



# DFEC15W SERIES

DIN RAIL DC-DC CONVERTER

4:1 ULTRA WIDE INPUT RANGE  
UP TO 15 Watts



## FEATURES

- NO MINIMUM LOAD REQUIRED
- 1600VDC INPUT TO OUTPUT ISOLATION
- SCREW TERMINALS FOR INPUT AND OUTPUT CONNECTIONS
- RELIABLE SNAP-ON FOR DIN RAIL TS-35/7.5 OR TS-35/15
- CASE PROTECTION MEET IP20(IEC60529)
- INTERNAL OUTPUT DC-OK INDICATOR
- MEET EN55022 CLASS B
- SAFETY MEETS UL60950-1, EN60950-1, & IEC60950-1
- CE MARKED
- COMPLIANT TO RoHS II & REACH

## APPLICATIONS

- COMMUNICATION SYSTEM
- INDUSTRY CONTROL SYSTEM
- FACTORY AUTOMATIC EQUIPMENT
- SEMICONDUCTOR EQUIPMENT

1600VDC ISOLATION	REMOTE CONTROL	UVP	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
DFEC15-24S3P3W	9.5 ~ 36	3.3	4500	52mA	84	14700
DFEC15-24S05W	9.5 ~ 36	5	3000	67mA	85	7200
DFEC15-24S5P1W	9.5 ~ 36	5.1	3000	67mA	85	7200
DFEC15-24S12W	9.5 ~ 36	12	1250	26mA	85	1250
DFEC15-24S15W	9.5 ~ 36	15	1000	26mA	85	800
DFEC15-24D05W	9.5 ~ 36	±5	±1500	57mA	85	±3600
DFEC15-24D12W	9.5 ~ 36	±12	±625	35mA	86	±625
DFEC15-24D15W	9.5 ~ 36	±15	±500	35mA	86	±400
DFEC15-48S3P3W	18 ~ 75	3.3	4500	37mA	84	14700
DFEC15-48S05W	18 ~ 75	5	3000	38mA	86	7200
DFEC15-48S5P1W	18 ~ 75	5.1	3000	38mA	86	7200
DFEC15-48S12W	18 ~ 75	12	1250	18mA	85	1250
DFEC15-48S15W	18 ~ 75	15	1000	18mA	85	800
DFEC15-48D05W	18 ~ 75	±5	±1500	37mA	86	±3600
DFEC15-48D12W	18 ~ 75	±12	±625	20mA	86	±625
DFEC15-48D15W	18 ~ 75	±15	±500	20mA	86	±400

## PART NUMBER STRUCTURE

<b>DFEC15</b> -	<b>48</b>	<b>S</b>	<b>05</b>	<b>W</b> -	<b>P</b>
Series Name	Input Voltage (VDC)	Output Quantity	Output Voltage (VDC)	Input Range	Remote Control Option
	24: 9.5~36 48: 18~75	S: Single  D: Dual	3P3: 3.3 05: 5 5P1 5.1 12: 12 15: 15  05: ±5 12: ±12 15: ±15	4:1	P: Positive logic N: Negative logic

**INPUT SPECIFICATIONS**

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating input voltage range	24Vin(nom)	9.5	24	36	VDC
	48Vin(nom)	18	48	75	
Input fuse (slow blow)	24Vin(nom)		6		A
	48Vin(nom)		4		
In-rush current			15		A
Input reflected ripple current	Nominal input and Full load		10		mAp-p
Start up voltage	24Vin(nom)			9.5	VDC
	48Vin(nom)			18	
Shutdown voltage	24Vin(nom)		7.5		VDC
	48Vin(nom)		15		
Start up time	Nominal input and Constant resistive load Power up		100		ms
Input surge voltage	100ms, max.	24Vin(nom)		50	VDC
		48Vin(nom)		100	
Remote ON/OFF (Option)	Referred to -Vin pin	Positive logic	DC-DC ON	Open or 3 ~ 12VDC Short or 0 ~ 1.2VDC Short or 0 ~ 1.2VDC Open or 3 ~ 12VDC	
			DC-DC OFF		
		Negative logic	DC-DC ON		
			DC-DC OFF		
	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	-2.0		+2.0	%
	Others	-1.2		+1.2	
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	-2.0	+2.0	%
		Others	-1.5	+1.5	
Cross regulation	Asymmetrical load 25%/100% FL	Dual	-5.0	+5.0	%
Ripple and noise	Measured by 20MHz bandwidth	Single	3.3Vout, 5Vout, 5.1Vout	50	mVp-p
			12Vout, 15Vout	75	
		Dual	All	75	
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, 5.1Vout	6.2		
		12Vout	15		
		15Vout	18		
Output indicator					Green LED
Over load protection	% of Iout rated; Hiccup mode		150		%
Short circuit protection					Continuous, automatic recovery

**GENERAL SPECIFICATIONS**

Parameter	Conditions	Min.	Typ.	Max.	Unit
Isolation voltage	1 minute Input to Output Input (Output) to Chassis	1600			VDC
		1600			
Isolation resistance	500VDC	1			GΩ
Isolation capacitance				4000	pF
Switching frequency		360	400	440	kHz
Safety meets					UL60950-1 EN60950-1 IEC60950-1
Chassis material					Aluminum
Weight				147.5g (5.19oz)	
MTBF	MIL-HDBK-217F, Full load				1.681 x 10 <sup>6</sup> hrs

## ENVIRONMENTAL SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating ambient temperature	Without derating	-40		+85	°C
	With derating	+85		+95	
Storage temperature range		-40		+105	°C
Thermal shock					MIL-STD-810F
Vibration					MIL-STD-810F
Relative humidity					5% to 95% RH

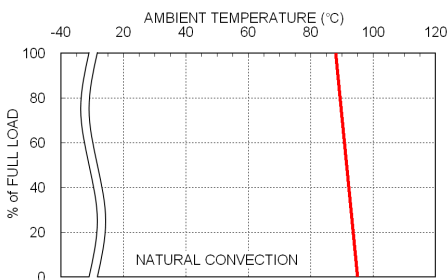
## EMC SPECIFICATIONS

Parameter	Conditions	Level
EMI	EN55022	Class B
ESD	EN61000-4-2 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 ± 0.5kV	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

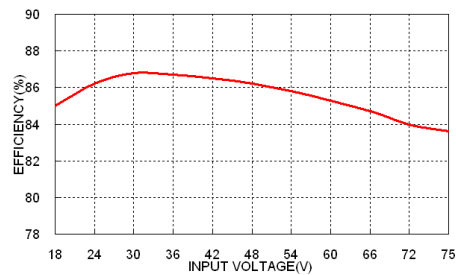
### Note:

1. Test by minimum input and constant resistive load.

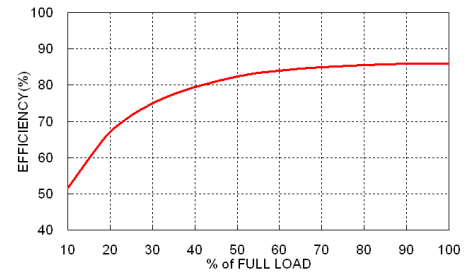
## CHARACTERISTIC CURVE



DFEC15-48S05W Derating Curve

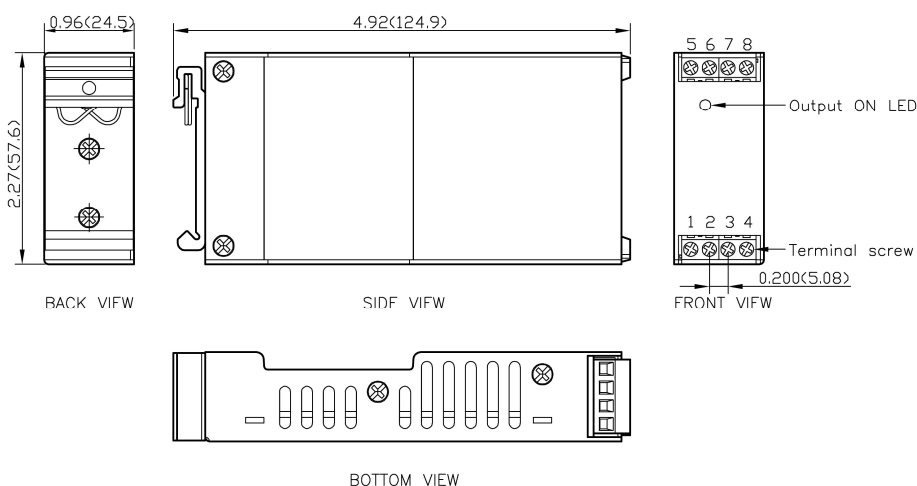


DFEC15-48S05W Efficiency vs. Input Voltage



DFEC15-48S05W Efficiency vs. Output Load

## MECHANICAL DRAWING



### PIN CONNECTION

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

\* NC : No Connection

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

1. All dimensions in Inch (mm)
2. Tolerance : X.XX±0.02 (X.X±0.5)
4. Tolerance : X.XXX±0.01 (X.XX±0.25)
3. Terminal screw locked torque : MAX 2.5kgf – cm (0.25N – m)