



# P-DUKE POWER

## UFEC40 Series

Chassis-Mount DC-DC Converter  
Up to 40 Watts

**3**  
YEARS  
WARRANTY

ROHS  
COMPLIANT

REACH  
COMPLIANT



Automation



Datacom



IPC



Industry



Measurement



Telecom



Automobile



Boat



Charger



Medical



PV



Railway



**1600**  
VDC  
Isolation  
Voltage

**2 : 1**  
Input  
Range

**FUSE**  
Installed

**INRUSH  
CURRENT  
LIMIT**

Internal  
EN55032  
Class  
Filter **B**

**REMOTE  
ON  
OFF**

**REVERSE  
POLARITY  
PROTECTION**

**OCP**

**OTP**

**OVP**

**SCP**

**UVP**

### PART NUMBER STRUCTURE

UFEC40 -	<b>48</b>	<b>S</b>	<b>05</b>	-	<b>R</b>	<b>EC</b>
Series Name	Input Voltage (VDC)	Output Quantity	Output Voltage (VDC)		Conformal Coating Option	Assembly Option
	12:9.5~18 24:18~36 48:36~75	S:Single	3P3:3.3 05:5 12:12 15:15 24:24 28:28		□: None R: Conformal Coating	□: None EC: Enclosed Mounting Type DR: Din Rail Mounting Type ED: Enclosed & Din Rail Mounting Type
		D: Dual	12:±12 15:±15			
		T: Triple	3312:3.3 / ±12 3315:3.3 / ±15 0512:5 / ±12 0515:5 / ±15			

**TECHNICAL SPECIFICATION** All specifications are typical at nominal input, full load and 25°C unless otherwise noted

Model Number	Input Range	Output Voltage	Output Current @Full Load		Input Current @ No Load	Efficiency	Maximum Capacitor Load
	VDC	VDC	Min. Load mA	Full Load mA	mA	%	µF
UFEC40-12S3P3	9.5 ~ 18	3.3	0	8000	177	85	21000
UFEC40-12S05	9.5 ~ 18	5	0	8000	230	85	13600
UFEC40-12S12	9.5 ~ 18	12	0	3333	260	85	2360
UFEC40-12S15	9.5 ~ 18	15	0	2666	318	86	1510
UFEC40-12S24	9.5 ~ 18	24	144	1800	40	84	600
UFEC40-12S28	9.5 ~ 18	28	112	1400	48	84	375
UFEC40-12D12	9.5 ~ 18	±12	±144	±1800	35	84	±1200
UFEC40-12D15	9.5 ~ 18	±15	±112	±1400	43	84	±750
UFEC40-12T3312	9.5 ~ 18	3.3 / ±12	600 / ±40	6000 / ±400	220	83	13000 / ±330
UFEC40-12T3315	9.5 ~ 18	3.3 / ±15	600 / ±30	6000 / ±300	235	83	13000 / ±110
UFEC40-12T0512	9.5 ~ 18	5 / ±12	600 / ±40	6000 / ±400	285	85	6800 / ±330
UFEC40-12T0515	9.5 ~ 18	5 / ±15	600 / ±30	6000 / ±300	285	85	6800 / ±110
UFEC40-24S3P3	18 ~ 36	3.3	0	8000	65	86	21000
UFEC40-24S05	18 ~ 36	5	0	8000	80	88	13600
UFEC40-24S12	18 ~ 36	12	0	3333	85	87	2360
UFEC40-24S15	18 ~ 36	15	0	2666	90	88	1510
UFEC40-24S24	18 ~ 36	24	144	1800	30	86	600
UFEC40-24S28	18 ~ 36	28	112	1400	30	86	375
UFEC40-24D12	18 ~ 36	±12	±144	±1800	25	86	±1200
UFEC40-24D15	18 ~ 36	±15	±112	±1400	25	86	±750
UFEC40-24T3312	18 ~ 36	3.3 / ±12	600 / ±40	6000 / ±400	65	84	13000 / ±330
UFEC40-24T3315	18 ~ 36	3.3 / ±15	600 / ±30	6000 / ±300	65	84	13000 / ±110
UFEC40-24T0512	18 ~ 36	5 / ±12	600 / ±40	6000 / ±400	65	86	6800 / ±330
UFEC40-24T0515	18 ~ 36	5 / ±15	600 / ±30	6000 / ±300	75	86	6800 / ±110
UFEC40-48S3P3	36 ~ 75	3.3	0	8000	40	87	21000
UFEC40-48S05	36 ~ 75	5	0	8000	42	89	13600
UFEC40-48S12	36 ~ 75	12	0	3333	52	88	2360
UFEC40-48S15	36 ~ 75	15	0	2666	55	88	1510
UFEC40-48S24	36 ~ 75	24	144	1800	21	86	600
UFEC40-48S28	36 ~ 75	28	112	1400	21	86	375
UFEC40-48D12	36 ~ 75	±12	±144	±1800	18	86	±1200
UFEC40-48D15	36 ~ 75	±15	±112	±1400	18	86	±750
UFEC40-48T3312	36 ~ 75	3.3 / ±12	600 / ±40	6000 / ±400	40	85	13000 / ±330
UFEC40-48T3315	36 ~ 75	3.3 / ±15	600 / ±30	6000 / ±300	40	85	13000 / ±110
UFEC40-48T0512	36 ~ 75	5 / ±12	600 / ±40	6000 / ±400	40	87	6800 / ±330
UFEC40-48T0515	36 ~ 75	5 / ±15	600 / ±30	6000 / ±300	45	87	6800 / ±110

INPUT SPECIFICATIONS						
Parameter	Conditions		Min.	Typ.	Max.	Unit
Operating input voltage range		12Vin(nom)	9.5	12	18	VDC
		24Vin(nom)	18	24	36	
		48Vin(nom)	36	48	75	
Input fuse	slow blow	12Vin(nom)		8		A
		24Vin(nom)		8		
		48Vin(nom)		4		
In-rush current				15		A
Start up voltage		12Vin(nom)			9.5	VDC
		24Vin(nom)			18	
		48Vin(nom)			36	
Shutdown voltage		12Vin(nom)	7	8	9	VDC
		24Vin(nom)	15	16	17.5	
		48Vin(nom)	32.5	33	35.5	
Start up time	Constant resistive load	Power up		100		ms
		Remote ON/OFF		25		
Input surge voltage	100ms, max.	12Vin(nom)			36	VDC
		24Vin(nom)			50	
		48Vin(nom)			100	
Remote ON/OFF	Referred to –Vin pin	Positive logic DC-DC ON			Open or 3.5 ~ 12VDC	mA
		DC-DC OFF			Short or 0 ~ 1.2VDC	
		Input current of Ctrl pin	-0.5		0.5	mA
		Remote off input current		2.5		mA

OUTPUT SPECIFICATIONS						
Parameter	Conditions		Min.	Typ.	Max.	Unit
Voltage accuracy		3.3Vout Single / Dual Triple: 3.3Vout, 5Vout Triple: 12Vout, 15Vout	-1.5 -1.0 -1.5 -5.0		+1.5 +1.0 +1.5 +5.0	%
Line regulation	Low Line to High Line at Full Load		Single / Dual Triple: 3.3Vout, 5Vout Triple: 12Vout, 15Vout	-0.5 -1.0 -5.0	+0.5 +1.0 +5.0	%
Load regulation	Min. Load to Full Load	3.3Vout Single / Dual Triple: Main output : (3.3Vout, 5Vout) 10% to 100% with 10% to 100% balanced on auxiliaries. Auxiliary outputs 10% to 100% balanced on all outputs.	3.3Vout Single / Dual Triple: 3.3Vout, 5Vout Triple: 12Vout, 15Vout	-1.5 -1.0 -2.0 -5.0	+1.5 +1.0 +2.0 +5.0	%
Cross regulation	Dual: Asymmetrical load 25%/100% FL Triple: Main output : (3.3Vout, 5Vout) 100% load, auxiliary 100%, other auxiliary 25% to 100% load or main output : (3.3Vout, 5Vout) 25%, auxiliary 25%, other auxiliary 25% to 100%.	Dual Triple: 3.3Vout, 5Vout Triple: 12Vout, 15Vout	-5.0 -2.5 -5.0		+5.0 +2.5 +5.0	%
Voltage adjustability	Single output	28Vout Others	-3 -10		+17 +10	%
Ripple and noise	Measured by 20MHz bandwidth	Single / Triple: Main Single / Triple: Auxiliary Single Dual	3.3Vout, 5Vout 12Vout, 15Vout 24Vout, 28Vout 12Vout 15Vout	50 75 350 120 150		mVp-p
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 5Vout 12Vout 15Vout 24Vout 28Vout		3.9 6.2 15 18 30 36		VDC
Output indicator				Green LED		
Over load protection	% of lout rated			150		%
Short circuit protection				Continuous, automatics recovery		

## GENERAL SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Isolation voltage	1 minute Input to Output Input (Output) to Chassis	1600 1600			VDC
Isolation resistance	500VDC	1			GΩ
Isolation capacitance				4000	pF
Switching frequency		270	300	330	kHz
Safety meets				IEC/ UL/ EN60950-1	
Chassis material				Aluminum	
Conformal coating				Impregating varnish	
Weight				122g (4.29oz)	
MTBF	MIL-HDBK-217F, Full load			6.565 x 10 <sup>5</sup> hrs	

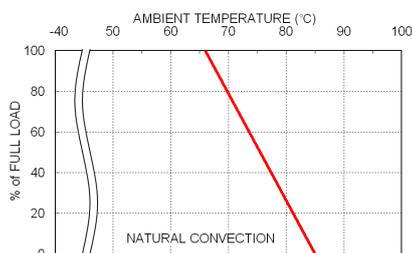
## ENVIRONMENTAL SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating ambient temperature	Without derating With derating	-40 +55		+55 +96	°C
Over temperature protection	Case of DC/DC module		+115		°C
Storage temperature range		-40		+105	°C
Thermal shock					MIL-STD-810F
Vibration	□□S□□ □□S□□ -EC □□S□□ -DR □□S□□ -ED				MIL-STD-810F MIL-STD-810F IEC60068-2-6 IEC60068-2-6
Relative humidity					5% to 95% RH

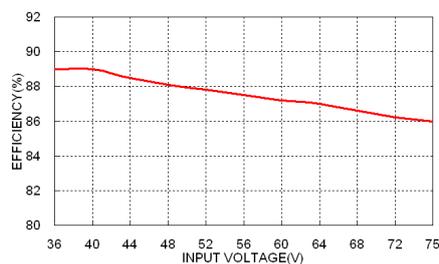
## EMC SPECIFICATIONS

Parameter	Conditions	Level
EMI	EN55032	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
Power frequency magnetic field	EN61000-4-8 100A/m continuous; 1000A/m 1 second	Perf. Criteria A

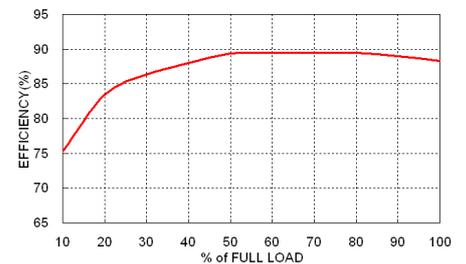
## CHARACTERISTIC CURVE



UFEC40-48S05 Derating Curve



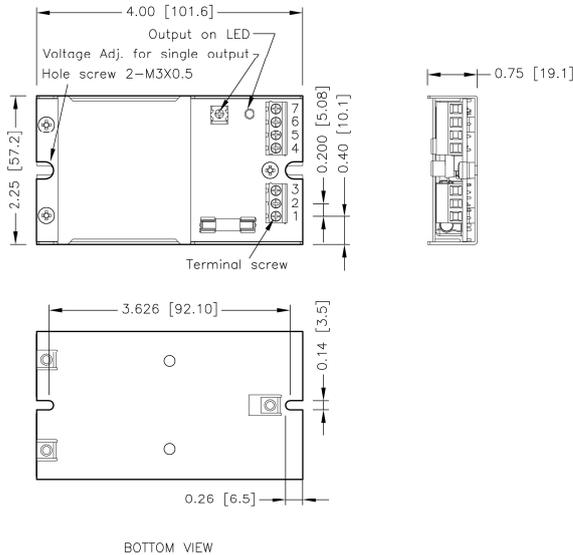
UFEC40-48S05 Efficiency vs. Input Voltage



UFEC40-48S05 Efficiency vs. Output Load

## MECHANICAL DRAWING

### CHASSIS MOUNTING TYPE



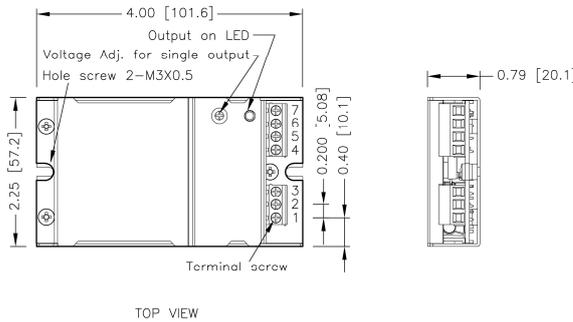
### TERMINAL CONNECTION

NO.	SINGLE	DUAL	TRIPLE
1	+Vin	+Vin	+Vin
2	-Vin	-Vin	-Vin
3	Ctrl	Ctrl	Ctrl
4	NC	NC	+Aux
5	-Vout	-Vout	Common
6	+Vout	Common	-Aux
7	NC	+Vout	+Vout

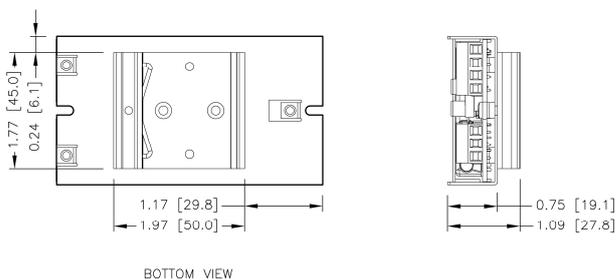
※ NC : No Connection

※ Screw terminals – wire range from 14 to 18 AWG

### ENCLOSED MOUNTING TYPE



### DIN RAIL MOUNTING TYPE



- All dimensions in Inch [mm]
- Tolerance : X.XX±0.02 [X.X±0.5]  
X.XXX±0.01 [X.XX±0.25]
- Hole screw locked torque :  
MAX 5.0kgf-cm/0.49N-m
- Terminal screw locked torque :  
MAX 2.5kgf-cm/0.25N-m