



FEATURES

- APPLICATION OF CHASSIS-MOUNT DC/DC CONVERTERS
- 40 WATTS MAXIMUM OUTPUT POWER
- OUTPUT CURRENT UP TO 8A
- 2:1 WIDE INPUT VOLTAGE RANGE
- SCREW TERMINALS FOR INPUT AND OUTPUT CONNECTIONS
- INTERNAL INPUT FUSE
- INTERNAL INPUT REVERSAL PROTECTION
- INTERNAL INPUT IN-RUSH CURRENT LIMIT CIRCUIT
- INTERNAL OUTPUT LED INDICATOR
- MEET EN55022 CLASS B
- COMPLIANT TO RoHS EU DIRECTIVE 2011/65/EU

OPTIONS

Din Rail Mounting For DIN 35 Rail

APPLICATIONS

Wireless Network
Telecom/Datacom
Industry Control System
Measurement Equipment
Semiconductor Equipment

DESCRIPTION

The UFEC40 series is a value added item designed to easy application of chassis mount DC-DC converters. The UFEC40 series with 2:1 wide input voltage of 9.5~18VDC, 18~36VDC and 36~75VDC and features 1600VDC of isolation, short-circuit and over-voltage protection.

TECHNICAL SPECIFICATION

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

OUTPUT SPECIFICATIONS			
Output power		40 Watts, max.	
Voltage accuracy	3.3Vout	± 1.5%	
	Single / Dual	± 1%	
	Triple Main	± 1.5%	
	Triple Auxiliary	± 5%	
Minimum load (Note 6)		See Table	
Voltage adjustability (Note 7)	Single 28Vout	-3% ~ +17%	
	Single Others	± 10%	
Line regulation LL to HL at Full Load	Single/Dual	± 0.5%	
	Triple Main	± 1%	
	Triple Auxiliary	± 5%	
Load regulation Min. Load to Full Load (Note 8)	3.3Vout	± 1.5%	
	Single / Dual	± 1%	
	Triple Main	± 2%	
	Triple Auxiliary	± 5%	
Load cross regulation (Note 9)	Triple Main	± 2%	
	Dual/ Triple Auxiliary	± 5%	
Ripple and noise 20MHz bandwidth		See table	
Temperature coefficient		±0.02% / °C, max.	
Transient response recovery time 25% load step change		250µs	
Over voltage protection Zener diode clamp	3.3VDC output	3.9VDC	
	5VDC output	6.2VDC	
	12VDC output	15VDC	
	15VDC output	18VDC	
	24VDC output	30VDC	
	28VDC output	36VDC	
Output indicator		Green LED	
Over load protection % of FL at nominal input		150%, max.	
Short circuit protection		Continuous, automatic recovery	
GENERAL SPECIFICATIONS			
Efficiency		See table	
Isolation voltage	Input to Output	1600VDC, min. 1minute	
	Input(Output) to Chassis	1600VDC, min. 1minute	
Isolation resistance	500VDC	10 ⁹ ohms, min.	
Isolation capacitance		4000pF, max.	
Switching frequency		300kHz±10%	
Design meets safety standard	IEC60950-1, UL60950-1, EN60950-1		
Chassis material		Aluminum	
Dimensions		4.00 X 2.25 X 0.75 Inch (101.6 X 57.15 X 19.05 mm)	
Weight		122g (4.29oz)	
MTBF (Note 1)	MIL-HDBK-217F	6.565 x 10 ⁵ hrs	

INPUT SPECIFICATIONS			
Input voltage range	12VDC nominal input	9.5 ~ 18VDC	
	24VDC nominal input	18 ~ 36VDC	
	48VDC nominal input	36 ~ 75VDC	
Input surge voltage	12VDC input	36VDC 100ms, max.	
	24VDC input	50VDC 100ms, max.	
	48VDC input	100VDC 100ms, max.	
Input fuse (slow blow)	12VDC input	8A	
	24VDC input	8A	
	48VDC input	4A	
In-rush current		15A	
Input reflected ripple current		15mA _{p-p}	
Start up time	Nominal input and constant resistive load	Power up	100ms
		Remote ON/OFF	25ms
Start-up voltage	12VDC input	9.5VDC	
	24VDC input	18VDC	
	48VDC input	36VDC	
Shutdown voltage	12VDC input	8VDC	
	24VDC input	16VDC	
	48VDC input	33VDC	
Remote ON/OFF (Note 10)			
(Positive logic)	DC-DC ON	Open or 3.5V < Vr < 12V	
	DC-DC OFF	Short or 0V < Vr < 1.2V	
Input current of remote control pin	Nominal input	-0.5mA~+0.5mA	
Remote off state input current	Nominal input	2.5mA	

ENVIRONMENTAL SPECIFICATIONS			
Operating ambient temperature	-40°C ~ +55°C (without derating)		
	+55°C ~ +85°C (with derating)		
Storage temperature range	-40°C ~ +105°C		
Over temperature protection (DC/DC Converter Case)	115°C		
Thermal shock	MIL-STD-810F		
Vibration	MIL-STD-810F		
Relative humidity	5% to 95% RH		

EMC CHARACTERISTICS			
EM I	EN55022	Class B	
ESD	EN61000-4-2	Air ± 8kV	Perf. Criteria A
		Contact ± 6kV	
Radiated immunity	EN61000-4-3	10 V/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	10 Vr.m.s	Perf. Criteria A

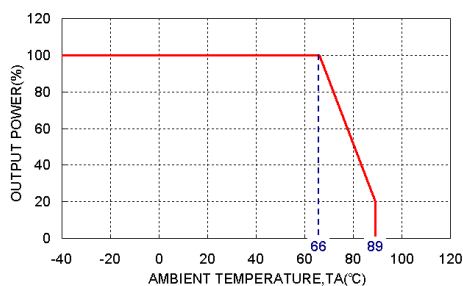


Model Number	Input Range	Output Voltage	Output Current		Output ⁽²⁾ Ripple & Noise	No load ⁽³⁾ Input Current	Eff ⁽⁴⁾ (%)	Capacitor ⁽⁵⁾ Load max
			Min. load	Full load				
UFEC40-12S3P3	9.5 ~ 18 VDC	3.3 VDC	0mA	8000mA	50mVp-p	177mA	85	21000μF
UFEC40-12S05	9.5 ~ 18 VDC	5 VDC	0mA	8000mA	50mVp-p	230mA	85	13600μF
UFEC40-12S12	9.5 ~ 18 VDC	12 VDC	0mA	3333mA	75mVp-p	260mA	85	2360μF
UFEC40-12S15	9.5 ~ 18 VDC	15 VDC	0mA	2666mA	75mVp-p	318mA	86	1510μF
UFEC40-12S24	9.5 ~ 18 VDC	24VDC	0mA	1800mA	350mVp-p	40mA	84	600μF
UFEC40-12S28	9.5 ~ 18 VDC	28 VDC	0mA	1400mA	350mVp-p	48mA	84	375μF
UFEC40-12D12	9.5 ~ 18 VDC	± 12 VDC	0mA	± 1800mA	120mVp-p	35mA	84	± 1200μF
UFEC40-12D15	9.5 ~ 18 VDC	± 15 VDC	0mA	± 1400mA	150mVp-p	43mA	84	± 750μF
UFEC40-12T3312	9.5 ~ 18 VDC	3.3 / ±12 VDC	600mA / ±40mA	6000mA / ±400mA	50 / 75mVp-p	220mA	83	13000 / ±330μF
UFEC40-12T3315	9.5 ~ 18 VDC	3.3 / ±15 VDC	600mA / ±30mA	6000mA / ±300mA	50 / 75mVp-p	235mA	83	13000 / ±110μF
UFEC40-12T0512	9.5 ~ 18 VDC	5 / ±12 VDC	600mA / ±40mA	6000mA / ±400mA	50 / 75mVp-p	285mA	85	6800 / ±330μF
UFEC40-12T0515	9.5 ~ 18 VDC	5 / ±15 VDC	600mA / ±30mA	6000mA / ±300mA	50 / 75mVp-p	285mA	85	6800 / ±110μF
UFEC40-24S3P3	18 ~ 36 VDC	3.3 VDC	0mA	8000mA	50mVp-p	65mA	86	21000μF
UFEC40-24S05	18 ~ 36 VDC	5 VDC	0mA	8000mA	50mVp-p	80mA	88	13600μF
UFEC40-24S12	18 ~ 36 VDC	12 VDC	0mA	3333mA	75mVp-p	85mA	87	2360μF
UFEC40-24S15	18 ~ 36 VDC	15 VDC	0mA	2666mA	75mVp-p	90mA	88	1510μF
UFEC40-24S24	18 ~ 36 VDC	24 VDC	0mA	1800mA	350mVp-p	30mA	86	600μF
UFEC40-24S28	18 ~ 36 VDC	28 VDC	0mA	1400mA	350mVp-p	30mA	86	375μF
UFEC40-24D12	18 ~ 36 VDC	± 12 VDC	0mA	± 1800mA	120mVp-p	25mA	86	± 1200μF
UFEC40-24D15	18 ~ 36 VDC	± 15 VDC	0mA	± 1400mA	150mVp-p	25mA	86	± 750μF
UFEC40-24T3312	18 ~ 36 VDC	3.3 / ±12 VDC	600mA / ±40mA	6000mA / ±400mA	50 / 75mVp-p	65mA	84	13000 / ±330μF
UFEC40-24T3315	18 ~ 36 VDC	3.3 / ±15 VDC	600mA / ±30mA	6000mA / ±300mA	50 / 75mVp-p	65mA	84	13000 / ±110μF
UFEC40-24T0512	18 ~ 36 VDC	5 / ±12 VDC	600mA / ±40mA	6000mA / ±400mA	50 / 75mVp-p	65mA	86	6800 / ±330μF
UFEC40-24T0515	18 ~ 36 VDC	5 / ±15 VDC	600mA / ±30mA	6000mA / ±300mA	50 / 75mVp-p	75mA	86	6800 / ±110μF
UFEC40-48S3P3	36 ~ 75 VDC	3.3 VDC	0mA	8000mA	50mVp-p	40mA	87	21000μF
UFEC40-48S05	36 ~ 75 VDC	5 VDC	0mA	8000mA	50mVp-p	42mA	89	13600μF
UFEC40-48S12	36 ~ 75 VDC	12 VDC	0mA	3333mA	75mVp-p	52mA	88	2360μF
UFEC40-48S15	36 ~ 75 VDC	15 VDC	0mA	2666mA	75mVp-p	55mA	88	1510μF
UFEC40-48S24	36 ~ 75 VDC	24 VDC	0mA	1800mA	350mVp-p	21mA	86	600μF
UFEC40-48S28	36 ~ 75 VDC	28 VDC	0mA	1400mA	350mVp-p	21mA	86	375μF
UFEC40-48D12	36 ~ 75 VDC	± 12 VDC	0mA	± 1800mA	120mVp-p	18mA	86	± 1200μF
UFEC40-48D15	36 ~ 75 VDC	± 15 VDC	0mA	± 1400mA	150mVp-p	18mA	86	± 750μF
UFEC40-48T3312	36 ~ 75 VDC	3.3 / ±12 VDC	600mA / ±40mA	6000mA / ±400mA	50 / 75mVp-p	40mA	85	13000 / ±330μF
UFEC40-48T3315	36 ~ 75 VDC	3.3 / ±15 VDC	600mA / ±30mA	6000mA / ±300mA	50 / 75mVp-p	40mA	85	13000 / ±110μF
UFEC40-48T0512	36 ~ 75 VDC	5 / ±12 VDC	600mA / ±40mA	6000mA / ±400mA	50 / 75mVp-p	40mA	87	6800 / ±330μF
UFEC40-48T0515	36 ~ 75 VDC	5 / ±15 VDC	600mA / ±30mA	6000mA / ±300mA	50 / 75mVp-p	45mA	87	6800 / ±110μF

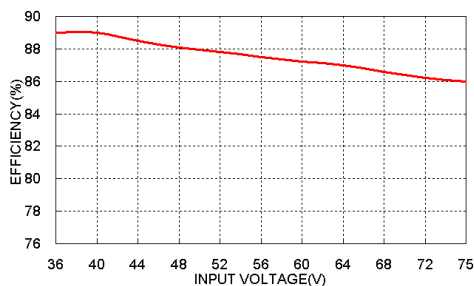
Note

1. MIL-HDBK-217F @Ta=25 °C, Full load.
2. Typical value at nominal input and full load. (20MHz BW.)
3. Typical value at nominal input voltage and no load.
4. Typical value at nominal input voltage and full load.
5. Test by minimum input and constant resistive load.
6. The output requires minimum loading on the output to maintain specified regulation. Operation in no-load condition will not damage these devices, however they may not meet all listed specification.
7. Single output installs a potentiometer to adjust the output voltage.
8. Load regulation for triple output:
Main output(V1):10% to 100% with 10% to 100% balanced on auxiliaries.
Auxiliary outputs(V2 and V3):10% to 100% balanced on all outputs.
9. Cross regulation for dual output: asymmetrical load 25% / 100% FL.
Cross regulation for triple output:
Main output 100% load, auxiliary 100%,other auxiliary25% to 100%.
Auxiliary outputs(V2 and V3):main output 100% load, auxiliary 100%, other auxiliary 25% to 100% or main output 25%,auxiliary 25%,other auxiliary 25% to 100%.
10. The ON/OFF control pin voltage is referenced to -INPUT.

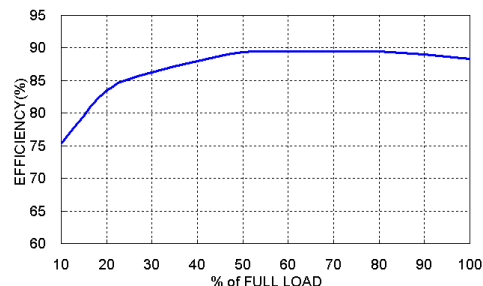
UFEC40-48S05 Derating Curve



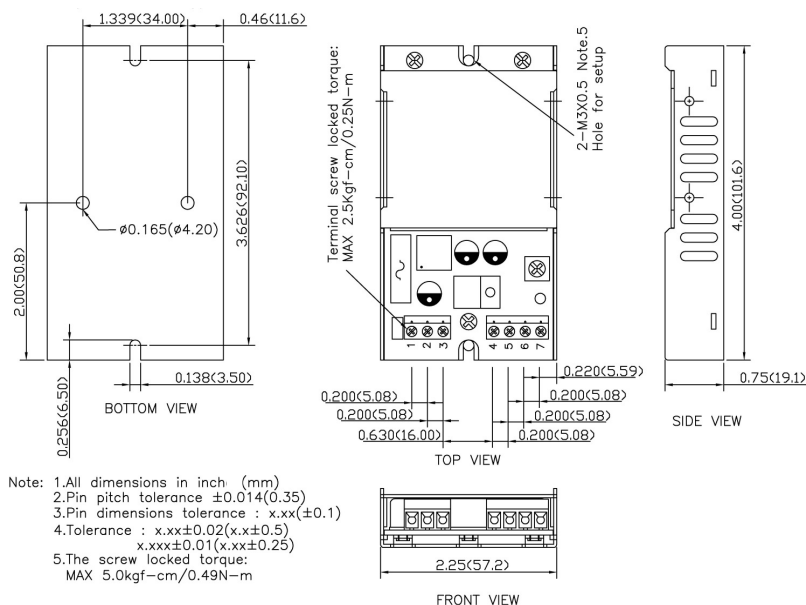
UFEC40-48S05 Efficiency VS Input Voltage



UFEC40-48S05 Efficiency VS Output Current



MECHANICAL DRAWING :



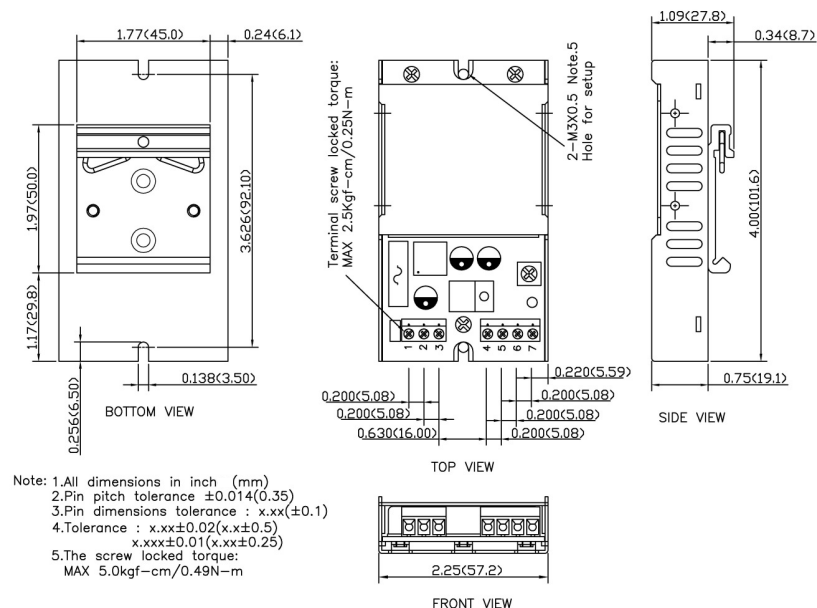
PIN CONNECTION

PIN	SINGLE	DUAL	TRIPLE
1	+INPUT	+INPUT	+INPUT
2	-INPUT	-INPUT	-INPUT
3	CTRL	CTRL	CTRL
4	NC	NC	+AUXILIARY
5	-OUTPUT	-OUTPUT	COMMON
6	+OUTPUT	COMMON	-AUXILIARY
7	NC	+OUTPUT	+OUTPUT

※NC : No Connection

※Screw terminals – wire range from 14 to 18 AWG

DIN RAIL MOUNTING TYPE OPTION



PRODUCT OPTIONS TABLE

Option	Suffix
Din Rail Mounting Type	-DR