

# U: 97 \* \$ SERIES

DC/DC Converter Single Ci ldi h \* \$ 'K Uhg



## Features

- 2:1 input range
- 24V and 48V input options
- Single output
- 60 watts output power
- High efficiency up to 88%
- Fixed switching efficiency
- High isolation 1600VDC
- Output voltage trim
- Overload & Overvoltage protection
- Remote ON/OFF
- LED Indicator
- Optional DIN Rail mounting

Model Number	Input Range VDC	Output Voltage VDC	Output Current @Full Load mA	Input Current @ No Load mA	Efficiency %	Maximum Capacitor Load (1) uF
UFEC60-24S3P3	18 ~ 36	3.3	14	102	87	36000
UFEC60-24S05	18 ~ 36	5	12	132	88	20400
UFEC60-24S12	18 ~ 36	12	5	57	89	3550
UFEC60-24S15	18 ~ 36	15	4	72	89	2300
UFEC60-24S24	18 ~ 36	24	2.5	85	88	885
UFEC60-48S3P3	36 ~ 75	3.3	14	100	87	36000
UFEC60-48S05	36 ~ 75	5	12	92	88	20400
UFEC60-48S12	36 ~ 75	12	5	35	89	3550
UFEC60-48S15	36 ~ 75	15	4	40	89	2300
UFEC60-48S24	36 ~ 75	24	2.5	60	88	885

## PART NUMBER STRUCTURE

<b>UFEC60</b>	<b>-</b>	<b>48</b>	<b>S</b>	<b>05</b>	<b>-</b>	<b>N</b>	<b>EC</b>
Series Name		Input Voltage (VDC)	Output Quantity	Output Voltage (VDC)		Remote Control Option	Assembly Option
		24: 18~36 48: 36~75	S: Single	3P3: 3.3 05: 5 12: 12 15: 15 24: 24		<input type="checkbox"/> : Positive logic N: Negative logic	<input type="checkbox"/> : No Assembly Option EC: Enclosed Mounting Type DR: Din Rail Mounting Type ED: Enclosed & Din Rail Mounting Type

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## INPUT SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating input voltage range	24Vin(nom)	18	24	36	VDC
	48Vin(nom)	36	48	75	
Input fuse (slow blow)	24Vin(nom)		8		A
	48Vin(nom)		4		
In-rush current			15		A
Input reflected ripple current	Nominal input and Full load		15		mAp-p
Start up voltage	24Vin(nom)			17.5	VDC
	48Vin(nom)			34.5	
Shutdown voltage	24Vin(nom)		15		VDC
	48Vin(nom)		32		
Start up time	Constant resistive load	Power up	100		ms
		Remote ON/OFF	20		
Input surge voltage	100ms, max.	24Vin(nom)		50	VDC
		48Vin(nom)		100	
Remote ON/OFF	Referred to -Vin pin	Positive logic (Standard)	DC-DC ON	Open or 3 ~ 12VDC	mA
		DC-DC OFF	Short or 0 ~ 1.2VDC		
		Negative logic (Option)	DC-DC ON	Short or 0 ~ 1.2VDC	
		DC-DC OFF	Open or 3 ~ 12VDC		
		Input current of Ctrl pin	-0.5	1.0	
Remote off input current		4			

## OUTPUT SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Voltage accuracy	3.3Vout	-1.5		+1.5	%
	Others	-1.0		+1.0	
Line regulation	Low Line to High Line at Full Load	-0.2		+0.2	%
Load regulation	No Load to Full Load	3.3Vout		+2.0	%
		Others		+1.5	
Voltage adjustability	Single output	24Vout		+20	%
		Others		+10	
Ripple and noise	Measured by 20MHz bandwidth	3.3Vout, 5Vout	75		mVp-p
		12Vout, 15Vout	100		
		24Vout	130		
Temperature coefficient		-0.02		+0.02	%/°C
Transient response recovery time	25% load step change		250		µs
Over voltage protection	Zener diode clamp	3.3Vout	3.7	5.4	VDC
		5Vout	5.6	7.0	
		12Vout	13.8	17.5	
		15Vout	16.8	20.5	
		24Vout	30.0	33.0	
Output indicator			Green LED		
Over load protection	% of lout rated			150	%
Short circuit protection				Continuous, automatic recovery	

## GENERAL SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Isolation voltage	1 minute	Input to Output	1600		VDC
		Input (Output) to Chassis	1600		
Isolation resistance	500VDC	1			GΩ
Isolation capacitance				4000	pF
Switching frequency		270	300	330	kHz
Safety meets					UL60950-1 EN60950-1 IEC60950-1
Chassis material					Aluminum
Weight					122g (4.29oz)
MTBF	MIL-HDBK-217F, Full load				3.307 x 10 <sup>5</sup> hrs

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## ENVIRONMENTAL SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating ambient temperature	Without derating	-40		+54	°C
	With derating	+54		+85	
Over temperature protection	DC/DC Converter Case		120		°C
Storage temperature range		-40		+105	°C
Thermal shock					MIL-STD-810F
Vibration					MIL-STD-810F
Relative humidity					5% to 95% RH

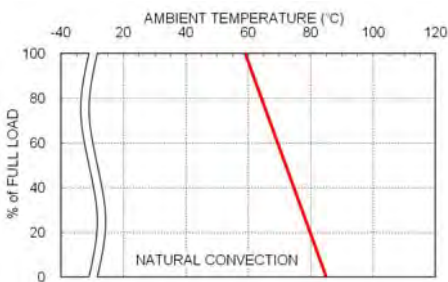
## EMC SPECIFICATIONS

Parameter	Conditions	Level
EMI	EN55022	Class B
ESD	EN61000-4-2 Air ± 8kV and Contact ± 6kV	Perf. Criteria A
Radiated immunity	EN61000-4-3 10V/m	Perf. Criteria A
Fast transient	EN61000-4-4 ± 2kV	Perf. Criteria A
Surge	EN61000-4-5 ± 1kV	Perf. Criteria A
Conducted immunity	EN61000-4-6 10Vr.m.s	Perf. Criteria A

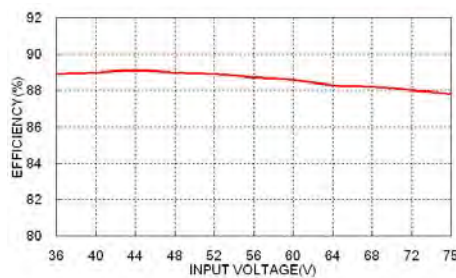
### Note:

1. Test by minimum input and constant resistive load.

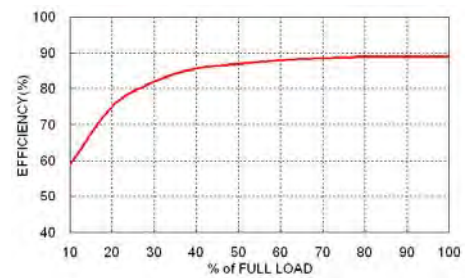
## CHARACTERISTIC CURVE



UFEC60-48S05 Derating Curve



UFEC60-48S05 Efficiency vs. Input Voltage



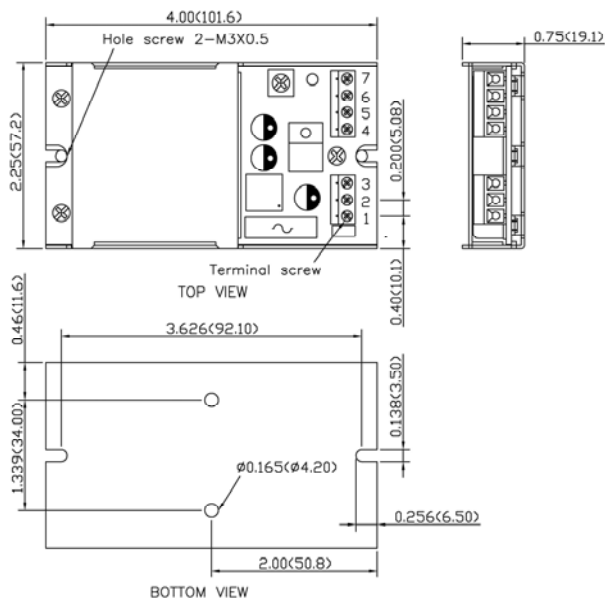
UFEC60-48S05 Efficiency vs. Output Load

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## MECHANICAL DRAWINGS

### CHASSIS MOUNTING TYPE - STD



### PIN CONNECTION

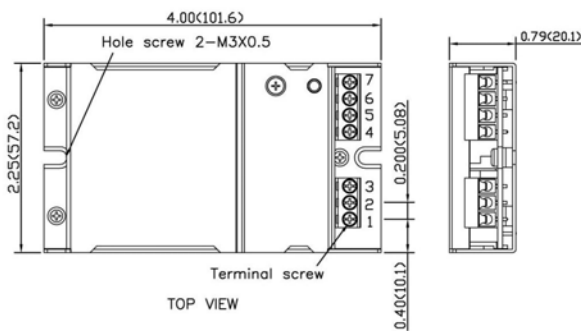
PIN	SINGLE
1	+Vin
2	-Vin
3	Ctrl
4	NC
5	-Vout
6	+Vout
7	NC

\* NC : No Connection

\* Screw terminals – wire range from 14 to 18 AWG

1. All dimensions in Inch (mm)
2. Tolerance : X.XX±0.02 (X.X±0.5)  
X.XXX±0.01 (X.XX±0.25)
3. Hole screw locked torque :  
MAX 5.0kgf-cm (0.49N-m)
4. Terminal screw locked torque :  
MAX 2.5kgf-cm (0.25N-m)

### ENCLOSED MOUNTING TYPE - ( OPTION - EC )



### DIN RAIL MOUNTING TYPE - ( OPTION - DR )

