onsemi

LEDMODULE v2.0

Intelligent LED Load

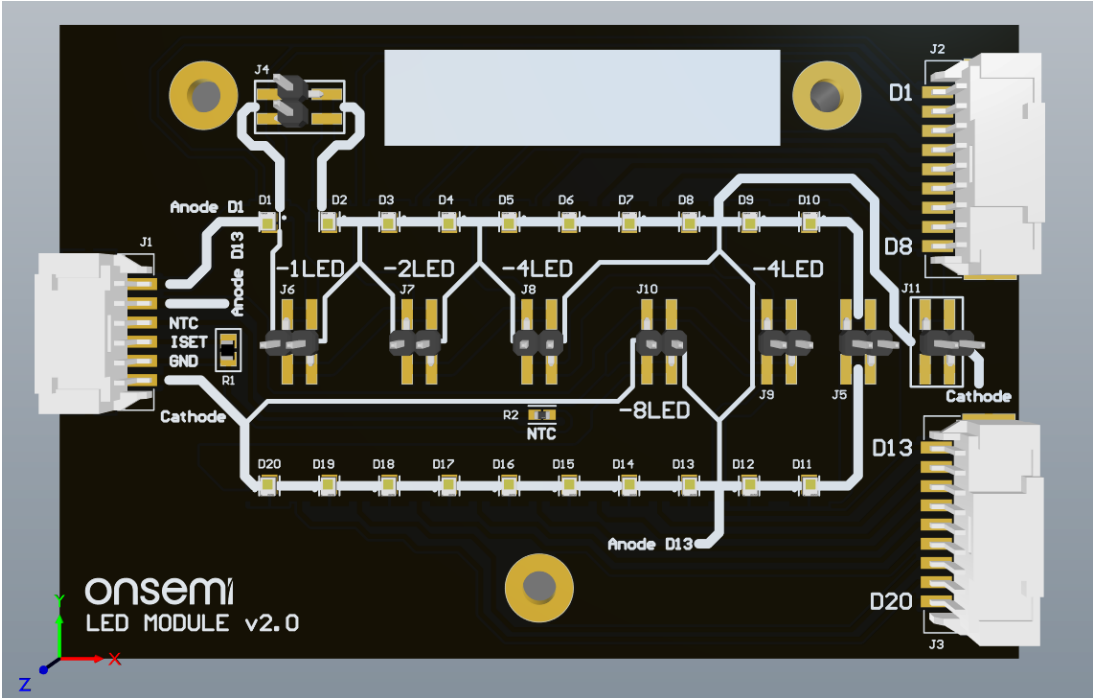# LED MODULE v2.0

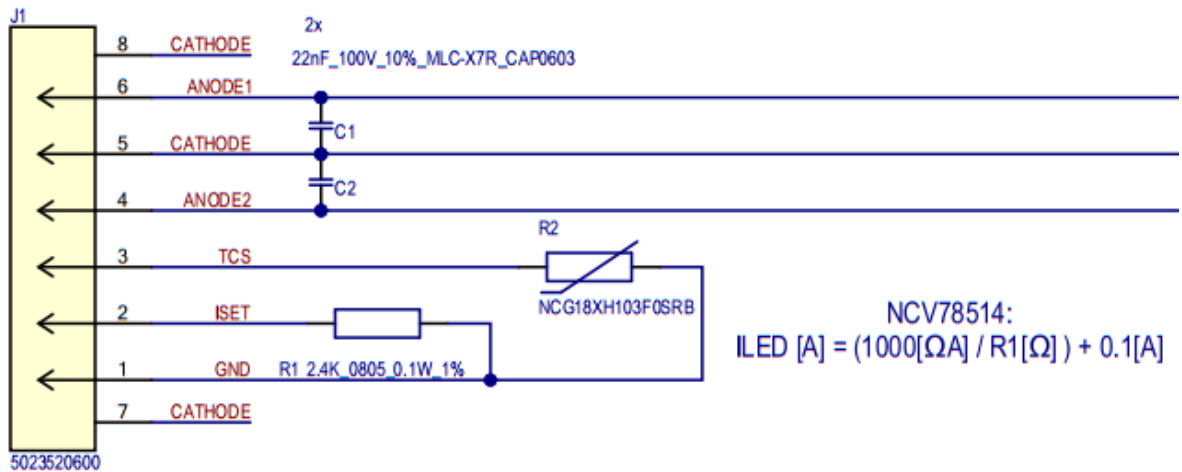*Figure 1: Photo of LED module*

Schematic

Figure 2:LED MODULE v2.0 schematic part I.

Figure 3:LED MODULE v2.0 schematic part II.

Pinout – connector J1

pin	function	Note
1	GND	Gnd for pins 2,3
2	ISET	Connection for ISET resistor
3	TCS	Connection for temperature sensor
4	ANODE2	Anode D13
5	CATHODE	Common LED string Cathode
6	ANODE1	Anode D1
7,8	Mechanical	Mechanical pads no electric function

Pinout – connector J2 & J3

Pin	Function J2	Function J3
1	Cathode D8	Cathode D20
2	Anode D8	Anode D20
3	Anode D7	Anode D19
4	Anode D6	Anode D18
5	Anode D5	Anode D17
6	Anode D4	Anode D16
7	Anode D3	Anode D15
8	Anode D2	Anode D14
9	Anode D1	Anode D13
10, 11	Mechanical pads no electric function	Mechanical pads no electric function

LED configuration table

# LEDs	J6 (-1LED)	J7 (-2LED)	J8 (-4LED)	J9 (-4LED)	J10 (-8LED)	J4	J5	J11
1	closed	closed	closed	closed	closed	closed	closed	open
2	open	closed	closed	closed	closed	closed	closed	open
3	closed	open	closed	closed	closed	closed	closed	open
4	open	open	closed	closed	closed	closed	closed	open
5	closed	closed	open	closed	closed	closed	closed	open
6	open	closed	open	closed	closed	closed	closed	open
7	closed	open	open	closed	closed	closed	closed	open
8	open	open	open	closed	closed	closed	closed	open
9	closed	closed	open	open	closed	closed	closed	open
10	open	open	open	open	closed	closed	closed	open
11	closed	open	open	open	closed	closed	closed	open
12	open	open	open	open	closed	closed	closed	open
13	closed	closed	closed	open	open	closed	closed	open
14	open	closed	closed	open	open	closed	closed	open
15	closed	closed	closed	closed	closed	closed	closed	open
16	open	open	closed	open	open	closed	closed	open
17	closed	closed	open	open	open	closed	closed	open
18	open	closed	open	open	open	closed	closed	open
19	closed	open	open	open	open	closed	closed	open
20	open	open	open	open	open	closed	closed	open

LED MODULE v2.0 description

The LED MODULE v2.0 is designed to simulate various loads ranging from 1 to 20 LEDs. By shorting specific jumpers, sections of the LED string can be bypassed, effectively reducing the number of active LEDs. This allows for flexible configuration of the LED string length. The module can be divided into two independent strings, with LEDs D1-D8 and D13-D20 individually controlled by a pixel controller.

The LED MODULE v2.0 includes a current-setting resistor (R1) and a temperature-sensing thermistor (R2), which are used by the NCV78514 to adjust the LED string current in case of overheating. These resistors can be placed either on the evaluation kit (EVK) module or the LED module. However, ensure that the resistor and thermistor are not placed on both the LED module and the evaluation module simultaneously. The positions are duplicated to accommodate driving other LED loads that do not have positions for the ISET and TCS components.

To change the LED current, use equation (1) below (based on NCV78514 LED driver):

$$ILED\ [A] = \frac{1000\ [\Omega \cdot A]}{RSET\ [\Omega]} + 0.1\ [A] \tag{1}$$

The measured resistance of thermistor (NCG18XH103F0SRB) changes with temperature as (2)

$$ILED\ [A] = \frac{1000\ [\Omega \cdot A]}{RSET\ [\Omega]} + 0.1\ [A] \tag{2}$$

The following table characterizes the thermistor.

Parameter	Value
Resistance @ 25 °C	10 kΩ
Resistance tolerance	± 1%
B-Constant (25/50℃)	3380K
B-Constant (25/50℃) Tolerance	±1%
B-Constant(25/80℃)	3428K
B-Constant(25/85℃)	3434K
B-Constant(25/100℃)	3455K

Temperature estimation can be done by equation 3.

$$T\ [K] = \frac{T_0\ [K] \cdot B\ [K]}{T_0\ [K] \ln\left(\frac{R[\Omega]}{R_0[\Omega]}\right) + B\ [K]} \tag{3}$$

Technical support

In case of any issue with the evaluation kit, please contact:

Martin.Rejthar@onsemi.com

The latest release of datasheet can be found on onsemi.com > LINK