Delta Current Control
Automotive Control Systems
Made in the USA

VC1240 / VC1265 High Efficiency Pulse Width Modulator

1 Features

- High Current Capability
- Short Circuit Protection
- Overload Protection
- Over-Temperature Protection
- Under and Over Voltage Shut-down
- Short Pulse timing
- Long Life
- UL-94 compliant
- Hermetically Sealed

2 Applications

- Automotive Fan Controller
- Variable Speed Motor Controller
- Brushed and Solid State Commutators

3 Description

These pulse width modulators are precision devices capable of controlling high current electric motors up to forty Amperes with the VC1240 and sixty five Amperes with the VC1265 with only moderate airflow. Both controllers will tolerate a short circuit to ground or a short circuit to 12V, current overload, and over temperature conditions, and will do so indefinitely without damage. Custom configurations allow for scaled current limits, allowing protection for a seized or damaged motor.

With regard to motor longevity, the VC series of controllers utilize the correct minimum-pulse-timing required to control electric motors designed for automotive use without causing unnecessary motor wear. In order to provide a long controller life, the power FET output transistor die is electronically temperature limited to 270^0 F (132^0 C), while the electronic circuitry is isolated from the high power components in order to limit their maximum temperature to 220^0 F, providing an MTBF that will far exceed the lifespan of the application. In order to tolerate harsh environments, the VC series of controllers are hermetically sealed with UL-94-0 rated epoxy. Moreover, every component contained is UL-94 complaint.

Both controllers have inputs to set a forced minimum power output of 50%, an I/O line to either read the set temperature or set the temperature externally, and a temperature sensor input. The controllers are fully self-contained and require no other circuitry for operation. When utilized as an automotive fan controller, the controller will vary the duty cycle from 0 to 100% in order to keep the set temperature within +/- 3 ½ degrees under all conditions by way of the supplied temperature sensor. An AC input sets the minimum output power to 50%, and an external temperature set can be used in order to adjust the temperature remotely or force the controller on or off, while a local temperature adjustment (in-shroud or integral on-board) is available as a factory option.

Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
$Vmax_{no}$	Maximum non-operating voltage(1)	30	V
$Vmax_{op}$	Maximum operating voltage	18	V
Imax	Maximum output current(2)	70/90	A
$Tmax_{no}$	Maximum non-operating temperature(1)	257	F
$Tmax_{op}$	Maximum airflow temperature	200	F

1) Built in Test Equipment provides automatic shut-off
2) Built in Test Equipment provides limit protection

Electrical Characteristics (VC1240)

VCC = 12V to 15 V, TA = 200F (unless otherwise noted)

Symbol	Parameter	Value	Unit
Ilimit	Current limit	70	A
Pmin	Minimum on or off pulse width(1)	0.5	mS
Vdrop	Voltage Drop at max output(2)	0.30	V
n	efficiency(2)	98.1	%
Pdiss	Power dissipation(2)	10	W
Dmin	PWM minimum duty cycle	0	%
Dmax	PWM maximum duty cycle	99.6	%
Tr	Temperature set range	180 +/- 30	F
Trext	External temperature set range	180 + 95 / -180	F
AC	Ac input override power	50	%
Lvs	Low Voltage shut off	9	V
Hvs	High voltage shutoff	18	V

1) minimum of on-time / off time
2) At 40A and 13V

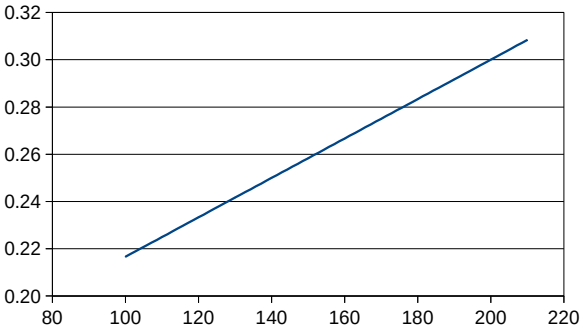
Electrical Characteristics (VC1265)

VCC = 12V to 15 V, TA = 200F (unless otherwise noted)

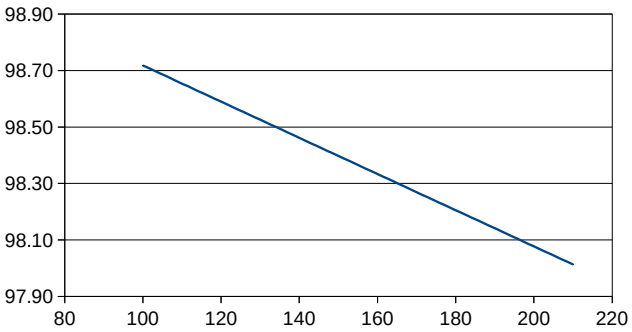
Symbol	Parameter	Value	Unit
Ilimit	Current limit	90	A
Pmin	Minimum on or off pulse width(1)	0.5	mS
Vdrop	Voltage Drop at max output(2)	0.30	V
n	efficiency(2)	98.1	%
Pdiss	Power dissipation(2)	16.2	W
Dmin	PWM minimum duty cycle	0	%
Dmax	PWM maximum duty cycle	99.6	%
Tr	Temperature set range	180 +/- 30	F
Trext	External temperature set range	180 + 95 / -180	F
AC	Ac input override power	50	%
Lvs	Low Voltage shut off	9	V
Hvs	High voltage shutoff	18	V

1) minimum of on-time / off time
2) At 65A and 13V

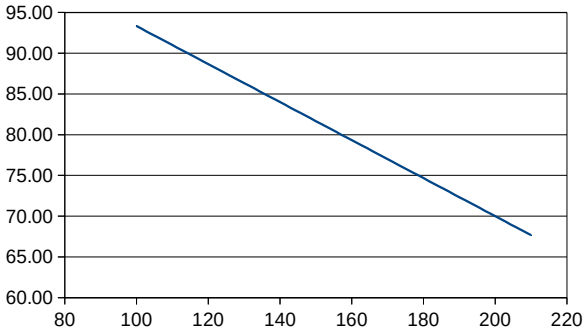
VC1240
Voltage Drop Vs Temperature (I = 40A)



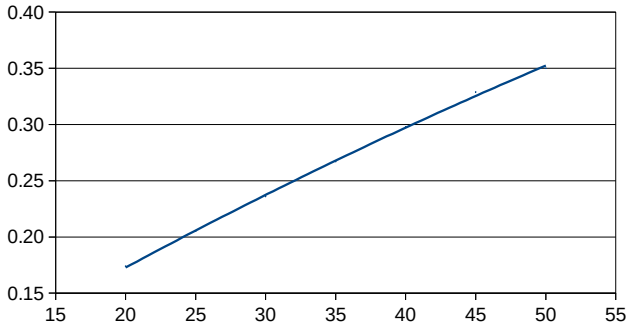
VC1240
Efficiency Vs Temperature (I = 40A)



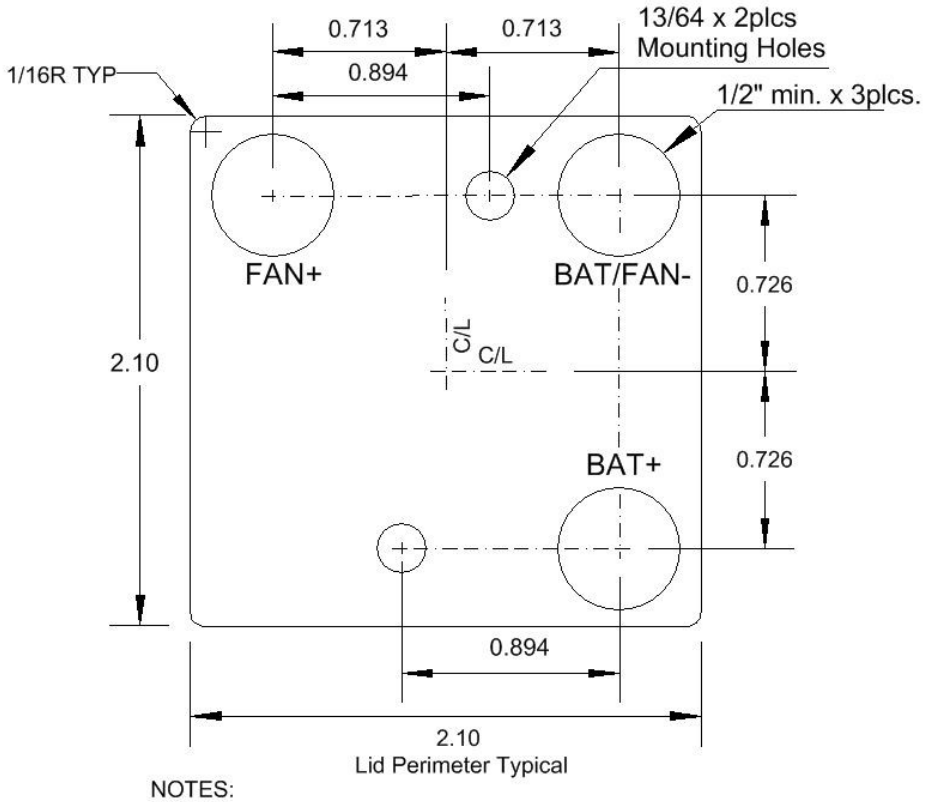
VC1240
Current Limit Vs Temperature



VC1240
Voltage Drop Vs Current (T=200F)



Mounting Hole Placement - All Models



NOTES:

1) Controller depth 0.68".
2) Use #10 x 3/8" maximum length button head screws for mounting.
3) Heat sink/lid perimeter shown for reference.
4) Maximum mounting surface thickness 1/8".