WOOFER G1
12G1 / 12G1PE**

Guitar Woofer, 12 "designed to attend the need for all manufacturers of amplifiers and musicians. And to became evident the speaker performance in the high-end sound, is Selenium puts all his knowledge allied the best materials and process, to provide a quality product and reliability.

The cone light, made from long fibre, provides for all mobile great stability, high efficiency and good distortion.

The voice coil is made with wire resistant to high temperatures and has a body of Kapton®.

The basket made of reinforced steeel sheet and epoxi paint, gives to the woofer vast structure and mechanical strength.

The dust cap of fabric ensures a perfect dissipation of heat from voice coil.

The use of high-strength adhesive provide optimum sizing and durability.

*** 12G1PE - Product with black basket.*

SPECIFICATIONS

Nominal diameter	305 (12)	mm (in)
Nominal impedance	8	Ω
Minimum impedance @ 280 Hz	7.0	Ω
Power handling		
Musical program[1]	160	W
AES[2]	80	W
Sensitivity (2.83V@1m) averaged from 100 to 3,000 Hz	98	dB SPL
Power compression @ 0 dB (nom. power)	4.4	dB
Power compression @ -3 dB (nom. power)/2	2.7	dB
Power compression @ -10 dB (nom. power)/10	1.0	dB
Frequency response @ -10 dB	55 to 5,000	Hz

[1] Power handling specifications refer to normal speech and/or music program material, reproduced by an amplifier producing no more than 5% distortion. Power is calculated as true RMS voltage squared divided by the nominal impedance of the loudspeaker.
[2] AES Standard (60 - 600 Hz).

THIELE-SMALL PARAMETERS

Fs	73	Hz
Vas	50,0 (1.76)	l (ft^3)
Qts	0.70	
Qes	0.73	
Qms	17.7	
ηo (half space)	2.62	%
Sd	0.0510 (79.05)	m^2 (in^2)
Vd (Sd x Xmax)	17.85 (1.09)	cm^3 (in^3)
Xmax (max. excursion (peak) with 10% distortion)	0.35 (0.01)	mm (in)
Xlim (max.excursion (peak) before physical damage)	9.5 (0.37)	mm (in)

Atmospheric conditions at TS parameter measurements:

Temperature	22 (71.6)	°C (°F)
Atmospheric pressure	1,008	mb
Humidity	53	%

Thiele-Small parameters are measured after a 2-hour power test using half AES power . A variation of ± 15% is allowed.

ADDITIONAL PARAMETERS

βL	11.3	Tm
Flux density	1.1	T
Voice coil diameter	51 (2.0)	mm (in)
Voice coil winding length	9.5 (31.2)	m (ft)
Wire temperature coefficient of resistance (α25)	0.00403	1/°C
Maximum voice coil operation temperature	250 (482)	°C (°F)
θvc (max.voice coil operation temp./max.power)	3.12 (6.02)	°C/W(°F/W)
Hvc (voice coil winding depth)	6.0 (0.24)	mm (in)
Hag (air gap height)	6.3 (0.25)	mm (in)
Re	6.6	Ω
Mms	34.0 (0.075)	g (lb)
Cms	160.0	μm/N
Rms	1.20	kg/s

NON-LINEAR PARAMETERS

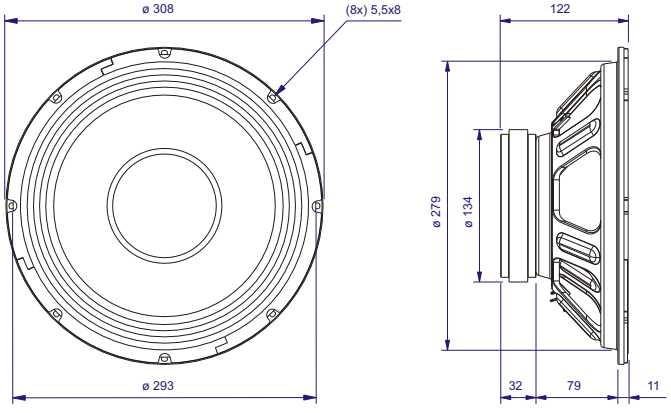
Le @ Fs (voice coil inductance @ Fs)	1.174	mH
Le @ 1 kHz (voice coil inductance @ 1 kHz)	0.669	mH
Le @ 20 kHz (voice coil inductance @ 20 kHz)	0.357	mH
Red @ Fs	0.13	Ω
Red @ 1 kHz	1.88	Ω
Red @ 20 kHz	37.70	Ω
Krm	0.3	mΩ
Kxm	4.2	mH
Erm	1.00	
Exm	0.79	

ADDITIONAL INFORMATION

Magnet material	Barium ferrite	
Magnet weight	1,600 (56.4)	g (oz)
Magnet diameter x depth	169 x 19 (6.65 x 0.75)	mm (in)
Magnetic assembly weight	4,360 (9.61)	g (lb)
Frame material	Steel	
Frame finish	Black and orange epoxy	
Voice coil material	Copper	
Voice coil former material	Polyimide (Kapton®)	
Cone material	Long fiber pulp	
Volume displaced by woofer	1.8 (0.065)	l (ft^3)
Net weight	4,520 (9.96)	g (lb)
Gross weight	4,700 (10.36)	g (lb)
Carton dimensions (W x D x H)	32 x 32 x 14 (12.8 x 12.8 x 5.6)	cm (in)

MOUNTING INFORMATION

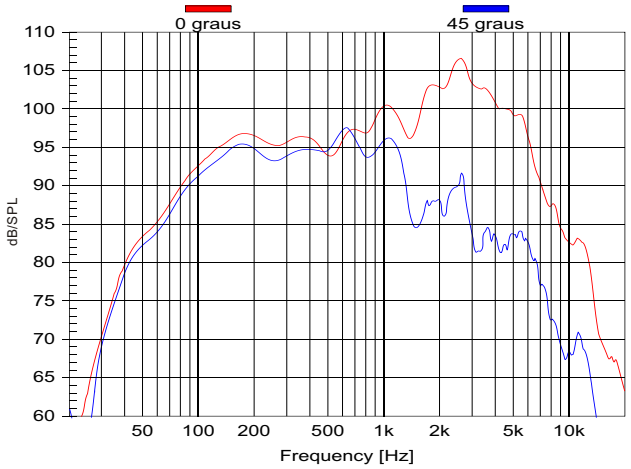
Number of bolt-holes	8	
Bolt-hole dimension	5.5 x 8 (0.22 x 0.31)	mm (in)
Bolt-circle diameter	293 (11.49)	mm (in)
Baffle cutout diameter (front mount)	281 (11.06)	mm (in)
Baffle cutout diameter (rear mount)	275 (10.83)	mm (in)
Connectors	Soldier	
Polarity	Positive voltage applied to the positive (+) terminal gives forward cone motion	
Minimum clearance between the back of the magnetic assembly and the enclosure wall	75 (3)	mm (in)



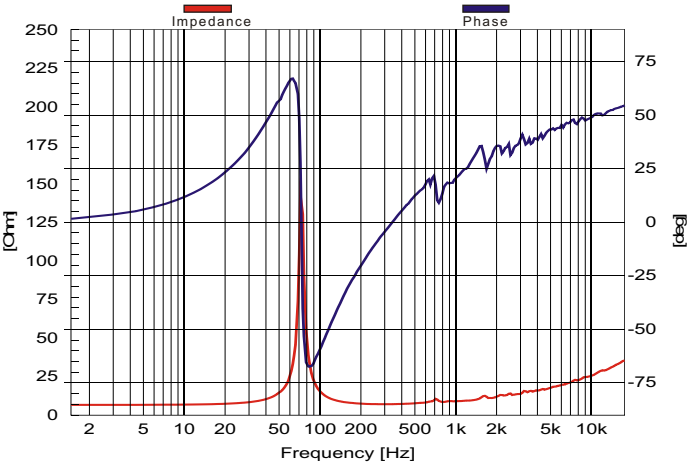
Dimensions in mm.

WOOFER G1
12G1 / 12G1PE**

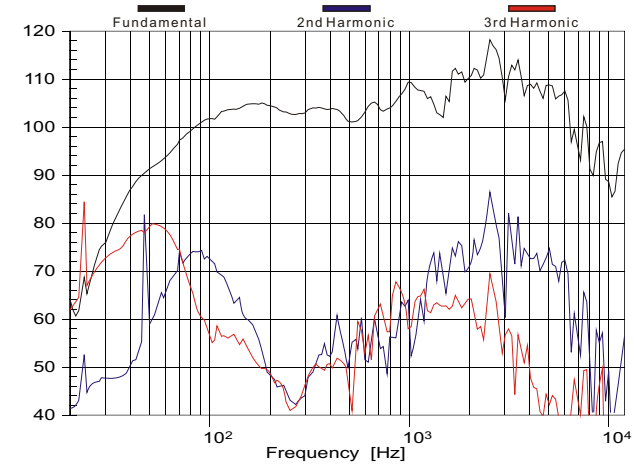
RESPONSE CURVES (0° AND 45°) IN A TEST ENCLOSURE INSIDE AN ANECHOIC CHAMBER,1 W / 1m



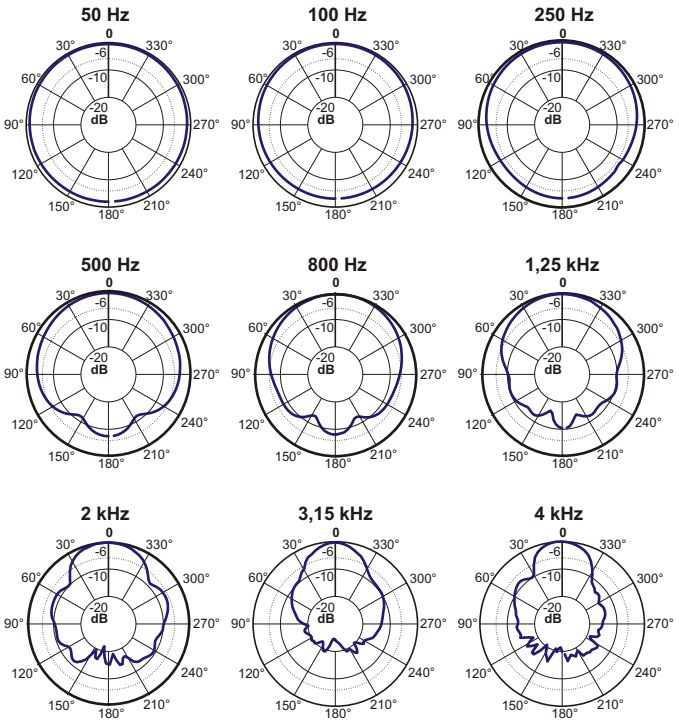
IMPEDANCE AND PHASE CURVES MEASURED IN FREE-AIR



HARMONIC DISTORTION CURVES MEASURED AT 10% AES INPUT POWER, 1 m



POLAR RESPONSE CURVES



Polar Response Curve.

HOW TO CHOOSE THE RIGHT AMPLIFIER

The power amplifier must be able to supply twice the RMS driver power. This 3 dB headroom is necessary to handle the peaks that are common to musical programs. When the amplifier clips those peaks, high distortion arises and this may damage the transducer due to excessive heat. The use of compressors is a good practice to reduce music dynamics to safe levels.

FINDING VOICE COIL TEMPERATURE

It is very important to avoid maximum voice coil temperature. Since moving coil resistance (R_E) varies with temperature according to a well known law, we can calculate the temperature inside the voice coil by measuring the voice coil DC resistance:

$$T_B = T_A + \left(\frac{R_B}{R_A} - 1\right)\left(T_A - 25 + \frac{1}{\alpha_{25}}\right)$$

T_A , T_B= voice coil temperatures in °C.
R_A , R_B= voice coil resistances at temperatures T_A and T_B, respectively.
α_{25}= voice coil wire temperature coefficient at 25 °C.

POWER COMPRESSION

Voice coil resistance rises with temperature, which leads to efficiency reduction. Therefore, if after doubling the applied electric power to the driver we get a 2 dB rise in SPL instead of the expected 3 dB, we can say that power compression equals 1 dB. An efficient cooling system to dissipate voice coil heat is very important to reduce power compression.

NON-LINEAR VOICE COIL PARAMETERS

Due to its close coupling with the magnetic assembly, the voice coil in electrodynamic loudspeakers is a very non-linear circuit. Using the non-linear modeling parameters Krm, Kxm, Erm and Exm from an empirical model, we can calculate voice coil impedance with good accuracy.

SUGGESTED PROJECTS

Auditorium Kit Electoral Kit
For additional project suggestions, please access our website.

TEST ENCLOSURE

65-liter volume with a duct ø 4” by 0.8” in length.

Kapton®: Du Pont trademark.