




- OFFER SINGLE, DUAL (TOTAL OUTPUT CURRENT 8A) AND TRIPLE OUTPUT
- 40 WATTS MAXIMUM OUTPUT POWER
- 2:1 WIDE INPUT VOLTAGE RANGE
- INTERNATIONAL SAFETY STANDARD APPROVAL
- SIX-SIDED CONTINUOUS SHIELD
- HIGH EFFICIENCY UP TO 90%
- STANDARD 2" x 2" x 0.4" PACKAGE
- FIXED SWITCHING FREQUENCY


UL E193009
TUV R50009835
CB JPTUV-003843
CE MARK
Patent No.144566

The FEC40 series offer 40 watts of output power from a 2 x 2 x 0.4 inch package. The FEC40 series with 2:1 wide input voltage of 18-36VDC and 36-75VDC and features 1600VDC of isolation, short-circuit and over-voltage protection, as well as six sided shielding. All models are particularly suited to telecommunications, industrial, mobile telecom and test equipment applications.

TECHNICAL SPECIFICATION

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

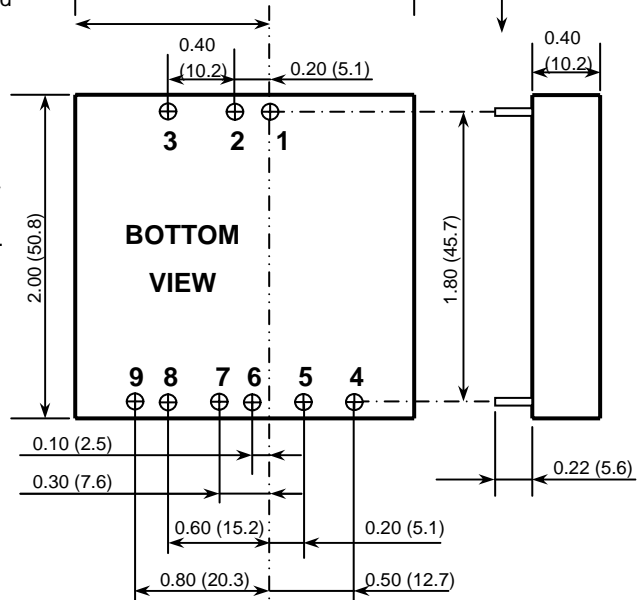
OUTPUT SPECIFICATIONS			
Output power			40 Watts max
Voltage accuracy FL and nominal Vin	Single / Dual		± 1%
	Triple Main		± 1%
	Auxiliary		± 3%
Voltage adjustability (Note 1)	Single output only		± 10%
Minimum load (Note 2)	Single and Dual		0%
	Triple		10% of FL
Line regulation LL to HL at Full Load	Single/Dual		± 0.5%
	Triple(main)		± 1%
	Triple(auxiliary)		± 5%
Load regulation (Note 3)	10% to 100% FL	Single	± 0.5%
		Dual	± 1%
		Triple Main	± 2%
		Auxiliary	± 5%
Load cross regulation (Note 4)	Single/Dual/Triple(main)		± 1%
	Triple(auxiliary)		± 5%
Ripple and noise (Note 5)	20MHz bandwidth (Measured with a 104pF/50V MLCC)		See table
Temperature coefficient			±0.02% / °C, max
Transient response recovery time	25% load step change		400uS
Over voltage protection Zener diode clamp	3.3V output		3.9V
	5V output		6.2V
	12V output		15V
	15V output		18V
Over load protection	% of FL at nominal input		150% max
Short circuit protection			Hiccup, automatics recovery
INPUT SPECIFICATIONS			
Input voltage range	24V nominal input		18 – 36VDC
	48V nominal input		36 – 75VDC
Under voltage lockout	24V input	DC-DC ON	17.8VDC
		DC-DC OFF	16VDC
	48V input	DC-DC ON	36VDC
		DC-DC OFF	34VDC
Input filter (Note 6)			L-C type
Input voltage variation dv/dt			5V/ms,max
			(Complies with ETS300 132 part 4.4)
Input surge voltage 100mS max	24V input		50VDC
	48V input		100VDC
Input reflected ripple (Note 7)	Nominal Vin and full load		40mA-p-p
Start up time	Nominal Vin and constant resistor load		25mS typ
Remote ON/OFF (Note 8)	DC-DC ON		Open or 3.5V < Vr < 12V
	DC-DC OFF		Short or 0V < Vr < 1.2V
Remote off input current	Nominal Vin		2.5mA

GENERAL SPECIFICATIONS		
Efficiency		See table
Isolation voltage		1600VDC, min
Isolation resistance		10 ⁹ ohms, min
Isolation capacitance		1000pF, max
Switching frequency (Note 9)		300KHz, typ
Approvals and standard		IEC60950, UL1950, EN60950
Case material		Nickel-coated copper
Base material		Non-conductive black FR4
Potting material		Epoxy (UL94-V0)
Dimensions		2.00 X 2.00 X 0.40 Inch (50.8 X 50.8 X 10.2 mm)
Weight		60g (2.11oz)
MTBF (Note 10)		1.398 x 10 ⁶ hrs
ENVIRONMENTAL SPECIFICATIONS		
Operating temperature range		-40°C ~ +85°C (with derating)
Maximum case temperature		100°C
Storage temperature range		-55°C ~ +105°C
Over temperature protection		115°C, typ
Thermal impedance (Note 11)	Nature convection	9.2°C/Watt
	Heat-sink with 20LFM	8.5°C/Watt
	Heat-sink with 500LFM	2.8°C/Watt
Thermal shock		MIL-STD-810D
Vibration		10~55Hz, 2G, 30minutes along X,Y and Z
Relative humidity		5% to 95% RH
EMC CHARACTERISTICS		
Conducted emissions	EN55022	Level A
Radiated emissions	EN55022	Level A
ESD	EN61000-4-2	Perf. Criteria2
Radiated immunity	EN61000-4-3	Perf. Criteria2
Fast transient	EN61000-4-4	Perf. Criteria2
Surge	EN61000-4-5	Perf. Criteria2
Conducted immunity	EN61000-4-6	Perf. Criteria2



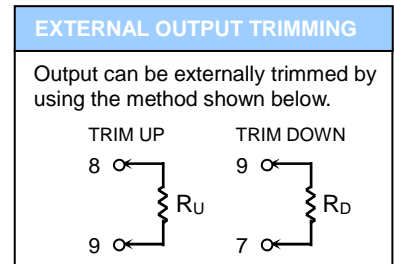
Model Number	Input Range	Output Voltage	Output Current	Output Ripple & Noise	Input Current ⁽¹³⁾	Eff ⁽¹⁴⁾ (%)	Capacitor ⁽¹⁵⁾ Load max
FEC40-24S3P3	18 – 36 VDC	3.3 VDC	8000mA	50mVp-p	1325mA	87	21000uF
FEC40-24S05	18 – 36 VDC	5 VDC	8000mA	50mVp-p	1961mA	89	13600uF
FEC40-24S12	18 – 36 VDC	12 VDC	3333mA	75mVp-p	2048mA	88	2360uF
FEC40-24S15	18 – 36 VDC	15 VDC	2666mA	75mVp-p	1985mA	89	1510uF
FEC40-24D3305	18 – 36 VDC	3.3 / 5 VDC	4A / 4A (total 8A) ⁽¹²⁾	100mVp-p	1729mA	84	11000 / 6800uF
FEC40-24T3312	18 – 36 VDC	3.3 / ±12 VDC	6000mA / ±400mA	50 / 75mVp-p	1512mA	85	13000 / ±330uF
FEC40-24T3315	18 – 36 VDC	3.3 / ±15 VDC	6000mA / ±300mA	50 / 75mVp-p	1481mA	85	13000 / ±110uF
FEC40-24T0512	18 – 36 VDC	5 / ±12 VDC	6000mA / ±400mA	50 / 75mVp-p	1989mA	87	6800 / ±330uF
FEC40-24T0515	18 – 36 VDC	5 / ±15 VDC	6000mA / ±300mA	50 / 75mVp-p	1958mA	87	6800 / ±110uF
FEC40-48S3P3	36 – 75 VDC	3.3 VDC	8000mA	50mVp-p	655mA	88	21000uF
FEC40-48S05	36 – 75 VDC	5 VDC	8000mA	50mVp-p	969mA	90	13600uF
FEC40-48S12	36 – 75 VDC	12 VDC	3333mA	75mVp-p	1000mA	89	2360uF
FEC40-48S15	36 – 75 VDC	15 VDC	2666mA	75mVp-p	992mA	89	1510uF
FEC40-48D3305	36 – 75 VDC	3.3 / 5 VDC	4A / 4A (total 8A) ⁽¹²⁾	100mVp-p	854mA	85	11000 / 6800uF
FEC40-48T3312	36 – 75 VDC	3.3 / ±12 VDC	6000mA / ±400mA	50 / 75mVp-p	747mA	86	13000 / ±330uF
FEC40-48T3315	36 – 75 VDC	3.3 / ±15 VDC	6000mA / ±300mA	50 / 75mVp-p	732mA	86	13000 / ±110uF
FEC40-48T0512	36 – 75 VDC	5 / ±12 VDC	6000mA / ±400mA	50 / 75mVp-p	982mA	88	6800 / ±330uF
FEC40-48T0515	36 – 75 VDC	5 / ±15 VDC	6000mA / ±300mA	50 / 75mVp-p	967mA	88	6800 / ±110uF

- Note
- Maximum output deviation is ±0.5% inclusive of remote sense and trim. If remote sense is not being used, the +Vsense should be connected to its corresponding +OUTPUT and likewise the sense should be connected to its corresponding -OUTPUT.
 - The triple output required a minimum 10% 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
 - Load regulation for triple output:
Main output(V1):10 to 100% with 10% to 100% balanced on auxiliaries.
Auxiliary outputs(V2 and V3):10% to 100% balanced on all outputs.
 - Cross regulation for triple output:
Main output 100% load, auxiliary 100%,other auxiliary25% to 100%.
Auxiliary outputs(V2 and V3):main output 100% load, auxiliary 100%, other auxiliary 25% to 100% or main output 25%,auxiliary 25%,other auxiliary 25% to 100%.
 - The models of FEC40-XXD3305 are specified with a 1uF ceramic output capacitors.
 - An external filter capacitor is required for normal operation. The capacitor should be capable of handling 1A ripple current for 48V/24V models. Power mate suggest: Nippon chemi-con KMF series, 220uF/100V, ESR 90mΩ.
 - Simulated source impedance of 12uH. 12uH inductor in series with +Vin.
 - The ON/OFF control pin voltage is referenced to negative input.
 - Switching frequency for dual output:
master (5Vo) 300KHz slave (3.3Vo) 500KHz
 - BELLCORE TR-NWT-000332. Case I: 50% Stress, Temperature at 40°C. (Ground fixed and controlled environment).
 - Heat sink is optional and P/N : 7G-0026A.
 - Any condition of dual output (3.3V/5V) rated lout current, not to exceed 8A of total output currents. The product safety approval pending..
 - Maximum value at nominal input voltage and full load.
 - Typical value at nominal input voltage and full load.
 - Test by minimum Vin and constant resistor load.

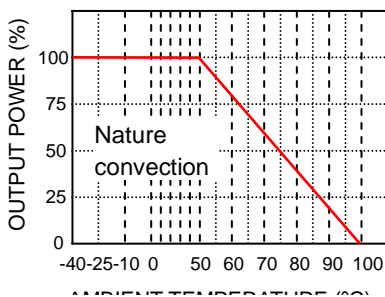


- All dimensions in Inches (mm)
- Pin pitch tolerance ±0.014(0.35)

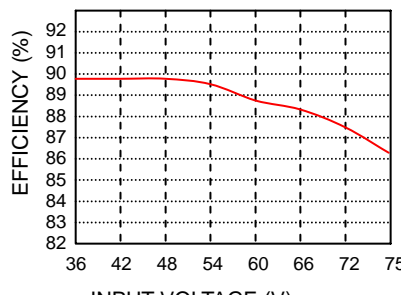
PIN CONNECTION			
PIN	SINGLE	DUAL	TRIPLE
1	+ INPUT	+ INPUT	+ INPUT
2	- INPUT	- INPUT	- INPUT
3	CTRL	CTRL	CTRL
4	NC	3.3V	+ AUX
5	- SENSE (Note1)	3.3V RTN (COM)	COMMON
6	+ SENSE (Note1)	NC	- AUX
7	+ OUTPUT	NC	+ OUTPUT
8	- OUTPUT	5V	- OUTPUT (COM)
9	TRIM	5V RTN (COM)	NC



FEC40-48S05
Derating Curve



FEC40-48S05
Efficiency VS Input voltage



FEC40-48S05
Efficiency VS Output load

