74142 BCD Counter/4-Bit Latch/BCD Decoder/Driver

	Schottky TTL					High-Speed TTL					Low-Power Schottky TTL					Standard TTL					Low-Power TTL				
	Device Type	Package				Device Type	Package				Device Type	Package				Device Type	Package				Device Type	Package			
		C	P	M	CF		C	P	M	CF		C	P	M	CF		C	P	M	CF		C	P	M	CF
T.I.																SN74142		J ① N ①							
FAIRCHILD																									
MOTOROLA																									
N. S. C.																									
PHILIPS																									
SIGNETICS																									
SIEMENS																FLL151		①							
FUJITSU																									
HITACHI																									
MITSUBISHI																									
NEC																									
TOSHIBA																									

Electrical Characteristics SN74142

absolute maximum ratings over operating free-air temperature range

Supply voltage, V_{CC}	7V	Operating free-air temperature range	SN74'	0°C to 70°C
Input voltage	5.5V			
Off-state current into outputs 0 thru 9	1mA	Storage temperature range		−65°C to 150°C

recommended operating conditions

		SN74142 MIN	NOM	MAX	UNIT
Supply voltage, V_{CC}		4.75	5	5.25	V
High-level output current from $\bar{Q}_D$, I_{OH}				−400	μA
Low-level output current from $\bar{Q}_D$, I_{OL}				8	mA
Input clock frequency, f_{clock}		0		20	MHz
Clock pulse width, $t_{w(clock)}$	High logic level	15			ns
	Low logic level	35			
Clear pulse width, $t_{w(clear)}$		25			ns
Strobe pulse width, $t_{w(strobe)}$		20			ns
Clear inactive-state setup time, t_{setup}		20			ns
Strobe time, t_{strobe}		45		$t_{w(clock)}+10$	ns
Operating free-air temperature, T_A		0		70	°C

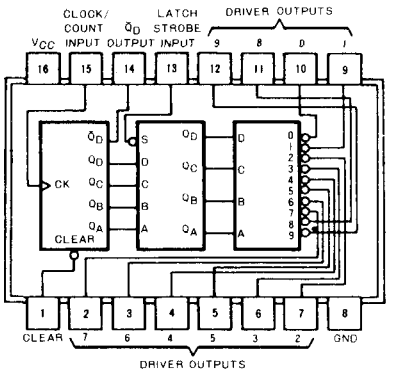
electrical characteristics over recommended operating free-air temperature range

PARAMETER		TEST CONDITIONS †	MIN	TYP‡	MAX	UNIT
V_{IH}	High-level input voltage		2			V
V_{IL}	Low-level input voltage				0.8	V
V_I	Input clamp voltage	V_{CC} = MIN, I_I = −12mA			−1.5	V
V_{OH}	High-level $\bar{Q}_D$ output voltage	V_{CC} = MIN, I_{OH} = −400μA	2.4	3.4		V
V_{OL}	Low-level $\bar{Q}_D$ output voltage	V_{CC} = MIN, I_{OL} = 8mA		0.2	0.4	V
$V_{O(on)}$	On-state voltage, outputs 0 thru 9	V_{CC} = MIN, I_O = 7mA			2.5	V
$V_{O(off)}$	Off-state voltage, outputs 0 thru 9	V_{CC} = MAX, I_O = 0.5mA	60			V
$I_{O(off)}$	Off-state current, outputs 0 thru 9	V_{CC} = MAX, V_O = 55V			50	μA
I_I	Input current at maximum input voltage	V_{CC} = MAX, V_I = 5.5V			1	mA
I_{IH}	High-level input current	V_{CC} = MAX, V_I = 2.4V			40	μA
I_{IL}	Low-level input current	V_{CC} = MAX, V_I = 0.4V			−1.6	mA
I_{OS}	Short-circuit $\bar{Q}_D$ output current	V_{CC} = MAX	−18		−55	mA
I_{CC}	Supply current	V_{CC} = MAX, All outputs open		68	102	mA
t_{PLH}	Propagation delay time, low-to-high-level $\bar{Q}_D$ output from clock	V_{CC} = 5V, T_A = 25°C, C_L = 15pF, R_L = 800Ω		35	55	ns
t_{PHL}	Propagation delay time, high-to-low-level $\bar{Q}_D$ output from clock			30	45	
t_{PLH}	Propagation delay time, low-to-high-level $\bar{Q}_D$ output from clear			30	45	ns

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.
‡ All typical values are at V_{CC} = 5V, T_A = 25°C.

Pin Assignment (Top View)

①



positive logic: see function table

Function Table

'142

INPUTS			OUTPUTS	
COUNT PULSE (CLOCK)	CLEAR	LATCH STROBE	ON †	$\bar{Q}_D$
X	L	L	0	H
1	H	L	1	H
2	H	L	2	H
3	H	L	3	H
4	H	L	4	H
5	H	L	5	H
6	H	L	6	H
7	H	L	7	H
8	H	L	8	L
9	H	L	9	L
10	H	L	0	H
11	H	H	0	H

† All other outputs are off.
H = high level, L = low level, X = irrelevant