





















$P_{md}$	
$N_S$	PV array output Power
$N_P$	maximum power produced by PV
$V_{OC}$	Series PV modules
$I_{SC}$	Parallel PV modules
$FF$	voltage when the circuit is open
$G_N$	current when the circuit is short
$G_a$	Fill Factor of PV cell
$T_N$	nominal solar irradiance on PV cell
$T_a$	actual solar irradiance on PV cell
$V_{NOC}$	nominal PV cell temperature
$I_{NSC}$	actual PV cell temperature
$R_S$	nominal open circuit voltage of PV cell
$c_1, c_2$ and $c_3$	nominal short circuit current of PV cell
$T$	series resistance of PV cell
$K$	three various constants
$q$	
$GF$	PV cell temperature (in Kelvin)
$GC$	Boltzmann's constant ( $1.38 \times 10^{-23}$ J/K)
$M_i$	charge of electron ( $1.6 \times 10^{-19}$ C)
$M_j$	Gravitational Force
$D$	Gravitational Constant

$fit$	Mass of object i
$Bad$	Mass of object j
$Good$	Distance between objects
$d$	fitness

### Abbreviations

BA	BAT Algorithm
GSA	Gravitational Search Algorithm
DG	Distributed Generation
FW/BW	Forward and Backward
PV	Photo Voltaic
PL	Power Losses
PDS	Power Distribution System
PQ	Power Quality
CPD	Custom Power Devices
VSI	Voltage Stability Index
CSP	Concentrated Solar Plant
LCOE	Levelized Charge Of Energy
NREL	National Renewable Energy Lab
FF	Fill Factor