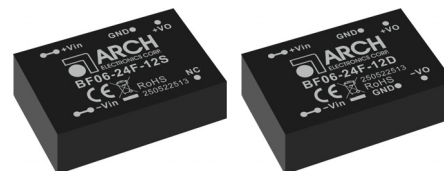


BF06 SERIES

6 Watts

KEY FEATURES

- Wide Input Voltage range (4:1)
- Efficiency up to 88%(typ.)
- No-Load Power Consumption 0.12W (typ.)
- Operating Temperature from -40°C to +85°C
- Input Under Voltage, Output Short Circuit, Over Current, Over Voltage Protections
- Isolation Voltage 3000VDC
- Remote ON/OFF Control for Option
- International Standard Pin-Out



ELECTRICAL SPECIFICATIONS

All specifications valid at normal input voltage, full load and +25°C after warm-up time unless otherwise stated

Model No. (Single Output)		BF06-24F-3.3S	BF06-24F-5S	BF06-24F-12S	BF06-24F-15S	BF06-24F-24S
Input Voltage (V.DC.)		24V (9-36V)	24V (9-36V)	24V (9-36V)	24V (9-36V)	24V (9-36V)
Output Voltage (V.DC.)		3.3	5	12	15	24
Current (mA)	Max.	1500	1200	500	400	250
	Min.	75	81	83	84	84
	Typ.	77	83	85	86	86
Capacitor Load (μF)		Max. 2200	2200	680	680	680

Model No. (Single Output)		BF06-48F-3.3S	BF06-48F-5S	BF06-48F-12S	BF06-48F-15S	BF06-48F-24S
Input Voltage (V.DC.)		48V (18-75V)	48V (18-75V)	48V (18-75V)	48V (18-75V)	48V (18-75V)
Output Voltage (V.DC.)		3.3	5	12	15	24
Current (mA)	Max.	1500	1200	500	400	250
	Min.	78	82	85	86	85
	Typ.	80	84	87	88	87
Capacitor Load (μF)		Max. 2200	2200	680	680	680

Model No. (Dual Output)		BF06-24F-5D	BF06-24F-12D	BF06-24F-15D
Input Voltage (V.DC.)		24V (9-36V)	24V (9-36V)	24V (9-36V)
Output Voltage (V.DC.)		±5	±12	±15
Current (mA)	Max.	600	250	200
	Min.	80	83	84
	Typ.	82	85	86
Capacitor Load (μF)		Max. 1000	330	330

Model No. (Dual Output)		BF06-48F-5D	BF06-48F-12D	BF06-48F-15D
Input Voltage (V.DC.)		48V (18-75V)	48V (18-75V)	48V (18-75V)
Output Voltage (V.DC.)		±5	±12	±15
Current (mA)	Max.	600	250	200
	Min.	81	85	86
	Typ.	83	87	88
Capacitor Load (μF)		Max. 1000	330	330

BF06 SERIES

6 Watts

ELECTRICAL SPECIFICATIONS

All specifications valid at normal input voltage, full load and +25°C after warm-up time unless otherwise stated

Model No. (Single Output)			BF06-24F-3.3S	BF06-24F-5S	BF06-24F-12S	BF06-24F-15S	BF06-24F-24S
			BF06-48F-3.3S	BF06-48F-5S	BF06-48F-12S	BF06-48F-15S	BF06-48F-24S
Max Output Wattage			6W				
Input	Stand-by Power Consumption (Typ.)		0.12W (Nominal Input voltage, No Load)				
	Voltage		BF06-24F- x S / BF06-24F- x D: 24VDC (9-36VDC)				
			BF06-48F- x S / BF06-48F- x D: 48VDC (18-75VDC)				
	Input Inrush Voltage (1sec.max)		24VDC Normal Input: Min: -0.7VDC / Max: 50VDC				
			48VDC Normal Input: Min: -0.7VDC / Max: 100VDC				
	Start-Up Voltage		24VDC Normal Input: Max: 9VDC				
			48VDC Normal Input: Max: 18VDC				
	Input Under Voltage Protection		24VDC Normal Input: Min: 5.5VDC / Typ: 6.5VDC				
			48VDC Normal Input: Min: 12VDC / Typ: 15VDC				
Filter		π type					
Reflected Ripple Current (Typ.)		20mA					
Output	Voltage		3.3VDC	5VDC	12VDC	15VDC	24VDC
	Voltage Accuracy (Max.)	5-100%	$\pm 3\%$				
		0-5%	$\pm 3\%$				
	Voltage Balance		—				
	Current (Max.)		1500mA	1200mA	500mA	400mA	250mA
	Line Regulation (LL-HL) (Max.)		$\pm 0.5\%$				
	Load Regulation (5-100%) (Max.)		$\pm 1\%$				
	Capacitor Load		2200 μ F	2200 μ F	680 μ F	680 μ F	680 μ F
	Ripple & Noise (5-100%) (Max.)		100mVp-p				
	Switching Frequency (Typ.)		300KHz				
	Overshoot (%Vo)		Max.: 10				
Protection	Over Power Protection (%Io)		Min.: 110 / Typ.: 150 / Max.: 260				
	Over Voltage Protection (%Vo)		Min.: 110 / Max.: 200				
	Short Circuit Protection		Continuous, Auto-recovery				
Isolation	Voltage		3000VDC (I/P-O/P, Test 1min, Leakage Current<1mA)				
	Capacitance		1000pF (I/P-O/P, 100KHz/0.1V)				
Environment	Operating Temperature		-40°C...+85°C (with derating)				
	Storage Temperature		-55°C...+125°C				
	Relative Humidity		Min.: 5% RH / Max.: 95% RH				
	MTBF (Min.)		1000K Hrs @ 25°C (MIL-HDBK-217F)				
	Temperature Drift Coefficient (Full Load)		$\pm 0.03\%$ / °C				
Physical	Dimensions (L x W x H)		1.244 x 0.799 x 0.402 Inches				
	Tolerance ± 0.5 mm		31.6 x 20.3 x 10.2 mm				
	Case Material		Plastic in Black, Flame Class UL94 V-0				
	Weight (Typ.)		12 g				
	Cooling Method		Natural Air Cooling				

BF06 SERIES

6 Watts

ELECTRICAL SPECIFICATIONS

All specifications valid at normal input voltage, full load and +25°C after warm-up time unless otherwise stated

Model No. (Dual Output)			BF06-24F-5D	BF06-24F-12D	BF06-24F-15D
			BF06-48F-5D	BF06-48F-12D	BF06-48F-15D
Max Output Wattage			6W		
Input	Stand-by Power Consumption (Typ.)		0.12W (Nominal Input voltage, No Load)		
	Voltage		BF06-24F- x S / BF06-24F- x D: 24VDC (9-36VDC)		
			BF06-48F- x S / BF06-48F- x D: 48VDC (18-75VDC)		
	Input Inrush Voltage (1sec.max)		24VDC Normal Input: Min: -0.7VDC / Max: 50VDC		
			48VDC Normal Input: Min: -0.7VDC / Max: 100VDC		
	Start-Up Voltage		24VDC Normal Input: Max: 9VDC		
			48VDC Normal Input: Max: 18VDC		
	Input Under Voltage Protection		24VDC Normal Input: Min: 5.5VDC / Typ: 6.5VDC		
			48VDC Normal Input: Min: 12VDC / Typ: 15VDC		
Filter		π type			
Reflected Ripple Current (Typ.)		20mA			
Output	Voltage		±5VDC	±12VDC	±15VDC
	Voltage Accuracy (Max.)	5-100%	±3%		
		0-5%	±5%		
	Voltage Balance (Max.)		Max.: ±1.5% (Dual Output, Balanced Laod)		
	Current (Max.)		600mA	250mA	200mA
	Line Regulation (LL-HL) (Max.)		Positive Output: ±0.5%		
			Negative Output: ±1%		
	Load Regulation (5-100%) (Max.)		Positive Output: ±1%		
			Negative Output: ±1.5%		
	Capacitor Load		1000μF	330μF	330μF
	Ripple & Noise (5-100%) (Max.)		100mVp-p		
	Switching Frequency (Typ.)		300KHz		
	Overshoot (%Vo)		Max.: 10		
Protection	Over Power Protection (%Io)		Min.: 110 / Typ.: 150 / Max.: 260		
	Over Voltage Protection (%Vo)		Min.: 110 / Max.: 200		
	Short Circuit Protection		Continuous, Auto-recovery		
Isolation	Voltage		3000VDC (I/P-O/P, Test 1min, Leakage Current<1mA)		
	Capacitance		1000pF (I/P-O/P, 100KHz/0.1V)		
Environment	Operating Temperature		-40°C...+85°C (with derating)		
	Storage Temperature		-55°C...+125°C		
	Relative Humidity		Min.: 5% RH / Max.: 95% RH		
	MTBF (Min.)		1000K Hrs @ 25°C (MIL-HDBK-217F)		
	Temperature Drift Coefficient (Full Load)		±0.03% / °C		
Physical	Dimensions (L x W x H) Tolerance ±0.5 mm		1.244 x 0.799 x 0.402 Inches		
			31.6 x 20.3 x 10.2 mm		
	Case Material		Plastic in Black, Flame Class UL94 V-0		
	Weight (Typ.)		12 g		
	Cooling Method		Natural Air Cooling		

BF06 SERIES

6 Watts

ELECTRICAL SPECIFICATIONS

All specifications valid at normal input voltage, full load and +25°C after warm-up time unless otherwise stated

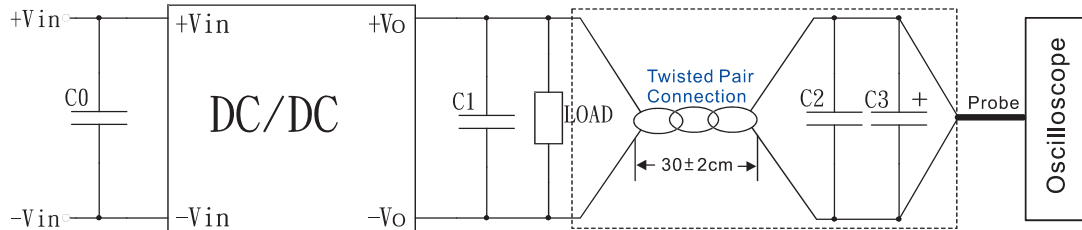
Model No. (Single Output)			BF06-24F-3.3S	BF06-24F-5S	BF06-24F-12S	BF06-24F-15S	BF06-24F-24S
			BF06-48F-3.3S	BF06-48F-5S	BF06-48F-12S	BF06-48F-15S	BF06-48F-24S
Model No. (Dual Output)			BF06-24F-5D		BF06-24F-12D		BF06-24F-15D
			BF06-48F-5D		BF06-48F-12D		BF06-48F-15D
Parameter	Standards & Level						Performance
EMC	EMI	Conduction (EMC Recommended Circuit)			EN 55032		Class B
		Radation (EMC Recommended Circuit)			EN 55032		Class B
	EMS	RS			IEC / EN 61000-4-3 10V/m		Perf.Criteria A
		CS			IEC / EN 61000-4-6 3Vr.m.s		Perf.Criteria A
		ESD			IEC / EN 61000-4-2, Contact ± 4KV		Perf.Criteria B
		Surage (EMC Recommended Circuit)			IEC / EN 61000-4-5 ± 2KV		Perf.Criteria B
		EFT (EMC Recommended Circuit)			IEC / EN 61000-4-4 ± 2KV		Perf.Criteria B
		Voltage Dips, Short Interruptions & Voltage Variations			IEC / EN 61000-4-29 0%-70%		Perf.Criteria B

NOTE

1. The typical value of efficiency is tested at nominal input voltage and rated load.
2. The maximum capacitive load is the capacitance allowed to be used when the power supply operates at full load. The converter may not start up if the capacitor exceeds this value.
3. The control chip could work at lower frequency at no load or low load to decrease the no load power and improve the efficiency.
4. The ripple & noise $\leq 5\%V_o$ at 0-5% load, it is tested by the twisted pair method according to the following test instruction.
5. It is not recommended to connect the power supply outputs in parallel to achieve a bigger power output.
6. Unless otherwise specified, the above data are measured at $T_a=25^\circ\text{C}$, humidity<75%, input nominal voltage and output rated load (pure resistance load).
7. If the product works below the minimum required load, it cannot be guaranteed that the product performance meets all the performance indicators in this manual.
8. If the product works beyond the product load range, it cannot be guaranteed that the product performance meets all the performance indicators in this manual.
9. The products should be used according to the specifications in this manual, otherwise it could be permanently damaged.
10. Please check the derating curve for more details.
11. All values or indicators in this manual had been tested based on ARCH test specifications.
12. The specifications are specially for the parts listed in this manual, any other non-standard model performances could be out of the specifications. Please contact our technician for specific requirements.
13. Product specifications are subject to change without prior notice. Please pay attention to the latest manual published on our official website.
14. ARCH can provide customization service.

NOTE

15. Ripple & Noise Test (Twisted Pair Method)

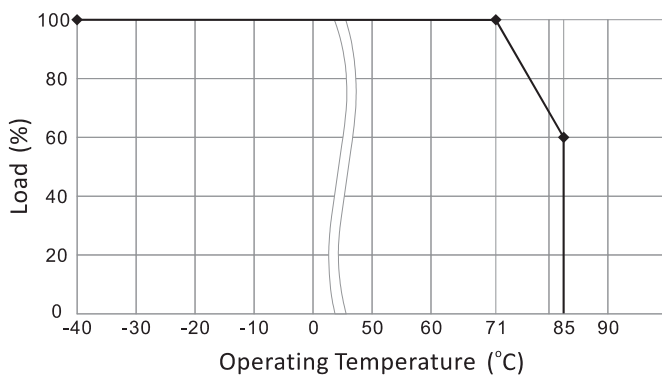


Test Conditions:

1. Ripple noise test need 12# twisted pair cables, an oscilloscope which should be set at the Sample Mode, bandwidth 20MHz. 100M bandwidth probe with cap and ground removed. C1(0.1uF) polypropylene capacitor and C2(10uF) high-frequency low-resistance electrolytic capacitor are connected in parallel with the probes and one side of the twisted pair.
2. The power supply output connects to the load by the cables. The other side of the twisted pair (length 30cm±2 cm) should be connected in parallel with the load, the polarity of the output and the oscilloscope probe should not be reversed. The test can be started after input power on.

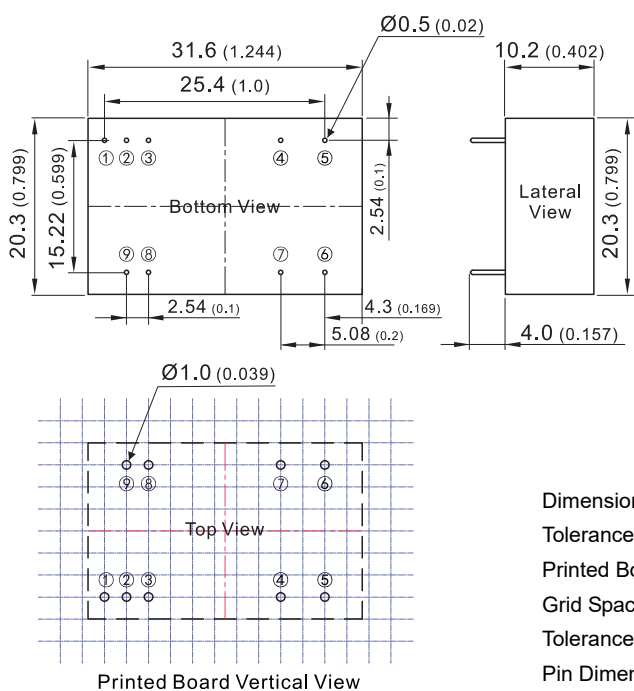
DERATING

Derating Output Load versus Operating Temperature



BF06 SERIES
6 Watts
MODEL ENCODING

BF06-24F-12S-R ① ② ③			
① Input Voltage	② Output Voltage		③ Option
24 = 24 Vdc (9-36 Vdc) 48 = 48 Vdc (18-75 Vdc)	Single Output Type	Dual Output Type	R = Remote ON/OFF Control
	3.3S = 3.3 Vdc 5 S= 5 Vdc 12S = 12 Vdc 15 S= 15 Vdc 24 S= 24 Vdc	5D = ± 5 Vdc 12D = ± 12 Vdc 15D = ± 15 Vdc	

MECHANICAL DIMENSIONS


PIN#	Single	Dial
1	NO PIN	NO PIN
2	-VIN	-VIN
3	-VIN	-VIN
4	NO PIN	GND
5	NC	-VOUT
6	+VOUT	+VOUT
7	GND	GND
8	+VIN	+VIN
9	+VIN	+VIN

Dimension in mm (inch)

 Tolerances: x.x ± 0.50 (x.xx ± 0.02)

Printed Board Vertical View

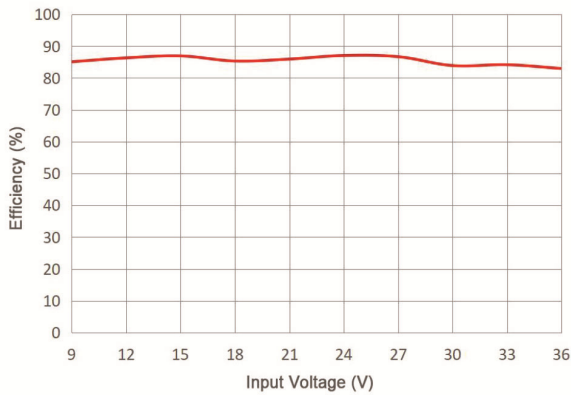
Grid Space: 2.54 (0.1)

 Tolerances: ± 0.25 (0.01)

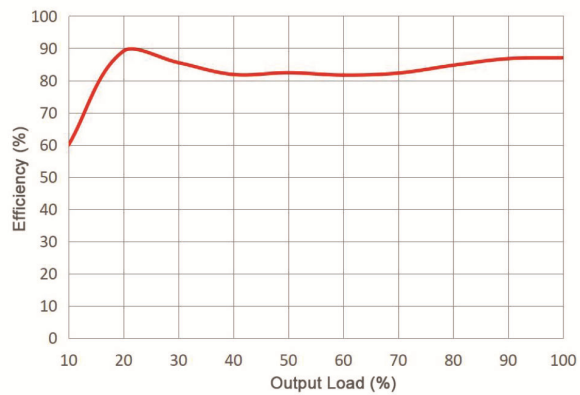
 Pin Dimension Tolerance: ± 0.10 (± 0.004)

EFFICIENCY VERSUS LOAD

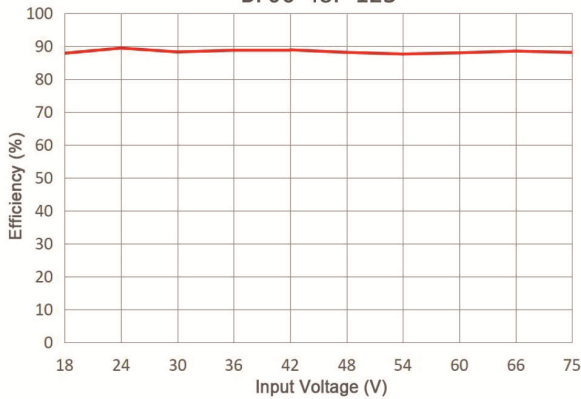
Efficiency VS Input Voltage
BF06-24F-15D



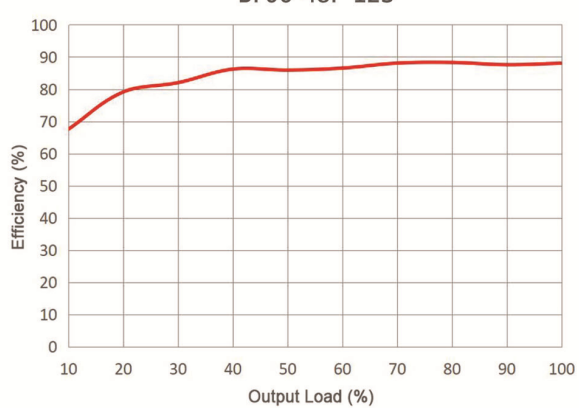
Efficiency VS Output Load
BF06-24F-15D



Efficiency VS Input Voltage
BF06-48F-12S



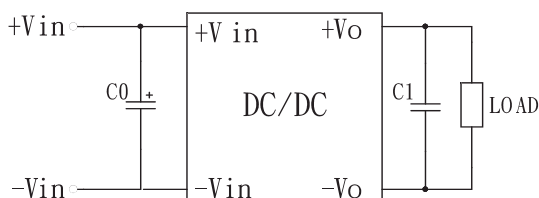
Efficiency VS Output Load
BF06-48F-12S



RECOMMENDED CIRCUITS FOR APPLICATION

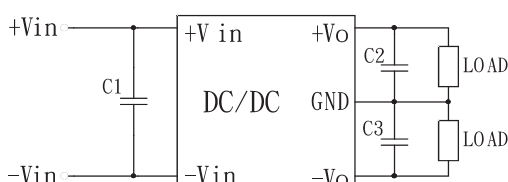
- All this series of converters will be tested according to the circuits below before shipping.

Single Output



Single Output	
Component	Parameter
C0	100uF/100V
C1	10uF/50V

Dual Output



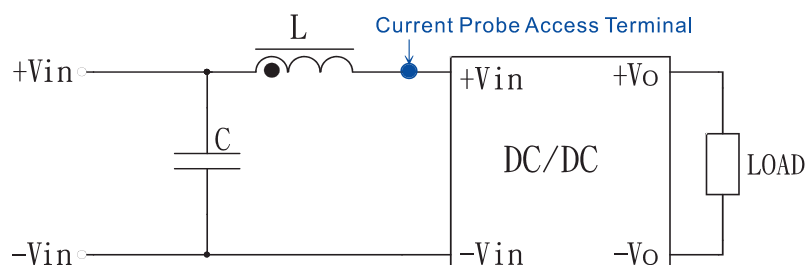
Dual Output	
Component	Parameter
C1	100uF/100V
C2,C3	10uF/50V

BF06 SERIES

6 Watts

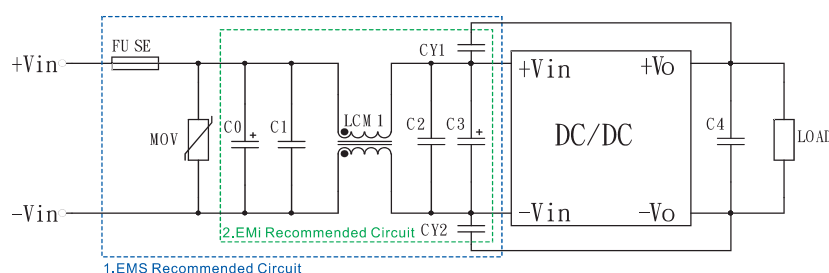
RECOMMENDED CIRCUITS FOR APPLICATION

2. Input reflected ripple current test peripheral circuit.



Component	Parameter
C	100uF/100V
L	4.7uH/15A

- ### 3. Recommended EMC circuits

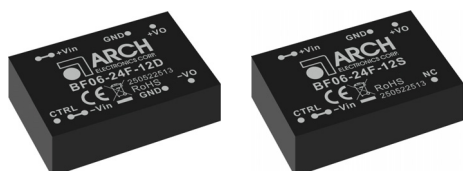


Component	Vin=24V	Vin=48V
FUSE	TBD by the Customer	
MOV	10D470K	10D101K
C0,C3	330uF/50V	100uF/100V
C1,C2,C4	10uF/50V	10uF/100V
LCM1	10mH	
CY1,CY2	1nF/3Kv	

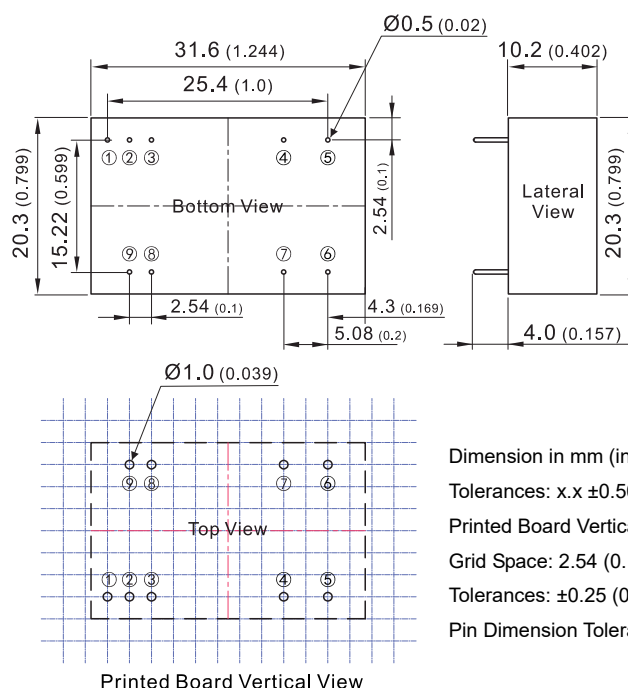
Note: Part 1 in the figure is for EMS testing, and part 2 is for EMI filtering, which can be adjusted according to the actual situation.

REMOTE ON/OFF CONTROL (for Option)

BF06-xF-xS-R



PIN#	Single	Dial
1	CTRL	CTRL
2	-VIN	-VIN
3	-VIN	-VIN
4	NO PIN	GND
5	NC	-VOUT
6	+VOUT	+VOUT
7	GND	GND
8	+VIN	+VIN
9	+VIN	+VIN



Dimension in mm (inch)
Tolerances: x.x ± 0.50 (x.xx ± 0.02)
Printed Board Vertical View
Grid Space: 2.54 (0.1)
Tolerances: ± 0.25 (0.01)
Pin Dimension Tolerance: ± 0.10 (± 0.004)