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 UKCA

1600 VDC Isolation Voltage | 2 : 1 Input Range | FUSE Installed | INRUSH CURRENT LIMIT | Internal EN55032 Class B Filter | 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	**S:**Single	**3P3:**3.3
	24:18~36		**05:**5
	48:36~75		**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℃ 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	mA	mA	mA	%	μF
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		
		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	-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	Dual	-5.0		+5.0	%
	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%.	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		
		15Vou		150		
Temperature coefficient			-0.02		+0.02	%/℃
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, automatics 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 10^5 hrs

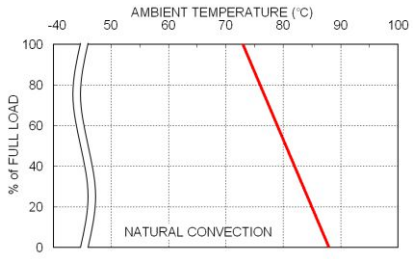
ENVIRONMENTAL SPECIFICATIONS

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

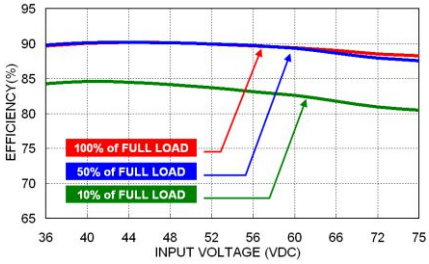
EMC SPECIFICATIONS

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

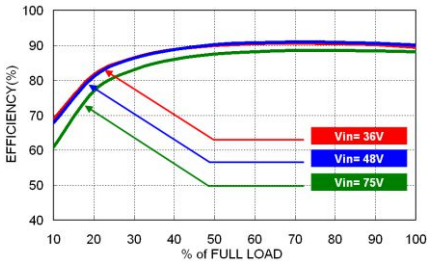
CHARACTERISTIC CURVE



DFEC40-48S05 Derating Curve

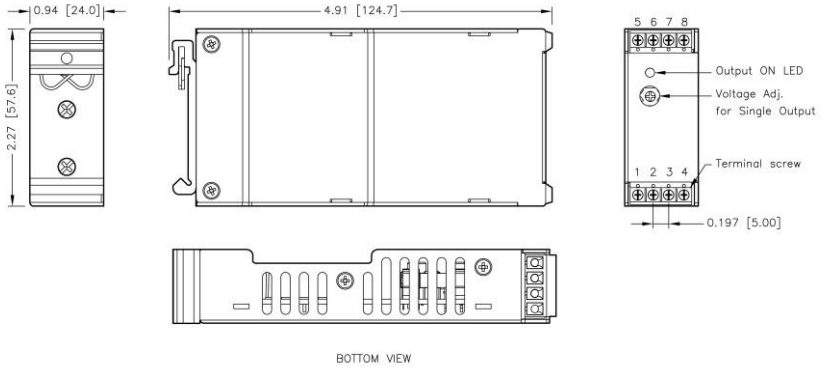


DFEC40-48S05 Efficiency vs. Input Voltage



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

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