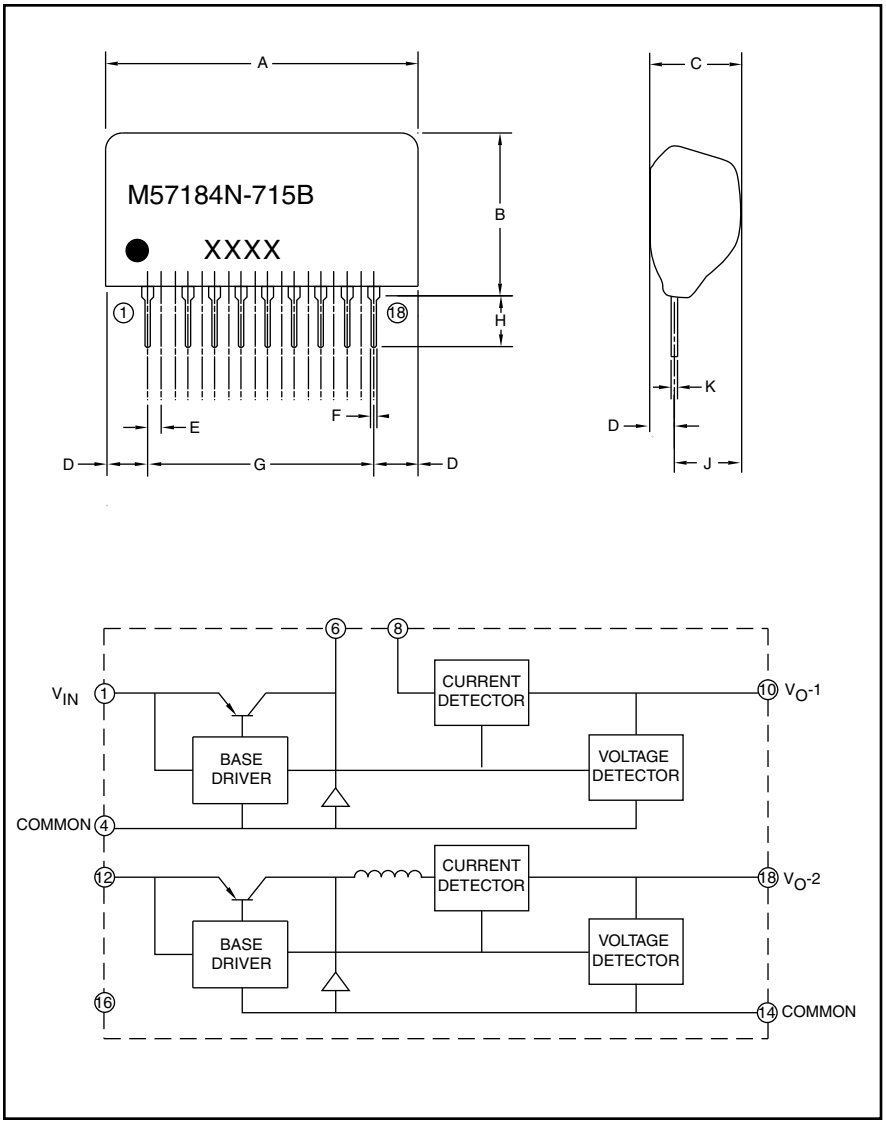
Powerex, Inc., 200 E. Hillis Street, Youngwood, Pennsylvania 15697-1800 (724) 925-7272

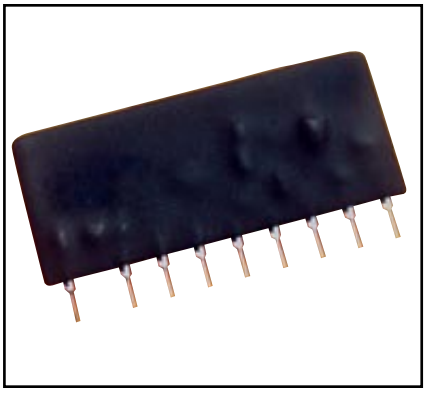
High Voltage Input DC-to-DC Converter



Outline Drawing and Circuit Diagram

Dimensions	Inches	Millimeters
A	2.05 Max.	52.0 Max.
B	0.95 Max.	24.0 Max.
C	0.47 Max.	12.0 Max.
D	0.18 Max.	4.5 Max.
E	0.10	2.54

Dimensions	Inches	Millimeters
F	0.02±0.004	0.55±0.1
G	1.70	43.18
H	0.16±0.4	4.0±1.0
J	0.3 Max.	7.5 Max.
K	0.01±0.008	0.35±0.2



Description:
M57184N-715B is a non-isolated step down DC-to-DC converter designed to take direct input of 140 ~ 360 V_{DC} and provide 2 outputs. One output is +15V/350mA and the other is rated at +5V/200mA. This converter allows use of fewer external components than does a combination of electrolytic capacitors and choke coils only.

Features:

- ☐ Input Voltage Range DC 140V ~ 360V
- ☐ Output Specifications 15V, 350mA and 5V, 200mA

Applications:

- ☐ Power Source for DIP IPMs and ASIPMs
- ☐ Home Appliances
- ☐ Industrial Controls

Ordering Information:

M57184N-715B

Absolute Maximum Ratings, T_a = 25 °C unless otherwise specified

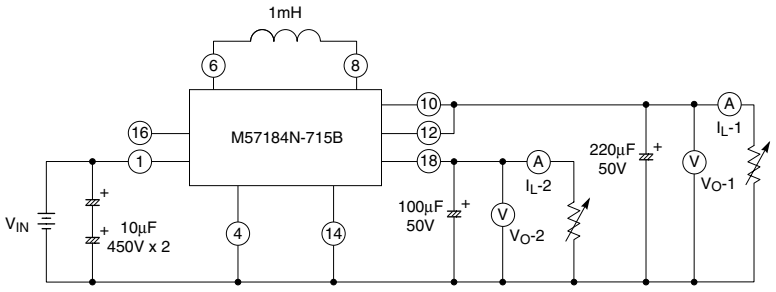
Characteristics	Symbol	Test Conditions	M57184N-715B	Units
Input Voltage	V_{IN}	–	600	Volts
Load Current-1	I_L-1	–	350	mA
Load Current-2	I_L-2	–	200	mA
Operating Temperature	T_{opr}	No Condensation	-20 ~ +70	°C
Storage Temperature	T_{stg}	Allowable	-25 ~ +85	°C

Electrical Characteristics, V_{IN} = 280V, T_a = 25 °C unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Input Source Voltage	V_{IN}	Recommended Range	140*	280	360	Volts
Output Voltage-1, Pin 10	V_O-1	I_L-1 = 350mA	14	15	16	Volts
Output Voltage-2, Pin 18	V_O-2	I_L-2 = 200mA	4.7	5.0	5.3	Volts
Efficiency	η	I_L-1 = 350mA, I_L-2 = 200mA	65	73	—	mV_{p-p}
Rippple	V_{p-p}	I_L-1 = 350mA, I_L-2 = 200mA	—	0.1	0.2	Volts

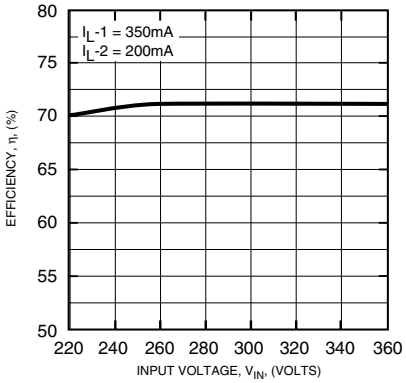
*At input voltages less than 220VAC, I_L-1 must be limited to less than 250mA.

Application Circuit

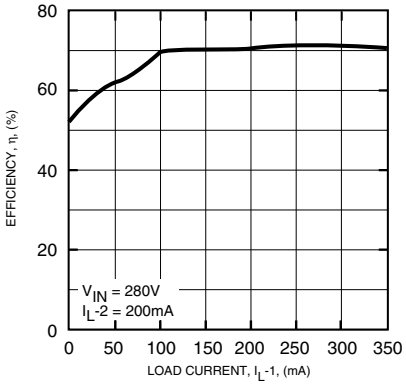


M57184N-715B
High Voltage Input
DC-to-DC Converter

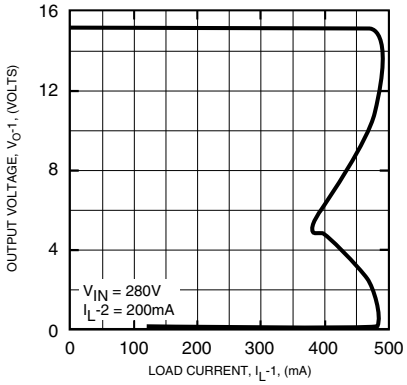
EFFICIENCY VS. INPUT VOLTAGE CHARACTERISTICS



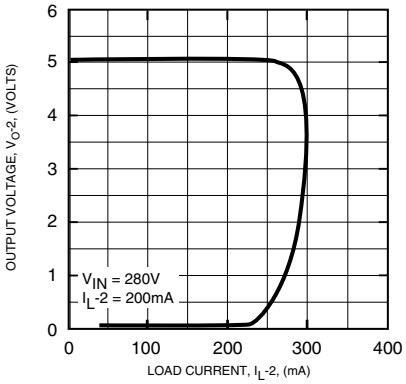
EFFICIENCY VS. LOAD CURRENT CHARACTERISTICS



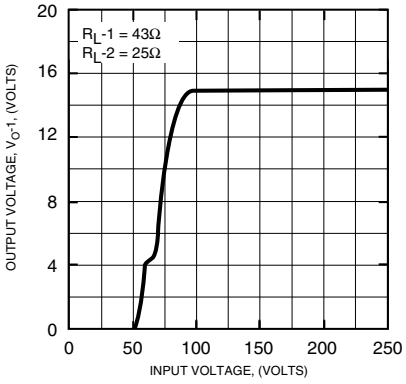
OUTPUT VOLTAGE VS. LOAD CURRENT CHARACTERISTICS (V_O-1)



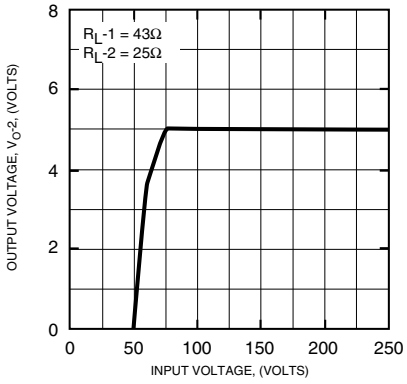
OUTPUT VOLTAGE LOAD CURRENT CHARACTERISTICS (V_O-2)



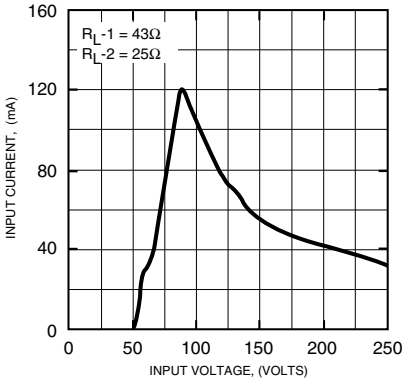
OUTPUT VOLTAGE VS. INPUT VOLTAGE CHARACTERISTICS (V_O-1)



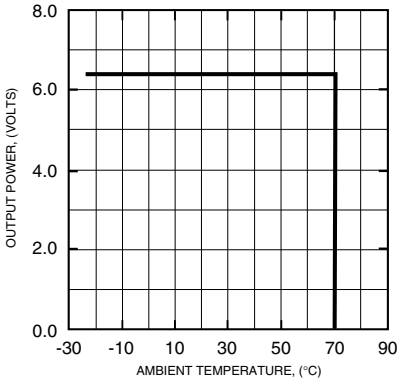
OUTPUT VOLTAGE VS. INPUT VOLTAGE CHARACTERISTICS (V_O-2)



INPUT CURRENT VS. INPUT VOLTAGE CHARACTERISTICS



DERATING CHARACTERISTICS



Inductor for Application Example Circuit

1. Recommended Inductors

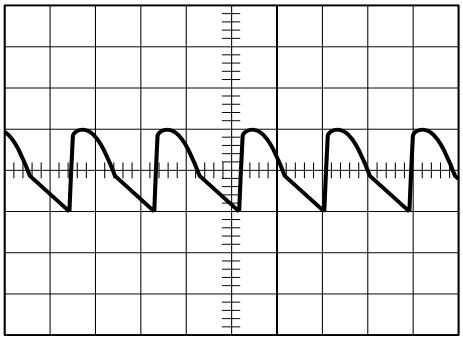
Manufacturer	Part Number
Mitsumi	C13-FR Series, Type # GA 102
API Delevan	4590-105K
J.W. Miller	5900-102

2. Specifications for Inductor

We recommend an inductor with these specifications: an inductance of 1mH, rated current of at least 500mA, and good performance with DC superimposition. Please note there must be no magnetic saturation in the inductor.

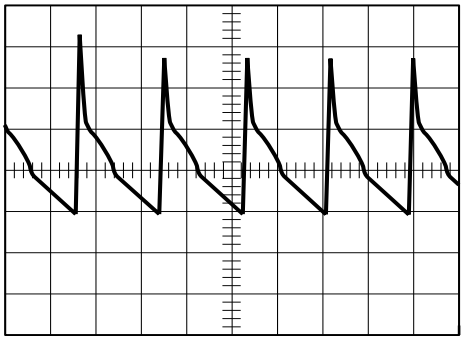
The following waveforms show the output ripple voltage on V_O-1 for good versus bad inductors. These waveforms are produced with output V_O-2 unloaded and the scope coupling set to AC.

GOOD INDUCTOR



50.0mV/div 50.0µsec/div

BAD INDUCTOR



50.0mV/div 50.0µsec/div