

Gooch & Housego



Q-Switch Driver A27-Series

15 Watt RF Drivers for
Acousto-Optic Q-Switches

The A27x RF driver series provides up to 15 Watt output power. Various types cover a frequency range from 24 to 80 MHz.

The maximum RF output power is adjustable by an internal potentiometer. The analogue modulation voltage controls the output power from 0 to 100% of the adjusted maximum power.

Additionally to the analogue modulation voltage a digital modulation control signal can switch the RF power. 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 15 Watt
- Conductive 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 80 MHz

Applications:

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



光技術をサポートする
株式会社オプトサイエンス
<http://www.optoscience.com>

東京本社 〒160-0014 東京都新宿区内藤町1番地 内藤町ビルディング
TEL:03(3356)1064 FAX:03(3356)3466 E-mail:info@optoscience.com
大阪支店 〒532-0011 大阪市淀川区西中島7-7-2 新大阪ビル西館
TEL:06(6305)2064 FAX:06(6305)1030 E-mail:osk@optoscience.com
名古屋営業所 〒450-0002 名古屋市中村区名駅2-37-21 東海ソフトビル
TEL:052(569)6064 FAX:052(569)8064 E-mail:ngo@optoscience.com

Technical Data

Supply voltage	+24 VDC (+15 VDC on request)																								
Supply current	typ. 3.0 A @ 15 W RF output power																								
Output impedance	nom. 50 Ω																								
Maximum RF output power (adjustable) *	> 15 W																								
Adjustment range	< 0.3 W ... > 15 W																								
Frequency accuracy	< ± 30 ppm																								
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 **																								
RF ON / OFF ratio	> 35 dB																								
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	<table border="1"> <thead> <tr> <th>Input signal:</th> <th>High</th> <th>Low</th> <th>not connected</th> </tr> </thead> <tbody> <tr> <td>RF power: positive logic, pull-up</td> <td>on</td> <td>off</td> <td>on</td> </tr> <tr> <td>positive logic, pull-down</td> <td>on</td> <td>off</td> <td>off</td> </tr> <tr> <td>negative logic, pull-up</td> <td>off</td> <td>on</td> <td>off</td> </tr> <tr> <td>negative logic, pull-down</td> <td>off</td> <td>on</td> <td>on</td> </tr> </tbody> </table>					Input signal:	High	Low	not connected	RF power: positive logic, pull-up	on	off	on	positive logic, pull-down	on	off	off	negative logic, pull-up	off	on	off	negative logic, pull-down	off	on	on
Input signal:	High	Low	not connected																						
RF power: positive logic, pull-up	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 ON / OFF ratio	> 52 dB																								
RF output frequency*** [MHz]	24	27.12	40.68	68	80																				
Harmonics distortion * [dBc]	< -23	< -23	< -23	< -23	< -25																				
Analogue modulation																									
RF rise time / fall time (10 ... 90%) *	< 35 ns	< 35 ns	< 35 ns	< 25 ns	< 20 ns																				
Digital modulation																									
RF rise time / fall time (10 ... 90%) *	< 35 ns	< 35 ns	< 35 ns	< 25 ns	< 20 ns																				
* into 50 Ω load ** other combinations on request *** other frequencies on request																									

Connectors, Cooling, Dimensions, Weight

RF output connector	SMA female	
Control connector	D-Sub 7W2	
Pin 1	OVERHEAT OUT	(LOW = failure)
Pin 2	HIGH SWR OUT	(LOW = failure)
Pin 3	INTERLOCK INPUT	(CGND = unlocked)
Pin 4	DIGITAL GROUND (DGND)	
Pin 5	RESET SWR / INIT	(LOW pulse = reset)
Pin A1 (coaxial)	DIGITAL MODULATION INPUT	
Pin A2 (coaxial)	ANALOGUE MODULATION INPUT	
Power Supply Cords	2x 750±50 mm H05V-K 1mm ²	
red (or yellow)	+ V _s (24 VDC)	
black (or violet)	CGND (case ground)	
Cooling	Conduction	
	The base plate must be attached to a suitable heat sink capable of dissipating 72 Watt.	
Dimensions [mm]	Tapped hole mounting	Flange mounting
Casing	140 x 80 x 40 **	140 x 80 x 40 **
Mounting flat	140 x 100	140 x 100
Weight	800 grams	800 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 base plate temperature

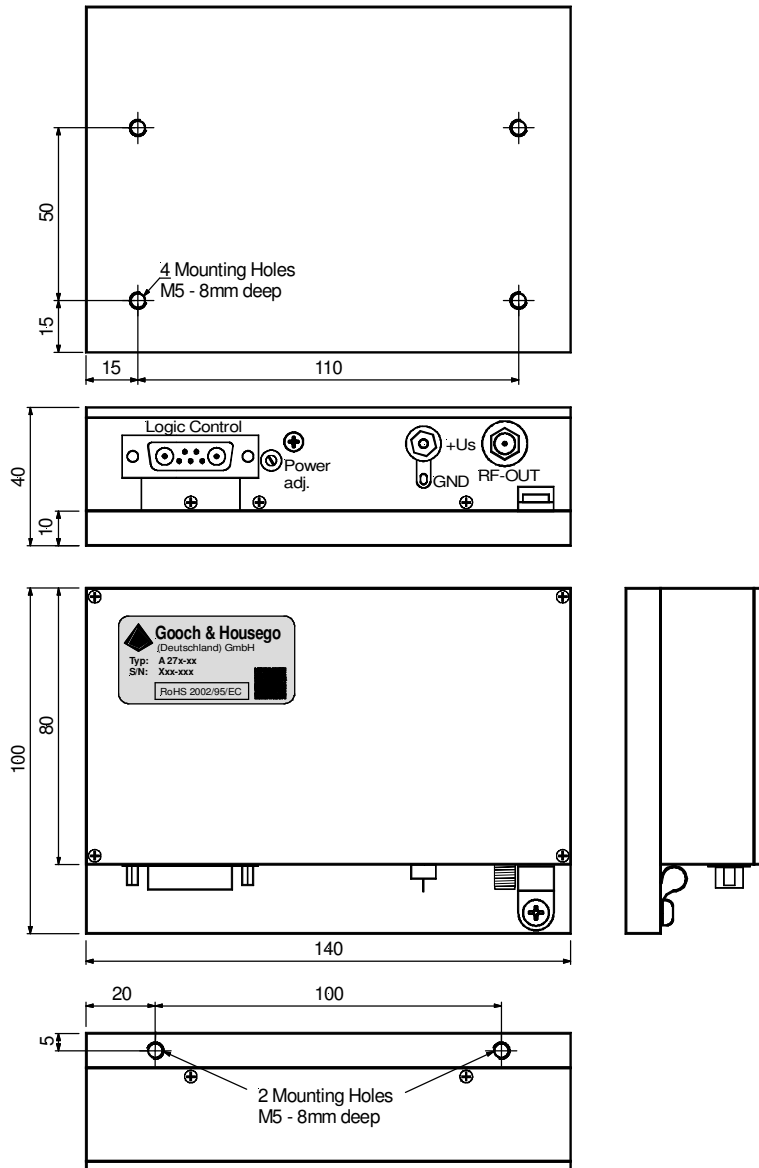
Quality Standards

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

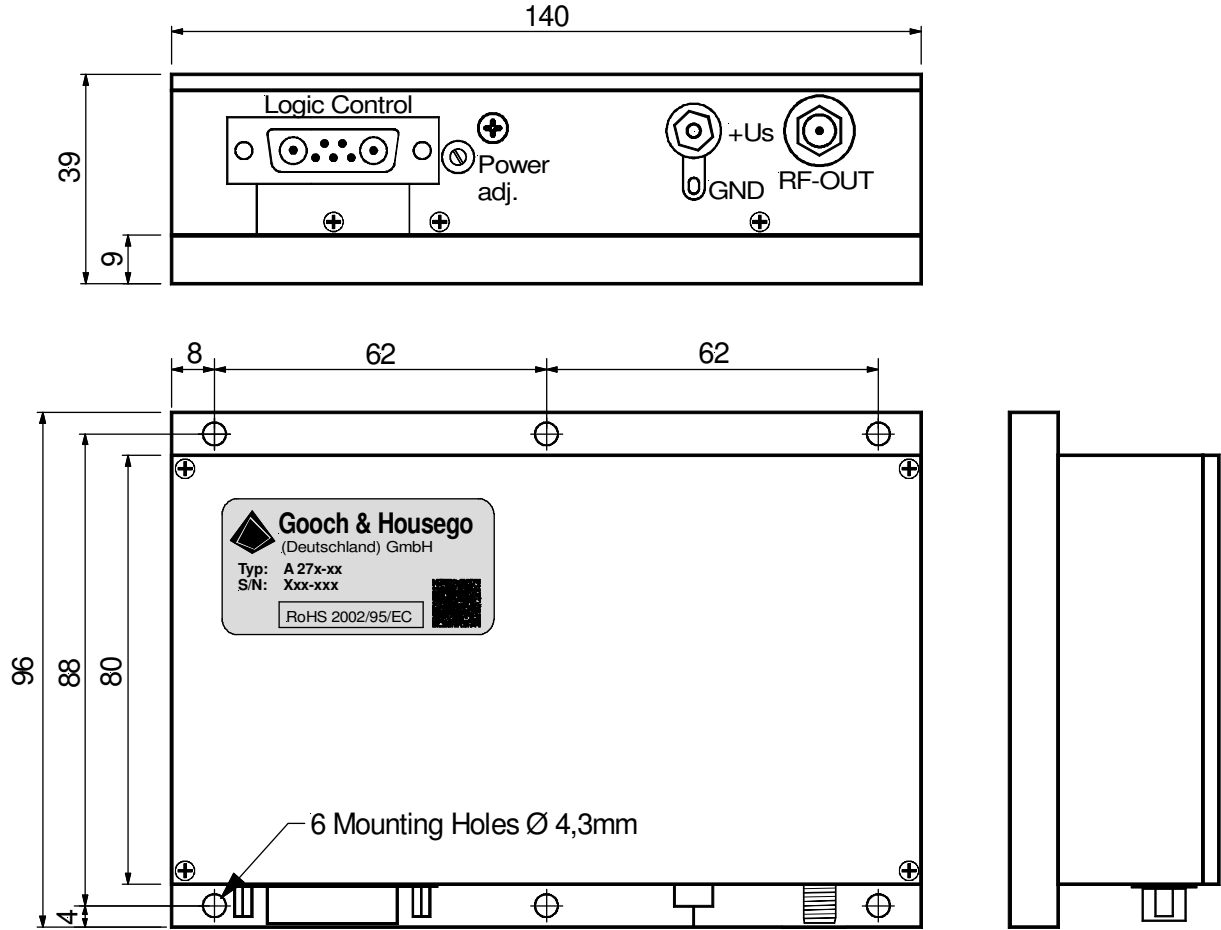
Outline Drawings

Dimensions in mm

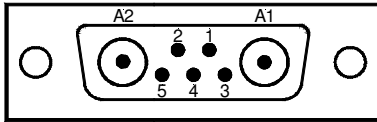
Conductive Cooling, Tapped Hole Mount



Conductive Cooling, Flange Mount

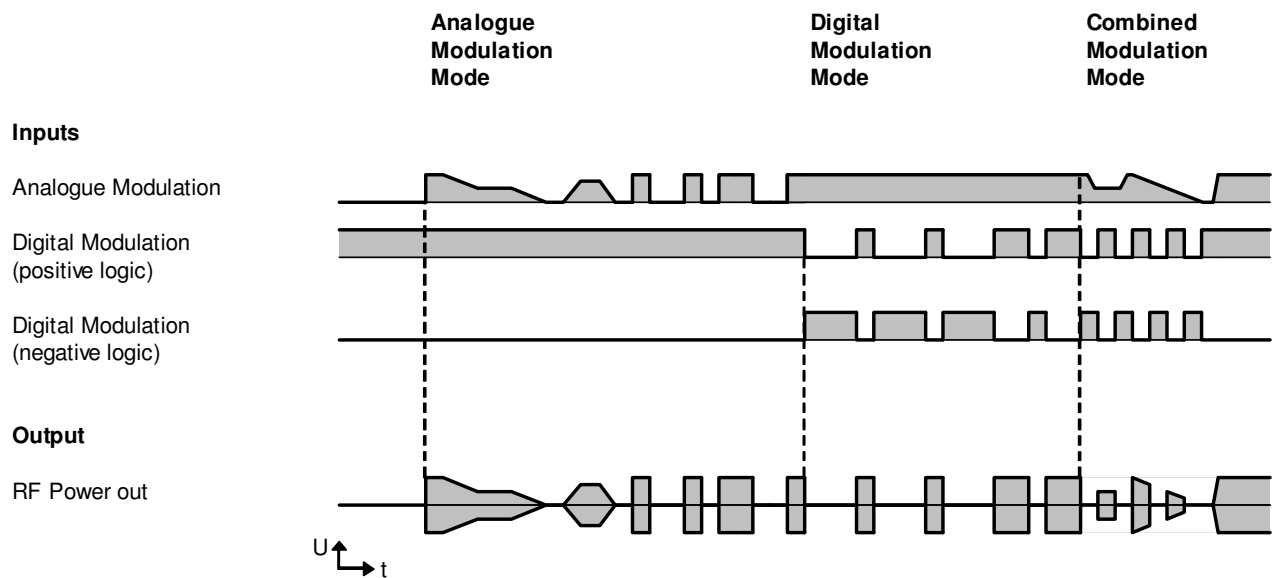


Control Connector



- | | | | |
|---|---------------------------|----|---------------------|
| 1 | Overheat fault indication | A1 | Digital modulation |
| 2 | High SWR fault indication | A2 | Analogue modulation |
| 3 | Interlock Input | | |
| 4 | Digital Ground (DGND) | | |
| 5 | Reset SWR fault / Init | | |

Operation Scheme of Analogue and Digital Modulation



Variants List / Ordering Codes

A27 - - -

	Frequency [MHz]	Base Plate	Analogue Modulation Input) ¹) ⁴		Digital Modulation Input) ²) ⁴	
			Voltage Range	Impedance	Logic	Impedance
0	24	T Conductive, Tapped Hole Mount	1/50	0..1V	50Ω	p4k7u) ³ positive 4.7kΩ pull-up
1	27.12		5/50	0...5V	50Ω	p4k7d positive 4.7kΩ pull-down
2	40.68		5/600	0...5V	600Ω	p50d positive 50Ω pull-down
3	68	F Conductive, Flange Mount	5/600	0...5V	600Ω	n4k7u negative 4.7kΩ pull-up
4	80		10/600	0...10V	600Ω	n4k7d) ³ negative 4.7kΩ pull-down
						n50d) ³ negative 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 These models can be put into operation with an open digital modulation input.

)⁴ Further configurations on request.

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

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

Accessories

Connector Set for Q-Switch-Driver Series
A22x, A23x, A24x, A25x, A27x, A28x, A29x

Part-No. 508A00135