



APPLICATIONS

Communication System
Industry Control System
Factory Automatic Equipment
Semiconductor Equipment

FEATURES

- DIN RAIL DC/DC CONVERTERS
- 20 WATTS MAXIMUM OUTPUT POWER
- OFFER SINGLE AND DUAL OUTPUT
- OVERLOAD AND SHORT CIRCUIT PROTECTION
- OVER VOLTAGE PROTECTION
- RELIABLE SNAP-ON FOR DIN RAIL TS-35/7.5 OR TS-35/15
- I/O-ISOLATION 1600 VDC
- CASE PROTECTION MEET IP20(IEC60529)
- INTERNAL INPUT FUSE PROTECTION
- INTERNAL INPUT REVERSAL POLARITY PROTECTION
- INTERNAL INPUT IN-RUSH CURRENT LIMIT CIRCUIT
- INTERNAL OUTPUT DC-OK INDICATOR
- MEET EN55022 CLASS B
- COMPLIANT TO RoHS EU DIRECTIVE 2011/65/EU

DESCRIPTION

The DFED20 series was designed to easy application of din rail DC-DC converters. Easy installation is provided with snap-on mounting on the DIN-rail. Internal protection circuits such as input reversal and in-rush current limit protection, as well as output short-circuit and over-voltage protection. A green LED at the front displays the status of the output(s).

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	± 1.5%
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
Zener diode clamp	5VDC output	6.2VDC
	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 ⁹ ohms, min.
Isolation capacitance		4000pF, max.
Switching frequency		500kHz±10%
Design meets safety standard		IEC60950-1, UL60950-1, EN60950-1
Chassis material		Aluminum
Dimensions		4.92 X 2.27 X 0.97 Inch (125.0 X 57.6 X 24.5 mm)
Weight		147.5g (5.19oz)
MTBF (Note 1)	MIL-HDBK-217F	1.682 x 10 ⁶ hrs

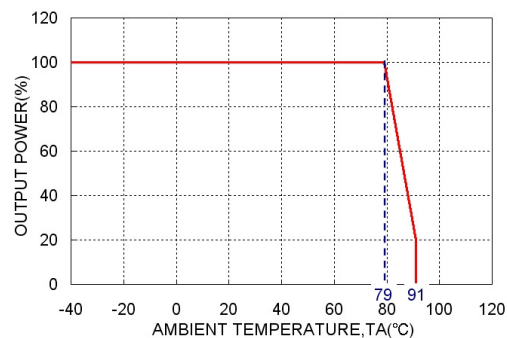
INPUT SPECIFICATIONS			
Input voltage range	12VDC nominal input	9.5 ~ 18VDC	
	24VDC nominal input	18 ~ 36VDC	
	48VDC nominal input	36 ~ 75VDC	
Input surge voltage	12VDC input	36VDC 100ms,max.	
	24VDC input	50VDC 100ms,max.	
	48VDC input	100VDC 100ms,max.	
Input fuse (slow blow)	12VDC input	6A	
	24VDC 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	Power up 100ms	
		Remote ON/OFF 10ms	
Remote ON/OFF (Note 8)			
(Positive logic) (Standard)	DC-DC ON	Open or 3 V < 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 ~ +73°C (without derating)	
		+73°C ~ +90°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 Contact ± 8kV ± 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 ⁽²⁾ Ripple & Noise	No load ⁽³⁾ Input Current	Eff ⁽⁴⁾ (%)	Capacitor ⁽⁵⁾ Load max
			Min. load	Full load				
DFED20-12S3P3	9.5 ~ 18 VDC	3.3 VDC	0mA	5000mA	60mVp-p	118mA	83	13000μF
DFED20-12S05	9.5 ~ 18 VDC	5 VDC	0mA	4000mA	75mVp-p	79mA	85	6800μF
DFED20-12S12	9.5 ~ 18 VDC	12 VDC	0mA	1670mA	75mVp-p	97mA	84	2200μF
DFED20-12S15	9.5 ~ 18 VDC	15 VDC	0mA	1330mA	75mVp-p	44mA	84	755μF
DFED20-12D12	9.5 ~ 18 VDC	±12VDC	0mA	±833mA	100mVp-p	52mA	84	±680μF
DFED20-12D15	9.5 ~ 18 VDC	±15VDC	0mA	±667mA	100mVp-p	59mA	84	±450μF
DFED20-24S3P3	18 ~ 36 VDC	3.3 VDC	0mA	5000mA	60mVp-p	32mA	84	13000μF
DFED20-24S05	18 ~ 36 VDC	5 VDC	0mA	4000mA	75mVp-p	37mA	87	6800μF
DFED20-24S12	18 ~ 36 VDC	12 VDC	0mA	1670mA	75mVp-p	59mA	85	2200μF
DFED20-24S15	18 ~ 36 VDC	15 VDC	0mA	1330mA	75mVp-p	45mA	85	755μF
DFED20-24D12	18 ~ 36 VDC	±12VDC	0mA	±833mA	100mVp-p	34mA	85	±680μF
DFED20-24D15	18 ~ 36 VDC	±15VDC	0mA	±667mA	100mVp-p	35mA	86	±450μF
DFED20-48S3P3	36 ~ 75 VDC	3.3 VDC	0mA	5000mA	60mVp-p	17mA	85	13000μF
DFED20-48S05	36 ~ 75 VDC	5 VDC	0mA	4000mA	75mVp-p	22mA	87	6800μF
DFED20-48S12	36 ~ 75 VDC	12 VDC	0mA	1670mA	75mVp-p	38mA	86	2200μF
DFED20-48S15	36 ~ 75 VDC	15 VDC	0mA	1330mA	75mVp-p	53mA	85	755μF
DFED20-48D12	36 ~ 75 VDC	±12VDC	0mA	±833mA	100mVp-p	23mA	86	±680μF
DFED20-48D15	36 ~ 75 VDC	±15VDC	0mA	±667mA	100mVp-p	23mA	86	±450μF

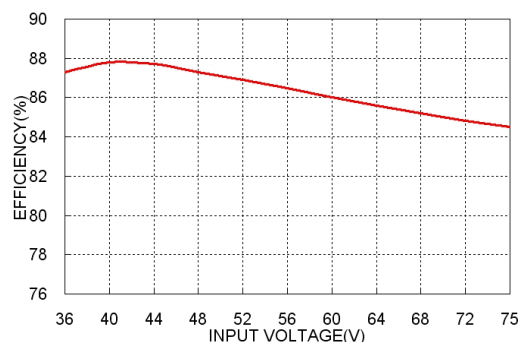
Note

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:DFED20-48S05-N)

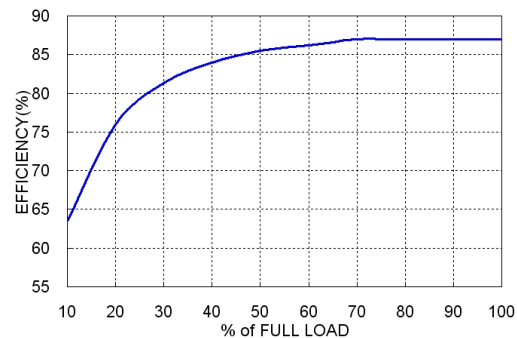
DFED20-48S05 Derating Curve



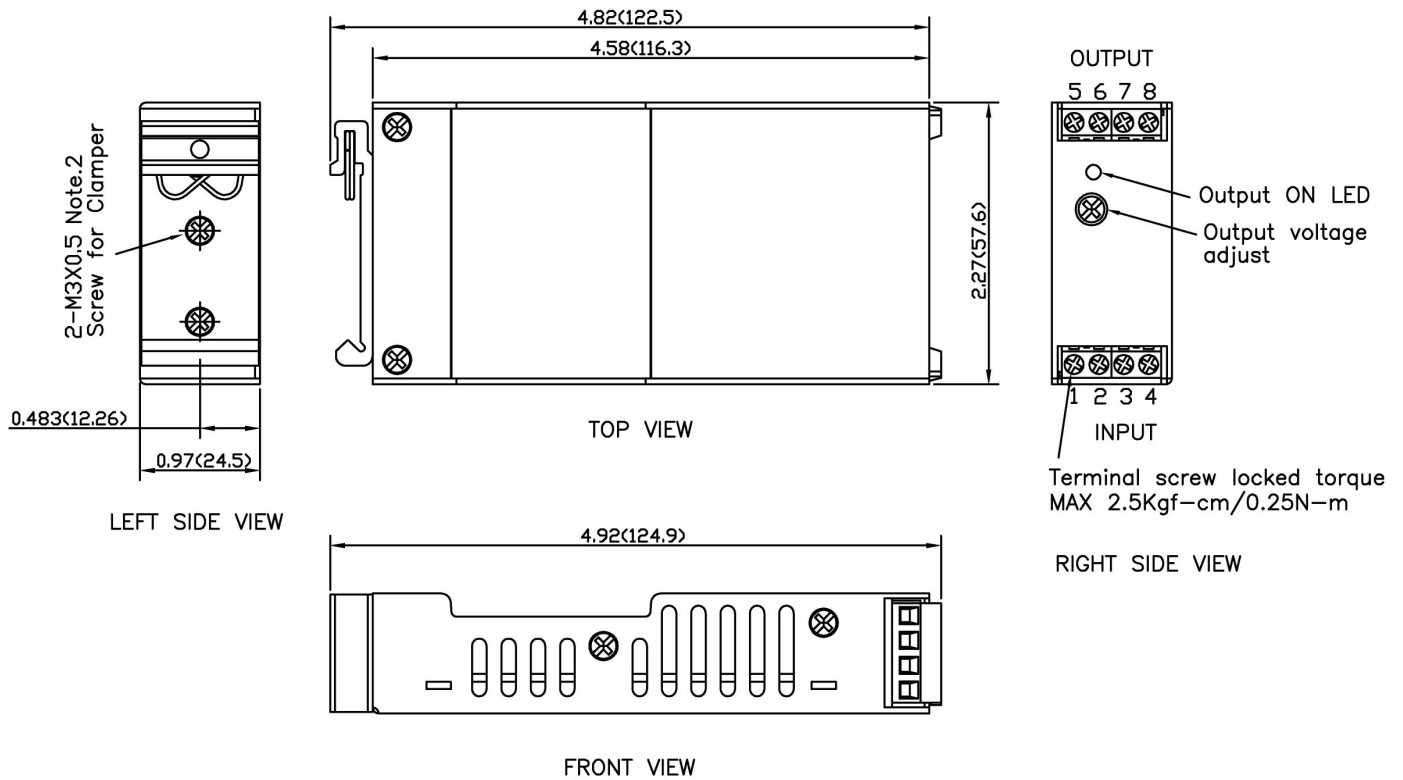
DFED20-48S05 Efficiency VS Input Voltage



DFED20-48S05 Efficiency VS Output Current



MECHANICAL DRAWING :



Note: 1.All dimensions in inch(mm)

Tolerance : $x.xx \pm 0.02 (x.x \pm 0.5)$

$x.xxx \pm 0.01 (x.xx \pm 0.25)$

2.The screw locked torque: MAX 5.0kgf-cm/0.49N-m

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

※ NC : No Connection

※ Screw terminals – wire range from 14 to 18 AWG

PRODUCT OPTIONS TABLE	
Option	Suffix
Negative logic Remote ON/OFF	-N