12-280/8-W 2012-6-13

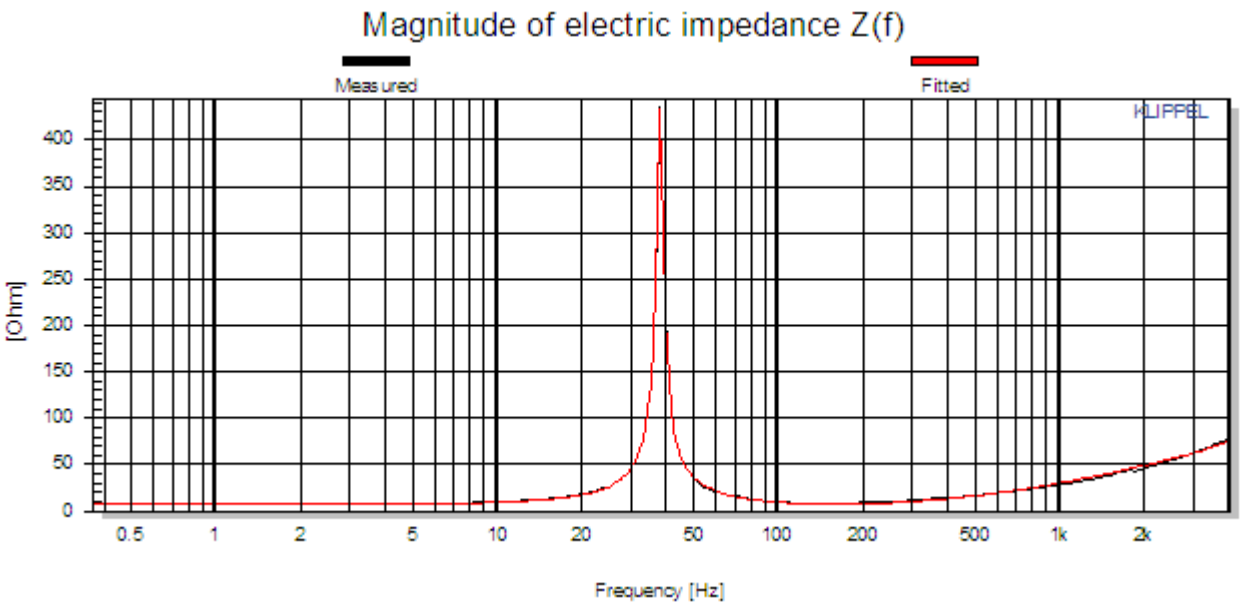
Linear parameters

Name	Value	Unit	Comment
Electrical Parameters			
Re	6.95	Ohm	electrical voice coil resistance at DC
Le	2.292	mH	frequency independent part of voice coil inductance
L2	2.743	mH	para-inductance of voice coil
R2	29.24	Ohm	electrical resistance due to eddy current losses
Cmes	202.66	µF	electrical capacitance representing moving mass
Lces	87.22	mH	electrical inductance representing driver compliance
Res	430.04	Ohm	resistance due to mechanical losses
fs	37.9	Hz	driver resonance frequency
Mechanical Parameters			
(using laser)			
Mms	97.016	g	mechanical mass of driver diaphragm assembly including air load and voice coil
Mmd (Sd)	90.486	g	mechanical mass of voice coil and diaphragm without air load
Rms	1.113	kg/s	mechanical resistance of total-driver losses
Cms	0.182	mm/N	mechanical compliance of driver suspension
Kms	5.49	N/mm	mechanical stiffness of driver suspension
Bl	21.879	N/A	force factor (Bl product)
Lambda s	-0.036		suspension creep factor
Loss factors			
Qtp	0.330		total Q-factor considering all losses
Qms	20.730		mechanical Q-factor of driver in free air considering Rms only
Qes	0.335		electrical Q-factor of driver in free air considering Re only

Qts	0.330		total Q-factor considering Re and Rms only
Vas	67.2497	l	equivalent air volume of suspension
n0	1.047	%	reference efficiency (2 pi-radiation using Re)
Lm	92.40	dB	characteristic sound pressure level (SPL at 1m for 1W @ Re)
Lnom	93.01	dB	nominal sensitivity (SPL at 1m for 1W @ Zn)
rmse Z	2.05	%	root-mean-square fitting error of driver impedance Z(f)
rmse Hx	2.32	%	root-mean-square fitting error of transfer function Hx (f)
Series resistor	0.00	Ohm	resistance of series resistor
Sd	510.71	cm	diaphragm area

Electrical Impedance

The two figures below show the magnitude and the phase response of the measured and estimated transfer function Z(f)= U(f)/I(f) where U is the terminal voltage and I is the current. The **solid** curve is the ratio of the measured spectra U(f), I(f) while the *thin* curve is the impedance of the linear driver equivalent circuit using the linear model and the identified electrical parameters shown



Displacement Transfer Function

The figure below shows the magnitude of the measured and estimated transfer function Hx(f)= X(f)/U(f) between the voice coil displacement X and the terminal voltage U. The **solid black curve** is the ratio of the measured spectra X(f), U(f) while the ***thin black curve*** is the transfer function based on the linear driver equivalent circuit using the identified electrical and mechanical parameters as well as the creep parameter. The dashed red curve is based on the conventional model without considering the creep factor.