TDA30X Series

30 Watt, 1.6kV Isolation

- 30W power in compact 1"x1" package
- 4:1 Wide input range voltage
- -40°C to 105°C operating temperature
- Continuous short circuit protection
- 6-sided continuous shield
- No minimum load requirement
- EMI Class A without external circuit

Applications

- Industrial control application
- Telecom/Datacom application
- Stand by power application
- Space saving solution

Model-Type	Input Voltage (VDC)	Output Voltage (Vdc)	Output Current mA (max)	Efficiency (typ.)	Capacitive load (max.)
TDA30X-2403S	9-36 Vdc Nom. 24 Vdc	3.3 Vdc	7000 mA	88%	10000 µF
TDA30X-2405S		5 Vdc	6000 mA	89%	7200 µF
TDA30X-2412S		12 Vdc	2500 mA	89%	1200 µF
TDA30X-2415S		15 Vdc	2000 mA	89%	1000 µF
TDA30X-2424S		24 Vdc	1250 mA	90%	380 µF
TDA30X-2412D		±12 Vdc	±1250 mA	89%	±750 µF
TDA30X-2415D		±15 Vdc	±1000 mA	91%	±500 µF
TDA30X-4803S	18-75 Vdc Nom. 48 Vdc	3.3 Vdc	7000 mA	88%	10000 µF
TDA30X-4805S		5 Vdc	6000 mA	90%	7200 µF
TDA30X-4812S		12 Vdc	2500 mA	90%	1200 µF
TDA30X-4815S		15 Vdc	2000 mA	90%	1000 µF
TDA30X-4824S		24 Vdc	1250 mA	91%	380 µF
TDA30X-4812D		±12 Vdc	±1250 mA	91%	±750 µF
TDA30X-4815D		±15 Vdc	±1000 mA	92%	±500 µF

S: Single Output D: Dual Output

1. The efficiency is tested by nominal input and maximum full load @25°C.
2. The capacitive load is tested by minimum input and constant resistive load.
3. All specifications valid at nominal voltage, full load and 25°C after warm-up time unless otherwise stated.

Part Number

TDA30X - 24 05 S

- TDA30X: TDA30X Series 30W, 4:1 Wide Input
- 24: Input Voltage
- 05: Output Volltage
- S: Single or Dual Output

Output Voltage Codes: 03 = 3.3V
05 = 5.0V
12 = 12.0V
15 = 15.0V
24 = 24.0V

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Specifications

Input

Input Voltage Range	• 4:1; 9 - 36Vdc (24V) and 18 - 75 Vdc (48V)
Input filter	• Pi filter
Start up Time	• Nom. Vin @ 100% load
Start - up Input Voltage	• 24V input @ 9 Vdc, 48V input @ 18Vdc
Under voltage lockout	• 24V input @ 7.5Vdc, 48V input @ 16Vdc Typ.
Input surge voltage	• 24V input @ 50Vdc, 48V input @ 100Vdc Max .
Remote ON/Off	• DC-DC ON: Open or 3.5~15Vdc DC-DC OFF: Short or 0~1.2Vdc Input Current (OFF Mode): 2mA

Output

Output Voltage Accuracy	• ±1%
Load Regulation (0% to 100% Load)	• Single Output: ±0.2% Dual Output: 1.0%
Line Regulation (L-N @ Full load)	• Single Output: ±0.2% Dual Output: ±0.5%
Ripple & Noise[1]	• 24V: 75mVp-p @ Full Load
Minimum Load	• 0%
Operating Frequency	• 100% load @ V_{in} Range 400KHz
Crossing Regulation	• Asymetrical load 25%/100%, ±5%
Voltage adjustability	• 0%~100% load @ V_{in} Range ±10% P_{out} ≤ max rated power
Transient response recovery	• 25% load step change: 250μs (75%-100% load)

Environment

Operating Temperature	• -40°C to +105°C, see derating curve below
Storage Temperature	• -55°C to +125°C
Max.Case Temperature	• 105°C
Relative Humidity	• 5-95% RH
Vibration	• MIL-STD-202G

Function

Efficiency (@ Full Load)	• 88% to 92% typical
Isolation Voltage	• 1.6 kVdc, 60 sec, Input to Output
Isolation Resistance	• 500Vdc 1GΩ, min.
Isolation Capacitance	• 2400pF
MTBF	• @25°C TBD Hours
Short Circuit Protection	• Continuous, Automatic Recovery
Overload Protection	• 24Vin @ 170%typ, 48Vin @ 190% typ.
Over Voltage Protection	• 3.3V output @ 5.3Vdc typ. 5V output @ 6.2 Vdc typ. 12V output @ 15Vdc typ. 15V output @ 18Vdc typ. 24V output @ 30Vdc typ. ±12V output @ ±15Vdc typ. ±15V output @ ±18Vdc typ.
Over temperature Protection	• 115°C
Safety Approvals	• Meets EN62368-1

Physical

Dimensions	• 25.40 X 25.40 X 10.00 mm 1.0" x 1.0" x .39"
Weight	• .6 Oz. (17 grams)
Case Material	• Nickel plated metal with FR-4 base
Potting Material	• Silicone
Cooling Method	• Free air convection

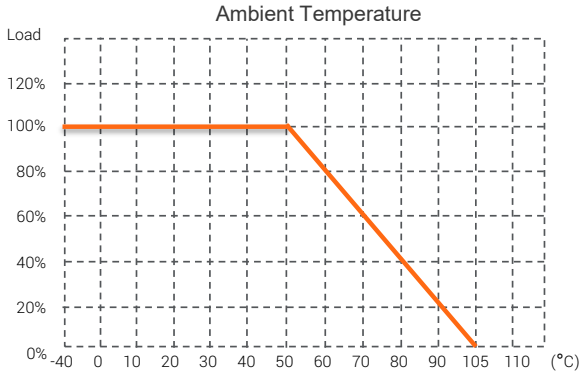
EMC

EMI	• EN55032 Class A/B
ESD	• EN61000-4-2, Air: ±8kV; Contact: ±6kV, Criteria A
Rated Immunity	• EN61000-4-3, Criteria A
Fast Transient	• EN61000-4-4, ±2kV, Criteria A
Surge	• EN61000-4-5, ±2kV, Criteria A
Conducted Immunity	• EN61000-4-6, Criteria A
Magnetic field immunity	• EN61000-4-8, Criteria A

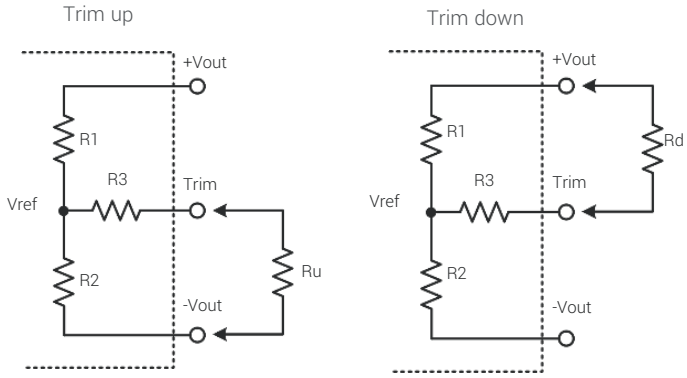
Notes

1. Ripple & noise: 20MHz BW at Vin range 0%~100% load (contact MLCC 22uF). Light load ripple & noise is no more than 150mVp-p.
2. EMI class A without external circuit, and class B suggestion circuit, please check with our sales.
3. Test with E-CAP 680uF/100V at input terminal.
4. The product information and specifications are subject to change without prior notice.

Derating Curve



External Output Voltage Trimming



Formula for trim resistor:

UP: $Ru=\frac{aR_2}{R_2-a}-R_3$ $a=\frac{V_{ref}}{V_o'-V_{ref}}\cdot R_1$

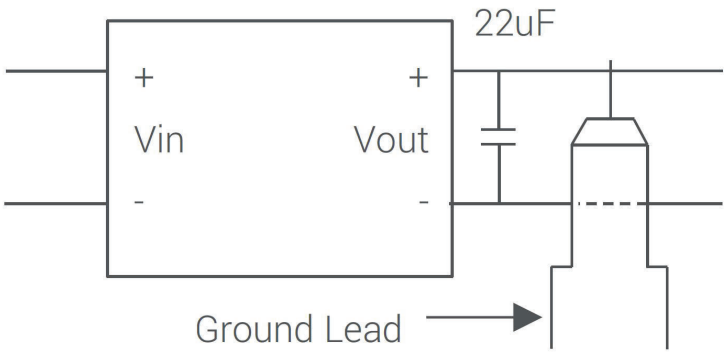
DOWN: $Rd=\frac{bR_1}{R_1-b}-R_3$ $b=\frac{V_o'-V_{ref}}{V_{ref}}\cdot R_2$

NOTES:

1. Ru and Rd are the mean trim resistors.
2. a & b are user defined parameters.
3. V_o' is the mean up/down trim voltage.
4. Refer to the table below for R1, R2, R3 and V_{ref} values.

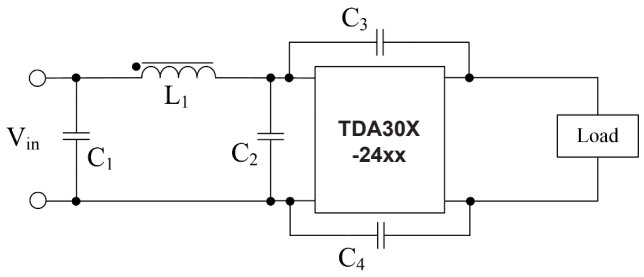
Model	R1	R2	R3	Vref
TDA30X-xx03	16.6kΩ	10kΩ	52.3Ω	1.25V
TDA30X-xx05	10.0kΩ	10kΩ	35.7Ω	2.5V
TDA30X-xx12	38.0kΩ	10kΩ	48.7Ω	2.5V
TDA30X-xx15	50.1kΩ	10kΩ	51.0Ω	2.5V
TDA30X-xx24	86.0kΩ	10kΩ	73.2Ω	2.5V

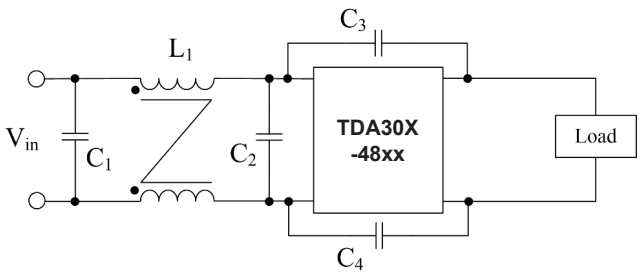
Ripple and Noise Measure Method



TDA30X Series Specifications

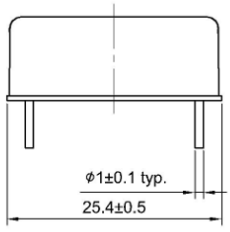
EMI Filtering-Suggestion for Class B

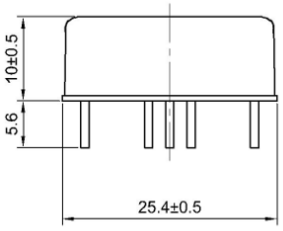


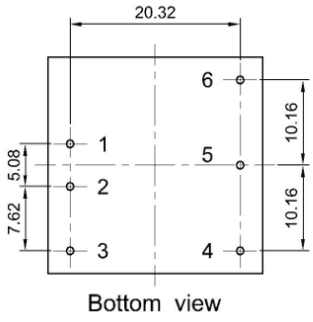


Part Number	C_1	L_1	C_2	C_3	C_4
TDA30X-24xx	4.7μF	10μF	4.7μH	2200pF	2200pF
TDA30X-48xx	4.7μF	2.2μF	Common mode choke K5B 32mH	2200pF	2200pF

Mechanical Drawing



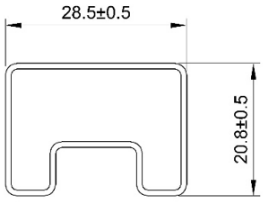




Units: mm

Tolerance : ±0.25mm

Packaging:



UNIT:mm
1 Tube = 8 pcs
Length:260±2mm

Pin	Single Output	Dual Output
1	+Vin	+Vin
2	-Vin	-Vin
3	Remote ON/OFF	Remote ON/OFF
4	-Vout	-Vout
5	Trim	Common
6	+Vout	+Vout

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