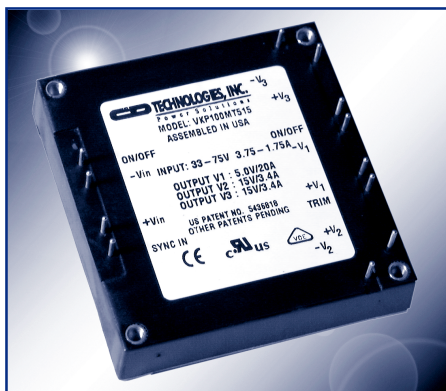


VKP100xT

100 Watt Triple Output Half Brick DC/DC Converter



- 18 - 40 & 33 - 75V Input Range
- 2.3" X 2.4" X 0.5"
- User Configurable as a Single, Dual or Triple Output
- Each Channel Independently Current Limited
- Excellent Cross Regulation
- 500VDC Channel to Channel Isolation
- High Efficiency: 88% Typical
- Fixed-Frequency Operation
- Operation to +100°C Baseplate Temperature
- 50μS Transient Recovery, 0-90% Load Step
- Primary & Secondary Remote On/Off
- Adjustable Output Voltage
- External Synchronization
- VKP100MT Series are Approved to UL/CUL1950, EN 60950

The VKP100xT Series are members of the VK high density DC/DC converter family. They are multiple output DC/DC converters offered in a 33-75 input voltage range. Their versatile architecture featuring fully isolated channels enables the system designer to utilize the converter in either a single, dual or triple output scheme without excessive minimum load requirements or cross regulation

degradation.

The VKP100xT's architecture results in an economical and practical solution for use in distributed power schemes for today's demanding telecommunication and electronic data processing applications requiring ground separation between noise sensitive digital logic and bipolar analog components. The VKP100xT's proprietary control circuitry responds

to 50-100% load steps in 35μSeconds to within 1% of nominal Vout. The peak deviation will not exceed 10% of Vout for pulsed load slew rates in excess of 75 Amps per microsecond. The VKP100xT is ideal for electronic data processing applications utilizing modern disk drives and low voltage microprocessors that require dynamic load current response while maintaining tight output voltage tolerances.

PRODUCT SELECTION CHART

MODEL	INPUT VOLTAGE (VDC)	RATED VOUT (VDC)			RATED MAXIMUM IOUT (A)		
		V1 (±)	V2 (±)	V3 (±)	V1(±)	V2(±)	V3(±)
VKP100MT312	48 (33-75)	3.3	12	12	30	4.2	4.2
VKP100MT315	48 (33-75)	3.3	15	15	30	3.4	3.4
VKP100MT512	48 (33-75)	5.1	12	12	20	4.2	4.2
VKP100MT515	48 (33-75)	5.0	15	15	20	2.0	2.0

SPECIFICATIONS, ALL MODELS

Specifications are at $T_{CASE} = +40^{\circ}C$ nominal input voltage unless otherwise specified.

INPUT	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
	Input Fusing				10	A
	Voltage Range		33	48	75	V _{DC}
	Reflected Ripple Current	Peak - Peak			370	mA
	Input Ripple Rejection	DC to 1KHz	50	60		dB
	Maximum Input Current	Output Power = 100W $V_{IN} = 30V$			5	A
	No Load Power Dissipation	$P_{OUT} = 0, V_{IN, Min} < V_{IN} < V_{IN, Max}$			6	W
	Inrush Charge				0.247	mC
	Quiescent Operating Current					
	Primary On/Off Disabled			7.5	10	mA
	Secondary On/Off Disabled			15	20	mA

GENERAL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
	ISOLATION					
	Input to Each Output	Peak Test	1500			V _{DC}
	Input to Baseplate		1500			V _{DC}
	Channel to Channel	Any Channel to Any Channel	500			V _{DC}
	Resistance, Input - Output		10			MΩ
	Capacitance, Input - Output			2000		pF
	Leakage Current	$V_{ISO} = 240V_{AC}, 60Hz$		180		μA, rms
	GENERAL					
	Set Point Accuracy	$V_{IN} = \text{Nominal}, 50\% \text{ Load}$			1	%
	Turn-on Time	Within 1% of Nominal V_{OUT}		3.5	5	mSec
	Remote On/Off Control Inputs					
	Primary	Open Collector/Drain				
	Sink Current-Logic Low	$V_{IN} = V_{MAX}$			7	mA
	Vlow				0.8	V
	Vhigh				Open Collector	
	Secondary	Open Collector/Drain				
	Sink Current-Logic Low				100	μA
	Vlow				0.4	V
	Vhigh				Open Collector	
	External Synchronization Input					
	Frequency		440		520	KHz
	Pulse Width		150		320	nSec
	Source Impedance				47	Ω
	Input High Voltage		4		5	V
	Input Low Voltage		0		1	V
	Input Impedance			470		Ω
	Switching Frequency		470	480	490	KHz
	Weight				3 (85)	oz (g)
	TEMPERATURE					
	Operation/Specification	Case Temperature	-40		+100	°C
	Storage		-55		+125	°C
	Shutdown		+100		+115	°C
	Thermal Impedance	Case to Ambient		8.2		°C/W

VKP100MT312 OUTPUT	PARAMETER	CONDITIONS	Min	V1 Nom	Max	Min	V2 Nom	Max	Min	V3 Nom	Max	UNITS
	Output Power	Total Combined O/P Power = 100 Watts Max		50	100		25	50		25	50	W
	Set Point Voltage	$I_{O, Nom}$		3.3			12.2			12.2		V
	Output Current, I_{OUT}		0.5	15	30.0	0	2.1	4.2	0	2.1	4.2	A
	Output Ripple, p-p	DC to 20MHz*		100	200		150	500		150	500	mV
	Output Adjust Range	*	3.15		3.80		Dependent on V1					V
	Output Temperature Drift			.02	.05		.02	.05		.02	.05	%/°C
	Line Regulation	$V_{IN, Min} \leq V_{IN} \leq V_{IN, Max}$ $I_O = I_{O, Nom}$		0.05	0.10		1.0	2.0		1.0	2.0	%
	Load Regulation	Min Load to Rated Load		0.50	1.00	See Regulation Curves			See Regulation Curves			%
	Current Limit Inception	Other Outputs Min Load		38			6.0			6.0		A
	Short-Circuit Current			30	38		5.0	6.0		5.0	6.0	A
	Transient Response	50 to 100% Load Step										
	Peak Deviation			150	250							mV
	Settling Time	$V_{OUT}^*, 1\% \text{ of } V_{OUT}^* \text{ Nom}$		35	50							μSec
	Overvoltage Limit		4.2		5.0							V
	Efficiency	$I_{OUT1} = 15A, (I_{OUT2} + I_{OUT3}) = 4.2A$ F.L. $V_{IN} = \text{Nominal}$	85	86								%

* See Application Notes available on the web at www.cdpowerelectronics.com

SPECIFICATIONS, ALL MODELS

Specifications are at $T_{CASE} = +40^{\circ}\text{C}$ nominal input voltage unless otherwise specified.

PARAMETER	CONDITIONS	V1			V2			V3			UNITS
		Min	Nom	Max	Min	Nom	Max	Min	Nom	Max	
VKP100MT315 OUTPUT	Output Power	Total Combined O/P Power = 100 Watts Maximum									
			50	100		25	50		25	50	W
	Set Point Voltage	$I_{O,Nom}$				15.85			15.85		V
	Output Current, I_{OUT}	0.5	15	30.0	0	1.66	3.33	0	1.66	3.33	A
	Output Ripple, p-p	DC to 20MHz*				125	500		125	500	mV
	Output Adjust Range	*			Dependent on V1						V
	Output Temperature Drift		.02	.05		.02	.05		.02	.05	%/ $^{\circ}\text{C}$
	Line Regulation	$V_{IN,Min} \leq V_{IN} \leq V_{IN,Max}$ $I_O = I_{O,Nom}$				1.0	2.0		1.0	2.0	%
	Load Regulation	Min Load to Rated Load			See Regulation Curves			See Regulation Curves			%
	Current Limit Inception	Other Outputs Min Load				5.0			5.0		A
	Short-Circuit Current		30	38		4.0	5.0		4.0	5.0	A
	Transient Response	50 to 100% Load Step									mV
	Peak Deviation		150	250							
	Settling Time	V_{OUT} , 1% of $V_{OUT,Nom}$				35	50				μSec
	Overvoltage Limit		4.2	5.0							V
	Efficiency	$I_{OUT1}=15\text{A}, (I_{OUT2}+I_{OUT3})=3.4\text{A}$ F.L. $V_{IN}=\text{Nominal}$				85	86				%

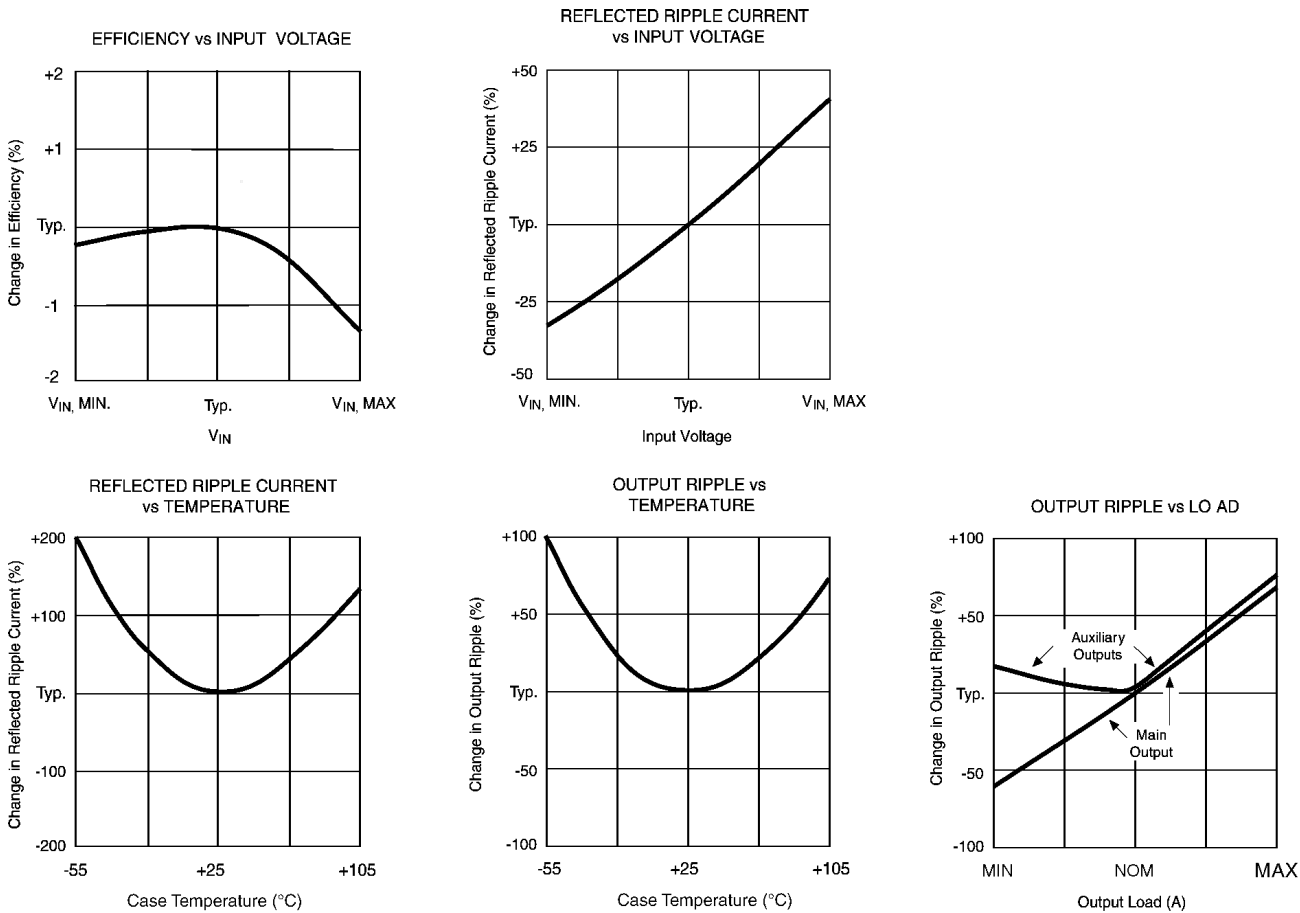
PARAMETER	CONDITIONS	V1			V2			V3			UNITS
		Min	Nom	Max	Min	Nom	Max	Min	Nom	Max	
VKP100MT512 OUTPUT	Output Power	Total Combined O/P Power = 100 Watts Combined									
			50	100		25	50		25	50	W
	Set Point Voltage	$I_{O,Nom}$				12			12		V
	Output Current, I_{OUT}	0.5	10	20	0	2.1	4.2	0	2.1	4.2	A
	Output Ripple, p-p	DC to 20MHz*				150	500		150	500	mV
	Output Adjust Range	*			Dependent on V1						V
	Output Temperature Drift		.02	.05		.02	.05		.02	.05	%/ $^{\circ}\text{C}$
	Line Regulation	$V_{IN,Min} \leq V_{IN} \leq V_{IN,Max}$ $I_O = I_{O,Nom}$				1.0	2.0		1.0	2.0	%
	Load Regulation	Min Load to Rated Load			See Regulation Curves			See Regulation Curves			%
	Current Limit Inception	Other Outputs Min Load				6.0			6.0		A
	Short-Circuit Current		20.0	26.0		5.0	6.0		5.0	6.0	A
	Transient Response	50 to 100% Load Step									mV
	Peak Deviation		200	300							
	Settling Time	V_{OUT} , 1% of $V_{OUT,Nom}$				35	50				μSec
	Overvoltage Limit		6.0	7.0							V
	Efficiency	$I_{OUT1}=10\text{A}, (I_{OUT2}+I_{OUT3})=4.2\text{A}$ F.L. $V_{IN}=\text{Nominal}$				86	87				%

PARAMETER	CONDITIONS	V1			V2			V3			UNITS
		Min	Nom	Max	Min	Nom	Max	Min	Nom	Max	
VKP100MT515 OUTPUT	Output Power	Total Combined O/P Power = 100 Watts Max									
			50	100		25	50		25	50	W
	Set Point Voltage	$I_{O,Nom}$				15.3			15.3		V
	Output Current, I_{OUT}	0.5	10	20	0	1.66	3.33	0	1.66	3.33	A
	Output Ripple, p-p	DC to 20MHz*				125	500		125	500	mV
	Output Adjust Range	*			Dependent on V1						V
	Output Temperature Drift		.02	.05		.02	.05		.02	.05	%/ $^{\circ}\text{C}$
	Line Regulation	$V_{IN,Min} \leq V_{IN} \leq V_{IN,Max}$ $I_O = I_{O,Nom}$				1.0	2.0		1.0	2.0	%
	Load Regulation	Min Load to Rated Load			See Regulation Curves			See Regulation Curves			%
	Current Limit Inception	Other Outputs Min Load				5.0			5.0		A
	Short-Circuit Current		20.0	26.0		4.0	5.0		4.0	5.0	A
	Transient Response	50 to 100% Load Step									mV
	Peak Deviation		200	300							
	Settling Time	V_{OUT} , 1% of $V_{OUT,Nom}$				35	50				μSec
	Overvoltage Limit		6.0	7.0							V
	Efficiency	$I_{OUT1}=10\text{A}, (I_{OUT2}+I_{OUT3})=4.2\text{A}$ F.L. $V_{IN}=\text{Nominal}$				86	87				%

* See Application Notes available on the web at www.cdpowerelectronics.com

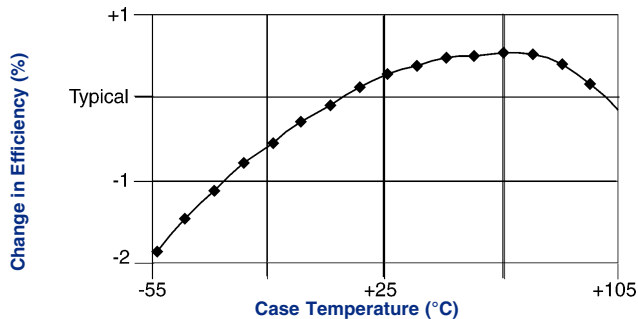
TYPICAL PERFORMANCE CURVES

Specifications are at $T_{CASE} = +40^{\circ}\text{C}$ nominal input voltage, nominal load, recommended external components applied, unless otherwise specified. (Refer to Application Note DCAN-9 at www.cdpowerelectronics.com)



EFFICIENCY vs TEMPERATURE

$T_{CASE} = +40^{\circ}\text{C}$, nominal input voltage, nominal load, recommended external components applied, unless otherwise specified.*



ABSOLUTE MAX. RATINGS

Output Short-Circuit Duration	Continuous
Baseplate Temperature	$+100^{\circ}\text{C}$
Lead Temperature (soldering, 10 seconds max)	$+300^{\circ}\text{C}$
Storage Temperature	$+125^{\circ}\text{C}$
Input to Output Isolation	1500 VDC

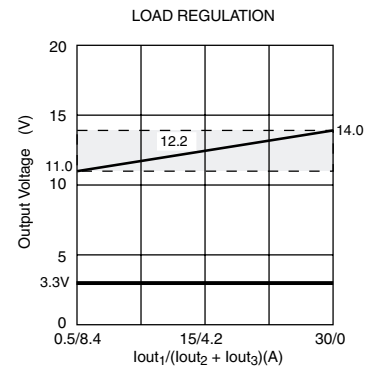
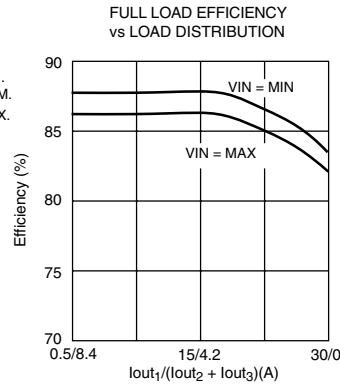
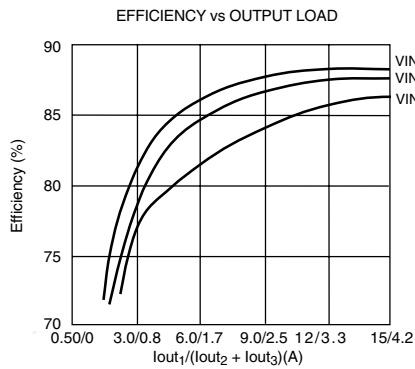
ORDERING INFORMATION

Device Family VKP100 MTyz - L
 Indicates 100 Watt Regulated Unit
 Model Number _____
 Selected from Table of Electrical Characteristics
 Where:
 X = Input Voltage (M = 48VDC)
 T = Number of Outputs (Triple 'T')
 y = 3 for 3.3V, 5 for 5V
 yz = 12 for 12V, 15 for 15V
 Lead Length _____
 0.250" - No Number
 0.145" - (6)
 0.110" - (8)

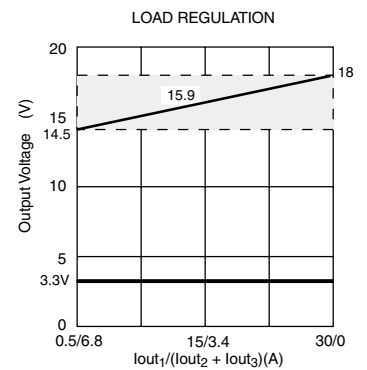
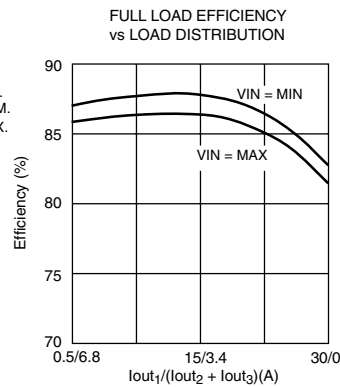
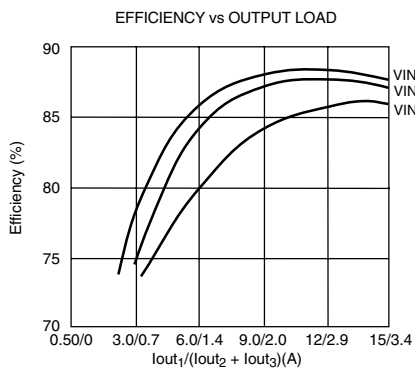
TYPICAL PERFORMANCE CURVES

Specifications are at $T_{CASE} = +40^{\circ}\text{C}$ nominal input voltage, nominal load, recommended external components applied, unless otherwise specified. (Refer to Application Note DCAN-9 at www.cdpowerelectronics.com)

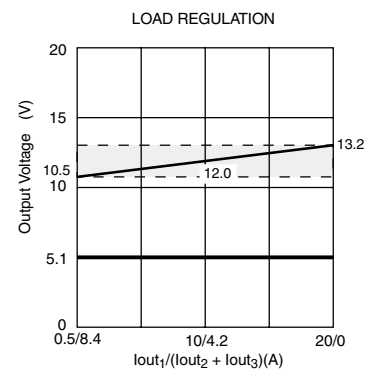
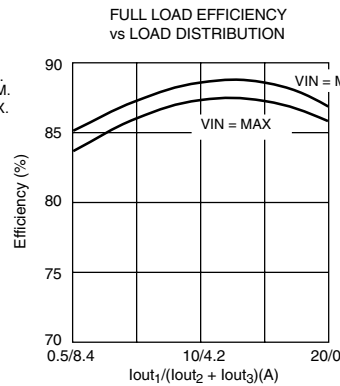
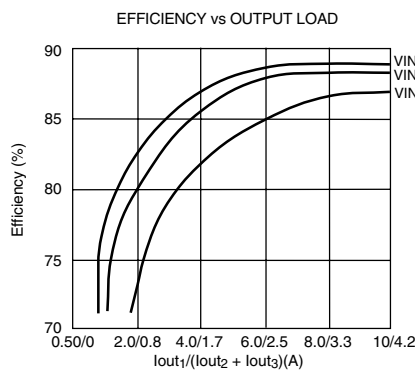
VKP100xT312



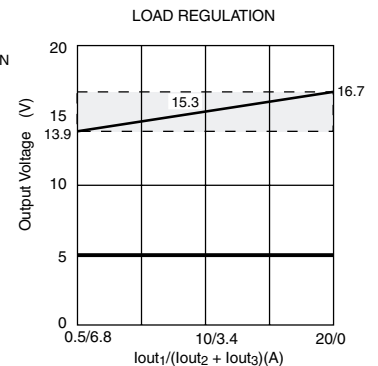
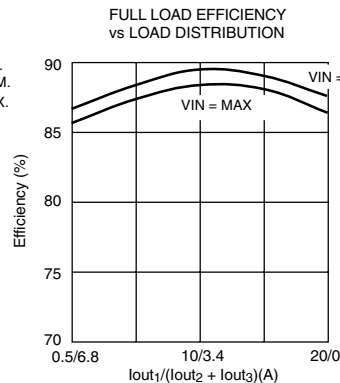
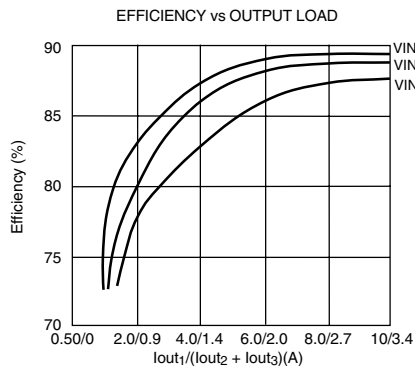
VKP100xT315



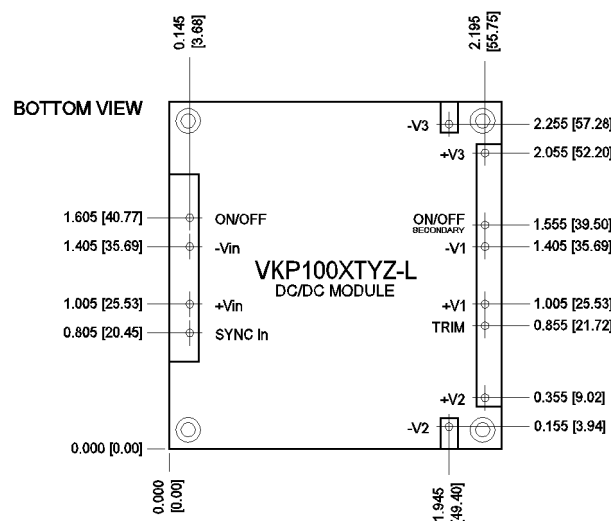
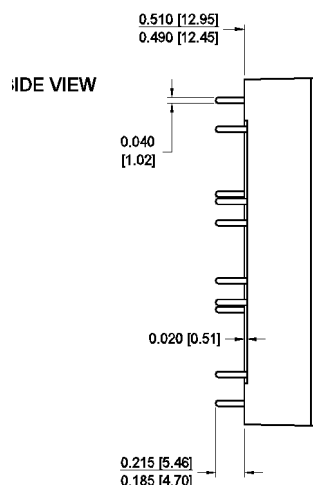
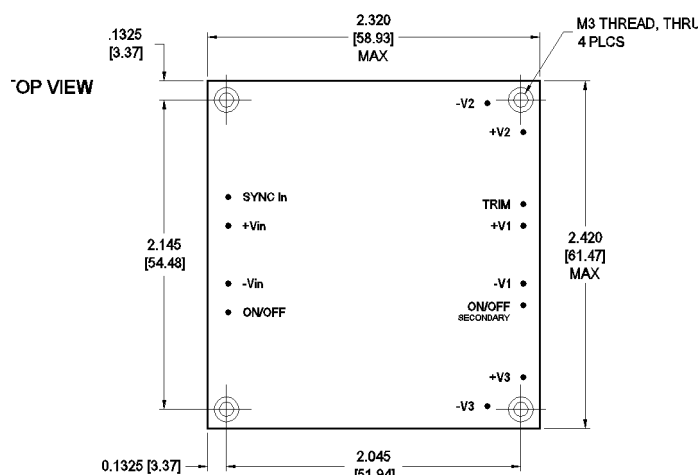
VKP100xT512



VKP100xT515



MECHANICAL



PIN CONNECTIONS

1	PRIMARY ON/OFF
2	-VIN
3	+VIN
4	SYNC IN
5	-V2
6	+V2
7	TRIM
8	+V1
9	-V1
10	SECONDARY ON/OFF
11	+V3
12	-V3

NOTES:

All dimensions are in inches (millimeters).

PIN PLACEMENT TOLERANCE: ± 0.005 "

MECHANICAL TOLERANCE: ± 0.015 "

Marked with: specific model ordered, date code, job code.

MATERIAL: Units are encapsulated in a low thermal resistance molding compound which has excellent chemical resistance and electrical properties in high humidity environments and over a wide operating temperature range. The encapsulant and outer shell of the unit have UL94V-0 ratings. Lead material is solder plated to allow ease of solderability.

*See Ordering Information on page 4 for available lead lengths.

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