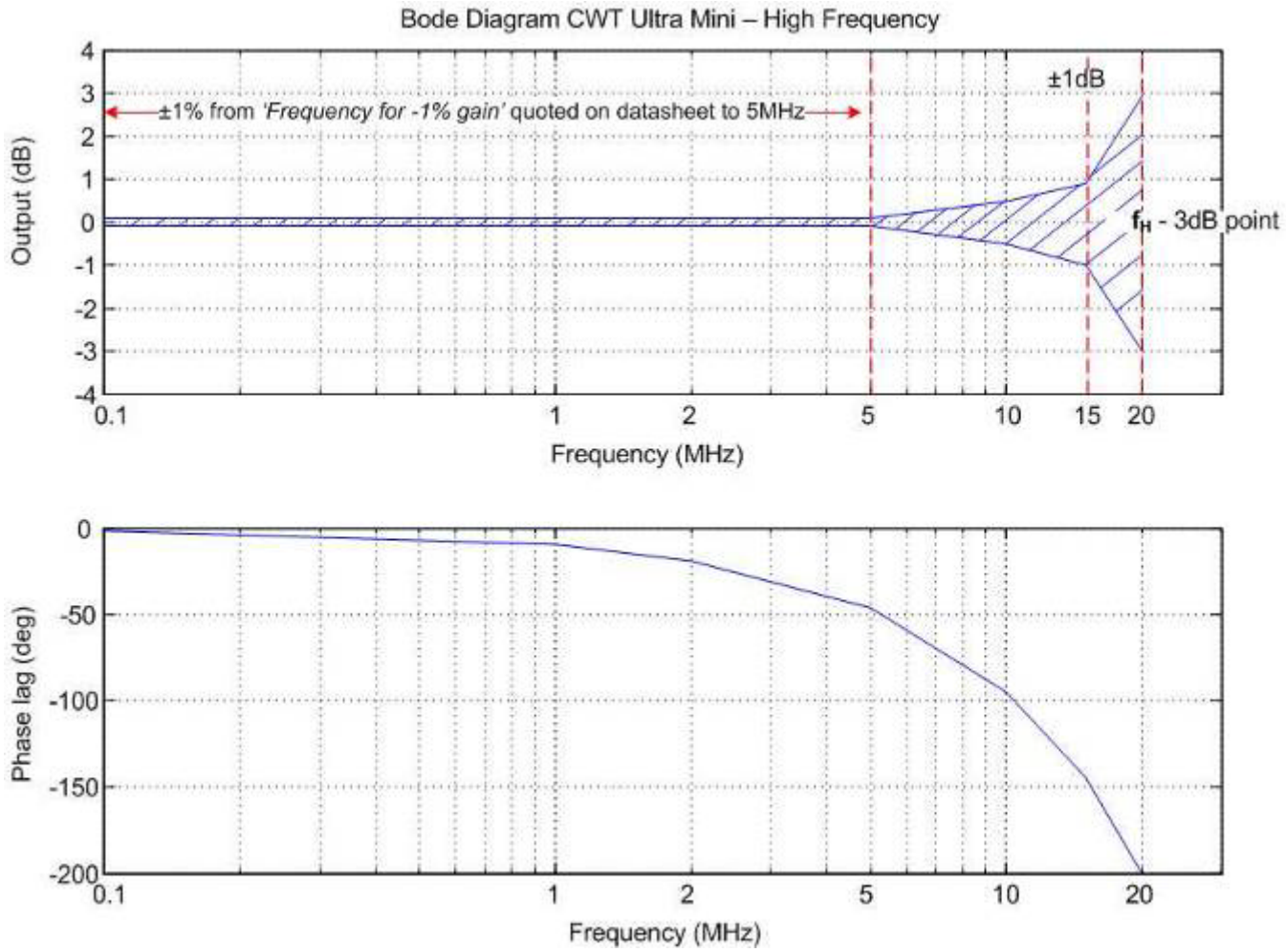
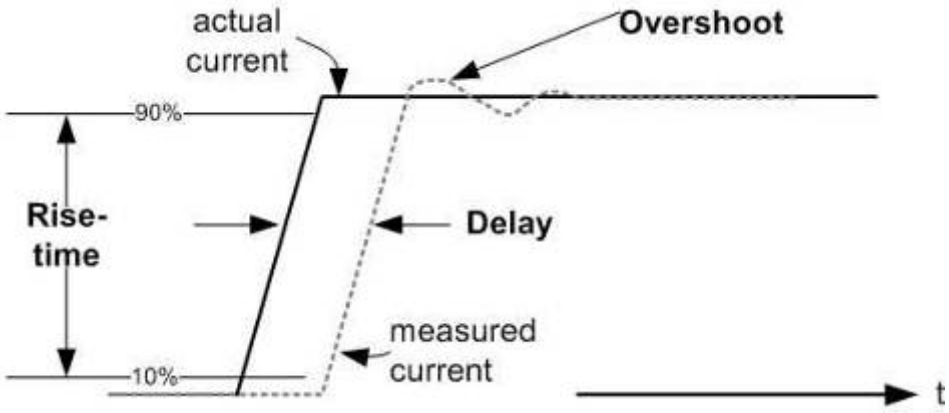
High Frequency Bandwidth



The high frequency phase response includes the inherent transport lag in the 1m cable connecting the Rogowski coil to the electronic integrator.

The low frequency limit for -1% gain is quoted on the datasheet.

Rise-time and Delay



The CWT ULTRA mini has an inherent measurement delay.

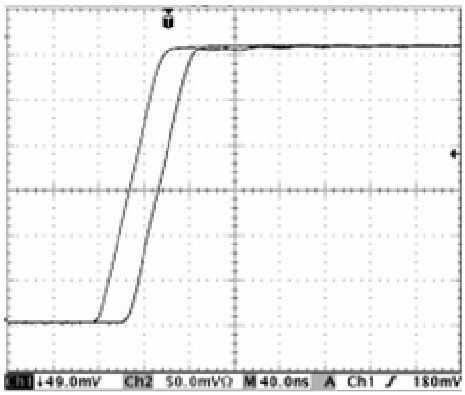
Provided the actual current rise time is within the limits of the high frequency bandwidth of the transducer the delay is predictable. The delay is a combination of

- T_a – the transit delay for the cable connecting the coil to the integrator (4.2ns/m)
- T_b – the delay of the electronic integrator. This is a function of the GBW product of the integrating op-amp and the various parasitic impedances that determine the hf performance of the integrator.
- T_c – the delay for the Rogowski coil. This is dependant on the distributed inductance and capacitance of the Rogowski coil.

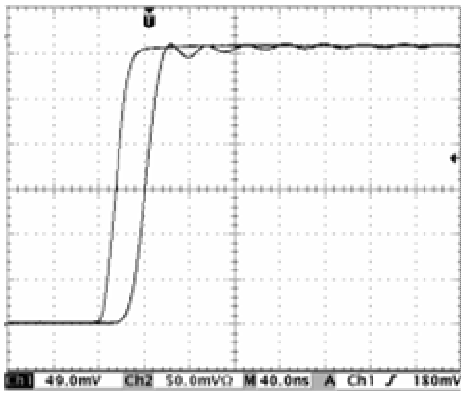
T_b and T_c cause an attenuation of the measurement T_a does not.

The fastest 10 to 90% rise-time for which PEM would recommend the CWT ULTRA Mini is used is 40ns. This is a conservative value. However for faster rise-times the transducer may exhibit distortion and the settling behaviour will become increasingly oscillatory. As an example, the pulse response below is that of a CWT015 to a rise-time of 50ns and also 20ns. The comparative device is an 800MHz bandwidth co-axial shunt. From the traces

- **Recommended rise time is conservatively 40ns** for the CWT ULTRA Mini range.
- **Delay is typically 28ns** (this includes 2.5ns from the 0.5m output BNC-BNC cable)



Rise time 10 to 90% 50ns
Current peak 2A
Timebase 40ns per div



Rise time 10 to 90% 20ns
Current peak 2A
Timebase 40ns per div

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