POEB1FB

Power over ethernet (PoE)/PD flyback transformer

Product features

- Flyback topology
- IEEE 802.3xx
- Up to 250 kHz switching frequency
- Input range from 32 V to 57 V
- EFD15 SMT package (22.3 mm x 17.3 mm x 9.0 mm)
- 1500 Vac isolation between primary and secondary
- Four power levels: 12, 13, 14 and 18 watts
- Low leakage inductance
- Ferrite core material
- Moisture sensitivity level (MSL): 1

Applications

- Lighting
- Industrial automation
- Security systems
- VoIP phone systems
- Network and Bluetooth access points
- Network routers, repeaters
- Uninterruptible power supplies (UPS)
- Retail point-of-information (POI) systems
- Vending and gaming machines
- Remote cameras

Environmental compliance and general specifications

- Storage temperature (component): -40 °C to +125 °C
- Operating temperature range: -40 °C to +125 °C (ambient plus self-temperature rise)

Pb HALOGEN HF FREE RoHS

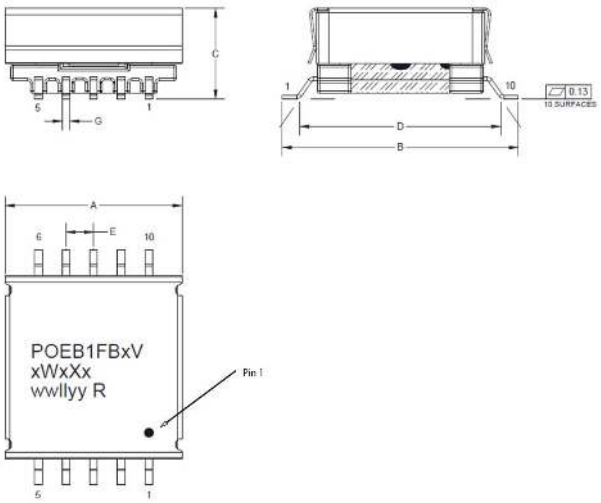
Powering Business Worldwide

Product specifications

Part number[4]	Output power (W)	OCL[1] (µH) ±7%	SCL[2] (µH) maximum	I_{sat}[3] (A)	**Turns ratio** Schematic 1: Pri : Sec 1 : Aux Schematic 2: Pri : Sec 1 : Sec 2 :Aux Schematic 3: Pri : Sec 1 Sec 2 : Aux Schematic 4: Pri : Sec 1 : Aux ±3%	Output	DCR (mΩ) maximum @ +25 °C (Pri)	DCR (mΩ) maximum @ +25 °C (Sec 1)	DCR (mΩ) maximum @ +25 °C (Sec 2)	DCR (mΩ) maximum @ +25 °C (Aux)	Schematic
POEB1FB1V12W1X12	12	140	1.3	1	1: 0.389: 0.444	(1) x 12.0 V @ 1.0 A	365	40	-	200	1
POEB1FB1V13W2X5	13	155 ± 10%	2.5	1	1: 0.143: 0.143: 0.31	(2) x 5.0 V	500	220	16	270	2
POEB1FB1V14W2D	14	143	1.5	1	1: 0.1: 0.2: 0.25	(1) 5.0 V @ .010 A (1) 9.0 V @ 1.5 A	440	110	28	300	3
POEB1FB1V18W1X12	18	70 ± 10%	1.8	2	1: 0.343: 0.314	(1) x 12.0 V @ 1.5 A	260	30	-	270	4

1. Open circuit inductance (OCL) is for the primary, test parameters: 100 kHz, 0.1 V_{rms}, 0.0 Adc, +25 °C
2. Short circuit inductance (SCL) is for the primary with the other windings shorted, test parameters: 100 kHz, 0.1 V_{rms}, 0.0 Adc, +25 °C
3. I_{sat} is for the primary, peak current for less than or equal to 10% rolloff @ +25 °C
4. Part Number Definition: POEB1FBxVxWxXx
POEB1FB=Product code and size
xVxW, xV=Version indicator, xW= Output power, xXx=number of outputs and output voltage

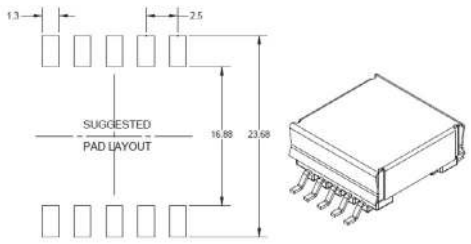
Mechanical parameters, schematic, pad layout (mm)



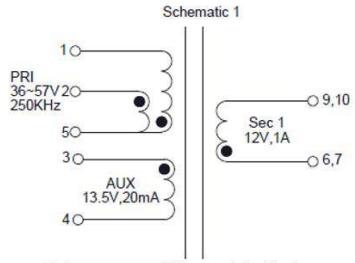
Dimension	Value
A	17.3 maximum
B	22.3 maximum
C	9.0 maximum
D	18.0 typical
E	2.5 ± 0.3
G	0.7 ± 0.15

Part marking: Dot indicates pin 1, POEB1FB = Product code and size,
xV=Version indicator, xW= Output power,
xXx=number of outputs and output voltage.
wwllyy R= Lot code
All pin length doesn't include tin icicles
All soldering surfaces to be coplanar within 0.13 millimeters
Tolerances are ±0.25 millimeters unless stated otherwise
Pad layout tolerances are ±0.1 millimeters unless stated otherwise
Traces or vias underneath the transformer is not recommended

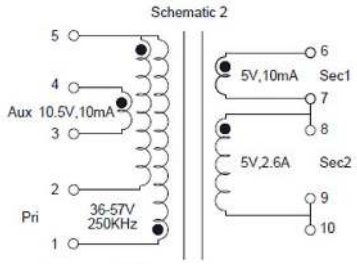
Recommended PCB Layout



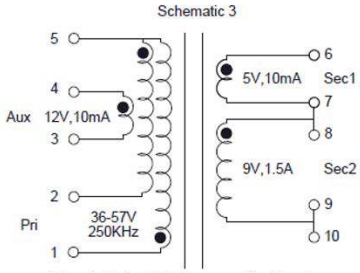
Schematic



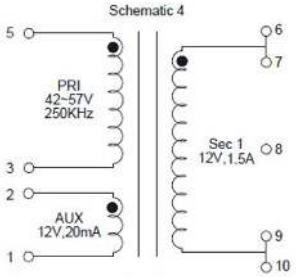
Primary is pins 1 to 2. Pin 5 is a tap and should not be connected. Connect pins 6 to 7 together and pins 9 to 10 together on PCB.



Primary is pins 1 to 2. Pin 5 is a tap and should not be connected. Connect pins 7 to 8 together and pins 9 to 10 together on PCB.



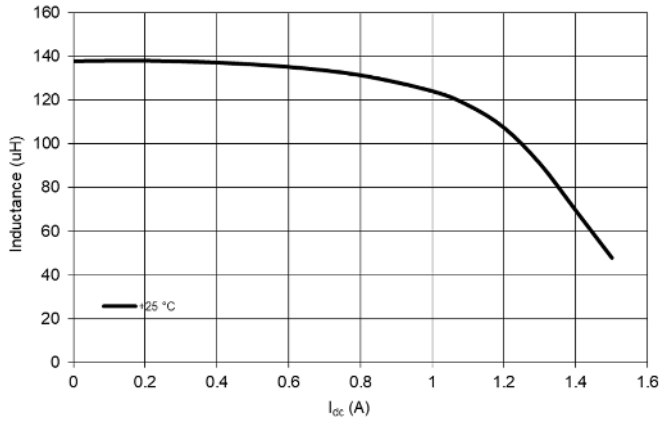
Primary is pins 1 to 2. Pin 5 is a tap and should not be connected. Connect pins 7 to 8 together and pins 9 to 10 together on PCB



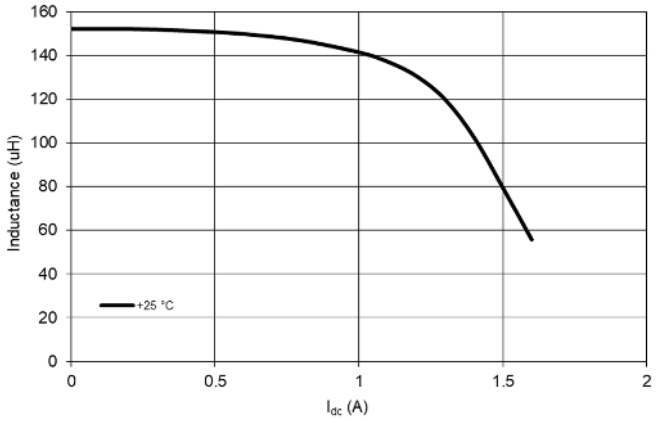
Connect pins 6 to 7 together and pins 9 to 10 together on the PCB board

OCL (inductance) vs current characteristics

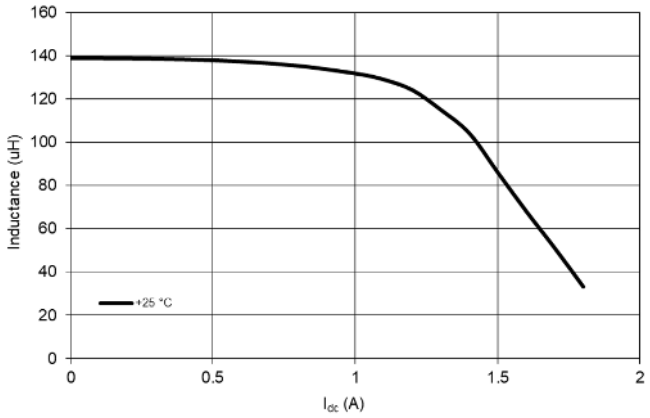
POEB1FB1V12W1X12



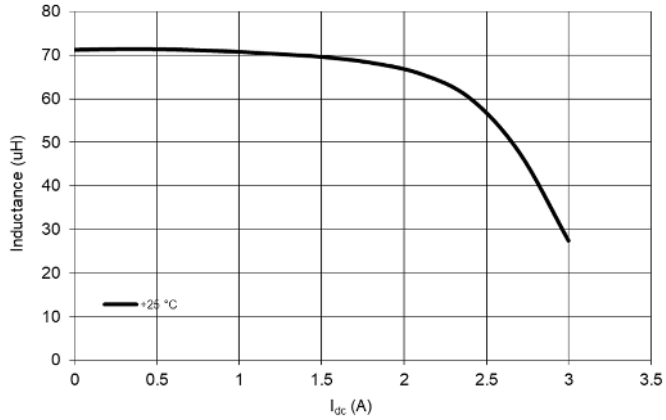
POEB1FB1V13W2X5



POEB1FB1V14W2D

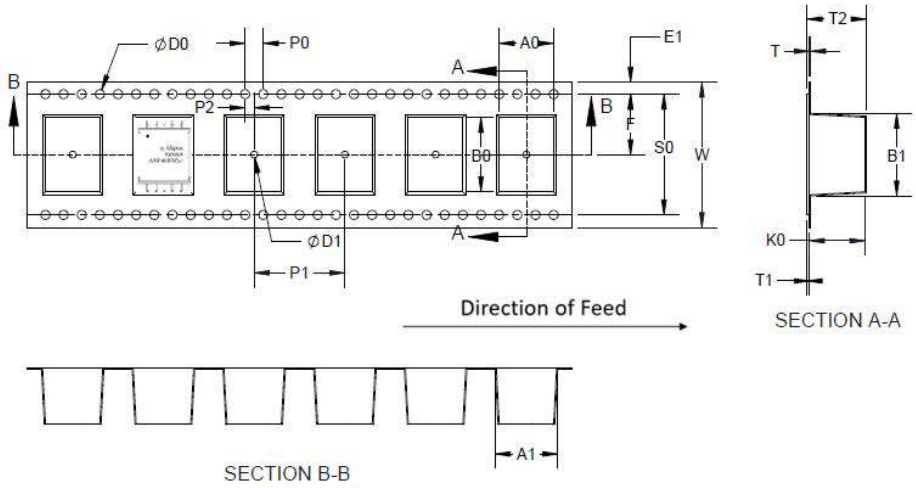


POEB1FB1V18W1X12



Packaging information (mm)

Supplied in tape and reel packaging, 13" diameter reel (EIA-481 compliant)
250 parts per reel



Dimension	Value
W ± 0.30	44
F ± 0.15	20.20
E1 ± 0.10	1.75
P0 ± 0.10	4
P1 ± 0.10	24
P2 ± 0.15	2
D0 + 0.10/-0	1.5
D1 minimum	2
A0 ± 0.10	17
A1 ref.	15.4
B0 ± 0.10	23.6
B1 ± 0.1	17.9
K0 ± 0.10	9.5
T ± 0.05	0.5
T1 maximum	0.1
T2 maximum	10.2
S0	40.4

General specifications

Reflow: MIL-STD-202G Condition J, +245 °C ± 5 °C, 30 s ± 5 s, 1 times reflow
Solderability: J-STD-002. 8 hours steam age test, Flux type: ROL0, Solder: +245 °C ± 5 °C
Mechanical shock: MIL-STD-202 Method 213. Half-sine shock pulse, peak=100 g's, 6.0 ms, total 18 shocks
Vibration: MIL-STD-202, Method 204. Gravity= 10 g, Frequency= 10 Hz to 55 Hz to 10 Hz, Direction: 3 (X,Y, Z), each 12 cycles, Duration= 20 minutes in each direction
Salt spray: GB/T6461-2002, Salt spray concentration= 5% ± 1%, Test temperature= +35 ± 2 °C, pH value= 6.5 to 7.2, Time= 48 hours, After removing the product, wash in warm water or salted water, then natural air-dried for 1 hour
High temperature storage test: MIL-STD-202G Method 108, +125 °C, Duration= 1000 hours
Temperature cycling: JESD22 Method JA-104,High temperature= +125 °C, low temperature -40 °C, conversion time 30 minutes, 100 cycles.
Biased humidity: MIL-STD-202G Method 103, +85 °C, 85% RH, Duration= 1000 hours.
Life: MIL-STD-202 Method 108, 1000 hours, +85 °C at rated I_{rms} (Ambient plus self temperature rise no more than +125 °C)

Solder reflow profile

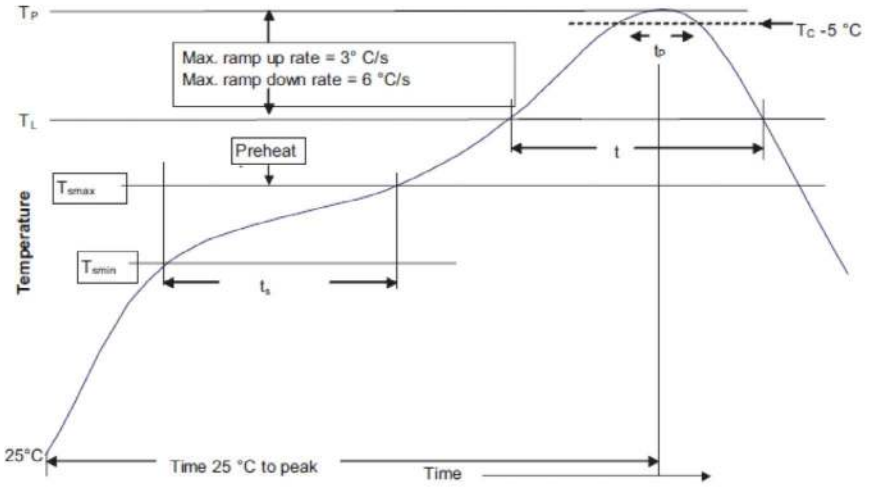


Table 1 - Standard SnPb solder (T_C)

Package thickness	Volume mm3 <350	Volume mm3 ≥350
<2.5 mm)	235 °C	220 °C
≥2.5 mm	220 °C	220 °C

Table 2 - Lead (Pb) free solder (T_C)

Package thickness	Volume mm³ <350	Volume mm³ 350 - 2000	Volume mm³ >2000
<1.6 mm	260 °C	260 °C	260 °C
1.6 – 2.5 mm	260 °C	250 °C	245 °C
>2.5 mm	250 °C	245 °C	245 °C

Profile feature		Standard SnPb solder	Lead (Pb) free solder
Preheat and soak	• Temperature min. (T_{smin})	100 °C	150 °C
	• Temperature max. (T_{smax})	150 °C	200 °C
	• Time (T_{smin} to T_{smax}) (t_s)	60-120 seconds	60-120 seconds
Ramp up rate T_L to T_p		3 °C/ second max.	3 °C/ second max.
Liquidous temperature (T_L) Time (t_L) maintained above T_L		183 °C 60-150 seconds	217 °C 60-150 seconds
Peak package body temperature (T_P)*		Table 1	Table 2
Time (t_p)* within 5 °C of the specified classification temperature (T_c)		10 seconds*	10 seconds*
Ramp-down rate (T_p to T_L)		6 °C/ second max.	6 °C/ second max.
Time 25 °C to peak temperature		6 minutes max.	8 minutes max.

* Tolerance for peak profile temperature (T_p) is defined as a supplier minimum and a user maximum.

Eaton
Electronics Division
1000 Eaton Boulevard
Cleveland, OH 44122
United States
Eaton.com/electronics

Printed in USA
Publication No. ELX1268 BU-ELX22131
January 2023

Powering Business Worldwide

Follow us on social media to get the latest product and support information.