

# EHM-UP 303

## Energy Harvesting Module

### DESCRIPTION

The EHM-UP 303 DC/DC Module can be started up from 30 mV and boost ultra low input voltage into 3V loading with micro watt output range. It is designed for an application of harvesting ambient energy to supply batteryless-wireless- sensor/actuator. User can use this module to design-in charging super capacitor and/or solid state battery for higher power application.

### FEATURES

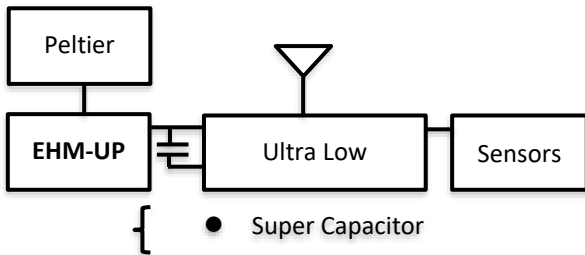
- Ultra low start up voltage from 30mV
- Input over voltage clamping
- Voltage regulated to 3V

### APPLICATIONS

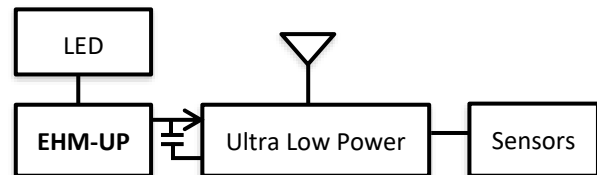
- Energy Harvesting from thermoelectric generator
- Energy Harvesting form Kinetics device
- Energy Harvesting form Photovoltaic device
- Energy Harvesting form Radio frequency by rectifier-antenna

### TYPICAL APPLICATION

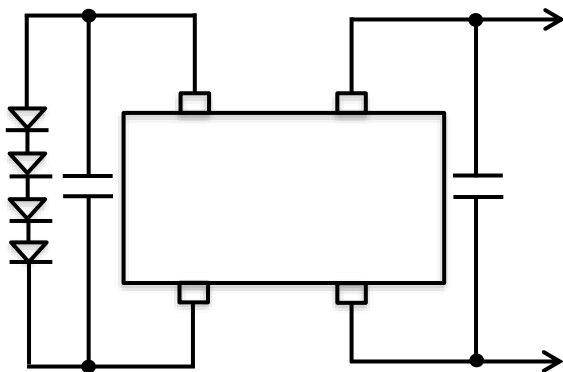
#### Thermo Electric Powered Application



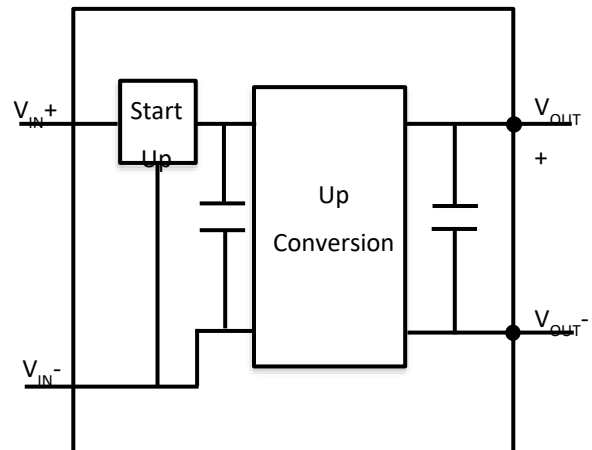
#### Photovoltaic Powered Application



#### Application Circuit with Photovoltaic



#### Block Diagram



## ABSOLUTE MAXIMUM RATINGS

Vin max +20V and -5V

Temperature -40 to 85 degree C

Reverse input 1V max

Maximum output power 100mW



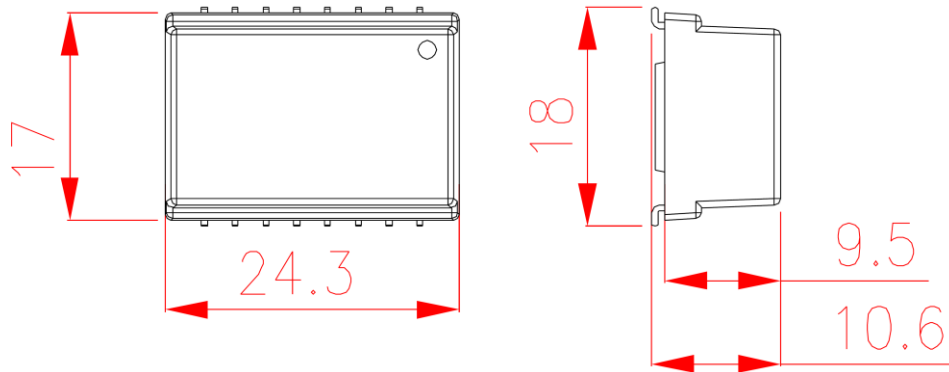
## ELECTRICAL CHARACTERISTICS

TA = 25°C

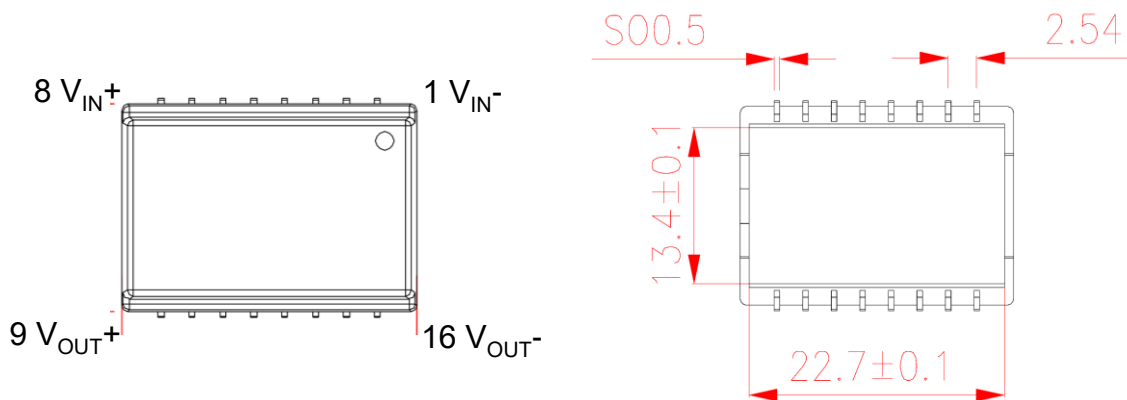
SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
	Minimum Start-Up Voltage	Open load circuit voltage No output load current	30	40		mV
	No-Load Input Current	VIN = 30mV, VOU = 1.8V ;		0.6		mA
	Input Voltage Range	Apply to input + and - Reverse input voltage not allow	VSTARTUP		20	V
	Output Voltage		1.8	3.0	3.05	V
PD	Power Dissipation	PD, Vin=30mV		13.5		uW
E	Useful Energy Output	VIN=30mV		3.4		mJ
E	Useful Energy Output	VilN=100mV		32.2		mJ
E	Useful Energy Output	VIN=300mV		135.4		mJ
Vo min	Minimum Output Voltage	VIN = 100mV, R load= 1 M ohm	2.8			V
Vo max	Maximum Output Voltage	VIN = 300mV, R load =1M ohm		3.0		V
IOUT	Output Current	Load resistance =1M ohm		0.87		mA

## MECHANICAL SPECIFICATIONS

- Outline Dimensions W\*L\*H: 24.3\*18\*10.6mm
- Weight: 0.21 ounce ( 6 grams) nominal



## PIN CONFIGURATION

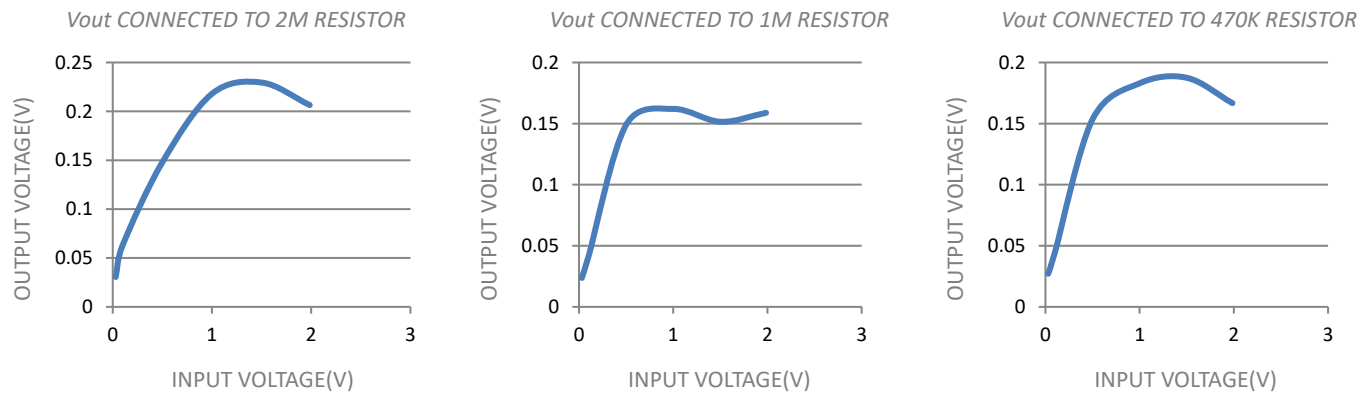


## MECHANICAL SPECIFICATIONS

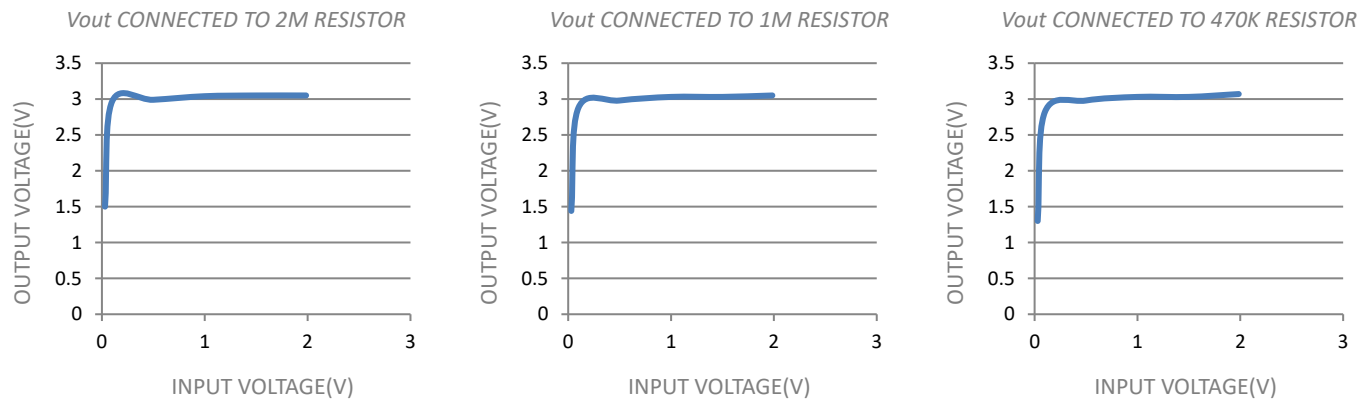
- Lead-free (ROHS) compliant
- Operating Temperature Range: -20 to 70° C
- Max. Average Operating Temperature : 70° C
- Storage Temperature: -40 to +85° C
- Humidity: To 95% (Non-Condensing)
- Protection: Conformal and Epoxy coated
- Soldering temperature 250 degree C, 10 seconds

# OPERATION CHARACTERISTIC

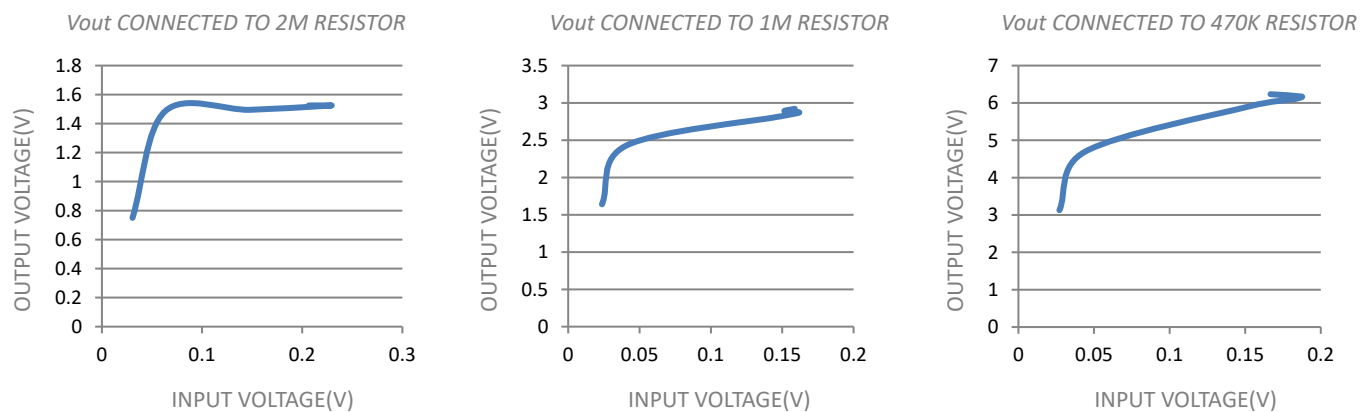
## INPUT POWER AS A FUNCTION OF INPUT VOLTAGE



## OUTPUT POWER AS A FUNCTION OF INPUT VOLTAGE



## OUTPUT CURRENT AS A FUNCTION OF INPUT VOLTAGE



## POWER EFFICIENCY AS A FUNCTION OF INPUT VOLTAGE

