



# P-DUKE POWER

## DFEC60 Series

Din Rail DC-DC Converter  
Up to 60 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 **B**  
Filter

**NO**  
Min. Load  
Required

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

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

**OCP**

**OVP**

**SCP**

**UVP**

### PART NUMBER STRUCTURE

Series Name	Input Voltage (VDC)	Output Quantity	Output Voltage (VDC)	Remote Control Options
DFEC60 -	<b>48</b>	<b>S</b>	<b>05</b>	<b>N</b>
	24:18~36 48:36~75	S:Single	3P3:3.3 05:5 12:12 15:15 24:24	□:Positive logic N:Negative logic

**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
	VDC	VDC	A	mA	%	μF
DFEC60-24S3P3	18 ~ 36	3.3	14	104	87	36000
DFEC60-24S05	18 ~ 36	5	12	134	88	20400
DFEC60-24S12	18 ~ 36	12	5	59	88	3550
DFEC60-24S15	18 ~ 36	15	4	74	88	2300
DFEC60-24S24	18 ~ 36	24	2.5	76	87	855
DFEC60-48S3P3	36 ~ 75	3.3	14	102	87	36000
DFEC60-48S05	36 ~ 75	5	12	94	89	20400
DFEC60-48S12	36 ~ 75	12	5	37	88	3550
DFEC60-48S15	36 ~ 75	15	4	42	88	2300
DFEC60-48S24	36 ~ 75	24	2.5	45	88	855

INPUT SPECIFICATIONS						
Parameter	Conditions		Min.	Typ.	Max.	Unit
Operating input voltage range	24Vin(nom)		18	24	36	VDC
	48Vin(nom)		36	48	75	
Input fuse	slow blow	24Vin(nom)	8			A
		48Vin(nom)	4			
In-rush current			15			A
Start up voltage	24Vin(nom)		18			VDC
	48Vin(nom)		36			
Shutdown voltage	24Vin(nom)		14.5	15.5	17.5	VDC
	48Vin(nom)		31	32	35.5	
Start up time	Constant resistive load	Power up	100			ms
		Remote ON/OFF	20			
Input surge voltage	100ms, max.	24Vin(nom)	50			VDC
		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	1.0		mA
		Remote off input current	4			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		+2.5	%
		Others		+1.5	
Voltage adjustability	24Vout	-10		+20	%
	Others	-10		+10	
Ripple and noise	Measured by 20MHz bandwidth	3.3Vout, 5Vout	75		mVp-p
		12Vout, 15Vout	100		
		24Vout	130		
Temperature coefficient		-0.02		+0.02	%/°C
Transient response recovery time	25% load step change		250		µs
Over voltage protection	3.3Vout	3.7		5.4	VDC
	5Vout	5.6		7.0	
	12Vout	13.8		17.5	
	15Vout	16.8		20.5	
	24Vout	30.0		33.0	
Output indicator			Green LED		
Over load protection	% of Iout rated			150	%
Short circuit protection			Continuous, automatic recovery		

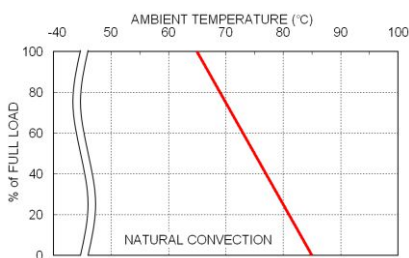
GENERAL SPECIFICATIONS					
Parameter	Conditions	Min.	Typ.	Max.	Unit
Isolation voltage	1 minute	Input to Output	1600		VDC
		Input (Output) to Chassis	1600		
Isolation resistance	500VDC	1			GΩ
Isolation capacitance				4000	pF
Switching frequency		270	300	330	kHz
Safety meets				IEC/ EN/ UL62368-1	
Chassis material				Aluminum	
Weight				182g (6.40oz)	
MTBF	MIL-HDBK-217F, Full load			5.296 x 10 <sup>5</sup> hrs	

ENVIRONMENTAL SPECIFICATIONS					
Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating ambient temperature	Without derating	-40		+55	°C
	With derating	+55		+99	
Storage temperature range		-40		+105	°C
Thermal shock				MIL-STD-810F	
Vibration				IEC60068-2-6	
Relative humidity				5% to 95% RH	

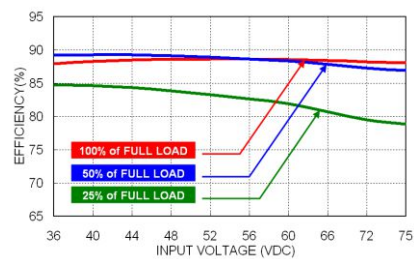
## EMC SPECIFICATIONS

Parameter	Conditions		Level
EMI	EN55032		Class B
EMS	EN55035		
ESD	EN61000-4-2	Air $\pm$ 8kV and Contact $\pm$ 6kV	Perf. Criteria A
Radiated immunity	EN61000-4-3	10V/m	Perf. Criteria A
Fast transient	EN61000-4-4	$\pm$ 2kV	Perf. Criteria A
Surge	EN61000-4-5	$\pm$ 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

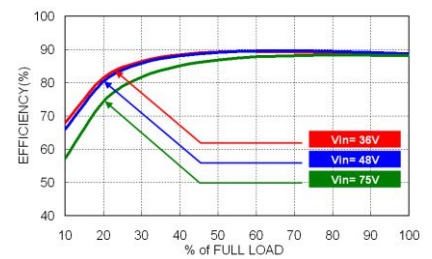
## CHARACTERISTIC CURVE



DFEC60-48S05 Derating Curve

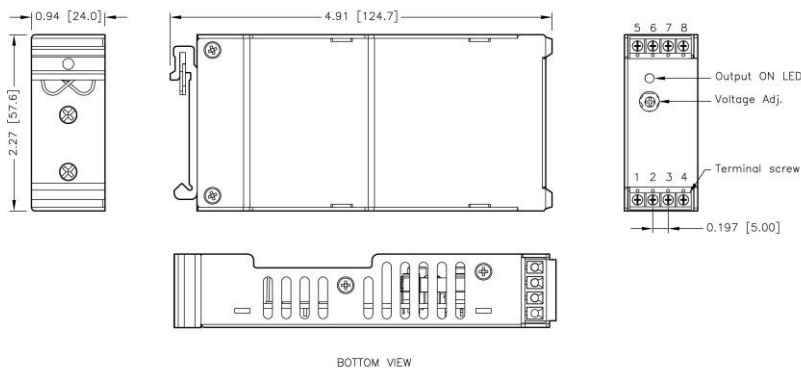


DFEC60-48S05 Efficiency vs. Input Voltage



DFEC60-48S05 Efficiency vs. Output Load

## MECHANICAL DRAWING



## TERMINAL CONNECTION

NO.	SINGLE
1	Ctrl
2	-Vin
3	-Vin
4	+Vin
5	NC
6	-Vout
7	+Vout
8	NC

- ※ NC : No Connection
- ※ Screw terminals – wire range from 14 to 18 AWG

1. All dimensions in Inch [mm]
2. Tolerance : X.XX $\pm$ 0.02 [X.X $\pm$ 0.5]  
X.XXX $\pm$ 0.01 [X.XX $\pm$ 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