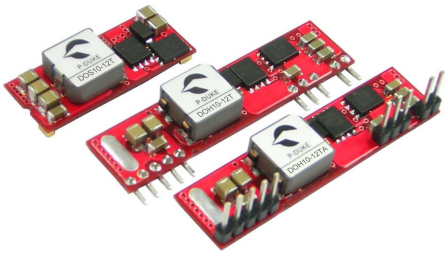
POWER MATE TECHNOLOGY CO.,LTD.

DOS10-12T Non-isolated
DOH10-12T Point of load DC/DC converters



FEATURES

- **OUTPUT CURRENT UP TO 10A**
- **SMALL SIZE AND LOW PROFILE : 1.30" X 0.53" X 0.30" (SMD) ; 2.00" X 0.50" X 0.28" (SIP)**
- **HIGH EFFICIENCY - 93% @ 3.3V FULL LOAD**
- **INPUT RANGE FROM 8.3VDC TO 14.0VDC**
- **FIXED SWITCHING FREQUENCY (300KHZ)**
- **SMD & SIP PACKAGES**
- **OUTPUT VOLTAGE PROGRAMMABLE FROM 0.75VDC TO 5.0VDC VIA EXTERNAL RESISTOR**
- **INPUT UNDER-VOLTAGE LOCKOUT**
- **UL60950-1, EN60950-1 AND IEC60950-1 LICENSED**
- **ISO9001 CERTIFIED MANUFACTURING FACILITIES**
- **COMPLIANT TO RoHS EU DIRECTIVE 2002/95/EC**

APPLICATIONS

Wireless Network
Telecom/Datacom
Industry Control System
Distributed Power Architectures
Semiconductor Equipment
Microprocessor Power Applications

OPTIONS

Positive Logic Remote on/off

DESCRIPTION

DOS10-12T (SMD type), DOH10-12T (for Vertical Mounting SIP type) and DOH10-12TA (for Horizontal Mounting SIP type) are non-isolated DC/DC converters that can deliver up to 10A of output current with full load efficiency of 93% at 3.3V output.

TECHNICAL SPECIFICATION

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

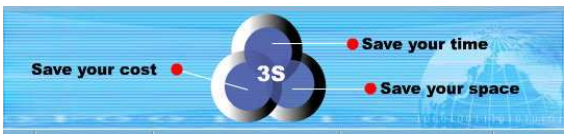
OUTPUT SPECIFICATIONS			
Output current			10A max
Voltage accuracy	Full load and Vin(nom)		± 2%Vo(set)
Minimum load			0%
Line regulation	Vin=Vin(min) to Vin(max) at Full Load		± 0.3%Vo(set),typ
Load regulation	No Load to Full Load		± 0.4%Vo(set),typ
Ripple and noise (Note2)	20MHz bandwidth		30mVrms,max 75mVp-p,max
Temperature coefficient			±0.4%, typ
Dynamic load response (Note 2)	∆Io / ∆t = 2.5A/µS ,Vin(nom)	Peak deviation	200mV,typ
	Load change step (50% to 100% or 100% to 50% of Io(max))	Setting time (Vo<10%peak deviation)	25µS,typ
Dynamic load response (Note 3)	∆Io / ∆t = 2.5A/µS,Vin(nom)	Peak deviation	100mV,typ
	Load change step (50% to 100% or 100% to 50% of Io(max))	Setting time (Vo<10%peak deviation)	25µS,typ
Output current limit			200%
Output short-circuit current			Hiccup, automatics recovery
External load capacitance	ESR≧1mΩ ESR≧10mΩ		1000µF,max 5000µF,max
Output voltage overshoot-startup	Vin=Vin(min) to Vin(max) F.L.		1%Vo(set)
Voltage adjustability (see fig.1)	(Note 4)		0.7525V ~ 5.0V

GENERAL SPECIFICATIONS		
Efficiency		See table
Isolation voltage		None
Switching frequency		300KHz, typ
Approvals and standard		IEC60950-1, UL60950-1, EN60950-1
Dimensions	SMD	1.30 X 0.53 X 0.30 Inch (33.0 X 13.5 X 7.7 mm)
	SIP	2.00 X 0.50 X 0.28 Inch (50.8 X 12.7 X 7.2 mm)
Weight		6.0g(0.22oz)
MTBF (Note 1)	BELLCORE TR-NWT-000332 MIL-HDBK-217F	1.409×10^7 hrs 1.048×10^6 hrs

INPUT SPECIFICATIONS			
Input voltage range	Vo(set) ≦3.63V Vo(set) >3.63V	Vin(nom) =12V	8.3 – 14VDC 8.3 – 13.2VDC
Maximum input current	Vin=8.3 to 14.0Vdc; Io=Io(max)		7A
Input filter (Note 5)			C filter
Input no load current (Vin=12V, Io=0, module enabled)		Vo(set) =0.75Vdc Vo(set) =5.0Vdc	40mA,typ 100mA,typ
Input under voltage lockout		Start-up voltage Shutdown voltage	7.9V,typ 7.8V,typ
Input reflected ripple current	5~20MHz, 1µH source impedance		20mAp-p

ENVIRONMENTAL SPECIFICATIONS	
Operating ambient temperature	–40ºC ~ +85ºC(with derating)
Storage temperature range	–55ºC ~ +125ºC
Thermal shock	MIL-STD-810F
Over temperature protection	125ºC,typ

FEATURE SPECIFICATIONS		
Remote ON/OFF(Note 6)		
Negative logic(standard)	ON = 0V < Vr < 0.3V	I_{IN}=10µA,max
	OFF =2.5V < Vr < Vin(max)	I_{IN}=1mA,max
Positive logic(option)	ON = (Vin-4) < Vr < Vin(max)	I_{IN}=10µA,max
	OFF=0V < Vr < 0.3V	I_{IN}=1mA,max
Input current of Remote control pin		10µA~1.0mA
Remote off state input current	Nominal Vin	2.0mA,typ
Remote sense range		0.5V,max
Rise time	Time for Vo to rise from 10% to 90%of Vo(set)	6ms,max.
Turn-on delay time	Case 1 (Note 7) Case 2 (Note 8)	3ms,typ 3ms,typ



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Model Name	ON/OFF Logic	Package	Input Voltage	Output Voltage	Output Current		Efficiency (%)
					Min. Load	Max. Load	12Vin, 3.3Vdc@10A
DOS10-12T	Negative	SMD	Vo(set)≦3.63V Vin = 8.3-14Vdc	0.75 ~ 5.0Vdc	0A	10A	93%
DOS10-12T-P	Positive						
DOH10-12T	Negative	Vertical Mounting SIP	Vo(set)＞3.63V Vin = 8.3-13.2Vdc				
DOH10-12T-P	Positive						
DOH10-12TA	Negative	Horizontal Mounting SIP					
DOH10-12TA-P	Positive						

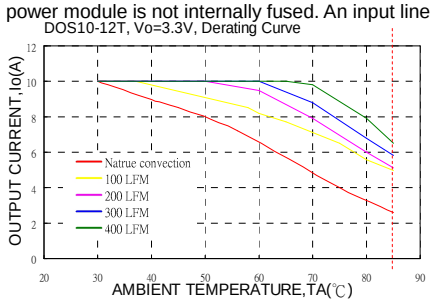
Note

1. BELLCORE TR-NWT-000332. Case 1: 50% Stress, Temperature at 40ºC.
   MIL-HDBK-217F Notice2 @Ta=25 ºC, Full load(Ground, Benign, controlled environment).
2. External with C_{out} = 1μF ceramic//10μF tantalum capacitors.
3. External with C_{out} = 2×150μF polymer capacitors.
4. Output voltage programmable from 0.7525V to 5V by connecting a single resistor (shown as Rtrim in Table 1) between the TRIM and GND pins of the module.To calculate the value of the resistor ***Rtrim*** for a particular output voltage ***Vo***, use the following equation:

$$Rtrim = \left[\frac{10500}{Vo - 0.7525} - 1000 \right] \Omega$$

5. It's necessary to equip the external input capacitors at the input of the module. The capacitors should connect as close as possible to the input terminals that ensuring module stability. The external C_{in} is 4×47μF ceramic capacitors at least.
6. Device code with suffix "**-P**" – Positive logic(On/Off is open collector/drain logic input; Signal referenced to GND)
   Device code with no suffix – Negative logic (On/Off pin is open collector/drain logic input with external pull –up resistor; signal referenced to GND)
7. Case 1 :On/Off input is set to logic low (module on) and then input power is applied (delay from instant at which Vin=Vin(min) until Vo=10% of Vo(set))
8. Case 2 :Input power is applied for at least one second and then the On/Off input is set to logic low (delay form instant at which Von/off=0.3V until Vo=10% of Vo(set))

CAUTION: This power module is not internally fused. An input line fuse must always be used.



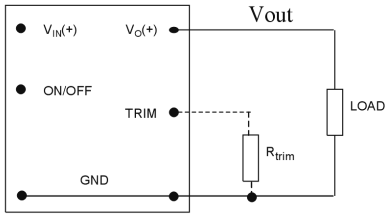


Fig. 1

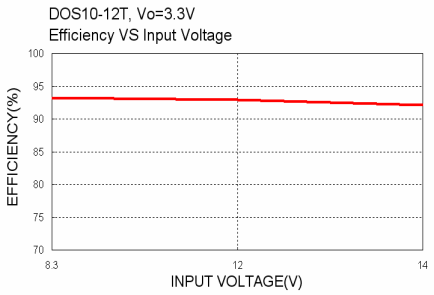
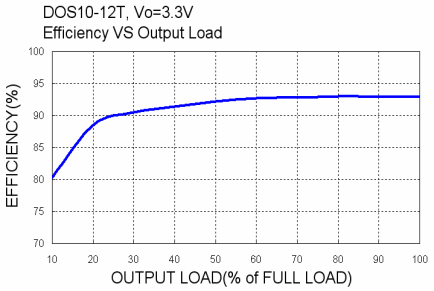


Table 1	
Vo(set) (V)	Rtrim (KΩ)
0.7525	Open
1.2	22.46
1.5	13.05
1.8	9.024
2.5	5.009
3.3	3.122
5	1.472



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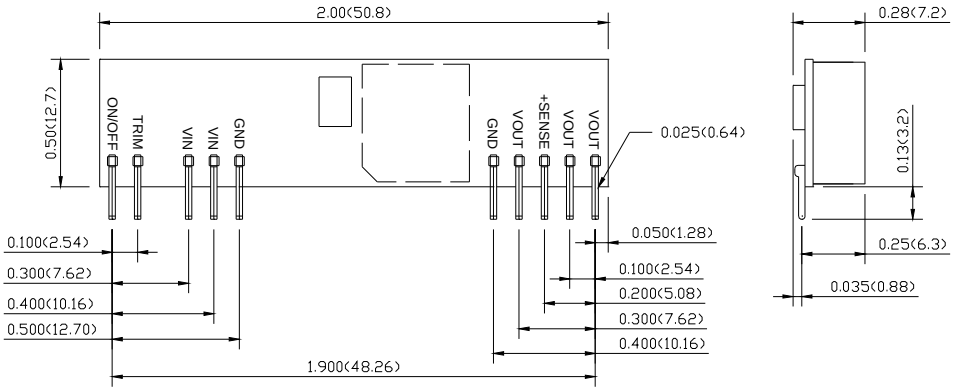
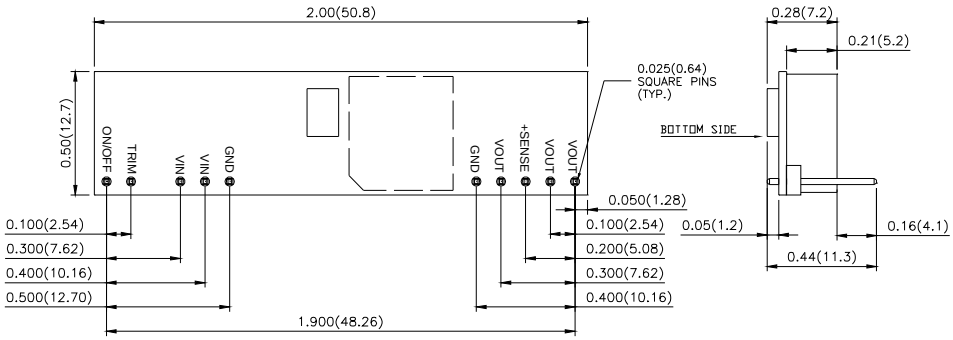
DOH10-12T



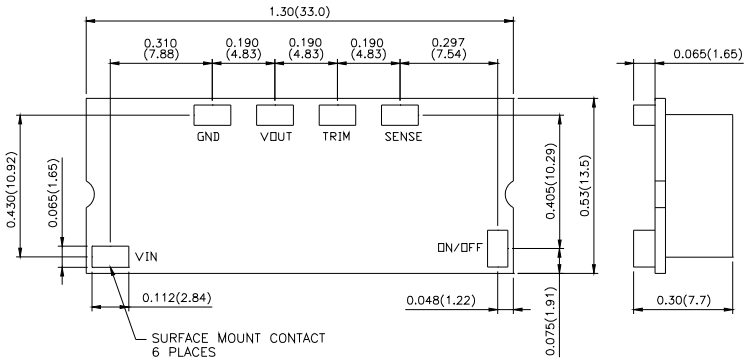
BOTTOM VIEW SIDE VIEW

DOH10-12TA



BOTTOM VIEW SIDE VIEW

DOS10-12T



BOTTOM VIEW SIDE VIEW

1. All dimensions in Inches (mm)
   Tolerance: X.XX±0.02 (X.X±0.5)
   X.XXX±0.01 (X.XX±0.25)
2. Pin pitch tolerance ±0.01(0.25)
3. Pin dimension tolerance ±0.004 (0.1)

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We are here for you. Addresses and Contacts

Sales Switzerland

Postcode 3000 – 9999
Liechtenstein

Matthias Rüegg
Ruhbergstrasse 32
CH-9230 Flawil

Phone + 41 44 877 35 18
Mobile + 41 76 491 66 66
Fax + 41 44 877 35 19

matthias.rueegg@pewatron.com

Postcode 1000 – 2999

Raffael Favaretto
Route d'Oron 124
CH-1673 Promasens

Phone + 41 44 877 35 22
Mobile + 41 76 444 63 14
Fax + 41 44 877 35 23

raffael.favaretto@pewatron.com

Sales Germany

Postcode 60000 – 79999

Dieter Hirthe
Mühlweg 23
D-71554 Weissach i.T.

Phone + 49 719 149 60 58
Mobile + 49 163 762 74 30
Fax + 49 719 193 31 88

dieter.hirthe@pewatron.com

Postcode 10000 – 59999
Postcode 80000 – 99999

Kurt Stritzelberger
Neumarkter Str. 86a
D-81673 Munich

Phone + 49 89 260 38 47
Mobile + 49 171 803 41 35
Fax + 49 89 43 10 91 91

kurt.stritzelberger@pewatron.com

Key Accounts
Aerospace and Defence

Claus Wübbena
Vogelkamp 26
D-26655 Westerstede

Phone + 49 4488 5204 614
Mobile + 49 173 9700 691
Fax + 49 4488 5204 616

claus.wuebbena@pewatron.com

Sales Austria

Kurt Stritzelberger
Neumarkter Str. 86a
D-81673 Munich

Phone + 49 89 260 38 47
Mobile + 49 17 18 03 41 35
Fax + 49 89 43 10 91 91

kurt.stritzelberger@pewatron.com

Sales Other Countries / Product Management

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Peter Felder
Phone + 41 44 877 35 05
peter.felder@pewatron.com

Geometrical Sensors

Eric Letsch
Phone + 41 44 877 35 14
eric.letsch@pewatron.com

Power Supplies

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Sebastiano Leggio
Phone + 41 44 877 35 06
sebastiano.leggio@pewatron.com

E-Components

Current Sensors
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Measurement Probes

Sebastiano Leggio
Phone + 41 44 877 35 06
sebastiano.leggio@pewatron.com

PEWATRON AG
Thurgauerstrasse 66
CH-8052 Zurich

Phone + 41 44 877 35 00
Fax + 41 44 877 35 25

www.pewatron.com
info@pewatron.com