



## FEATURES

- APPLICATION OF CHASSIS-MOUNT DC/DC CONVERTERS
- 20 WATTS MAXIMUM OUTPUT POWER
- OUTPUT CURRENT UP TO 5A
- 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

## APPLICATIONS

Wireless Network  
Telecom/Datacom  
Industry Control System  
Measurement  
Semiconductor Equipment

## OPTIONS

Din Rail Mounting For DIN 35 Rail  
Negative logic Remote ON/OFF

## DESCRIPTION

The UFED20 series is a value added item designed to easy application of chassis mount DC-DC converters. The UFED20 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		20 Watts, max.	
Voltage accuracy	3.3Vout	± 1.5%	
	Others	± 1%	
Minimum load		0%	
Voltage adjustability (Note 6)	Single output	± 10%	
Line regulation	LL to HL at Full Load	Single	± 0.2%
		Dual	± 0.5%
Load regulation	No load to Full load	3.3Vout	± 1.5%
		Others	± 1%
Load cross regulation (Note 7)	Dual	± 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	3.3VDC output	3.9VDC	
	5VDC output	6.2VDC	
Zener diode clamp	12VDC output	15VDC	
	15VDC output	18VDC	
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 <sup>9</sup> ohms, min.	
Isolation capacitance		4000pF, max.	
Switching frequency		500kHz±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		89g (3.13oz)	
MTBF (Note 1)	MIL-HDBK-217F	2.073 x 10 <sup>6</sup> hrs	

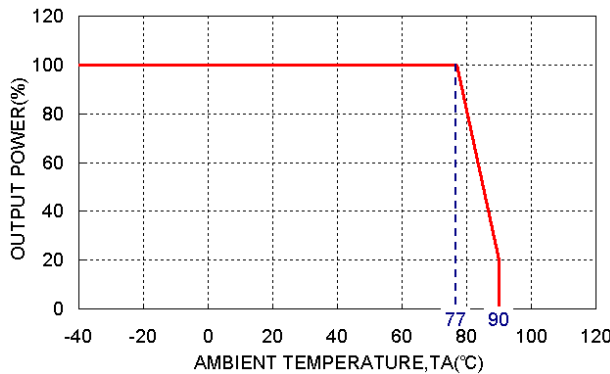
INPUT SPECIFICATIONS		
Input voltage range	12VDC nominal input	9.5 ~ 18VDC
	24VDC nominal input	18 ~ 36VDC
	48VDC nominal input	36 ~ 75VDC
Input surge voltage	12VDC input	36VDC 100ms, max.
	24VDC input	50VDC 100ms, max.
	48VDC input	100VDC 100ms, max.
Input fuse (slow blow)	12VDC input	6A
	24VDC input	6A
	48VDC input	4A
In-rush current		15A
Input reflected ripple current		10mA p-p
Start up time	Nominal input and constant resistive load	100ms
	Power up Remote ON/OFF	10ms
Remote ON/OFF (Note 8)	(Positive logic)(Standard)	DC-DC ON Open or 3V < Vr < 12V DC-DC OFF Short or 0V < Vr < 1.2V
	(Negative logic)(Option)	DC-DC ON Short or 0V < Vr < 1.2V DC-DC OFF Open or 3V < Vr < 12V
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 ~ +70°C (without derating)
		+70°C ~ +88°C (with derating)
Storage temperature range		-40°C ~ +105°C
Thermal shock		MIL-STD-810F
Vibration		MIL-STD-810F
Relative humidity		5% to 95% RH
EMC CHARACTERISTICS		
EMI	EN55022	Class B
ESD	EN61000-4-2	Air ± 8kV
		Contact ± 6kV Perf. Criteria A
Radiated immunity	EN61000-4-3	10 V/m Perf. Criteria A
Fast transient	EN61000-4-4	± 2kV Perf. Criteria A
Surge	EN61000-4-5	± 0.5kV Perf. Criteria A
Conducted immunity	EN61000-4-6	10 Vr.m.s Perf. Criteria A

Model Number	Input Range	Output Voltage	Output Current		Output <sup>(2)</sup> Ripple & Noise	No load <sup>(3)</sup> Input Current	Eff <sup>(4)</sup> (%)	Capacitor <sup>(5)</sup> Load max
			Min. load	Full load				
UFED20-12S3P3	9.5 ~ 18 VDC	3.3 VDC	0mA	5000mA	60mVp-p	117mA	84	13000μF
UFED20-12S05	9.5 ~ 18 VDC	5 VDC	0mA	4000mA	75mVp-p	78mA	86	6800μF
UFED20-12S12	9.5 ~ 18 VDC	12 VDC	0mA	1670mA	75mVp-p	96mA	85	2200μF
UFED20-12S15	9.5 ~ 18 VDC	15 VDC	0mA	1330mA	75mVp-p	43mA	85	755μF
UFED20-12D12	9.5 ~ 18 VDC	±12VDC	0mA	±833mA	100mVp-p	51mA	85	±680μF
UFED20-12D15	9.5 ~ 18 VDC	±15VDC	0mA	±667mA	100mVp-p	58mA	85	±450μF
UFED20-24S3P3	18 ~ 36 VDC	3.3 VDC	0mA	5000mA	60mVp-p	31mA	85	13000μF
UFED20-24S05	18 ~ 36 VDC	5 VDC	0mA	4000mA	75mVp-p	36mA	88	6800μF
UFED20-24S12	18 ~ 36 VDC	12 VDC	0mA	1670mA	75mVp-p	58mA	86	2200μF
UFED20-24S15	18 ~ 36 VDC	15 VDC	0mA	1330mA	75mVp-p	44mA	86	755μF
UFED20-24D12	18 ~ 36 VDC	±12VDC	0mA	±833mA	100mVp-p	33mA	86	±680μF
UFED20-24D15	18 ~ 36 VDC	±15VDC	0mA	±667mA	100mVp-p	34mA	87	±450μF
UFED20-48S3P3	36 ~ 75 VDC	3.3 VDC	0mA	5000mA	60mVp-p	16mA	86	13000uF
UFED20-48S05	36 ~ 75 VDC	5 VDC	0mA	4000mA	75mVp-p	21mA	88	6800μF
UFED20-48S12	36 ~ 75 VDC	12 VDC	0mA	1670mA	75mVp-p	37mA	87	2200μF
UFED20-48S15	36 ~ 75 VDC	15 VDC	0mA	1330mA	75mVp-p	52mA	86	755μF
UFED20-48D12	36 ~ 75 VDC	±12VDC	0mA	±833mA	100mVp-p	22mA	87	±680μF
UFED20-48D15	36 ~ 75 VDC	±15VDC	0mA	±667mA	100mVp-p	22mA	87	±450μF

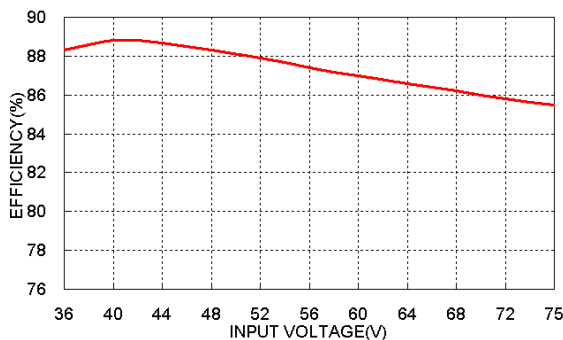
**Note**

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 and no load.
4. Typical value at nominal input and full load.
5. Test by minimum input and constant resistive load.
6. Single output installs a potentiometer to adjust the output voltage.
7. Cross regulation for dual output : asymmetrical load 25% / 100% FL
8. The ON/OFF control pin voltage is referenced to -INPUT  
To order negative logic ON/OFF control add the suffix-N (Ex:UFED20-48S05-N)

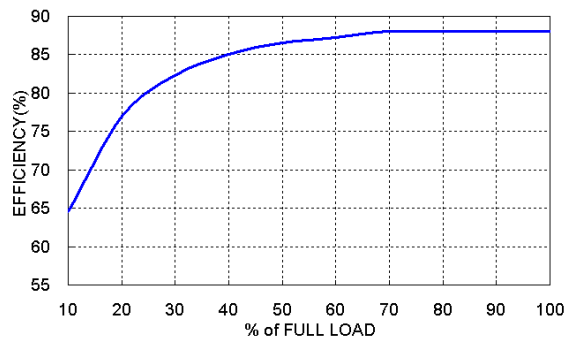
UFED20-48S05 Derating Curve



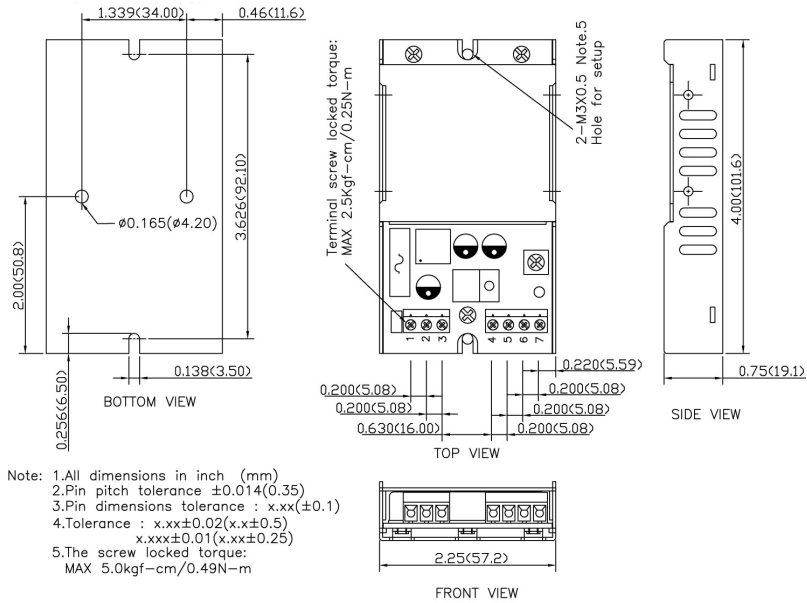
UFED20-48S05 Efficiency VS Input Voltage



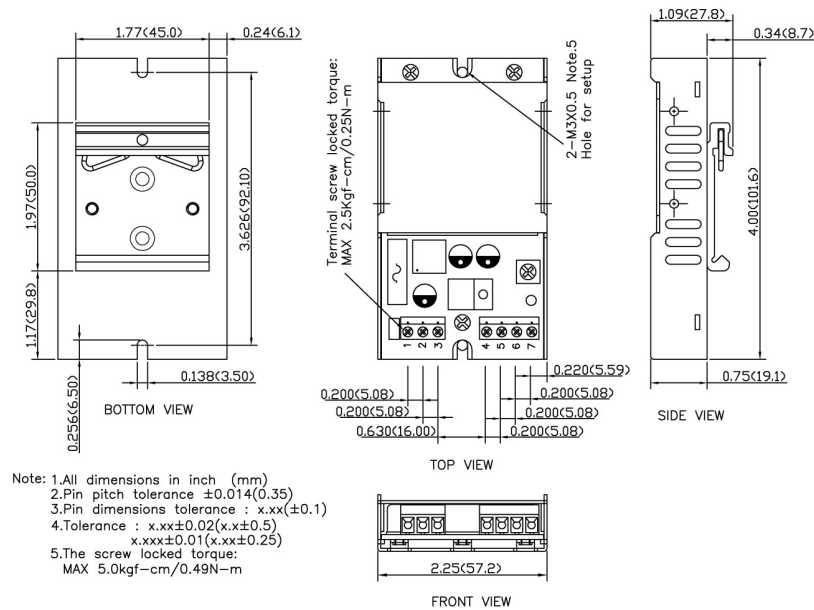
UFED20-48S05 Efficiency VS Output Current



**MECHANICAL DRAWING :**



**DIN RAIL MOUNTING TYPE OPTION**



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

PRODUCT OPTIONS TABLE	
Option	Suffix
Din Rail Mounting Type	-DR
Negative logic Remote ON/OFF	-N

- ※ NC : No Connection
- ※ Screw terminals – wire range from 14 to 18 AWG