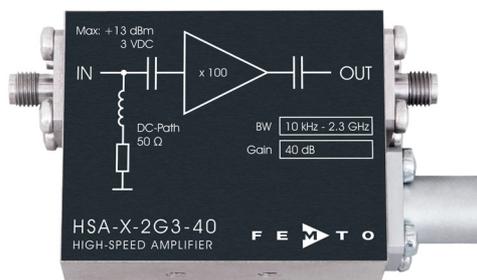
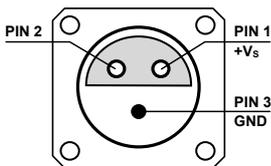


2.3 GHz High-Speed Amplifier



<p>Features</p>	<ul style="list-style-type: none"> • Bandwidth 10 kHz – 2.3 GHz • Rise time 170 ps • Integrated bias circuit 								
<p>Applications</p>	<ul style="list-style-type: none"> • Preamplifier for ultra-fast detectors (microchannel-plates, photomultipliers, avalanche-photodiodes and PIN-photodiodes) • Oscilloscope and transient-recorder preamplifier • Time-resolved pulse and transient measurements 								
<p>Block Diagram</p>									
<p>Intended Use</p>	<p>The HSA-X-2G3-40 is a low noise, ultra-fast fixed-gain amplifier. Thanks to its integrated bias-T, it is suitable for signal acquisition from photodiodes and photomultipliers. Operation is mostly self-explanatory. If in doubt, consult this document or contact support@femto.de.</p> <p>For safe operation, please refer to the damage thresholds specified in the "Absolute Maximum Ratings", "Temperature Range" and "Power Supply" sections of this document.</p> <p>The operating environment must be free of smoke, dust, grease, oil, condensing moisture, and other contaminants that could affect the operation or performance.</p>								
<p>Related Models</p>	<table border="0"> <tr> <td>HSA-X-1-40</td> <td>gain 40 dB, bandwidth 1.2 GHz</td> </tr> <tr> <td>HSA-X-2-20</td> <td>gain 20 dB, bandwidth 2.5 GHz</td> </tr> <tr> <td>HSA-X-2-40</td> <td>gain 40 dB, bandwidth 2.0 GHz, limited availability</td> </tr> <tr> <td>HSA-X-1-2-40</td> <td>gain 40 dB, bandwidth 2.2 GHz, inverting</td> </tr> </table>	HSA-X-1-40	gain 40 dB, bandwidth 1.2 GHz	HSA-X-2-20	gain 20 dB, bandwidth 2.5 GHz	HSA-X-2-40	gain 40 dB, bandwidth 2.0 GHz, limited availability	HSA-X-1-2-40	gain 40 dB, bandwidth 2.2 GHz, inverting
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<p>Available Accessories</p>	<p>PS-15-25-L</p> <p>Power Supply Input: 100 – 240 VAC Output: ±15 VDC</p>								

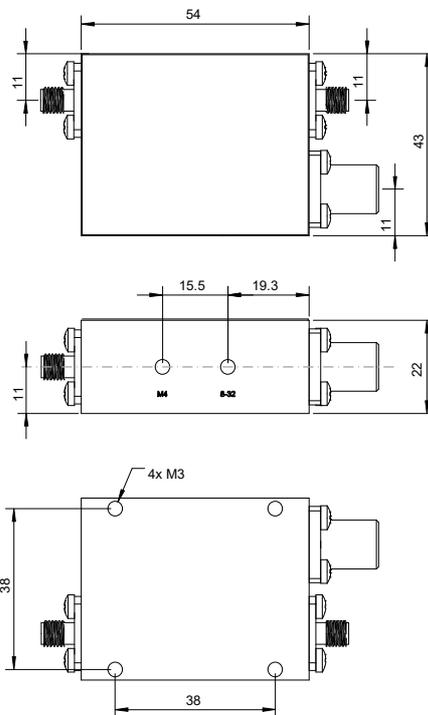
2.3 GHz High-Speed Amplifier

Specifications	Test conditions	$V_S = +15\text{ V}$, $T_A = 25\text{ }^\circ\text{C}$, system impedance $50\ \Omega$, warm-up 20 minutes (min. 10 minutes recommended)
Gain	Gain Transimpedance gain Gain accuracy	40 dB ($\times 100$) $5.0 \times 10^3\text{ V/A}$ ($40\text{ dB} \times 50\ \Omega$) $\pm 1\text{ dB}$
Frequency Response	Lower cut-off frequency (-3 dB) Upper cut-off frequency (-3 dB)	10 kHz ($\pm 25\%$) 2.3 GHz ($\pm 15\%$)
Time Response	Rise/fall time (10% – 90%)	170 ps ($\pm 15\%$)
Input	DC input impedance RF input impedance $50\ \Omega$ noise figure Equivalent input voltage noise Equivalent input noise current Input VSWR Input reflection S11	$50\ \Omega$ $50\ \Omega$ 2.8 dB (@ $f < 1\text{ GHz}$) typ. 430 pV/ $\sqrt{\text{Hz}}$ typ. 8.6 pA/ $\sqrt{\text{Hz}}$ (calculated: 430 pV/ $\sqrt{\text{Hz}}$ divided by $50\ \Omega$) 1.45 : 1 (@ $f < 2\text{ GHz}$) -15 dB (@ $f < 2\text{ GHz}$)
Output	Output impedance Output VSWR Output reflection S22 Output power P1dB Output peak-to-peak voltage Output noise	$50\ \Omega$ 1.4 : 1 (@ $f < 3\text{ GHz}$) -15.5 dB (@ $f < 3\text{ GHz}$) +12.5 dBm (@ $f < 1\text{ GHz}$) 2.0 V (@ $f < 500\text{ MHz}$, for linear amplification) typ. 3.0 mV RMS or 20 mV PP* (measurement BW: 4 GHz)
	* The peak-to-peak output noise is derived from the RMS noise as follows: $V_{PP} = V_{RMS} \times 6.6$ (99.9% of the time the output noise voltage will be within the specified peak-to-peak value.)	
Power Supply	Supply voltage Supply current	+15 V 135 mA (depends on operating conditions, recommended power supply capability min. 200 mA)
Case	Weight Material	100 g (0.23 lbs) AlMg4.5Mn, nickel-plated
Temperature Range	Storage temperature Operating temperature	$-40\text{ }^\circ\text{C} \dots +100\text{ }^\circ\text{C}$ $0\text{ }^\circ\text{C} \dots +60\text{ }^\circ\text{C}$
Absolute Maximum Ratings	Power supply voltage DC and LF input voltage RF input power	+20 V $\pm 3\text{ V}$ +13 dBm
Connectors	Input Output Power supply	SMA jack (female) SMA jack (female) LEMO® series 1S, 3-pin fixed socket (mating plug type: FFA.1S.303.CLAC52)
		 <p>Pin 1: +15 V Pin 2: NC Pin 3: GND</p>
Scope of Delivery	HSA-X-2G3-40, LEMO® 3-pin connector, datasheet, transport package	
Ordering Information	HSA-X-2G3-40	gain 40 dB, bandwidth 2.3 GHz

2.3 GHz High-Speed Amplifier

Dimensions

HSA-X-2G3-40



DZ-HSA-X_R3

all dimensions in mm unless otherwise noted

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