



# UFED20 SERIES

CHASSIS-MOUNT DC-DC CONVERTER

2:1 WIDE INPUT RANGE  
UP TO 20 Watts



## FEATURES

- NO MINIMUM LOAD REQUIRED
- 1600VDC INPUT TO OUTPUT ISOLATION
- APPLICATION OF CHASSIS-MOUNT DC/DC CONVERTERS
- SCREW TERMINALS FOR INPUT AND OUTPUT CONNECTIONS
- INTERNAL INPUT FUSE PROTECTION
- INTERNAL OUTPUT LED INDICATOR
- MEET EN55022 CLASS B
- SAFETY MEETS UL60950-1, EN60950-1, & IEC60950-1
- CE MARKED
- COMPLIANT TO RoHS II & REACH

## APPLICATIONS

- WIRELESS NETWORK
- TELECOM/DATACOM
- INDUSTRY CONTROL SYSTEM
- MEASUREMENT EQUIPMENT
- SEMICONDUCTOR EQUIPMENT

1600VDC ISOLATION	REMOTE CONTROL	OCP	SCP	OVP	FUSE INCLUDED	INRUSH LIMIT	REVERSE POLARITY PROTECTION
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## TECHNICAL SPECIFICATION

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

Model Number	Input Range	Output Voltage	Output Current @Full Load	Input Current @ No Load	Efficiency	Maximum Capacitor Load (1)
	VDC	VDC	mA	mA	%	µF
UFED20-12S3P3	9.5 ~ 18	3.3	5000	117	84	13000
UFED20-12S05	9.5 ~ 18	5	4000	78	86	6800
UFED20-12S12	9.5 ~ 18	12	1670	96	85	2200
UFED20-12S15	9.5 ~ 18	15	1330	43	85	755
UFED20-12D12	9.5 ~ 18	±12	±833	51	85	±680
UFED20-12D15	9.5 ~ 18	±15	±667	58	85	±450
UFED20-24S3P3	18 ~ 36	3.3	5000	31	85	13000
UFED20-24S05	18 ~ 36	5	4000	36	88	6800
UFED20-24S12	18 ~ 36	12	1670	58	86	2200
UFED20-24S15	18 ~ 36	15	1330	44	86	755
UFED20-24D12	18 ~ 36	±12	±833	33	86	±680
UFED20-24D15	18 ~ 36	±15	±667	34	87	±450
UFED20-48S3P3	36 ~ 75	3.3	5000	16	86	13000
UFED20-48S05	36 ~ 75	5	4000	21	88	6800
UFED20-48S12	36 ~ 75	12	1670	37	87	2200
UFED20-48S15	36 ~ 75	15	1330	52	86	755
UFED20-48D12	36 ~ 75	±12	±833	22	87	±680
UFED20-48D15	36 ~ 75	±15	±667	22	87	±450

## PART NUMBER STRUCTURE

<b>UFED20</b> -	<b>48</b>	<b>S</b>	<b>05</b>	-	<b>N</b>	<b>EC</b>
Series Name	Input Voltage (VDC)	Output Quantity	Output Voltage (VDC)		Remote Control Option	Assembly Option
	12: 9.5~18 24: 18~36 48: 36~75	S: Single  D: Dual	3P3: 3.3 05: 5 12: 12 15: 15 12: ±12 15: ±15		<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

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)			6		A
	24Vin(nom)			6		
	48Vin(nom)			4		
In-rush current				15		A
Input reflected ripple current	Nominal input and Full load			10		mAp-p
Start up time	Constant resistive load	Power up		100		ms
		Remote ON/OFF		10		
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 ~ 12VDC		mA
		(Standard)	DC-DC OFF	Short or 0 ~ 1.2VDC		
		Negative logic	DC-DC ON	Short or 0 ~ 1.2VDC		
		(Option)	DC-DC OFF	Open or 3 ~ 12VDC		
		Input current of Ctrl pin		-0.5	0.5	
Remote off input current			2.5		mA	

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	Single	-0.2		+0.2	%
		Dual	-0.5		+0.5	
Load regulation	No Load to Full Load	3.3Vout	-1.5		+1.5	%
		Others	-1.0		+1.0	
Cross regulation	Asymmetrical load 25%/100% FL		-5.0		+5.0	%
Voltage adjustability	Single output		-10		+10	%
Ripple and noise	Measured by 20MHz bandwidth	Single	3.3Vout,	60		mVp-p
			5Vout, 12Vout, 15Vout	75		
		Dual	All	100		
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		3.9		VDC
		5Vout		6.2		
		12Vout		15		
		15Vout		18		
Output indicator			Green LED			
Over load protection	% of Iout 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			450	500	550	kHz
Safety meets						UL60950-1 EN60950-1 IEC60950-1
Chassis material						Aluminum
Weight						89g (3.13oz)
MTBF	MIL-HDBK-217F, Full load					2.073 x 10 <sup>6</sup> hrs

## ENVIRONMENTAL SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating ambient temperature	Without derating	-40		+70	°C
	With derating	+70		+88	
Storage temperature range		-40		+105	°C
Thermal shock					MIL-STD-810F
Vibration					MIL-STD-810F
Relative humidity					5% to 95% RH

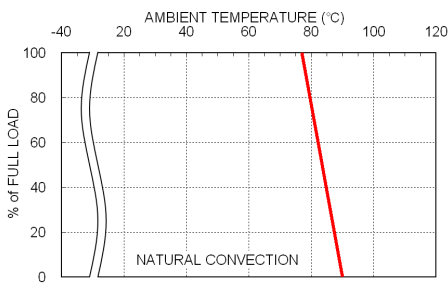
## EMC SPECIFICATIONS

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

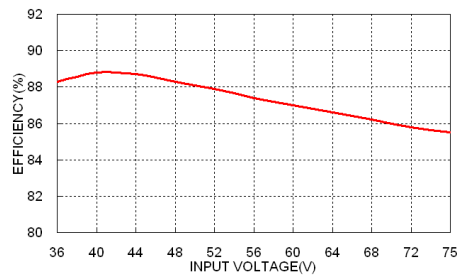
### Note:

1. Test by minimum input and constant resistive load.

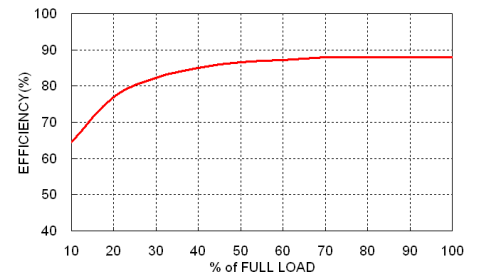
## CHARACTERISTIC CURVE



UFED20-48S05 Derating Curve

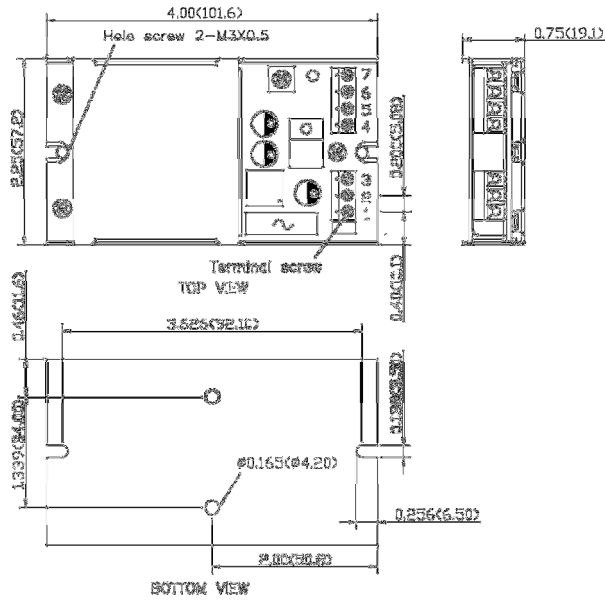


UFED20-48S05 Efficiency vs. Input Voltage



UFED20-48S05 Efficiency vs. Output Load

CHASSIS MOUNTING TYPE



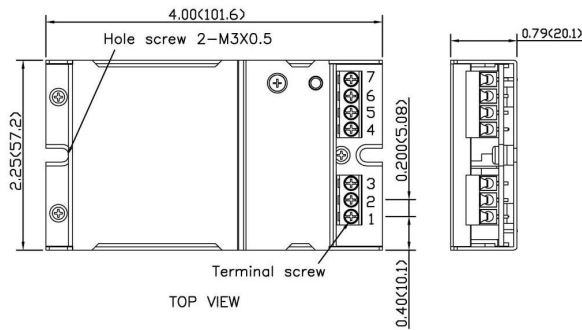
PIN CONNECTION

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

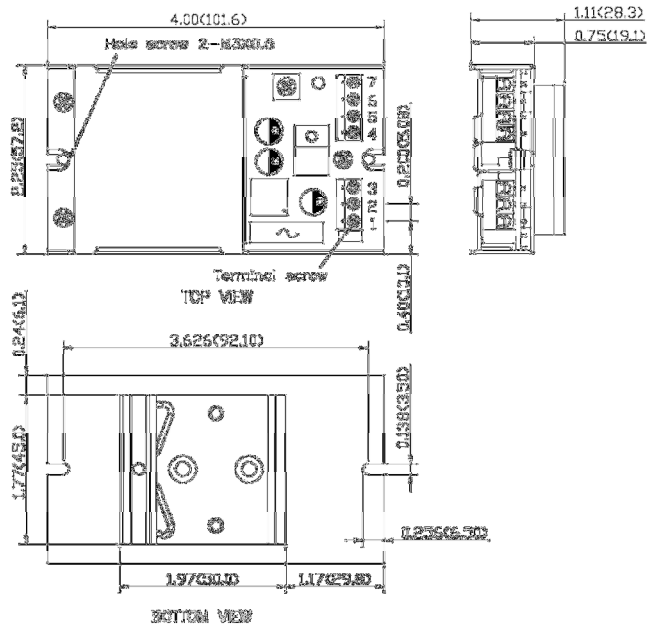
\* NC : No Connection

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

ENCLOSED MOUNTING TYPE



DIN RAIL MOUNTING TYPE



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)