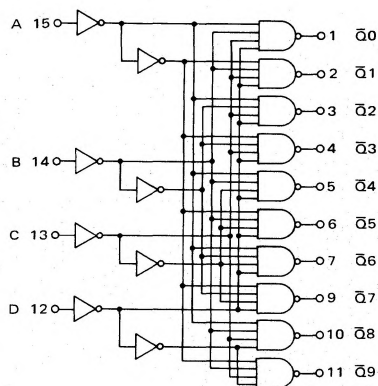


BCD TO ONE-OF-TEN
DECODER/DRIVERS

MC5400/7400 series

MC54145L • MC74145L,P*
MC5445L • MC7445L,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

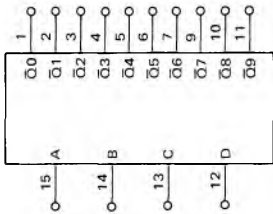
Total Power Dissipation = 215 mW typ/pkg
Propagation Delay Time = 50 ns max

INPUTS				OUTPUTS									
D	C	B	A	Q9	Q8	Q7	Q6	Q5	Q4	Q3	Q2	Q1	Q0
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														
					IOL1	IOL2	ICEX	VIL	VIH	VIHH	Vth1	Vth0	VCC	VCCL	VCCH				
MC5445, MC54145 MC7445, MC74145			20	80	0.25	0.4	2.4	5.5	2.0	0.8	5.0	4.5	5.5						
			20	80	0.25	0.4	2.4	5.5	2.0	0.8	5.0	4.75	5.25						
			TEST CURRENT/VOLTAGE APPLIED TO PINS LISTED BELOW:																
Characteristic	Symbol	Pin Under Test	MC5445/MC54145 Test Limits -55 to +125°C				MC7445/MC74145 Test Limits 0 to +70°C												
			Min	Max	Unit	Min	Max	Unit	IOL1	IOL2	ICEX	VIL	VIH	VIHH	Vth1	Vth0	VCC	VCCL	VCCH
Input	Forward Current	IF	12	-	-1.6	mAdc	-	-1.6	mAdc	-	12	-	-	-	-	-	-	16	8
	Leakage Current	IR1	12	-	40	µAdc	-	40	µAdc	-	-	12	-	-	-	-	-	16	8
		IR2	12	-	1.0	mAdc	-	1.0	mAdc	-	-	-	12	-	-	-	-	16	8
Output	Output Voltage	VOL	1	-	0.9	Vdc	-	0.9	Vdc	-	-	-	-	-	-	12,13,14,15	16	-	8
			1	-	0.4	Vdc	-	0.4	Vdc	1	-	-	-	-	-	12,13,14,15	16	-	8
MC5445/7445 MC54145/74145	VCEX	1	30	-	Vdc	30	-	Vdc	-	1	-	-	-	-	12,13,14,15	-	-	16	8
		1	15	-	Vdc	15	-	Vdc	-	1	-	-	-	-	12,13,14,15	-	-	16	8
Power Requirements (Total Device)																			
Power Supply Drain			16	-	62	mAdc	-	70	mAdc	-	-	-	-	-	-	-	-	16	8,12,13,14,15
Switching Parameters																			
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.																			

#Tested only at 25°C.

MC54145L, MC74145L,P/MC5445L, MC7445L,P (continued)

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 $\bar{D}$ 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

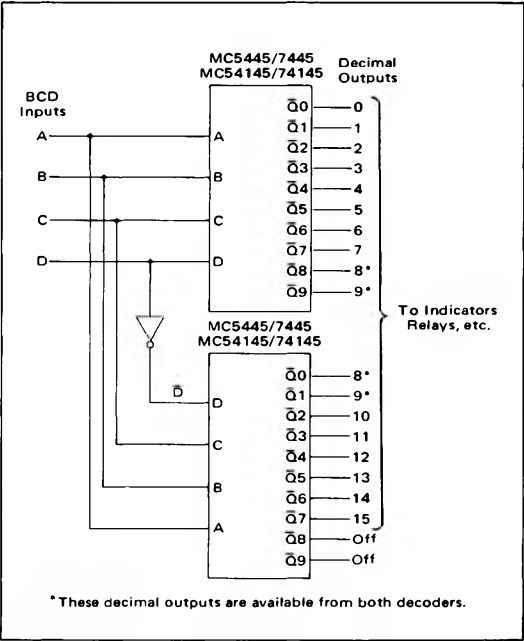
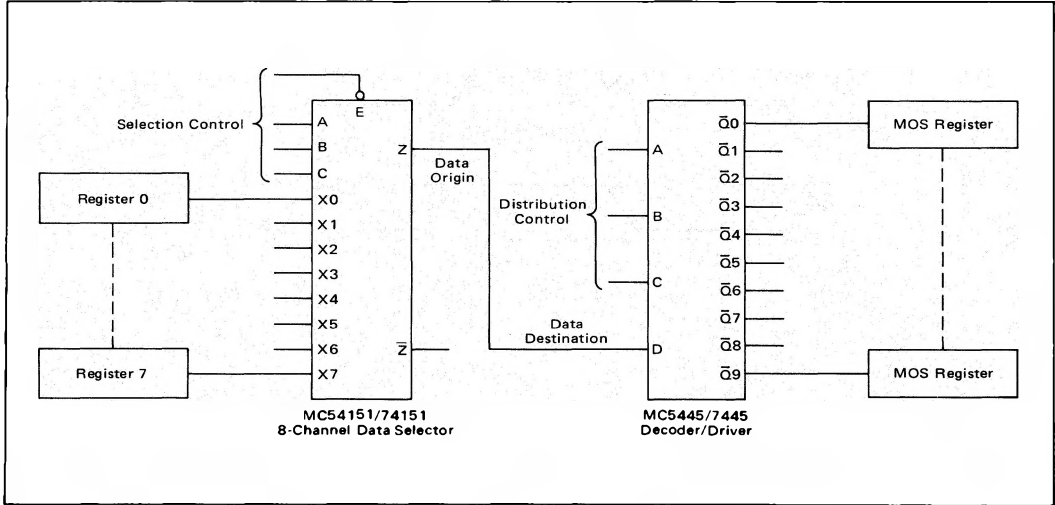
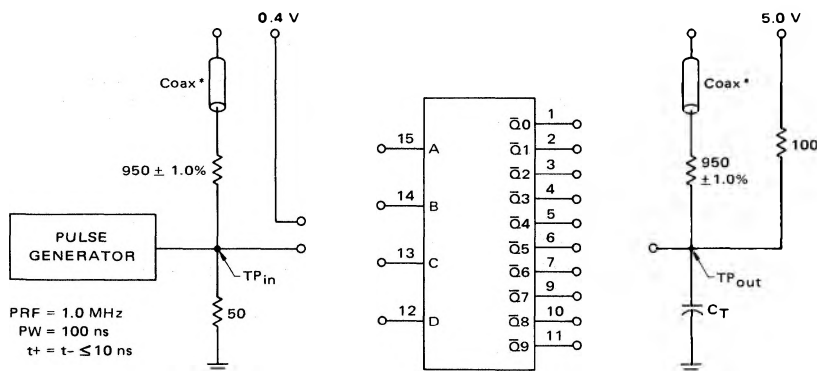


FIGURE 2 – COMPOUND DATA ROUTING USING MC5445/7445



MC54145L, MC74145L,P/MC5445L, MC7445L,P (continued)

SWITCHING TIME TEST CIRCUIT AND VOLTAGE WAVEFORMS



$C_T = 15 \text{ pF}$ = 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.

