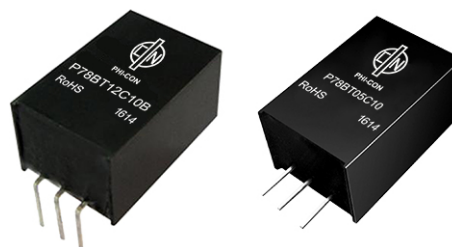




PHI-CON

1000 mA DC-DC Step Down Converter P78BTxxC10-Series

- Pin compatible to linear 78xx regulator (TO-220)
- Not isolated
- Efficiency up to 96 %
- Input voltage range up to 36 V
- Positive or negative output voltage possible
- Operating temperature range -40... 85 °C
- Continuous short circuit protection



bended

straight

Model guide

Type	Input voltage		Input current		Output				Efficiency	
	Nom. [V _{DC}]	Range [V _{DC}]	No load		Voltage		Current max. [mA]	Capacitive load max. [μF]	@ V _{in}	
			typ. [mA]	max. [mA]	[V _{DC}]	Tol. max. [%]			min. [%]	max. [%]
P78BT3R3C10	24	6...36	0.1	1	3.3	± 4	1000	680	90	81
P78BT05C10	24	8...36	0.1	1	5.0	± 3	1000	680	93	86
	12	8...27			-5.0		-500	330	86	82
P78BT09C10	24	13...36	0.1	1	9.0	± 3	1000	680	95	90
P78BT12C10	24	16...36	0.1	1	12.0	± 3	1000	680	96	93
	12	8...20			-12.0		-300	330	89	88
P78BT15C10	24	20...36	0.1	1	15.0	± 3	1000	680	96	94
	12	8...18			-15		-300	330	89	89

Suffix "B" for bended version

Specifications

Output	
Input voltage regulation	± 0.4 %, max.
Load regulation	± 0.6 % @ load 10..100 %
Temperature coefficient	± 0.03 % / °C
Ripple and noise @ >20 % load (at 20 MHz BW)	75 mVp-p, max. (See fig. 1)
Short circuit protection	Continuous, automatic restart
Transient response deviation at 25% load step change, V _{in} nom.	300 mV, max.
Transient recovery time at 25 % load step change, V _{in} nom.	1 ms, max.
Input	
Ingrated filter	Capacitor
No load current consumption	1 mA, max.
Reverse polarity	Unacceptable
Environmental	
Operating ambient temperature	-40 ... 85 °C Derating > 71 °C
Storage temperature	-55 ... 125 °C
Storage Humidity	Up to 95 %, non condensing
Cooling	free air convection >0.8 m/s

General	
Safety standard	EN60950-1
Switching frequency	420...780 kHz
Reliability calc. MTBF MIL-HDBK-217F	> 2 Mio. h @ 25 °C
EMI	
Conducted emission	EN55022, class B
Radiated emission (See fig. 2)	EN55022, class B
EMC	
Electrostatic discharge	EN 61000-4-2 Contact ± 4 kV perf. Criteria B
Radiation immunity	EN 61000-4-3 10 V/m perf. Criteria A
Electrical fast transient (See fig. 2)	EN 61000-4-4 ± 1 kV perf. Criteria B
Surge (See fig. 2)	EN 61000-4-5 ± 1 kV perf. Criteria B
Conducted disturbance immunity	EN 61000-4-6 3 Vrms perf. Criteria A
Cooling	free air convection >0.8 m/s
Physical	
Case material	Plastic UL94-V0
Dimensions	9 x 11.5 x 17.5 mm
Weight	3.8 g
Soldering temperature	260 °C, max., 10 s, max.
1.5 mm distance to body	

1. The output load should not be less than 10 %. Operation under 10 % load will not damage the converter. However, they may not meet all listed specifications
2. The max. capacitive load should be tested within the input voltage range and under full load conditions.
3. All specifications measured at T_a 25 °C, humidity < 75 %, nominal input voltage and rated output load unless otherwise specified.
4. All parameter are specified for the positive application unless otherwise specified.

1000 mA DC-DC Step Down Converter P78BTxxC10-Series



Fig. 1 Output ripple and noise measure circuit

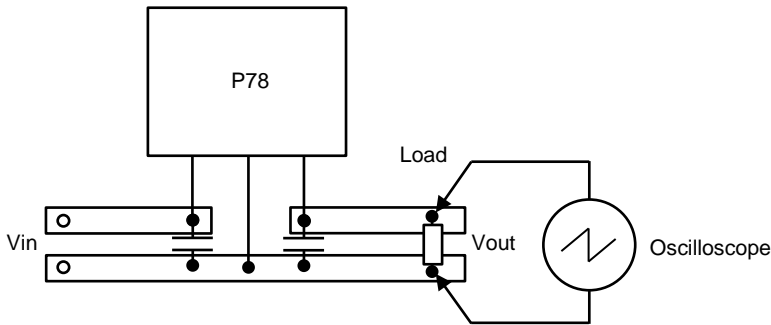
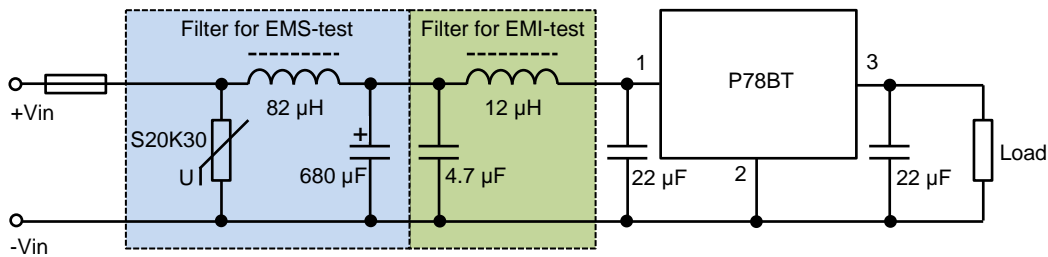
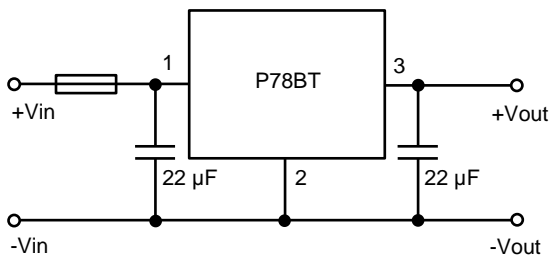


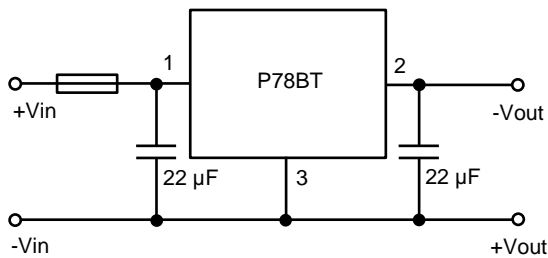
Fig. 2 EMC test circuit



Typical application circuit for positive output



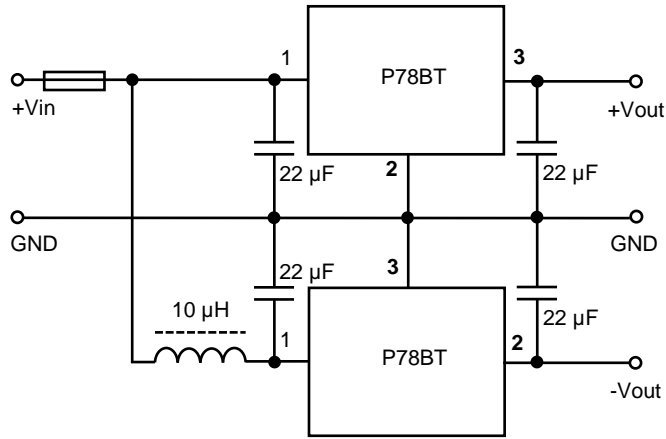
Typical application circuit for negative output



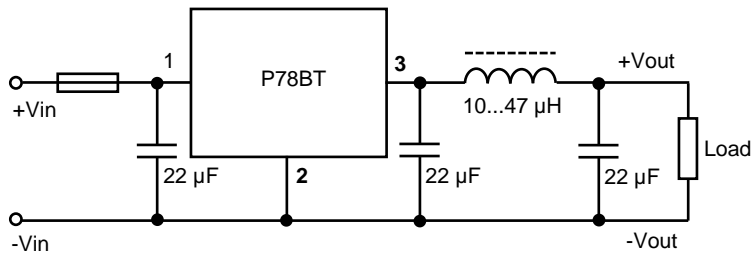
1000 mA DC-DC Step Down Converter P78BTxxC10-Series



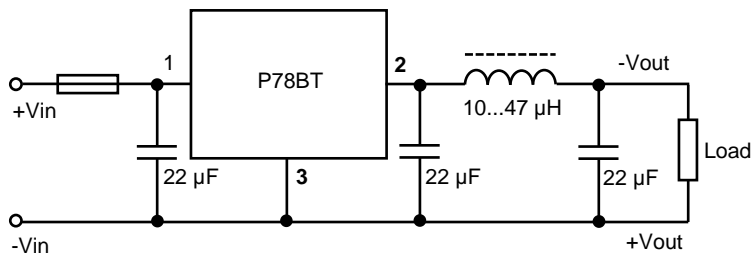
Typical application circuit for \pm dual output



Typical application for positive output filter circuit



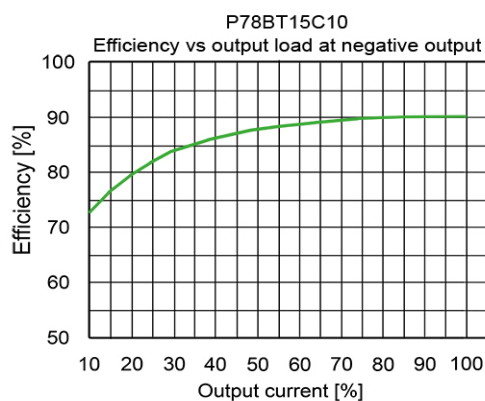
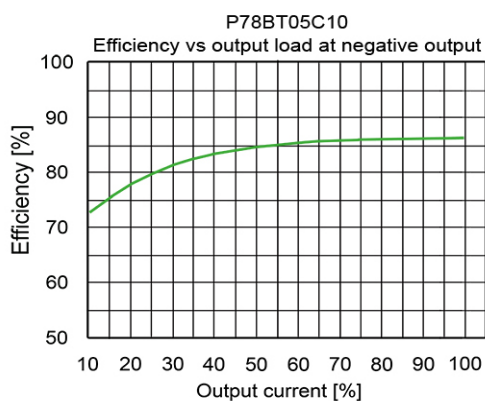
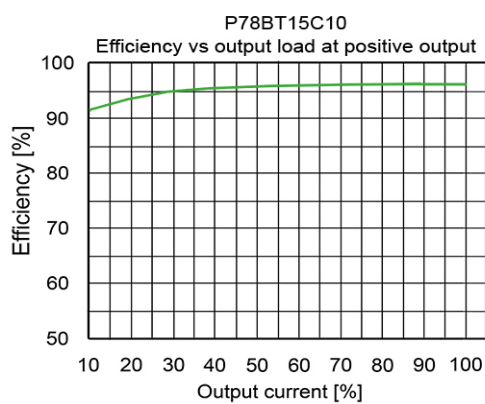
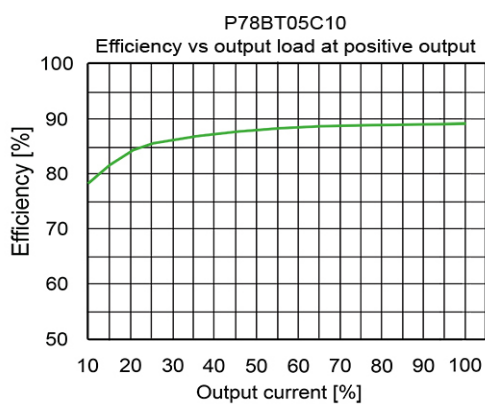
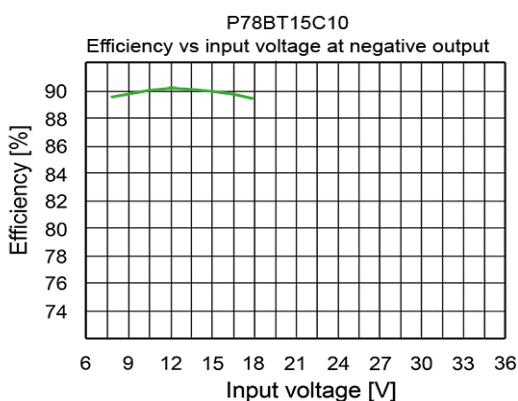
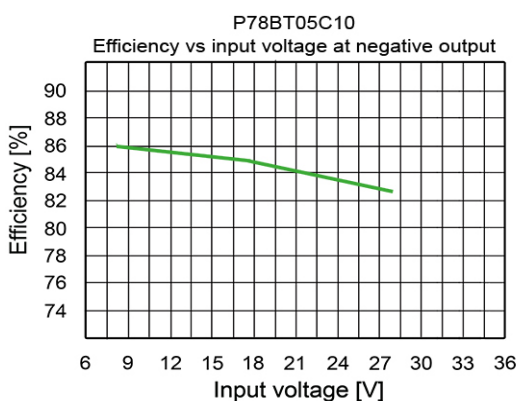
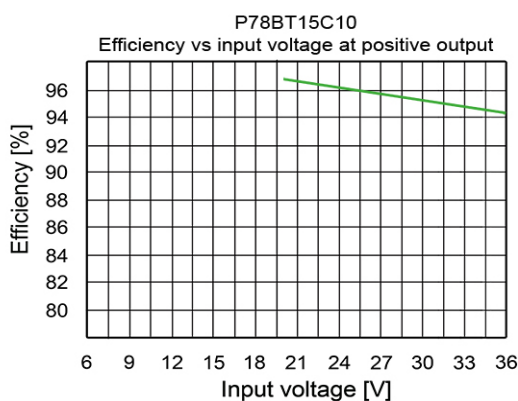
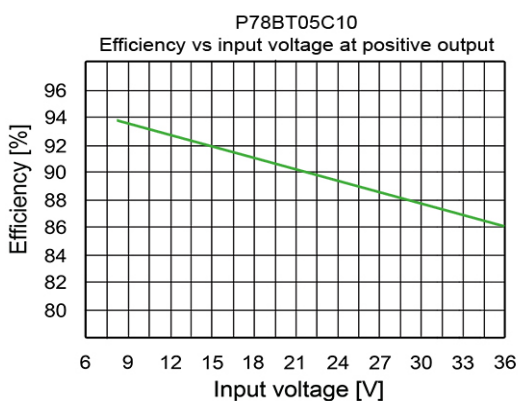
Typical application for negative output filter circuit



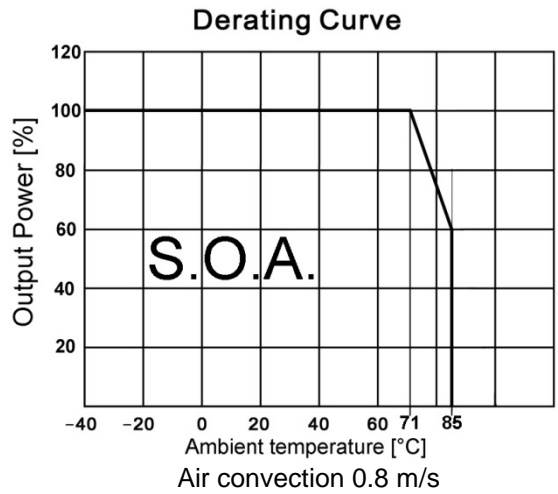


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1000 mA DC-DC Step Down Converter P78BTxxC10-Series



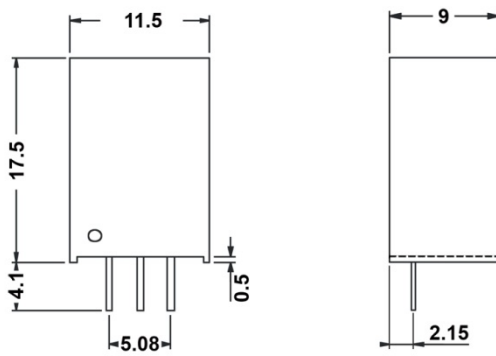
1000 mA DC-DC Step Down Converter P78BTxxC10-Series



Dimensions

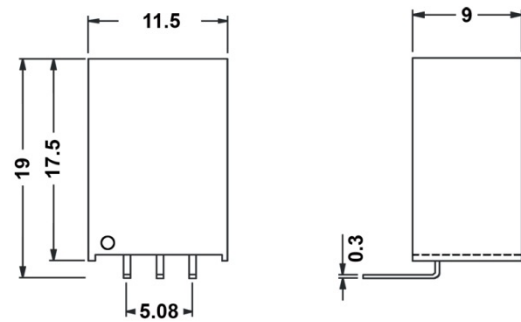
P78BTxxC

straight version

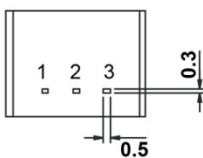


P78BTxxCB

bended version

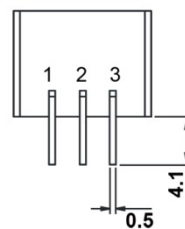


Bottom View



All dimensions in mm
Pin tolerances: 0.10mm
Package and pitch tolerances: 0.25mm

Bottom View



Pin assignment	
	Negativ output
1	+V Input
2	-V Output
3	GND

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