

### APPLICATIONS

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

### FEATURES

- OUTPUT CURRENT UP TO 6A
- SMALL SIZE AND LOW PROFILE :  
0.80" X 0.45" X 0.22" (SMD) ; 0.9" X 0.40" X 0.20" (SIP)
- HIGH EFFICIENCY UP TO 94% @ 3.3V FULL LOAD
- INPUT RANGE FROM 2.4VDC TO 5.5VDC
- FIXED SWITCHING FREQUENCY
- 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
- SAFETY MEETS UL60950-1, EN60950-1 AND IEC60950-1
- ISO9001 CERTIFIED MANUFACTURING FACILITIES
- COMPLIANT TO RoHS EU DIRECTIVE 2011/65/EU

### OPTIONS

POSITIVE LOGIC REMOTE ON/OFF

### DESCRIPTION

DOS06-05T (SMD type), DOH06-05T (for Vertical Mounting SIP type) and DOH06-05TA (for Horizontal Mounting SIP type) are non-isolated DC/DC converters that can deliver up to 6A of output current with full load efficiency of 94% 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	6A max	Input voltage range	$V_{out(set)} < V_{in} - 0.5V$ 2.4 ~ 5.5VDC
Voltage accuracy	$\pm 2\% V_{out(set)}$	Maximum input current	$V_{in}=V_{in(min)}$ ; $V_{out(set)}=3.3V$ ; $I_o=I_o(max)$ 6A
Minimum load	0%	Input filter (Note 5)	C filter
Line regulation	$V_{in}=V_{out(set)}+0.5V$ to $V_{in(max)}$ at Full Load	Input no load current	$V_{out(set)}=0.75VDC$ 20mA $V_{out(set)}=3.3VDC$ 45mA ( $V_{in}=5V$ , $I_o=0$ , module enabled)
Load regulation	No Load to Full Load	Input under voltage lockout	Start-up voltage 2.2VDC Shutdown voltage 2.0VDC
Ripple and noise (Note2) 20MHz bandwidth	20mVrms, max. 50mVp-p, max.	Input reflected ripple current	5~20MHz, 1 $\mu$ H source impedance 35mA <sub>p-p</sub>
Temperature coefficient	$\pm 0.4\%$	ENVIRONMENTAL SPECIFICATIONS	
Dynamic load response (Note2)	$\Delta I_o / \Delta t = 2.5A/\mu s$ , $V_{in}(nom)$	Operating ambient temperature	-40°C ~ +85°C (with derating)
	Load change step (50% to 100% or 100% to 50% of $I_o(max)$ )	Storage temperature range	-55°C ~ +125°C
Dynamic load response (Note3)	$\Delta I_o / \Delta t = 2.5A/\mu s$ , $V_{in}(nom)$	Thermal shock	MIL-STD-810F
	Load change step (50% to 100% or 100% to 50% of $I_o(max)$ )	Vibration	MIL-STD-810F
Output current limit	220%	Relative humidity(non-condensing)	5% ~ 95% RH
Output short-circuit current	Continuous, automatics recovery	Lead-free reflow solder process	IPC J-STD-020D
External load capacitance	$ESR \geq 1m\Omega$	Moisture sensitivity level(MSL)	IPC J-STD-033B Level 2a
	$ESR \geq 10m\Omega$	Over temperature protection	135 °C
Output voltage overshoot-startup $V_{in}=2.4 \sim 5.5V$ , F.L.	1% $V_{out(set)}$	FEATURE SPECIFICATIONS	
Voltage adjustability (see fig.1) (Note 4)	0.7525V ~ 3.63V	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 = $1.5V < V_r < V_{in}(max)$ $I_{IN}=1mA$ , max
Efficiency	See table	(Positive logic)(option)	ON = Open or $V_{in}(max)$ $I_{IN}=10\mu A$ , max OFF = $0V < V_r < 0.3V$ $I_{IN}=1mA$ , max
Isolation voltage	None	Input current of Remote control pin	10 $\mu A$ ~1.0mA
Switching frequency	300kHz $\pm 10\%$	Remote off state input current	Nominal Input 0.6mA
Design meets safety standard	IEC60950-1, UL60950-1, EN60950-1	Rise time	Time for $V_{out}$ to rise from 10% to 90% of $V_{out(set)}$ 6mS,max.
Dimensions	SMD	0.80 X 0.45 X 0.22 Inch (20.3 X 11.4 X 5.5 mm)	Turn-on delay time
	SIP	0.90 X 0.40 X 0.20 Inch (22.9 X 10.2 X 5.0 mm)	
Weight	2.8g(0.1oz)	Case 1 (Note 7)	1ms
MTBF (Note 1)	MIL-HDBK-217F	Case 2 (Note 8)	1ms

Model Name	ON/OFF Logic	Package	Input Voltage	Output Voltage	Output Current		Efficiency (%)
					Min. Load	Max. Load	
DOS06-05T	Negative	SMD	2.4 ~ 5.5VDC $V_{in(min)}=V_{out(set)}+0.5V$	0.75 ~ 3.3VDC	0A	6A	94%
DOS06-05T-P	Positive						
DOH06-05T	Negative	Vertical Mounting SIP					
DOH06-05T-P	Positive						
DOH06-05TA	Negative	Horizontal Mounting SIP					
DOH06-05TA-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 150uF polymer capacitors.
4. Output voltage programmable from 0.75V to 3.3V 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:

$$R_{trim} = \left[ \frac{21070}{V_{out} - 0.750} - 5110 \right] \Omega$$

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<sub>in</sub> is 2pcs 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.

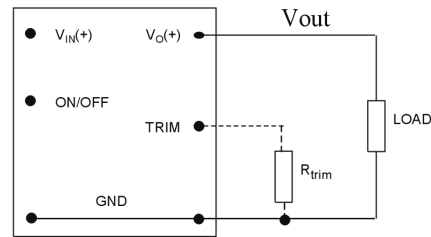
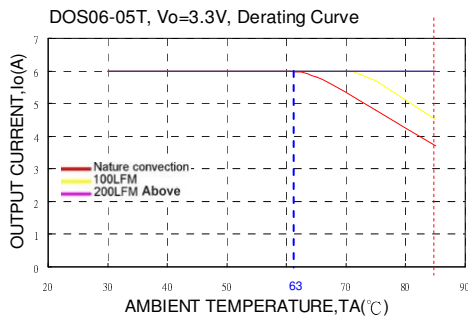
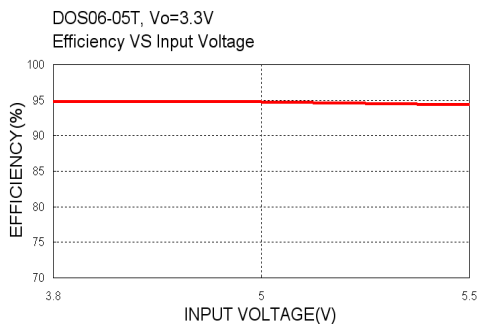
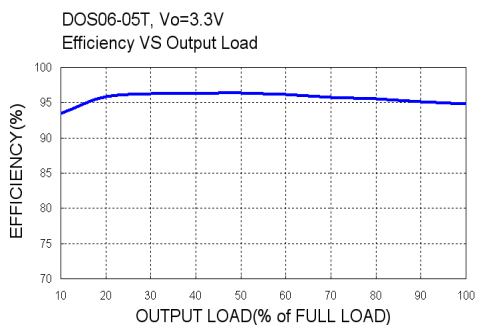


Fig. 1

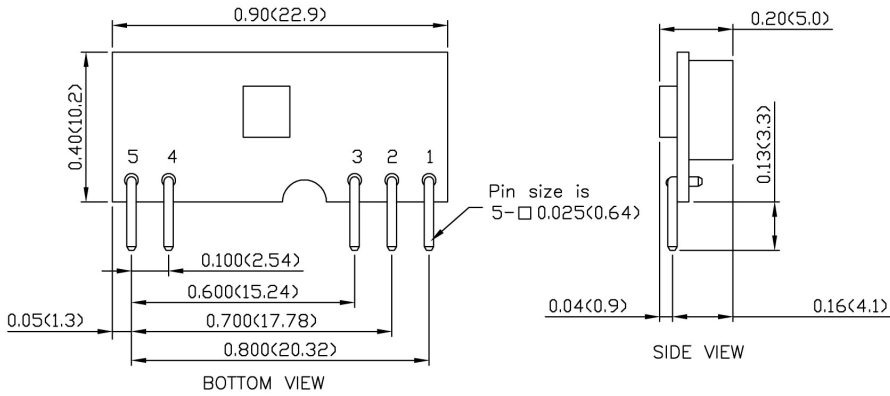


Vout(set) (V)	Rtrim (KΩ)
0.7525	Open
1.2	41.973
1.5	23.077
1.8	15.004
2.5	6.974
3.3	3.160



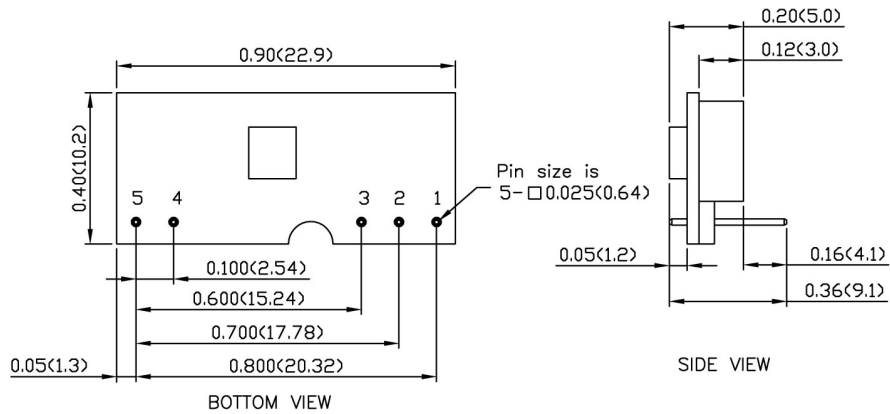
**MECHANICAL DRAWING :**

**DOH06-05T TYPE**



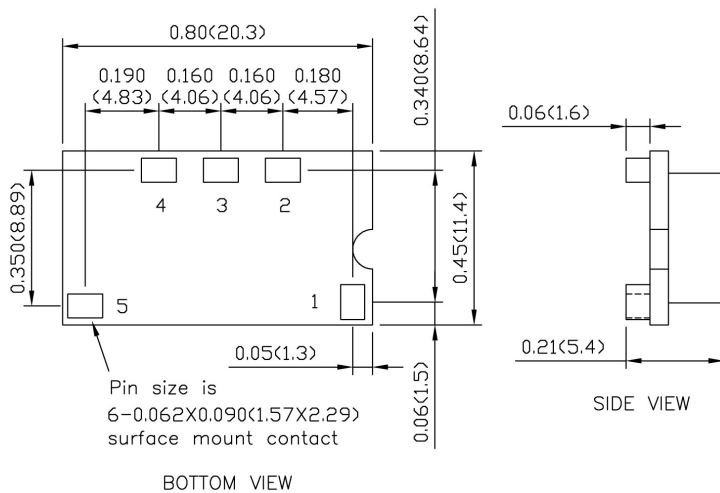
PIN CONNECTION	
PIN	DEFINE
1	+OUTPUT
2	TRIM
3	GND
4	+ INPUT
5	CTRL

**DOH06-05TA TYPE**



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

**DOS06-05T TYPE**



PIN CONNECTION	
PIN	DEFINE
1	CTRL
2	+OUTPUT
3	TRIM
4	GND
5	+ 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)