

Gooch & Housego



**High Power RF Driver:
For Acousto-optic Q-Switch**

MQH0XX-YYDM-ZZZ

Former Model Number:

390XX-YYDMZZZ-A

Description:

The **MQH0XX-YYDM-ZZZ** module is a High Power RF Driver, designed to drive a Q-Switch. The driver has two digital modulation inputs: Fixed and Variable. These controls allow the customer to issue a pulse command of a "Fixed" pulse width, the duration determined by the Driver's pulse width control, settable by the customer, or issue a "Variable" pulse command, the duration determined by the input signal's pulse width. The output power is controlled by the analog input, where the mode of operation is defined by ZZZ = A05 normal analog mode, or R05 analog switched to full RF mode or a triggered RF Ramp Down mode where ZZZ = FPS first pulse suppression mode or PPK pre-pulse kill mode. The choices of Frequency (XX), Output Power (YY), and Power Control (ZZZ) option are "Factory Set" when ordered. The RF Driver requires forced air cooling.

The product delivered will be manufactured to be compliant with EU Directive 2011/65/EU for Reduction of Hazardous Substance. The product will be manufactured to other standards upon customer request.

Key Features:

- 24, 27.12, 40.68, 68, or 80 MHz RF Frequency (XX)
- 0.01% Quartz Stabilized
- Up to 100* watts RF power output (YY)
- Two TTL Digital Modulation Inputs: fixed and variable pulse width.
- Analogue Modulation or Triggered RF Ramp Down Mode (ZZZ)
- Up to 100 kHz Pulse Rate.
- Fault Protection on Low Power, High Power, and High VSWR
- Operates on 28 VDC

Applications:

- RF Driver for an Acousto-Optic Q-Switch Device used to spoil the "Q" of a CW laser so as to output an intense pulse of light.
- Used in industrial, medical, or military applications.

MQH0XX-YYDM-ZZZ

SPECIFICATIONS:

| PARAMETER | SPECIFICATION |
|--|---|
| Output Frequency is " <u>Factory Set When Ordered</u> ": | XX = 24, 27, 41, 68, or 80 |
| RF Frequency: | 24.00, 27.12, 40.68, 68.00, 80.00 MHz \pm 0.01% |
| Spurious Levels: | -50 dBc maximum |
| Harmonic Distortion | -30 dBc maximum |
| Digital Inputs: | |
| Fixed Mod In | TTL Levels, Triggered on Rising Edge. Pulse Width Applied >50 ns. |
| Variable Mod In | TTL Levels, TTL High = RF off |
| Extinction Ratio: | 35 dB minimum |
| RF Rise Time 10% to 90% | 500 ns maximum |
| RF Fall Time: 90% to 10% | 100 ns maximum |
| Modulation Repetition Rates: | 1 Hz to 100 kHz for Fixed Modulation DC to 100 kHz for Variable Modulation |
| Fixed Modulation Output Pulse Width Adjustment Range: | 1 to 14 μ s, Customer Adjustable |
| Available Pulse Control Options: | ZZZ = Mode |
| Pulse Control Mode is " <u>Factory Set When Ordered</u> ": | FPS = First Pulse Suppression See Figure 2 PPK = Pre Pulse Kill See Figure 3 A05 = Analog Control See Figure 4 R05 = RF Switched to Analog Control See Figure 5 ___ = Digital Modulation Only See Figure 6 |
| FPS Trigger / Analog input | Units configured with FPS, PPK: TTL Levels, Triggered on TTL Rising Edge. Units configured with A05, R05: 0 to 5 volts analog. |
| *RF Output Power " <u>Factory Set When Ordered</u> ": | YY = 50 or 100 watts nominal for 24, 27, 41, and 68 MHz units Adjustable from 25 to 100 watts. 50 watts nominal for 80 MHz units, Adjustable from 20 to 50 watts. |
| Output Impedance: | 50 ohms nominal |
| Shutter Output: | 0.3 sec delay. Opens on fault. Capable of sinking 1 amp at 28 volts Maximum. |
| Supply Voltage Input | +28 VDC \pm 1% |
| Supply Current Input | 6.5 A for 50 W units 9.0 A for 100 W units |
| Operating Temperature | +10°C to +55°C |
| Air Flow through Heat Sink | > 36 CFM (> 17 litres / second) @ 25°C |
| <u>MAXIMUM RATINGS:</u> | |
| Supply Voltage: | 30 volts DC maximum |
| Power Output: | No DC Feedback Allowed |
| Storage Temperature: | -20°C to +85°C |

CONNECTORS & MECHANICAL:

RF Output Connector:

Located on front panel

BNC Female

Power Supply Connections:

Vcc Solder Post
Return Ground Lug

25PIN D-SUB CONNECTOR PINOUT:

Located on front panel. See Detail A of Outline Drawing.

| | | |
|--------|-----------------|--|
| 1 | +5V | +5V output for external fault indicators, 75 mA available. |
| 2 – 3 | NC | No connection. |
| 4 | THERM RTN | Ground – to be used as a return for THERM. |
| 5 | NC | No connection. |
| 6 | THERM | Thermostat connection – driver enters a fault condition unless this is Shorted to ground. |
| 7 | DRV TEMP | Normally HIGH, goes LOW when the driver is in an overheat fault. |
| 8 | QS TEMP | Normally HIGH, goes LOW when no short present on THERM. |
| 9 | HVSWR | High VSWR fault, normally HIGH, goes LOW during fault. |
| 10 | LP | Low RF Power indicator, normally HIGH, goes LOW while driver output is below the Low RF Power threshold. |
| 11 | HP | High RF Power fault, normally HIGH, goes LOW during fault. |
| 12 | MOD IN ANALOG | Controls the output power level in A05 and R05 models |
| 13 | FAULT RESET | Pulse LOW to reset the driver from a fault condition. This line should not be held LOW or it will defeat some of the fault conditions. |
| 14 | FPS TRG | Triggers a suppression pulse on a RISING edge. |
| 15 | MOD IN FIXED | Turns the driver off for the duration set by the pulse width control. |
| 16 | MOD IN VARIABLE | Turns the driver off while this input is HIGH. |
| 17 | SYNC OUT | Outputs a signal synchronized to the modulation output. |
| 18-19 | NC | No connection. |
| 20 | SHUTTER | 0.3 sec delay. Opens on fault. Capable of sinking 1 amps at 28 volts maximum. |
| 21 -24 | NC | No Connection |
| 25 | GND | Ground. |

Note: Some Control Signals Shown on Outline Drawing are Not Available on Standard Units.

INDICATORS:

Located on front panel

| | |
|-----------------|---|
| Power | Power Indicator – The module has 28V applied on the DC connector. |
| Low Power | Faults after 0.3 second, power below LP Set Point. Resets on power adjusted above Set Point. |
| High Power | Faults when power above HP Set Point. Reset required after removing fault. |
| High VSWR | Faults when reflected power above VSWR Set Point. Reset required after removing fault. |
| QS Temp | Faults on open Thermostat. Resets on closed Thermostat. (Q-Switch below set temperature) |
| DRV Temp Driver | The internal temperature of the module has reached 60°C. The driver will remain in this fault condition until it cools down. |

ADJUSTMENTS:

Located Inside Unit Through Holes in Module Top Cover

| | |
|---------------------------|---|
| RF Power Level Adjustment | Adjusts the output RF Power. |
| LP Set Point | Adjusts the minimum power threshold. If the module's output goes Below this set value, the low power warning light will turn on, but the driver will continue to output power. This is a warning, not a true fault condition. |
| HP Set Point | Adjusts the maximum power threshold for the module. If the output rises above this threshold, the module will cease output until it is reset. |
| VSWR Set Point | Adjusts the module's tolerance for a mismatched load connected to RF Out. If a mismatch is detected, the driver will cease outputting power until reset. |
| Pulse Width | Adjusts the length of time the driver outputs no RF energy after receiving a trigger. 1 μ s to 14 μ s. |

The following adjustment is not used on units configured with FPS or PPK:

| | |
|-----------|---|
| Threshold | Sets the point below which the analog voltage is ignored and the system output is shut off. |
|-----------|---|

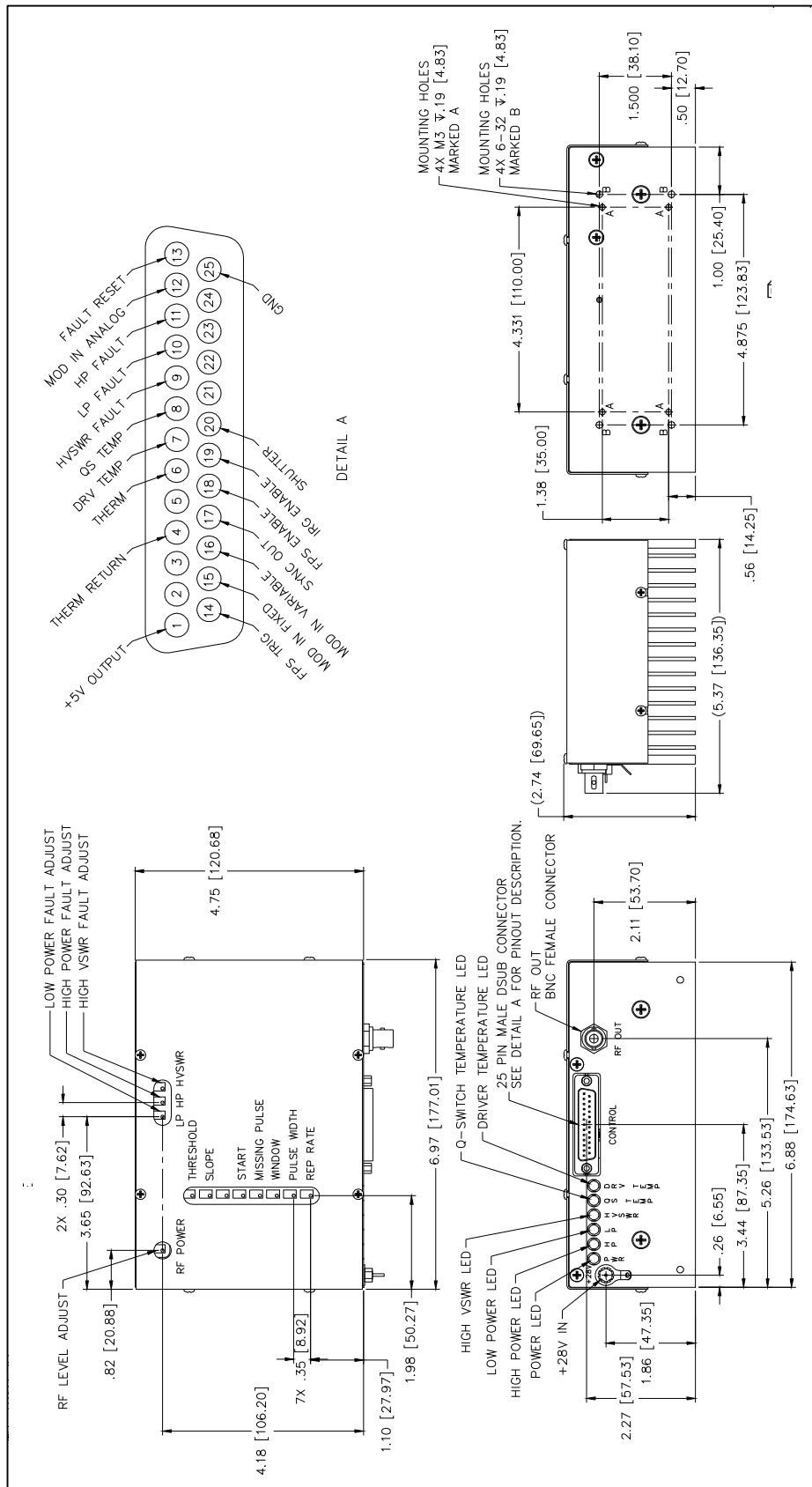
The following adjustments are not used on units configured with Analog Input (A05, R05):

| | |
|------------|---|
| FPS Start | Adjusts the initial power level of the first pulse. |
| FPS Slope | Adjusts how quickly the RF pulses return to their normal level after the FPS has been triggered. 20 μ s to 300 μ s. |
| FPS Window | Adjusts the duration of the suppression pulse cycle. 20 μ s to 300 μ s. |

Note: Some Adjustments Shown on Outline Drawing are Not Available on Standard Units.

Mechanical Dimensions:

Dimensions in inches and [mm]



Control Diagrams

Figure 2

MQH0XX-YYDM-FPS (HIGH POWER) First Pulse Suppression Control Connection and Control Diagrams

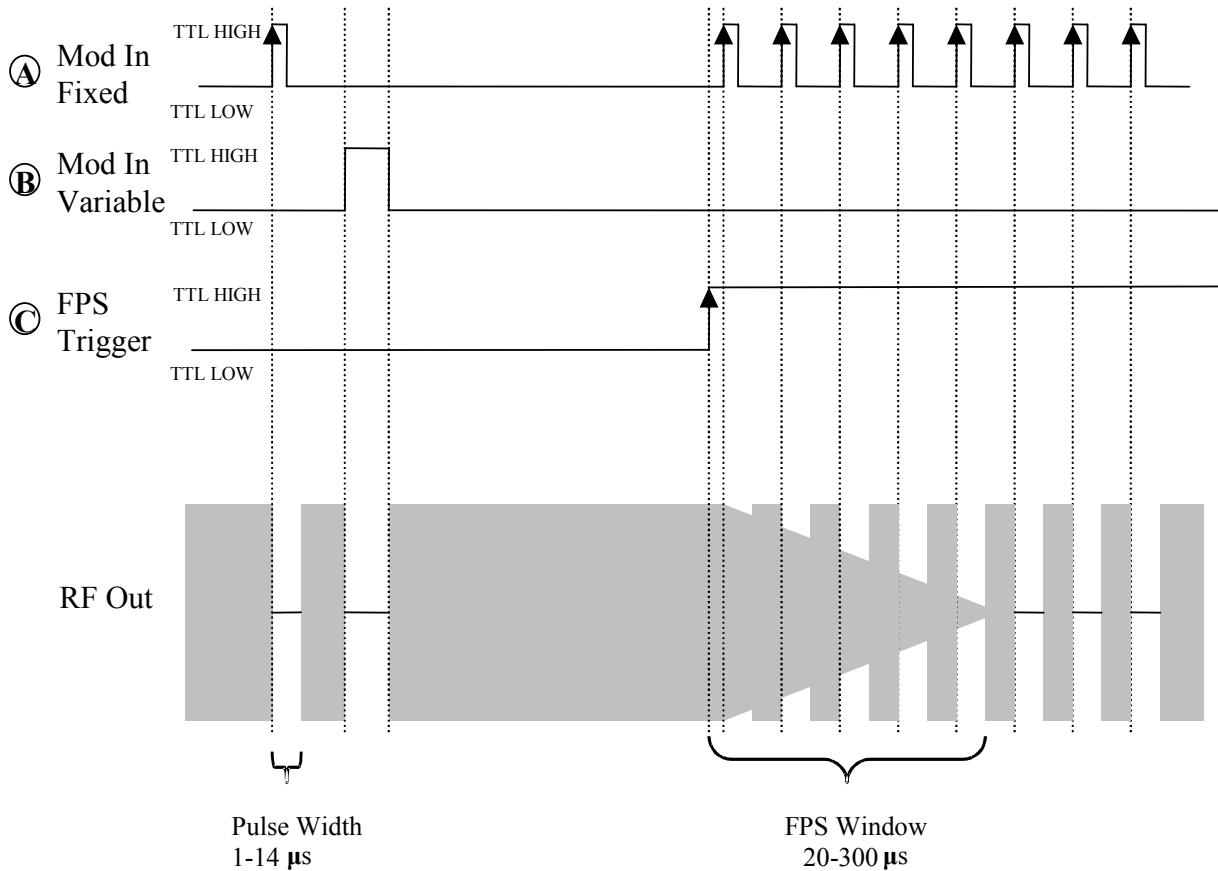
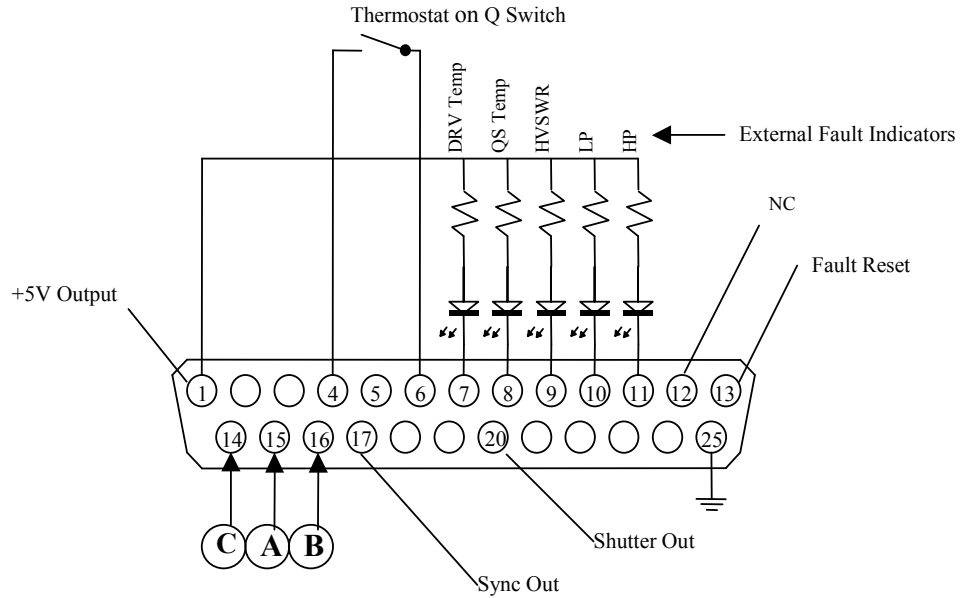


Figure 3

MQH0XX-YYDM-PPK (HIGH POWER) Pre-Pulse Kill Control
Connection and Control diagram

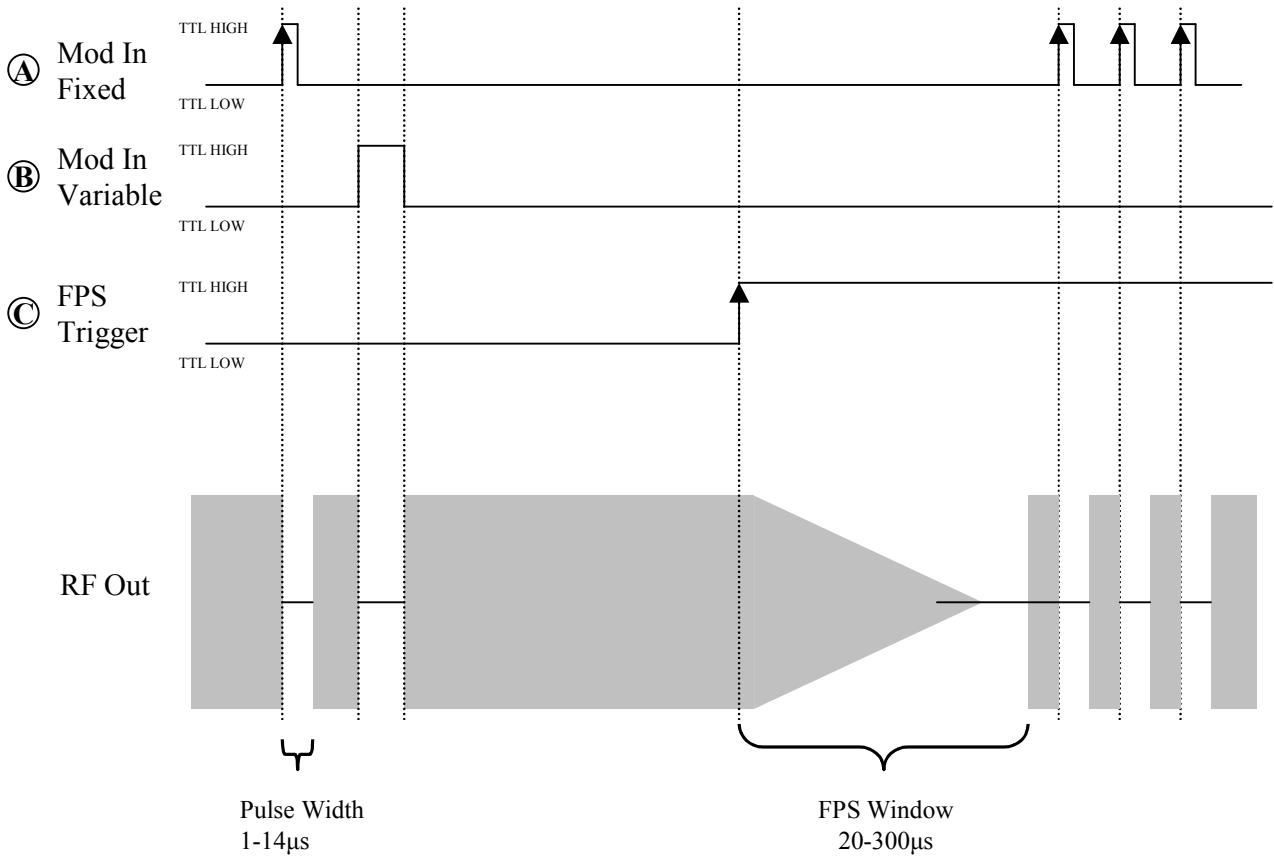
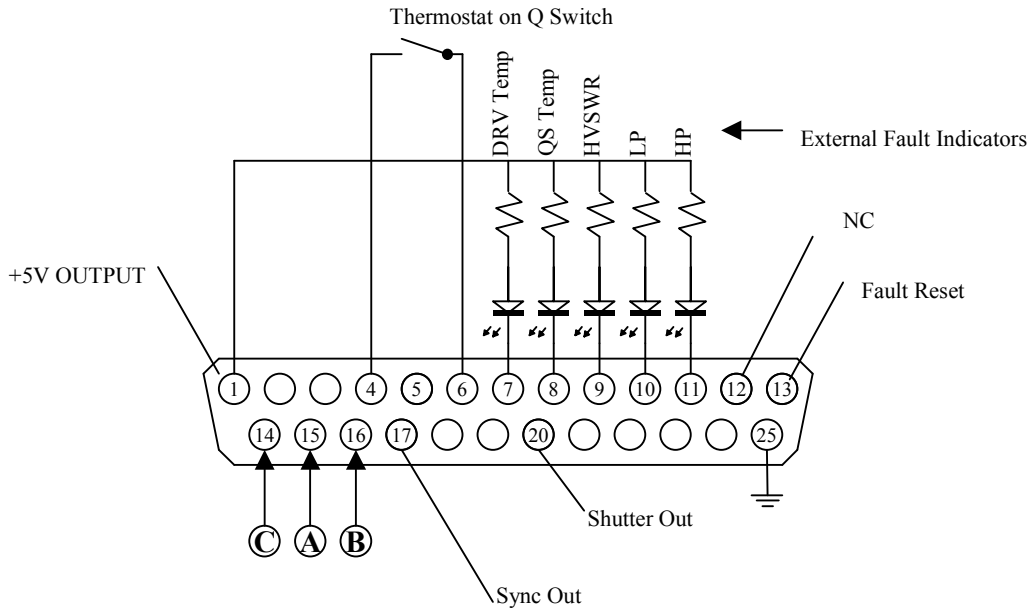


Figure 4

MQH0XX-YYDM-A05 (HIGH POWER) Analog 5 Volt Control
Connection and Control Diagrams

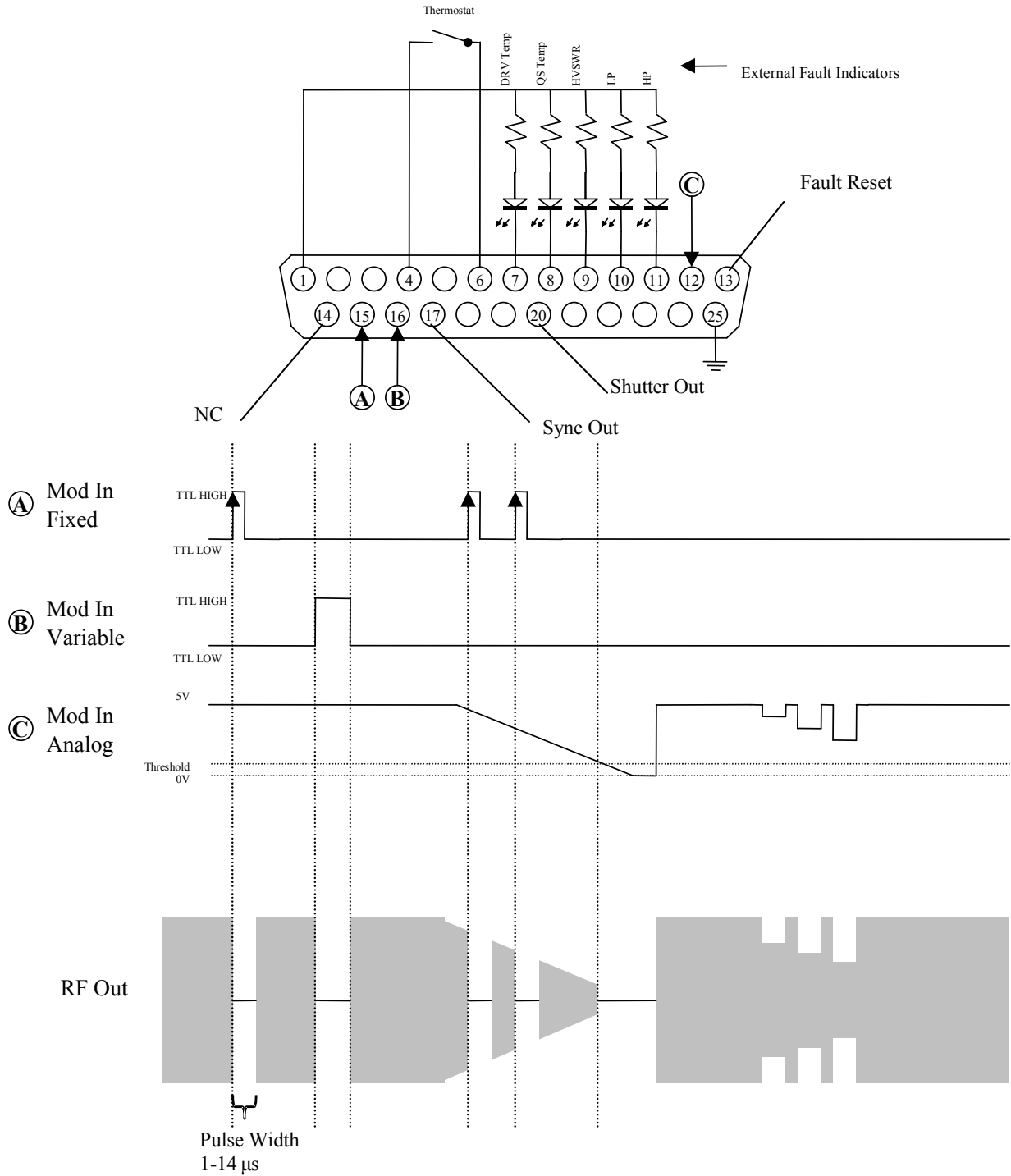


Figure 5

MQH0XX-YYDM-R05 (HIGH POWER) RF Switch to Analog 5 Volt Control
Connection and Control Diagrams

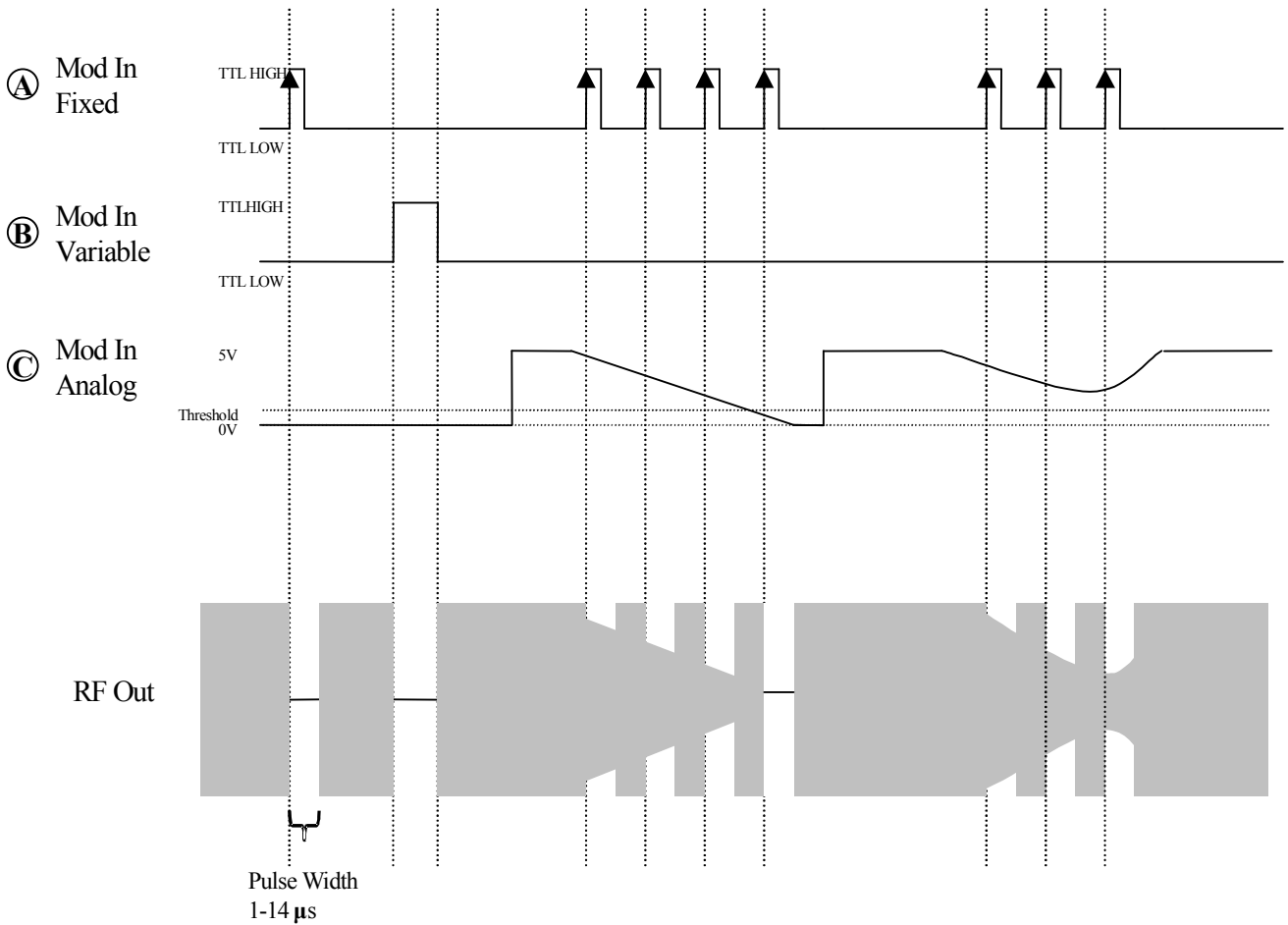
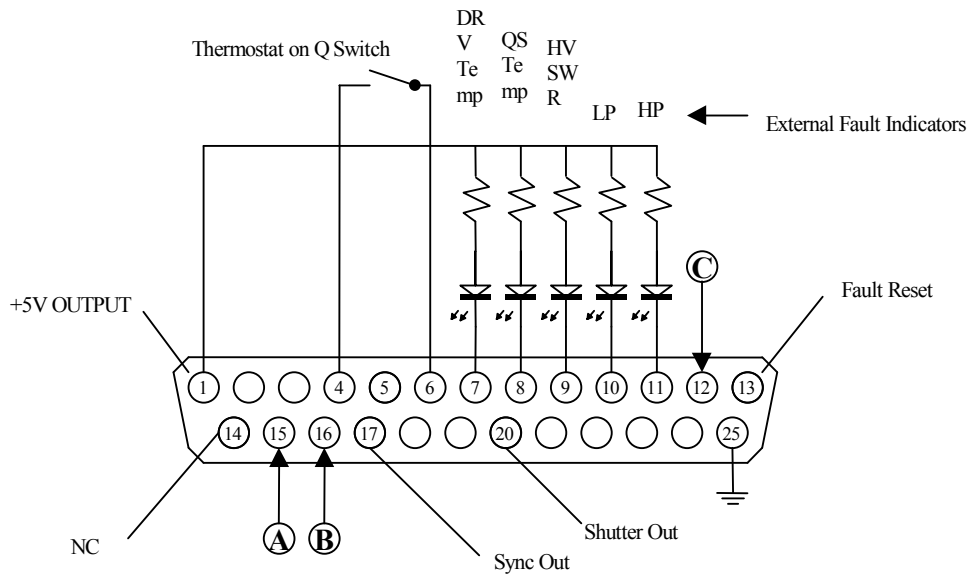
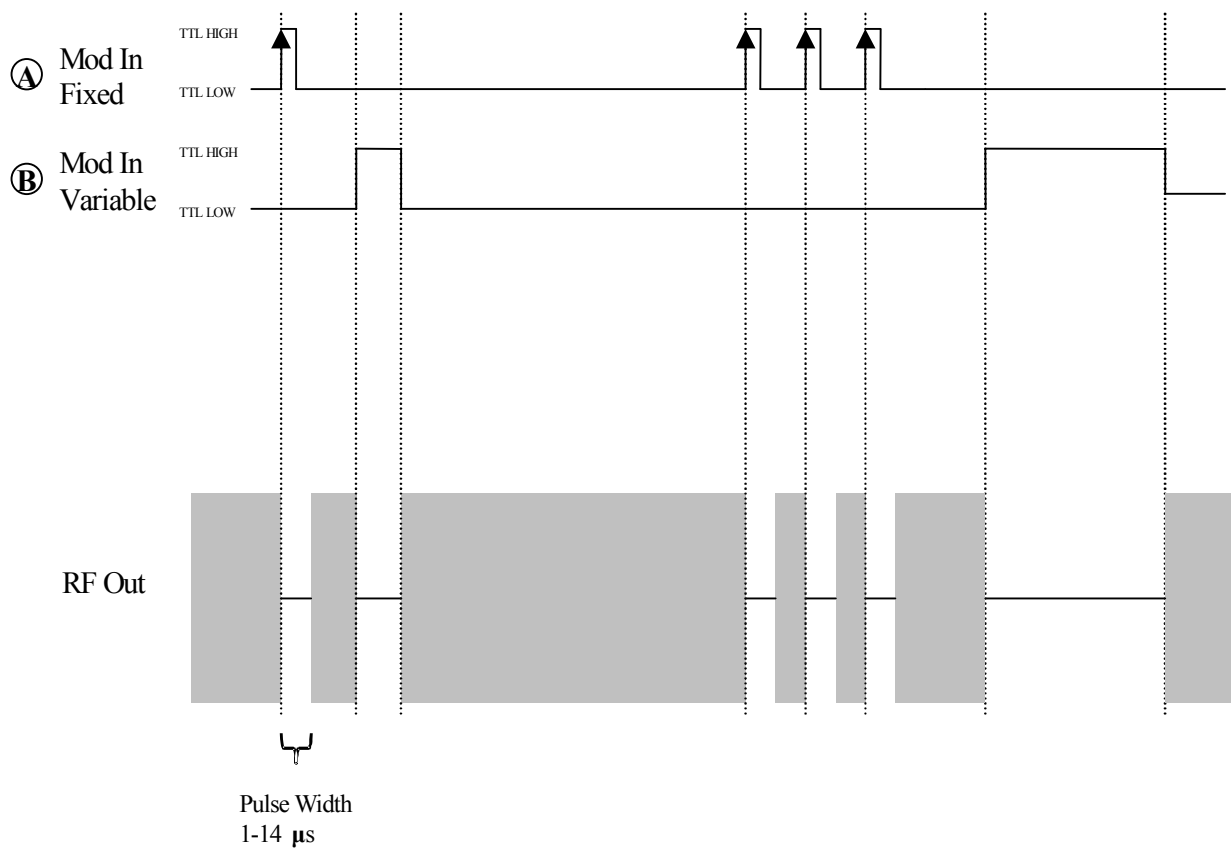
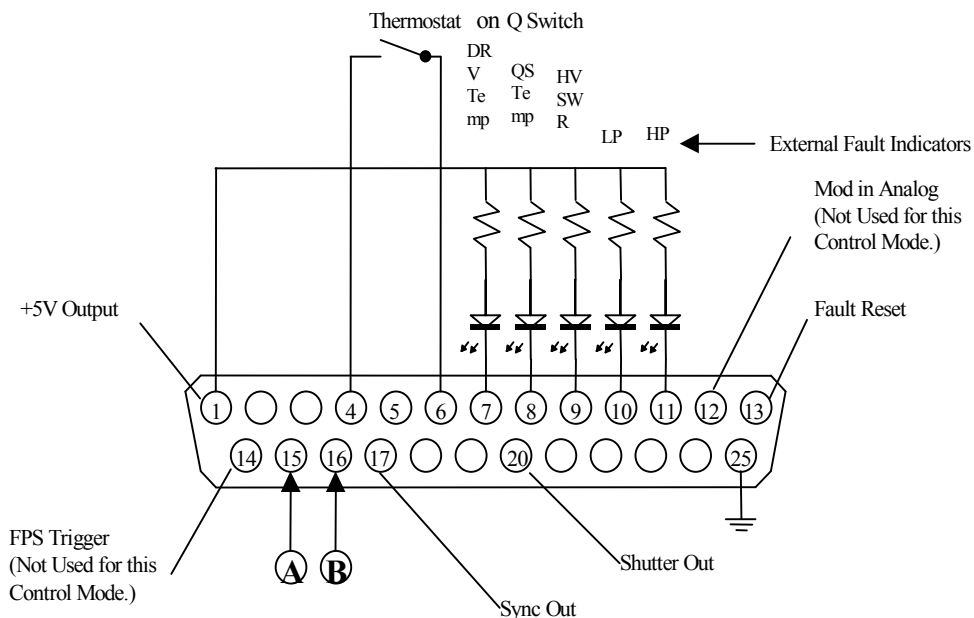


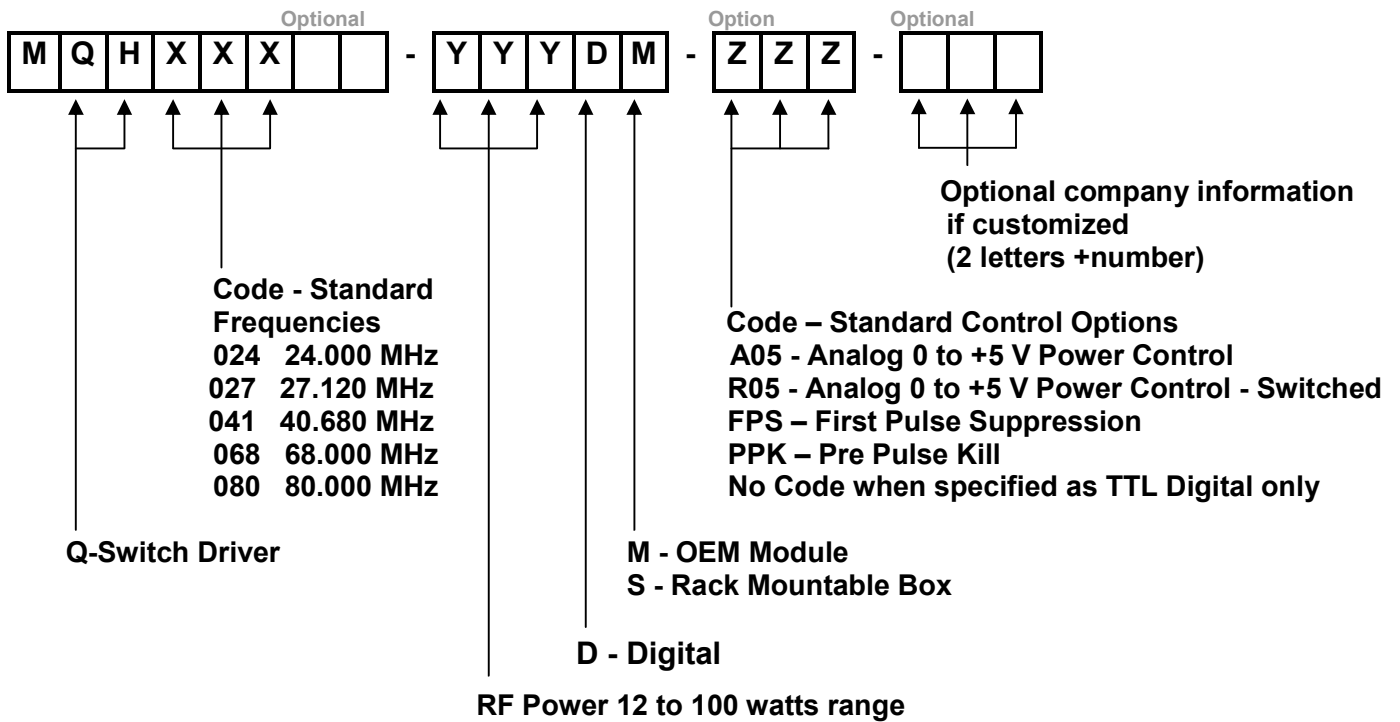
Figure 6

MQH0XX-YYDM (HIGH POWER) Digital Control Only
Connection and Control Diagrams



Ordering Codes:
Example: MQH027-100DM-A05

A 27 MHz RF Driver with two TTL Digital Modulation inputs (fixed and variable pulse width) and an analog input (A05) which enables control of the RF output power. Designed to Drive an AO Q-Switch requiring 100 watts RF Power or less. Delivered as a RoHS compliant, forced air cooled OEM Module.



Ordering Information:



800 Village Walk #316
 Guilford, CT 06437
 Ph: 203-401-8093

Email orders to: sales@xsoptix.com
 Fax orders to: 800-878-7282

Technical Assistance & Customization

Our Engineering and Sales team are available to discuss your requirements and will assist you in selecting the most appropriate acousto-optic Q-Switch/ Driver combination for your application.