

Model S61 High Frequency Solid State Thyatron Replacement

The Model S61 is a high voltage switch for high pulse repetition rate systems. It can be used to replace thyratrons as well as gas and vacuum triggered spark gap switches in high voltage applications such as modulators. This switch consists of multiple series connected fast turn-off thyristors specifically designed for high di/dt, high voltage, pulsed power applications. Snubber capacitance and resistive balancing are included making it easier to use than a Thyatron, such as E2V's CX1154L or a triggered spark gap.

Operational Ratings (T_j=80°C)

Peak Non-Repetitive Forward Current	14000	Amps
Peak Repetitive Forward Current	9000	Amps
Peak di/dt	10	kA/μSec
Maximum RMS On-State Current	100	Amps
Operating Temperature Range	10 to 50	°C
Peak Rate of Reapplication of Off-State Voltage	1000	V/μSec
Peak Pulse Repetition Rate	400	Hz

Typical Operational Characteristics

Turn-On Delay (from external electrical trigger) ₁	<200	nSec
Turn-On Delay Jitter	<2	nSec
Turn-Off Time	<400	μSec

Typical Operational Condition

Pulse Width	6	μSec
Pulse Frequency	400	Hz
Forward Current	600	Amps
Reverse Current	100	Amps
Operating Temperature	25	°C
Current Rise Time (10-90%)	250	nSec
Switching Efficiency	98	%



Part Number Selection Guide

Part Number	Maximum DC Voltage Rating	Peak Off-State Voltage Rating	Off State Resistance	Capacitance	On-State Resistance	Cooling Capability ₂	Switch Height ("H")
S61-3	12kV	15kV	66MΩ	400pF	30mΩ	60W	4.2"
S61-4	16kV	20kV	88MΩ	300pF	40mΩ	80W	5.2"
S61-5	20kV	25kV	110MΩ	240pF	50mΩ	100W	6.2"
S61-6	24kV	30kV	132MΩ	200pF	60mΩ	120W	7.2"
S61-8	32kV	40kV	176MΩ	150pF	80mΩ	160W	9.2"
S61-10	40kV	50kV	220MΩ	120pF	100mΩ	200W	11.2"
S61-12	48kV	60kV	264MΩ	100pF	120mΩ	240W	13.2"

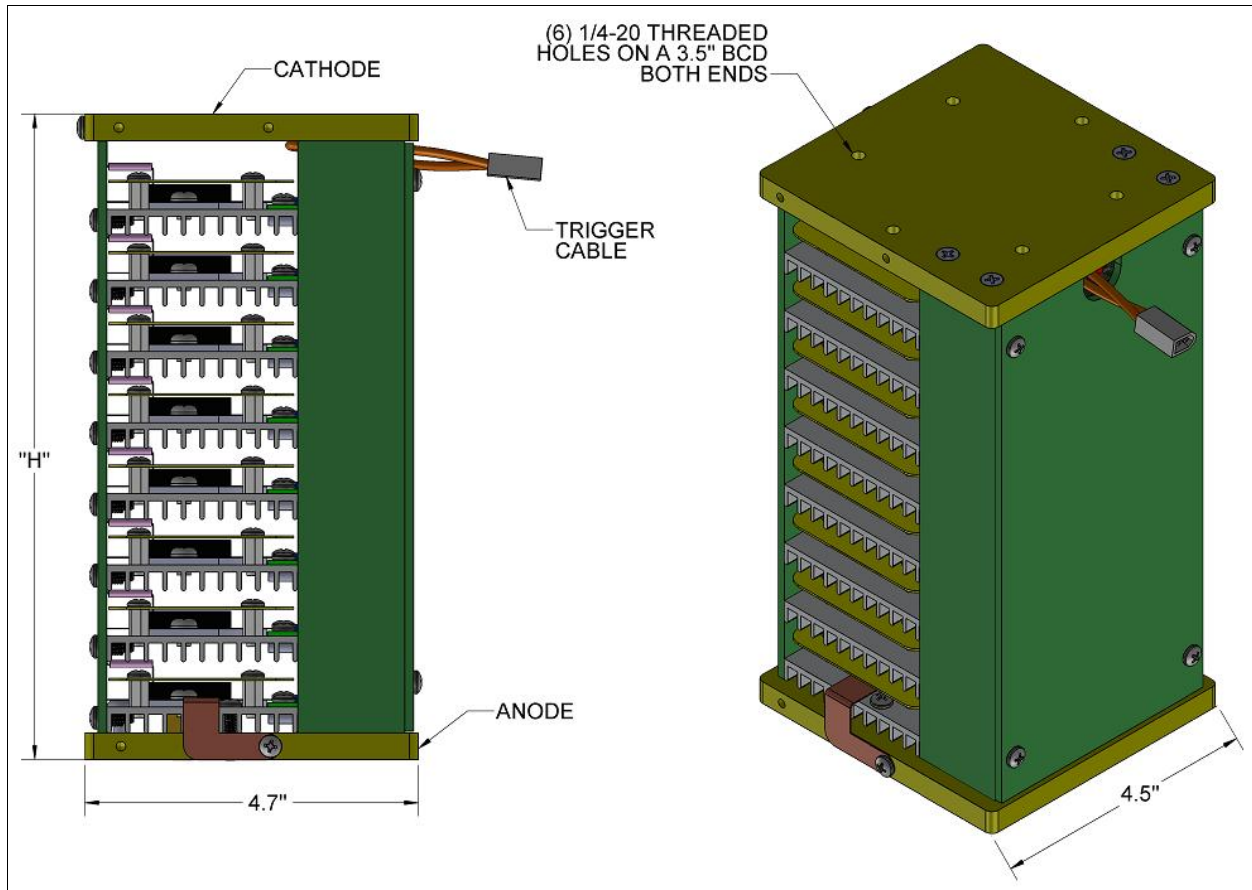


Figure 1: Switch Dimensions₃



Notes:

1. Assumes TTL over BNC into 50Ω for trigger input. Other trigger circuit options for trigger input and power are available, contact technical support for more details.
2. Assuming at least 160LFM 25°C air flow over switch.
3. For height dimension, H, see part number selection guide

S61 Options

- H High Frequency, up to 2500Hz
- F Fans Included

We recommend our EA0046 trigger circuit for this switch. Other trigger options are available.

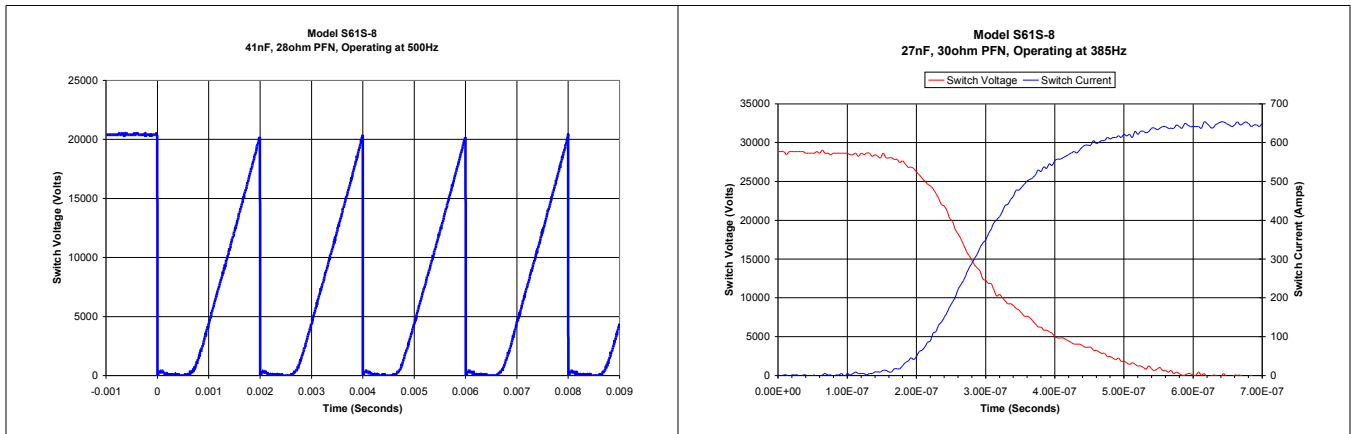


Figure 2: Example Test Results for S61S-8