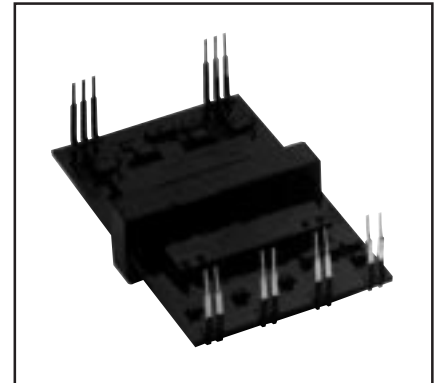
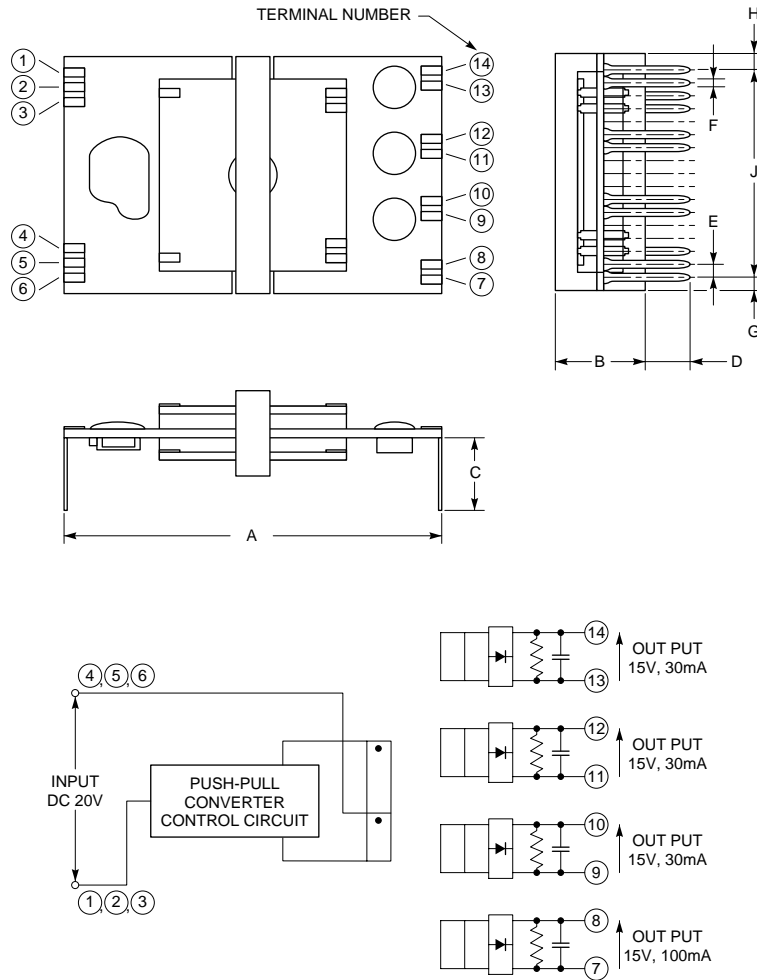


# HYBRID IC M57140-01

IPM POWER SUPPLY HYBRID IC



## Description:

M57140-01 is an isolated DC-to-DC converter designed to drive IPMs (Intelligent Power Modules). With an input of DC 20V, the module supplies four 15V outputs. Isolation is provided from primary to secondary and also between the secondaries. Interwinding isolation is designed for driving the IPM.

## Features::

- Output Specification:  
+15V x 4, Total 3W max.
- Primary-to-secondary Isolation:  
2500 V<sub>RMS</sub>, One Minute
- Secondary-to-secondary Isolation Voltage:  
1500 V<sub>RMS</sub>, One Minute
- Compact, Low Profile Design

## Applications:

- IPMs for General Purpose Inverter and AC Servo
- Power Source for MOSFET Driving Circuits

## Ordering Information:

M57140-01

## Outline Drawing and Circuit Diagram

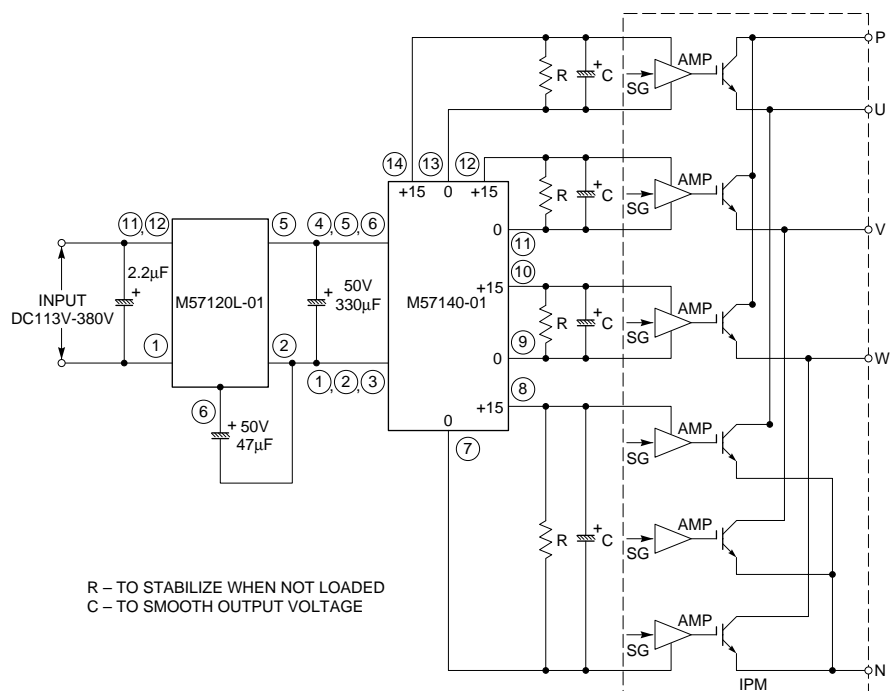
Dimensions	Inches	Millimeters
A	2.03	51.5
B	0.71	18.0 MAX
C	.39±.06	12.5±1.5
D	.18±.06	4.5±1.5
E	0.07	1.8

Dimensions	Inches	Millimeters
F	0.02	0.55
G	0.08	2.1
H	0.08	2.1
J	1.13	28.8

Item	Symbol	Test Conditions	Limit	Units
Input Voltage	$V_{IN}$	Terminals ④, ⑤, ⑥ - ①, ②, ③	25	Volts
Load Current	$I_L$	Terminals ⑭ - ⑬, ⑫ - ⑪, ⑩ - ⑨	30	mA
		Terminals ⑧ - ⑦	100	mA
Operating Temperature	$T_{opr}$	There Should be	-10 ~ +75	°C
Storage Temperature	$T_{stg}$	No Condensation	-20 ~ +85	°C
Internal Power Dissipation	$P_d$	∅	1.5	Watts
Primary-to-Secondary Isolation		1 Minute	2500	$V_{rms}$
Secondary-to-Secondary Isolation		1 Minute	1500	$V_{rms}$

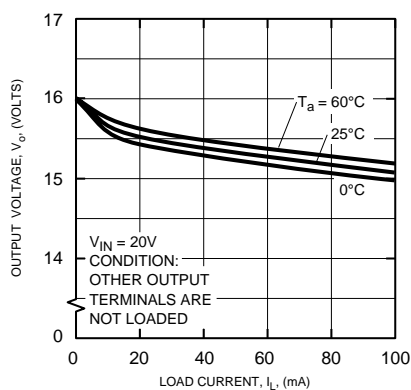
Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Input Source Voltage	V <sub>IN</sub>	Direct Current	18	20	22	Volts
Output Voltage	V <sub>O</sub>	Between Pins <del>(10)-(9)</del> , <del>(12)-(11)</del> , <del>(14)-(13)</del> I <sub>L</sub> = 30mA	13.5	15.0	16.5	Volts
		Between Pins <del>(8)-(7)</del> , I <sub>L</sub> = 100mA	13.5	15.0	16.5	Volts
Peak Load Current	I <sub>LP</sub>	Between Pins <del>(10)-(9)</del> , <del>(12)-(11)</del> , <del>(14)-(13)</del>	∅	33	∅	mA
		Between Pins <del>(8)-(7)</del>	∅	110	∅	mA
Load Regulation	Reg-out	Between Pins <del>(10)-(9)</del> , <del>(12)-(11)</del> , <del>(14)-(13)</del> I <sub>L</sub> = 0 ~ 30mA	∅	5	10	%
		Between Pins <del>(8)-(7)</del> , I <sub>L</sub> = 0 ~ 100mA	∅	7	12	%
Efficiency	η	Between Pins <del>(10)-(9)</del> , <del>(12)-(11)</del> , <del>(14)-(13)</del> I <sub>L</sub> = 30mA	∅	70	∅	%
		Between Pins <del>(8)-(7)</del> , I <sub>L</sub> = 100mA	∅	70	∅	%

The schematic diagram shows the internal circuitry of the M57140-01. It starts with an input voltage  $V_{IN} = 20V$  connected to a  $330\mu F$  capacitor. The output is a  $5V$  regulated supply. The circuit includes a  $33\mu F$  capacitor, a  $10\mu F$  capacitor, and a  $10\mu F$  capacitor. The output voltage is  $V_{OUT} = 5V$ . The circuit is labeled M57140-01.

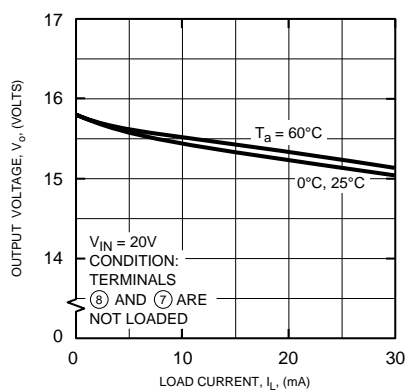
**Application Circuit****Handling Precautions:**

- When M57140-01 is used under excessive load condition, output side rectifying diodes will be destroyed. Care should be exercised so as not to operate the device above the rated maximum load current.
- Coating Materials should not be applied on this device because the application of coating materials for waterproofing could cause a stress and destroy a device.

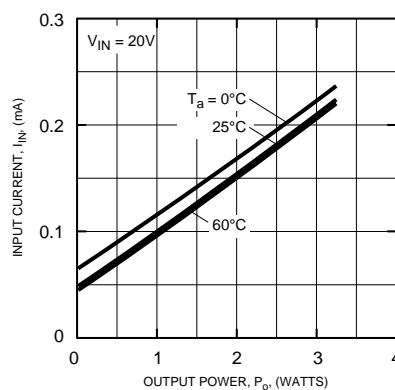
OUTPUT VOLTAGE -  
LOAD CURRENT CHARACTERISTICS  
BETWEEN TERMINALS ⑧ AND ⑦



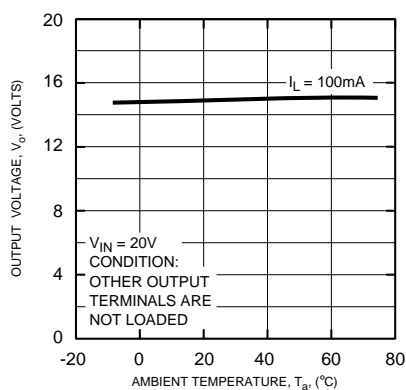
OUTPUT VOLTAGE-LOAD CURRENT  
CHARACTERISTICS BETWEEN  
TERMINALS ⑩-⑨, ⑫-⑪, ⑭-⑬



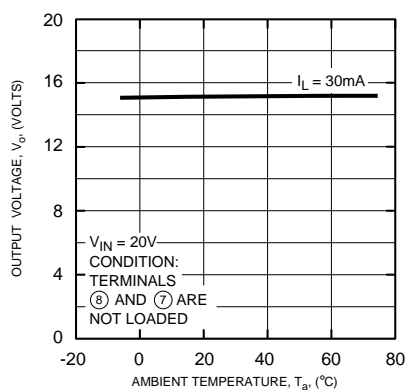
INPUT CURRENT - OUTPUT POWER



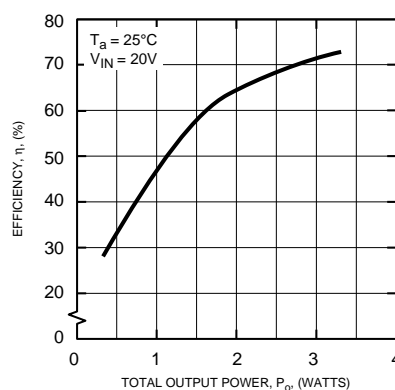
OUTPUT VOLTAGE  
VS AMBIENT TEMPERATURE  
BETWEEN TERMINALS ⑧ AND ⑦



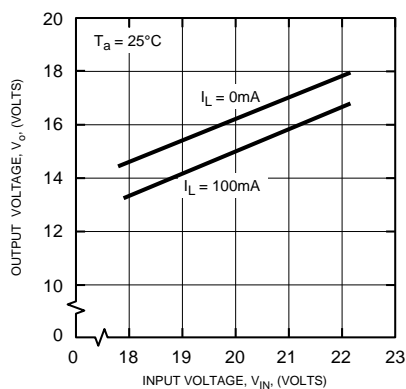
OUTPUT VOLTAGE VS  
AMBIENT TEMPERATURE BETWEEN  
TERMINALS ⑩-⑨, ⑫-⑪, ⑭-⑬



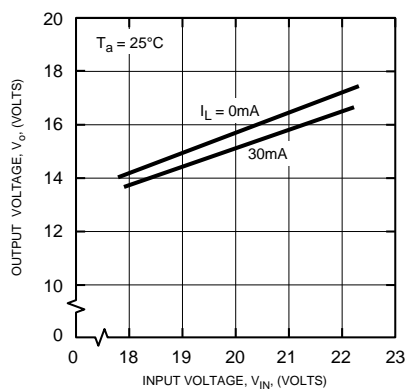
EFFICIENCY CHARACTERISTICS



OUTPUT VOLTAGE  
VS INPUT VOLTAGE  
BETWEEN TERMINALS ⑧ AND ⑦



OUTPUT VOLTAGE VS  
INPUT VOLTAGE BETWEEN  
TERMINALS ⑩-⑨, ⑫-⑪, ⑭-⑬



## FOR SAFETY USING

Great detail and careful attention are given to the production activity of Hics, such as the development, the quality of production, and in its reliability. However the reliability of Hics depends not only on their own factors but also in their condition of usage. When handling Hics, please note the following cautions.

CAUTIONS	
Packing	The materials used in packing Hics can only withstand normal external conditions. When exposed to outside shocks, rain and certain environmental contaminants, the packing materials will deteriorates. Please take care in handling.
Carrying	<ol style="list-style-type: none"> <li>1) Don't stack boxes too high. Avoid placing heavy materials on boxes.</li> <li>2) Boxes must be positioned correctly during transportation to avoid breakage.</li> <li>3) Don't throw or drop boxes.</li> <li>4) Keep boxes dry. Avoid rain or snow.</li> <li>5) Minimal vibration and shock during transportation is desirable.</li> </ol>
Storage	<p>When storing Hics, please observe the following notices or possible deterioration of their electrical characteristics, risk of solder ability, and external damage may occur.</p> <ol style="list-style-type: none"> <li>1) Devices must be stored where fluctuation of temperature and humidity is minimal, and must not be exposed to direct sunlight. Store at the normal temperature of 5 to 30 degrees Celsius with humidity at 40 to 60%.</li> <li>2) Avoid locations where corrosive gasses are generated or where much dust accumulates.</li> <li>3) Storage cases must be static proof.</li> <li>4) Avoid putting weight on boxes.</li> </ol>
Extended storage	When extended storage is necessary, Hics must be kept non-processed. When using Hics which have been stored for more than one year or under severe conditions, be sure to check that the exterior is free from flaw and other damages.
Maximum ratings	To prevent any electrical damages, use Hics within the maximum ratings. The temperature, current, voltage, etc. must not exceed these conditions.
Polarity	To protect Hics from destruction and deterioration due to wrong insertion, make sure of polarity in inserting leads into the board holes, conforming to the external view for the terminal arrangement.



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**Keep safety first in your circuit designs!**

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