

TEST REPORT

Alpine SWT-10S2 Woofer Review

BY GARRY SPRINGGAY



ELECTRICAL PARAMETERS	COILS IN SERIES		COILS IN PARALLEL		Description
	Value	Unit	Value	Unit	
Re	1.69	Ohm			Electrical voice coil resistance at DC
Le	0.897	mH			Frequency independent part of voice coil inductance
L2	1.377	mH			Para-inductance of voice coil
R2	3.61	Ohm			Electrical resistance due to eddy current losses
Cmes	1684	µF			Electrical capacitance representing moving mass
Lces	13.18	mH			Electrical inductance representing driver compliance
Res	15.25	Ohm			Resistance due to mechanical losses
fs	33.8	Hz			Driver resonance frequency

MECHANICAL PARAMETERS	COILS IN SERIES		COILS IN PARALLEL		Description
	Value	Unit	Value	Unit	
Mrms	142.017g				Mechanical mass of driver diaphragm assembly including air load and voice coil
Mmd	135.241g				Mechanical mass of voice coil and diaphragm without air load
Rms	5.528	kg/s			Mechanical resistance of total-driver losses
Cms	0.156	mm/N			Mechanical compliance of driver suspension
Kms	6.40	N/mm			Mechanical stiffness of driver suspension
Bl	9.182	N/A			Force factor (Bl product)

LOSS FACTORS	COILS IN SERIES		COILS IN PARALLEL		Description
	Value	Unit	Value	Unit	
Qtp	0.551				Total Q-factor considering all losses
Qms	5.451				Mechanical Q-factor of driver in free air considering Rms only
Qes	0.605				Electrical Q-factor of driver in free air considering Re only
Qts	0.545				Total Q-factor considering Re and Rms only

OTHER PARAMETERS	COILS IN SERIES		COILS IN PARALLEL		Description
	Value	Unit	Value	Unit	
Vas	24.107	l			Equivalent air volume of suspension
η0	0.148	%			Reference efficiency (2 pi-radiation using Re)
Lm	83.89	dB			Characteristic sound pressure level (SPL at 1 m for 1 W @ Re)
Lnom	84.61	dB			Nominal sensitivity (SPL at 1 m for 1 W @ Zn)
Sd	330.06	cm²			Diaphragm area

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Although most of our readers lean toward high-performance, sports-oriented vehicles, a lot of us also enjoy having a truck for hauling parts, towing other toys and simply for daily driving when the weather sucks. Of course we all need good audio in the truck as well, but sometimes struggle with a lack of space for a good subwoofer system. That's where the SWT series of woofers from Alpine come in. The SWT-10S2 and SWT-10S4 10-inch woofers are designed to install and provide great bass performance in very small spaces. As you may have already deduced from the model numbers, the woofer is available in either four or two ohm single coil versions. The woofers are rated to handle up to 350 watts of continuous power, and sell for \$269 in Canada, and around \$230 in the U.S.

Features

The Alpine SWT woofers are shallow mount type woofers, requiring only 4.2 inches of

mounting depth, thanks to the "Airflow" bottom plate design that requires zero clearance between the woofer and the inside of the enclosure. To accomplish this, a series of five wide "slots" are cast into the bottom plate, surrounding the rear vent opening of the woofer and permitting air to flow through, even when mounted with no clearance. Such a shallow mounting depth also means the woofer can be fitted under the seat of many trucks, thereby retaining maximum cargo space.

According to Alpine, the woofer can be used in either sealed or vented enclosures, with the vented style being preferred if the room is available. Acceptable sealed enclosure volumes range from 0.35 to 0.8 cubic feet, with optimal being about 0.47 cubic feet. The recommended vented enclosures range from 0.75 to 1.24 cubic feet, with the latter being the optimum size. When using a vented design, Alpine suggests tuning the enclosure to approximately 31 Hz.

The SWT-10S2 is built in a heavy

gauge stamped steel basket, which supports a 4.27-pound ferrite motor, which is covered with a rubber boot. The magnetic energy drives a four-layer 2.5-inch EISV copper coil, wound on an aluminum former. The coil assembly is located and suspended by a progressive type Nomex spider, which includes woven-in tinsel leads for improved reliability and elimination of lead slap under high excursion conditions. This mechanism drives a pressed pulp/Kevlar cone which is anchored to the outer basket diameter with Alpines patented multi-roll High Amplitude Multi Roll [HAMR] profile polyurethane foam surround. On this woofer, the HAMR profile is all new, as is the use of Polyurethane foam as the surround material. These changes provide improvements in damping of cone edge reflections as well as increased sensitivity and reduced mass. X-Max [one direction] is eleven millimeters, which gives this woofer almost a full inch of excursion capability.

The woofer is a good-looking

unit, with a smooth inverted dust-cap, and a well-executed gasket system that includes a concealed mounting system.

Speaker terminals are the typical nickel-plated spring loaded type, and will accept eight gauge cable.

Listening

Just as you should never judge a book by its cover, nor should you judge a woofer system by the space it requires. I evaluate this woofer in the recommended 1.24 cubic foot vented enclosure, and I'm immediately impressed with the performance. Delivering deep and authoritative bass, the shallow Alpine quickly proves its mettle. Whether you like 50 Cent or Bach, Brooks & Dunn or Nirvana, this woofer system provides you with clean, very musical bottom end. The bass output from the system is surprisingly good, and has a natural timbre. Kick drum and tympani are well defined with nice attack and definition of the batter striking the drum head. Low notes from acoustic bass sound clean

and retain the instruments natural tone and resonance.

Overall, the Alpine system simply works, and given its size, the sonic performance is formidable. Only when pushed well beyond its 350 watt power rating did I get it to complain at all, and then only minimally. Nice job, fellas.

On The Bench

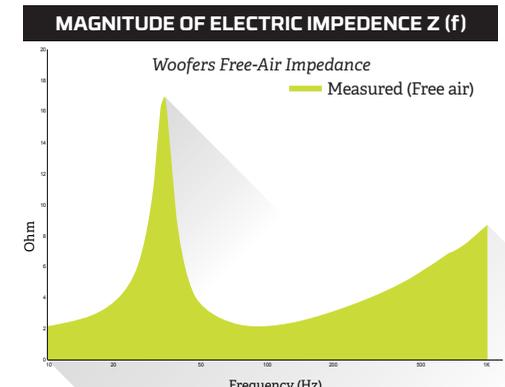
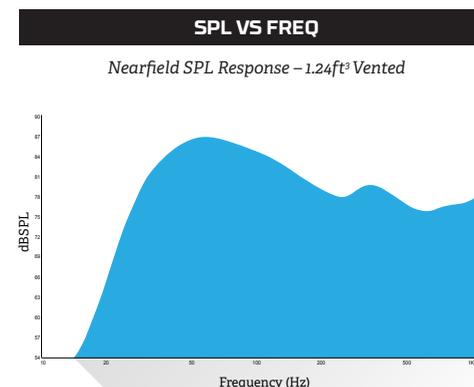
On the test bench, I fire up my trusty Klippel and measure the woofer's parameters. My numbers are a bit different than the published specs in the manual, but that might be attributed to their sample undergoing a more extensive break-in than my schedule allowed. In any case, the performance of the woofer is certainly excellent in the recommended enclosure, so custom enclosure designs won't be required. Simply

use the factories suggested designs, and you'll be pleased.

Conclusion

The Alpine SWT-10S2 woofer is a great choice for a great sounding woofer that can be made to work in space restrictive applications. Its flexibility in shallow applications, overall musicality and great low frequency output makes it worth every penny. Go listen to one for yourself at your local Alpine dealer, and hear it for yourself! PMS

For an expanded version of this test report, go to pasmag.com/test-reports/?????



Power Handling	350 Watts RMS
Frequency Range	30 Hz - 400 Hz
Sensitivity	87 dB/SPL @ 1.0 W (1.414 V @ 2 ohms)
Nominal Impedance	2 ohm coil

