

# FED30TW SERIES

DC-DC CONVERTER

4 : 1 ULTRA WIDE INPUT RANGE  
UP TO 30Watts



## FEATURES

- 1600VDC INPUT TO OUTPUT ISOLATION
- STANDARD 2.00 X 1.00 X 0.40 INCH
- SIX-SIDED CONTINUOUS SHIELD
- UL60950-1, EN60950-1, IEC60950-1, & EN50155 SAFETY APPROVALS
- CE MARKED
- COMPLIANT TO RoHS II & REACH

## APPLICATIONS

- WIRELESS NETWORK
- TELECOM/DATACOM
- INDUSTRY CONTROL SYSTEM
- DISTRIBUTED POWER ARCHITECTURES
- SEMICONDUCTOR EQUIPMENT

1600VDC ISOLATION	REMOTE CONTROL	UVP	OCP	SCP	OVP	OTP
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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 <sup>(2)</sup>
	VDC	VDC	Min. Load <sup>(1)</sup> mA	Full Load mA	mA	%	µF
FED30-24T3312W	9 ~ 36	3.3 / ±12	500 / ±42	5000 / ±416	105	87	15000 / ±340
FED30-24T3315W	9 ~ 36	3.3 / ±15	500 / ±33	5000 / ±333	105	87	15000 / ±220
FED30-24T0512W	9 ~ 36	5 / ±12	400 / ±42	4000 / ±416	105	88	8000 / ±340
FED30-24T0515W	9 ~ 36	5 / ±15	400 / ±33	4000 / ±333	105	88	8000 / ±220
FED30-48T3312W	18 ~ 75	3.3 / ±12	500 / ±42	5000 / ±416	55	87	15000 / ±340
FED30-48T3315W	18 ~ 75	3.3 / ±15	500 / ±33	5000 / ±333	55	87	15000 / ±220
FED30-48T0512W	18 ~ 75	5 / ±12	400 / ±42	4000 / ±416	55	88	8000 / ±340
FED30-48T0515W	18 ~ 75	5 / ±15	400 / ±33	4000 / ±333	55	88	8000 / ±220

## PART NUMBER STRUCTURE

<b>FED30</b>	-	<b>48</b>	<b>T</b>	<b>0515</b>	<b>W</b>	-	<b>N</b>	<b>HS</b>
Series Name		Input Voltage (VDC)	Output Quantity	Output Voltage Primary / Auxiliary (VDC)	Input Range		Remote Control Option	Assembly Option
		24: 9-36 48: 18-75	T: Triple	3312: 3.3 / ±12 3315: 3.3 / ±15 0512: 5 / ±12 0515: 5 / ±15	4:1		□: Positive logic N: Negative logic	□: None HS: Heat-sink HC: Heat-sink with Clamp

## INPUT SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating input voltage range	24Vin(nom)	9	24	36	VDC
	48Vin(nom)	18	48	75	
Input reflected ripple current			20		mAp-p
Start up voltage	24Vin(nom)			9	VDC
	48Vin(nom)			18	
Shutdown voltage	24Vin(nom)		8		VDC
	48Vin(nom)		16		
Start up time	Constant resistive load	Power up		30	ms
			Remote ON/OFF		
Input surge voltage	100 ms, max.	24Vin(nom)		50	VDC
		48 Vin(nom)		100	
Input filter					Pi type
Remote ON/OFF	Referred to -Vin pin	Positive logic (Standard)	DC-DC ON	Open or 3 ~ 12VDC	
			DC-DC OFF	Short or 0 ~ 1.2VDC	
		Negative logic (Option)	DC-DC ON	Short or 0 ~ 1.2VDC	
			DC-DC OFF	Open or 3 ~ 12VDC	
		Input current of Ctrl pin	-0.5	+0.5	mA
		Remote off input current	3		mA

**OUTPUT SPECIFICATIONS**

Parameter	Conditions	Min.	Typ.	Max.	Unit
Voltage accuracy		3.3Vout, 5Vout	-1.0	+1.0	%
		12Vout, 15Vout	-5.0	+5.0	
Line regulation	Low Line to High Line at Full Load	3.3Vout, 5Vout	-1.0	+1.0	%
		12Vout, 15Vout	-5.0	+5.0	
Load regulation	Min. Load to Full Load	3.3Vout, 5Vout	-1.0	+1.0	%
		12Vout, 15Vout	-5.0	+5.0	
Ripple and noise	20MHz bandwidth (Measured with a 0.1µF/50V MLCC)	3.3Vout, 5Vout	50		mVp-p
		12Vout, 15Vout	75		
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		
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	1600		VDC
		Input (Output) to Case	1600		
Isolation resistance	500VDC	1			GΩ
Isolation capacitance				1500	pF
Switching frequency		360	400	440	kHz
Safety approvals		IEC60950-1, UL60950-1, EN60950-1			
Case material		Nickel-coated copper			
Base material		FR4 PCB			
Potting material		Epoxy(UL94 V-0)			
Weight		30.5g (1.07oz)			
MTBF	MIL-HDBK-217F, Full load	1.177 x 10 <sup>6</sup> hrs			

**ENVIRONMENTAL SPECIFICATIONS**

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating ambient temperature	Without derating	-40		+50	°C
	With derating	+50		+85	
Maximum case temperature				105	°C
Over temperature protection			115		°C
Storage temperature range		-55		+125	°C
Thermal impedance	Vertical direction by natural convection (20LFM)	Without heat-sink	12		°C/W
		With heat-sink	10		
Thermal shock					MIL-STD-810F
Vibration					MIL-STD-810F
Relative humidity					5% to 95% RH

**EMC SPECIFICATIONS**

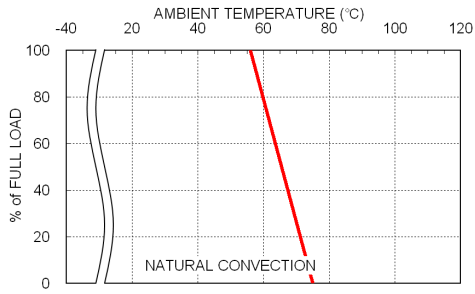
Parameter	Conditions	Level
EMI <sup>(3)</sup>	EN55022	Class A, Class B
ESD	EN61000-4-2	Air ± 8kV and Contact ± 6kV
Radiated immunity	EN61000-4-3	10 V/m
Fast transient <sup>(4)</sup>	EN61000-4-4	±2kV
Surge <sup>(4)</sup>	EN61000-4-5	±1kV
Conducted immunity	EN61000-4-6	10 Vr.m.s
Power frequency magnetic field	EN61000-4-8	100A/m continuous; 1000A/m 1 second

**Note:**

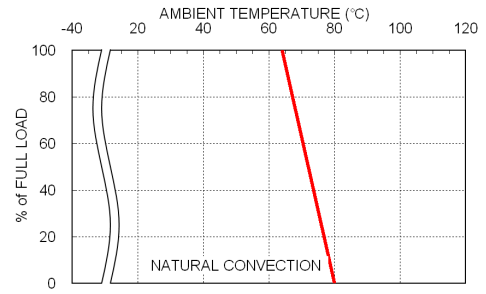
- The output requires a minimum loading on the output to maintain specified regulation. Operation under no-load condition will not damage these devices, however they may not meet all listed specification.
- Test by minimum input and constant resistive load
- The standard modules meet EN55022 Class A and Class B with external components. For more detail information, please contact with P-DUKE.
- An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5.  
The filter capacitor Power Mate suggest: 24VDC input Nippon chemi-con KY series, 330µF/50V  
48VDC input Nippon chemi-con KY series, 220µF/100V

**CAUTION:** This power module is not internally fused. An input line fuse must always be used.

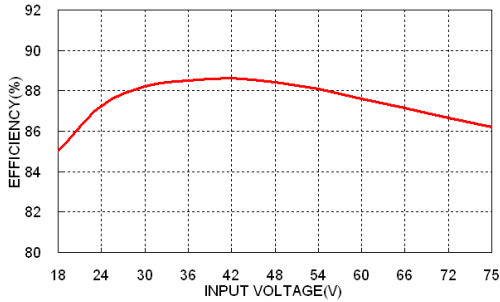
## CHARACTERISTIC CURVE



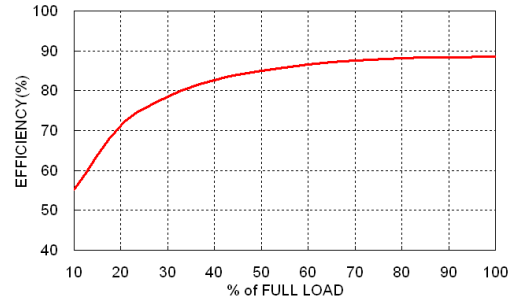
FED30-48T0515W Derating Curve



FED30-48T0515W Derating Curve With Heat-sink

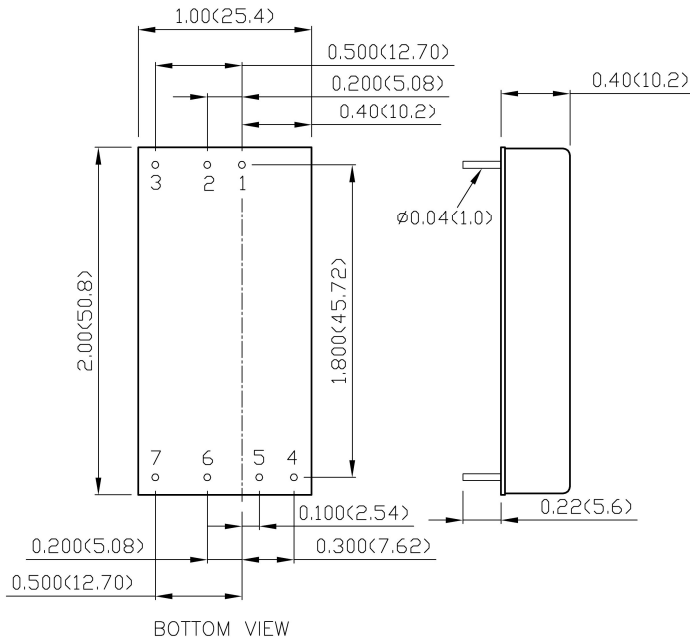


FED30-48T0515W Efficiency vs. Input Voltage



FED30-48T0515W Efficiency vs. Output Load

## MECHANICAL DRAWING



### PIN CONNECTION

PIN	TRIPLE
1	+Vin
2	-Vin
3	Ctrl
4	+Aux
5	-Aux
6	Common
7	+Vout

1. All dimensions in inch (mm)
2. Tolerance :x.xx±0.02 (x.xx±0.5)  
x.xxx±0.01 (x.xx±0.25)
3. Pin pitch tolerance ±0.01 (0.25)
4. Pin dimension tolerance ±0.004(0.1)