Important Nominal T-Method in Medium Line Formulas PDF

Formulas Examples with Units

List of 19
Important Nominal T-Method in Medium Line Formulas

1) Admittance using A Parameter in Nominal T Method Formula

Evaluate Formula

Formula

$$Y_t = 2 \cdot \frac{A_t - 1}{Z_t}$$

Example with Units

$$0.0221\,\text{S} = 2 \cdot \frac{1.1 - 1}{9.07\,\Omega}$$

2) Admittance using D Parameter in Nominal T Method Formula

Evaluate Formula

Formula

$$Y_t = 2 \cdot \frac{A_t - 1}{Z_t}$$

Example with Units

$$0.0221\,\text{S} = 2 \cdot \frac{1.1 - 1}{9.07\,\Omega}$$

3) A-Parameter for Reciprocal Network in Nominal T Method Formula

Evaluate Formula

Formula

$$A_t = \frac{1 + \left(B_t \cdot C\right)}{D_t}$$

Example with Units

$$0.5015 = \frac{1 + \left(9.66\,\Omega \cdot 0.25\,\text{S}\right)}{6.81}$$

4) A-Parameter in Nominal T Method Formula

Evaluate Formula

Formula

$$A_t = 1 + \left(Y_t \cdot \frac{Z_t}{2}\right)$$

Example with Units

$$1.1002 = 1 + \left(0.0221\,\text{S} \cdot \frac{9.07\,\Omega}{2}\right)$$

5) B Parameter in Nominal T Method Formula

Evaluate Formula

Formula

$$B_t = Z_t \cdot \left(1 + \left(Z_t \cdot \frac{Y_t}{4}\right)\right)$$

Example with Units

$$9.5245\,\Omega = 9.07\,\Omega \cdot \left(1 + \left(9.07\,\Omega \cdot \frac{0.0221\,\text{S}}{4}\right)\right)$$

6) Capacitive Current in Nominal T Method Formula

Evaluate Formula

Formula

$$I_{c(t)} = I_{s(t)} - I_{r(t)}$$

Example with Units

$$1.48\,\text{A} = 16.2\,\text{A} - 14.72\,\text{A}$$

7) Capacitive Voltage in Nominal T Method Formula

Evaluate Formula

Formula

$$V_{c(t)} = V_{r(t)} + \left(I_{r(t)} \cdot \frac{Z_t}{2} \right)$$

Example with Units

$$386.9552\,\text{V} = 320.2\,\text{V} + \left(14.72\,\text{A} \cdot \frac{9.07\,\Omega}{2} \right)$$

8) Capacitive Voltage using Sending End Voltage in Nominal T Method Formula

Evaluate Formula

Formula

$$V_{c(t)} = V_{s(t)} - \left(\frac{I_{s(t)} \cdot Z_t}{2} \right)$$

Example with Units

$$326.733\,\text{V} = 400.2\,\text{V} - \left(\frac{16.2\,\text{A} \cdot 9.07\,\Omega}{2} \right)$$

9) Impedance using Capacitive Voltage in Nominal T Method Formula

Evaluate Formula

Formula

$$Z_t = 2 \cdot \frac{V_{c(t)} - V_{r(t)}}{I_{r(t)}}$$

Example with Units

$$9.0761\,\Omega = 2 \cdot \frac{387\,\text{V} - 320.2\,\text{V}}{14.72\,\text{A}}$$

10) Impedance using D Parameter in Nominal T Method Formula

Evaluate Formula

Formula

$$Z_t = 2 \cdot \frac{A_t - 1}{Y_t}$$

Example with Units

$$9.0498\,\Omega = 2 \cdot \frac{1.1 - 1}{0.0221\,\text{S}}$$

11) Losses in Nominal T Method Formula

Evaluate Formula

Formula

$$P_{loss(t)} = 3 \cdot \left(\frac{R_t}{2} \right) \cdot \left(I_{r(t)}^{\,2} + I_{s(t)}^{\,2} \right)$$

Example with Units

$$5404.4556\,\text{W} = 3 \cdot \left(\frac{7.52\,\Omega}{2} \right) \cdot \left(14.72\,\text{A}^{\,2} + 16.2\,\text{A}^{\,2} \right)$$

12) Receiving End Angle using Sending End Power in Nominal T Method Formula

Evaluate Formula

Formula

$$\Phi_{r(t)} = a\cos\left(\frac{P_{s(t)} - P_{loss(t)}}{V_{r(t)} \cdot I_{r(t)} \cdot 3} \right)$$

Example with Units

$$90.3116^\circ = a\cos\left(\frac{8.2\,\text{W} - 85.1\,\text{W}}{320.2\,\text{V} \cdot 14.72\,\text{A} \cdot 3} \right)$$

13) Receiving End Voltage using Capacitive Voltage in Nominal T Method Formula

Evaluate Formula

Formula

$$V_{r(t)} = V_{c(t)} - \left(\frac{I_{r(t)} \cdot Z_t}{2}\right)$$

Example with Units

$$320.2448\,\text{V} = 387\,\text{V} - \left(\frac{14.72\,\text{A} \cdot 9.07\,\Omega}{2}\right)$$

14) Sending End Current in Nominal T Method Formula

Evaluate Formula

Formula

$$I_{s(t)} = I_{r(t)} + I_{c(t)}$$

Example with Units

$$16.2\,\text{A} = 14.72\,\text{A} + 1.48\,\text{A}$$

15) Sending End Current using Losses in Nominal T Method Formula

Evaluate Formula

Formula

$$I_{s(t)} = \sqrt{\left(\frac{P_{loss(t)}}{\frac{3}{2}} \cdot R_t\right) - \left(I_{r(t)}^{\,2}\right)}$$

Example with Units

$$14.4899\,\text{A} = \sqrt{\left(\frac{85.1\,\text{W}}{\frac{3}{2}} \cdot 7.52\,\Omega\right) - \left(14.72\,\text{A}^{\,2}\right)}$$

16) Sending End Voltage using Capacitive Voltage in Nominal T Method Formula

Evaluate Formula

Formula

$$V_{s(t)} = V_{c(t)} + \left(\frac{I_{s(t)} \cdot Z_t}{2}\right)$$

Example with Units

$$460.467\,\text{V} = 387\,\text{V} + \left(\frac{16.2\,\text{A} \cdot 9.07\,\Omega}{2}\right)$$

17) Sending End Voltage using Voltage Regulation in Nominal T Method Formula

Evaluate Formula

Formula

$$V_{s(t)} = V_{r(t)} \cdot \left(\%V_t + 1\right)$$

Example with Units

$$399.9298\,\text{V} = 320.2\,\text{V} \cdot \left(0.249 + 1\right)$$

18) Transmission Efficiency in Nominal T Method Formula

Evaluate Formula

Formula

$$\eta_t = \frac{P_{r(t)}}{P_{s(t)}}$$

Example with Units

$$30.5122 = \frac{250.2\,\text{W}}{8.2\,\text{W}}$$

19) Voltage Regulation using Nominal T Method Formula

Evaluate Formula

Formula

$$\%V_t = \frac{V_{s(t)} - V_{r(t)}}{V_{r(t)}}$$

Example with Units

$$0.2498 = \frac{400.2\,\text{V} - 320.2\,\text{V}}{320.2\,\text{V}}$$

Variables used in list of Nominal T-Method in Medium Line Formulas above

- $\%V_t$ Voltage Regulation in T
- A_t A Parameter in T
- B_t B Parameter in T *(Ohm)*
- **C** C Parameter *(Siemens)*
- D_t D Parameter in T
- $I_{c(t)}$ Capacitive Current in T *(Ampere)*
- $I_{r(t)}$ Receiving End Current in T *(Ampere)*
- $I_{s(t)}$ Sending End Current in T *(Ampere)*
- $P_{loss(t)}$ Power Loss in T *(Watt)*
- $P_{r(t)}$ Receiving End Power in T *(Watt)*
- $P_{s(t)}$ Sending End Power in T *(Watt)*
- R_t Resistance in T *(Ohm)*
- $V_{c(t)}$ Capacitive Voltage in T *(Volt)*
- $V_{r(t)}$ Receiving End Voltage in T *(Volt)*
- $V_{s(t)}$ Sending End Voltage in T *(Volt)*
- Y_t Admittance in T *(Siemens)*
- Z_t Impedance in T *(Ohm)*
- η_t Transmission Efficiency in T
- $\Phi_{r(t)}$ Receiving End Phase Angle in T *(Degree)*

Constants, Functions, Measurements used in list of Nominal T-Method in Medium Line Formulas above

- Functions: **acos**, acos(Number)
  The inverse cosine function, is the inverse function of the cosine function. It is the function that takes a ratio as an input and returns the angle whose cosine is equal to that ratio.
- Functions: **cos**, cos(Angle)
  Cosine of an angle is the ratio of the side adjacent to the angle to the hypotenuse of the triangle.
- Functions: **sqrt**, sqrt(Number)
  A square root function is a function that takes a non-negative number as an input and returns the square root of the given input number.
- Measurement: **Electric Current** in Ampere (A)
  Electric Current Unit Conversion
- Measurement: **Power** in Watt (W)
  Power Unit Conversion
- Measurement: **Angle** in Degree (°)
  Angle Unit Conversion
- Measurement: **Electric Resistance** in Ohm (Ω)
  Electric Resistance Unit Conversion
- Measurement: **Electric Conductance** in Siemens (S)
  Electric Conductance Unit Conversion
- Measurement: **Electric Potential** in Volt (V)
  Electric Potential Unit Conversion

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