

**FEATURES**



- 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
- 500V<sub>DC</sub> 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

**DESCRIPTION**

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 V<sub>out</sub>.

The peak deviation will not exceed 10% of V<sub>out</sub> 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.

**AGENCY APPROVALS**



**PRODUCT SELECTION CHART**

MODEL	INPUT VOLTAGE (V <sub>DC</sub> )	V <sub>out</sub>			I <sub>out</sub>		
		RATED OUTPUT VOLTAGE (VDC)			RATED MAXIMUM OUTPUT CURRENT (A)		
		Output 1 (±)	Output 2 (±)	Output 3 (±)	Output 1	Output 2	Output 3
VKP100MT312	48  (33-75)	3.3	12	12	30	4.2	4.2
VKP100MT315		3.3	15	15	30	3.4	3.4
VKP100MT512		5.1	12	12	20	4.2	4.2
VKP100MT515		5	15	15	20	3.4	3.4



For full details go to [www.murata-ps.com/rohs](http://www.murata-ps.com/rohs)

### INPUT SPECIFICATIONS, ALL MODELS

Specifications are at  $T_{CASE} = +40^{\circ}C$  nominal input voltage unless other-

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Input Fusing				10	A
Voltage Range					
VKP100MT Series		33	48	75	V <sub>DC</sub>
Reflected Ripple Current	Peak - Peak			370	mA
Input Ripple Rejection	DC to 1KHz	50	60		dB
Maximum Input Current	Output Power = 100W				
VKP100MT Series	$V_{IN} = 30V$			5	A
No Load Power Dissipation	$P_{OUT} = 0, V_{IN, Min} < V_{IN} < V_{IN, Max}$			6	W
Inrush Charge				0.247	mC
VKP100MT Series					
Quiescent Operating Current			7.5	10	mA
Primary On/Off Disabled			15	20	mA
Secondary On/Off Disabled					

### COMMON SPECIFICATIONS, ALL MODELS

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

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
<b>ISOLATION</b>					
Input to Each Output	Peak Test	1500			V <sub>DC</sub>
Input to Baseplate		1500			V <sub>DC</sub>
Channel to Channel	Any Channel to Any Channel	500			V <sub>DC</sub>
Resistance, Input - Output		10			MΩ
Capacitance, Input - Output			2000		pF
Leakage Current	$V_{ISO} = 240V_{AC}, 60Hz$		180		μA, rms
<b>GENERAL</b>					
Set Point Accuracy	$V_{IN} = \text{Nominal}, 50\% \text{ Load}$			1	%
Turn-on Time	Within 1% of Nominal V <sub>OUT</sub>		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)
<b>TEMPERATURE</b>					
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 SPECIFICATIONS

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

PARAMETER	CONDITIONS	OUTPUT 1			OUTPUT 2			OUTPUT 3			UNITS
		Min	Nom	Max	Min	Nom	Max	Min	Nom	Max	
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 <sub>OUT</sub>		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	$V_{IN, Min} \leq V_{IN} \leq V_{IN, Max}$		0.05	0.10		1.0	2.0		1.0	2.0	%
Load Regulation	$I_O = I_{O, Nom}$ 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	$V_{OUT} = 1\% \text{ of } V_{OUT, Nom}$		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								%

**VKP100MT315 OUTPUT SPECIFICATIONS** Specifications are at  $T_{CASE} = +40^{\circ}C$  nominal input voltage unless otherwise specified.

PARAMETER	CONDITIONS	OUTPUT 1			OUTPUT 2			OUTPUT 3			UNITS
		Min	Nom	Max	Min	Nom	Max	Min	Nom	Max	
Output Power	Total Combined O/P Power = 100 Watts Maximum		50	100		25	50		25	50	W
Set Point Voltage	$I_{O,Nom}$		3.3			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*		100	200		125	500		125	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	1.0	See Regulation Curves			See Regulation Curves			%
Current Limit Inception	Other Outputs Min Load		38			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										
Peak Deviation			150	250							mV
Settling Time	$V_{OUT} 1\%$ of $V_{OUT,Nom}$		35	50							µSec
Overvoltage Limit		4.2		5.0							V
Efficiency	$I_{OUT1}=15A, (I_{OUT2}+I_{OUT3}) = 3.4A$ F.L. $V_{IN}$ =Nominal	85		86							%

**VKP100MT512 OUTPUT SPECIFICATIONS** Specifications are at  $T_{CASE} = +40^{\circ}C$  nominal input voltage unless otherwise specified.

PARAMETER	CONDITIONS	OUTPUT 1			OUTPUT 2			OUTPUT 3			UNITS
		Min	Nom	Max	Min	Nom	Max	Min	Nom	Max	
Output Power	Total Combined O/P Power = 100 Watts Combined		50	100		25	50		25	50	W
Set Point Voltage	$I_{O,Nom}$		5.1			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*		100	150		150	500		150	500	mV
Output Adjust Range	*	4.75		5.50	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	1.0	See Regulation Curves			See Regulation Curves			%
Current Limit Inception	Other Outputs Min Load		26.0			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										
Peak Deviation			200	300							mV
Settling Time	$V_{OUT} 1\%$ of $V_{OUT,Nom}$		35	50							µSec
Overvoltage Limit		6.0		7.0							V
Efficiency	$I_{OUT1}=10A, (I_{OUT2}+I_{OUT3}) = 4.2A$ F.L. $V_{IN}$ =Nominal	86		87							%

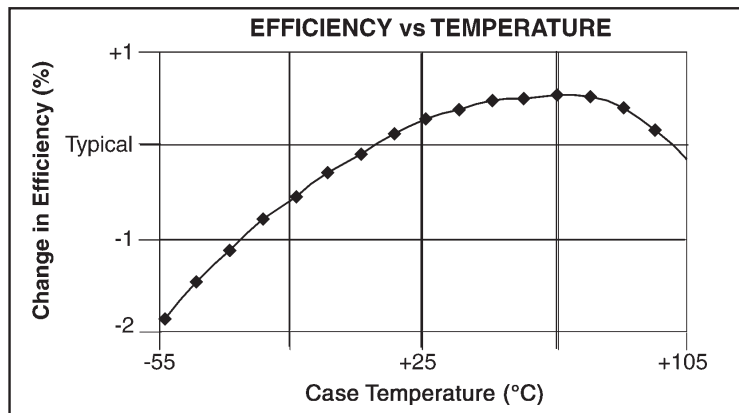
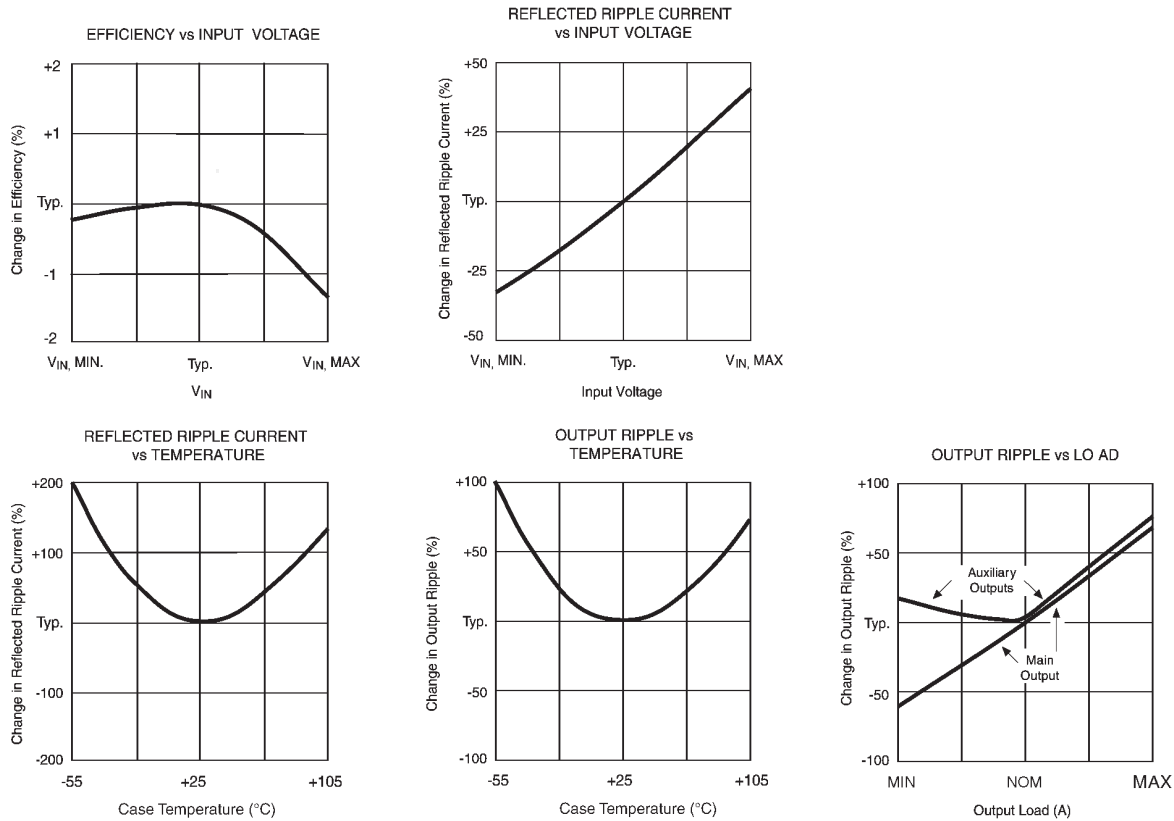
**VKP100MT515 OUTPUT SPECIFICATIONS** Specifications are at  $T_{CASE} = +40^{\circ}C$  nominal input voltage unless otherwise specified.

PARAMETER	CONDITIONS	OUTPUT 1			OUTPUT 2			OUTPUT 3			UNITS
		Min	Nom	Max	Min	Nom	Max	Min	Nom	Max	
Output Power	Total Combined O/P Power = 100 Watts Max		50	100		25	50		25	50	W
Set Point Voltage	$I_{O,Nom}$		5.0			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*		100	150		125	500		125	500	mV
Output Adjust Range	*	4.60		5.50	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	1.0		1.0	2.0		1.0	2.0	%
Load Regulation	Min Load to Rated Load		0.05	1.0	See Regulation Curves			See Regulation Curves			%
Current Limit Inception	Other Outputs Min Load		26.0			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										
Peak Deviation			200	300							mV
Settling Time	$V_{OUT} 1\%$ of $V_{OUT,Nom}$		35	50							µSec
Overvoltage Limit		6.0		7.0							V
Efficiency	$I_{OUT1}=10A, (I_{OUT2}+I_{OUT3}) = 4.2A$ F.L. $V_{IN}$ =Nominal	86		87							%

\*See Application Notes available on the web at [www.cdpowerelectronics.com](http://www.cdpowerelectronics.com)

**TYPICAL PERFORMANCE CURVE**

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



**ABSOLUTE MAXIMUM RATINGS**

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

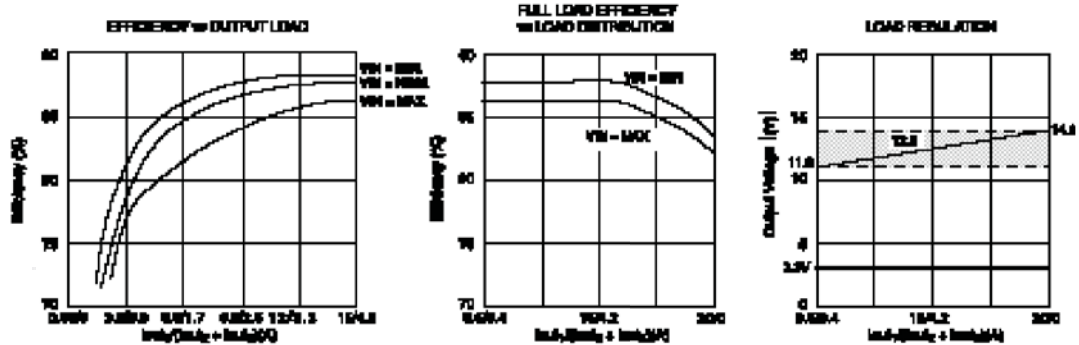
**ORDERING INFORMATION**

<b>VKP100 MTYZ - L</b>	
Device Family	_____
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	
Z = 12 for 12V, 15 for 15V	
Lead Length	_____
0.250" - No Number	
0.145" - (6)	
0.110" - (8)	

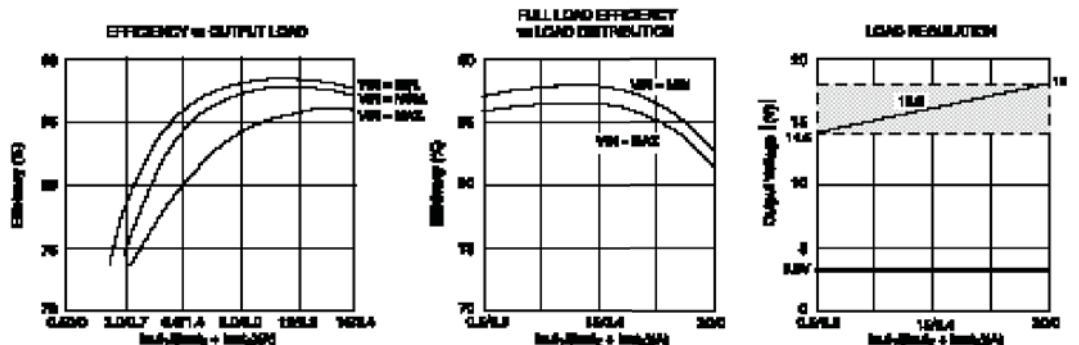
**TYPICAL PERFORMANCE CURVE**

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

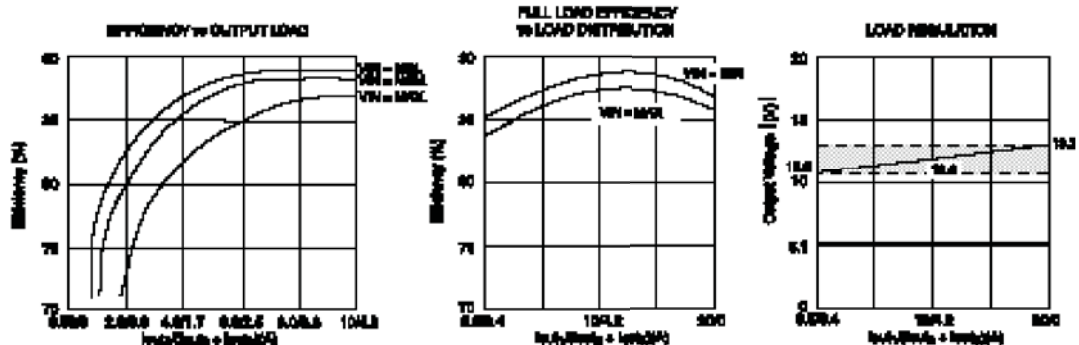
VKP100xT312



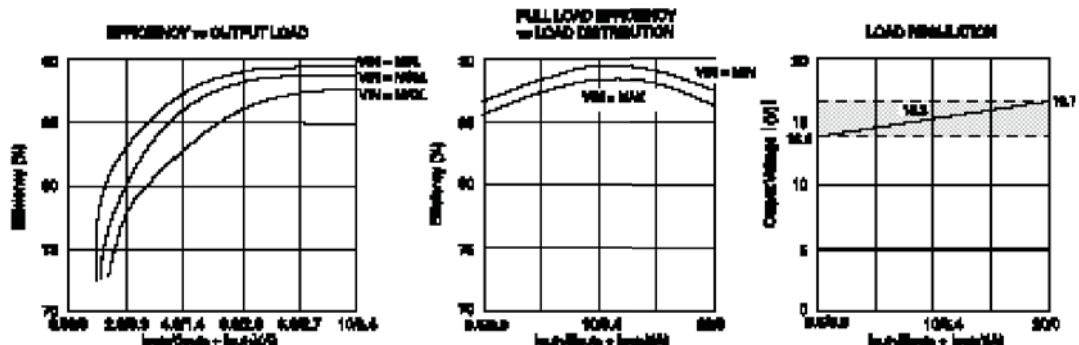
VKP100xT315



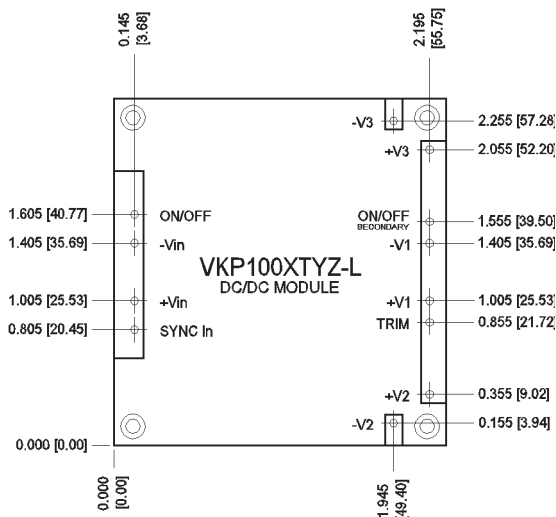
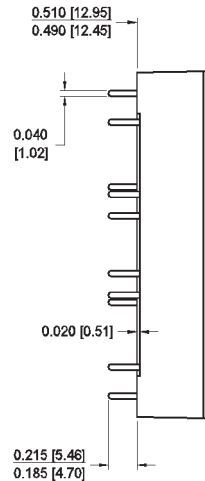
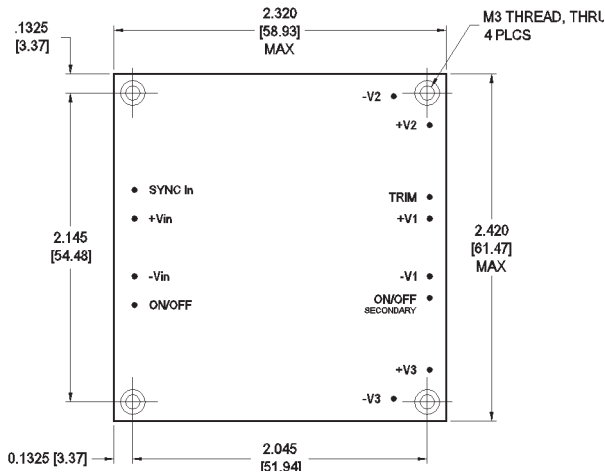
VKP100xT512



VKP100xT515



**MECHANICAL**



**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.

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