MOTOROLA

Quad Line Receiver

Military 10H515

ELECTRICALLY TESTED PER:
5962-87501

The 10H515 is a quad differential amplifier designed for use in sensing differential signals over long lines. This MECL 10H part is a functional/ pinout duplication of the standard MECL 10K family part, with 100% improvement in counting frequency, and no increase in power-supply current.

The base bias supply (V_{BB}) is made available at pin 9 to make the device useful as a Schmitt trigger, or in other applications where a stable reference voltage is necessary. Active current sources provide the 10H515 with excellent common mode rejection. If any amplifier in a package is not used, one input of that amplifier must be connected to V_{BB} (pin 9) to prevent upsetting the current source bias network.

- Propagation Delay, 1.0 ns Typical
- 160 mW Max/Pkg (No Load)
- Improved Noise Margin 150 mV (Over Operating Voltage and Temperature Range)
- Voltage Compensated
- MECL 10K-Compatible

AVAILABLE AS

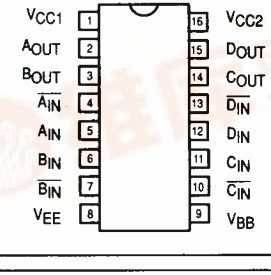
1) JAN: N/A
2) SMD: 5962-87501
3) 883: 10H515/BXAJC
X = CASE OUTLINE AS FOLLOWS:

PACKAGE: CERDIP: E
CERFLAT: F
LCC: 2

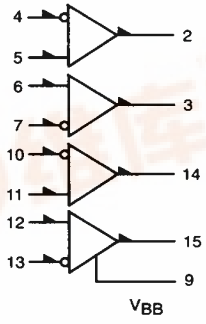
The letter "M" appears before the slash on LCC.

PIN ASSIGNMENTS

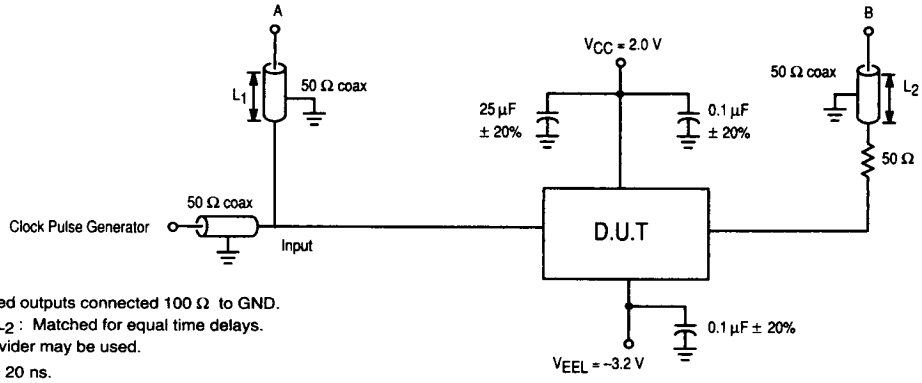
FUNCTION	DIL	FLATS	LCC	BURN-IN (CONDITION C)
V_{CC1}	1	5	2	GND
A_{OUT}	2	6	3	51 Ω to V_{TT}
B_{OUT}	3	7	4	51 Ω to V_{TT}
$\overline{A_{IN}}$	4	8	5	V_{BB}
A_{IN}	5	9	7	GND
B_{IN}	6	10	8	GND
$\overline{B_{IN}}$	7	11	9	V_{BB}
V_{EE}	8	12	10	V_{EE}
V_{BB}	9	13	12	V_{BB}
$\overline{C_{IN}}$	10	14	13	V_{BB}
C_{IN}	11	15	14	GND
D_{IN}	12	16	15	GND
$\overline{D_{IN}}$	13	1	17	V_{BB}
C_{OUT}	14	2	18	51 Ω to V_{TT}
D_{OUT}	15	3	19	51 Ω to V_{TT}
V_{CC2}	16	4	20	GND



LOGIC DIAGRAM



BURN - IN CONDITIONS:
V_{TT} = – 2.0 V MAX/ – 2.2 V MIN
V_{EE} = – 5.7 V MAX/ – 5.2 V MIN
V_{BB} = All pins designated for V_{BB} must be tied together, no external voltage applied.



NOTES

1. Unused outputs connected 100 Ω to GND.
2. $L_1 = L_2$: Matched for equal time delays.
3. 2:1 divider may be used.
4. $P_W \geq 20$ ns.
5. P_{RF} = 1.0 MHz.
6. $t_r = t_f$ = 1.0 ns ± 0.1 ns measured at (20% - 80%).

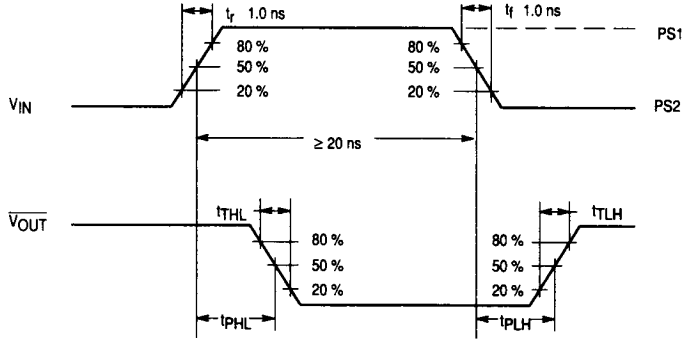


Figure 1. Switching Test Circuit and Waveforms

10H515
QUIESCENT LIMIT TABLE

* ELECTRICAL CHARACTERISTICS

Each MECL 10H series circuit has been designed to meet the dc specifications shown in the test table, after thermal equilibrium has been established. The circuit is in a test socket or mounted on a printed circuit board and transverse air flow greater than 500 linear fpm is maintained. Outputs are terminated through a 100 Ω resistor to -2.0 volts.

Test Temperature	Test Voltage Values (Volts)								
	V_{IH1}	V_{IL1}	V_{IH2}	V_{IL2}	P_{S1}	P_{S2}	V_{EE1}	V_{EE2}	V_{CB}
T_A = 25 °C	-0.78	-1.95	-1.11	-1.480	+1.11	+0.31	-5.46	-4.94	-5.2
T_A = 125 °C	-0.65	-1.95	-0.96	-1.465	+1.24	+0.36	-5.46	-4.94	-5.2
T_A = -55 °C	-0.84	-1.95	-1.16	-1.510	+1.01	+0.28	-5.46	-4.94	-5.2

Symbol	Parameter	Limits						Units	TEST VOLTAGE APPLIED TO PINS BELOW								
	Functional Parameters:	+ 25 °C		+ 125 °C		– 55 °C			Pinouts referenced are for DIL package, check Pin Assignments. V_{CC} = 0 V, Output Load = 100 Ω to - 2.0 V, V_{CB} = -5.2 V.								
		Subgroup 1		Subgroup 2		Subgroup 3											
		Min	Max	Min	Max	Min	Max		V_{IH1}	V_{IL1}	V_{IH2}	V_{IL2}	V_{EE1}	V_{EE2}	V_{CC}	V_{BB}	(PUT) LD_1
V_{OH}	High Output Voltage	–1.01	–0.78	–0.86	–0.65	–1.06	–0.84	V	** 5, 6, 11, 12	** 4, 7, 10, 13			8		1, 16		2, 3, 14, 15
V_{OL}	Low Output Voltage	–1.95	–1.58	–1.95	–1.565	–1.95	–1.61	V	** 4, 7, 10, 13	** 5, 6, 11, 12			8		1, 16		2, 3, 14, 15
V_{OH1}	High Output Voltage	–1.01	–0.78	–0.86	–0.65	–1.06	–0.84	V			** 5, 6, 11, 12	** 4, 7, 10, 13	8	8	1, 16		2, 3, 14, 15
V_{OL1}	Low Output Voltage	–1.95	–1.58	–1.95	–1.565	–1.95	–1.61	V			** 4, 7, 10, 13	** 5, 6, 11, 12	8	8	1, 16		2, 3, 14, 15
V_{BB1}	Reference Voltage	–1.37	–1.25	–1.31	–1.19	–1.41	–1.27	V					8		1, 16		*** 9
I_{EE}	Power Supply Current	–26		–29		–29		mA					8		1, 16		8
I_{IH}	Input Current High		95		150		150	µA	4 – 7, 10 – 13				8		1, 16		4 – 7, 10 – 13
I_{CBO}	Input Current	–1.0		–1.0		–1.5		µA					8		1, 16	** 4 – 7, 10 – 13	4 – 7, 10 – 13

** connected to pin 9.
*** Measure voltage on pin 9, while it is connected to other pins.

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Test Temperature	Test Voltage Values (Volts)							
	V_{IH1}	V_{IL1}	V_{IH2}	V_{IL2}	P_{S1}	P_{S2}	V_{EEL}	V_{EE1}	V_{EE2}
T_A = 25 °C	-0.78	-1.95	-1.11	-1.480	+1.11	+0.31	-2.94	-5.46	-4.94
T_A = 125 °C	-0.65	-1.95	-0.96	-1.465	+1.24	+0.36	-2.94	-5.46	-4.94
T_A = -55 °C	-0.84	-1.95	-1.16	-1.510	+1.01	+0.28	-2.94	-5.46	-4.94

Symbol	Parameter	Limits						Units	TEST VOLTAGE APPLIED TO PINS BELOW:				
	Functional Parameters:	+ 25 °C		+ 125 °C		− 55 °C			Pinouts referenced are for DIL package, check Pin Assignments V_{CC} = 2.0 V, Output Load = 100 Ω to GND				
		Subgroup 9		Subgroup 10		Subgroup 11							
		Min	Max	Min	Max	Min	Max		V_{IN}	V_{OUT}	V_{CC}	V_{EEL}	P.U.T.
t_{TLH}	Rise Time	0.5	1.4	0.5	1.7	0.5	1.4	ns	4	2	1, 16	8	3, 14, 15
t_{THL}	Fall Time	0.5	1.4	0.5	1.7	0.5	1.4	ns	7	3	1, 16	8	2, 14, 15
t_{PHL}	Propagation Delay High to Low	0.45	1.2	0.5	1.8	0.45	1.2	ns	10	14	1, 16	8	2, 3, 15
t_{PLH}	Propagation Delay Low to High	0.45	1.2	0.5	1.4	0.45	1.2	ns	13	14	1, 16	8	2, 3, 14