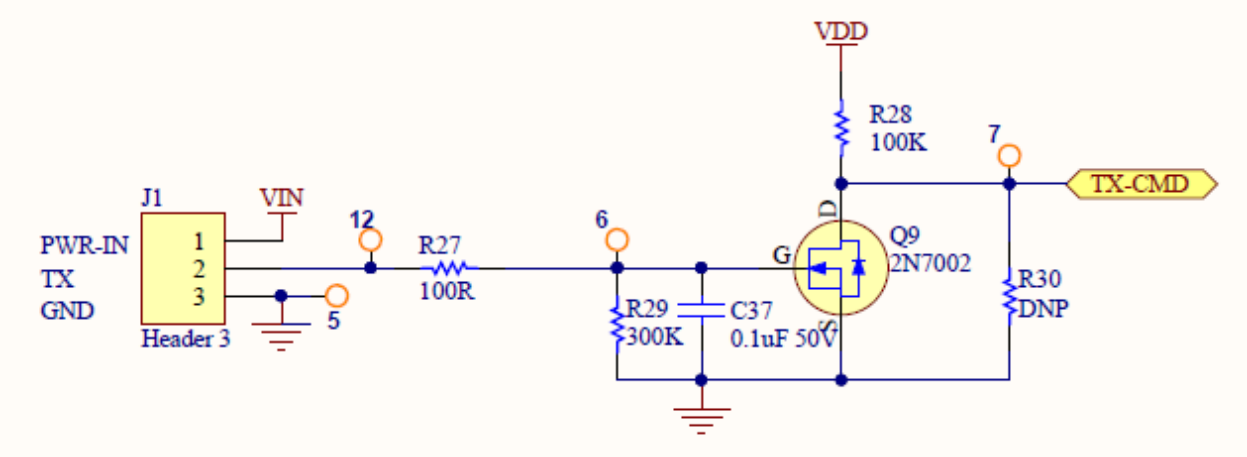
Theory of operation, WTC TX

The WTC TX module is a self-contained 433 MHz transmitter requiring only a 5 – 25 VDC power input and a 5-20VDC transmit enable signal. The module includes a linear regulator to adapt and condition the input power for the module circuitry. The module is intended to be employed in power tools where power and the enable signal originates from the power tool control module and the enable signal indicates the run/not run status of the tool.

When the transmit enable signal of the module is pulled high (not left floating or pulled to ground) the module broadcasts a fixed pre-programmed data packet. The prefix of the data packet is the target address of the paired receiver. Receivers are paired in a manner similar to Bluetooth device pairing. If the transmit signal is sustained the same data packet is transmitted every 10 seconds. Whenever the transmit signal is disabled, a different data packet is sent for one transmission cycle.

In a typical configuration, a constant voltage of +5VDC is applied to J1-Pin 1 and GND applied to J1-Pin 3. When the tool is not operating, J1-Pin2 is pulled to GND by an external circuit. When the tool begins operation, the voltage on J1-Pin2 is transitioned from GND to +5VDC and held high. Once operation ceases, the voltage is then transitioned back to GND. The system then waits 1 second and goes to sleep awaiting another transition.



The 433 MHz is intended to broadcast simple messaging from a power tool to a paired remote accessory that can react to the status changes indicated by the power tool. Specifically, a power tool that creates concrete dust, saw dust, or other fine particulate can indicate operation to a remote vacuum to automatically activate it when the tool is operating, and thus creating the dust. Though wirelessly enabled, the system is for practical use in close proximity because of the low power of the transmitter.