



DFEC60 SERIES

CHASSIS-MOUNT DC-DC CONVERTER

2:1 WIDE INPUT RANGE
UP TO 60 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 unless otherwise noted

Model Number	Input Range VDC	Output Voltage VDC	Output Current @Full Load A	Input Current @ No Load mA	Efficiency %	Maximum Capacitor Load ⁽¹⁾ F
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	885
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	885

PART NUMBER STRUCTURE

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

INPUT SPECIFICATIONS

Parameter	Conditions		Min.	Typ.	Max.	Unit
Operating input voltage range		24Vin(nom) 48Vin(nom)	18 36	24 48	36 75	VDC
Input fuse (slow blow)		24Vin(nom) 48Vin(nom)		8 4		A
In-rush current				15		A
Input reflected ripple current	Nominal input and Full load			15		mAp-p
Start up voltage		24Vin(nom) 48Vin(nom)			17.5 34.5	VDC
Shutdown voltage		24Vin(nom) 48Vin(nom)		15 32		VDC
Start up time	Nominal input and Constant resistive load	Power up Remote ON/OFF		100 20		ms
Input surge voltage	100ms, max.	24Vin(nom) 48Vin(nom)			50 100	VDC
Remote ON/OFF	Referred to -Vin pin	Positive logic (Standard) Negative logic (Option) Input current of Ctrl pin Remote off input current			Open or 3 ~ 12VDC Short or 0 ~ 1.2VDC Short or 0 ~ 1.2VDC Open or 3 ~ 12VDC	mA mA

OUTPUT SPECIFICATIONS

Parameter	Conditions		Min.	Typ.	Max.	Unit
Voltage accuracy		3.3Vout Others	-1.5 -1.0		+1.5 +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 Others	-2.5 -1.5		+2.5 +1.5	%
Voltage adjustability	Single output	24Vout Others	-10 -10		+20 +10	%
Ripple and noise	Measured by 20MHz bandwidth	Single 3.3Vout, 5Vout 12Vout, 15Vout 24Vout		75 100 130		mVp-p
Temperature coefficient			-0.02		+0.02	%/°C
Transient response recovery time	25% load step change			250		s
Over voltage protection	Zener diode clamp	3.3Vout 5Vout 12Vout 15Vout 24Vout	3.7 5.6 13.8 16.8 30.0		5.4 7.0 17.5 20.5 33.0	VDC
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 1600			VDC
Isolation resistance	500VDC		1			G
Isolation capacitance					4000	pF
Switching frequency			270	300	330	kHz
Safety meets						UL60950-1 EN60950-1 IEC60950-1
Chassis material						Aluminum
Weight						182g (6.40oz)
MTBF	MIL-HDBK-217F, Full load					5.296 x 10 ⁵ hrs

ENVIRONMENTAL SPECIFICATIONS

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

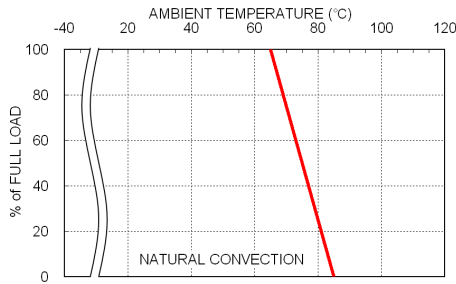
EMC SPECIFICATIONS

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

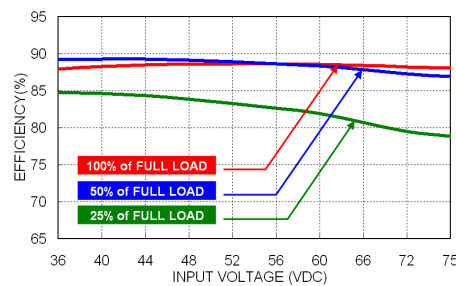
Note:

1. Test by minimum input and constant resistive load.

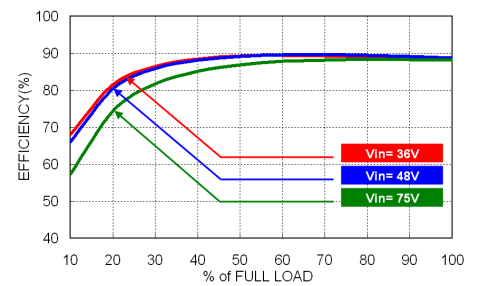
CHARACTERISTIC CURVE



DFEC60-48S05 Derating Curve

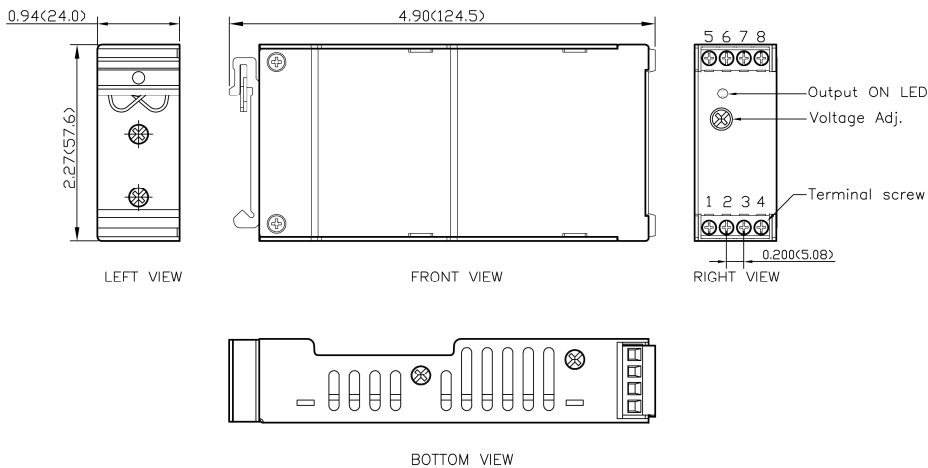


DFEC60-48S05 Efficiency vs. Input Voltage



DFEC60-48S05 Efficiency vs. Output Load

MECHANICAL DRAWING



PIN CONNECTION

PIN	DEFINE
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±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)