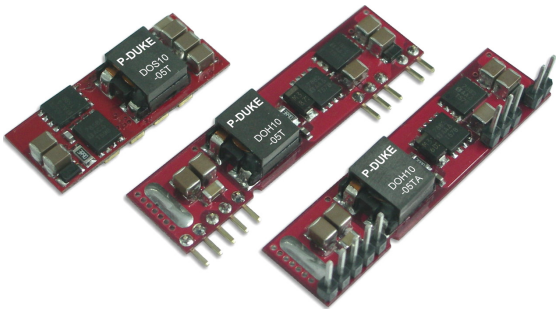
DOS(H)10-05T SERIES

POINT OF LOAD DC-DC CONVERTER



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 95% @ 3.3V FULL LOAD**
- **INPUT RANGE FROM 2.4VDC TO 5.5VDC**
- **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 3.3VDC 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

DOS10-05T (SMD type), DOH10-05T (for Vertical Mounting SIP type) and DOH10-05TA (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 95% 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			± 2%Vout(set)
Minimum load			0%
Line regulation	Vin=Vout(set)+0.5V 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		15mVrms,max 50mVp-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)	100μs
Output current limit			200%
Output short-circuit current		Continuous, automatics recovery	
External load capacitance	ESR≧1mΩ ESR≧10mΩ		1000μF,max 5000μF,max
Output voltage overshoot-startup	Vin=2.4 ~ 5.5V, F.L.		1%Vout(set)
Voltage adjustability (see fig.1)	(Note 4)		0.7525V ~ 3.63V

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	3.239 x 10^6 hrs

INPUT SPECIFICATIONS

Input voltage range	Vout(set) < Vin – 0.5V	2.4 ~ 5.5VDC
Maximum input current	Vin=2.4 to 5.5V; Io=Io(max)	10A
Input filter (Note 5)		C filter
Input no load current (Vin=5V, Io=0, module enabled)	Vout(set) =0.75VDC Vout(set) =3.3VDC	100mA 130mA
Input under voltage lockout	Start-up voltage Shutdown voltage	2.2VDC 2.0VDC
Input reflected ripple current	5~20MHz, 1μH source impedance	100mAp-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% ~ 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 =1.5V < Vr < Vin(max)	I_{IN}=1mA,max
(Positive logic)(option)	ON = Open or 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	1.5mA,typ
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 (Note7)	1ms
	Case 2 (Note8)	1ms

DOS(H)10-05T SERIES

POINT OF LOAD DC-DC CONVERTER

Model Name	ON/OFF Logic	Package	Input Voltage	Output Voltage	Output Current		Efficiency (%)
					Min. Load	Max. Load	5.0Vin, 3.3VDC@10A
DOS10-05T	Negative	SMD	2.4 ~ 5.5VDC Vin(min)=Vout(set)+0.5V	0.75 ~ 3.3VDC	0A	10A	95%
DOS10-05T-P	Positive						
DOH10-05T	Negative	Vertical Mounting SIP					
DOH10-05T-P	Positive						
DOH10-05TA	Negative	Horizontal Mounting SIP					
DOH10-05TA-P	Positive						

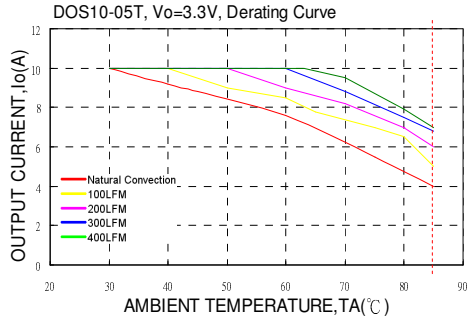
Note

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 0.75V to 3.3V 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:

$$\text{Rtrim} = \left[\frac{21070}{\text{Vout} - 0.7525} - 5110\right]\Omega$$

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 3pcs of 150μF low-ESR polymer capacitors // 2pcs 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.



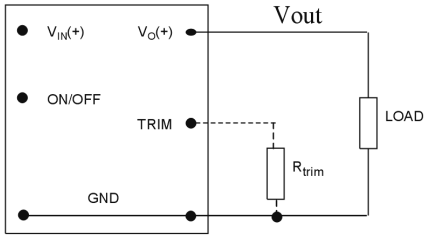


Fig. 1

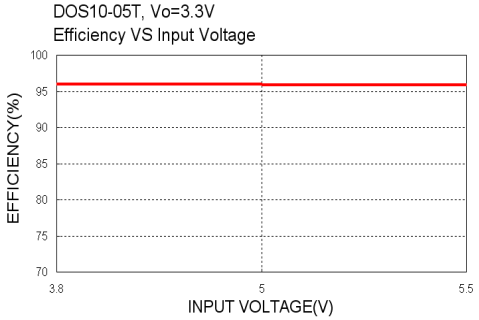
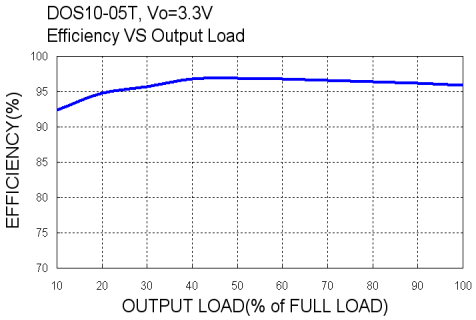
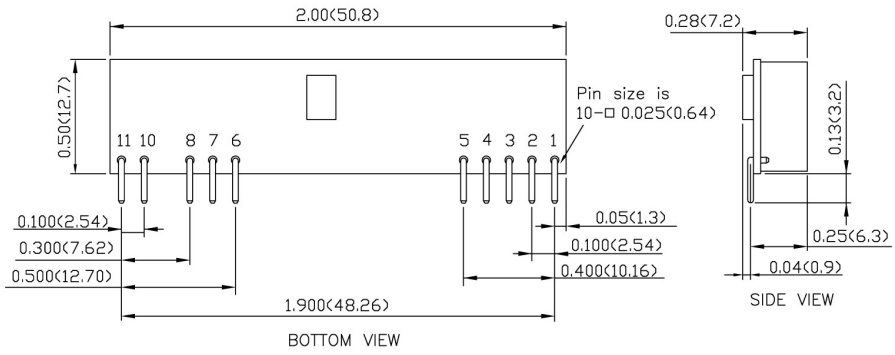


Table 1	
Vout(set) (V)	Rtrim (KΩ)
0.7525	Open
1.2	41.973
1.5	23.077
1.8	15.004
2.5	6.974
3.3	3.160



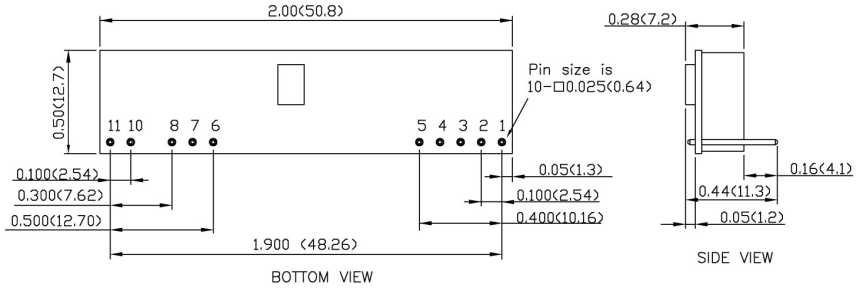
MECHANICAL DRAWING :

DOH10-05T TYPE



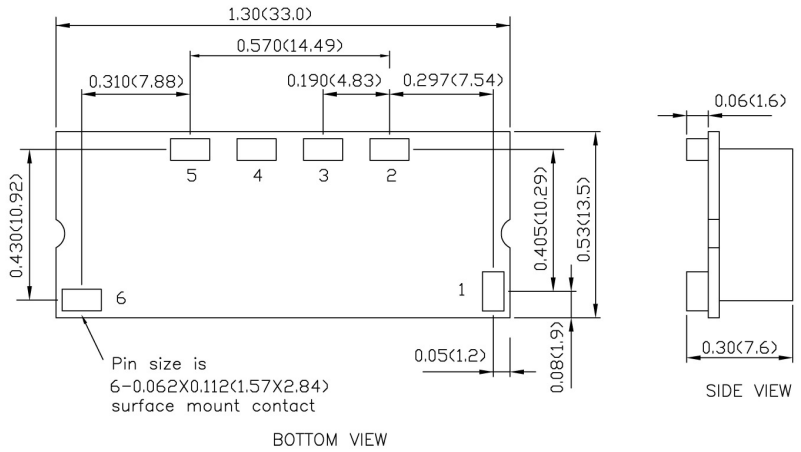
PIN CONNECTION	
PIN	DEFINE
1	+OUTPUT
2	+OUTPUT
3	+SENSE
4	+OUTPUT
5	GND
6	GND
7	+ INPUT
8	+ INPUT
10	TRIM
11	CTRL

DOH10-05TA 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

DOS10-05T 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)