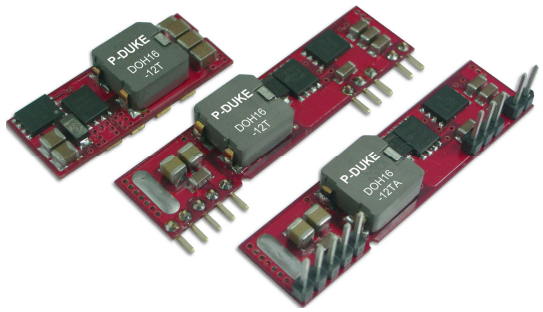
DOS(H)16-12T SERIES

POINT OF LOAD DC-DC CONVERTER



FEATURES

- **OUTPUT CURRENT UP TO 16A**
- **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 92% @ 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**

APPLICATIONS

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

OPTIONS

POSITIVE LOGIC REMOTE ON/OFF

DESCRIPTION

DOS16-12T (SMD type), DOH16-12T (for Vertical Mounting SIP type) and DOH16-12TA (for Horizontal Mounting SIP type) are non-isolated DC/DC converters that can deliver up to 16A of output current with full load efficiency of 92% at 3.3V output.

TECHNICAL SPECIFICATION

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

OUTPUT SPECIFICATIONS

Output current			16A max
Voltage accuracy			± 2%Vout(set)
Minimum load			0%
Line regulation	Vin=Vin(min) to Vin(max) at Full Load		± 0.3%Vout(set)
Load regulation	No Load to Full Load		± 0.4%Vout(set)
Ripple and noise (Note2)	20MHz bandwidth		30mVrms,max 75mVp-p,max
Temperature coefficient			±0.4%
Dynamic load response (Note 2)	ΔIo / Δt = 2.5A/μs ,Vin(nom)	Peak deviation	200mV
	Load change step (50% to 100% or 100% to 50% of Io(max))	Setting time (Vout<10%peak deviation)	25μs
Dynamic load response (Note 3)	ΔIo / Δt = 2.5A/μs ,Vin(nom)	Peak deviation	100mV
	Load change step (50% to 100% or 100% to 50% of Io(max))	Setting time (Vout<10%peak deviation)	50μs
Output current limit			180%
Output short-circuit current		Continuous, 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%Vout(set)
Voltage adjustability (see fig.1)	(Note 4)		0.7525V ~ 5.0V

GENERAL SPECIFICATIONS

Efficiency		See table
Isolation voltage		None
Switching frequency		300kHz±10%
Safety approvals		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)	MIL-HDBK-217F	3.416 x 10^6 hrs

INPUT SPECIFICATIONS

Input voltage range	Vout(set) ≦3.63V Vin(nom) =12V Vout(set) >3.63V	8.3 ~ 14VDC 8.3 ~ 13.2VDC
Maximum input current	Vin=8.3 to 14.0VDC; Io=Io(max)	10A
Input filter (Note 5)		C filter
Input no load current (Vin=12V, Io=0, module enabled)	Vout(set) =0.75VDC Vout(set) =5.0VDC	40mA 100mA
Input under voltage lockout	Start-up voltage Shutdown voltage	7.9VDC 7.8VDC
Input reflected ripple current	5~20MHz, 1μH source impedance	30mAp-p

ENVIRONMENTAL SPECIFICATIONS

Operating ambient temperature	–40ºC ~ +85ºC(with derating)
Storage temperature range	–55ºC ~ +125ºC
Thermal shock	MIL-STD-810F
Vibration	MIL-STD-810F
Relative humidity(non-condensing)	5% to 95% RH
Lead-free reflow solder process	IPC J-STD-020D
Moisture sensitivity level(MSL)	IPC J-STD-033B Level 2a
Over temperature protection	125ºC

FEATURE SPECIFICATIONS

Remote ON/OFF(Note 6)		
Negative logic(standard)	ON = Open or 0V < Vr < 0.3V	I_{IN}=10μA,max
	OFF =2.5V < Vr < Vin(max)	I_{IN}=1mA,max
Positive logic(option)	ON = Open or (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 Input	2.0mA
Remote sense range		0.5V,max
Rise time	Time for Vout to rise from 10% to 90%of Vout(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 (%)
					Min. Load	Max. Load	12Vin, 3.3VDC@16A
DOS16-12T	Negative	SMD	Vout(set)≦3.63V Vin = 8.3-14VDC	0.75 ~ 5.0VDC	0A	16A	92%
DOS16-12T-P	Positive						
DOH16-12T	Negative	Vertical Mounting SIP					
DOH16-12T-P	Positive						
DOH16-12TA	Negative	Horizontal Mounting SIP	Vout(set)＞3.63V Vin = 8.3-13.2VDC				
DOH16-12TA-P	Positive						

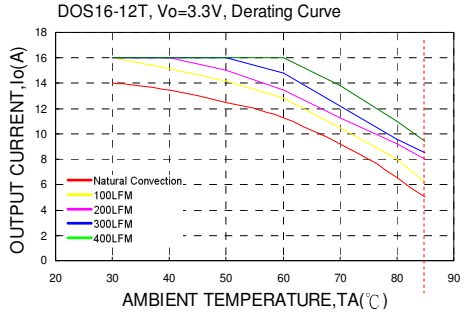
Note

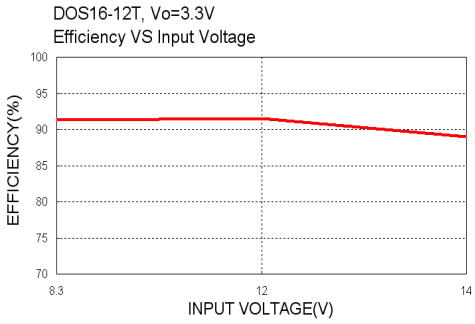
1. MIL-HDBK-217F @Ta=25 ºC, Full load.
2. External with C_{out} = 1μF ceramic//10μF tantalum capacitors.
3. External with C_{out} = 2pcs of 150μF polymer capacitors.
4. Output voltage programmable from 0.7525V to 5V by connecting a single resistor (shown as Rtrim in Table 1) between the TRIM and GND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

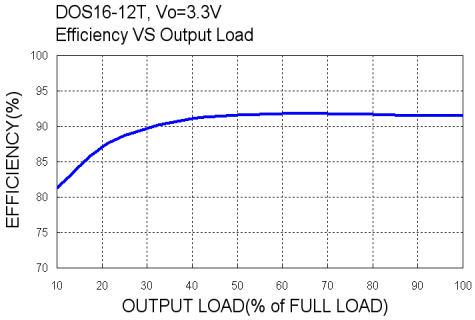
$$\text{Rtrim} = \left[\frac{10500}{\text{Vout} - 0.7525} - 1000\right]\Omega$$

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 6pcs 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.







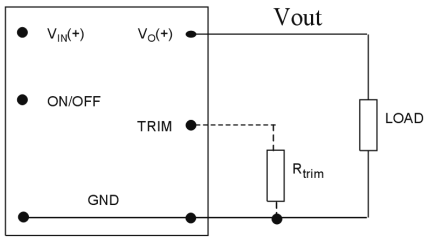
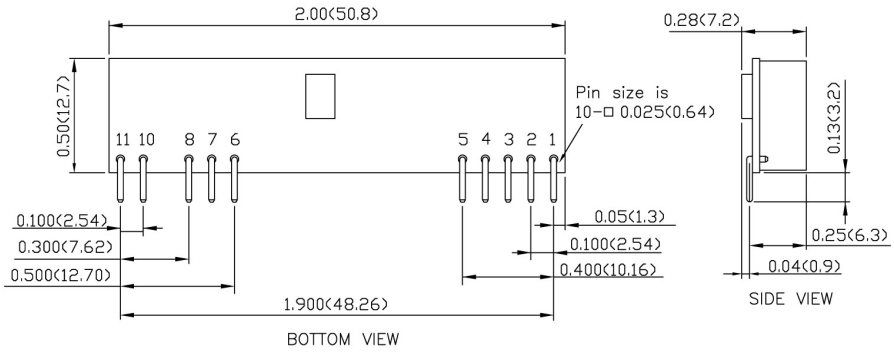


Fig. 1

Table 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

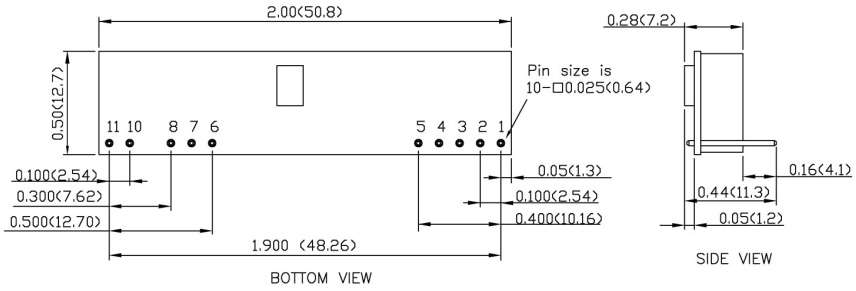
MECHANICAL DRAWING：

DOH16-12T TYPE



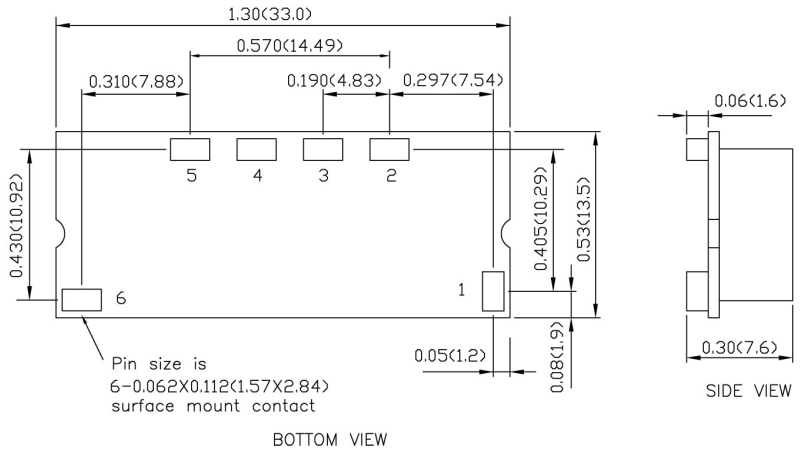
PIN CONNECTION	
PIN	DEFINE
1	+OUTPUT
2	+OUTPUT
3	+SENSE
4	+OUTPUT
5	GND
6	GND
7	+ INPUT
8	+ INPUT
10	TRIM
11	CTRL

DOH16-12TA 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

DOS16-12T TYPE



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

1. All dimensions in Inch (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)