

**MOTOROLA**

Quad Line Receiver

**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

PIN ASSIGNMENTS

FUNCTION	DIL	FLATS	LCC	BURN-IN (CONDITION C)
V_{CC1}	1	5	2	GND
AOUT	2	6	3	51 Ω to V_{TT}
BOUT	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}
COUT	14	2	18	51 Ω to V_{TT}
DOUT	15	3	19	51 Ω to V_{TT}
V_{CC2}	16	4	20	GND

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

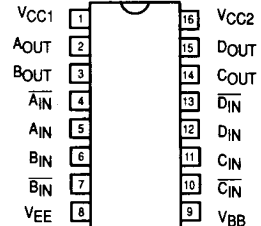
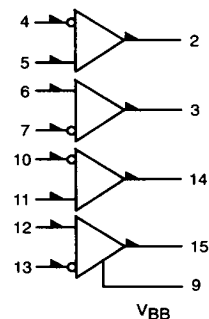
Military 10H515

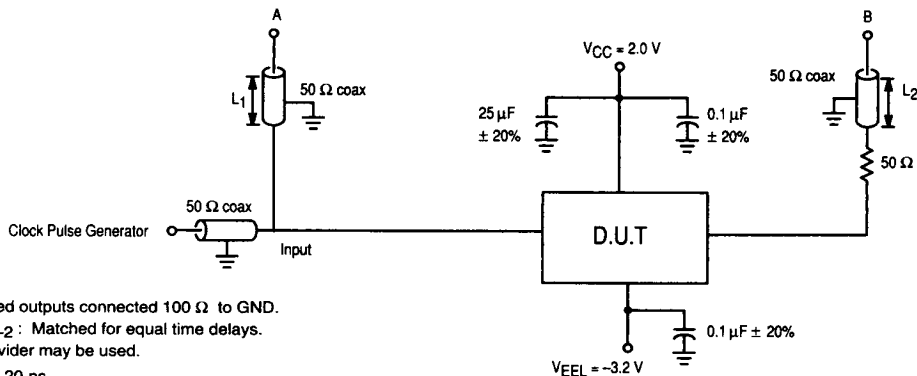
**AVAILABLE AS**

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

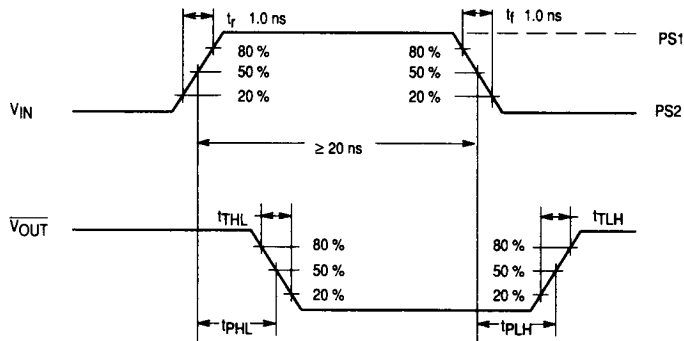
PACKAGE: CERDIP: E
CERFLAT: F
LCC: 2

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

**LOGIC DIAGRAM**

**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. $P_{VW} \geq 20\text{ ns}$.
5. $P_{RF} = 1.0\text{ MHz}$.
6. $t_r = t_f = 1.0\text{ ns} \pm 0.1\text{ ns}$ 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 _{IH2}	V _{IL1}	V _{IL2}	PS ₁	PS ₂	V _{EE1}	V _{EE2}	V _{CB}	V _{CB}
T _A = 25 °C	-0.78	-1.11	-1.95	-1.480	+1.11	+0.31	-5.46	-4.94	-5.2	-5.2
T _A = 125 °C	-0.65	-0.96	-1.95	-1.485	+1.24	+0.36	-5.46	-4.94	-5.2	-5.2
T _A = -55 °C	-0.84	-1.16	-1.95	-1.510	+1.01	+0.28	-5.46	-4.94	-5.2	-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 _{IH2}	V _{IL1}	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	

** connected to pin 9.

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

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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 VCC = 2.0 V, Output Load = 100 Ω to GND									
		Subgroup 9		Subgroup 10		Subgroup 11												
		Min	Max	Min	Max	Min	Max											
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					