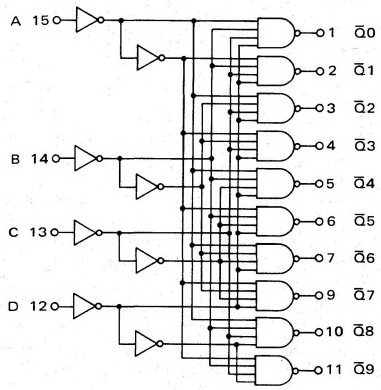
BCD TO ONE-OF-TEN
DECODER/DRIVERS

MC5445L • MC7445L,P*
MC54145L • MC74145L,P*



V_{CC} = Pin 16
GND = Pin 8

These devices are intended for use as drivers for indicators or relays, rather than drivers for MTTL logic gates, as is the case with the MC5442/7442, which is functionally identical. The output transistors of these devices are capable of sinking 80 mA, and have breakdown voltages of 30 V (MC5445/7445) and 15 V (MC54145/74145). The outputs are suitable for open-collector logic applications, and are compatible for interfacing with most MOS integrated circuits. Since full decoding is included, all outputs remain off for non-BCD inputs

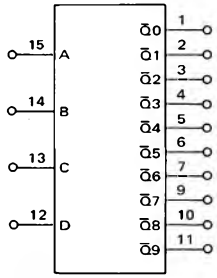
Total Power Dissipation = 215 mW typ/pkg
Propagation Delay Time = 50 ns max

INPUTS				OUTPUTS									
D	C	B	A	Q̄9	Q̄8	Q̄7	Q̄6	Q̄5	Q̄4	Q̄3	Q̄2	Q̄1	Q̄0
0	0	0	0	1	1	1	1	1	1	1	1	1	0
0	0	0	1	1	1	1	1	1	1	1	1	0	1
0	0	1	0	1	1	1	1	1	1	1	0	1	1
0	0	1	1	1	1	1	1	1	1	0	1	1	1
0	1	0	0	1	1	1	1	1	0	1	1	1	1
0	1	0	1	1	1	1	1	0	1	1	1	1	1
0	1	1	0	1	1	1	0	1	1	1	1	1	1
0	1	1	1	1	1	0	1	1	1	1	1	1	1
1	0	0	0	1	0	1	1	1	1	1	1	1	1
1	0	0	1	0	1	1	1	1	1	1	1	1	1
1	0	1	0	1	1	1	1	1	1	1	1	1	1
1	0	1	1	1	1	1	1	1	1	1	1	1	1
1	1	0	0	1	1	1	1	1	1	1	1	1	1
1	1	0	1	1	1	1	1	1	1	1	1	1	1
1	1	1	0	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1	1

*L suffix = 16-pin dual in-line ceramic package (Case 620).
P suffix = 16-pin dual in-line plastic package (Case 612).

ELECTRICAL CHARACTERISTICS

Test procedures are shown for only one input and one output. Test other inputs and outputs in the same manner according to the truth table. Test all input-output combinations according to the truth table.

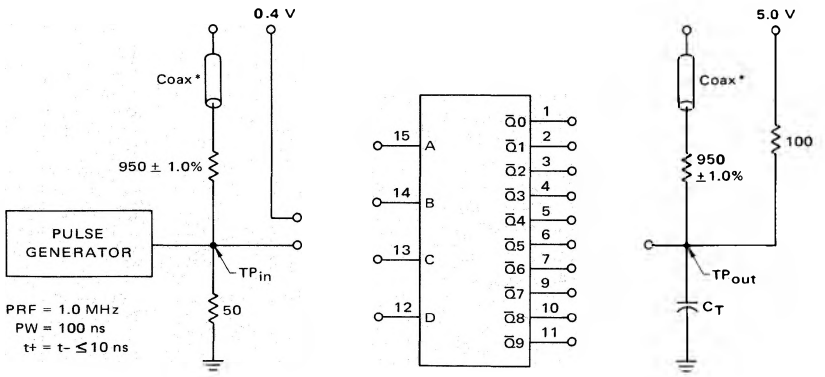


	TEST CURRENT/VOLTAGE VALUES (All Temperatures)											
	mA			Volts								
	I_{OL1}	I_{OL2}	I_{CEX}	V_{IL}	V_{IH}	V_{IHH}	$V_{th\,1}$	$V_{th\,0}$	V_{CC}	V_{CCL}	V_{CCH}	
MC5445, MC54145	20	80	0.25	0.4	2.4	5.5	2.0	0.8	5.0	4.5	5.5	
MC7445, MC74145	20	80	0.25	0.4	2.4	5.5	2.0	0.8	5.0	4.75	5.25	

Characteristic	Symbol	Pin Under Test	MC5445/MC54145 Test Limits -55 to +125°C			MC7445/MC74145 Test Limits 0 to +70°C			TEST CURRENT/VOLTAGE APPLIED TO PINS LISTED BELOW:										Gnd
			Min	Max	Unit	Min	Max	Unit	I_{OL1}	I_{OL2}	I_{CEX}	V_{IL}	V_{IH}	V_{IHH}	$V_{th\,1}$	$V_{th\,0}$	V_{CC}	V_{CCL}	V_{CCH}	
Input																			
Forward Current	I_F	12	–	-1.6	mAdc	–	-1.6	mAdc	–	–	–	12	–	–	–	–	–	–	16	8
Leakage Current	I_{R1}	12	–	40	µAdc	–	40	µAdc	–	–	–	–	12	–	–	–	–	–	16	8
	I_{R2}	12	–	1.0	mAdc	–	1.0	mAdc	–	–	–	–	–	12	–	–	–	–	16	8
Output																			
Output Voltage	V_{OL}	1	–	0.9	Vdc	–	0.9	Vdc	–	1	–	–	–	–	–	12,13,14,15	–	16	–	8
		1	–	0.4	Vdc	–	0.4	Vdc	1	–	–	–	–	–	–	12,13,14,15	–	16	–	8
MC5445/7445	V_{CEX}	1	30	–	Vdc	30	–	Vdc	–	–	1	–	–	–	12,13,14,15	–	–	–	16	8
MC54145/74145		1	15	–	Vdc	15	–	Vdc	–	–	1	–	–	–	12,13,14,15	–	–	–	16	8
Power Requirements (Total Device)																			
Power Supply Drain	I_{PD}	16	–	62	mAdc	–	70	mAdc	–	–	–	–	–	–	–	–	–	–	16	8,12,13,14,15
Switching Parameters									Pulse In		Pulse Out								
Turn-On Delay	t_{pd-}	15,1	–	50#	ns	–	50#	ns	15		1	12,13,14	–	–	–	–	16	–	–	8
Turn-Off Delay	t_{pd+}	15,1	–	50#	ns	–	50#	ns	15		1	12,13,14	–	–	–	–	16	–	–	8

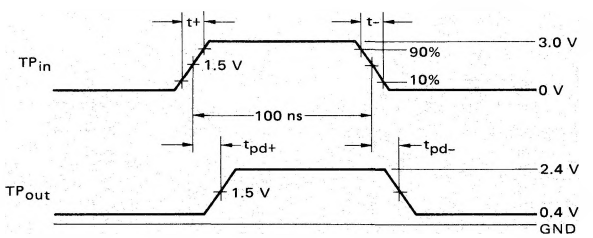
#Tested only at 25°C.

SWITCHING TIME TEST CIRCUIT AND VOLTAGE WAVEFORMS



C_T = 15 pF = total parasitic capacitance, which includes probe and wiring capacitances.

*The coax delays from input to scope and output to scope must be matched. The scope must be terminated in 50-ohm impedance. The 950-ohm resistor and the scope termination impedance constitute a 20:1 attenuator probe. Coax shall be CT-070-50 or equivalent.



TYPICAL APPLICATIONS

Two MC5445/7445 or MC54145/74145 decoder/drivers (depending on drive requirements) may be used to perform 4-line to 16-line decoding. Data inputs A, B, and C are applied to both decoder/drivers, while input D is applied to one decoder and $\overline{D}$ to the other. (See Figure 1.)

In addition to the obvious decoder applications, these circuits can also be used for data distribution (Figure 2). Inputs A, B, and C of the decoder/driver are used as control inputs, while the D input serves as the data input. In a typical compound data routing application, origin data is selected by the control inputs of the MC54151/74151 8-channel data selector. The data is then routed to the proper destination by means of the MC5445/7445 decoder/driver control lines.

FIGURE 1 – BINARY-TO-DECIMAL DECODING USING MC5445/7445 OR MC54145/74145

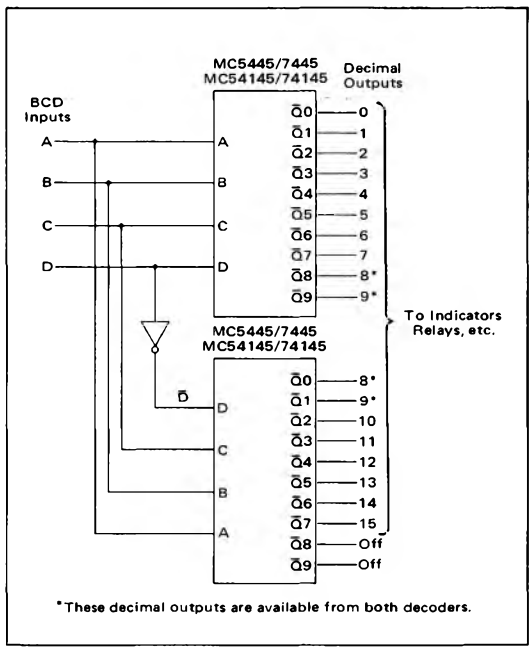


FIGURE 2 – COMPOUND DATA ROUTING USING MC5445/7445