



DFEC30 SERIES

DIN RAIL DC-DC CONVERTER

2:1 WIDE INPUT RANGE
UP TO 30 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	A	mA	%	µF
DFEC30-12S3P3	9.5 ~ 18	3.3	6	119	83	19500
DFEC30-12S05	9.5 ~ 18	5	6	100	85	10200
DFEC30-12S12	9.5 ~ 18	12	2.5	178	86	3240
DFEC30-12S15	9.5 ~ 18	15	2	220	86	1100
DFEC30-12S24	9.5 ~ 18	24	1.25	74	85	510
DFEC30-12S28	9.5 ~ 18	28	1	56	85	340
DFEC30-12D12	9.5 ~ 18	±12	±1.25	68	85	±1020
DFEC30-12D15	9.5 ~ 18	±15	±1	50	85	±675
DFEC30-24S3P3	18 ~ 36	3.3	6	52	84	19500
DFEC30-24S05	18 ~ 36	5	6	52	86	10200
DFEC30-24S12	18 ~ 36	12	2.5	84	87	3300
DFEC30-24S15	18 ~ 36	15	2	95	87	1100
DFEC30-24S24	18 ~ 36	24	1.25	38	86	510
DFEC30-24S28	18 ~ 36	28	1	39	86	340
DFEC30-24D12	18 ~ 36	±12	±1.25	34	86	±1020
DFEC30-24D15	18 ~ 36	±15	±1	35	86	±675
DFEC30-48S3P3	36 ~ 75	3.3	6	32	85	19500
DFEC30-48S05	36 ~ 75	5	6	37	87	10200
DFEC30-48S12	36 ~ 75	12	2.5	38	88	3300
DFEC30-48S15	36 ~ 75	15	2	58	88	1100
DFEC30-48S24	36 ~ 75	24	1.25	29	86	510
DFEC30-48S28	36 ~ 75	28	1	29	86	340
DFEC30-48D12	36 ~ 75	±12	±1.25	23	86	±1020
DFEC30-48D15	36 ~ 75	±15	±1	23	86	±675

PART NUMBER STRUCTURE

DFEC30 -	48	S	05
Series Name	Input Voltage (VDC)	Output Quantity	Output Voltage (VDC)
	12: 9.5~18 24: 18~36 48: 36~75	S: Single	3P3: 3.3 05: 5 12: 12 15: 15 24: 24 28: 28
		D: Dual	12: ±12 15: ±15

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			15		mAp-p
Start up voltage	12Vin(nom)				9.5	VDC
	24Vin(nom)				18	
	48Vin(nom)				36	
Shutdown voltage	12Vin(nom)			8		VDC
	24Vin(nom)			16		
	48Vin(nom)			33		
Start up time	Nominal input and Constant resistive load	Power up		100		ms
		Remote ON/OFF		25		
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
		DC-DC OFF			Short or 0 ~ 1.2VDC	
		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		-1.5		+1.5	%	
	Others		-1.0		+1.0		
Line regulation	Low Line to High Line at Full Load		-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		28Vout		-3	+17	%
			Others		-10	+10	
Ripple and noise	Measured by 20MHz bandwidth	Single	3.3Vout, 5Vout			50	mVp-p
			12Vout, 15Vout			75	
		Dual	24Vout, 28Vout			100	
			All			100	
Temperature coefficient			-0.02		+0.02	%/°C	
Transient response recovery time	25% load step change			300		µs	
Over voltage protection	Zener diode clamp	3.3Vout			3.9	VDC	
		5Vout			6.2		
		12Vout			15		
		15Vout			18		
		24Vout			30		
		28Vout			36		
Output indicator			Green LED				
Over load protection	% of lout 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	1600			VDC
		Input (Output) to Chassis	1600			
Isolation resistance	500VDC		1			GΩ
Isolation capacitance					4000	pF
Switching frequency			270	300	330	kHz
Safety meets						UL60950-1 EN60950-1 IEC60950-1
Chassis material						Aluminum
Weight						170g (5.98oz)
MTBF	MIL-HDBK-217F, Full load					9.229 x 10 ⁵ hrs

ENVIRONMENTAL SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating ambient temperature	Without derating With derating	-40 +68		+68 +90	°C
Storage temperature range		-40		+105	°C
Thermal shock				MIL-STD-810F	
Vibration				MIL-STD-810F	
Relative humidity				5% to 95% RH	

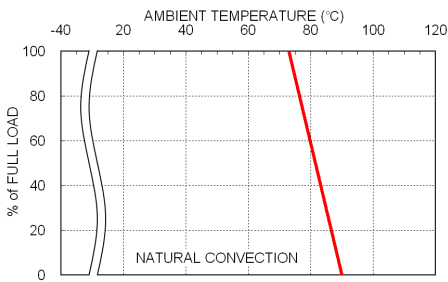
EMC SPECIFICATIONS

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 ± 1kV	Perf. Criteria A
Conducted immunity	EN61000-4-6 10Vr.m.s	Perf. Criteria A

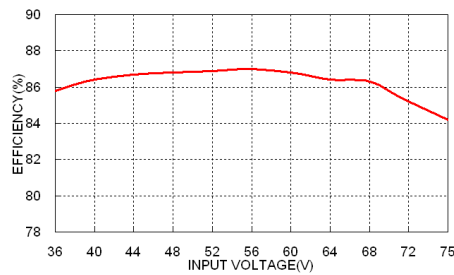
Note:

1. Test by minimum input and constant resistive load.

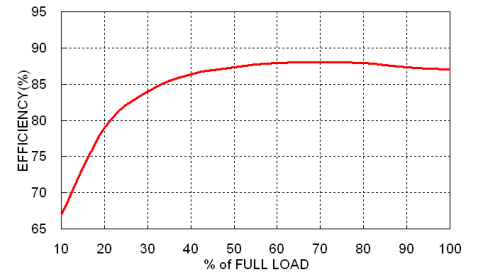
CHARACTERISTIC CURVE



DFEC30-48S05 Derating Curve

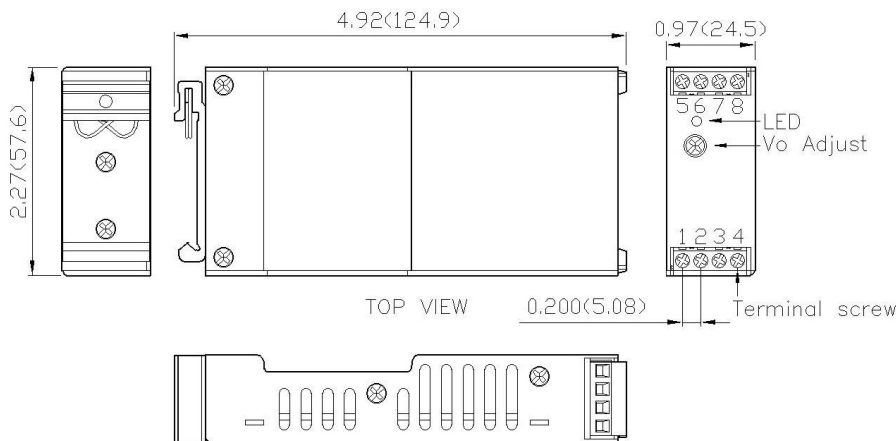


DFEC30-48S05 Efficiency vs. Input Voltage



DFEC30-48S05 Efficiency vs. Output Load

MECHANICAL DRAWING



PIN CONNECTION

PIN	SINGLE	DUAL
1	Ctrl	Ctrl
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)
X.XXX±0.01 (X.XX±0.25)
3. Terminal screw locked torque :
MAX 2.5kgf-cm (0.25N-m)