



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		UNIT
						MIN	MAX	
543	Input Voltage Low Level (Noise Immunity) (Functional Test)	V_{IL1}	-	4 (h)	Address and Inhibit Inputs: $V_{IL} = 1.5V_{dc}$, $V_{IH} = 3.5V_{dc}$ Channel Inputs: $V_{IL} = 0V_{dc}$, $V_{IH} = 5V_{dc}$ $V_{DD} = 5V_{dc}$, $V_{SS} = 0V_{dc}$ Note 5 (Pins D/F 2-3-4-5-6-7-8-9- 16-17-18-19-20-21-22-23) (Pins C 2-3-5-6-7-8-9-10- 19-21-22-23-24-26-27)	-	0.5	V
	Input Voltage High Level (Noise Immunity) (Functional Test)	V_{IH1}				4.5	-	
544	Input Voltage Low Level (Noise Immunity) (Functional Test)	V_{IL2}	-	4 (h)	Address and Inhibit Inputs: $V_{IL} = 4V_{dc}$, $V_{IH} = 11V_{dc}$ Channel Inputs: $V_{IL} = 0V_{dc}$, $V_{IH} = 15V_{dc}$ $V_{DD} = 15V_{dc}$, $V_{SS} = 0V_{dc}$ Note 5 (Pins D/F 2-3-4-5-6-7-8-9- 16-17-18-19-20-21-22-23) (Pins C 2-3-5-6-7-8-9-10- 19-21-22-23-24-26-27)	-	1.5	V
	Input Voltage High Level (Noise Immunity) (Functional Test)	V_{IH2}				13.5	-	
545	Threshold Voltage N-Channel	V_{THN}	-	4 (i)	Inhibit Input at Ground. All Other Inputs: $V_{IN} = 5V_{dc}$ $V_{DD} = 5V_{dc}$, $I_{SS} = -10\mu A$ (Pin D/F 12) (Pin C 14)	-0.7	-3.0	V
546	Threshold Voltage P-Channel	V_{THP}	-	4 (j)	Inhibit Input at Ground. All Other Inputs: $V_{IN} = -5V_{dc}$ $V_{SS} = -5V_{dc}$, $I_{DD} = 10\mu A$ (Pin D/F 24) (Pin C 28)	0.7	3.0	V
547 to 551	Input Clamp Voltage (to V_{SS})	V_{IC1}	-	4 (k)	I_{IN} (Under Test) = $-100\mu A$ $V_{DD} = \text{Open}$, $V_{SS} = 0V_{dc}$ All Other Pins Open (Pins D/F 10-11-13-14-15) (Pins C 12-13-15-16-17)	-	-2.0	V
552 to 556	Input Clamp Voltage (to V_{DD})	V_{IC2}	-	4 (l)	V_{IN} (Under Test) = $6V_{dc}$ $V_{SS} = \text{Open}$, $R = 30k\Omega$ (Pins D/F 10-11-13-14-15) (Pins C 12-13-15-16-17)	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	
557 to 561	Input Capacitance Address or Inhibit	C _{IN}	3012	4 (m)	V _{IN} (Not under Test) = 0Vdc V _{DD} = V _{SS} = 0Vdc Note 6 (Pins D/F 10-11-13-14-15) (Pins C 12-13-15-16-17)	-	7.5	pF
562 to 577	Channel Capacitance (Input)	C _{INC}	3012	4 (n)	V _{DD} = V _{SS} = 0Vdc Note 6 (Pins D/F 2-3-4-5-6-7-8-9-16-17-18-19-20-21-22-23) (Pins C 2-3-5-6-7-8-9-10-19-20-21-22-23-24-26-27)	-	7.5	pF
578	Channel Capacitance (Output)	C _{OC}	3012	4 (o)	V _{DD} = V _{SS} = 0Vdc Note 6 (Pin D/F 1) (Pin C 1)	-	120	pF
579	Propagation Delay Address to Signal OUT (Channel turning ON)	t _{PLH1}	3003	4 (p)	V _{IN} (Under Test) = Pulse Generator V _{IL} = 0Vdc, V _{IH} = 5Vdc R _L = 10kΩ V _{DD} = 5Vdc, V _{SS} = 0Vdc Note 7 <u>Pins D/F</u> <u>Pins C</u> 10 to 1 12 to 1	-	650	ns
580	Propagation Delay Inhibit 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} = 0Vdc Note 7 <u>Pins D/F</u> <u>Pins C</u> 15 to 1 17 to 1	-	650	ns
581	Propagation Delay Channel Input to Channel Output	t _{PLH3}	3003	4 (q)	V _{IN} (Under Test) = Pulse Generator V _{IL} = 0Vdc, V _{IH} = 5Vdc V _{IN} (All other channels) = 0Vdc R _L = 200kΩ V _{DD} = 5Vdc, V _{SS} = 0Vdc Note 7 <u>Pins D/F</u> <u>Pins C</u> 9 to 1 10 to 1	-	60	ns

NOTES: See Page 25.

**TABLE 2 - ELECTRICAL MEASUREMENTS AT ROOM TEMPERATURE - A.C. PARAMETERS (CONT'D)**

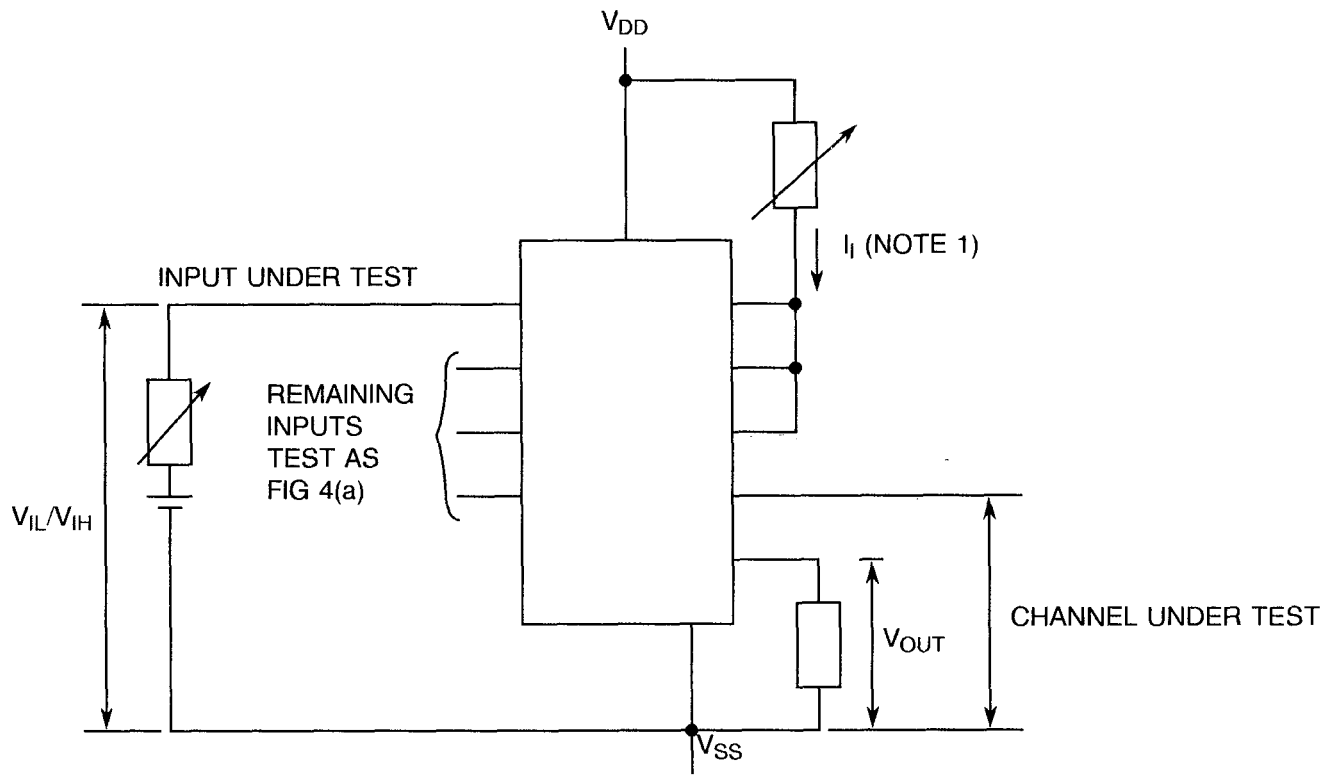
NO.	CHARACTERISTICS	SYMBOL	TEST METHOD MIL-STD 883	TEST FIG.	TEST CONDITIONS (PINS UNDER TEST D/F = DIP AND FP C = CCP)	LIMITS		UNIT
						MIN	MAX	
582	Propagation Delay Address to Signal OUT (Channel turning OFF)	t _{PHL1}	3003	4 (p)	V _{IN} (Under Test) = Pulse Generator V _{IL} = 0Vdc, V _{IH} = 5Vdc R _L = 300Ω V _{DD} = 5Vdc, V _{SS} = 0Vdc Note 7 <u>Pins D/F</u> <u>Pins C</u> 10 to 1 12 to 1	-	440	ns
583	Propagation Delay Inhibit 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} = 0Vdc Note 7 <u>Pins D/F</u> <u>Pins C</u> 15 to 1 17 to 1	-	440	ns
584	Propagation Delay Channel Input to Channel Output	t _{PHL3}	3003	4 (q)	V _{IN} (Under Test) = Pulse Generator V _{IL} = 0Vdc, V _{IH} = 5Vdc V _{IN} (All other channels) = 0Vdc R _L = 200kΩ V _{DD} = 5Vdc, V _{SS} = 0Vdc Note 7 <u>Pins D/F</u> <u>Pins C</u> 9 to 1 10 to 1	-	60	ns

NOTES

- GO-NO-GO Test, each pattern of Test Table 4(a).
VOH ≥ VDD - 0.5V VOL ≤ 0.5V
- Maximum time to output comparator strobe 300μsec.
- Measure each value of IDD for the input conditions given in Table 4(b).
- 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.
- This is performed as a Functional Test in which extreme VIN conditions are applied and output voltage is measured.
- Measurement performed on a sample basis LTPD 7, or less, with a Capacitance Bridge connected between each input under test and VSS, only for Lots where LAT Level 2 is to be performed. (For LTPD sampling plan, see Annexe I of ESA/SCC 9000).
- 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. $I_I < 2\mu A$ for all OFF Channels.

FIGURE 4(i) - THRESHOLD VOLTAGE N-CHANNEL

FIGURE 4(j) - THRESHOLD VOLTAGE P-CHANNEL

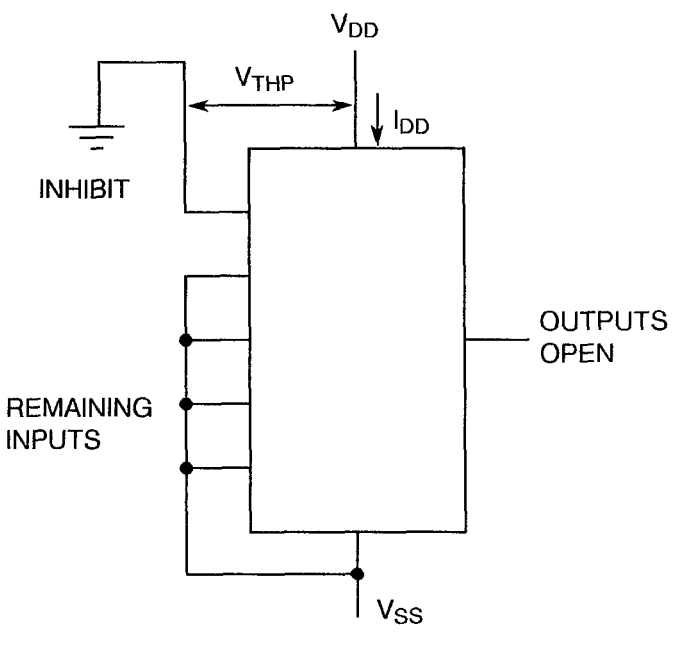
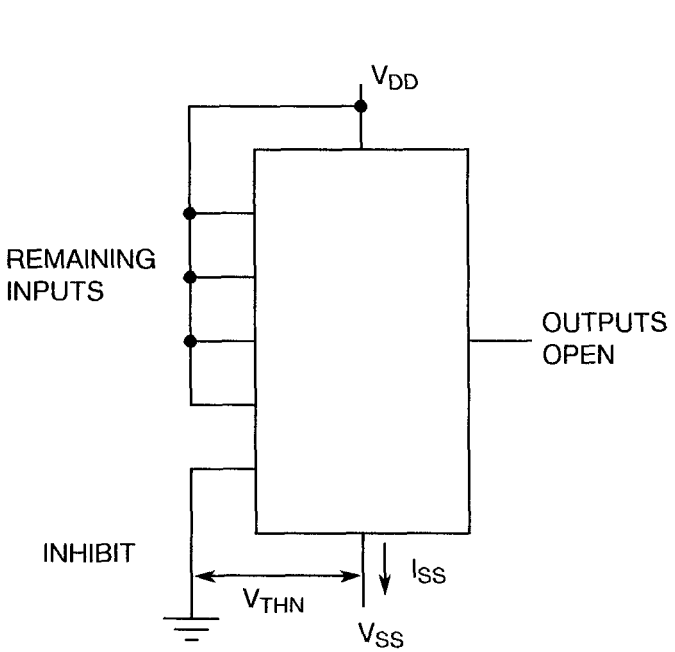
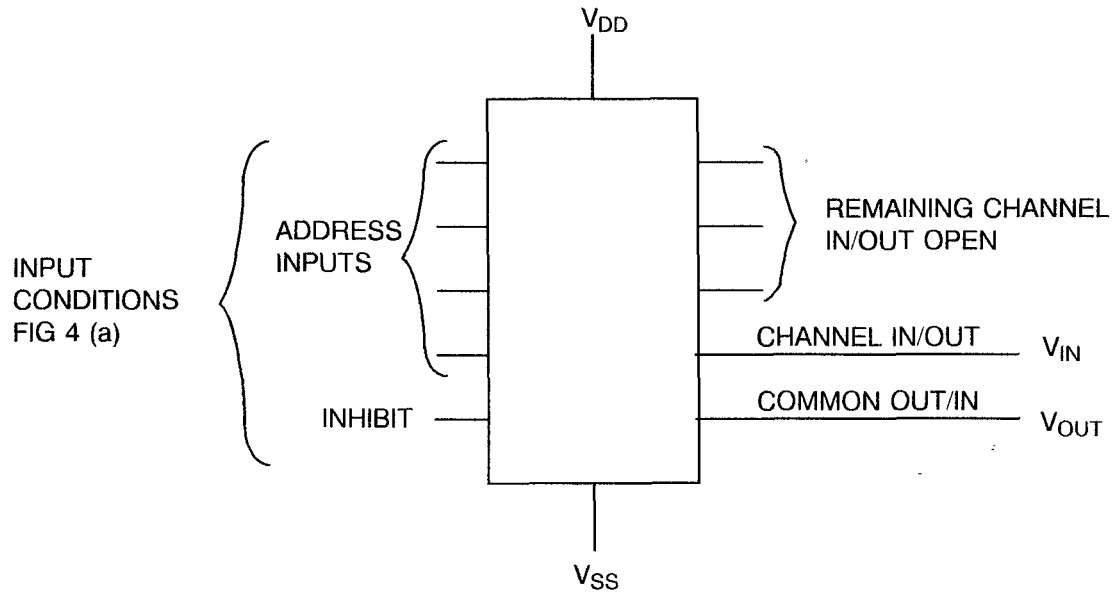


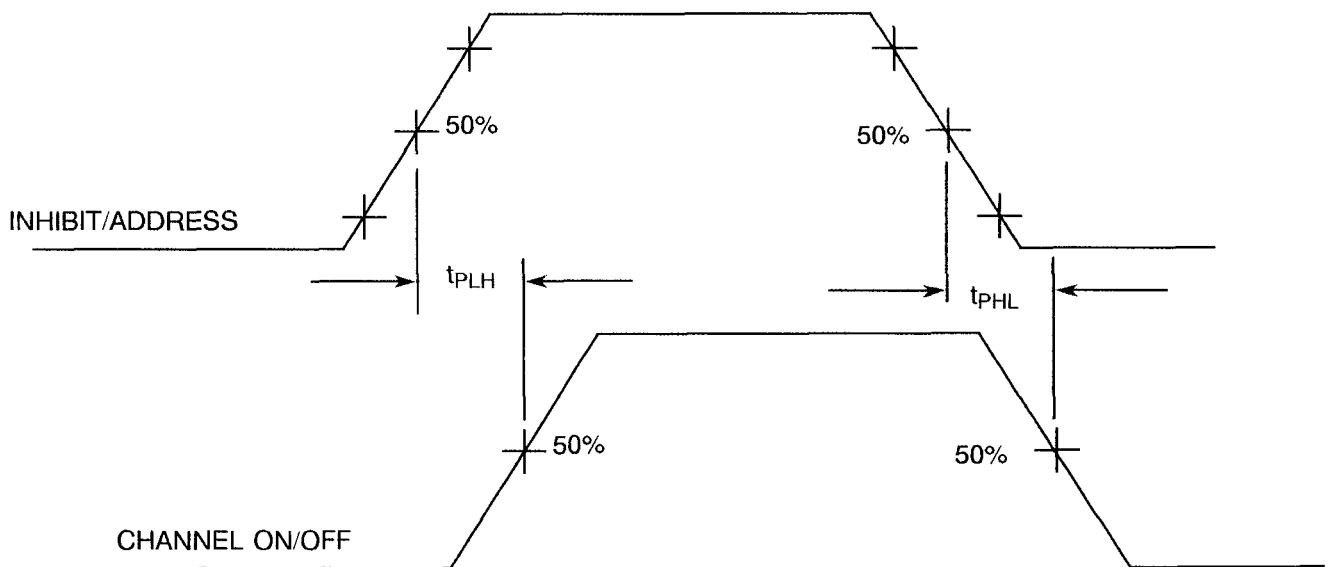


FIGURE 4 - CIRCUITS FOR ELECTRICAL MEASUREMENTS (CONTINUED)

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



VOLTAGE WAVEFORMS



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

**TABLE 4 - PARAMETER DRIFT VALUES**

NO.	CHARACTERISTICS	SYMBOL	SPEC. AND/OR TEST METHOD	TEST CONDITIONS	CHANGE LIMITS (Δ)	UNIT
3 to 18	Quiescent Current	I_{DD}	As per Table 2	As per Table 2	± 75	nA
Note (1)	Channel on Resistance	R_{ON1}	As per Table 2	As per Table 2	± 50	Ω
Note (2)	Channel on Resistance	R_{ON2}	As per Table 2	As per Table 2	± 15	Ω
545	Threshold Voltage N-Channel	V_{THN}	As per Table 2	As per Table 2	± 0.3	V
546	Threshold Voltage P-Channel	V_{THP}	As per Table 2	As per Table 2	± 0.3	V

NOTES

1. Test Numbers: 63, 68, 73, 78, 83, 88, 93, 175, 180, 185, 190, 195, 200, 205.
2. Test Numbers: 278, 292, 297, 302, 307, 312, 317, 322, 415, 420, 425, 430, 435, 440, 445, 450.

Characteristics	Symbols	MIL-STD-883 Test Method	Test Conditions Note 1	Limits		Units
				Min	Max	
Quiescent Current	I_{DD}	3005	$V_{IL}=0V, V_{IH}=15V$ $V_{DD}=15V,$ $V_{SS}= 0V$ Note 3	-	500	nA
Low Level Input Current, Control Inputs	I_{IL}	3009	V_{IN} (Under Test)=0V $V_{DD}=15V,$ $V_{SS}=0V$	-	-50	nA
High Level Input Current, Control Inputs	I_{IH}	3010	V_{IN} (Under Test)=15V $V_{DD}=15V,$ $V_{SS}= 0V$	-	50	nA
Channel OFF Leakage Current 1, Any Channel CHn	I_{OFF1}	-	Channel Under Test V_{IN} (CH)=15V V_{IN} (COM)=0V All other Channels Open $V_{DD}=15V,$ $V_{SS}= 0V$	-	-100	nA
Channel OFF Leakage Current 2, Any Channel CHn	I_{OFF2}	-	Channel Under Test V_{IN} (CH)=0V V_{IN} (COM)=15V All other Channels Open $V_{DD}=15V,$ $V_{SS}= 0V$	-	100	nA
Channel OFF Leakage Current 3, All Channels Tested Together	I_{OFF3}	-	V_{IN} (CH)=0V V_{IN} (COM)=15V $V_{DD}=15V,$ $V_{SS}= 0V$	-	100	nA
Channel OFF Leakage Current 4, All Channels Tested Together	I_{OFF4}	-	V_{IN} (CH)=15V V_{IN} (COM)=0V $V_{DD}=15V,$ $V_{SS}= 0V$	-	-100	nA
Channel ON Resistance 1	R_{ON1}	-	$V_{IL}=0V, V_{IH}=5V$ $R_L=10k\Omega$ $V_{DD}=5V, V_{SS}= 0V$ Note 4	-	1050	Ω
Channel ON Resistance 2	R_{ON2}	-	$V_{IL}=0V, V_{IH}=15V$ $R_L=10k\Omega$ $V_{DD}=15V,$ $V_{SS}= 0V$ Note 4	-	240	Ω
Low Level Input Voltage 1 (Noise Immunity) (Functional Test)	V_{IL1}	-	Verify Truth Table $V_{DD}=5V, V_{SS}=0V$ Note 5	-	1.5	V

Characteristics	Symbols	MIL-STD-883 Test Method	Test Conditions Note 1	Limits		Units
				Min	Max	
Low Level Input Voltage 2 (Noise Immunity) (Functional Test)	V_{IL2}	-	Verify Truth Table $V_{DD}=15V$, $V_{SS}=0V$ Note 5	-	4	V
High Level Input Voltage 1 (Noise Immunity) (Functional Test)	V_{IH1}	-	Verify Truth Table $V_{DD}=5V$, $V_{SS}=0V$ Note 5	3.5	-	V
High Level Input Voltage 2 (Noise Immunity) (Functional Test)	V_{IH2}	-	Verify Truth Table $V_{DD}=15V$, $V_{SS}=0V$ Note 5	11	-	V
Threshold Voltage N-Channel	V_{THN}	-	INH Input at Ground All Other Inputs: $V_{IN}=5V$ $V_{DD}=5V$, $I_{SS}=-10\mu A$	-0.7	-3	V
Threshold Voltage P-Channel	V_{THP}	-	INH Input at Ground All Other Inputs: $V_{IN}=-5V$ $V_{SS}=-5V$, $I_{DD}=10\mu A$	0.7	3	V
Input Clamp Voltage 1, to V_{SS} , Control Inputs	V_{IC1}	-	I_{IN} (Under Test) = -100 μA $V_{DD}=\text{Open}$, $V_{SS}=0V$ All Other Pins Open	-	-2	V
Input Clamp Voltage 2, to V_{DD} , Control Inputs	V_{IC2}	-	V_{IN} (Under Test)=6V $R=30k\Omega$, $V_{SS}=\text{Open}$ All Other Pins Open Note 6	3	-	V
Input Capacitance, Control Inputs	C_{IN}	3012	V_{IN} (Not Under Test)=0V $V_{DD}=V_{SS}=0V$ $f = 100 \text{ kHz to } 1 \text{ MHz}$ Note 7	-	7.5	pF
Channel Capacitance, CHn	C_{CH}	3012	V_{IN} (Not Under Test)=0V $V_{DD}=V_{SS}=0V$ $f = 100 \text{ kHz to } 1 \text{ MHz}$ Note 7	-	7.5	pF
Channel Capacitance, COM	C_{COM}	3012	V_{IN} (Not Under Test)=0V $V_{DD}=V_{SS}=0V$ $f = 100 \text{ kHz to } 1 \text{ MHz}$ Note 7	-	120	pF

Characteristics	Symbols	MIL-STD-883 Test Method	Test Conditions Note 1	Limits		Units
				Min	Max	
Propagation Delay Low to High 1, CH0 to COM	t_{PLH1}	3003	$V_{IN(CH)}$ =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	-	60	ns
Propagation Delay High to Low 1, CH0 to COM	t_{PHL1}	3003	$V_{IN(CH)}$ =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	-	60	ns
Propagation Delay Low to High 2, A to COM (Channel ON)	t_{PLH2}	3003	$V_{IN(A)}$ =Pulse Generator V_{IN} (Remaining Inputs)=Truth Table $V_{IN(CH)}=0V$ and 5V $R_L=10k\Omega$ $V_{DD}=5V$, $V_{SS}=0V$ Note 8	-	650	ns
Propagation Delay High to Low 2, A to COM (Channel ON)	t_{PHL2}	3003	$V_{IN(A)}$ =Pulse Generator V_{IN} (Remaining Inputs)=Truth Table $V_{IN(CH)}=0V$ and 5V $R_L=10k\Omega$ $V_{DD}=5V$, $V_{SS}=0V$ Note 8	-	670	ns
Output Enable Time High Impedance to High Output, INH to COM	t_{PZH}	3003	$V_{IN(INH)}$ =Pulse Generator V_{IN} (Remaining Inputs)=Truth Table $V_{IL}=0V$, $V_{IH}=5V$, $V_{IN(CH)}=5V$, $R_L=10k\Omega$ $V_{DD}=5V$, $V_{SS}=0V$ Note 8	-	400	ns
Output Disable Time High Output to High Impedance, INH to COM	t_{PHZ}	3003	$V_{IN(INH)}$ =Pulse Generator V_{IN} (Remaining Inputs)=Truth Table $V_{IL}=0V$, $V_{IH}=5V$, $V_{IN(CH)}=5V$, $R_L=300\Omega$ $V_{DD}=5V$, $V_{SS}=0V$ Note 8	-	400	ns

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: $V_{IN}=-5V$ $V_{SS}=-5V, I_{DD}=10\mu A$ $T_{amb}=+125^{\circ}C$ $T_{amb}=-55^{\circ}C$	0.3 0.7	3.5 3.5	V

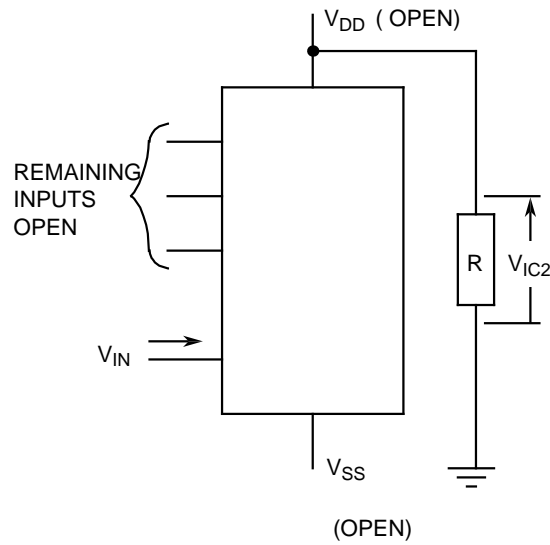
2.3.3 Notes to Electrical Measurement Tables

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 = 300 μ s.
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	C	D	COM	CH 0	CH 1	CH 2	CH 3	CH 4	CH 5	CH 6	CH 7	CH 8	CH 9	CH 10	CH 11	CH 12	CH 13	CH 14	CH 15	
(a)	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(b)	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(c)	0	0	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(d)	0	1	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
(e)	0	0	0	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
(f)	0	1	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
(g)	0	0	1	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
(h)	0	1	1	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
(i)	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
(j)	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
(k)	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
(l)	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
(m)	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
(n)	0	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
(o)	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
(p)	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
(q)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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, C, D = V_{IL} or V_{IH} per Truth Table to select channel under test.
 - (c) I_{IN} (CHn or COM) = 100 μ A.
 - (d) R_{ON1} shall be tested with V_{IN} (CHn or COM) = 1.5V, 1.9V, 2.3V, 2.7V, 3.3V, 3.7V, 4.1V.
 R_{ON2} shall be tested with V_{IN} (CHn or COM) = 1.5V, 1.9V, 2.3V, 2.7V, 13.3V, 13.7V, 14.1V, 14.5V.

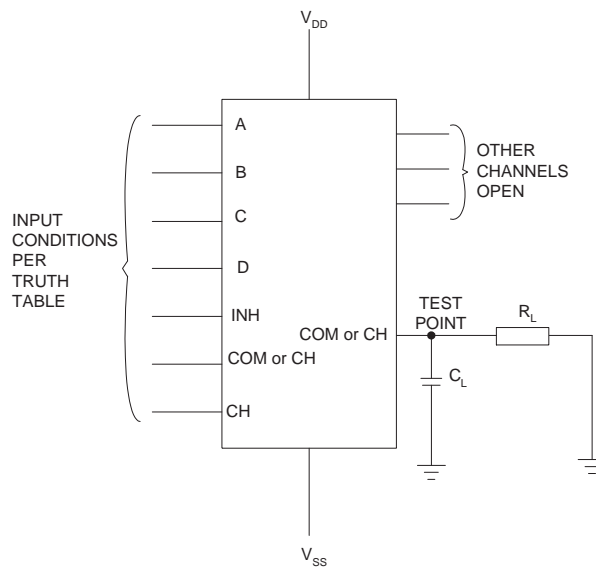
Channel ON Resistance shall be recorded for Channel 4 (CH4 to COM, COM to CH4) at each specified V_{IN} . Other channels may be tested go-no-go.
5. Performed as a functional test to verify for all OFF channels $I_{OFF} < 2\mu A$ with V_{IN} (CH) = V_{DD} through 1k Ω , COM output load resistance $R_L = 1k\Omega$.
6. Input Clamp Voltage 2 to V_{DD} , V_{IC2} , shall be tested on each input as follows:-

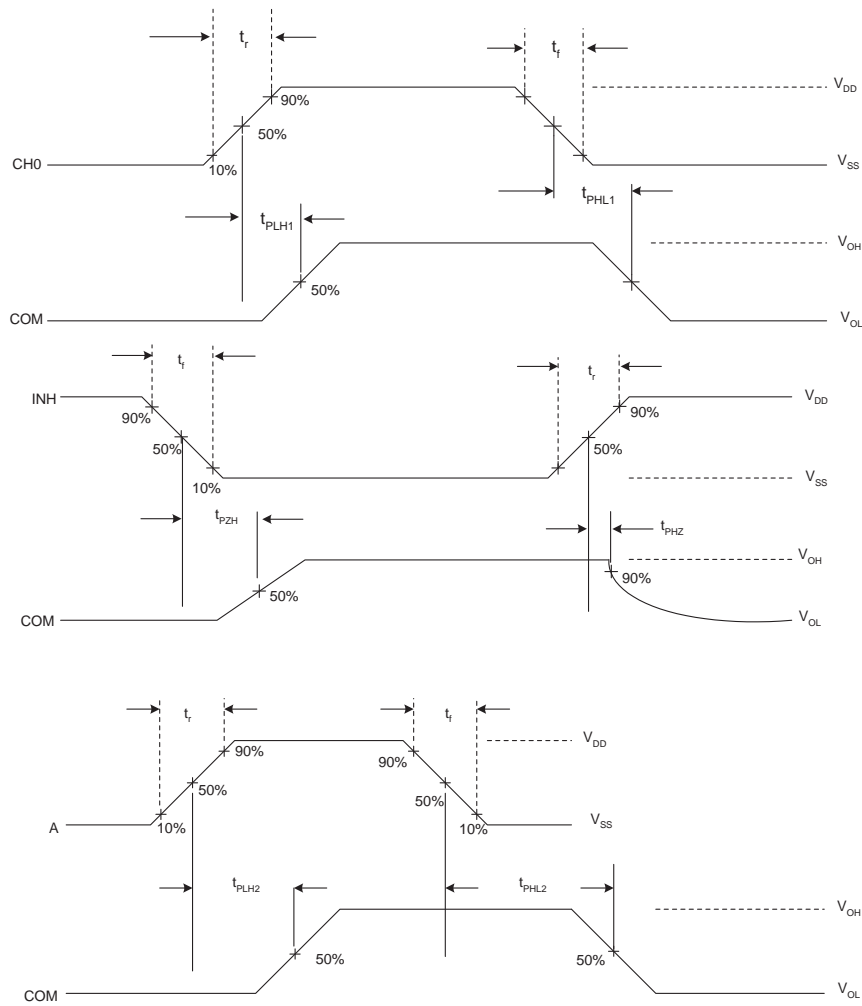


7. Guaranteed but not tested.
8. Read and record measurements shall be performed on a sample of 32 components with 0 failures permitted.
The pulse generator shall have the following characteristics:

$V_{GEN} = 0$ to V_{DD} ; $f = 500\text{kHz}$; t_r and $t_f \leq 15$ ns (10% to 90%); duty cycle = 50%. Output load capacitance $C_L = 50\text{pF} \pm 5\%$ 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:





2.4 PARAMETER DRIFT VALUES

Unless otherwise specified, the measurements shall be performed at $T_{amb}=+22 \pm 3^{\circ}\text{C}$.

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	Limits			Units
		Drift Value Δ	Absolute		
			Min	Max	
Quiescent Current	I_{DD}	± 75	-	500	nA
Channel ON Resistance 1, CH4 to COM, COM to CH4 Note 2	R_{ON1}	± 50	-	1050	Ω
Channel ON Resistance 2, CH4 to COM, COM to CH4 Note 2	R_{ON2}	± 15	-	240	Ω
Threshold Voltage N-Channel	V_{THN}	± 0.3	-0.7	-3	V
Threshold Voltage P-Channel	V_{THP}	± 0.3	0.7	3	V

NOTES:

1. Unless otherwise specified all inputs and outputs shall be tested for each characteristic.
2. Channel ON Resistance shall be tested at each input voltage level specified in Room Temperature Electrical Measurements in both directions for CH4 to COM only.

2.5

INTERMEDIATE AND END-POINT ELECTRICAL MEASUREMENTS

Unless otherwise specified, the measurements shall be performed at $T_{amb} = +22 \pm 3^{\circ}C$.

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 where specified. The corresponding absolute limit values for each characteristic shall not be exceeded.