

### Dual J-K̄ Flip-Flop with Set and Reset

The CD54HC109F3A and CD54HCT109F3A are dual J-K̄ flip-flops with set and reset. The flip-flop changes state with the positive transition of Clock (1CP and 2CP).

The flip-flop is set and reset by active-low  $\bar{S}$  and  $\bar{R}$ , respectively. A low on both the set and reset inputs simultaneously will force both Q and  $\bar{Q}$  outputs high. However, both set and reset going high simultaneously results in an unpredictable output condition.

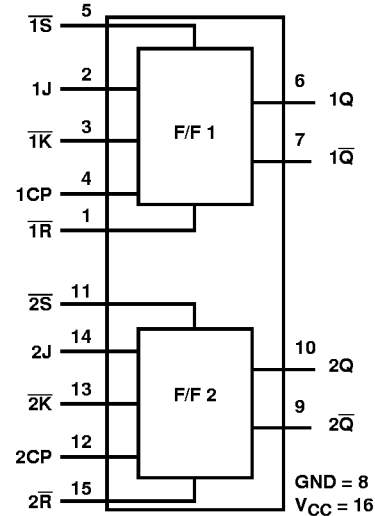
HCT INPUT LOAD TABLE

INPUT	UNIT LOAD (NOTE 1)
All	0.3

NOTE:

- Unit load is  $\Delta I_{CC}$  limit specified in DC Electrical Specifications Table, e.g., 360 $\mu$ A Max at +25°C.

### Functional Diagram



### Absolute Maximum Ratings

DC Supply Voltage,  $V_{CC}$   
 Voltages Referenced to GND. . . . . -0.5V to +7.0V  
 DC Input Voltage Range, All Inputs,  $V_{IN}$  . . . . . -0.5V to  $V_{CC} + 0.5V$   
 DC Output Voltage Range, All Outputs,  $V_{OUT}$  . . -0.5V to  $V_{CC} + 0.5V$   
 DC Input Diode Current,  $I_{IK}$   
 For  $V_I < -0.5V$  or  $V_I > V_{CC} + 0.5V$  . . . . .  $\pm 20mA$   
 DC Output Diode Current,  $I_{OK}$   
 For  $V_O < -0.5V$  or  $V_O > V_{CC} + 0.5V$  . . . . .  $\pm 20mA$   
 DC Drain Current, Per Output,  $I_O$ , For  $-0.5V < V_O < V_{CC} + 0.5V$   
 Standard Output . . . . .  $\pm 25mA$   
 Bus Driver Output . . . . .  $\pm 35mA$   
 DC  $V_{CC}$  or GND Current,  $I_{CC}$   
 Standard Output . . . . .  $\pm 50mA$   
 Bus Driver Output . . . . .  $\pm 70mA$

Power Dissipation Per Package,  $P_D$   
 $T_A = -55^\circ C$  to  $+100^\circ C$  (Package F) . . . . . 500mW  
 $T_A = +100^\circ C$  to  $+125^\circ C$  (Package F) . . . . . Derate Linearly at  
 8mW/ $^\circ C$  to 300mW

Operating Temperature Range,  $T_A$   
 Package Type F . . . . .  $-55^\circ C$  to  $+125^\circ C$   
 Storage Temperature,  $T_{STG}$  . . . . .  $-65^\circ C$  to  $+150^\circ C$   
 Lead Temperature (During Soldering)  
 At Distance 1/16in.  $\pm$  1/32in. (1.59mm  $\pm$  0.79mm)  
 From Case For 10s Max . . . . .  $+265^\circ C$   
 Unit Inserted Into a PC Board (Min Thickness 1/16in., 1.59mm)  
 With Solder Contacting Lead Tips Only . . . . .  $+300^\circ C$

CAUTION: Stresses above those listed in "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.

### Recommended Operating Conditions

Supply Voltage Range,  $V_{CC}$   
 $T_A$  = Full Package Temperature Range  
 CD54HC Types . . . . . 2V to 6V  
 CD54HCT Types . . . . . 4.5V to 5.5V  
 DC Input or Output Voltage,  $V_{IN}$ ,  $V_{OUT}$  . . . . . 0V to  $V_{CC}$

Operating Temperature Range,  $T_A$  . . . . .  $-55^\circ C$  to  $+125^\circ C$   
 Input Rise and Fall Times,  $t_R$ ,  $t_F$   
 at 2V . . . . . 0ns to 1000ns  
 at 4.5V . . . . . 0ns to 500ns  
 at 6V . . . . . 0ns to 400ns