

Gooch & Housego



Q-Switch Driver A25-Series

125 Watt RF Drivers for
Acousto-Optic Q-Switches

The A25xxx RF driver series provides up to 125 Watt output power. Combined with a power splitter cable this driver is ideal for synchronously driving a pair of Q-switches.

Various types cover a frequency range from 24 to 68 MHz.

The device can be driven either by a digital or an analogue control signal as well as by a combination of both. An operation scheme below (page 7) illustrates the interaction of the two modulation signals in detail.

Both the analogue and digital modulation controls allow excellently short rise and fall times for high laser pulse energies.

The driver can be operated with modulation frequencies (analogue and digital) up to 1 MHz

Optimum EMC shielding and mechanical protection is achieved by an aluminium casing and a conductive surface passivation.

Key Features:

- RF output power up to 125 Watt
- Choice of air and water cooling
- Excellently short fall and rise times
- Constant output power design
- High SWR and Overheat safety shutdown
- Compact casing, fully shielded (EMC)
- Frequency range 24 to 68 MHz

Applications:

- High reliability / industrial purpose acousto-optic Q-switched lasers, such as:
 - Material processing machines
 - Laser marking devices
 - Medical systems



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Technical Data

| | | | | |
|---|---|--------------|--------------|-----------|
| Supply voltage | +24 VDC | | | |
| Supply current | max. 12.5 A @ 125 W RF output power | | | |
| Maximum RF output power (adjustable) * | > 125 Watt | | | |
| Adjustment range | < 1 ... >125 Watt | | | |
| Output impedance | nom. 50 Ω | | | |
| Frequency accuracy | < ± 30 ppm | | | |
| RF ON / OFF ratio | > 60 dB | | | |
| Analogue modulation | | | | |
| Impedance | 50 or 600 Ω ** | | | |
| Voltage range @ 50 Ω | 0 ... +1 V or 0 ... +5 V ** | | | |
| Voltage range @ 600 Ω | 0 ... +5 V or 0 ... +10 V ** | | | |
| Digital modulation | | | | |
| Impedance | 4.7 k Ω (pull-up or pull-down) or 50 Ω (pull-down)** | | | |
| Level | High = $\geq 3V$... 5V Low = 0 ... < 2V | | | |
| Logic styles | Input signal: High Low not connected | | | |
| positive logic, pull-up | RF power: on off on | | | |
| positive logic, pull-down | on off off | | | |
| negative logic, pull-up | off on off | | | |
| negative logic, pull-down | off on on | | | |
| RF output frequency*** [MHz] | 24 | 27.12 | 40.68 | 68 |
| Harmonics distortion * [dBc] | < -23 | < -25 | < -30 | < -38 |
| Analogue modulation | | | | |
| RF rise time / fall time (10 ... 90%) * | < 100 ns | < 100 ns | < 80 ns | < 80 ns |
| Digital modulation | | | | |
| RF rise time / fall time (10 ... 90%) * | < 100 ns | < 100 ns | < 80 ns | < 80 ns |
| * into 50 Ω load ** other combinations on request *** other frequencies on request | | | | |

Connectors, Cooling, Dimensions, Weight

| | | |
|---|--|---|
| RF output connector | BNC female (standard) TNC female (on demand) | |
| Control connector | D-Sub 25-pole, female for pin assignment refer to section Control Connector, p. 7 | |
| Power Supply Cords red (or yellow) black (or violet) | 2x 750±50 mm H07V-K 1.5 mm ² + V _s (24 VDC) CGND (case ground) | |
| Cooling | Air | Water |
| | Aluminium heat sink with two fans 24 V DC, 110 mA each | tube material: Aluminium AlMgSi 0.5, stainless steel water connectors for hosepipe OD = 6 mm, ID = 4 mm |
| Dimensions [mm] | | |
| Casing | 226 x 125 x 102** | 200 x 114 x 53** |
| Mounting flat | 200 x 125 | 200 x 100 |
| Weight | 2640 grams | 1470 grams |
| ** length x width x height | | |

Environmental Conditions

| | |
|-----------------------------------|-------------------------------------|
| Warm up time | 10 minutes for optimum stability |
| Operating case temperature | < +50 °C, safety shutdown at ≈55 °C |
| Storage temperature | -20 °C ... +65 °C, non condensing |

Absolute Maximum Ratings

| | |
|--------------------------------------|--|
| Supply voltage max. | +26 VDC |
| Analogue modulation | |
| Voltage range @ 0 ... +1 V | -0.5 V ... +1.1 V |
| Voltage range @ 0 ... +5 V | -0.5 V ... +5.5 V |
| Voltage range @ 0 ... +10 V | -0.5 V ... +11.0 V |
| Digital modulation | |
| Level | -0.5 V ... +5.5 V |
| Maximum operating temperature | +55°C heat sink / base plate temperature |

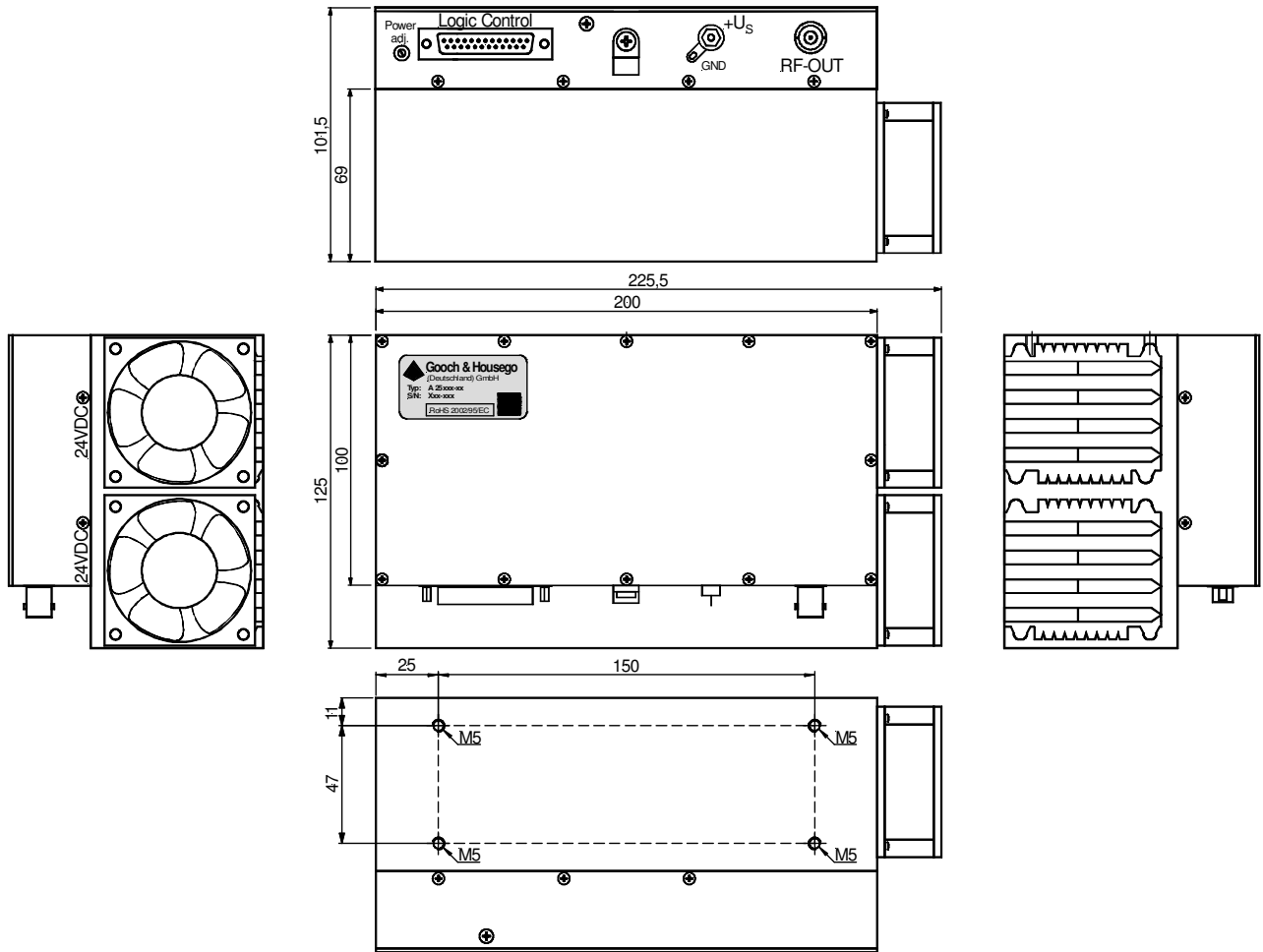
Quality Standards

| | |
|-----------------------------|--------------------------------------|
| EU 2002/95/EC (RoHS) | compliant |
| EMC standards | VDE 0871-B FCC Rules Part 15-B |
| Thermal test | 2h @ 60°C passive |
| Burn-in test | 30 minutes @ maximum RF power output |

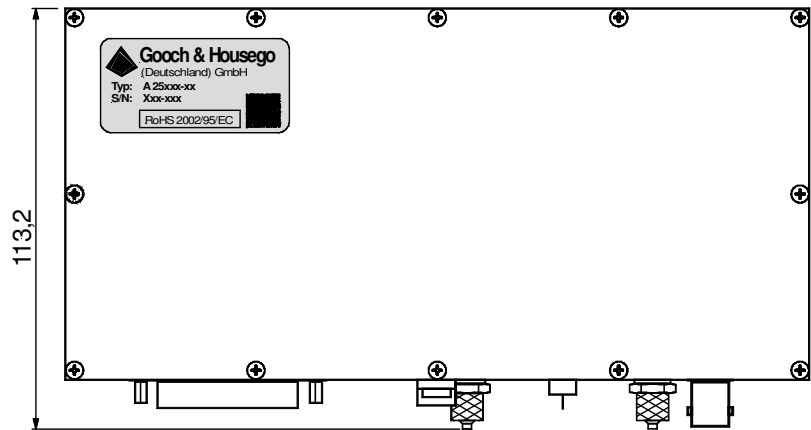
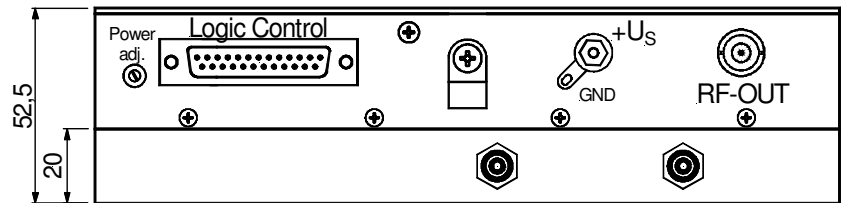
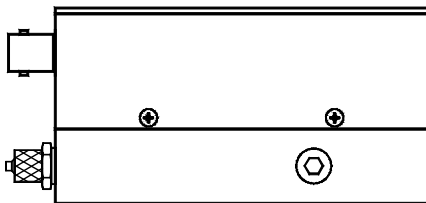
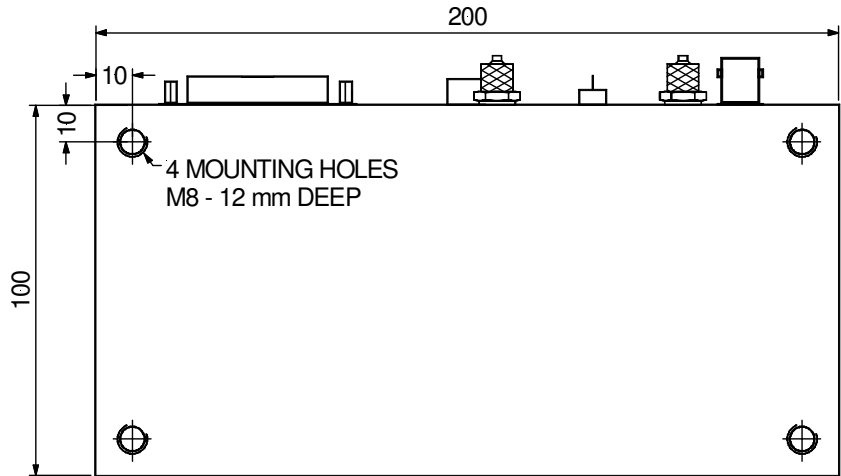
Outline Drawings

Dimensions in mm

Air Cooling



Water Cooling

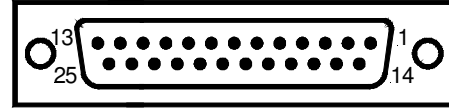


Control Connector

D-Sub 25-pole, female

Pin assignment

Any signals refer to chassis ground (CGND) unless denoted differently.



| | |
|----------------|---|
| Pin 1 | RF ON status (out) |
| Pin 2 | SWR fault indication (out) |
| Pin 3 | Driver temperature fault indication (out) |
| Pin 4 | Reset SWR fault / Init (in) |
| Pin 5 | Interlock 2 fault indication (out) |
| Pin 6 | Interlock 2 (in) |
| Pin 7 | Interlock 1 (in) |
| Pin 8 | Interlock 1 fault indication (out) |
| Pin 9 | Driver temperature monitor (out) |
| Pin 10 | Digital Ground (DGND) |
| Pin 11 | } refer to versions p, n, s |
| Pin 12 | |
| Pin 13 | |
| Pins 14 ... 22 | Chassis ground (CGND) |
| Pins 23 ... 24 | Digital ground (DGND) |
| Pin 25 | Auxiliary interface power supply +5VDC / 60mA (output, ref. DGND) |

Version *p*

Digital Modulation, Positive Logic

| | |
|--------|---------------------------------|
| Pin 11 | Analogue modulation (ref. DGND) |
| Pin 12 | n.c. |
| Pin 13 | Digital modulation (ref. DGND) |

Version *n*

Digital Modulation, Negative Logic

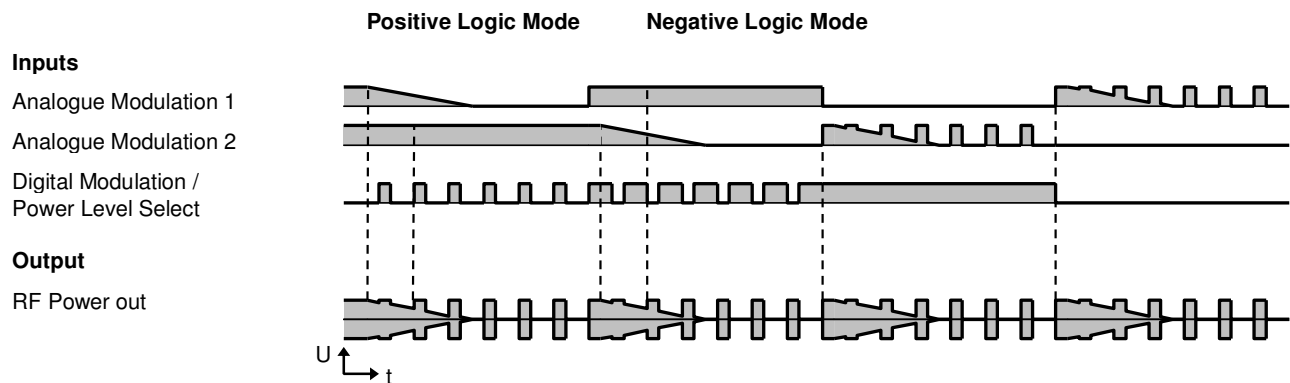
| | |
|--------|---------------------------------|
| Pin 11 | n.c. |
| Pin 12 | Analogue modulation (ref. DGND) |
| Pin 13 | Digital modulation (ref. DGND) |

Version *s*

Digital Modulation, Power Level Select

| | |
|--------|---|
| Pin 11 | Analogue modulation 2 (ref. DGND) |
| Pin 12 | Analogue modulation 1 (ref. DGND) |
| Pin 13 | Power Level Select (ref. DGND) LOW → select Analogue Mod. 1 HIGH → select Analogue Mod. 2 |

Operation Scheme of Analogue and Digital Modulation



Variants List / Ordering Codes

A25 - - -

| | Frequency [MHz] | Cooling | | Analogue Modulation Input) ¹) ³ | | Digital Modulation Input) ²) ³ | | | |
|-----|-----------------|---------|-------|---|-----------|--|-----------|--------------------|-----------------|
| | | | | Voltage Range | Impedance | Logic | Impedance | | |
| 024 | 24 | A | Air | 1/50 | 0..1V | 50Ω | p4k7u | positive | 4.7kΩ pull-up |
| 027 | 27.12 | | | 5/50 | 0..5V | 50Ω | p4k7d | positive | 4.7kΩ pull-down |
| 041 | 40.68 | W | Water | 5/600 | 0..5V | 600Ω | p50d | positive | 50Ω pull-down |
| 068 | 68 | | | 10/600 | 0...10V | 600Ω | n4k7u | negative | 4.7kΩ pull-up |
| | | | | | | | n4k7d | negative | 4.7kΩ pull-down |
| | | | | | | | n50d | negative | 50Ω pull-down |
| | | | | | | | s4k7u | Power Level Select | 4.7kΩ pull-up |
| | | | | | | | s4k7d | Power Level Select | 4.7kΩ pull-down |
| | | | | | | | s50d | Power Level Select | 50Ω pull-down |

Remarks

-)¹ The voltage range corresponds to 0 to 100% of the potentiometer pre-adjusted maximum RF output power.
-)² A pull-up resistor provides HIGH level, a pull-down resistor LOW level in case of not connected input.
-)³ Further configurations on request.

Various extras are available on demand, e.g.:

- clock output signal
- non-standard frequencies
- TNC connector for RF output
- Pre-Pulse Kill (PPK) or First Pulse Suppression (FPK) function

Accessories

Coax Transformer Cable C61x/C62x Series
3 dB Power Splitter

refer to data sheet for details