



**Electro Optical Components, Inc.**

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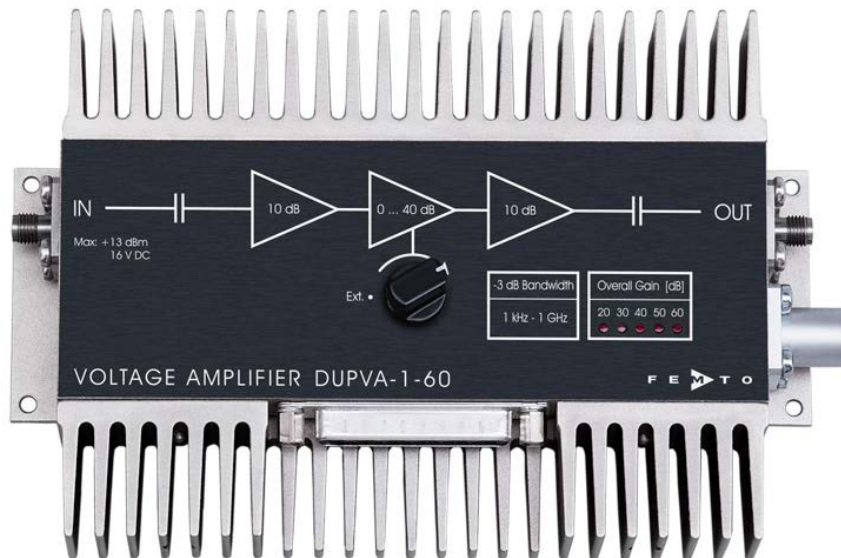
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## GHZ-WIDEBAND AMPLIFIERS

Suitable as Current and Voltage Amplifiers



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CURRENT AMPLIFIERS

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VOLTAGE AMPLIFIERS

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GHZ-WIDEBAND  
AMPLIFIERS

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PHOTORECEIVERS

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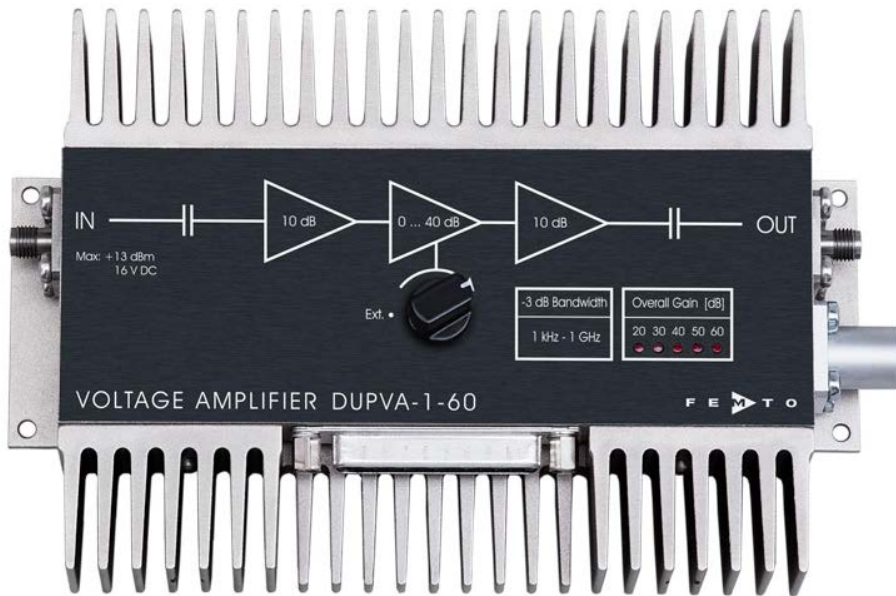
LOCK-IN AMPLIFIERS

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ACCESSORIES

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DUPVA Series 1 GHz Variable Gain Voltage Amplifiers



- Variable gain up to 70 dB (approx. × 3000), switchable in 10 dB steps
- Bandwidth 1 kHz to 1.2 GHz
- Bandwidth independent of gain setting (guaranteed)
- Noise figure down to 1.9 dB (330 pV/√Hz)
- Local and remote gain control

APPLICATIONS

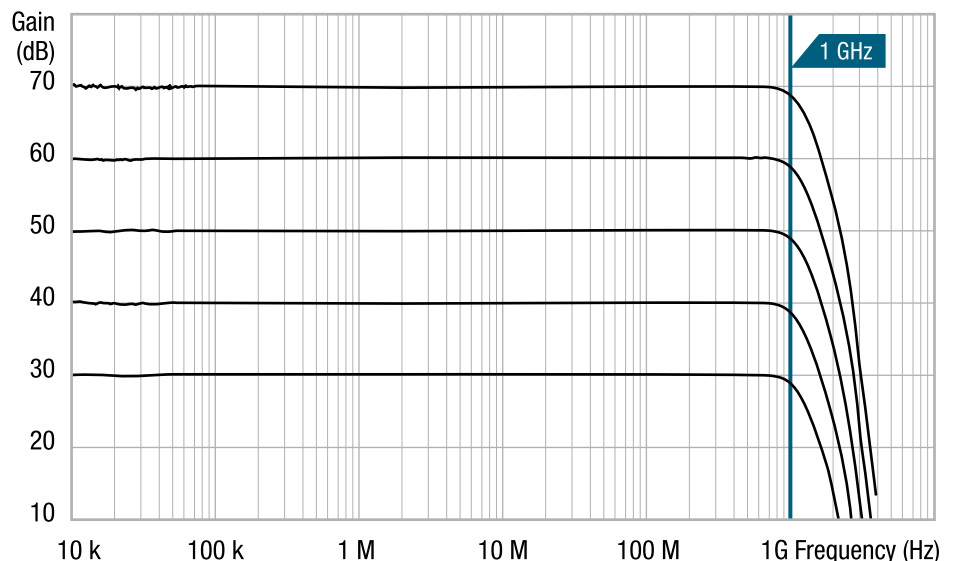
Oscilloscope and transient recorder preamplifier | Photomultiplier and microchannel plate amplifier | Signal booster for optical receivers and current amplifiers | Time-resolved pulse and transient measurements | Automated measurement systems

Model	DUPVA-1-60	DUPVA-1-70
Lower Cut-Off-Frequency	1 kHz	1 kHz
Upper Cut-Off-Frequency	1.2 GHz	1.1 GHz
Rise/Fall Time	380 ps	390 ps
Gain	20/30/40/50/60 dB	30/40/50/60/70 dB
Input Noise	NF 3.0 dB (450 pV/√Hz)	NF 1.9 dB (330 pV/√Hz)
Output Power	13 dBm (−1 dB compression @ 100 MHz)	12 dBm (−1 dB compression @ 100 MHz)
Power Requirements	±15 V, +350 mA / −100 mA, typ.	±15 V, +250 mA / −100 mA, typ.
Input/Output	50 Ω, SMA connector	
Monitor Output	DC - 100 kHz monitor output at D-Sub connector, gain of 1	
Control Interface	3 opto-isolated digital inputs, TTL/CMOS compatible	
Dimensions	165 x 105 x 45 mm (L x W x H), weight 510 g (1.1 lbs)	

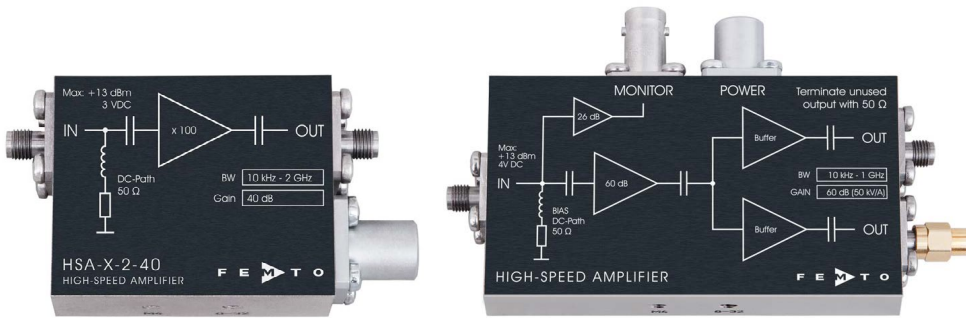
Indication of selected gain setting by LED. Output short-circuit protected. Power supply via 3-pin Lemo® socket. A mating connector is provided with the device. Optional power supply PS-15 available. For further information please view the datasheet.

TYPICAL PERFORMANCE CHARACTERISTICS

- Bandwidth independent of gain setting (guaranteed), see figure: DUPVA-1-70 gain vs. frequency
- Upper cut-off frequency rolloff: 40 dB/oct.



HSA Series High-Speed GHz Amplifiers



- Ultra-wide bandwidth from 10 kHz up to 2.5 GHz
- Gain up to 60 dB (× 1,000)
- Transimpedance gain with photodetectors up to 50,000 V/A
- Very low input noise down to 310 pV/√Hz (6.2 pA/√Hz)
- Integrated DC-current path for biased photodetector applications

APPLICATIONS

Preamplifier for ultra-fast detectors (microchannel plates, photomultipliers, avalanche photodiodes and PIN photodiodes) | Oscilloscope and spectrum/network analyzer preamplifier | Time-resolved pulse and transient measurements | Signal booster in 50 Ω high-speed systems

Only HSA-Y series:

- Two identical signal outputs
- DC-monitor output

HSA-X Models	HSA-X-1-40	HSA-X-2-20	HSA-X-2-40	HSA-X-1-2-40
Lower Cut-Off-Frequency	10 kHz	10 kHz	10 kHz	10 kHz
Upper Cut-Off-Frequency	1.2 GHz	2.5 GHz	2.0 GHz	2.2 GHz
Rise/Fall Time	290 ps	140 ps	180 ps	160 ps
Gain	40 dB (× 100)	20 dB (× 10)	40 dB (× 100)	40 dB (× 100) inverting
Transimpedance*	5,000 V/A	500 V/A	5,000 V/A	5,000 V/A inverting
Input Noise [V/√Hz]**	310 pV (6.2 pA)	610 pV (12.2 pA)	620 pV (12.4 pA)	430 pV (8.6 pA)
Input VSWR	1.6 : 1	1.23 : 1	1.4 : 1	1.25 : 1
Maximum Output Voltage @ 50 Ω	2 V <sub>pp</sub>	2 V <sub>pp</sub>	1.9 V <sub>pp</sub>	2 V <sub>pp</sub>
Output VSWR	1.35 : 1	1.4 : 1	2.5 : 1	1.4 : 1
Power Requirements	+15 V, +140 mA, typ.	+15 V, +105 mA, typ.	+15 V, +125 mA, typ.	+15 V, +140 mA, typ.
Input/Output	50 Ω, SMA			
Dimensions	80 x 45 x 25 mm (L x W x H), weight 100 g (0.23 lb)			

HSA-Y Models	HSA-Y-1-40	HSA-Y-1-60	HSA-Y-2-20	HSA-Y-2-40
Lower Cut-Off-Frequency	10 kHz	10 kHz	10 kHz	10 kHz
Upper Cut-Off-Frequency	1.0 GHz	1.1 GHz	2 GHz	1.9 GHz
Rise/Fall Time	330 ps	320 ps	175 ps	185 ps
Gain	40 dB (× 100)	60 dB (× 1,000)	20 dB (× 10)	40 dB (× 100)
Transimpedance*	5,000 V/A	50,000 V/A	500 V/A	5,000 V/A
Input Noise [V/√Hz]**	330 pV (6.6 pA)	330 pV (6.6 pA)	680 pV (13.6 pA)	650 pV (13 pA)
Input VSWR	1.45 : 1	1.4 : 1	1.15 : 1	1.2 : 1
Maximum Output Voltage @ 50 Ω	2.0 V <sub>pp</sub>	2.3 V <sub>pp</sub>	2.5 V <sub>pp</sub>	1.7 V <sub>pp</sub>
Output VSWR	1.6 : 1	1.4 : 1	2.5 : 1	1.8 : 1
Power Requirements	±15 V, +200 / -10 mA, typ.	±15 V, +180 / -10 mA, typ.	±15 V, +160 / -10 mA, typ.	±15 V, +185 / -10 mA, typ.
Input	50 Ω, SMA			
Output	Two identical signal outputs, 50 Ω, SMA			
Monitor Output	Gain: 26 dB (× 20), transimpedance*: 1 kV/A, output voltage range: ±10 V (R <sub>load</sub> > 10 kΩ), bandwidth: DC - 100 kHz			
Dimensions	110 x 70 x 25 mm (L x W x H), weight 180 g (0.41 lb)			

\* Transimpedance = Gain × 50 Ω (Input Impedance)

\*\* Input Noise Current = Input Noise Voltage ÷ 50 Ω (Input Impedance)

Integrated DC path for use with photodetectors. 8-32 and M4 mounting threads. Power supply via 3-pin Lemo<sup>®</sup> socket. A mating connector is provided with the device. Optional power supply PS-15 available. For further information please view the datasheet.