APPENDIX–A

Analytical Approach

Following algorithm has been implemented for analytical approach

Start

Define all constants

Define optical power for illumination

Calculate induced optical voltage at the gate, the channel potential using analytical relation

Plot channel potential vs.
1. Normalized distance for various \( L_g \)
2. Normalized distance for various illuminations
3. Normalized distance for various \( V_{ds} \)

Plot \( I_{ds}-V_{ds} \) of the simulated 2D model

Stop
APPENDIX–B

Numerical Approach
Following algorithm has been implemented for Monte Carlo Finite difference method.

Start

Define all constants

Define optical power for illumination

Form a grid of nxn on MESFET channel

Define all boundary conditions

A
Calculate the voltage \( (\psi_{i,j}) \) for all grid points using Monte Carlo Finite difference method.

Iterate the above steps 100 times for optimization.
Calculate the lateral electric field $E_x = -\frac{\partial V}{\partial x}$ and tranverse electric field, $E_y = -\frac{\partial V}{\partial y}$

Plot 3D graph for channel potential with and without illumination

Plot graph for electric field $E_x$ and $E_y$ under dark and illuminated condition

Stop