# POEB2FB

## Power over ethernet (PoE)/PD flyback transformer


### Product features

- Flyback topology
- IEEE 802.3xx
- Up to 250 kHz switching frequency
- EFD20 SMT package (29.3 mm x 21.8 mm x 12 mm)
- Input range from 10 V to 60 V
- 1500 Vac isolation between primary and secondary
- Five power levels: 24, 30, 40, 42 and 60 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

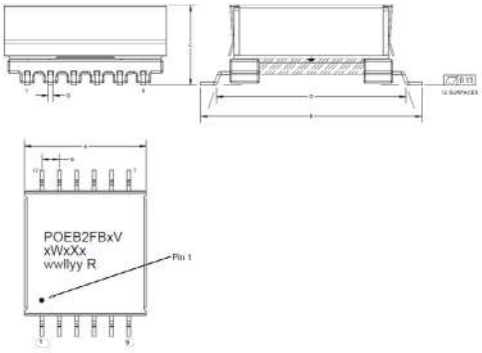
Powering Business Worldwide

## Product specifications

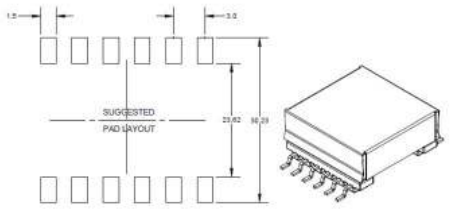
| Part number[4] | Output power (W) | OCL[1] (µH) ±10% | SCL[2] (µH) maximum | $I_{sat}$[3] (A) | **Turns ratio**<br>Schematic 1: Pri : Sec 1 : Sec 2) : Aux<br>Schematic 2: Pri : Sec 1 : Sec 2 : Aux)<br>Schematic 3: Pri) : Sec 1 : Aux)<br>Schematic 4: Pri : Sec 1 : Aux<br>Schematic 5: Pri : Sec 1 : Aux<br>±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 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| POEB2FB1V24W2X12 | 24 | 11.5 | 0.5 | 3 | 1: 1 :0.9: 0.9 | (2) x 12.0 V | 28 | 23 | 130 | 130 | 1 |
| POEB2FB1V30W2X5 | 30 | 100 | 1 | 1 | 1:0.182:0.227:0.409 | (2) x 5.0 V | 100 | 7 | 70 | 260 | 2 |
| POEB2FB1V40W1X5 | 40 | 100 | 2 | 1 | 1:0.25:0.625 | (1) x 5.0 V @ 8.0 A | 150 | 11 | - | 215 | 3 |
| POEB2FB1V42W1X12 | 42 | 100 ± 12% | 1 | 1 | 1:0.5:0.5 | (1) x 12.0 V @ 3.5 A | 100 | 18 | - | 260 | 4 |
| POEB2FB1V60W1X12 | 60 | 70 | 1 | 1.6 | 1:0.35:0.3 | (1) x 12.0 V @ 5.0 A | 85 | 7.2 | - | 120 | 5 |

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: POEB2FBxVxWxXx
POEB2FB=Product code and size
xVxW, xV=Version indicator, xW= Output power, xXx=number of outputs and output voltage

## Mechanical parameters, schematic, pad layout (mm)



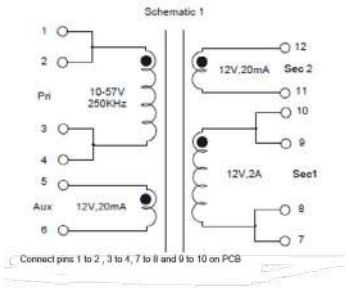

Recommended PCB Layout

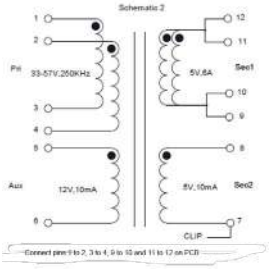


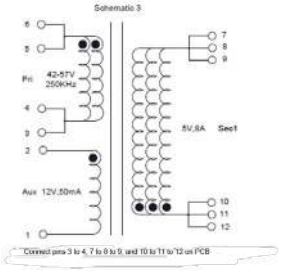

| Dimension | Value |
|---|---|
| A | 21.85 maximum |
| B | 29.3 maximum |
| C | 12.0 maximum |
| D | 24.6 typical |
| E | 3.0 ± 0.3 |
| G | 0.65 ± 0.15 |

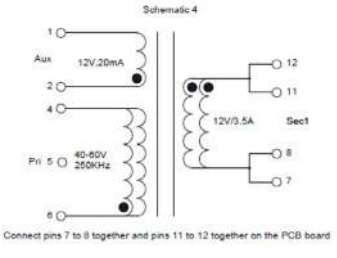
Part marking: Dot indicates pin 1, POEB2FB = Product code and size,
xV=Version indicator, xW= Output power,
xXx=number of outputs and output voltage.
wwllyy R= Lot code
All pin length doesn't include tin icicles
All soldering surfaces to be coplanar within 0.13 millimeters
Tolerances are ±0.25 millimeters unless stated otherwise
Pad layout tolerances are ±0.1 millimeters unless stated otherwise
Traces or vias underneath the transformer is not recommended

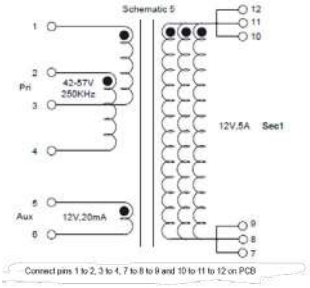
## Schematic



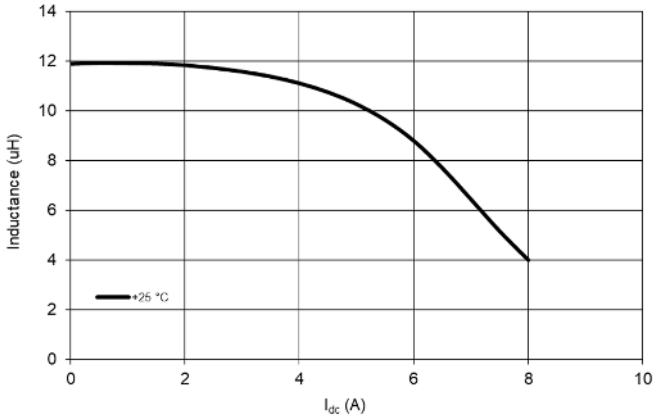



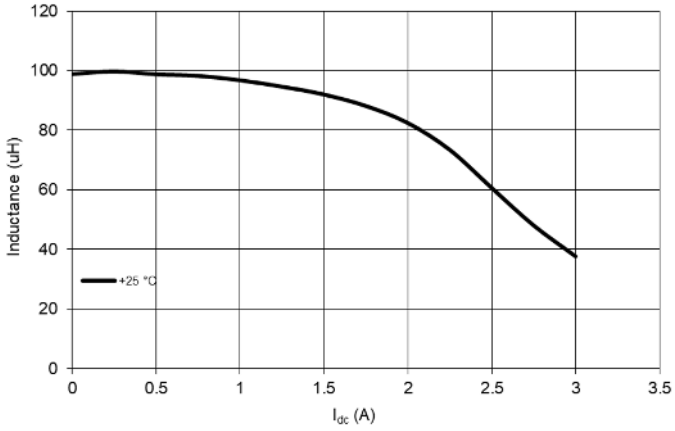



**OCL (inductance) vs current characteristics**

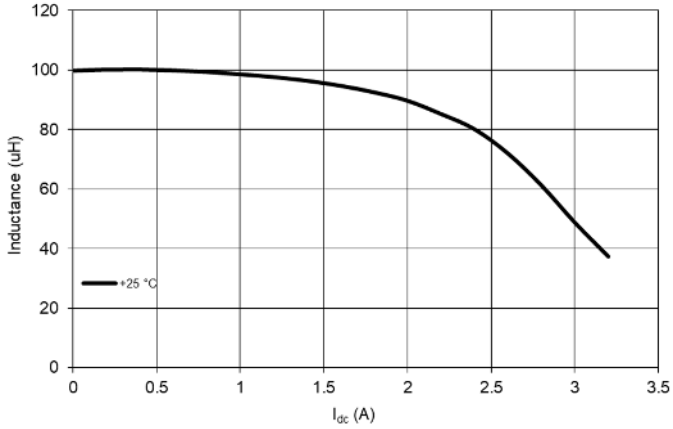
**POEB2FB1V24W2X12**



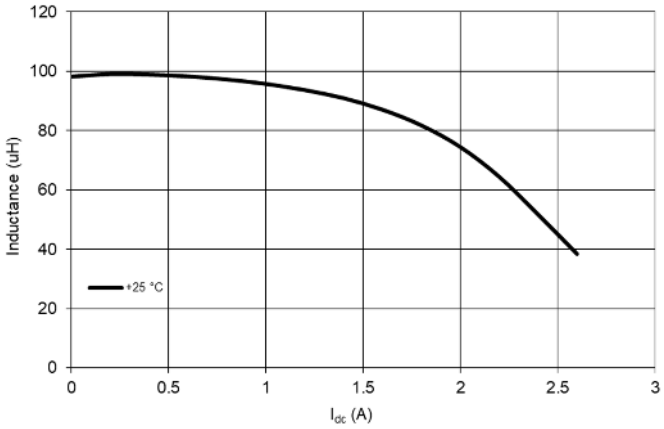

**POEB2FB1V30W2X5**



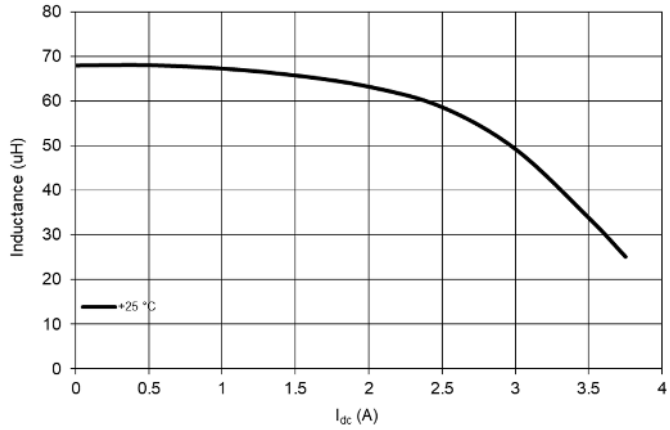

**POEB2FB1V40W1X5**




**POEB2FB1V42W1X12**

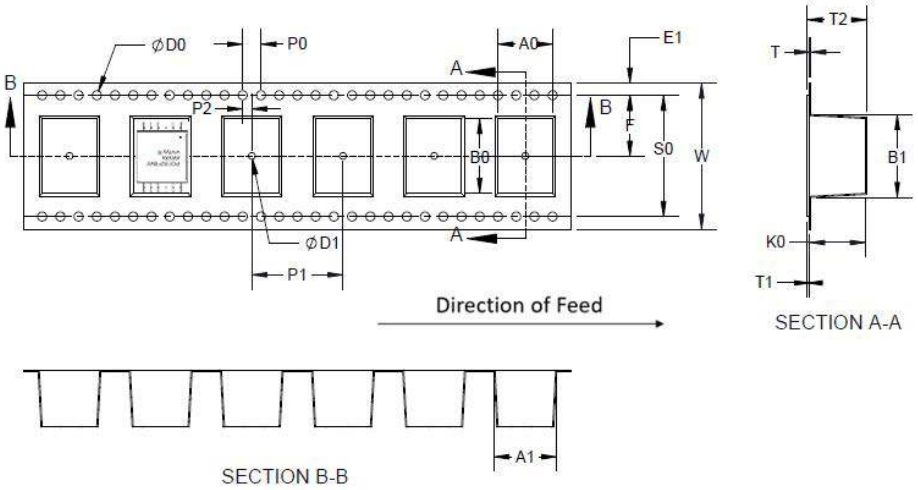



**POEB2FB1V60W1X12**



**Packaging information (mm)**

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







| Dimension | Value |
|---|---|
| W ± 0.30 | 44 |
| F ± 0.10 | 20.2 |
| E1 ± 0.10 | 1.75 |
| P0 ± 0.10 | 4 |
| P1 ± 0.10 | 28 |
| P2 ± 0.15 | 2 |
| D0 + 0.10/-0 | 1.5 |
| D1 minimum | 2 |
| A0 ± 0.10 | 22 |
| A1 ref. | 20.3 |
| B0 ± 0.10 | 30 |
| B1 ± 0.1 | 23 |
| K0 ± 0.10 | 13 |
| T ± 0.05 | 0.5 |
| T1 maximum | 0.1 |
| T2 maximum | 13.7 |
| 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

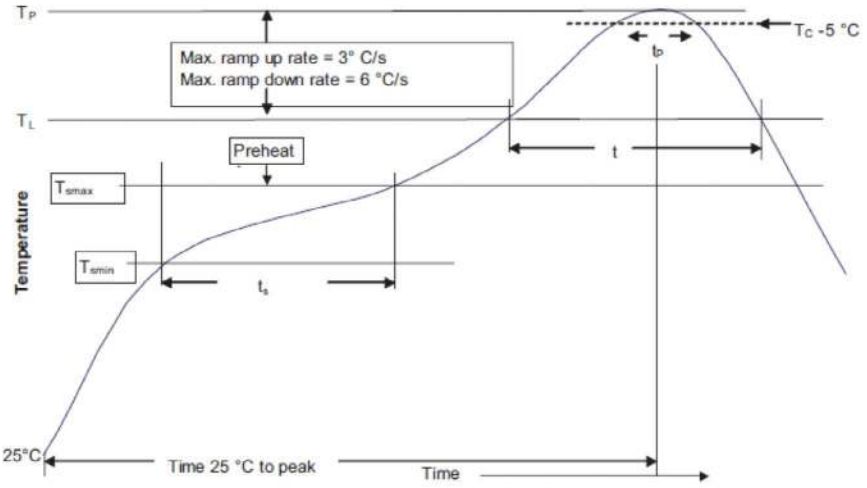



**Table 1 - Standard SnPb solder ($T_C$)**

| 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 ($T_L$)<br>Time ($t_L$) maintained above $T_L$ | | 183 °C<br>60-150 seconds | 217 °C<br>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.



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