

APPLICATIONS

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

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

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 25°C otherwise noted

OUTPUT SPECIFICATIONS		INPUT SPECIFICATIONS	
Output current	16A max	Input voltage range	$V_{out(set)} \leq 3.63V$ $V_{in(nom)} = 12V$ 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; $I_o = I_o(max)$ 10A
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 $V_{out(set)} = 5.0VDC$ 100mA ($V_{in} = 12V$, $I_o = 0$, module enabled)
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 μ H source impedance 30mA p-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	Operating ambient temperature	-40°C ~ +85°C(with derating)
	Load change step (50% to 100% or 100% to 50% of $I_o(max)$) Setting time ($V_{out} < 10\%$ peak deviation) 25 μ s	Storage temperature range	-55°C ~ +125°C
Dynamic load response (Note 3)	$\Delta I_o / \Delta t = 2.5A/\mu s$, $V_{in(nom)}$ Peak deviation 100mV	Thermal shock	MIL-STD-810F
	Load change step (50% to 100% or 100% to 50% of $I_o(max)$) Setting time ($V_{out} < 10\%$ peak deviation) 50 μ s	Vibration	MIL-STD-810F
Output current limit	180%	Relative humidity(non-condensing)	5% to 95% RH
Output short-circuit current	Continuous, automatics recovery	Lead-free reflow solder process	IPC J-STD-020D
External load capacitance	ESR $\geq 1m\Omega$ 1000 μ F,max	Moisture sensitivity level(MSL)	IPC J-STD-033B Level 2a
	ESR $\geq 10m\Omega$ 5000 μ F,max	Over temperature protection	125°C
Output voltage overshoot-startup	$V_{in} = V_{in(min)}$ to $V_{in(max)}$ F.L. 1% $V_{out(set)}$	FEATURE SPECIFICATIONS	
Voltage adjustability (see fig.1) (Note 4)	0.7525V ~ 5.0V	Remote ON/OFF(Note 6)	
GENERAL SPECIFICATIONS		Negative logic(standard)	ON = Open or $0V < V_r < 0.3V$ $I_{IN} = 10\mu A, max$ OFF = $2.5V < V_r < V_{in(max)}$ $I_{IN} = 1mA, max$
Efficiency	See table	Positive logic(option)	ON = Open or $(V_{in} - 4) < V_r < V_{in(max)}$ $I_{IN} = 10\mu A, max$ OFF = $0V < V_r < 0.3V$ $I_{IN} = 1mA, max$
Isolation voltage	None	Input current of Remote control pin	10 μ A~1.0mA
Switching frequency	300kHz $\pm 10\%$	Remote off state input current	Nominal Input 2.0mA
Safety approvals	IEC60950-1, UL60950-1, & EN60950-1	Remote sense range	0.5V,max
Dimensions	SMD 1.30 X 0.53 X 0.30 Inch (33.0 X 13.5 X 7.7 mm)	Rise time	Time for V_{out} to rise from 10% to 90% of $V_{out(set)}$ 6ms,max.
	SIP 2.00 X 0.50 X 0.28 Inch (50.8 X 12.7 X 7.2 mm)	Turn-on delay time	Case 1 (Note 7) 3ms
Weight	6.0g(0.22oz)		Case 2 (Note 8) 3ms
MTBF (Note 1)	MIL-HDBK-217F 3.416 x 10 ⁶ hrs		

Model Name	ON/OFF Logic	Package	Input Voltage	Output Voltage	Output Current		Efficiency (%) 12Vin, 3.3VDC@16A
					Min. Load	Max. Load	
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	Vout(set) > 3.63V Vin = 8.3-13.2VDC	0.75 ~ 5.0VDC	0A	16A	92%
DOH16-12T-P	Positive	SIP					
DOH16-12TA	Negative	Horizontal Mounting					
DOH16-12TA-P	Positive	SIP					

Note

1. MIL-HDBK-217F @Ta=25 °C, 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 R_{trim} in Table 1) between the TRIM and GND pins of the module. To calculate the value of the resistor **R_{trim}** for a particular output voltage **V_{out}**, 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_{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.

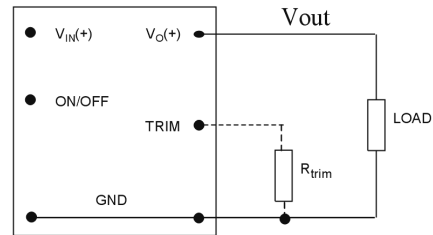
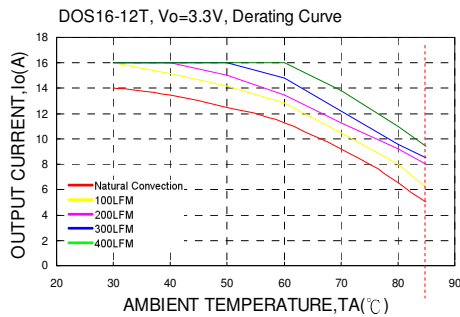
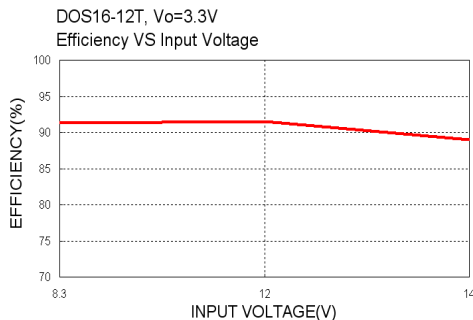
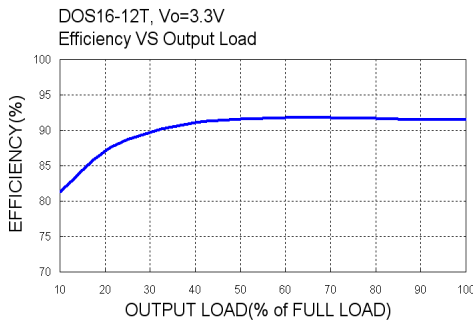


Fig. 1

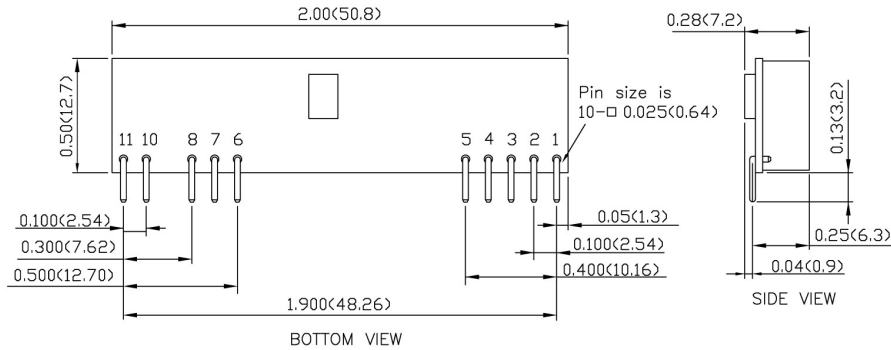


Vout(set) (V)	Rtrim (KΩ)
0.7525	Open
1.2	22.46
1.5	13.05
1.8	9.024
2.5	5.009
3.3	3.122
5	1.472



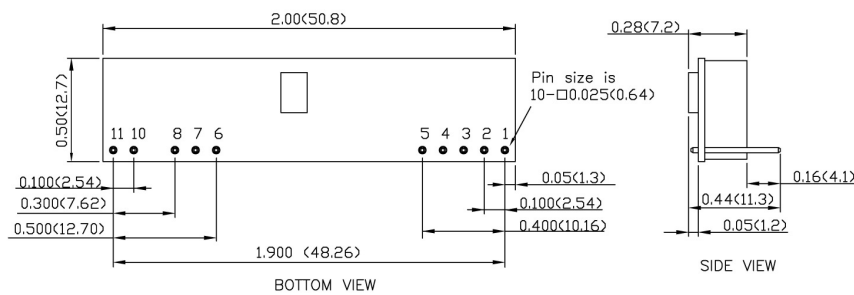
MECHANICAL DRAWING :

DOH16-12T TYPE



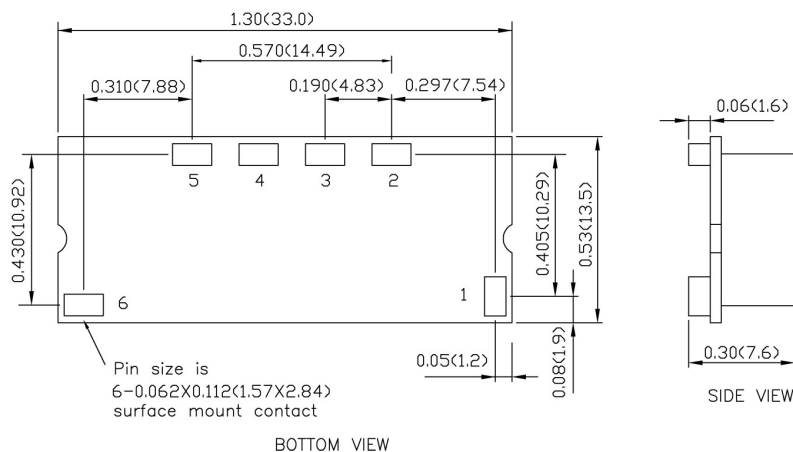
PIN CONNECTION	
PIN	DEFINE
1	+OUTPUT
2	+OUTPUT
3	+SENSE
4	+OUTPUT
5	GND
6	GND
7	+ INPUT
8	+ INPUT
10	TRIM
11	CTRL

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

- 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)