

INTERNATIONAL RECTIFIER



CRYDOM

SERIES FC

Integrated
Firing Circuit

PRELIMINARY DATA

100mA
10-280V AC

General Description

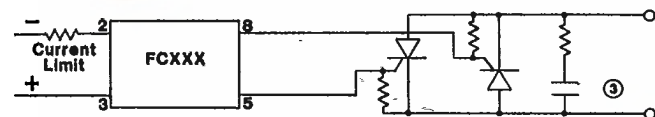
The Crydom Firing Circuit uses the exclusive International Rectifier S³X power integrated circuit technology to form a fully functioning low current (100mA) solid state relay or a driver for high current thyristors. The S³X technology combines MOS and bipolar processes, derived from IR's HEXFET[®] power MOSFET designs, to eliminate the need for both discrete components and hybrid circuits. The basic Firing Circuit consists simply of two identical power integrated circuits connected in inverse parallel (analogous to back-to-back SCRs) for AC control plus an isolated light emitting diode (LED) for actuation.

Extreme reliability is achieved by the use of only 3 basic components in the Firing Circuit, which is "normally open" with precise zero voltage turn-on and zero current turn-off. EMI emission conforms to the most severe FCC and VDE Requirements.

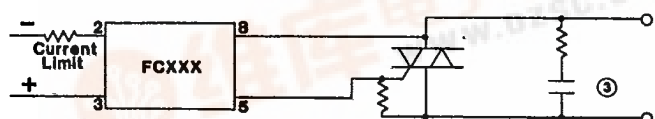
These devices are ideally suited for interfacing microprocessors to small AC loads or for driving high current SCRs and triacs. The economy of the Firing Circuit allows designers to replace discrete driving assemblies with a highly reliable single component.

Firing Circuit for High Current SCRs or Triac

(a) SCRs

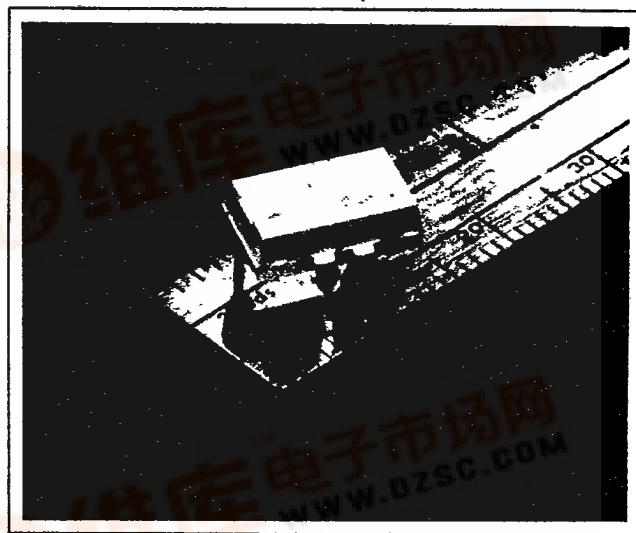


(b) Triac



Note: Firing Circuit may be used to drive loads directly up to 100mA.

- S³X Power IC Chips ■
- 2.5 Amps Surge ■
- 3750V RMS Isolation ■
- Zero Voltage Turn-On ■
- EMI Meets FCC/VDE Limits ■
- 600V/ μ sec dv/dt ■
- 10 Microamps Leakage ■



Part Identification

Part No.	Transient Overvoltage	DC Input Turn-On (mA)
FC510	500	5-20
FC520	500	10-20
FC610	600	5-20
FC620	600	10-20



FIRING CIRCUIT

GENERAL CHARACTERISTICS

Dielectric Strength — Input/Output		3750	V (RMS)
Insulation Resistance @ 500VDC — Input/Output		10 ⁹	Ohms
Max Capacitance — Input/Output		1.0	pF
Ambient Temperature Range	Operating	-30 to 80	°C
	Storage	-40 to 100	°C

ELECTRICAL SPECIFICATIONS (-30°C ≤ T_A ≤ 80°C unless otherwise specified)

INPUT CHARACTERISTICS	FC510	FC520		FC610	FC620	Units
Control Current Range (see Fig. 3)	5-20	10-20		5-20	10-20	mA (DC)
Max Reverse Voltage	7.0					V (DC)
Max Turn-On Current	5.0	10		5.0	10	mA (DC)
Max Turn-Off Current	0.25					mA (DC)
Max Turn-On Time (47-470 Hz)	0.5					Cycle
Max Turn-Off Time (47-470 Hz)	0.5					Cycle

OUTPUT CHARACTERISTICS

Operating Voltage Range (47-470 Hz)	10-280	10-280	V (RMS)
Transient Overvoltage (Non-Repetitive)	500	600	V (peak)
Min Off-State dv/dt (static) ① @ Max Rated Voltage (25°C)	600		V/μs
Max Load Current (See Fig. 1) ②	100		mA (RMS)
Min Load Current	0.5		mA (RMS)
Max Surge Current (Non-Rep.) 20 ms (see Fig. 2)	2.5		A (peak)
Max Over Current (Non-Rep.) 1 sec	1.0		A (peak)
Max On-State Voltage Drop @ 0.1A (RMS)	1.6		V (peak)
Max I ² T for Fusing (.01 sec)	0.03		A ² sec
Max Zero Voltage Turn-On	6.0		V (peak)
Max Peak Repetitive Turn-On Voltage	1.5		V (peak)
Max Off-State Leakage ④ Current @ Rated Voltage	10		μA (RMS)

GENERAL NOTES ① Off-state dv/dt test method per EIA/NARM standard RS-443 with V_p equal to the instantaneous peak of the maximum operating voltage.
② Parameters are met at 0.5 power factor or greater.

③ The application of an RC snubber (see front cover diagram) is good practice when operating inductive loads at high ambient temperatures and under heavy load conditions. Typical values are 0.03 mfd plus 47 ohms. Consult factory for application aid.
④ LED Input Current of zero mA.

Firing Circuit Performance Characteristics Curves

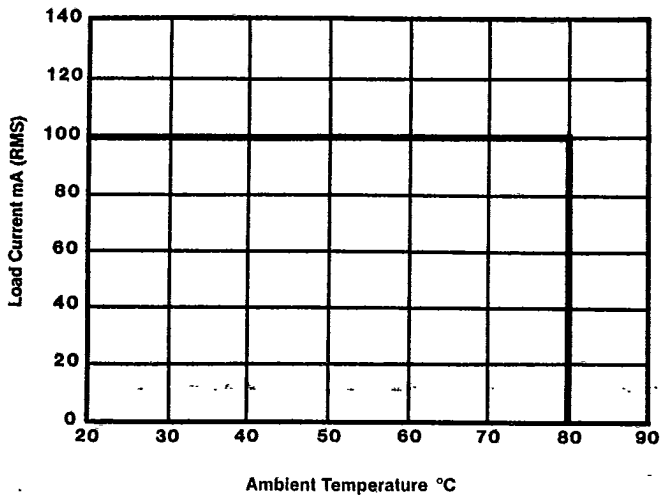


Figure 1. Thermal Derating Curve

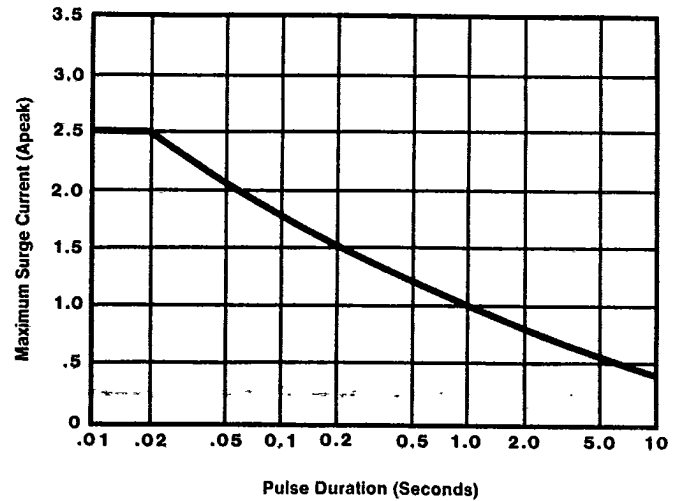


Figure 2. Maximum Allowable Surge

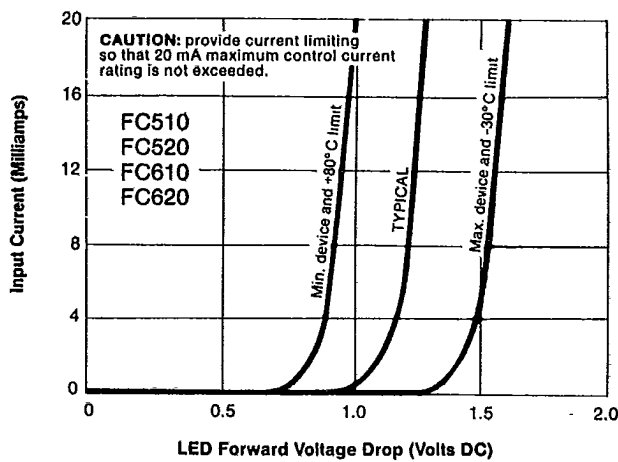
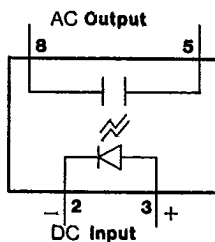


Figure 3. Input Characteristics (Current Controlled)

Wiring Diagram



Mechanical Specifications

Dimensions: Inches (millimeters)

Package Size: 8 Pin DIP

Tolerances: .015 (.38)

unless otherwise specified

Case Material: Molded epoxy

Case Color: White

Weight: .07 oz. (2 grams)

