Advanced Pulse WattNode - Option SSR (Solid-State Relay)

Option SSR is recommended whenever the WattNode pulse output channels must switch more than 5-8 milliamps.

Option SSR replaces the standard pulse output optoisolators with opto-MOS solid-state relays (SSR) that are capable of driving much higher output currents. The SSRs can handle both positive and negative voltages, so they can be used to switch AC voltages. SSRs have a much lower effective resistance when they are conducting, so the voltage drop across the output can be lower. On the down side, SSRs are much slower to switch and have somewhat higher leakage current.

Details

Isolation: 5000 VAC RMS

Breakdown Voltage: ±60 VDC or 40 VAC; can switch positive, negative or AC voltages

The pulse outputs can safely switch 40 VDC (positive or negative) and up to 30 VAC.

Maximum Leakage (Off) Current: 1000nA (1µA)

The leakage current generally isn't important, but if you are using an Option SSR pulse output channel with a pull-up or pull-down resistor, you should select a resistor value so that the "on current" is at least five times higher than the leakage current. For example, if you are using the pulse output to switch a 5V signal, you should use a pull-up resistor of one mega-ohm or smaller to ensure the leakage doesn't cause problems.

Note: the leakage current will generally only reach 1µA at maximum operating temperature.

On Resistance: 1.0 to 2.5 ohms

The low on-resistance of the SSR allows switching much higher currents and results in smaller voltage drops across the pulse terminals.

For example, with a standard optoisolator output, at 5 mA of current, the voltage drop across the terminals will be approximately 220 millivolts.

By comparison, with the SSR outputs, at 5 mA of current, the voltage drop across the terminals will be between 5 mV and 12 mV.

Maximum Load Current: 500 mA

With Option SSR, the WattNode can switch currents up to 500 milliamps. By comparison, the normal optoisolator outputs can only switch up to about 8 milliamps.

Output Turn On Time (milliseconds): 1.8 ms typical, 5.0 ms maximum

Output Turn Off Time (milliseconds): 0.5 ms typical, 2.0 ms maximum

Maximum Recommended Pulse Frequency: 30 Hz

Because of the slower turn-on and turn-off times, the maximum pulse frequency is only 30 Hz (vs. 600 Hz for optoisolator outputs).

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