Sintec Optronics
新特光电

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 "Factory Set When Ordered": RF Frequency:	**XX** = 24, 27, 41, 68, or 80 24.00, 27.12, 40.68, 68.00, 80.00 MHz ± 0.01%
Spurious Levels:	-50 dBc maximum

Harmonic Distortion
 Digital Inputs:
     Fixed Mod In
     Variable Mod In
	-30 dBc maximum
	
	 TTL Levels, Triggered on Rising Edge. Pulse Width Applied >50 ns.
	 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 µs, Customer Adjustable

PARAMETER	SPECIFICATION	
Available Pulse Control Options: Pulse Control Mode is "Factory Set When Ordered":	**ZZZ =** Mode FPS = First Pulse Suppression PPK = Pre Pulse Kill A05 = Analog Control R05 = RF Switched to Analog Control ___ = Digital Modulation Only	 See Figure 2 See Figure 3 See Figure 4 See Figure 5 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 "Factory Set When Ordered":	**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 ± 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	

MAXIMUM RATINGS:

Supply Voltage:	30 volts DC maximum
Power Output:	No DC Feedback Allowed
Storage Temperature:	-20°C to +85°C

As part of our policy of continuous product improvement we reserve the right to change specifications at any time

CONNECTORS & MECHANICAL: Located on front panel

RF Output Connector: 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.

Pin	Name	Description
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

Indicator	Description
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. $1\mu s$ to $14\mu s$.

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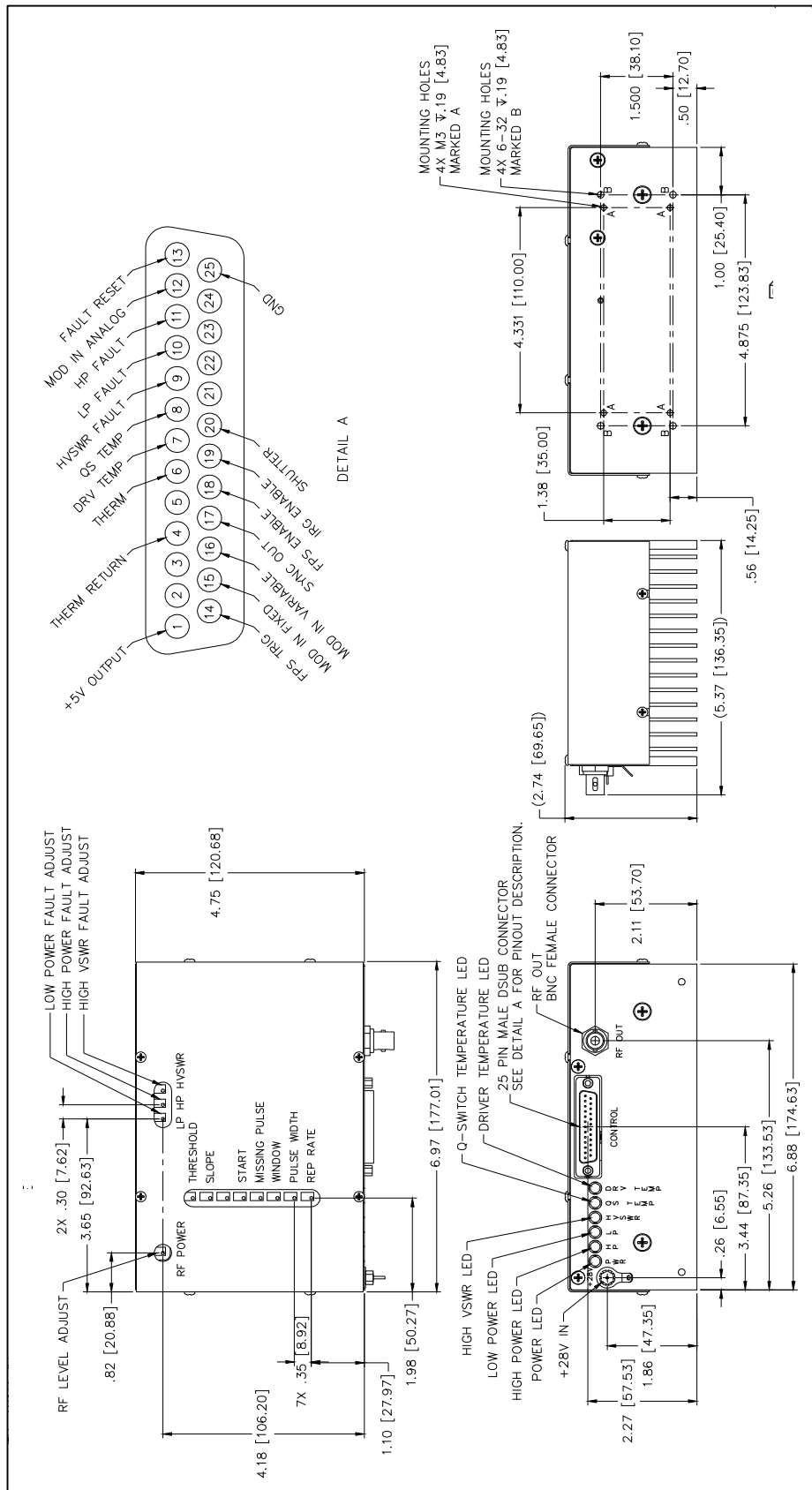
The following adjustments are not used on units configured with Analog Input (A05, R05):

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. $20\ \mu s$ to $300\ \mu s$.

FPS Window   Adjusts the duration of the suppression pulse cycle. $20\ \mu s$ to $300\ \mu s$.

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

Mechanical Dimensions:

Dimensions in inches and [mm]

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Control Diagrams

Figure 2

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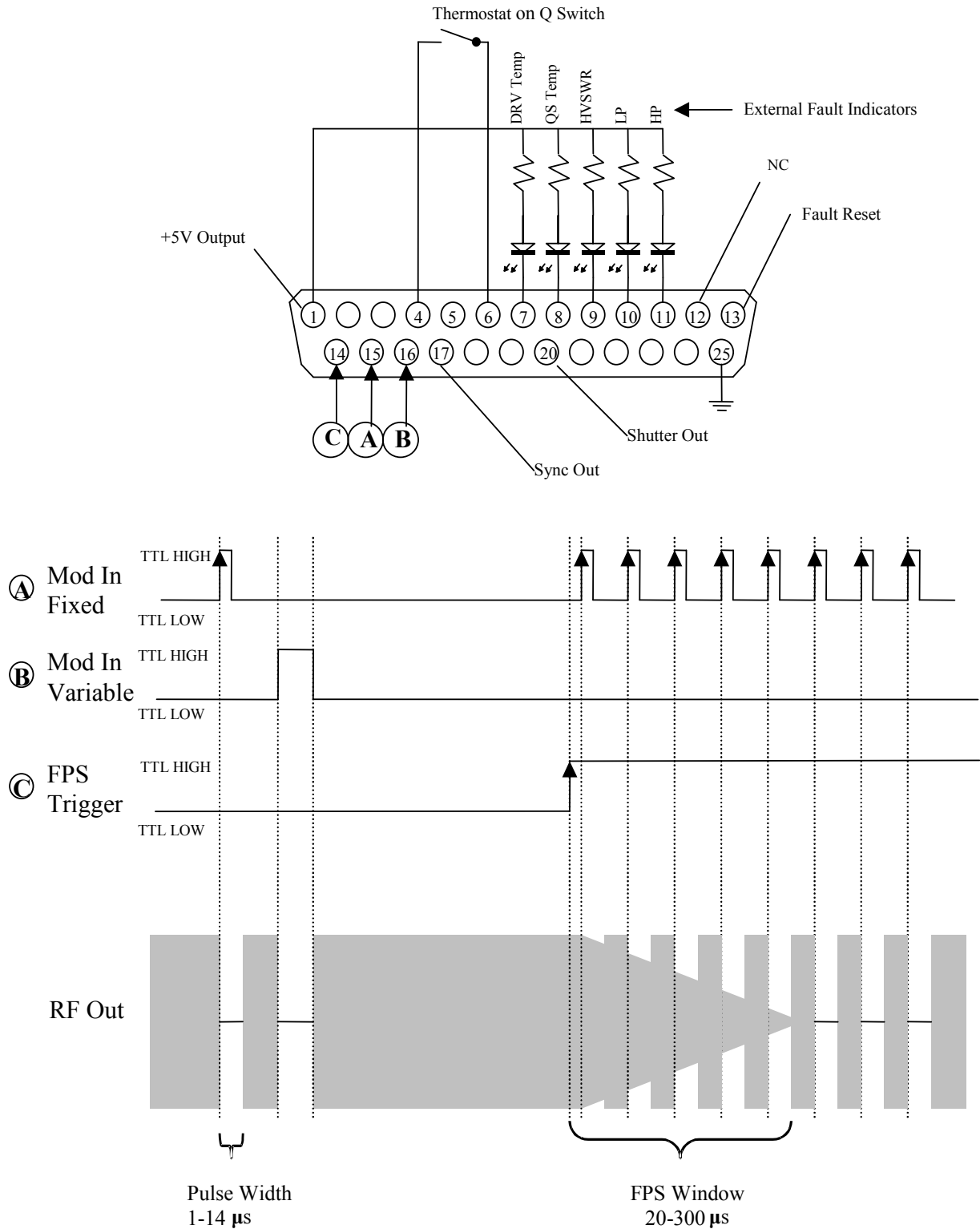

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Figure 3

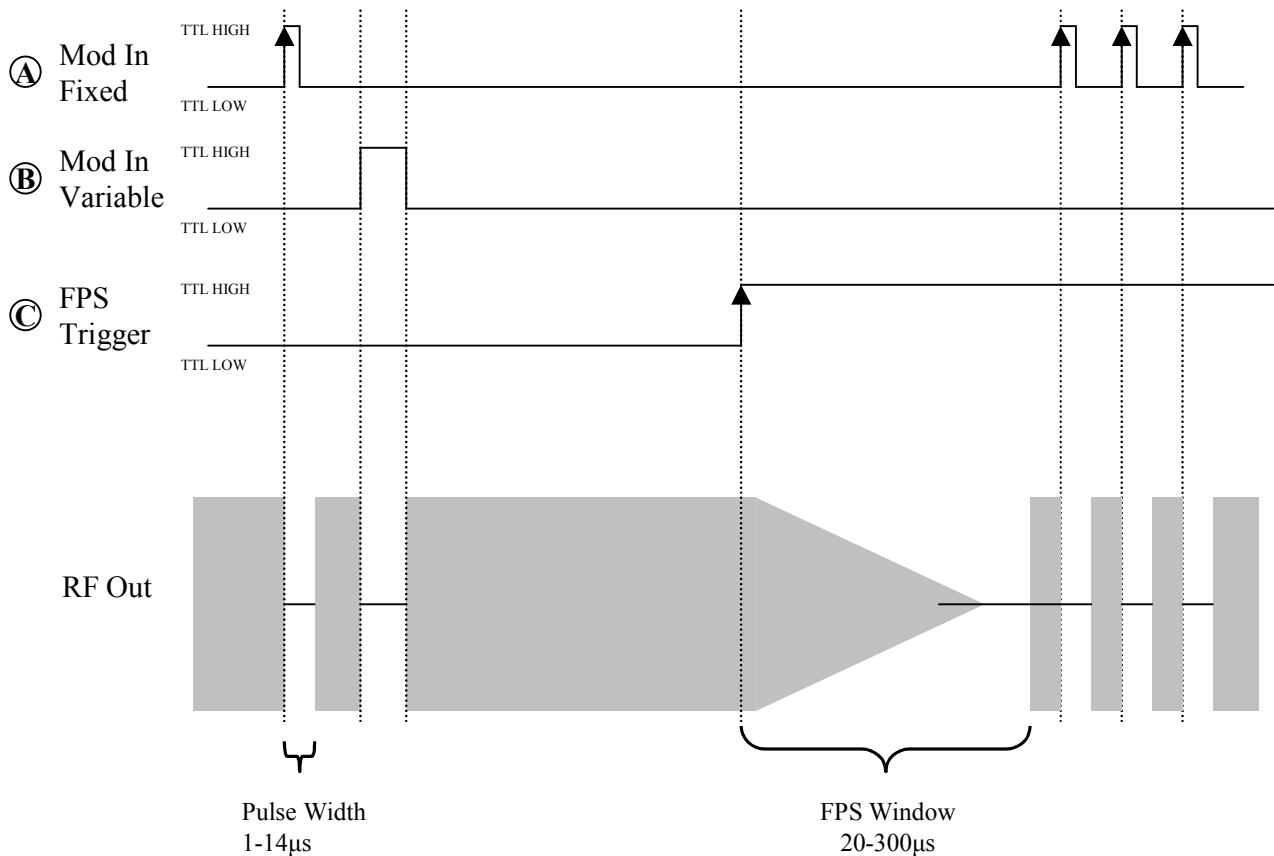## MQH0XX-YYDM-PPK (HIGH POWER) Pre-Pulse Kill Control
Connection and Control diagram
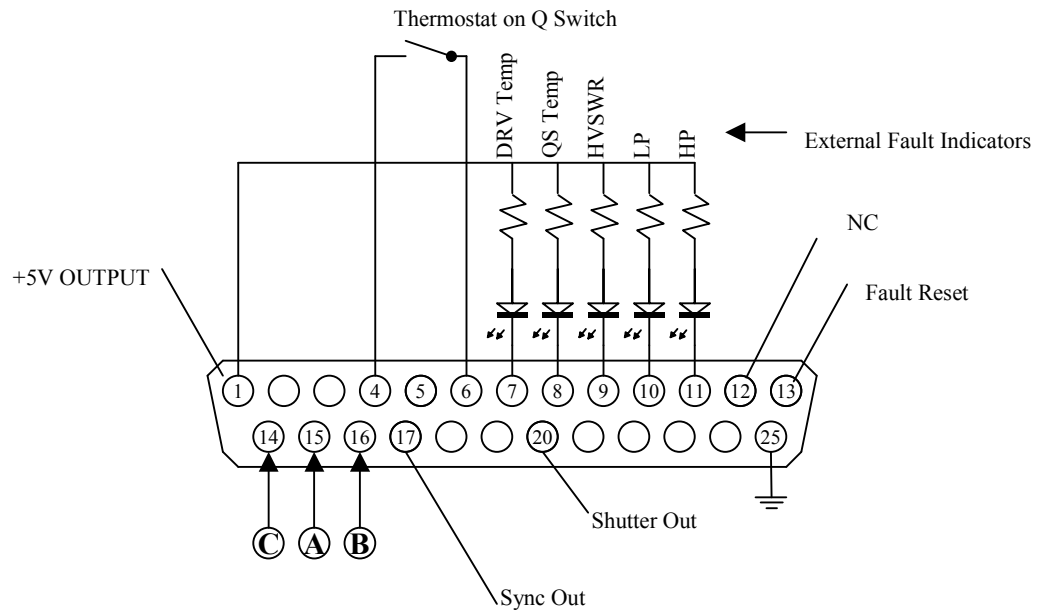
Figure 4

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

Thermostat

DRV Temp
QS Temp
HVSWR
LP
HP

External Fault Indicators

Fault Reset

Shutter Out

Sync Out

NC

Ⓐ Mod In Fixed

TTL HIGH

TTL LOW

Ⓑ Mod In Variable

TTL HIGH

TTL LOW

Ⓒ Mod In Analog

5V

Threshold
0V

RF Out

Pulse Width
1-14 μs

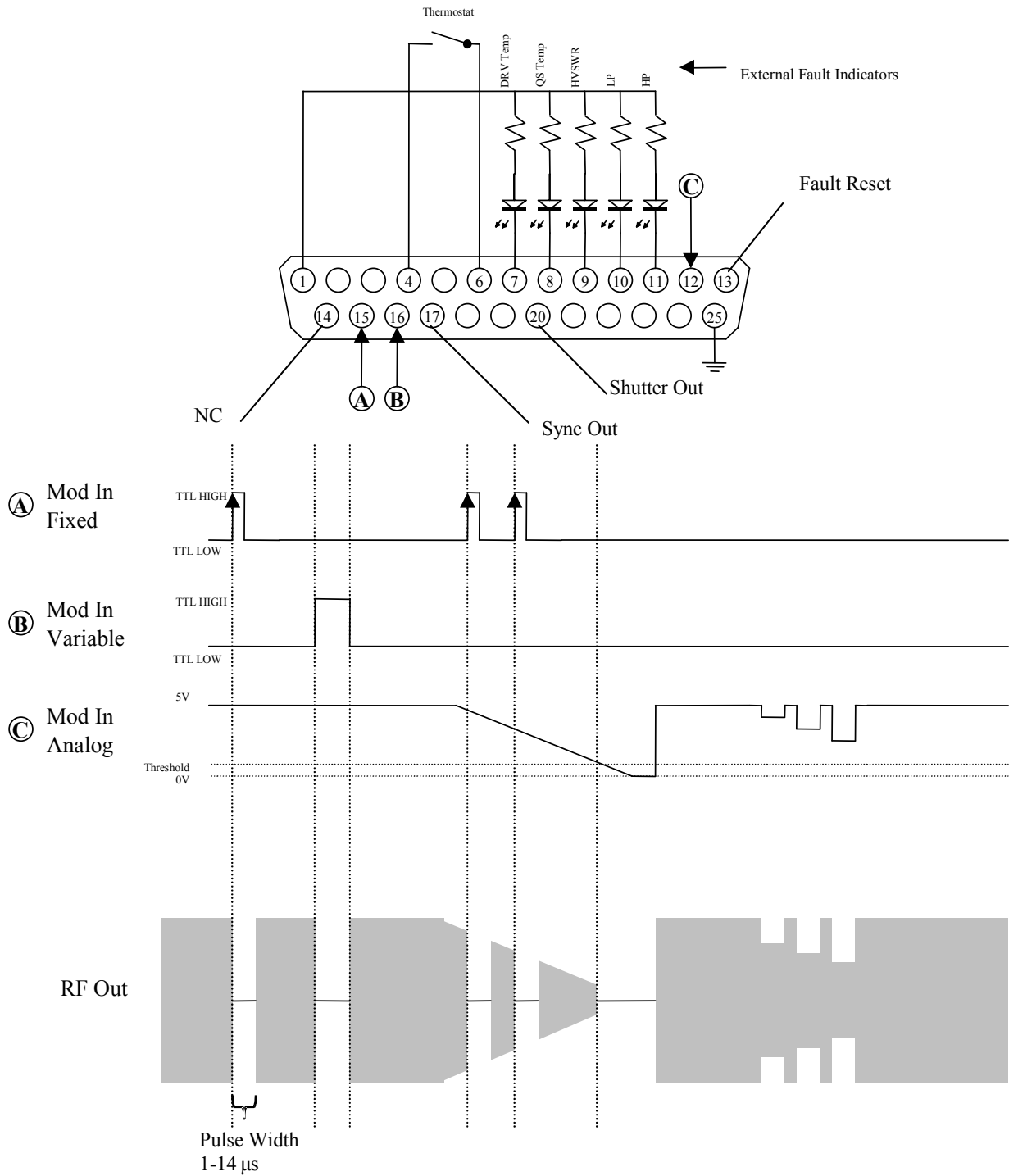As part of our policy of continuous product improvement we reserve the right to change specifications at any time

Figure 5

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

As part of our policy of continuous product improvement we reserve the right to change specifications at any time
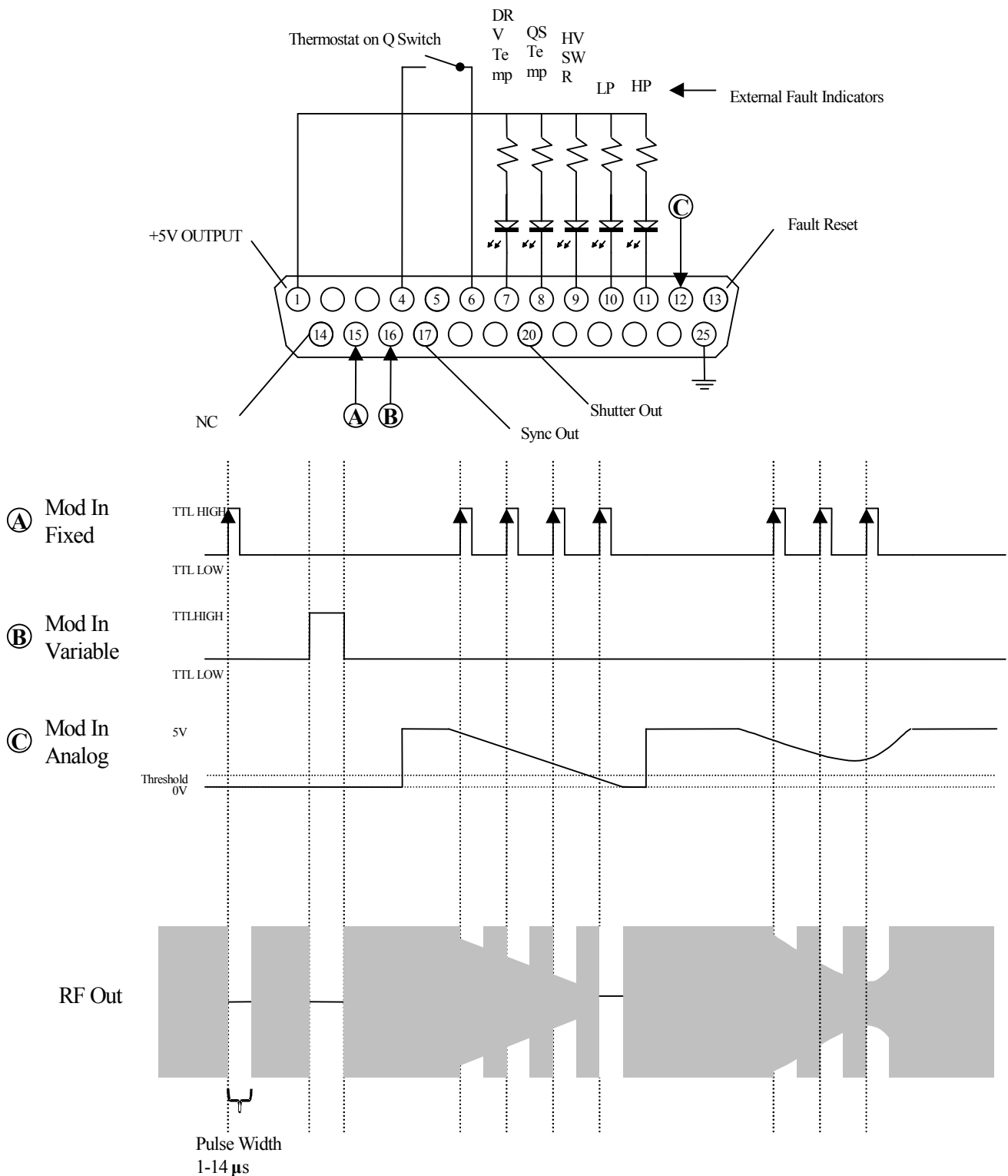
Figure 6

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

Thermostat on Q Switch

DR V Temp

QS Temp

HV SWR

LP   HP ← External Fault Indicators

Mod in Analog
(Not Used for this
Control Mode.)

+5V Output

Fault Reset

① ○ ○ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬

⑭ ⑮ ⑯ ⑰ ○ ○ ⑳ ○ ○ ○ ○ ㉕

FPS Trigger
(Not Used for this
Control Mode.)

Ⓐ Ⓑ

Shutter Out

Sync Out

Ⓐ Mod In
Fixed

TTL HIGH

TTL LOW

Ⓑ Mod In
Variable

TTL HIGH

TTL LOW

RF Out
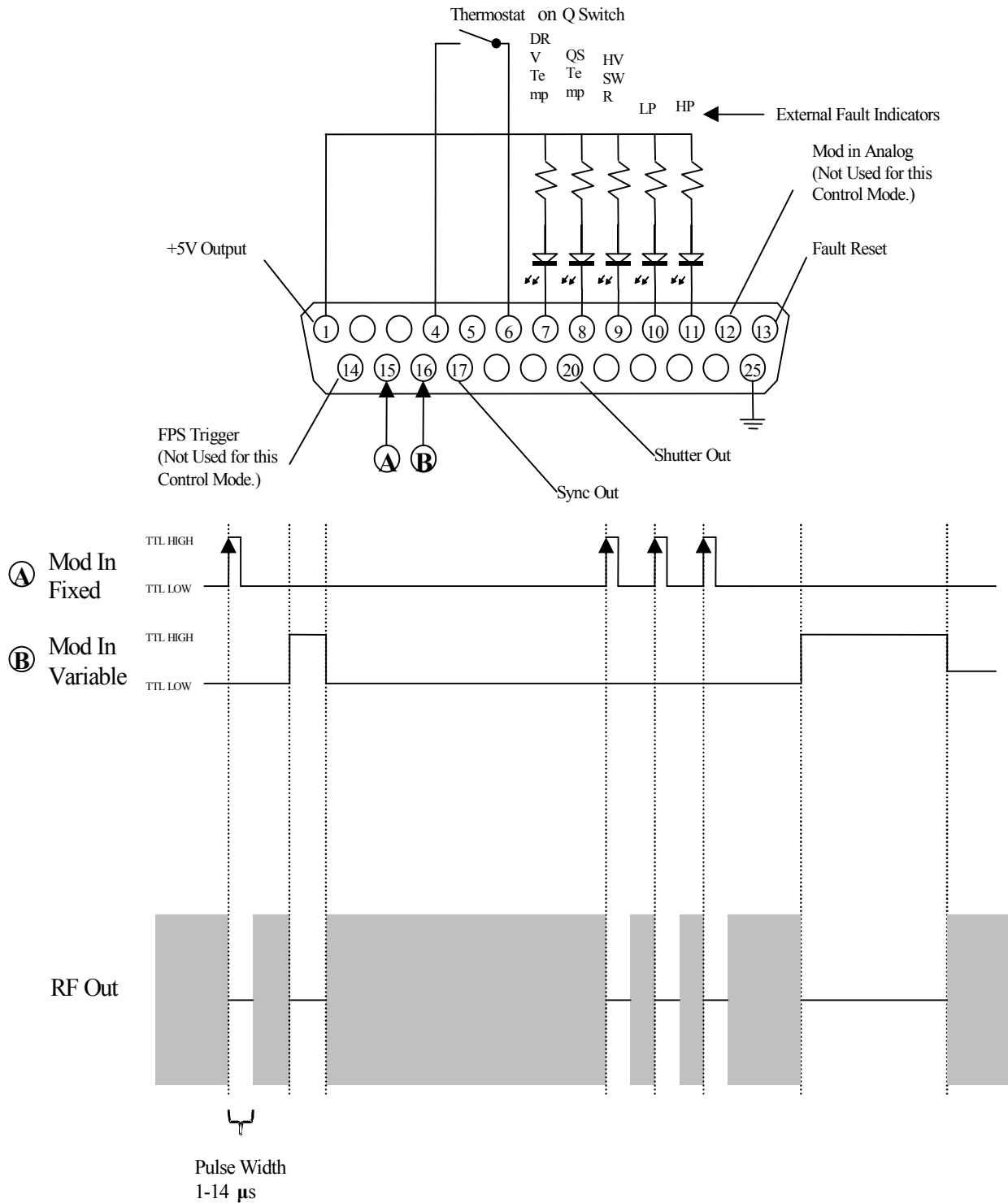
Pulse Width
1-14 μs

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.

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        Optional                            Option   Optional
┌─┬─┬─┬─┬─┬─┬─┐   ┌─┬─┬─┬─┬─┐   ┌─┬─┬─┐   ┌─┬─┬─┐
│M│Q│H│X│X│X│ │ - │Y│Y│Y│D│M│ - │Z│Z│Z│ - │ │ │ │
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Optional company information if customized (2 letters +number)

Code - Standard Frequencies
024   24.000 MHz
027   27.120 MHz
041   40.680 MHz
068   68.000 MHz
080   80.000 MHz

Code – Standard Control Options
A05 - Analog 0 to +5 V Power Control
R05 - Analog 0 to +5 V Power Control - Switched
FPS – First Pulse Suppression
PPK – Pre Pulse Kill
No Code when specified as TTL Digital only

Q-Switch Driver

M - OEM Module
S - Rack Mountable Box

D - Digital

RF Power 12 to 100 watts range

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.

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