



**APPLICATIONS**

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

**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 UP TO 93% @ 3.3V FULL LOAD
- INPUT RANGE FROM 8.3VDC TO 14.0VDC
- FIXED SWITCHING FREQUENCY (300kHz)
- SMD & SIP PACKAGES
- SMD PACKAGE QUALIFIED FOR LEADFREE REFLOW SOLDER PROCESS ACCORDING IPC J-STD-020D
- OUTPUT VOLTAGE PROGRAMMABLE FROM 0.75VDC TO 5.0VDC VIA EXTERNAL RESISTOR
- INPUT UNDER-VOLTAGE PROTECTION
- UL60950-1, EN60950-1, & IEC60950-1 SAFETY APPROVALS
- CE MARKED
- COMPLIANT TO RoHS II & REACH

**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 25°C otherwise noted

OUTPUT SPECIFICATIONS		INPUT SPECIFICATIONS	
Output current	10A max	Input voltage range	$V_{out(set)} \leq 3.63V$ 8.3 ~14VDC $V_{out(set)} > 3.63V$ 8.3 ~13.2VDC
Voltage accuracy	$\pm 2\%V_{out(set)}$	Maximum input current	$V_{in}=8.3$ to 14.0VDC; $I_o=I_o(max)$ 7A
Minimum load	0%	Input filter (Note 5)	C filter
Line regulation	$V_{in}=V_{in(min)}$ to $V_{in(max)}$ at Full Load $\pm 0.3\%V_{out(set)}$	Input no load current	$V_{out(set)} =0.75VDC$ 40mA $(V_{in}=12V, I_o=0, \text{module enabled})$ $V_{out(set)} =5.0VDC$ 100mA
Load regulation	No Load to Full Load $\pm 0.4\%V_{out(set)}$	Input under voltage lockout	Start-up voltage 7.9VDC Shutdown voltage 7.8VDC
Ripple and noise (Note2)	20MHz bandwidth 30mVrms,max 75mVp-p,max	Input reflected ripple current	5~20MHz, 1 $\mu$ H source impedance 20mA $\mu$ p
Temperature coefficient	$\pm 0.4\%$	ENVIRONMENTAL SPECIFICATIONS	
Dynamic load response (Note 2)	$\Delta I_o / \Delta t = 2.5A/\mu s, V_{in(nom)}$ Peak deviation 200mV Load change step (50% to 100% or 100% to 50% of $I_o(max)$ ) Setting time ( $V_{out}<10\%$ peak deviation) 25 $\mu$ s	Operating ambient temperature	-40°C ~ +85°C(with derating)
Dynamic load response (Note 3)	$\Delta I_o / \Delta t = 2.5A/\mu s, V_{in(nom)}$ Peak deviation 100mV Load change step (50% to 100% or 100% to 50% of $I_o(max)$ ) Setting time ( $V_{out}<10\%$ peak deviation) 25 $\mu$ s	Storage temperature range	-55°C ~ +125°C
Output current limit	200%	Thermal shock	MIL-STD-810F
Output short-circuit current	Continuous, automatics recovery	Vibration	MIL-STD-810F
External load capacitance	$ESR \geq 1m\Omega$ 1000 $\mu$ F,max $ESR \geq 10m\Omega$ 5000 $\mu$ F,max	Relative humidity(non-condensing)	5% to 95% RH
Output voltage overshoot-startup	$V_{in}=V_{in(min)}$ to $V_{in(max)}$ F.L. 1% $V_{out(set)}$	Lead-free reflow solder process	IPC J-STD-020D
Voltage adjustability (see fig.1)	(Note 4) 0.7525V ~ 5.0V	Moisture sensitivity level(MSL)	IPC J-STD-033B Level 2a
GENERAL SPECIFICATIONS		Over temperature protection	125°C
Efficiency	See table	FEATURE SPECIFICATIONS	
Isolation voltage	None	Remote ON/OFF(Note 6)	
Switching frequency	300kHz $\pm$ 10%	Negative logic(standard)	ON = Open or $0V < V_r < 0.3V$ $I_{IN}=10\mu A,max$ OFF = $2.5V < V_r < V_{in(max)}$ $I_{IN}=1mA,max$
Safety approvals	IEC60950-1, UL60950-1, & EN60950-1	Positive logic(option)	ON = Open or $(V_{in}-4) < V_r < V_{in(max)}$ $I_{IN}=10\mu A,max$ OFF = $0V < V_r < 0.3V$ $I_{IN}=1mA,max$ 10 $\mu$ A~1.0mA
Dimensions	SMD	Input current of Remote control pin	A
	SIP	Remote off state input current	Nominal Input 2.0mA
Weight	6.0g(0.22oz)	Remote sense range	0.5V,max
MTBF (Note 1)	MIL-HDBK-217F 3.355 x 10 <sup>6</sup> hrs	Rise time	Time for $V_{out}$ to rise from 10% to 90%of $V_{out(set)}$ 6ms,max.
		Turn-on delay time	Case 1 (Note 7) 3ms Case 2 (Note 8) 3ms

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

**Note**

1. MIL-HDBK-217F @Ta=25 °C, Full load.
2. External with C<sub>out</sub> = 1µF ceramic//10µF tantalum capacitors.
3. External with C<sub>out</sub> = 2pcs of 150µF polymer capacitors.
4. Output voltage programmable from 0.7525V to 5V by connecting a single resistor (shown as R<sub>trim</sub> in Table 1) between the TRIM and GND pins of the module. To calculate the value of the resistor **R<sub>trim</sub>** for a particular output voltage **V<sub>out</sub>**, use the following equation:

$$R_{trim} = \left[ \frac{10500}{V_{out} - 0.7525} - 1000 \right] \Omega$$

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<sub>in</sub> is 4pcs of 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 Vout=10% of Vout(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 Vout=10% of Vout(set))

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

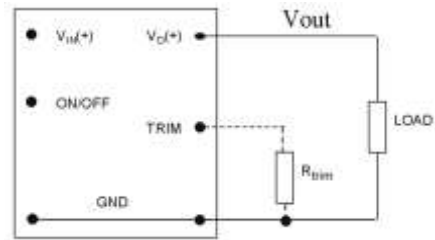
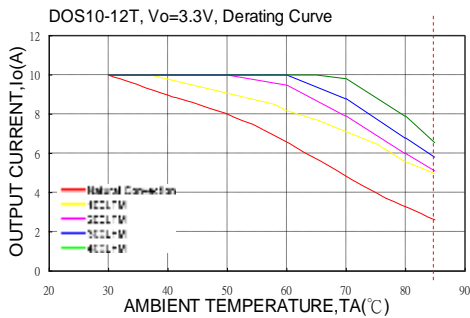
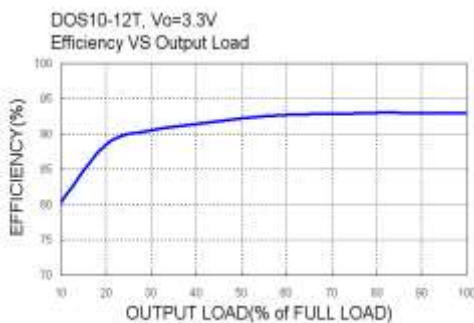
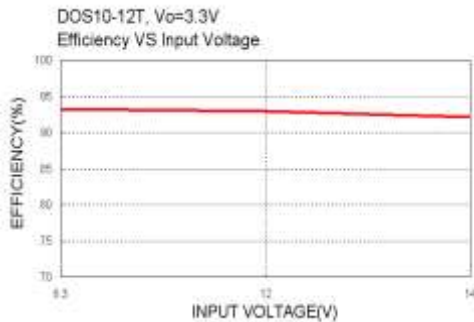


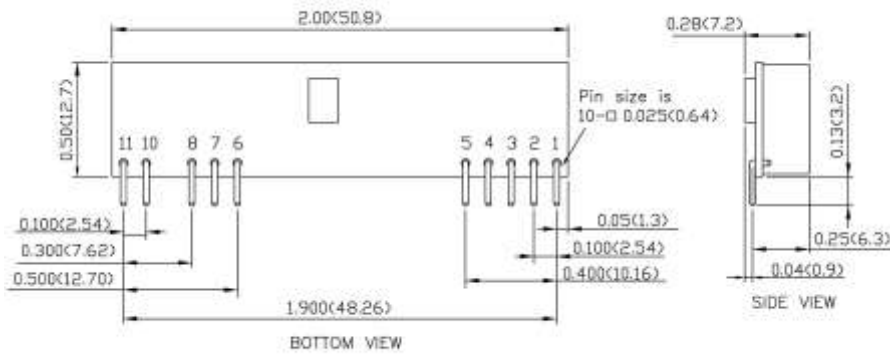
Fig. 1



Vout(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

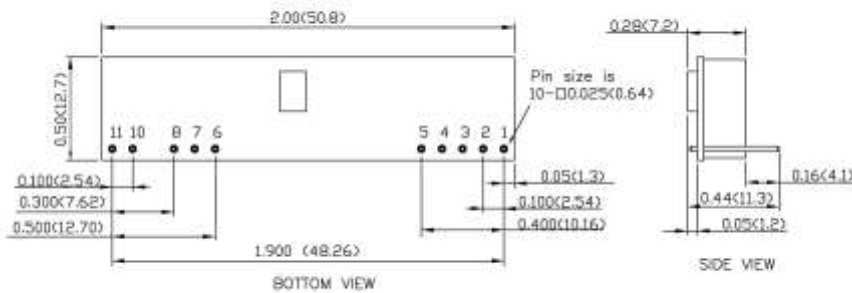
**MECHANICAL DRAWING :**

**DOH10-12T TYPE**



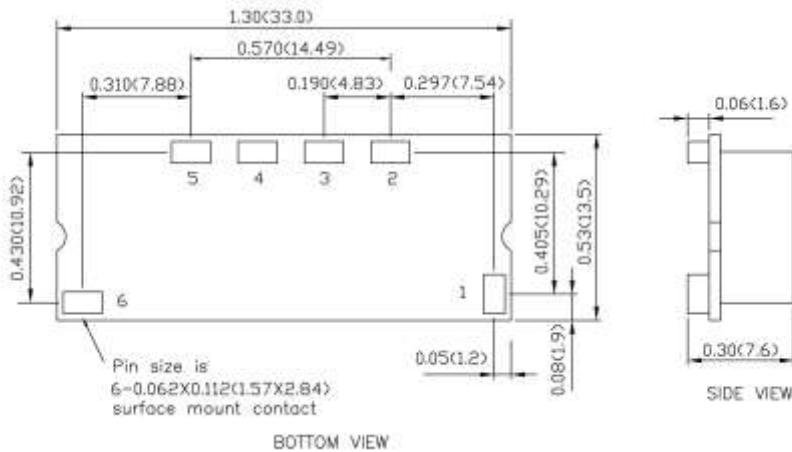
PIN CONNECTION	
PIN	DEFINE
1	+OUTPUT
2	+OUTPUT
3	+SENSE
4	+OUTPUT
5	GND
6	GND
7	+ INPUT
8	+ INPUT
10	TRIM
11	CTRL

**DOH10-12TA TYPE**



PIN CONNECTION	
PIN	DEFINE
1	+OUTPUT
2	+OUTPUT
3	+SENSE
4	+OUTPUT
5	GND
6	GND
7	+ INPUT
8	+ INPUT
10	TRIM
11	CTRL

**DOS10-12T TYPE**



PIN CONNECTION	
PIN	DEFINE
1	CTRL
2	+SENSE
3	TRIM
4	+OUTPUT
5	GND
6	+ INPUT

- All dimensions in Inch (mm)  
Tolerance: X.XX±0.02 (X.X±0.5)  
X.XXX±0.01 (X.XX±0.25)
- Pin pitch tolerance ±0.01 (0.25)
- Pin dimension tolerance ±0.004 (0.1)