



# P-DUKE POWER

## DFEC40 Series

Din Rail DC-DC Converter  
Up to 40 Watts

**3**  
YEARS  
WARRANTY

ROHS  
COMPLIANT

REACH  
COMPLIANT



Automation



Datacom



IPC



Industry



Measurement



Telecom



Automobile



Boat



Charger



Medical



PV



Railway

CE UK CA

**1600**  
VDC  
Isolation  
Voltage

**2 : 1**  
Input  
Range

**FUSE**  
Installed

**INRUSH**  
**CURRENT**  
**LIMIT**

Internal  
EN55032  
Class  
Filter **B**

**REMOTE**  
**ON**  
**OFF**

**REVERSE**  
**POLARITY**  
**PROTECTION**

**OCP**

**OVP**

**SCP**

**UVP**

### PART NUMBER STRUCTURE

DFEC40 -	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
		T: Triple	3312:3.3 / ±12 3315:3.3 / ±15 0512:5 / ±12 0515:5 / ±15

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

Model Number	Input Range	Output Voltage	Output Current @Full Load		Input Current @No Load	Efficiency	Maximum Capacitor Load
			Min. Load	Full Load			
			VDC	VDC			
DFEC40-12S3P3	9.5 ~ 18	3.3	0	8000	179	84	21000
DFEC40-12S05	9.5 ~ 18	5	0	8000	232	85	13600
DFEC40-12S12	9.5 ~ 18	12	0	3333	262	85	2360
DFEC40-12S15	9.5 ~ 18	15	0	2666	320	85	1510
DFEC40-12S24	9.5 ~ 18	24	144	1800	42	83	600
DFEC40-12S28	9.5 ~ 18	28	112	1400	50	83	375
DFEC40-12D12	9.5 ~ 18	±12	±144	±1800	37	83	±1200
DFEC40-12D15	9.5 ~ 18	±15	±112	±1400	45	83	±750
DFEC40-12T3312	9.5 ~ 18	3.3 / ±12	600 / ±40	6000 / ±400	222	82	13000 / ±330
DFEC40-12T3315	9.5 ~ 18	3.3 / ±15	600 / ±30	6000 / ±300	237	82	13000 / ±110
DFEC40-12T0512	9.5 ~ 18	5 / ±12	600 / ±40	6000 / ±400	287	85	6800 / ±330
DFEC40-12T0515	9.5 ~ 18	5 / ±15	600 / ±30	6000 / ±300	287	84	6800 / ±110
DFEC40-24S3P3	18 ~ 36	3.3	0	8000	67	85	21000
DFEC40-24S05	18 ~ 36	5	0	8000	82	87	13600
DFEC40-24S12	18 ~ 36	12	0	3333	87	86	2360
DFEC40-24S15	18 ~ 36	15	0	2666	92	87	1510
DFEC40-24S24	18 ~ 36	24	144	1800	32	86	600
DFEC40-24S28	18 ~ 36	28	112	1400	32	86	375
DFEC40-24D12	18 ~ 36	±12	±144	±1800	27	85	±1200
DFEC40-24D15	18 ~ 36	±15	±112	±1400	27	85	±750
DFEC40-24T3312	18 ~ 36	3.3 / ±12	600 / ±40	6000 / ±400	67	84	13000 / ±330
DFEC40-24T3315	18 ~ 36	3.3 / ±15	600 / ±30	6000 / ±300	67	83	13000 / ±110
DFEC40-24T0512	18 ~ 36	5 / ±12	600 / ±40	6000 / ±400	67	86	6800 / ±330
DFEC40-24T0515	18 ~ 36	5 / ±15	600 / ±30	6000 / ±300	77	86	6800 / ±110
DFEC40-48S3P3	36 ~ 75	3.3	0	8000	42	86	21000
DFEC40-48S05	36 ~ 75	5	0	8000	44	89	13600
DFEC40-48S12	36 ~ 75	12	0	3333	54	88	2360
DFEC40-48S15	36 ~ 75	15	0	2666	57	87	1510
DFEC40-48S24	36 ~ 75	24	144	1800	23	86	600
DFEC40-48S28	36 ~ 75	28	112	1400	23	86	375
DFEC40-48D12	36 ~ 75	±12	±144	±1800	20	86	±1200
DFEC40-48D15	36 ~ 75	±15	±112	±1400	20	86	±750
DFEC40-48T3312	36 ~ 75	3.3 / ±12	600 / ±40	6000 / ±400	42	85	13000 / ±330
DFEC40-48T3315	36 ~ 75	3.3 / ±15	600 / ±30	6000 / ±300	42	85	13000 / ±110
DFEC40-48T0512	36 ~ 75	5 / ±12	600 / ±40	6000 / ±400	42	87	6800 / ±330
DFEC40-48T0515	36 ~ 75	5 / ±15	600 / ±30	6000 / ±300	47	87	6800 / ±110

\* The output requires a minimum loading on the output to maintain specified regulation. Operation under no-load condition will not damage these devices, however they may not meet all listed specification.

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)		8		A
		24Vin(nom)		8		
		48Vin(nom)		4		
In-rush current				15		A
Start up voltage	12Vin(nom)				9.5	VDC
	24Vin(nom)				18	
	48Vin(nom)				36	
Shutdown voltage	12Vin(nom)		7	8	9	VDC
	24Vin(nom)		15	16	17.5	
	48Vin(nom)		32.5	34	35.5	
Start up time	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 3.5 ~ 12VDC		mA
			DC-DC OFF	Short or 0 ~ 1.2VDC		
		Input current of Ctrl pin	-0.5		0.5	
		Remote off input current		2.5		

OUTPUT SPECIFICATIONS							
Parameter	Conditions		Min.	Typ.	Max.	Unit	
Voltage accuracy	3.3Vout		-2.0		+2.0	%	
	Single / Dual		-1.5		+1.5		
	Triple: 3.3Vout, 5Vout		-2.0		+2.0		
	Triple: 12Vout, 15Vout		-5.0		+5.0		
Line regulation	Low Line to High Line at Full Load	Single / Dual	-0.5		+0.5	%	
		Triple: 3.3Vout, 5Vout	-1.0		+1.0		
		Triple: 12Vout, 15Vout	-5.0		+5.0		
Load regulation	Min. Load to Full Load	3.3Vout	-2.0		+2.0	%	
		Single / Dual	-1.5		+1.5		
		Triple: Main output : (3.3Vout, 5Vout) 10% to 100% with 10% to 100% balanced on auxiliaries. Auxiliary outputs 10% to 100% balanced on all outputs.	Triple: 3.3Vout, 5Vout	-2.5			+2.5
		Triple: 12Vout, 15Vout	-5.0		+5.0		
Cross regulation	Dual: Asymmetrical load 25%/100% FL Triple: Main output : (3.3Vout, 5Vout) 100% load, auxiliary 100%, other auxiliary 25% to 100% load or main output : (3.3Vout, 5Vout) 25%, auxiliary 25%, other auxiliary 25% to 100%.	Dual	-5.0		+5.0	%	
		Triple: 3.3Vout, 5Vout	-2.5		+2.5		
		Triple: 12Vout, 15Vout	-5.0		+5.0		
Voltage adjustability	Single output	28Vout	-3		+17	%	
		Others	-10		+10		
Ripple and noise	Measured by 20MHz bandwidth	Single / Triple: Main	3.3Vout, 5Vout		50	mVp-p	
		Single / Triple: Auxiliary	12Vout, 15Vout		75		
		Single	24Vout, 28Vout		350		
		Dual	12Vout		120		
			15Vout		150		
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			
		24Vout		30			
		28Vout		36			
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 Input (Output) to Chassis	1600 1600			VDC
Isolation resistance	500VDC	1			GΩ
Isolation capacitance				4000	pF
Switching frequency		270	300	330	kHz
Safety meets				IEC/ EN/ UL62368-1	
Chassis material				Aluminum	
Weight				182g (6.40oz)	
MTBF	MIL-HDBK-217F, Full load			8.080 x 10 <sup>5</sup> hrs	

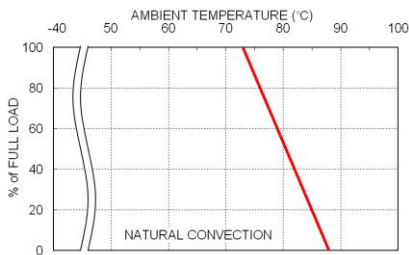
**ENVIRONMENTAL SPECIFICATIONS**

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating ambient temperature	Without derating With derating	-40 +58		+58 +97	°C
Storage temperature range		-40		+105	°C
Thermal shock				MIL-STD-810F	
Vibration				IEC60068-2-6	
Relative humidity				5% to 95% RH	

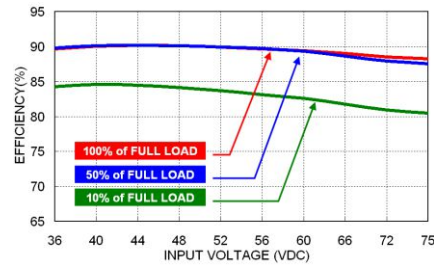
**EMC SPECIFICATIONS**

Parameter	Conditions	Level
EMI	EN55032	Class B
EMS	EN55035	
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
Power frequency magnetic field	EN61000-4-8 100A/m continuous; 1000A/m 1 second	Perf. Criteria A

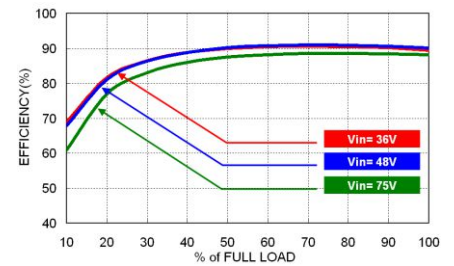
## CHARACTERISTIC CURVE



DFEC40-48S05 Derating Curve

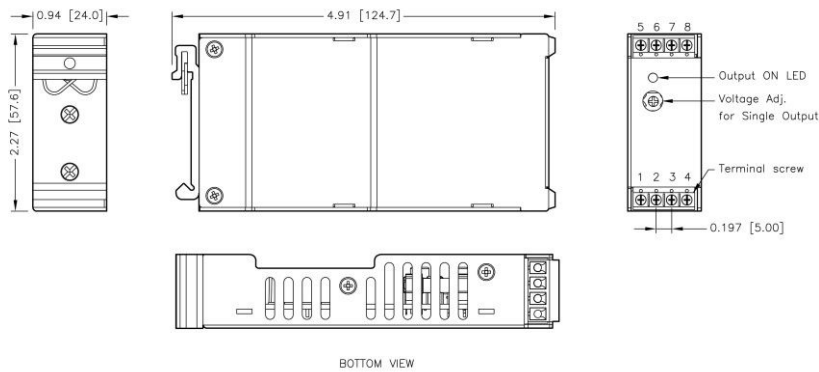


DFEC40-48S05 Efficiency vs. Input Voltage



DFEC40-48S05 Efficiency vs. Output Load

## MECHANICAL DRAWING



## TERMINAL CONNECTION

NO.	SINGLE	DUAL	TRIPLE
1	Ctrl	Ctrl	Ctrl
2	-Vin	-Vin	-Vin
3	-Vin	-Vin	-Vin
4	+Vin	+Vin	+Vin
5	NC	NC	+Aux
6	-Vout	-Vout	Common
7	+Vout	Common	-Aux
8	NC	+Vout	+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. Clamp screw locked torque:  
MAX 5.0kgf-cm/0.49N-m
4. Terminal screw locked torque:  
MAX 2.5kgf-cm/0.25N-m