



Line Drivers/Receivers

LM55109/LM75109, LM55110/LM75110 dual line drivers

general description

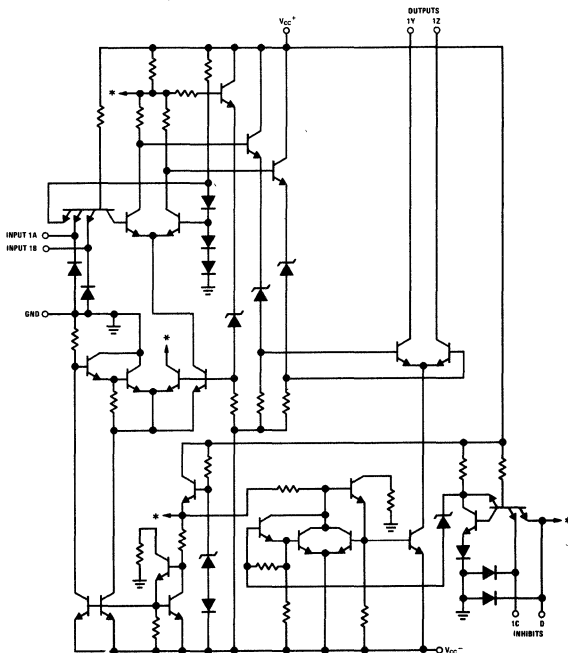
These products are TTL compatible high speed differential line drivers intended for use in terminated twisted-pair party-line data transmission systems. They may also be used for level shifting since output common-mode range is $-3V$ to $+10V$. An internal current sink is switched to either output dependent on input logic conditions. The current sink may be turned off by appropriate inhibit input conditions.

features

- Tightly controlled output currents over temperature, V_{CC} , and common-mode variations

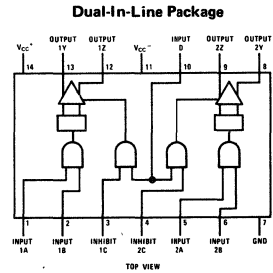
- High speed 15 ns max
- Wide output common-mode range
- High output impedance
- Inhibits for party-line applications
- Current sink outputs 6 or 12 mA
- Dual circuits
- Standard supply voltages $\pm 5V$
- Input clamp diodes
- 14 pin cavity or molded DIP

schematic diagram



Note 1: 1/2 of the dual circuit shown
 Note 2: * Indicates connections common to second half of circuit.

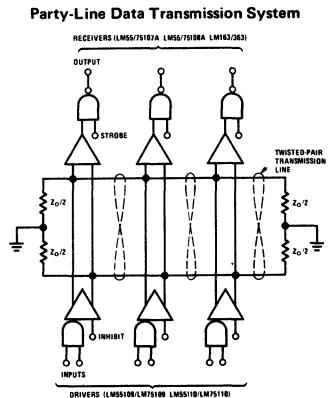
connection diagram



Order Number LM55109J, LM55110J,
 LM75109J, or LM75110J
 See Package 16

Order Number LM75109N or LM75110N
 See Package 22

typical application



LM55109/LM75109, LM55110/LM75110

4

absolute maximum ratings

Supply Voltage, V_{CC}^+	7V
Supply Voltage, V_{CC}^-	-7V
Logic and Inhibitor Input Voltages	5.5V
Common-mode Output Voltage	-5V to 12V
Storage Temperature Range	-65°C to +150°C
Power Dissipation	600 mW
Lead Temperature (Soldering, 10 sec)	300°C

operating conditions

	MIN	MAX	UNITS
Supply Voltage (V_{CC})			
LM55109, LM55110	4.5	5.5	V
LM75109, LM75110	4.75	5.25	V
Temperature (T_A)			
LM55109, LM55110	-55	+125	°C
LM75109, LM75110	0	+70	°C

dc electrical characteristics ($T_{MIN} \leq T_A \leq T_{MAX}$)

PARAMETER	CONDITIONS	LIMITS						UNITS
		LM55109/LM75109			LM55110/LM75110			
		MIN	TYP	MAX	MIN	TYP	MAX	
Positive Common Mode Output Voltage		0		10	0		10	V
Negative Common Mode Output Voltage		0		-3	0		-3	V
High Level Input Current Into 1A, 1B, 2A or 2B ($I_{IH(L)}$)	$V_{CC}^+ = \text{Max}, V_{CC}^- = \text{Max}, V_{IH(L)} = 2.4V$			40			40	μA
High Level Input Current Into 1A, 1B, 2A or 2B ($I_{IH(L)}$)	$V_{CC}^+ = \text{Max}, V_{CC}^- = \text{Max}, V_{IH(L)} = \text{Max } V_{CC}^+$			1			1	mA
Low Level Input Current Into 1A, 1B, 2A or 2B ($I_{IL(L)}$)	$V_{CC}^+ = \text{Max}, V_{CC}^- = \text{Max}, V_{IL(L)} = 0.4V$			-3			-3	mA
High Level Input Current Into 1C or 2C ($I_{IH(I)}$)	$V_{CC}^+ = \text{Max}, V_{CC}^- = \text{Max}, V_{IH(I)} = 2.4V$			40			40	μA
High Level Input Current Into 1C or 2C ($I_{IH(I)}$)	$V_{CC}^+ = \text{Max}, V_{CC}^- = \text{Max}, V_{IH(I)} = \text{Max } V_{CC}^+$			1			1	mA
Low Level Input Current Into 1C or 2C ($I_{IL(I)}$)	$V_{CC}^+ = \text{Max}, V_{CC}^- = \text{Max}, V_{IL(I)} = 0.4V$			-3			-3	mA
High Level Input Current Into D ($I_{IH(I)}$)	$V_{CC}^+ = \text{Max } V_{CC}^- = \text{Max}, V_{IH(I)} = 2.4V$			80			80	μA
High Level Input Current Into D ($I_{IH(I)}$)	$V_{CC}^+ = \text{Max}, V_{CC}^- = \text{Max}, V_{IH(I)} = \text{Max } V_{CC}^+$			2			2	mA
Low Level Input Current Into D ($I_{IL(I)}$)	$V_{CC}^+ = \text{Max}, V_{CC}^- = \text{Max}, V_{IL(I)} = 0.4V$			-6			-6	mA
On State Output Current ($I_{O(ON)}$)	$V_{CC}^+ = \text{Max}, V_{CC}^- = \text{Max}, V_{CC}^+ = \text{Min}, V_{CC}^- = \text{Max}$	3.5		7	6.5		15	mA mA
Off State Output Current ($I_{O(OFF)}$)	$V_{CC}^+ = \text{Min}, V_{CC}^- = \text{Min}$			100			100	μA
Supply Current From V_{CC}^+ With Driver Enabled ($I_{CC^+(ON)}$)	$V_{IL(L)} = 0.4V, V_{IH(I)} = 2V$		18	30		23	35	mA
Supply Current From V_{CC}^- With Driver Enabled ($I_{CC^-(ON)}$)	$V_{IL(L)} = 0.4V, V_{IH(I)} = 2V$		-18	-30		-34	-50	mA
Supply Current From V_{CC}^+ With Driver Inhibited ($I_{CC^+(OFF)}$)	$V_{IL(L)} = 0.4V, V_{IL(I)} = 0.4V$		18			21		mA
Supply Current From V_{CC}^- With Driver Inhibited ($I_{CC^-(OFF)}$)	$V_{IL(L)} = 0.4V, V_{IL(I)} = 0.4V$		-10			-17		mA
Input Clamp Voltage on Inputs or Inhibits (V_I)	$V_{CC}^+ = \text{Min}, V_{CC}^- = \text{Min}, I_{IN} = -12 \text{ mA}, T_A = 25^\circ C$		-1	-1.5		-1	-1.5	V

ac switching characteristics ($V_{CC}^+ = 5V, V_{CC}^- = 5V, T_A = 25^\circ C$)

PARAMETER	CONDITIONS	LIMITS						UNITS
		LM55109/LM75109			LM55110/LM75110			
		MIN	TYP	MAX	MIN	TYP	MAX	
Propagation Delay Time, Low to High Level, From Logic Input A or B to Output Y or Z ($t_{PLH(L)}$)	$R_L = 50\Omega, C_L = 40\text{ pF}$		9	15		9	15	ns
Propagation Delay Time, High to Low Level, From Logic Input A or B to Output Y or Z ($t_{PHL(L)}$)	$R_L = 50\Omega, C_L = 40\text{ pF}$		9	15		9	15	ns
Propagation Delay Time, Low to High Level, From Inhibitor Input C or D to Output Y or Z ($t_{PLH(I)}$)	$R_L = 50\Omega, C_L = 40\text{ pF}$		16	25		16	25	ns
Propagation Delay Time, High to Low Level, From Inhibitor Input C or D to Output Y or Z ($t_{PHL(I)}$)	$R_L = 50\Omega, C_L = 40\text{ pF}$		13	25		13	25	ns