

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 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

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 25°C otherwise noted

| OUTPUT SPECIFICATIONS | |
|---|--|
| Output current | 16A max |
| Voltage accuracy | ± 2%Vout(set) |
| Minimum load | 0% |
| Line regulation | $V_{in}=V_{out(set)}+0.5V$ to $V_{in(max)}$ 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) | $\Delta I_o / \Delta t = 2.5A/\mu s$, $V_{in}(nom)$ Peak deviation 300mV Load change step (50% to 100% or 100% to 50% of $I_o(max)$) Setting time (Vout<10%peak deviation) 25μs |
| | $\Delta I_o / \Delta t = 2.5A/\mu s$, $V_{in}(nom)$ Peak deviation 150mV Load change step (50% to 100% or 100% to 50% of $I_o(max)$) Setting time (Vout<10%peak deviation) 100μs |
| Output current limit | 180% |
| Output short-circuit current | Continuous, automatic recovery |
| External load capacitance | ESR ≥ 1mΩ 1000μF,max |
| | ESR ≥ 10mΩ 5000μF,max |
| Output voltage overshoot-startup | $V_{in}=2.4\sim 5.5V$, 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 3.238 x 10 ⁶ hrs |
| INPUT SPECIFICATIONS | |
| Input voltage range | $V_{out(set)} < V_{in} - 0.5V$ 2.4 ~ 5.5VDC |
| Maximum input current | $V_{in}=2.4$ to 5.5V; $I_o=I_o(max)$ 16A |
| Input filter (Note 5) | C filter |
| Input no load current | $V_{out(set)} = 0.75VDC$ 100mA |
| ($V_{in}=5V$, $I_o=0$, module enabled) | $V_{out(set)} = 3.3VDC$ 130mA |
| Input under voltage lockout | Start-up voltage 2.2VDC |
| | Shutdown voltage 2.0VDC |
| Input reflected ripple current | 5~20MHz, 1μH source impedance 100mA _{p-p} |
| ENVIRONMENTAL SPECIFICATIONS | |
| Operating ambient temperature | -40°C ~ +85°C(with derating) |
| Storage temperature range | -55°C ~ +125°C |
| 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 | 125°C |
| FEATURE SPECIFICATIONS | |
| Remote ON/OFF(Note 6) | |
| Negative logic(standard) | ON = Open or $0V < V_r < 0.3V$ $I_{IN}=10\mu A,max$ |
| | OFF = $1.5V < V_r < V_{in}(max)$ $I_{IN}=1mA,max$ |
| Positive logic(option) | ON = Open or $V_{in}(max)$ $I_{IN}=10\mu A,max$ |
| | OFF = $0V < V_r < 0.3V$ $I_{IN}=1mA,max$ |
| Input current of Remote control pin | 10μA~1.0mA |
| Remote off state input current | Nominal Input 1.5mA |
| Remote sense range | 0.5V,max |
| Rise time | Time for Vout to rise from 10% to 90%of Vout(set) 6ms |
| Turn-on delay time | Case 1 (Note 7) 1ms |
| | Case 2 (Note 8) 1ms |



| Model Name | ON/OFF Logic | Package | Input Voltage | Output Voltage | Output Current | | Efficiency (%) 5.0Vin, 3.3VDC@16A |
|--------------|--------------|----------------------------|---|----------------|----------------|-----------|--------------------------------------|
| | | | | | Min. Load | Max. Load | |
| DOS16-05T | Negative | SMD | 2.4 ~ 5.5VDC Vin(min)=Vout(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 | | | | | | |

- Noted:
- MIL-HDBK-217F @Ta=25 °C, Full load.
 - External with C_{out} = 1μF ceramic//10μF tantalum capacitors.
 - External with C_{out} = 2pcs of 150μF polymer capacitors.
 - Output voltage programmable from 0.75V to 3.3V 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:

$$R_{trim} = \left[\frac{21070}{V_{out} - 0.75} - 5110 \right] \Omega$$

- It's necessary to use 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 4pcs of 150μF low-ESR polymer capacitors // 4pcs of 47μF ceramic capacitors at least.
- 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)
- 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))
- 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.

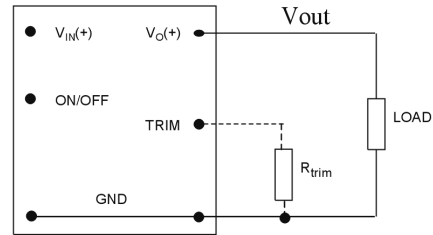
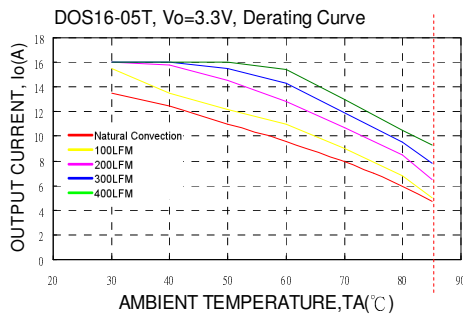
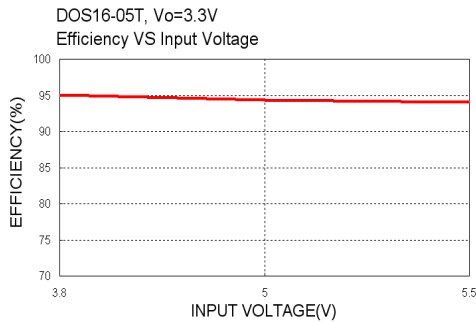
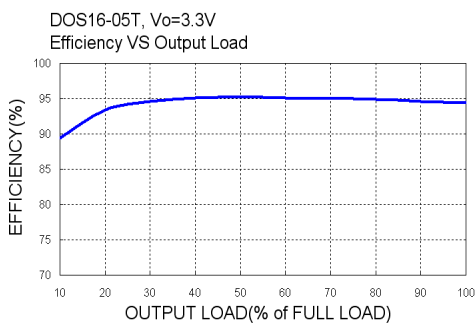


Fig. 1

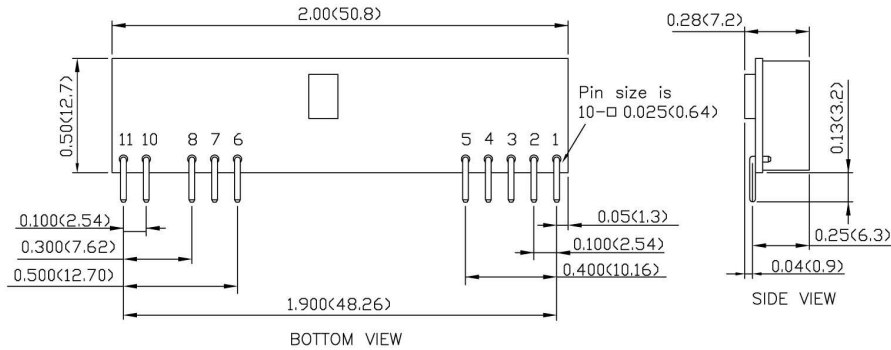


| Vout(set) (V) | Rtrim (KΩ) |
|---------------|------------|
| 0.7525 | Open |
| 1.2 | 41.973 |
| 1.5 | 23.077 |
| 1.8 | 15.004 |
| 2.5 | 6.974 |
| 3.3 | 3.160 |



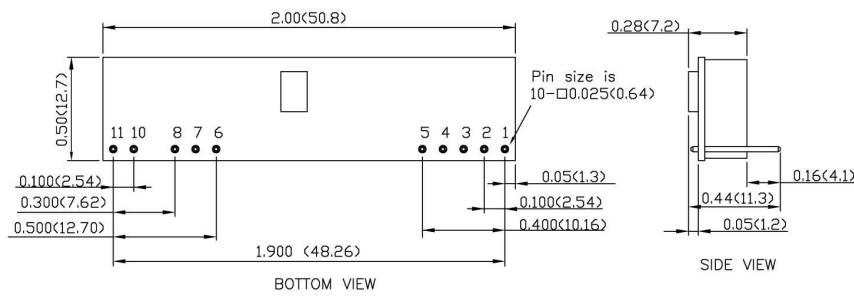
MECHANICAL DRAWING :

DOH16-05T TYPE



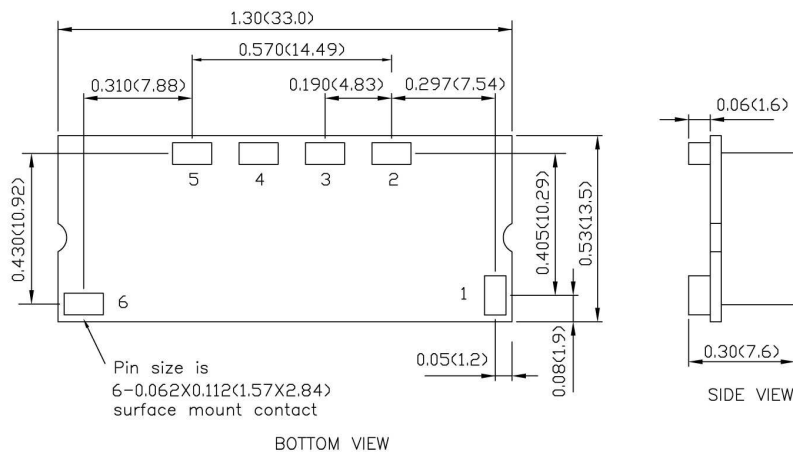
| PIN CONNECTION | |
|----------------|---------|
| PIN | DEFINE |
| 1 | +OUTPUT |
| 2 | +OUTPUT |
| 3 | +SENSE |
| 4 | +OUTPUT |
| 5 | GND |
| 6 | GND |
| 7 | + INPUT |
| 8 | + INPUT |
| 10 | TRIM |
| 11 | CTRL |

DOH16-05TA 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 |

DOS16-05T 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)