



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم



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شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم



شبكة المعلومات الجامعية التوثيق الإلكتروني والميكروفيلم



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شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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“Modified Algorithms for MPPT in PV Modules”

A Thesis

Submitted in partial fulfillment of the requirements of
a Master of Science Degree in Electrical Engineering
(Electronics and Communications Engineering)

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List of Symbols

Symbols.	Meaning
ΔP	Change in Power
ΔV	Voltage Perturbation
C_0	Diode constant
C_1	Boost Converter Input Capacitor Value
C_2	Boost Converter Output Capacitor Value
E	Error Signal
f	Switching Frequency
G	Irradiance
G_{STC}	Irradiance under STC
I	Boost Converter Input DC Current
I_{MPP}	Current at Maximum Power Point
I_o	Boost Converter Output DC Current
I_{ph}	Photo Current
I_{pv}	PV panel Output Current
I_s	Diode's Reverse Saturation Current
I_{sc}	Short Circuit Current
K	Boltzmann Constant
K_1	Constant of Proportionally
K_2	Constant of Proportionally
K_i	Short Circuit Current Temperature coefficient
K_v	Open Circuit Voltage Temperature coefficient
L	Boost Converter Inductance Value
N_s	Number of Cells per Module
P_{in}	Incident Power
P_{MPP}	Power at Maximum Power Point
P_{pv}	PV panel output power
q	Charge of an Electron
r	Constant value between [0.3, 0.5]
R	Load Resistance
R_{mp}	Maximum Power Point Resistance
R_s	Series Resistance

List of Symbols cont...

Symbols.	Meaning
R_{sh}	Shunt Resistance
t	Simulation time
T	Temperature in Kelvin
T_{STC}	Temperature under STC
V	Boost Converter Input DC Voltage
V_{MPP}	Voltage at Maximum Power Point
V_o	Boost Converter Output DC Voltage
V_{oc}	Open Circuit Voltage
V_{pv}	PV Panel Output Voltage
V_{ref}	Control Reference Signal
V_T	Thermal Voltage
W_{ij}	Link between the Nodes i and j
A	Diode Ideality Factor
α	Duty Cycle
β	Intermediate variable
ΔE	Change in Error Signal
η	Efficiency

List of Abbreviations

Abb.	Meaning
AC	Alternate Current
DC	Direct Current
DSP	Digital Signal Processing
FF	Fill Factor
FLC	Fuzzy Logic Control
FOSV	Fractional Open Circuit Voltage
FSCC.....	Fractional Short Circuit Current
INC	Incremental Conductance
I-V	Photovoltaic Current versus Voltage
MF.....	Membership Function
MPP	Maximum Power Point
MPPT	Maximum Power Point Tracking
M-VSS-INC.....	Modified Variable Step Size Incremental Conductance
M-VSS-P&O.....	Modified Variable Step Size Perturb and Observe
NB.....	Negative Big
NM.....	Negative Medium
NN.....	Neural Network
NS	Negative Small
P&O	Perturb and Observe
PB	Positive Big
PI.....	Proportional and Integrated
PS.....	Positive Small
PV	Photovoltaic
P-V	Photovoltaic Power versus Voltage