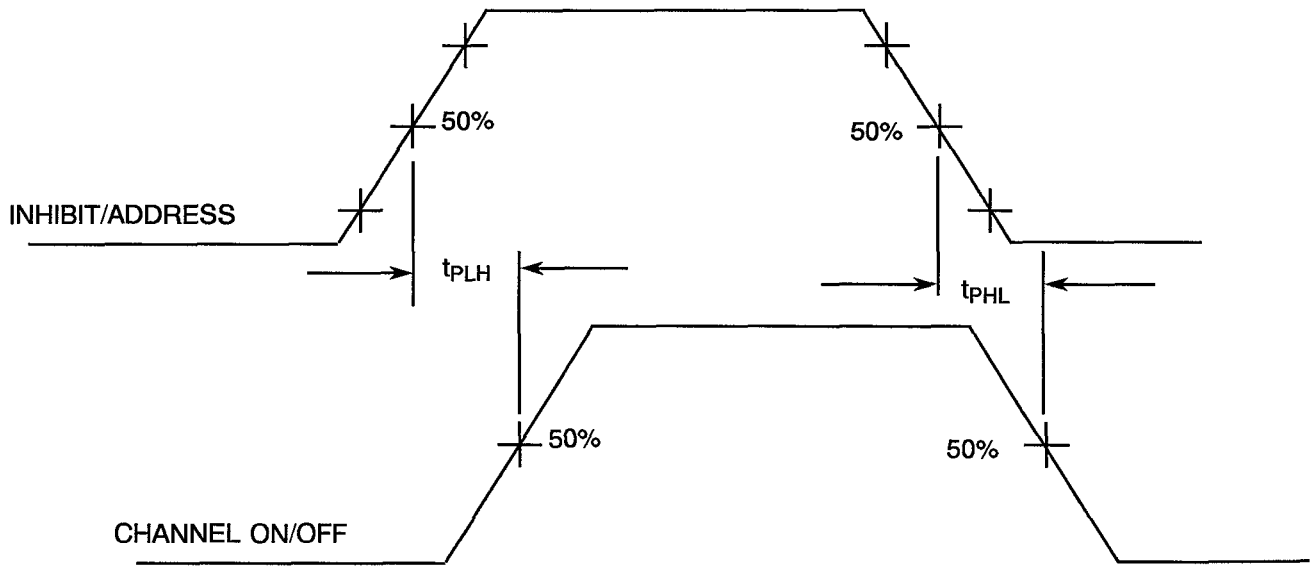
1. I_I < 2μA for all OFF Channels

FIGURE 4 - CIRCUITS FOR ELECTRICAL MEASUREMENTS (CONTINUED)

FIGURE 4(p) - PROPAGATION DELAY, INHIBIT OR ADDRESS INPUTS TO CHANNEL ON OR OFF



VOLTAGE WAVEFORMS



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

The terminal material and/or finish shall be in accordance with the requirements of ESCC Basic Specification No. 23500.

1.5 MAXIMUM RATINGS

The maximum ratings shall not be exceeded at any time during use or storage.

Maximum ratings shall only be exceeded during testing to the extent specified in this specification and when stipulated in Test Methods and Procedures of the ESCC Generic Specification.

Characteristics	Symbols	Maximum Ratings	Units	Remarks
Supply Voltage	V_{DD}	-0.5 to 18	V	Note 1
Supply Voltage Range	V_{DD}-V_{EE}	-0.5 to 18	V	Note 2
Control Input Voltage	V_{IN}	-0.5 to V_{DD} +0.5	V	Note 1 Power on
Channel Input/Output Voltage	V_{IN}	V_{EE} -0.5 to V_{DD} +0.5	V	Note 1, 3
Control Input Current	I_{IN}	±10	mA	-
Device Power Dissipation (Continuous)	P_D	200	mW	-
Power Dissipation per Single Output	P_{DSO}	100	mW	-
Operating Temperature Range	T_{op}	-55 to +125	^oC	T_{amb}
Storage Temperature Range	T_{stg}	-65 to +150	^oC	-
Soldering Temperature For FP, DIP and SO For CCP	T_{sol}	 +265 +245	^oC	 Note 4 Note 5

NOTES:

1. Device is functional for $3V \leq V_{DD} \leq 15V$ with reference to V_{SS}.
2. Device is functional for $3V \leq V_{DD}\text{-}V_{EE} \leq 15V$.
3. To avoid draining V_{DD} supply current into the ON Channel when current flows from CH to COM the voltage drop across the ON Channel shall not exceed 0.4V.
4. Duration 10 seconds maximum at a distance of not less than 1.5mm from the device body and the same terminal shall not be resoldered until 3 minutes have elapsed.
5. Duration 5 seconds maximum and the same terminal shall not be resoldered until 3 minutes have elapsed.

1.6 HANDLING PRECAUTIONS

These devices are susceptible to damage by electrostatic discharge. Therefore, suitable precautions shall be employed for protection during all phases of manufacture, testing, packaging, shipment and any handling.

These components are categorised as Class 1 per ESCC Basic Specification No. 23800 with a minimum Critical Path Failure Voltage of 400 Volts.

Characteristics	Symbols	MIL-STD-883 Test Method	Test Conditions Note 1	Limits		Units
				Min	Max	
Channel OFF Leakage Current 1, Any Channel CH	I_{OFF1}	-	Channel Under Test V_{IN} (CH)=15V V_{IN} (COM)=0V All other Channels Open V_{DD}=15V, V_{SS}=V_{EE}= 0V	-	-100	nA
Channel OFF Leakage Current 2, Any Channel CH	I_{OFF2}	-	Channel Under Test V_{IN} (CH)=0V V_{IN} (COM)=15V All other Channels Open V_{DD}=15V, V_{SS}=V_{EE}= 0V	-	100	nA
Channel OFF Leakage Current 3, All Channels Tested Together	I_{OFF3}	-	V_{IN} (CH)=0V V_{IN} (COM)=15V V_{DD}=15V, V_{SS}=V_{EE}= 0V	-	100	nA
Channel OFF Leakage Current 4, All Channels Tested Together	I_{OFF4}	-	V_{IN} (CH)=15V V_{IN} (COM)=0V V_{DD}=15V, V_{SS}=V_{EE}= 0V	-	-100	nA
Channel ON Resistance 1	R_{ON1}	-	V_{IL}=0V, V_{IH}=5V R_L=10kΩ V_{DD}=5V,V_{SS}=V_{EE}= 0V Note 4	-	1050	Ω
Channel ON Resistance 2	R_{ON2}	-	V_{IL}=0V, V_{IH}=15V R_L=10kΩ V_{DD}=15V, V_{SS}=V_{EE}= 0V Note 4	-	280	Ω
Low Level Input Voltage 1 (Noise Immunity) (Functional Test)	V_{IL1}	-	Verify Truth Table V_{DD}=5V, V_{SS}=V_{EE}=0V Note 5	-	1.5	V
Low Level Input Voltage 2 (Noise Immunity) (Functional Test)	V_{IL2}	-	Verify Truth Table V_{DD}=15V, V_{SS}=V_{EE}= 0V Note 5	-	4	V
High Level Input Voltage 1 (Noise Immunity) (Functional Test)	V_{IH1}	-	Verify Truth Table V_{DD}=5V, V_{SS}=V_{EE}=0V Note 5	3.5	-	V

Characteristics	Symbols	MIL-STD-883 Test Method	Test Conditions Note 1	Limits		Units
				Min	Max	
High Level Input Voltage 2 (Noise Immunity) (Functional Test)	V_{IH2}	-	Verify Truth Table V_{DD}=15V, V_{SS}=V_{EE}= 0V Note 5	11	-	V
Threshold Voltage N-Channel	V_{THN}	-	INH Input and V_{EE} at Ground All Other Inputs: V_{IN}=5V V_{DD}=5V, I_{SS}=-10µA	-0.7	-3	V
Threshold Voltage P-Channel	V_{THP}	-	INH Input at Ground All Other Inputs: V_{IN}=-5V V_{SS}=V_{EE}=-5V, I_{DD}=3.5µA	0.7	3	V
Input Clamp Voltage 1, to V_{SS}, Control Inputs	V_{IC1}	-	I_{IN} (Under Test)= -100µA V_{DD}=Open, V_{SS}=0V All Other Pins Open	-	-2	V
Input Clamp Voltage 2, to V_{DD}, Control Inputs	V_{IC2}	-	V_{IN} (Under Test)=6V R=30kΩ, V_{SS}=Open All Other Pins Open Note 6	3	-	V
Input Capacitance, Control Inputs	C_{IN}	3012	V_{IN} (Not Under Test)=0V V_{DD}= V_{SS}=V_{EE}=0V f = 100 kHz to 1 MHz Note 7	-	7.5	pF
Channel Capacitance, CH	C_{CH}	3012	V_{IN} (Not Under Test)=0V V_{DD}= V_{SS}=V_{EE}=0V f = 100 kHz to 1 MHz Note 7	-	7.5	pF
Channel Capacitance, XCOM, YCOM	C_{COM}	3012	V_{IN} (Not Under Test)=0V V_{DD}= V_{SS}=V_{EE}=0V f = 100 kHz to 1 MHz Note 7	-	30	pF
Propagation Delay Low to High 1, XCOM to XCH0	t_{PLH1}	3003	V_{IN}(COM)=Pulse Generator V_{IN} (Remaining Inputs)=Truth Table V_{IL}=0V, V_{IH}=5V, R_L=200kΩ V_{DD}=5V, V_{SS}=V_{EE}=0V Note 8	-	40	ns

Characteristics	Symbols	MIL-STD-883 Test Method	Test Conditions Note 1	Limits		Units
				Min	Max	
Propagation Delay High to Low 1, XCOM to CH0	t_{PHL1}	3003	V_{IN}(COM)=Pulse Generator V_{IN} (Remaining Inputs)=Truth Table V_{IL}=0V, V_{IH}=5V, R_L=200kΩ V_{DD}=5V, V_{SS}=V_{EE}=0V Note 8	-	40	ns
Propagation Delay Low to High 2, A to YCOM (Channels ON)	t_{PLH2}	3003	V_{IN}(A)=Pulse Generator V_{IN} (Remaining Inputs)=Truth Table V_{IL}=0V, V_{IH}=5V, V_{IN}(CH)=0V and 5V R_L=10kΩ V_{DD}=5V, V_{SS}=V_{EE}=0V Note 8	-	720	ns
Propagation Delay High to Low 2, A to YCOM (Channels ON)	t_{PHL2}	3003	V_{IN}(A)=Pulse Generator V_{IN} (Remaining Inputs)=Truth Table V_{IL}=0V, V_{IH}=5V, V_{IN}(CH)=0V and 5V R_L=10kΩ V_{DD}=5V, V_{SS}=V_{EE}=0V Note 8	-	720	ns
Output Enable Time High Impedance to High Output, INH to YCOM	t_{PZH}	3003	V_{IN}(INH)=Pulse Generator V_{IN} (Remaining Inputs)=Truth Table V_{IL}=0V, V_{IH}=5V, V_{IN}(CH)=5V, R_L=10kΩ V_{DD}=5V, V_{SS}=V_{EE}=0V Note 8	-	400	ns
Output Disable Time High Output to High Impedance, INH to YCOM	t_{PHZ}	3003	V_{IN}(INH)=Pulse Generator V_{IN} (Remaining Inputs)=Truth Table V_{IL}=0V, V_{IH}=5V, V_{IN}(CH)=5V, R_L=300Ω V_{DD}=5V, V_{SS}=V_{EE}=0V Note 8	-	400	ns

2.3.2 High and Low Temperatures Electrical Measurements

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

Characteristics	Symbols	MIL-STD-883 Test Method	Test Conditions Note 1	Limits		Units
				Min	Max	
Threshold Voltage P-Channel	V_{THP}	-	INH Input at Ground All Other Inputs: V_{IN}=-5V V_{SS}=V_{EE}=-5V, I_{DD}=3.5µA T_{amb}=+125°C T_{amb}=- 55°C	 0.3 0.7	 3.5 3.5	V

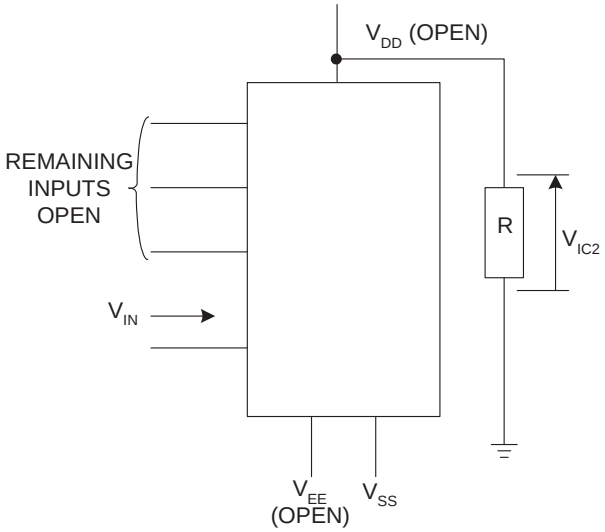
2.3.3 Notes to Electrical Measurement Tables

1. Unless otherwise specified all inputs and channels shall be tested for each characteristic, inputs not under test shall be V_{IN} = V_{SS} or V_{DD} and channels not under test shall be open.
2. Functional tests shall be performed to verify Truth Table. The Maximum time to output comparator strobe = 300µs.
3. Quiescent Current shall be tested using the following input conditions where 1 = V_{IH} and 0 =V_{IL}:

TEST	INPUT CONDITIONS												
	INH	A	B	XCOM	XCH0	XCH1	XCH2	XCH3	YCOM	YCH0	YCH1	YCH2	YCH3
(a)	0	0	0	1	1	1	1	1	1	1	1	1	1
(b)	0	1	0	1	1	1	1	1	1	1	1	1	1
(c)	0	0	1	0	0	0	0	0	0	0	0	0	0
(d)	0	1	1	0	0	0	0	0	0	0	0	0	0
(e)	1	0	0	1	1	1	1	1	1	1	1	1	1

4. Channel ON Resistance shall be tested for each channel in both directions using the following input conditions:
   (a) INH = V_{IL}
   (b) A, B = V_{IL} or V_{IH} per Truth Table to select channel under test.
   (c) I_{IN} (CH or COM) = 100µA.
   (d) R_{ON1} shall be tested with V_{IN} (CH or COM)= 1.5V, 1.9V, 2.3V, 2.7V, 3.3V, 3.7V, 4.1V.
   R_{ON2} shall be tested with V_{IN} (CH or COM)= 1.5V, 1.9V, 2.3V, 2.7V, 13.3V, 13.7V, 14.1V, 14.5V.
   Channel ON Resistance shall be recorded for Channel Y0 (YCH0 to YCOM, YCOM to YCH0) at each specified $V_{IN.}$ Other channels may be tested go-no-go.

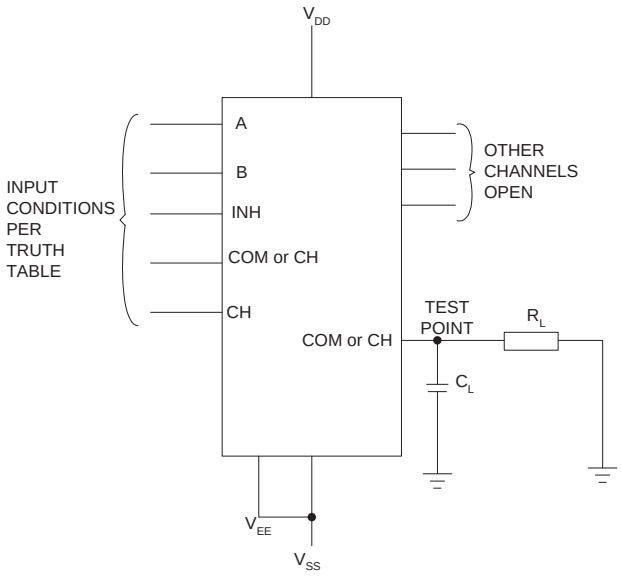
5. Performed as a functional test to verify for all OFF channels I_{OFF}<2µA with V_{IN} (CH)=V_{DD} through 1kΩ, COM output load resistance R_L=1kΩ.
6. Input Clamp Voltage 2 to V_{DD}, V_{IC2}, shall be tested on each input as follows:-

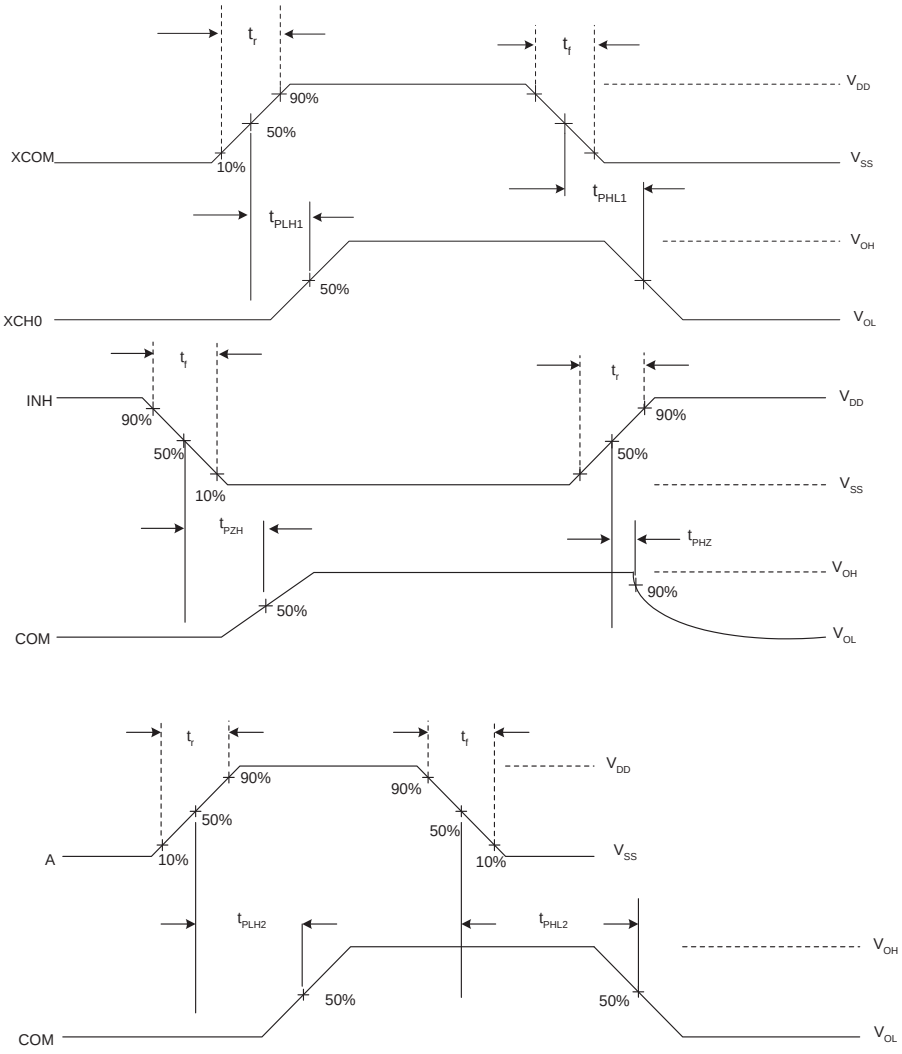


7. Guaranteed but not tested.
8. Read and record measurements shall be performed on a sample of 32 components with 0 failures permitted.
   The pulse generator shall have the following characteristics:

   V_{GEN} = 0 to V_{DD}; f = 500kHz; tr and t_f ≤15 ns (10% to 90%); duty cycle = 50%. Output load capacitance C_L = 50pF ±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:





2.4 PARAMETER DRIFT VALUES

Unless otherwise specified, the measurements shall be performed at T_{amb}=+22 ±3°C.

The test methods and test conditions shall be as per the corresponding test defined in Room Temperature Electrical Measurements.

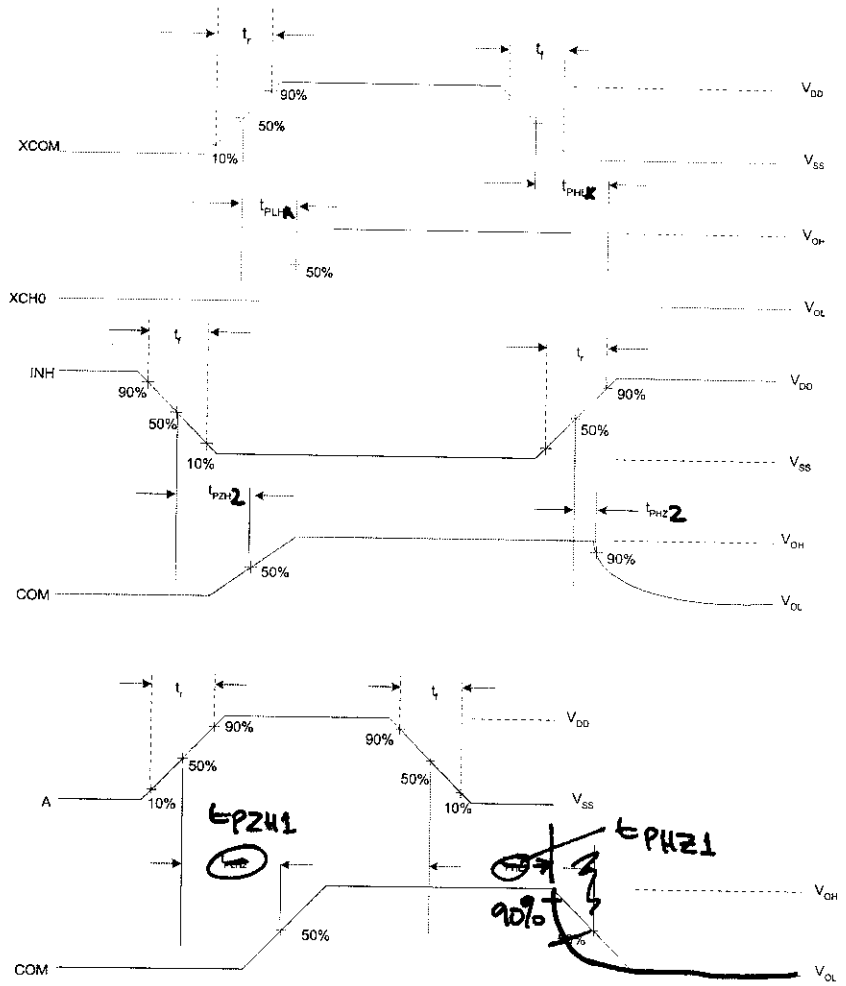
The drift values (Δ) shall not be exceeded for each characteristic specified. The corresponding absolute limit values for each characteristic shall not be exceeded.

Characteristics	Symbols	MIL-STD-883 Test Method	Test Conditions Note 1	Limits		Units
				Min	Max	
High Level Input Voltage 2 (Noise Immunity) (Functional Test)	V_{IH2}	-	Verify Truth Table V_{DD}=15V, V_{SS}=V_{EE}= 0V Note 5	11	-	V
Threshold Voltage N-Channel	V_{THN}	-	INH Input and V_{EE} at Ground All Other Inputs: V_{IN}=5V V_{DD}=5V, I_{SS}=-10µA	-0.7	-3	V
Threshold Voltage P-Channel	V_{THP}	-	INH Input at Ground All Other Inputs: V_{IN}=-5V V_{SS}=V_{EE}=-5V, I_{DD}=3.5µA	0.7	3	V
Input Clamp Voltage 1, to V_{SS}, Control Inputs	V_{IC1}	-	I_{IN} (Under Test)= -100µA V_{DD}=Open, V_{SS}=0V All Other Pins Open	-	-2	V
Input Clamp Voltage 2, to V_{DD}, Control Inputs	V_{IC2}	-	V_{IN} (Under Test)=6V R=30kΩ, V_{SS}=Open All Other Pins Open Note 6	3	-	V
Input Capacitance, Control Inputs	C_{IN}	3012	V_{IN} (Not Under Test)=0V V_{DD}= V_{SS}=V_{EE}=0V f = 100 kHz to 1 MHz Note 7	-	7.5	pF
Channel Capacitance, CH	C_{CH}	3012	V_{IN} (Not Under Test)=0V V_{DD}= V_{SS}=V_{EE}=0V f = 100 kHz to 1 MHz Note 7	-	7.5	pF
Channel Capacitance, XCOM, YCOM	C_{COM}	3012	V_{IN} (Not Under Test)=0V V_{DD}= V_{SS}=V_{EE}=0V f = 100 kHz to 1 MHz Note 7	-	30	pF
Propagation Delay Low to High X, XCOM to XCH0	t_{PLHX}	3003	V_{IN}(COM)=Pulse Generator V_{IN} (Remaining Inputs)=Truth Table V_{IL}=0V, V_{IH}=5V, R_L=200kΩ V_{DD}=5V, V_{SS}=V_{EE}=0V Note 8	-	40	ns

Characteristics	Symbols	MIL-STD-883 Test Method	Test Conditions Note 1	Limits Min	Limits Max	Units
Propagation Delay High to Low X XCOM to CH0	t_{PHL}X	3003	V_{IN}(COM)=Pulse Generator V_{IN} (Remaining Inputs)=Truth Table V_{IL}=0V, V_{IH}=5V, R_L=200kΩ V_{DD}=5V, V_{SS}=V_{EE}=0V Note 8	-	40	ns
~~Propagation Delay Low to High 2~~, A to YCOM ~~(Channels ON)~~ Output Enable Time High Impedance to High Output 1, A to YCOM	~~t_{PLH2}~~ t_{PZH1}	3003	V_{IN}(A)=Pulse Generator V_{IN} (Remaining Inputs)=Truth Table V_{IL}=0V, V_{IH}=5V, V_{IN}(CH)=~~0V and~~ 5V and Open R_L=10kΩ V_{DD}=5V, V_{SS}=V_{EE}=0V Note 8	-	720	ns
~~Propagation Delay High to Low 2~~, A to YCOM ~~(Channels ON)~~ Output Disable Time High Output to High Impedance 1, A to YCOM	~~t_{PHL2}~~ t_{PHZ1}	3003	V_{IN}(A)=Pulse Generator V_{IN} (Remaining Inputs)=Truth Table V_{IL}=0V, V_{IH}=5V, V_{IN}(CH)=~~0V and~~ 5V and Open R_L=~~10kΩ~~ 300Ω V_{DD}=5V, V_{SS}=V_{EE}=0V Note 8	-	720	ns
Output Enable Time High Impedance to High Output 2, INH to YCOM	t_{PZH}2	3003	V_{IN}(INH)=Pulse Generator V_{IN} (Remaining Inputs)=Truth Table V_{IL}=0V, V_{IH}=5V, V_{IN}(CH)=5V, R_L=10kΩ V_{DD}=5V, V_{SS}=V_{EE}=0V Note 8	-	400	ns
Output Disable Time High Output to High Impedance 2, INH to YCOM	t_{PHZ}2	3003	V_{IN}(INH)=Pulse Generator V_{IN} (Remaining Inputs)=Truth Table V_{IL}=0V, V_{IH}=5V, V_{IN}(CH)=5V, R_L=300Ω V_{DD}=5V, V_{SS}=V_{EE}=0V Note 8	-	400	ns

2.3.2 High and Low Temperatures Electrical Measurements

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



2.4 PARAMETER DRIFT VALUES

Unless otherwise specified, the measurements shall be performed at T_{amb}=+22 ±3°C.

The test methods and test conditions shall be as per the corresponding test defined in Room Temperature Electrical Measurements.

The drift values (Δ) shall not be exceeded for each characteristic specified. The corresponding absolute limit values for each characteristic shall not be exceeded.