Application Notes

SSR Application: Controlling Solenoids, Power Supplies And battery Chargers

Using: C60 Series; Commercial Relays

Using: C60 Series Solid State Relays; Commercial Relay

Market: Industrial and Process Control (IPC), Automatic Test Equipment (ATE), Instrumentation Test and Measurement (ITM)

System Application: Ion implant equipment (IPC),
Telecommunications test equipment (ATE), Battery chargers for portable thermal printers (ITM)

Primary Teledyne Relays Advantage: High current carrying capability (up to 2.5 Amps) in a small 6 pin mini-DIP package (SMT or THT); extremely low On-Resistance for DC switching: 70 milliohms at 60 Vdc; low voltage drop at significant load current.

Introduction: The C60 family is an exciting new series of bi-directional solid state relays that is gaining rapid market attention and acceptance. This popular family consists of: C60-10, C60-20, C60-30, C60-40. It provides the user with high performance through lower power dissipation and optical isolation maintaining Teledyne's tradition of high reliability. Optical isolation allows the relay to isolate control elements from load transients, eliminate ground loops and signal ground noise, and ensures complete protection of signal lines, power and ground bus and control circuits from switching noise and EMI. The following application profiles present three design wins for the C60 family. This unique combination of features: low on resistance, higher current carrying capability, and small package size lead the C60 into the world of semiconductor ion implant equipment, test sets for testing telecommunication boards, and battery chargers.

Controlling Solenoids: In the semiconductor ion implant equipment, Teledyne Relays C60 series is used to switch 5 Vdc, 12 Vdc, and 24 Vdc solenoids. The customer for this application has the luxury of using any of the C60 relays due to the relatively low load currents. The customer settled upon the C60-20. The customer was initially interested in an HP relay but experienced an interruption in the availability of foreign sourced components pushing deliveries out. The customer also considered using a CP Clare relay for this application but also experienced problems with availability. This opportunity allowed Teledyne to introduce our C60 solid state relay with its high performance capabilities. The low On-Resistance, the high current carrying capability, optical isolation, and the availability of the C60 relay gave the customer an immediate winning solution to the availability problems experienced with our competitors.

Battery Chargers: Another successful new application for the C60 relay is in battery chargers for portable thermal printers. The thermal printers are used for hardcopy readouts of bar code labels. The C60 is used to switch between the 4 batteries in the charger unit. In this application, the C60 carries 1.2 to 2.0 Amps at 12 Vdc. This requirement for switching high current in such a small 6 pin mini-DIP package gave Teledyne Relays the advantage for a design-win in a new market.

Summary: Teledyne Relays, in all of these situations, was able to offer the customer a more reliable relay, with the lowest available On-Resistance (70 milliohms at 60 Vdc) yielding lower power dissipation, higher current carrying capability (2.5 Amps) in a small 6 pin mini-DIP package (SMT or THT configuration), optical isolation, and enhanced availability. The above applications use the C60 relays in a DC configuration. The C60 family can also be used in a bi-directional/AC configuration as shown in Figure 1 on the next page. The above applications are only a few of the growing number of applications for the C60 family in the electronics market today.

C60 Electrical Specifications

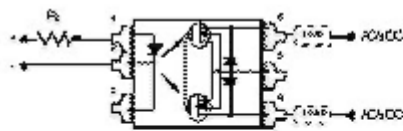| Relay Part Number	C60-10	C60-20	C60-30	C60-40	Units
Max Load Voltage	± 60	±100	±200	±400	Volts
On-Resistance: DC	0.07	0.2	0.45	1.0	Ohms
Max Load Current DC	2.5	1.5	1.0	0.5	Adc
On-Resistance: Bi-Directional	0.28	0.7	1.8	4.0	Ohms
Max Load Current: Bi-Directional	±1.25	±0.75	±0.50	±0.25	Amps

C60 Wiring Configuration

Figure 1
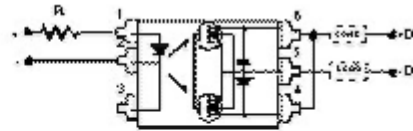BI-DIRECTIONAL/AC CONFIGURATION

Figure 2
DC CONFIGURATION

Note. Floating outputs allows for high and low side switching
Schematics are terminal view

C60 Dimensional Specifications