Example:

A 50 Hz, 138kV,3-Phase transmission line is 200km line, the distributed line parameters are:

The transition line delivers 40 MW at 132kV with 0.95 Power Factor Lagging. Find the sending end voltage and current, and also the transition line efficiency.

Solution:

For the given values of RLC we have for

For the above values:

The values of power and voltage specified in the problem refers to 3-phase and line-line quantities

Also using

Now, per phase power supplied to the load

**Example:**

A 3 phase 132kV overhead line delivers 60MVA. a 132Kv and power facto 0.8 lagging at its receiving end. the constants of the line are A=0.98 and B=ohms per phase.  
Find:

1. Sending end voltage and power angle
2. Sending end active and reactive power
3. Line losses and vars absorbed by the line
4. Capacity of static compensation equipment at the receiving end to reduce the sending end voltage to 145Kv for the same load conditions
5. The unity power factor load which can be supplied at the receiving end with 132Kv as the line voltage at both the ends.

Thus for and =48MW , a lagging MVAR of 0.2 will be supplied from the line along with the real power of 48MW .since the load requires 36MVar lagging , the static compensation equipment must deliver 36-0.2 ,I.e. 35.8MVar lagging (or must absorb 35.8 MVAR leading) . the capacity of static capacitors is, therefore ,35.8 Mvar.