



This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. This warranty is only valid on **Crossfire** products purchased in the U.S.A. from an authorized **Crossfire** dealer. All **Crossfire** products are warranted to be free from defects in materials and workmanship under normal use and serviced for a period of (3) years when the unit is installed by an authorized **Crossfire** dealer. Non-authorized dealer installed products carry a (1) year parts and labor limited warranty. The extent and conditions of **Crossfire's** limited warranty are as follows:

i. **Crossfire** will either repair or replace (at its' option) any unit which **Crossfire** has examined and found to be defective and under warranty, to the original purchaser, provided the defect occurs within (3) years of the date of purchase when the unit is installed by an authorized **Crossfire** dealer. This warranty includes both parts and labor and applies to the original purchaser only.

ii. **Crossfire** will either repair or replace (at its' option) any unit which **Crossfire** has examined and found to be defective and under warranty, to the original purchaser, provided the defect occurs within (1) year of the date of purchase when the unit is installed by a non-authorized **Crossfire** dealer. This (1) year warranty includes both parts and labor and applies to the original purchaser only.

iii. This warranty will be void to any unit found with the original factory serial number removed, altered or defaced. All units received by **Crossfire** for warranty with their original serial numbers removed will not be repaired and returned to sender freight collect.

iv. The provisions of this warranty shall not apply to products used for any industrial, professional or commercial purposes or any other uses for which it was not designed.

v. This warranty does not cover costs for removal of product for repair or reinstallation of the product after repair, nor does it cover the cost of returning the product to **Crossfire's** service center for repair.

vi. This warranty does not apply to repairs or replacements necessitated by any cause beyond the control of **Crossfire**. Including, but not limited to, any malfunction, defect or failure caused by or resulting from unauthorized service or parts, improper maintenance, operation contrary to furnished instructions, shipping or transit accidents, incorrect power line voltages, fire, flood or any other acts of nature, or normal wear and tear.

vii. The foregoing is in lieu of all other expressed warranties and **Crossfire** does not assume or authorize any party to assume for it any other obligation or liability. The duration of any warranties which may be implied by law (including the warranties of merchantability and fitness) is limited to the term of this warranty. In no event shall **Crossfire** be liable for special, incidental or consequential damages arising from obligations under this warranty due to causes beyond its control. Some states do not allow limitations on how long an implied warranty lasts and/or do not allow the exclusions or limitation of consequential damages, so the above limitations and exclusions may not apply to you.

viii. Return policy

Your unit will be serviced free of charges on an in-warranty basis only. If improper operation occurs, contact your authorized **Crossfire** dealer for assistance with the return and factory repair of your **Crossfire** product. If an authorized **Crossfire** dealer is not available, the following procedure must be followed: phone (562 906-0800) or fax (562 941-2294) in your name, address, telephone/fax number and the model number of the item to be returned to receive a return authorization number. Your return authorization number must be clearly written on the outside of the packing box returned to **Crossfire**. All returned products must be accompanied by a dated purchase invoice or the product may be subject to costs of parts and labor. Return the unit, prepaid postage, in the original protective carton or a carton with ample protection. Please include a brief description of the problem and send the unit to:



12222 Bell Ranch Dr.
Santa Fe Springs, CA 90670



Congratulations and thank you for choosing Crossfire Car Audio. You have just selected a meticulously crafted 8 inch stamped frame sub woofer. The CF28 is built in our own factory located in Southern, California. This woofer is a great example of the results when the finest quality materials and machining processes come together. Thank you again for your purchase and Enjoy the Music!!!

Crossfire realizes that build quality only makes up half the driver, so we made sure the second half was pure performance. So whether you are looking for high power handling, small enclosures, and lots of clean output, this is the perfect driver for you.

Mechanical Features

Stamped Frame Basket
Polymica Cone and Inverted Dust Cap
Four layer, 1.5" Voice Coil
Cotton Spider
One Piece Backplate/Pole Piece
-Bumped and Vented
Motor Boot

Performance Features

Computer Modeled Specifications
High Power Handling
1.0" Peak to Peak Excursion
Extremely Small Sealed Enclosures

Practice Safe Sound

The Crossfire CF28 is capable of producing sound pressure levels in excess of 120dB. Continuous exposure to sound pressure levels over 120dB may cause temporary and sometimes permanent hearing loss. High powered systems may produce levels well over 130dB. Use good judgement and practice safe listening levels.

SPEAKER ENCLOSURES

SEALED ENCLOSURES: Easy to design, simply constructed boxes make no compromises for power handling or performance. PROS include easy to build, high power handling, excellent transient response, good dampening, and good deep bass extension. CONS include low efficiency. ******Highly Recommended**

VENTED ENCLOSURES: Somewhat complex, vented boxes use a tuned port to extend the low frequency response of the sub woofer while increasing efficiency. PROS include high efficiency, low distortion above tuning frequency, good transient response, and high power handling. CONS include erratic cone movement below the tuning frequency, complexity of the box design, and large enclosure requirements. *****Recommended**

4th ORDER BANDPASS: For exotic looking, high output enclosures, 4th order bandpasses offer a variety of advantages of both sealed and vented enclosures. PROS include reasonable transient response, high efficiency, good deep bass extension (with the correct enclosure), and high power handling. CONS include very complex box designs, poor dampening characteristics, and large enclosure sizes. *****Recommended**

INFINITE BAFFLE: Simple design using the trunk of the car for an enclosure and either the rear deck or a baffle sealed off behind the rear seat to eliminate any sound wave cancellation. PROS include easy installation and adequate bass response for simple systems. CONS include 40% to 60% less power handling, poor dampening characteristics, substandard transient response, and extremely low efficiency. **Not Recommended!**

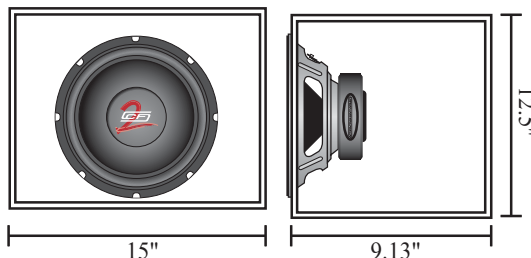
SUBWOOFER ENCLOSURE CONSTRUCTION:

A well built speaker box is essential for good performance, regardless of which design you choose. Crossfire recommends the use of 3/4" high density particle board or 3/4" MDF for maximum rigidity. Design your speaker enclosure, remembering to add the volume of the woofer and the port into your measurements. Make a layout of the pieces you need to cut to make the most out of your sheet of wood. Take your time to cut the wood with precision to insure proper fit. Pre-drill and counter sink screw holes before assembling to prevent your wood from splitting. Screws should be no more than three inches apart. Using a staple or nail gun is an acceptable option over screws, but space them no farther than 1.5" apart. Glue all seams with wood glue and screw or staple the pieces tightly together. Use a damp towel to wipe excess glue away. Cross brace any large walls of the enclosure that may resonate. Run your speaker wire into the box by drilling a hole just large enough for your wire to fit through. Ports used in your enclosure should be rounded on both top and bottom inside edges to prevent noise due to turbulence. Silicon or caulk all seams, around ports, and wire holes to assure no leaks. If necessary, now is the time to apply the exterior touches to your enclosure whether you are applying paint, carpet, vinyl or any other material to beautify your new enclosure. Check the chart for damping material before you screw your woofers in. It may be necessary to add the dampening material to the enclosure that you have chosen. Once you have screwed your woofers in place make a final check for leaks.

ENCLOSURE RECOMMENDATIONS

Optimum Sealed Volume

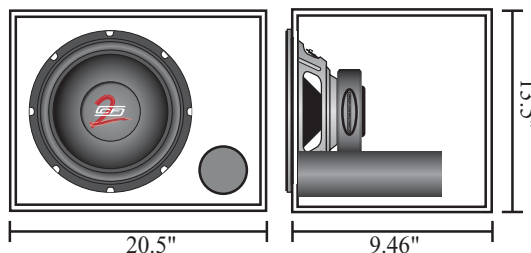
Internal volume: .6ft³ / 16.99L
 Enclosure "Q": 0.95
 -3dB response: 42Hz
 Efficiency: 87.5dB
 Maximum power handling: 150 watts



Cu. feet/liters	"Q"	-3dB	Efficiency	PE
small sealed volume: .35/9.91	1.16	68.1Hz	87dB	150 watts
large sealed volume: .8/22.66	.87	53.5Hz	88.7dB	150watts

Optimum Vented Volume

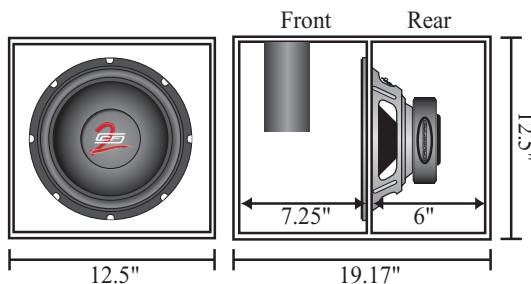
Internal volume: 1.05ft³ / 29.74L
 Tuning frequency: 34Hz
 Port (D x L): 3" x 13.16"
 -3dB response: 40Hz
 Efficiency: 88.4dB
 Maximum power handling: 150watts



Cu. feet/liters	Tune to	Port	-3dB	Efficiency	PE
small vented volume: .8/22.66	37Hz	3" x 14.84"	48Hz	89dB	150watts
large vented volume: 1.39/39.4	32Hz	3" x 10"	36Hz	88dB	300watts

Optimum Bandpass Volume

Front volume: .5ft³ / 14.1L
 Rear volume: .42ft³ / 11.89L
 Tuning frequency: 80Hz
 Port (D x L): 3" x 3.4"
 -3dB response: 50 - 112Hz
 Efficiency: 92dB
 Maximum power handling: 150w



Front cu. ft/liters	Rear cu.ft/liters	Tune to	Port	-3dB	Efficiency	PE
.75/21.24	.4 / 11.33	77Hz	4" x 4.2"	53 - 102Hz	94dB	150watts
.53/15.01	.67/18.97	72Hz	3" x 4.38"	46 - 97Hz	90.5dB	90watts

*Note: Dimensions given require the use of 0.75" (19mm) board.

**Be sure to add in .026ft³ / .736L for driver displacement in all "Other" enclosures.

DAMPING MATERIAL

The most common damping materials used are Dacron and Polyfill. Reclaimed fiber underlay has been discovered to be an excellent substitute especially when glued directly to the walls of the enclosure. Fiberglass may be used, but please limit usage to sealed enclosures only. When used in vented/bandpass enclosures, fiberglass fibers escaping through the port may be hazardous to your health.

	DACRON/POLYFILL	UNDERLAY	FIBERGLASS
SEALED ENCLOSURE	loosely fill the enclosure	line 5 walls	line 5 walls
VENTED ENCLOSURE	line 3-5 walls	line 1-3 wall	Please limit the use of fiberglass to sealed enclosures only
BANDPASS (sealed chamber)	line 3 walls	line 1-3 wall	
BANDPASS (vented chamber)	line 1 wall (optional)	line 1 wall (optional)	

SPECIFICATIONS

Model	CF28
Driver description	8" Subwoofer, Single Voice Coil
Mounting depth, in./mm	3.5/88.946
Cutout dimensions, in./mm	7.88/200.254
Impedance	4 ohms
Nominal power handling	100 watts
Maximum power handling (PE)	150 watts
Dynamic power handling	300 watts
Voice coil – size	1.5", 4 layer
Magnet weight	20 oz.
Frequency response	26Hz to 1200Hz
Resonance frequency (fs)	38Hz
QTS	.570
QMS	3.879
QES	.668
VAS, ft./liter	1.09/31.13
X-max, in./mm	.157/4
Efficiency (2.83V/1M)	86dB

POWER RATINGS

Rating the power handling of subwoofers is not a difficult task. However, understanding power ratings is often confusing. Many times the Maximum Power Ratings are viewed as the RMS power handling of the driver, when in actuality Maximum is generally the break point of the driver. This has lead Crossfire to come up with a system to rating the power necessary to drive our subwoofers. Please read the following cautiously before choosing your amplifier.

Nominal power handling

-Nominal power handling is the power rating given by Crossfire at which the subwoofer will experience minimal mechanical degradation over time when using a recommended enclosure. In other words, this is the recommended power to be used per woofer to assure long life.

Maximum power handling (PE)

-Maximum power handling is the power rating given by Crossfire at which the subwoofer could experience a high amount of mechanical degradation that may lead to possible failure over time when using a recommended enclosure. In other words, do not exceed this power level for extended periods of time.

Dynamic power handling

-Dynamic power handling is the power rating given by Crossfire for peak transients and short bursts. Continuous playing at or above this level will cause mechanical failure and/or thermal failure. In other words, this power level should never be attained with the exceptions of approved SPL competition vehicles. This could possibly void your warranty.