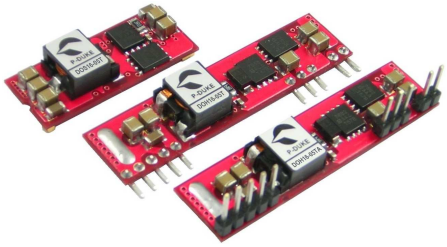
POWER MATE TECHNOLOGY CO.,LTD.

P-DUKE

DOS16-05T Non-isolated
DOH16-05T Point of load DC/DC converters



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 - 95% @ 3.3V FULL LOAD
- INPUT RANGE FROM 2.4VDC TO 5.5VDC
- FIXED SWITCHING FREQUENCY (300KHZ)
- SMD & SIP PACKAGES
- OUTPUT VOLTAGE PROGRAMMABLE FROM 0.75VDC TO 3.3VDC VIA EXTERNAL RESISTOR
- INPUT UNDER-VOLTAGE LOCKOUT
- UL60950-1, EN60950-1 AND IEC60950-1 LICENSED
- ISO9001 CERTIFIED MANUFACTURING FACILITIES
- COMPLIANT TO RoHS EU DIRECTIVE 2002/95/EC

APPLICATIONS

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

OPTIONS

Positive Logic Remote on/off

DESCRIPTION

DOS16-05T (SMD type), DOH16-05T (for Vertical Mounting SIP type) and DOH16-05TA (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 95% at 3.3V output.

TECHNICAL SPECIFICATION

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

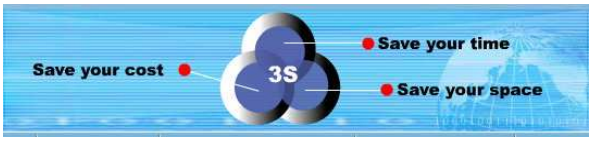
OUTPUT SPECIFICATIONS			
Output current			16A max
Voltage accuracy	Full load and Vin(nom)		± 2%Vo(set)
Minimum load			0%
Line regulation	Vin=Vo(set)+0.5V to Vin(max) at Full Load		± 0.3%Vo(set),typ
Load regulation	No Load to Full Load		± 0.4%Vo(set),typ
Ripple and noise (Note2)	20MHz bandwidth		15mVrms,max 50mVp-p,max
Temperature coefficient			±0.4%, typ
Dynamic load response (Note 2)	∆Io / ∆t = 2.5A/µS ,Vin(nom)	Peak deviation	300mV,typ
	Load change step (50% to 100% or 100% to 50% of Io(max))	Setting time (Vo<10%peak deviation)	25µS,typ
Dynamic load response (Note 3)	∆Io / ∆t = 2.5A/µS ,Vin(nom)	Peak deviation	150mV,typ
	Load change step (50% to 100% or 100% to 50% of Io(max))	Setting time (Vo<10%peak deviation)	100µS,typ
Output current limit			180%,typ
Output short-circuit current			Hiccup, 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%Vo(set)
Voltage adjustability (see fig.1)	(Note 4)		0.7525V ~ 3.63V

GENERAL SPECIFICATIONS		
Efficiency		See table
Isolation voltage		None
Switching frequency		300KHz, typ
Approvals and standard		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)	BELLCORE TR-NWT-000332 MIL-HDBK-217F	1.428×10^7 hrs 6.523×10^5 hrs

INPUT SPECIFICATIONS		
Input voltage range	Vo(set) < Vin – 0.5V	2.4 – 5.5VDC
Maximum input current	Vin=2.4 to 5.5V; Io=Io(max)	16A
Input filter (Note 5)		C filter
Input no load current (Vin=5V, Io=0, module enabled)	Vo(set) =0.75Vdc Vo(set) =3.3Vdc	100mA,typ 130mA,typ
Input under voltage lockout	Start-up voltage Shutdown voltage	2.2V,typ 2.0V,typ
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
Over temperature protection	125ºC,typ

FEATURE SPECIFICATIONS		
Remote ON/OFF(Note 6)		
Negative logic(standard)	ON = 0V < Vr < 0.3V	I_{IN}=10µA,max
	OFF =1.5V < Vr < Vin(max)	I_{IN}=1mA,max
Positive logic(option)	ON = 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 Vin	1.5mA,typ
Remote sense range		0.5V,max
Rise time	Time for Vo to rise from 10% to 90%of Vo(set)	6ms,max.
Turn-on delay time	Case 1 (Note 7) Case 2 (Note 8)	1ms,typ 1ms,typ



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DOS16-05T Non-isolated
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Model Name	ON/OFF Logic	Package	Input Voltage	Output Voltage	Output Current		Efficiency (%)
					Min. Load	Max. Load	5.0Vin, 3.3Vdc@16A
DOS16-05T	Negative	SMD	2.4 ~ 5.5Vdc Vin(min)=Vo(set)+0.5V	0.75 ~ 3.3Vdc	0A	16A	95%
DOS16-05T-P	Positive						
DOH16-05T	Negative	Vertical Mounting SIP					
DOH16-05T-P	Positive						
DOH16-05TA	Negative	Horizontal Mounting SIP					
DOH16-05TA-P	Positive						

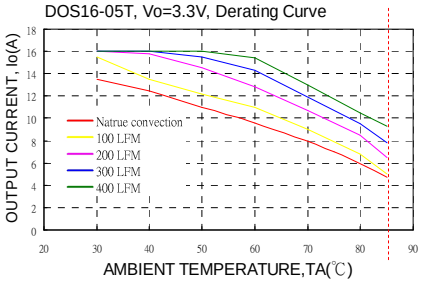
Note

1. BELLCORE TR-NWT-000332. Case 1: 50% Stress, Temperature at 40ºC.
   MIL-HDBK-217F Notice2 @Ta=25 ºC, Full load(Ground, Benign, controlled environment).
2. External with C_{out} = 1μF ceramic//10μF tantalum capacitors.
3. External with C_{out} = 2×150μF 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 ***Vo***, use the following equation:

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

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 4×150μF low-ESR polymer capacitors // 4×47μF 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 Vo=10% of Vo(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 Vo=10% of Vo(set))

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



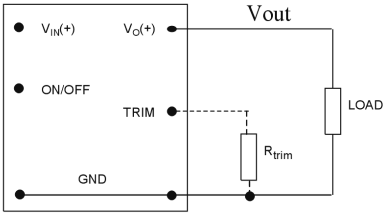


Fig. 1

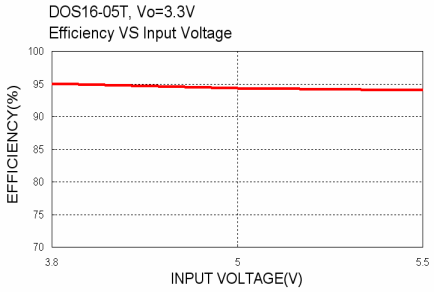
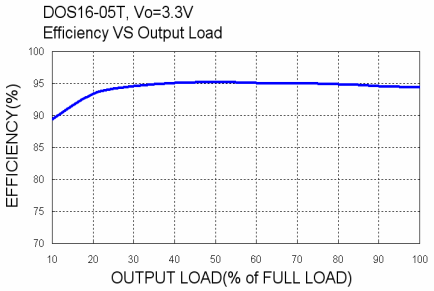


Table 1	
Vo(set) (V)	Rtrim (KΩ)
0.7525	Open
1.2	41.973
1.5	23.077
1.8	15.004
2.5	6.974
3.3	3.160



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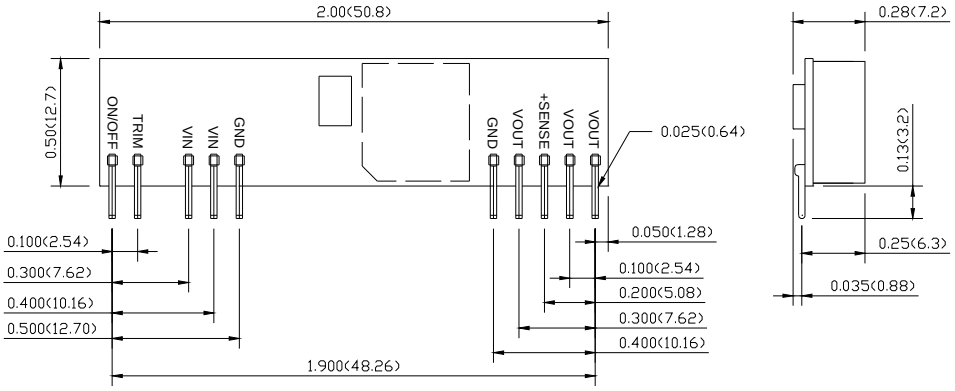
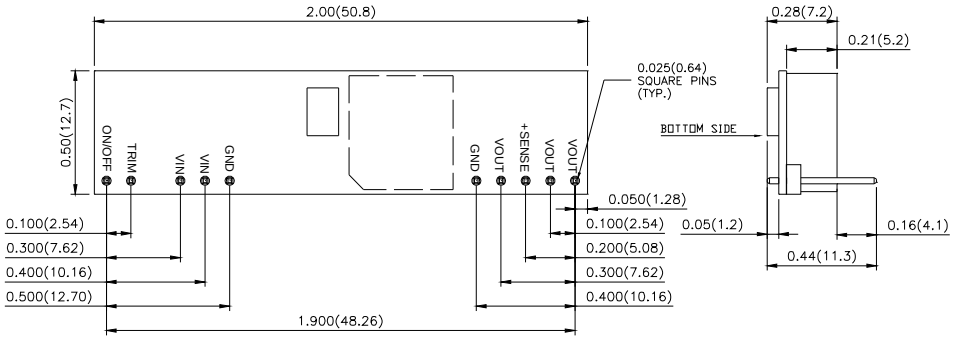
DOH16-05T



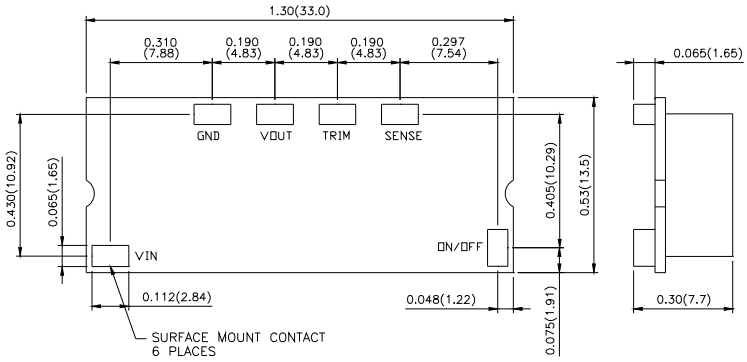
BOTTOM VIEW SIDE VIEW

DOH16-05TA



BOTTOM VIEW SIDE VIEW

DOS16-05T



BOTTOM VIEW SIDE VIEW

1. All dimensions in Inches (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)

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