Mach 5 Audio MJ-18

Power Handling: 600 Watts
SPL (2.83v/1m): 93.4 db
Impedance: 8 or 4 Ohms nominal

T/S parameters - 8 / 4 Ohm:
Fs = 30.4 / 28 Hz
Re = 7.2 / 3.2 Ohms[dc]
Qt = 0.35 / 0.31
Qes = 0.39 / 0.34
Qms = 3.41 / 4.99
Mms = 219 / 229 grams
Rms = 12.3 / 8.1 kg/s
Cms = 0.000100 / 0.00014 m/N
Vas = 243.8 / 208.4 liters
Sd= 1029.2 cm2
Bl = 27.6 / 19.6 Tm
Xmax = 12mm
Diameter= 36.20 cm

Dimensions
Outside Diameter: 46cm (18 3/8")
Mounting Diameter: 42.4cm (16 11/16")
Depth: 20.3cm (8")

Recommended Box Sizes
Sealed: 80 litres (2.8 cu. ft.)
Ported: 128 litres (4.5 cu. ft.) 27Hz tuning
EBS: 250 litres (8.8 cu. ft.) 18Hz tuning

Sd check

Known Driver Thiele / Small Parameters

$f_d := 30.4\,Hz$

$Q_{md} := 3.41$

$R_e := 7.2 \cdot ohm$

$Q_{ed} := 0.39$

$S_d := 1029.2\,cm^2$

$Bl := 27.6\,\dfrac{newton}{amp}$ (1 newton/amp = 1 Tesla-m)

Calculated Parameters

Derived Thiele / Small Parameters

$Q_{td} := \left(\dfrac{1}{Q_{ed}} + \dfrac{1}{Q_{md}} \right)^{-1}$ $Q_{td} = 0.35$

$M_{md} := \dfrac{Bl^2 \cdot Q_{ed}}{f_d \cdot R_e}$ $M_{md} = 216.021\,gm$

$C_{md} := \left(M_{md} \cdot f_d^2 \right)^{-1}$ $C_{md} = 1.269 \times 10^{-4}\,\dfrac{s^2}{kg}$

$V_{ad} := C_{md} \cdot \left(\rho \cdot c^2 \cdot S_d^2 \right)$ $V_{ad} = 190.21\,liter$

$\eta_o := V_{ad} \cdot \left(2 \cdot \pi \cdot c^3 \cdot Q_{ed} \cdot f_d^{-3} \right)^{-1}$ $\eta_o = 1.352\%$

$$SPL := 112 + 10 \cdot \log(\eta_o) \qquad SPL = 93.3 \quad \textbf{dB}$$

Vad check

Thiele - Small Parameter Consistency Check   **MJ King**
                                                                4/29/05

Constant Definitions

$$cycle := 2 \cdot \pi \cdot rad$$

$$Hz := cycle \cdot sec^{-1}$$

$$c := 344 \, m \cdot sec^{-1}$$

$$\rho := 1.21 \cdot kg \cdot m^{-3}$$

User Input Data

Known Driver Thiele / Small Parameters

$$f_d := 30.4 \, Hz \qquad\qquad Q_{md} := 3.41$$

$$R_e := 7.2 \cdot ohm \qquad\qquad Q_{ed} := 0.39$$

$$S_d := 1029.2 \, cm^2 \qquad V_{ad} := 190.2 \, liter$$

Calculated Parameters

Derived Thiele / Small Parameters

$$Q_{td} := \left(\frac{1}{Q_{ed}} + \frac{1}{Q_{md}} \right)^{-1} \qquad\qquad Q_{td} = 0.35$$

$$C_{md} := V_{ad} \cdot \left(\rho \cdot c^2 \cdot S_d^2 \right)^{-1} \qquad\qquad C_{md} = 1.254 \times 10^{-4} \, \frac{m}{newton} \qquad\qquad S_d = 0.103 \, m^2$$

$$M_{md} := \left(C_{md} \cdot f_d^2 \right)^{-1} \qquad\qquad M_{md} = 218.567 \, gm \qquad \frac{S_d}{m^2} = 0.103 \quad S_d := \frac{S_d}{m^2}$$

$$M_{ms} := M_{md} + 0.575 \, S_d^{1.5} \cdot gm \qquad M_{ms} = 0.218586 \, kg \qquad M_{md} := M_{ms}$$

$$Bl := \left(\frac{f_d \cdot R_e \cdot M_{md}}{Q_{ed}} \right)^{0.5} \qquad\qquad Bl = 27.763 \frac{newton}{amp} \qquad \text{(1 newton/amp = 1 Tesla-m)}$$

$$\eta_o := V_{ad} \cdot \left(2 \cdot \pi \cdot c^3 \cdot Q_{ed} \cdot f_d^{-3} \right)^{-1} \qquad\qquad \eta_o = 1.329\%$$

$$SPL := 112 + 10 \cdot \log(\eta_o) \qquad\qquad SPL = 93.2 \quad \textbf{dB}$$

Vad check

Thiele - Small Parameter Consistency Check

MJ King
4/29/05

Constant Definitions

$cycle := 2 \cdot \pi \cdot rad$

$Hz := cycle \cdot sec^{-1}$

$c := 344 \cdot m \cdot sec^{-1}$

$\rho := 1.21 \cdot kg \cdot m^{-3}$

User Input Data

Known Driver Thiele / Small Parameters

$f_d := 30.4\,Hz$ $Q_{md} := 3.41$

$R_e := 7.2 \cdot ohm$ $Q_{ed} := 0.39$

$S_d := 1029.2\,cm^2$ $V_{ad} := 243.8\,liter$

Calculated Parameters

Derived Thiele / Small Parameters

$Q_{td} := \left(\dfrac{1}{Q_{ed}} + \dfrac{1}{Q_{md}} \right)^{-1}$ $Q_{td} = 0.35$

$C_{md} := V_{ad} \cdot \left(\rho \cdot c^2 \cdot S_d^2 \right)^{-1}$ $C_{md} = 1.607 \times 10^{-4}\,\dfrac{m}{newton}$ $S_d = 0.103\,m^2$

$M_{md} := \left(C_{md} \cdot f_d^2 \right)^{-1}$ $M_{md} = 170.514\,gm$ $\dfrac{S_d}{m^2} = 0.103$ $S_d := \dfrac{S_d}{m^2}$

$M_{ms} := M_{md} + 0.575\,S_d^{1.5} \cdot gm$ $M_{ms} = 0.170533\,kg$ $M_{md} := M_{ms}$

$Bl := \left(\dfrac{f_d \cdot R_e \cdot M_{md}}{Q_{ed}} \right)^{0.5}$ $Bl = 24.523\,\dfrac{newton}{amp}$ (1 newton/amp = 1 Tesla-m)

$\eta_o := V_{ad} \cdot \left(2 \cdot \pi \cdot c^3 \cdot Q_{ed} \cdot f_d^{-3} \right)^{-1}$ $\eta_o = 1.703\%$

$SPL := 112 + 10 \cdot \log(\eta_o)$ $SPL = 94.3$ dB