CL-50 Energy Harvesting Module





Piezo electric devices, such as the MFC, generate an electric charge, which is proportional to the induced strain. The CL-50 is an interface between the high impedance source characteristic of piezo electric devices and various user applications. In most cases these user applications are microcontroller based electronics.

The CL-50 collects, stores and conditions the generated charge energy and provides a 3.3V stabilized DC output. The CL-50 consists of :

- An impedance matching for the piezo generators
- A bridge rectifier
- An energy storage
- A 3.3V DC output stabilization

CL-50 Specifications

Electrical	$V_{out} = 3.3V$
	I _{out max} = 40mA
	$W_{out max} = 0.5$ to 2 mJ (mWs)
	Plug 2.54mm pitch AMP connector
Mechanical	Length 47mm
	Width 22mm
	Depth 5mm
Temperature	0°C to 75°C

How to use the CL-50

Connect the MFC or any other piezo electric device to the "MFC in" connectors without preferred polarity. The user's application power supply input should be connected to V+ and GND. The

electric charge generated during straining the piezo electric device is temporarily stored in the module until it reaches a minimum energy level. After reaching the min. level the output of the module is enabled and 3.3V is supplied for the time the minimum energy is generated to satisfy output power consumption. The "On" time depends on the user application's current consumption and can be calculated as t= W_{out} /(3.3V * I_{app}).



If output consumption is higher than W_{out} (the harvester output) the output is disabled. After the output voltage is disabled, depending on the energy delivery of the MFC or piezo electric device, the output will be enabled again after a certain time period. This time period can be used to calculate the required energy input from the piezo electric generator.

Make sure the EN pin starts at high (not pulled to low). When pulled low, all the stored energy is transferred to the output until the internal accumulator is empty. The module will only start collecting energy from the MFC or piezo electric device when the EN is high.



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