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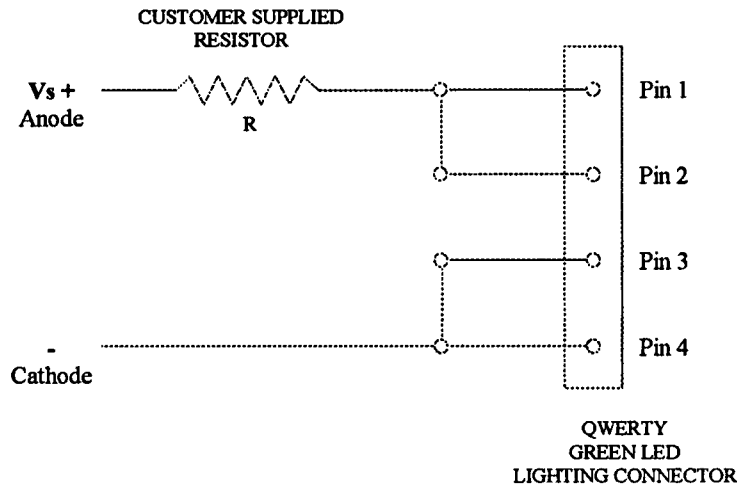
A Components Corporation of America Company

TECHNICAL BULLETIN TB-144

LED LIGHTING REQUIREMENTS OF QWERTY KEYPADS

Recommended Power Supply and Resistor to Simultaneously Light All Pushbuttons

The keypad may be lighted using various voltage sources as long as a current limiting circuit is provided. The recommended current limiting circuit includes user-supplied resistor as shown on the following figure. The V_s is the voltage source, and pin 1 through pin 4 are the pins of green LED lighting connector. By using this method, all pushbuttons are lighted simultaneously as V_s is applied.



The recommended resistor value (R) and minimum resistor power rating (P_R) for a given power supply voltage source (V_s) are shown on the following table. Also shown are the minimum power supply power rating (P_s).

DC POWER SUPPLY		RESISTOR		KEYPAD i (A)	LED V_L (V)
V_s (V)	P_s min (W)	R (OHM)	P_R min (W)		
2	3.16	0.000	0.00	1.58	2.0
5	7.90	1.899	4.74	1.58	2.0
12	18.96	6.329	15.80	1.58	2.0
14	22.12	7.595	18.96	1.58	2.0
28	44.24	16.456	41.08	1.58	2.0

If the voltage source is not listed on the table, the minimum power supply power rating, resistor value, and the minimum resistor power rating are determined by evaluating the equations which follow. The following equations are derived for a green lighted Qwerty keypad that requires 1.58 A typical current (i), and 2.0 V LED forward voltage (V_L).

$$R = \frac{V_s - V_L}{i}$$

$$P_R = i^2 R$$

$$P_s = i V_s$$

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