FDC15 SERIES

DC-DC CONVERTER

4 : 1 ULTRA WIDE INPUT RANGE
UP TO 15Watts

FEATURES

- 1600VDC INPUT TO OUTPUT ISOLATION
- STANDARD 2.00 X 1.60 X 0.40 INCH
- SIX-SIDED CONTINUOUS SHIELD
- UL60950-1, EN60950-1, & IEC60950-1 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	OCP	SCP	OVP

TECHNICAL SPECIFICATION

All specifications are typical at nominal input, full load and 25℃ otherwise noted

Model Number	Input Range VDC	Output Voltage VDC	Output Current @Full Load Min. Load (1) mA	Output Current @Full Load Full Load mA	Input Current @ No Load mA	Efficiency %	Maximum Capacitor Load (2) µF
FDC15-24S05	9 ~ 36	5	210	3000	20	80	6800
FDC15-24S12	9 ~ 36	12	100	1250	10	82	890
FDC15-24S15	9 ~ 36	15	80	1000	20	82	570
FDC15-24D05	9 ~ 36	±5	±105	±1500	20	80	±1700
FDC15-24D12	9 ~ 36	±12	±50	±625	20	82	±300
FDC15-24D15	9 ~ 36	±15	±40	±500	20	82	±200
FDC15-48S05	18 ~ 75	5	210	3000	15	80	6800
FDC15-48S12	18 ~ 75	12	100	1250	15	82	890
FDC15-48S15	18 ~ 75	15	80	1000	10	82	570
FDC15-48D05	18 ~ 75	±5	±105	±1500	10	80	±1700
FDC15-48D12	18 ~ 75	±12	±50	±625	20	82	±300
FDC15-48D15	18 ~ 75	±15	±40	±500	15	82	±200

PART NUMBER STRUCTURE

FDC15 - 48 S 05 - HS

Series Name	Input Voltage (VDC)	Output Quantity	Output Voltage (VDC)	Assembly Option
	24: 9~36	**S:** Single	**05:** 5	□: None
	48: 18~75		**12:** 12	**HS:** Heat-sink
			15: 15	**HC:** Heat-sink with Clamp
		D: Dual	**05:** ±5	
			12: ±12	
			15: ±15	

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	Nominal input and Full load			20		mAp-p
Start up time	Constant resistive load	Power up		20		ms
Input surge voltage	100 ms, max.	24Vin(nom)			50	VDC
		48Vin(nom)			100	
Input filter				Pi type		
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		20		mA

OUTPUT SPECIFICATIONS

Parameter	Conditions		Min.	Typ.	Max.	Unit
Voltage accuracy			-1.0		+1.0	%
Line regulation	Low Line to High Line at Full Load		-0.2		+0.2	%
Load regulation	Min. Load to Full Load	Single Dual	-0.5 -1.0		+0.5 +1.0	%
Cross regulation	Asymmetrical load 25%/100% FL	Dual	-5.0		+5.0	%
Voltage adjustability			-10		+10	%
Ripple and noise	Measured by 20MHz bandwidth			75		mVp-p
Temperature coefficient			-0.02		+0.02	%/℃
Transient response recovery time	25% load step change			250		μs
Over voltage protection	Zener diode clamp	5Vout 12Vout 15Vout		6.2 15 18		VDC
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 Case	1600 1600			VDC
Isolation resistance	500VDC		1			GΩ
Isolation capacitance					300	pF
Switching frequency			243	270	297	kHz
Safety approvals						UL60950-1 EN60950-1 IEC60950-1
Case material						Nickel-coated copper
Base material						Non-conductive black plastic
Potting material						Epoxy (UL94 V-0)
Weight						48g (1.69oz)
MTBF	MIL-HDBK-217F, Full load					2.250 x 10^6 hrs

ENVIRONMENTAL SPECIFICATIONS

Parameter	Conditions		Min.	Typ.	Max.	Unit
Operating ambient temperature		With derating	-40		+85	℃
Maximum case temperature					+100	℃
Storage temperature range			-55		+125	℃
Thermal impedance	Vertical direction by natural convection (20LFM)	Without heat-sink With heat-sink		10 8.24		℃/W
Thermal shock						MIL-STD-810F
Vibration						MIL-STD-810F
Relative humidity						5% to 95% RH

EMC SPECIFICATIONS

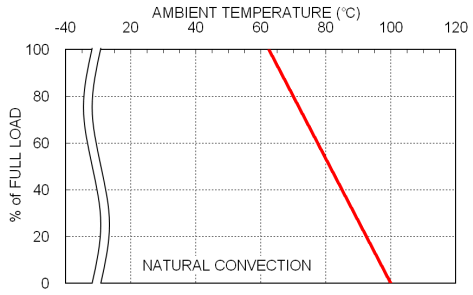
Parameter	Conditions		Level
EMI	EN55022		Class A, Class B
ESD	EN61000-4-2	Air ± 8kV and Contact ± 6kV	Perf. Criteria B
Radiated immunity	EN61000-4-3	10 V/m	Perf. Criteria A
Fast transient (3)	EN61000-4-4	± 2kV	Perf. Criteria B
Surge (3)	EN61000-4-5	± 1kV	Perf. Criteria B
Conducted immunity	EN61000-4-6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

Note:

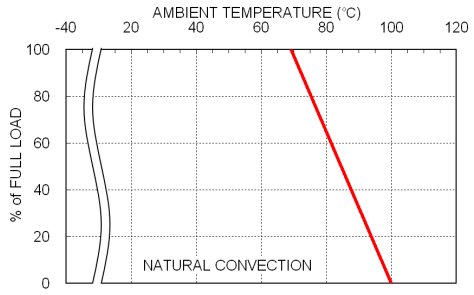
1. The output requires a minimum loading on the output to maintain specified regulation. Operation under no-load condition will not damage these devices, however they may not meet all listed specification.
2. Test by minimum input and constant resistive load.
3. An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5. The filter capacitor Power Mate suggest: Nippon chemi-con KY series, 220μF/100V.

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

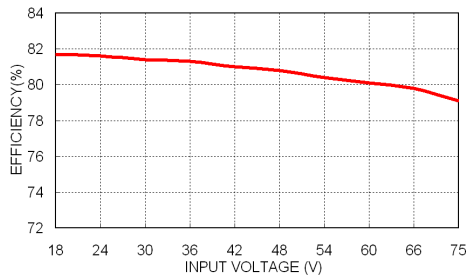
CHARACTERISTIC CURVE



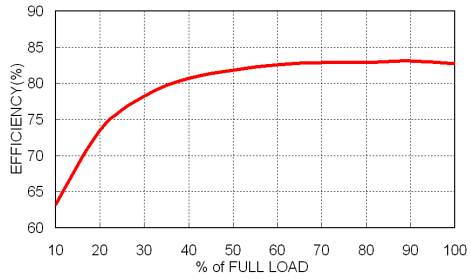
FDC15-48S05 Derating Curve



FDC15-48S05 Derating Curve With Heat-sink

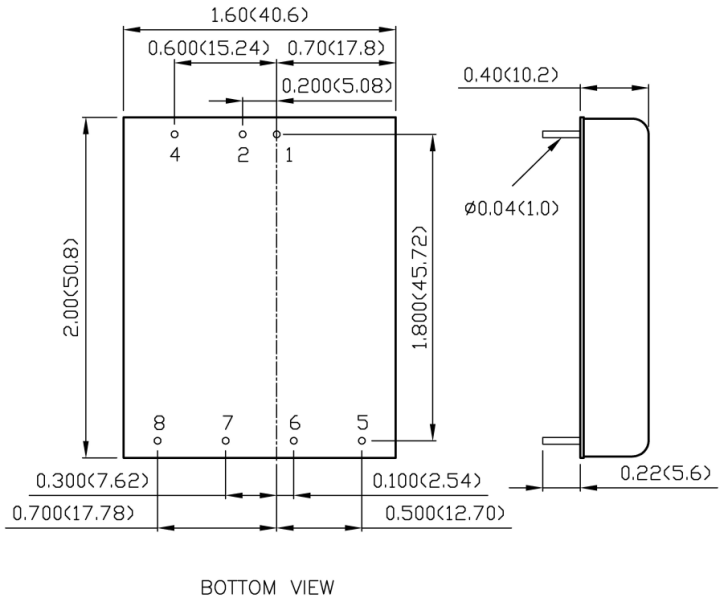


FDC15-48S05 Efficiency vs. Input Voltage



FDC15-48S05 Efficiency vs. Output Load

MECHANICAL DRAWING



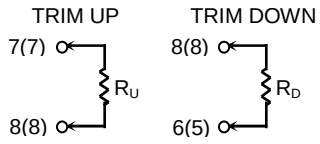
BOTTOM VIEW

PIN CONNECTION

PIN	SINGLE	DUAL
1	+Vin	+Vin
2	-Vin	-Vin
4	Ctrl	Ctrl
5	No pin	+Vout
6	+Vout	Common
7	-Vout	-Vout
8	Trim	Trim

EXTERNAL OUTPUT TRIMMING

Output can be externally trimmed by using the method shown below.
( ) for dual output trim.



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. Pin pitch tolerance ±0.01 (0.25)
4. Pin dimension tolerance ±0.004(0.1)