MOTOROLA

Triple Line Receiver (High Speed)

ELECTRICALLY TESTED PER:
MPG 10616

The 10616 is a high speed triple differential amplifier designed for use in sensing differential signals over long lines. The base bias supply (V_{BB}) is made available at pin 11 make the device useful as a Schmitt trigger, or in other application where a stable reference voltage is necessary.

Active current sources provide the 10616 with excellent common mode noise rejection. If any amplifier in a package is not used, one input of that amplifier must be connected to V_{BB} (pin 11) to prevent upsetting the current source bias network.

Complementary outputs are provided to allow driving twisted pair lines, to enable cascading of several amplifiers in a chain, or simply to provide complement outputs of the input logic function.

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- 150 mW Max/Pkg (No Load)
- t_{pd} = 2.0 ns typ (All Output Loaded)
- t_r, t_f = 2.0 ns typ (20% - 80%)

PIN ASSIGNMENTS

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

BURN - IN CONDITIONS:
V_{TT} = – 2.0 V MAX/ – 2.2 V MIN
V_{EE} = – 5.7 V MAX/ – 5.2 V MIN

NOTES:

1. **V_{BB} to be used to supply bias to the 10616 only and bypassed (when used) with 0.01 μF to 0.1 μF capacitor.**
2. **When the input pin with the bubble goes positive, the output goes posittive.**

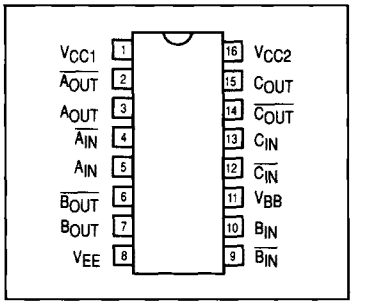
Military 10616

AVAILABLE AS:

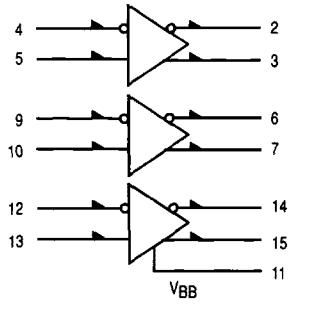
1) JAN: N/A
2) SMD: N/A
3) 883: 10616/BXAJC
X = CASE OUTLINE AS FOLLOWS:

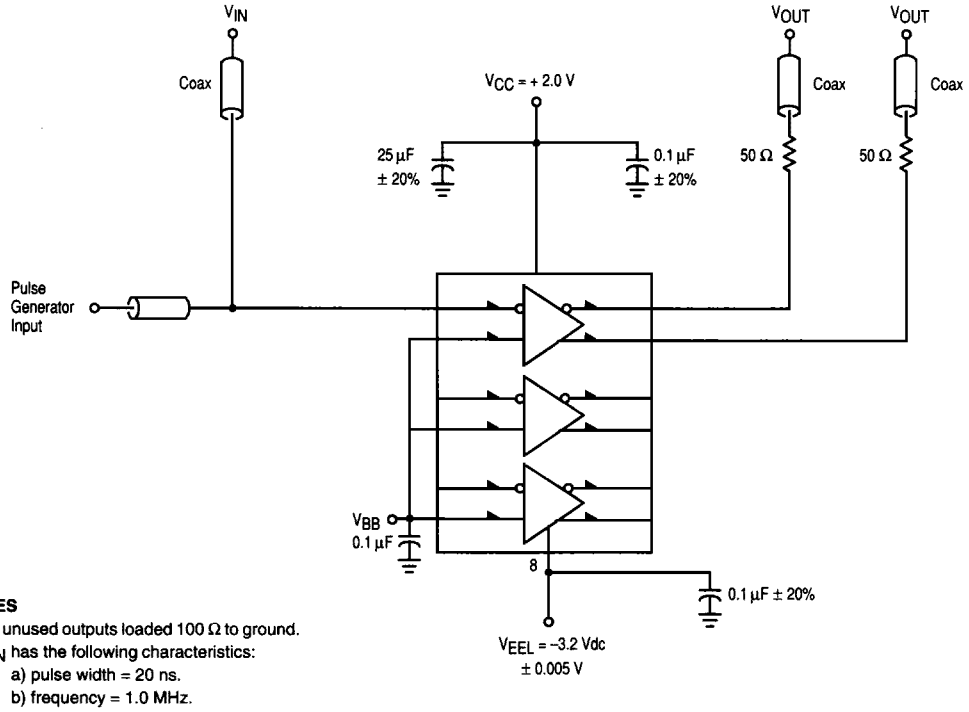
PACKAGE: CERDIP: E
CERFLAT: F
LCC: 2

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



LOGIC DIAGRAM





NOTES

1. All unused outputs loaded 100 Ω to ground.
2. V_{IN} has the following characteristics:
   a) pulse width = 20 ns.
   b) frequency = 1.0 MHz.
   c) t_r and t_f = 1.5 ns ± 0.2 ns.

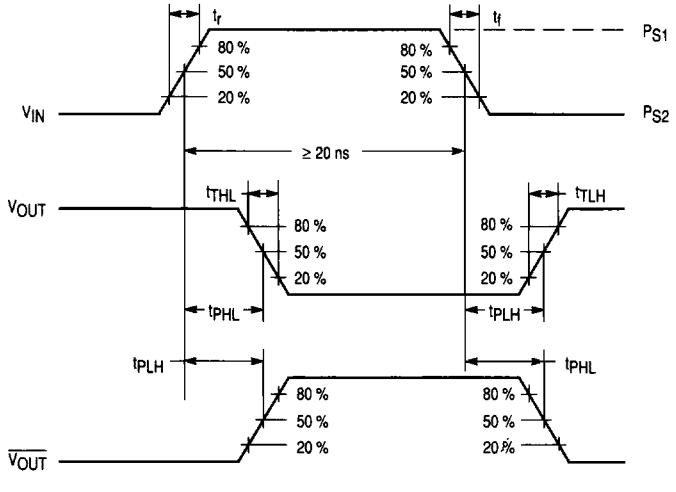


Figure 1. Switching Test Circuit and Waveforms

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QUIESCENT LIMIT TABLE *

* ELECTRICAL CHARACTERISTICS

Each MECL 10K 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_{IH}	V_{IL}	V_{IH1}	V_{IL1}	P_{S1}	P_{S2}	V_{CB}/V_{EE}	V_{EEL}
T_A = 25 °C	- 0.78	- 1.85	- 1.105	- 1.475	+ 1.11	+ 0.31	- 5.2	- 3.2
T_A = 125 °C	- 0.63	- 1.82	- 1.000	- 1.400	+ 1.24	+ 0.36	- 5.2	- 3.2
T_A = - 55 °C	- 0.88	- 1.92	- 1.255	- 1.510	+ 1.01	+ 0.28	- 5.2	- 3.2

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_{BB} to pin 11, V_{CC} = 0 V, Output Load = 100 Ω to - 2.0 V								
		Subgroup 1		Subgroup 2		Subgroup 3											
		Min	Max	Min	Max	Min	Max		V_{IH}	V_{IL}	V_{IH1}	V_{IL1}	V_{BB}	V_{CB}	V_{EE}	V_{CC}	P. U. T.
V_{OH}	High Output Voltage	- 0.93	- 0.78	- 0.825	- 0.63	- 1.08	- 0.88	V	4, 5, 9, 12, 13	4, 5, 9, 12, 13					8	1, 16	2, 3, 6, 7, 14, 15
V_{OL}	Low Output Voltage	- 1.85	- 1.62	- 1.82	- 1.545	- 1.92	- 1.655	V	4, 5, 9, 12, 13	4, 5, 9, 12, 13					8	1, 16	2, 3, 6, 7, 14, 15
V_{OL1}	Low Output Voltage		- 1.60		- 1.525		- 1.635	V			4, 5, 9, 10, 12, 13	4, 5, 9, 10, 12, 13	4, 9, 13, 14		8	1, 16	2, 3, 6, 7, 14, 15
V_{OH1}	High Output Voltage	- 0.95		- 0.845		- 1.10		V			4, 5, 9, 10, 12, 13	4, 5, 9, 10, 12, 13	4, 9, 13, 14		8	1, 16	2, 3, 6, 7, 14, 15
V_{BB}	Reference Bias Supply Voltage	- 1.35	- 1.23	- 1.24	- 1.12	- 1.44	- 1.32	V	4, 9, 12	5, 10, 13					8	1, 16	11
I_{CBO}	Open Collector Input Current	- 1.0		- 1.0		- 1.5		µA	4, 7, 9, 12, 14					5, 10, 13	8	1, 16	4, 5, 9, 10, 12, 13
I_{IH}	Input Current High		115		195		195	µA	4, 5, 9, 10, 12, 13	4, 5, 9, 10, 12, 13					8	1, 16	4, 5, 9, 10, 12, 13
I_{EE}	Power Supply Drain Current	- 25		- 28		- 28		mA		5, 10, 13					8	1, 16	8

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	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_{BB}	V_{CC}	V_{EEL}	P. U. T.
t_{TLH}	Rise Time	1.0	2.5	1.0	2.9	1.0	2.7	ns	4, 9, 12	2, 14	5, 10, 13	1, 16	8	2, 3, 6, 7, 14, 15
t_{THL}	Fall Time	1.0	2.5	1.0	2.9	1.0	2.7	ns	4, 9, 12	2, 14	5, 10, 13	1, 16	8	2, 3, 6, 7, 14, 15
t_{PHL}	Propagation Delay	1.0	2.5	1.0	2.9	1.0	2.7	ns	4, 9, 12	2, 14	5, 10, 13	1, 16	8	2, 3, 6, 7, 14, 15
t_{PLH}	Propagation Delay	1.0	2.5	1.0	2.9	1.0	2.7	ns	4, 9, 12	2, 14	5, 10, 13	1, 16	8	2, 3, 6, 7, 14, 15