

5474 FAMILIES OF COMPATIBLE TTL CIRCUITS

absolute maximum ratings over operating free-air temperature range (unless otherwise noted)

	54 FAMILY	SERIES 54 SERIES 54H	SERIES 54L	SERIES 54LS	SERIES 54LS	SERIES 54S	UNIT
	74 FAMILY	SERIES 74 SERIES 74H	SERIES 74L	SERIES 74LS WITH DIODE INPUTS	SERIES 74LS WITH EMITTER INPUTS	SERIES 74S	
Supply voltage, V_{CC} (see Note 1)		7	8	7	7	7	V
Input voltage		5.5	5.5	7	5.5	5.5	V
Interemitter voltage (see Note 2)		5.5	5.5		5.5	5.5	V
Off-state (high-level) voltage applied to open-collector outputs of SSI circuits (see Note 3)	'06, '07	30					V
	'16, '17, '26	15					
	Others		8	7	7	7	
High-level voltage applied to a disabled 3-state output		5.5		5.5	5.5	5.5	V
Operating free-air temperature range	54 Family	-55 to 125					°C
	74 Family	0 to 70					
Storage temperature range		-65 to 150					°C

- NOTES: 1. Voltage values, unless otherwise noted, are with respect to network ground terminal.
 2. This is the voltage between two emitters of a multiple-emitter transistor. This rating applies between inputs that go directly into the same $\overline{\text{AND}}$ or NAND gate in the functional block diagram.
 3. Ratings for MSI parts are given on the individual data sheets.

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unused inputs of positive-AND/NAND gates

For optimum switching times and minimum noise susceptibility, unused inputs of AND or NAND gates should be maintained at a voltage greater than $V_{OH\ min}$ (see tables of electrical characteristics), but not to exceed the absolute maximum rating. This eliminates the distributed capacitance associated with the floating input, bond wire, and package lead, and ensures that no degradation will occur in the propagation delay times. Some possible ways of handling unused inputs are:

- Connect unused inputs to an independent supply voltage. Preferably, this voltage should be between $V_{OH\ min}$ and 4.5 V. Series 54LS/74LS devices with diode inputs may be connected directly to V_{CC} .
- Connect unused inputs to a used input if maximum drive capability of the driving output will not be exceeded. Each additional input presents a full load to the driving output at a high-level voltage but adds no loading at a low-level voltage.
- Connect unused inputs to V_{CC} through a 1-k Ω resistor so that if a transient that exceeds the input maximum rating should occur, the impedance will be high enough to protect the input. One to 25 unused inputs may be connected to each 1-k Ω resistor. Series 54LS/74LS devices with diode inputs may be connected directly to V_{CC} .
- Connect unused inputs to any fixed-high-level compatible output such as the output of an inverter or NAND gate that has its input(s) grounded. Maximum high-level drive capability of the output should not be exceeded.