

## MES1315MH

### DC/DC Converter

#### General Description

MES1315MH is a DC/DC converter which can be used to supply DC output from a commercial power supply (185 to 265 VAC). Using these module enable simple, easy drive of microcomputers, LEDs, and other electronic components without using a transformer.

It also allows set PCBs to be kept compact and lightweight, with extremely few attachments. It can accommodate the 185VAC~265VAC power supplies used as household power supplies.



#### Application

- Small multi-purpose power supply
- Stand-by power supply aimed at low power consumption when loaded light
- Insulated-type DC-DC converted

#### Features

- Wide Input Range : AC 185V ~ 265V
- A switching power supply can be made easily by adding simply external circuit
- Permits reduction of power consumption at low loads(when in stand-by)
- Able to deal with inputs of worldwide areas
- Ultra-compact size attained by application of high-density mounting technique
- Application of the unique molding technique features
  - Compliance with various safety regulations from the compact size
  - Humming is prevented when intermittent oscillation
- Over Temperature Protection
- Output Short Circuit Protection
- Over Load Protection

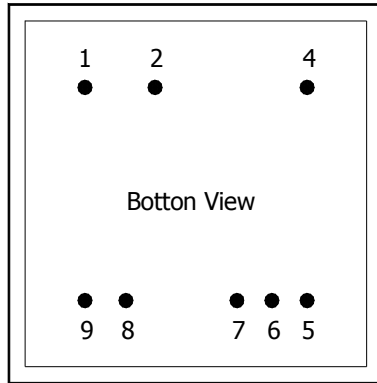
#### Absolute Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Input Voltage	$V_{DCIN}$	265 ~ 390	$V_{DC}$
Output Voltage 1	$V_{OUT}$	13	V
Maximum Output Current 1	$I_{OMAX}$	1	A
Output Voltage 2	$V_{OUT}$	15	V
Maximum Output Current 2	$I_{OMAX}$	100	mA

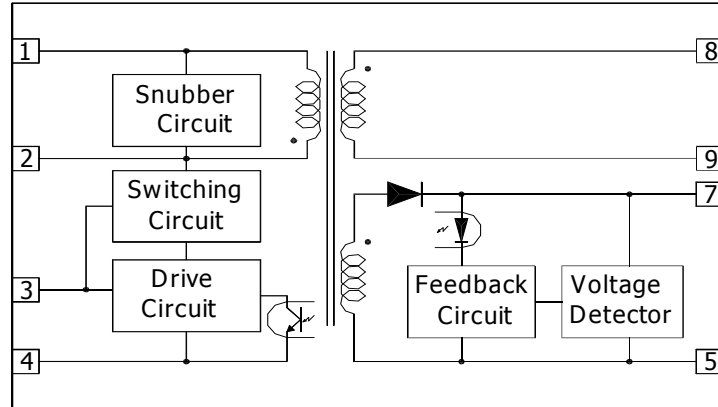
**MES-Series DC-to-DC Converter Modules**

ESD Endurance	$V_{SURGE}$	2	kV
Maximum Surface Temperature	$T_{CMAX}$	105	°C
Ambient Operating Temperature Range	$T_{OPR}$	-10 ~ +60	°C
Storage Temperature Range	$T_{STG}$	-40 ~ +105	°C

**Pin Assignment**



**Block Diagram**



**Pin Descriptions**

Pin Name	Pin No.	I/O	Description
+DC IN	1	I	Voltage Input Terminal, 265~390V <sub>DCIN</sub>
DRAIN	2	O	Drain Output Terminal
NC	3		No Connection
- DC IN	4	I	Voltage Input Terminal, 0V <sub>DCIN</sub>
- Vo1 OUT	5	O	DC Voltage Output Terminal, 0V
NC	6		No Connection
+Vo1 OUT	7	O	DC Voltage Output Terminal, 13.5V
+Vo2 OUT	8	O	AC Voltage Output Terminal, 15V
- Vo2 OUT	9	O	AC Voltage Output Terminal, 0V

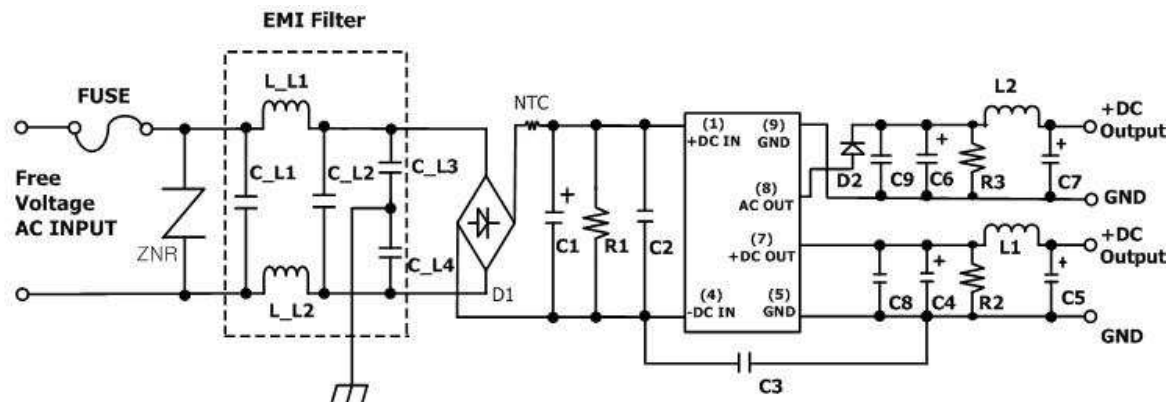
(Note1) Refer to the application circuit over pin connection

**Electrical Characteristics**

Characteristics	Symbo l	Condition	Min.	Typ.	Max.	Unit
Input Voltage Range	$V_{IN}$		265	311	390	V <sub>DC</sub>
Output Voltage 1 ( $V_{O1}$ )	$V_{O1}$	$V_{IN} = 311V, I_{O1} = 1,000mA,$	13.0	13.5	14.0	V
Output Current 1 ( $I_{O1}$ )	$I_{O1}$	$V_{IN} = 311V$	-	-	1,000	mA
Output Voltage 2 ( $V_{O2}$ )	$V_{O2}$	$V_{IN} = 311V, I_{O2} = 100mA$	13.5	15	16.5	V

Output Current 2 ( $I_{O2}$ )	$I_{O2}$	$V_{IN} = 311V$	-	-	100	mA
Line Regulation	$V_R$	$V_{IN} = 265\sim 390V, I_{O1}=1000mA$		0.05	0.25	V
Load Regulation	$V_L$	$V_{IN} = 311V, I_{O1}=0\sim 1000mA$		0.05	0.25	V
Output Ripple Voltage	$V_P$	$V_{IN} = 311V, I_{O1}=1000mA$	-	0.05	0.25	V <sub>p-p</sub>
Power Conversion Efficiency	$\eta$	$V_{IN} = 311V, I_{O1}=1000mA$	70	75	-	%

**Application Circuit**



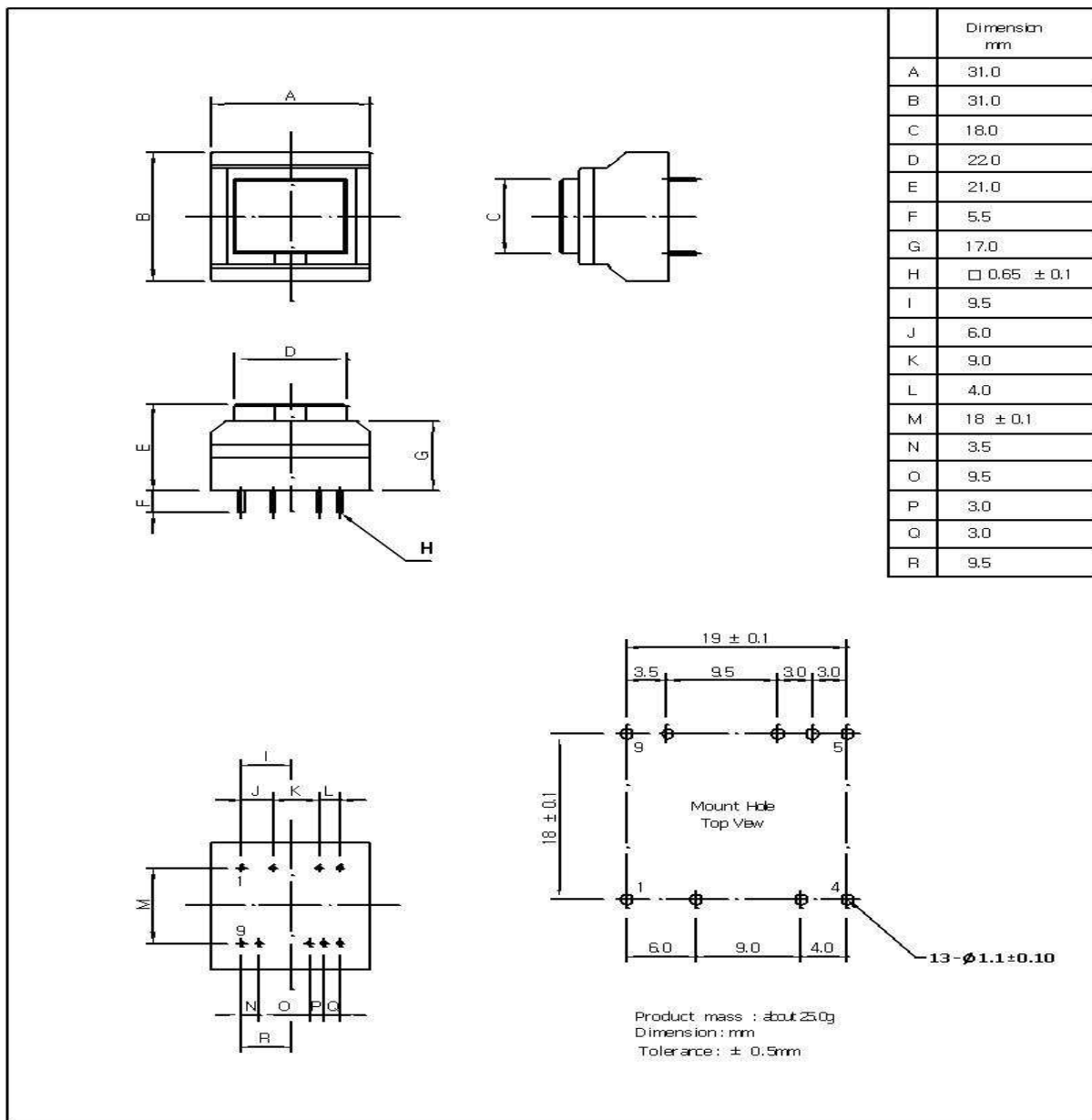
**External Component Setting**

<b>FUSE</b>	Fuse	Please make sure to use quick acting fuse 1A or higher
<b>C1</b>	Capacitor for input voltage smoothing	Capacitance : 33 $\mu$ F~820 $\mu$ F, Rated voltage : 400V or higher Ripple current is 0.15Arms above.
<b>C2</b>	For noise terminal voltage reduction	Capacitance : 4.7nF, Rated voltage : 2KV or higher Film capacitor or ceramic capacitor. Reduce the noise terminal voltage. The constant value should be evaluated in the set.
<b>C3</b>	Capacitor for Safety	Capacitance : 1nF~4.7nF, Rated voltage : 1KV or higher
<b>C4,C5 C5,C6</b>	Capacitor for output voltage smoothing	Capacitance : 470 $\mu$ F or higher, Rated voltage : 25V or higher ESD is 0.4 $\Omega$ max. Ripple current is 0.25Arms above. Output noise voltage is influenced. Please evaluate it in the actual set.
<b>C8,C9</b>	Bypass Capacitor for high frequency noise	Capacitance : 220nF or higher, Rated voltage : 50V or higher Film capacitor or ceramic capacitor. Reduce the high frequency noise terminal output.
<b>R1,R2</b>	Dummy Resistor	1.0k $\Omega$ , 0.5W
<b>L1</b>	Choke Coil	L : 4.7 $\mu$ H, Allowable current : 1,500mA or higher Please use the one that is hard to be magnetic saturated even in the high temperature.
<b>L2</b>	Choke Coil	L : 4.7 $\mu$ H, Allowable current : 150mA or higher Please use the one that is hard to be magnetic saturated even in the high temperature.

**MES-Series DC-to-DC Converter Modules**

<b>D1</b>	Rectifier Diode	In the absolute maximum ratings, the reverse peak voltage should be 500V or higher, the average rectifying current should be 1A or higher, and the peak surge current should be 10A or higher. (Full-wave rectifier can be used in out part.)
<b>D2</b>	Ultra Fast Recovery Diode	In the absolute maximum ratings, the reverse peak voltage should be 200V or higher, the average rectifying current should be 1A or higher, and the peak surge current should be 10A or higher.

**Package Outline**



**Ordering Information**

Order Number	Ambient Temperature Range	Package Type
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MES1315MH	-10°C ~ 60°C	
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\* Please consult the factory or sales representative for pricing and availability.

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