

PU SERIES

1W UNREGULATED

DANUBE

FEATURES

- SINGLE IN LINE PACKAGE
- 1W UNREGULATED OUTPUT POWER
- 100% BURN IN
- HIGH EFFICIENCY
- INTERNAL SMD TECHNOLOGY
- NO HEATSINK REQUIRED
- UL 94V-0 PACKAGE MATERIAL
- CUSTOM SOLUTIONS AVAILABLE
- RoHS COMPLIANT
- 3 YEARS WARRANTY



OUTPUT SPECIFICATIONS

| | |
|------------------------------|------------------|
| Voltage Set-point Accuracy | +/-2% max |
| Temperature Coefficient | +/-0.05%/°C |
| Ripple & Noise(20MHz BW) | 100mVp-p max |
| Line Regulation ¹ | +/-1.2% max |
| Load Regulation ² | +/-8% max |
| Minimum Load | 20% of Full Load |
| Short Circuit Protection | Momentary |

INPUT SPECIFICATIONS

| | |
|--------------------------------|-------------------------|
| Input Voltage Range | +/-10% max |
| Input Filter | Capacitor Typ |
| Input Reflected Ripple Current | 50mA _{p-p} max |
| Protection | Fuse Recommended |

GENERAL SPECIFICATIONS

| | |
|--------------------------------|--------------------------|
| Efficiency | 70%-83% |
| Isolation Voltage ³ | |
| Single/Dual | 1500-3000 VDC min |
| Twin | In to Out 1000 VDC min |
| | Out to Out 500 VDC min |
| Isolation Resistance | 10 ⁹ ohms min |
| Isolation Capacitance | 80pF max |
| Switching Frequency | 100KHz min |
| MTBF ⁴ | >2,000,000 Hours |
| Weight | 2.1g Typ |
| Case Material | Non-Conductive Plastic |
| Case Size | 19.6mm*6.1mm*10.2mm |
| | 19.6mm*7.1mm*10.2mm |
| Conducted Emissions | EN55022 Class A |
| Radiated Emissions | EN55022 Class A |

ENVIRONMENTAL SPECIFICATIONS

| | |
|-----------------------|---------------------|
| Operating Temperature | -40°C to +71°C |
| Storage Temperature | -55°C to +125°C |
| Humidity | 95% max |
| Cooling | Free-Air Convection |

ALL SPECIFICATIONS TYPICAL AT NOMINAL LINE, FULL LOAD AND 25°C UNLESS OTHERWISE NOTED.

¹ Line Regulation is for a 1.0% change in input Voltage.

² Load Regulation is for output load current change from 20% to 100%.

³ 1500VDC for 10 seconds,3000VDC for 3 seconds.

⁴ MIL-HDBK-217F @25 °C , Ground Benign.

● SELECTION GUIDE(1) 1W 1500VDC ISOLATION

| MODEL NUMBER | INPUT VOLTAGE (VDC) | OUTPUT VOLTAGE (VDC) | OUTPUT CURRENT (mA) | INPUT ⁵ | | EFF (%) ⁶ | ISOLATION (VDC) | PACKAGE |
|-----------------------|---------------------------|----------------------------|---------------------------|--------------------|------------|-------------------------|--------------------|-------------|
| | | | | CURRENT(mA) | | | | |
| | | | | FULL LOAD | NO LOAD | | | |
| PUS-0503.3(A or B) | 5 | 3.3 | 300 | 274 | 35 | 73 | 1500 | A or B |
| PUS-0505(A or B or E) | 5 | 5 | 200 | 283 | 35 | 71 | 1500 | A or B or E |
| PUS-0509(A or B or E) | 5 | 9 | 111 | 257 | 34 | 78 | 1500 | A or B or E |
| PUS-0512(A or B or E) | 5 | 12 | 84 | 253 | 33 | 79 | 1500 | A or B or E |
| PUS-0515(A or B or E) | 5 | 15 | 67 | 253 | 34 | 79 | 1500 | A or B or E |
| PUD-0505(A or B) | 5 | +/-5 | +/-100 | 278 | 35 | 72 | 1500 | A or B |
| PUD-0509(A or B) | 5 | +/-9 | +/-56 | 260 | 34 | 77 | 1500 | A or B |
| PUD-0512(A or B) | 5 | +/-12 | +/-42 | 253 | 33 | 79 | 1500 | A or B |
| PUD-0515(A or B) | 5 | +/-15 | +/-34 | 260 | 34 | 77 | 1500 | A or B |
| PUS-0909(A or B) | 9 | 9 | 111 | 148 | 24 | 75 | 1500 | A or B |
| PUS-1203.3(A or B) | 12 | 3.3 | 300 | 112 | 14 | 74 | 1500 | A or B |
| PUS-1205(A or B or E) | 12 | 5 | 200 | 112 | 15 | 74 | 1500 | A or B or E |
| PUS-1209(A or B or E) | 12 | 9 | 111 | 107 | 14 | 78 | 1500 | A or B or E |
| PUS-1212(A or B or E) | 12 | 12 | 84 | 102 | 14 | 82 | 1500 | A or B or E |
| PUS-1215(A or B or E) | 12 | 15 | 67 | 102 | 14 | 82 | 1500 | A or B or E |
| PUD-1205(A or B) | 12 | +/-5 | +/-100 | 112 | 15 | 74 | 1500 | A or B |
| PUD-1212(A or B) | 12 | +/-12 | +/-42 | 105 | 14 | 79 | 1500 | A or B |
| PUD-1215(A or B) | 12 | +/-15 | +/-34 | 101 | 15 | 83 | 1500 | A or B |
| PUS-2403.3C | 24 | 3.3 | 300 | 57 | 9 | 73 | 1500 | C |
| PUS-2405C | 24 | 5 | 200 | 57 | 9 | 73 | 1500 | C |
| PUS-2409C | 24 | 9 | 111 | 56 | 9 | 75 | 1500 | C |
| PUS-2412C | 24 | 12 | 84 | 54 | 9 | 77 | 1500 | C |
| PUS-2415C | 24 | 15 | 67 | 52 | 10 | 80 | 1500 | C |
| PUS-2424C | 24 | 24 | 42 | 54 | 9 | 77 | 1500 | C |
| PUD-2405C | 24 | +/-5 | +/-100 | 57 | 10 | 73 | 1500 | C |
| PUD-2412C | 24 | +/-12 | +/-42 | 54 | 10 | 77 | 1500 | C |
| PUD-2415C | 24 | +/-15 | +/-34 | 52 | 9 | 80 | 1500 | C |

Note: Other input to output voltages may be available. Please contact factory.

ORDERING INFORMATION:

FOR EXAMPLE: PUS-****A(SINGLE OUTPUT A PACKAGE)

PUD-****A(DUAL OUTPUT A PACKAGE)

PUS-****B(SINGLE OUTPUT B PACKAGE)

PUD-****B(DUAL OUTPUT B PACKAGE)

⁵ NOMINAL INPUT VOLTAGE.

⁶ NOMINAL INPUT VOLTAGE, FULL LOAD.

● SELECTION GUIDE(2) 1W 1500VDC ISOLATION

| MODEL NUMBER | INPUT VOLTAGE (VDC) | OUTPUT VOLTAGE (VDC) | OUTPUT CURRENT (mA) | INPUT ⁷ | | EFF (%) ⁸ | ISOLATION (VDC) | PACKAGE |
|-----------------|---------------------------|----------------------------|---------------------------|--------------------|------------|-------------------------|--------------------|---------|
| | | | | CURRENT(mA) | | | | |
| | | | | FULL LOAD | NO LOAD | | | |
| PUS-0503.3AY | 5 | 3.3 | 300 | 274 | 34 | 73 | 1500 | AY |
| PUS-0505AY | 5 | 5 | 200 | 283 | 34 | 71 | 1500 | AY |
| PUS-0509AY | 5 | 9 | 111 | 257 | 35 | 78 | 1500 | AY |
| PUS-0512AY | 5 | 12 | 84 | 253 | 34 | 79 | 1500 | AY |
| PUS-0515AY | 5 | 15 | 67 | 253 | 35 | 79 | 1500 | AY |
| PUD-0505AY | 5 | +/-5 | +/-100 | 278 | 35 | 72 | 1500 | AY |
| PUD-0512AY | 5 | +/-12 | +/-42 | 253 | 33 | 79 | 1500 | AY |
| PUD-0515AY | 5 | +/-15 | +/-34 | 260 | 34 | 77 | 1500 | AY |
| PUS-0909AY | 9 | 9 | 111 | 148 | 24 | 75 | 1500 | AY |
| PUS-1203.3AY | 12 | 3.3 | 300 | 112 | 14 | 74 | 1500 | AY |
| PUS-1205AY | 12 | 5 | 200 | 112 | 14 | 74 | 1500 | AY |
| PUS-1209AY | 12 | 9 | 111 | 107 | 15 | 78 | 1500 | AY |
| PUS-1212AY | 12 | 12 | 84 | 102 | 13 | 82 | 1500 | AY |
| PUS-1215AY | 12 | 15 | 67 | 102 | 14 | 82 | 1500 | AY |
| PUD-1205AY | 12 | +/-5 | +/-100 | 112 | 15 | 74 | 1500 | AY |
| PUD-1212AY | 12 | +/-12 | +/-42 | 105 | 14 | 79 | 1500 | AY |
| PUD-1215AY | 12 | +/-15 | +/-34 | 101 | 14 | 83 | 1500 | AY |
| PUS-2403.3CY | 24 | 3.3 | 300 | 57 | 10 | 73 | 1500 | CY |
| PUS-2405CY | 24 | 5 | 200 | 57 | 10 | 73 | 1500 | CY |
| PUS-2409CY | 24 | 9 | 111 | 56 | 9 | 75 | 1500 | CY |
| PUS-2412CY | 24 | 12 | 84 | 54 | 10 | 77 | 1500 | CY |
| PUS-2415CY | 24 | 15 | 67 | 52 | 9 | 80 | 1500 | CY |
| PUS-2424CY | 24 | 24 | 42 | 54 | 9 | 77 | 1500 | CY |
| PUD-2405CY | 24 | +/-5 | +/-100 | 57 | 10 | 73 | 1500 | CY |
| PUD-2412CY | 24 | +/-12 | +/-42 | 54 | 9 | 77 | 1500 | CY |
| PUD-2415CY | 24 | +/-15 | +/-34 | 52 | 9 | 80 | 1500 | CY |

Note: Other input to output voltages may be available. Please contact factory.

ORDERING INFORMATION:

FOR EXAMPLE: **PUS-****AY(SINGLE OUTPUT AY PACKAGE)**

PUD-**AY(DUAL OUTPUT AY PACKAGE)**

PUS-**CY(SINGLE OUTPUT CY PACKAGE)**

PUD-**CY(DUAL OUTPUT CY PACKAGE)**

⁷ NOMINAL INPUT VOLTAGE.

⁸ NOMINAL INPUT VOLTAGE, FULL LOAD.

● **SELECTION GUIDE(3)**
1W DUAL SEPARATE OUTPUT

| MODEL NUMBER | INPUT VOLTAGE (VDC) | OUTPUT VOLTAGE (VDC) | | OUTPUT CURRENT (mA) | | INPUT ⁹ CURRENT(mA) | | EFF (%) ¹⁰ | ISOLATION (VDC) | PACKAGE |
|----------------|---------------------|----------------------|------|---------------------|------|--------------------------------|---------|-----------------------|-----------------|---------|
| | | OUT1 | OUT2 | OUT1 | OUT2 | FULL LOAD | NO LOAD | | | |
| | | | | | | | | | | |
| PUD-050503.3 | 5 | +5 | +3.3 | +100 | +152 | 286 | 34 | 70 | 1500 | F |
| PUD-050505 | 5 | +5 | +5 | +100 | +100 | 255 | 34 | 78 | 1500 | F |
| PUD-050509 | 5 | +5 | +9 | +100 | +56 | 251 | 33 | 80 | 1500 | F |
| PUD-050512 | 5 | +5 | +12 | +100 | +42 | 250 | 35 | 80 | 1500 | F |
| PUD-050515 | 5 | +5 | +15 | +100 | +34 | 250 | 35 | 80 | 1500 | F |
| PUD-120505 | 12 | +5 | +5 | +100 | +100 | 119 | 15 | 70 | 1500 | F |
| PUD-120509 | 12 | +5 | +9 | +100 | +56 | 104 | 14 | 80 | 1500 | F |
| PUD-120512 | 12 | +5 | +12 | +100 | +42 | 102 | 14 | 82 | 1500 | F |
| PUD-120515 | 12 | +5 | +15 | +100 | +34 | 104 | 14 | 80 | 1500 | F |
| PUD-2403.303.3 | 24 | +3.3 | +3.3 | +152 | +152 | 60 | 11 | 70 | 1500 | F |
| PUD-240505 | 24 | +5 | +5 | +100 | +100 | 60 | 11 | 70 | 1500 | F |
| PUD-241212 | 24 | +12 | +12 | +41 | +41 | 52 | 10 | 80 | 1500 | F |

Note: Other input to output voltages may be available. Please contact factory.

ORDERING INFORMATION:

FOR EXAMPLE: PUD-*** (TWIN OUTPUT F PACKAGE)**

⁹ NOMINAL INPUT VOLTAGE.

¹⁰ NOMINAL INPUT VOLTAGE, FULL LOAD.

● **SELECTION GUIDE(4)**
1W 3000VDC ISOLATION

| MODEL NUMBER | INPUT VOLTAGE (VDC) | OUTPUT VOLTAGE (VDC) | OUTPUT CURRENT (mA) | INPUT ¹¹ CURRENT(mA) | | EFF (%) ¹² | ISOLATION (VDC) | PACKAGE |
|---------------|---------------------|----------------------|---------------------|---------------------------------|---------|-----------------------|-----------------|---------|
| | | | | FULL LOAD | NO LOAD | | | |
| | | | | PUS-03.305-3K | 3.3 | | | |
| PUS-0503.3-3K | 5 | 3.3 | 300 | 274 | 35 | 73 | 3000 | B |
| PUS-0505-3K | 5 | 5 | 200 | 283 | 34 | 71 | 3000 | B |
| PUS-0509-3K | 5 | 9 | 111 | 257 | 34 | 78 | 3000 | B |
| PUS-0512-3K | 5 | 12 | 84 | 255 | 34 | 78 | 3000 | B |
| PUS-0515-3K | 5 | 15 | 67 | 253 | 35 | 79 | 3000 | B |
| PUD-0503.3-3K | 5 | +/-3.3 | +/-150 | 274 | 35 | 73 | 3000 | B |
| PUD-0505-3K | 5 | +/-5 | +/-100 | 274 | 35 | 73 | 3000 | B |
| PUD-0512-3K | 5 | +/-12 | +/-42 | 253 | 35 | 79 | 3000 | B |
| PUD-0515-3K | 5 | +/-15 | +/-34 | 253 | 34 | 79 | 3000 | B |
| PUS-1203.3-3K | 12 | 3.3 | 300 | 112 | 14 | 74 | 3000 | B |
| PUS-1205-3K | 12 | 5 | 200 | 112 | 14 | 74 | 3000 | B |
| PUS-1209-3K | 12 | 9 | 111 | 107 | 15 | 78 | 3000 | B |
| PUS-1212-3K | 12 | 12 | 84 | 102 | 13 | 82 | 3000 | B |
| PUS-1215-3K | 12 | 15 | 67 | 103 | 14 | 81 | 3000 | B |
| PUD-1205-3K | 12 | +/-5 | +/-100 | 112 | 14 | 74 | 3000 | B |
| PUD-1212-3K | 12 | +/-12 | +/-42 | 101 | 15 | 83 | 3000 | B |
| PUD-1215-3K | 12 | +/-15 | +/-34 | 101 | 14 | 83 | 3000 | B |
| PUS-2403.3-3K | 24 | 3.3 | 300 | 57 | 10 | 73 | 3000 | D |
| PUS-2405-3K | 24 | 5 | 200 | 57 | 10 | 73 | 3000 | D |
| PUS-2409-3K | 24 | 9 | 111 | 56 | 10 | 75 | 3000 | D |
| PUS-2412-3K | 24 | 12 | 84 | 54 | 10 | 77 | 3000 | D |
| PUS-2415-3K | 24 | 15 | 67 | 52 | 9 | 80 | 3000 | D |
| PUD-2405-3K | 24 | +/-5 | +/-100 | 57 | 10 | 73 | 3000 | D |
| PUD-2412-3K | 24 | +/-12 | +/-42 | 54 | 9 | 77 | 3000 | D |
| PUD-2415-3K | 24 | +/-15 | +/-34 | 52 | 10 | 80 | 3000 | D |

Note: Other input to output voltages may be available. Please contact factory.

ORDERING INFORMATION:

FOR EXAMPLE: PUS-**-3K(SINGLE OUTPUT 3000V ISOLATION)**

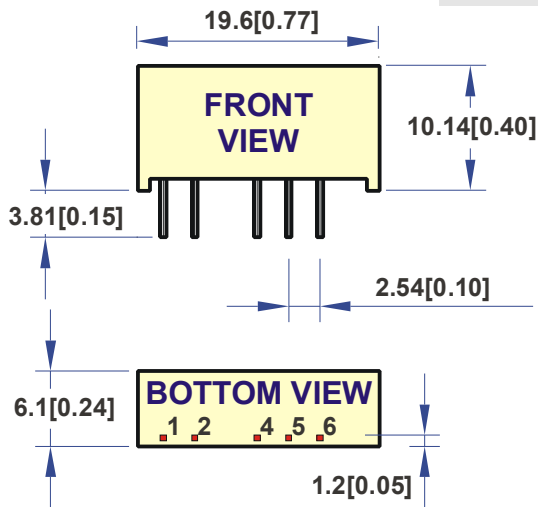
PUD-**-3K(DUAL OUTPUT 3000V ISOLATION)**

¹¹ NOMINAL INPUT VOLTAGE.

¹² NOMINAL INPUT VOLTAGE, FULL LOAD.

MECHANICAL DIMENSIONS & RECOMMENDED FOOTPRINT DETAILS

PACKAGE "A"

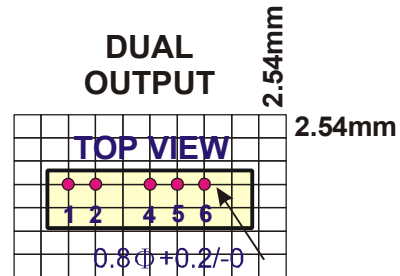
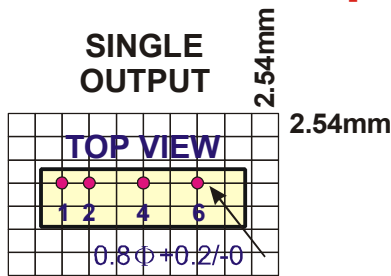


| PIN | SINGLE | DUAL |
|-----|--------|--------|
| 1 | +Vin | +Vin |
| 2 | -Vin | -Vin |
| 4 | -Vout | -Vout |
| 5 | NP | COMMON |
| 6 | +Vout | +Vout |

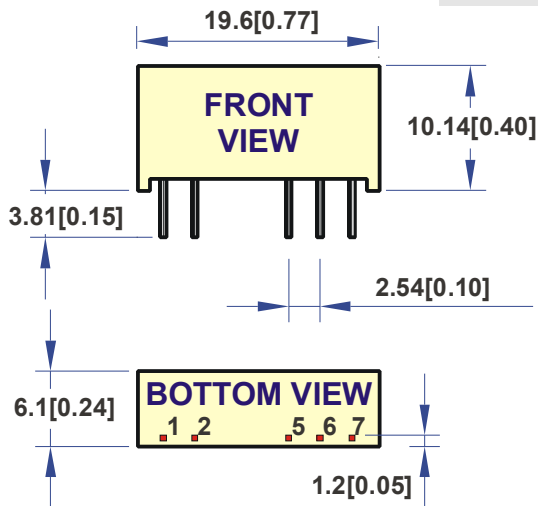
NOTE : All Dimensions In mm(Inches)

1. Pin Size is 0.50x0.30mm[0.02x0.01"]
2. Pin is Tolerance .XX= ±0.05mm
3. Tolerance .X or .XX= ±0.5mm

All dimensions are in mm[inches]



PACKAGE "B"

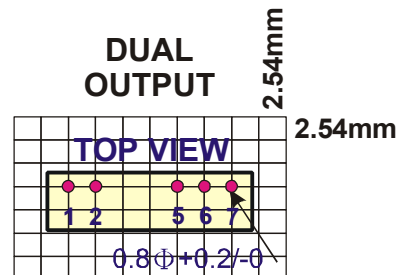
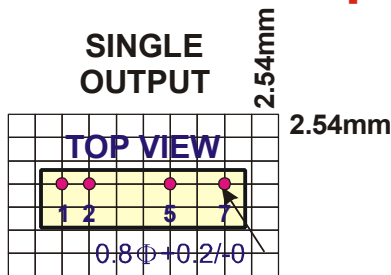


| PIN | SINGLE | DUAL |
|-----|--------|--------|
| 1 | +Vin | +Vin |
| 2 | -Vin | -Vin |
| 5 | -Vout | -Vout |
| 6 | NP | COMMON |
| 7 | +Vout | +Vout |

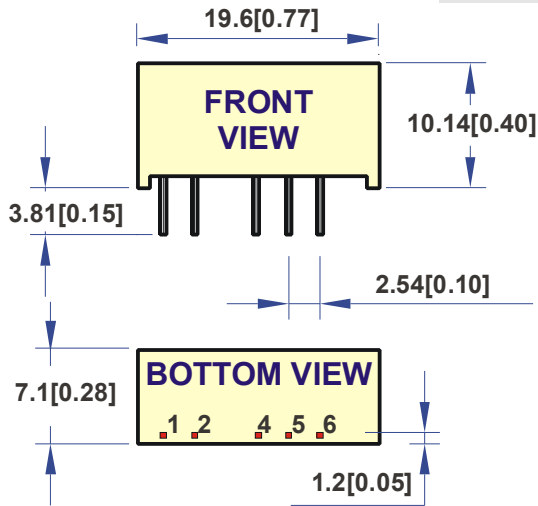
NOTE : All Dimensions In mm(Inches)

1. Pin Size is 0.50x0.30mm[0.02x0.01"]
2. Pin is Tolerance .XX= ±0.05mm
3. Tolerance .X or .XX= ±0.5mm

All dimensions are in mm[inches]



PACKAGE "C"

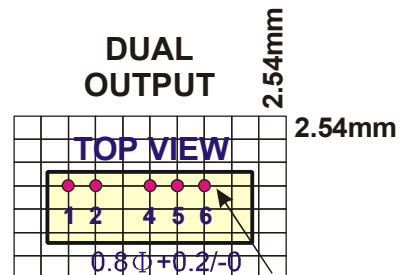
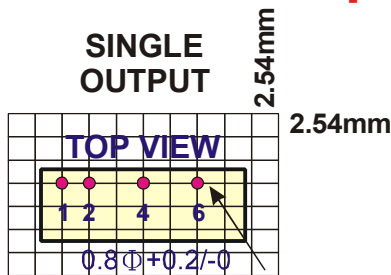


| PIN | SINGLE | DUAL |
|-----|--------|--------|
| 1 | +Vin | +Vin |
| 2 | -Vin | -Vin |
| 4 | -Vout | -Vout |
| 5 | NP | COMMON |
| 6 | +Vout | +Vout |

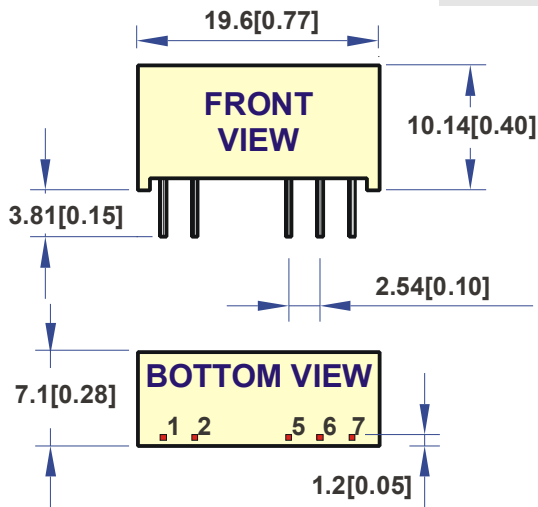
NOTE : All Dimensions In mm(Inches)

1. Pin Size is 0.50x0.30mm[0.02x0.01"]
2. Pin is Tolerance .XX= ±0.05mm
3. Tolerance .X or .XX= ±0.5mm

All dimensions are in mm[inches]



PACKAGE "D"

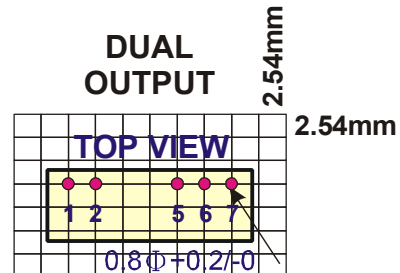
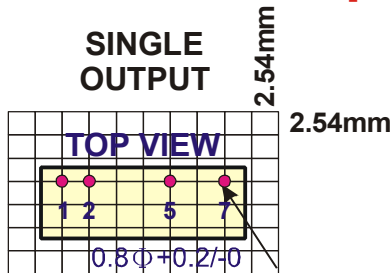


| PIN | SINGLE | DUAL |
|-----|--------|--------|
| 1 | +Vin | +Vin |
| 2 | -Vin | -Vin |
| 5 | -Vout | -Vout |
| 6 | NP | COMMON |
| 7 | +Vout | +Vout |

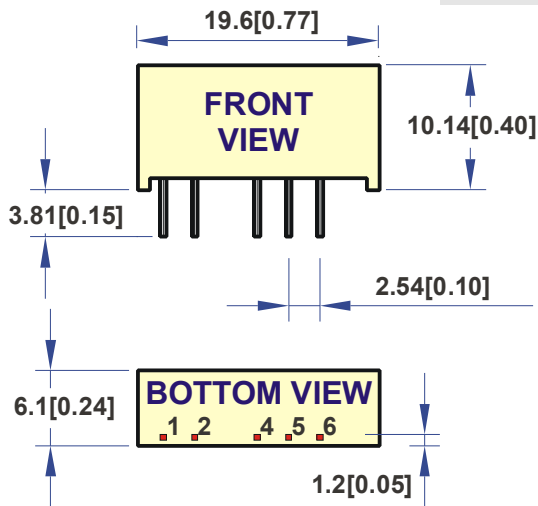
NOTE : All Dimensions In mm(Inches)

1. Pin Size is 0.50x0.30mm[0.02x0.01"]
2. Pin is Tolerance .XX= ±0.05mm
3. Tolerance .X or .XX= ±0.5mm

All dimensions are in mm[inches]



PACKAGE "E"

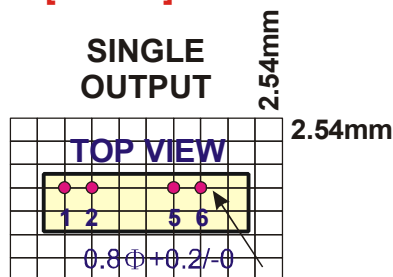


| PIN | SINGLE |
|-----|--------|
| 1 | +Vin |
| 2 | -Vin |
| 4 | NP |
| 5 | -Vout |
| 6 | +Vout |

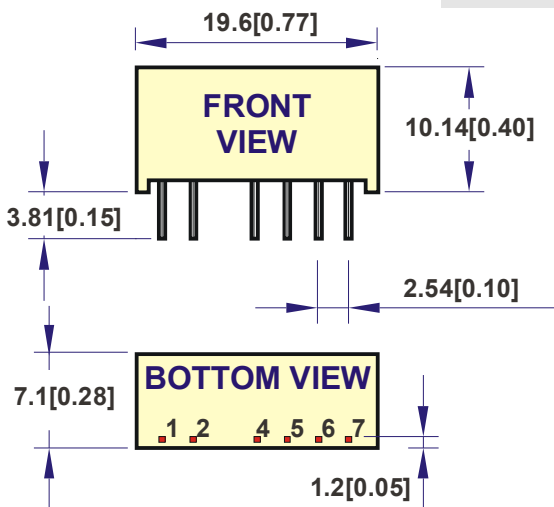
NOTE : All Dimensions In mm(Inches)

1. Pin Size is 0.50x0.30mm[0.02x0.01"]
2. Pin is Tolerance .XX= ±0.05mm
3. Tolerance .X or .XX= ±0.5mm

All dimensions are in mm[inches]



PACKAGE "F"

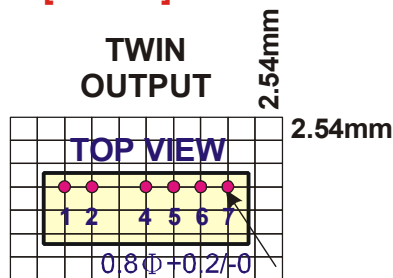


| PIN | TWIN |
|-----|---------------|
| 1 | +Vin |
| 2 | -Vin |
| 4 | +5V / Vout 1 |
| 5 | - 5V / Vout 1 |
| 6 | + Vout 2 |
| 7 | - Vout 2 |

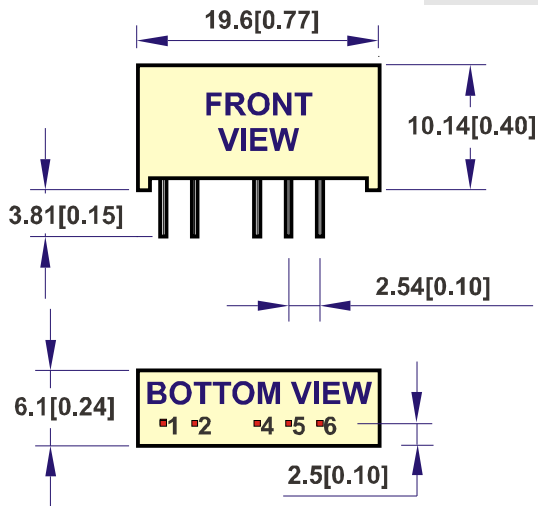
NOTE : All Dimensions In mm(Inches)

1. Pin Size is 0.50x0.30mm[0.02x0.01"]
2. Pin is Tolerance .XX= ±0.05mm
3. Tolerance .X or .XX= ±0.5mm

All dimensions are in mm[inches]



PACKAGE "AY"

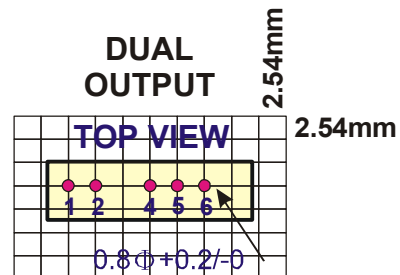
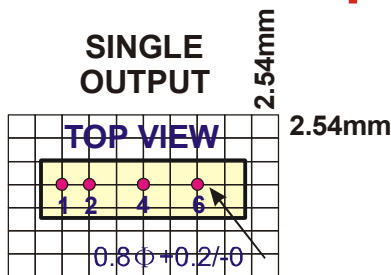


| PIN | SINGLE | DUAL |
|-----|--------|--------|
| 1 | +Vin | +Vin |
| 2 | -Vin | -Vin |
| 4 | -Vout | -Vout |
| 5 | NP | COMMON |
| 6 | +Vout | +Vout |

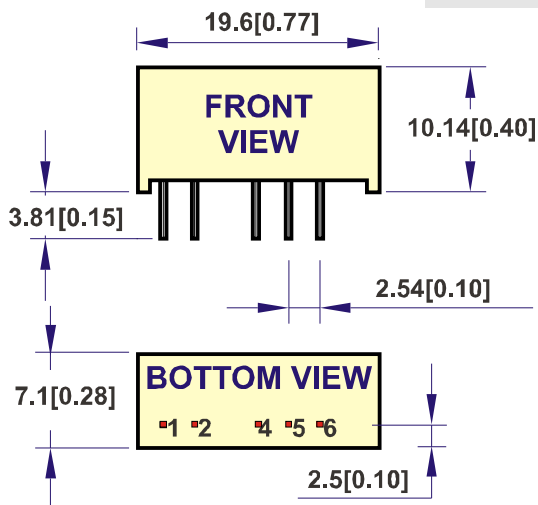
NOTE : All Dimensions In mm(Inches)

1. Pin Size is 0.50x0.30mm[0.02x0.01"]
2. Pin is Tolerance .XX= ±0.05mm
3. Tolerance .X or .XX= ±0.5mm

All dimensions are in mm[inches]



PACKAGE "CY"

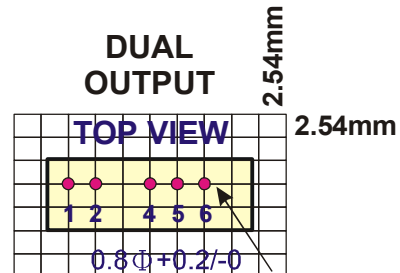
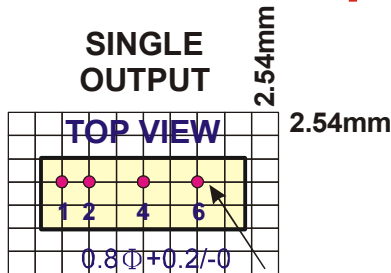


| PIN | SINGLE | DUAL |
|-----|--------|--------|
| 1 | +Vin | +Vin |
| 2 | -Vin | -Vin |
| 4 | -Vout | -Vout |
| 5 | NP | COMMON |
| 6 | +Vout | +Vout |

NOTE : All Dimensions In mm(Inches)

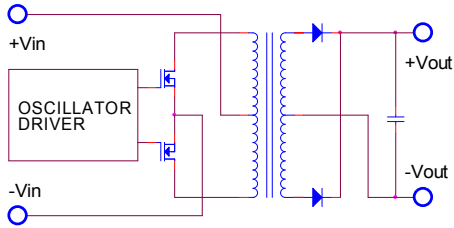
1. Pin Size is 0.50x0.30mm[0.02x0.01"]
2. Pin is Tolerance .XX= ±0.05mm
3. Tolerance .X or .XX= ±0.5mm

All dimensions are in mm[inches]

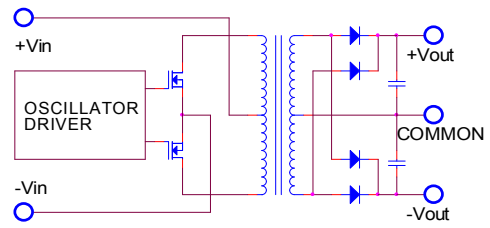


- SIMPLIFIED SCHEMATIC**

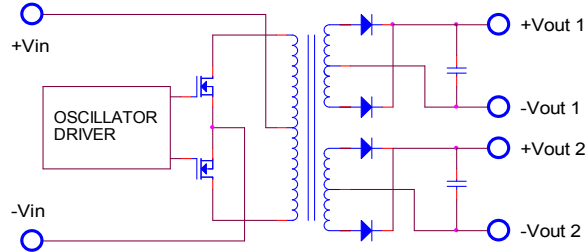
SINGLE OUTPUT



DUAL OUTPUT

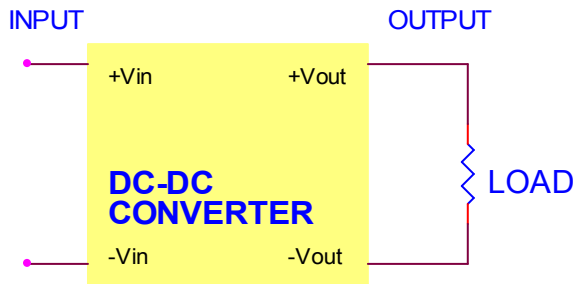


TWIN OUTPUT

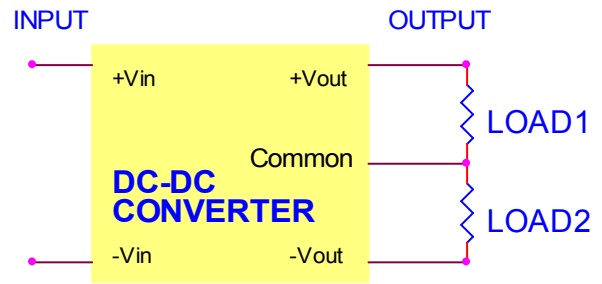


- TYPICAL APPLICATIONS**

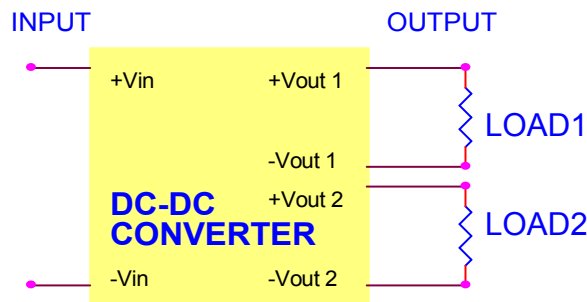
SINGLE OUTPUT



DUAL OUTPUT



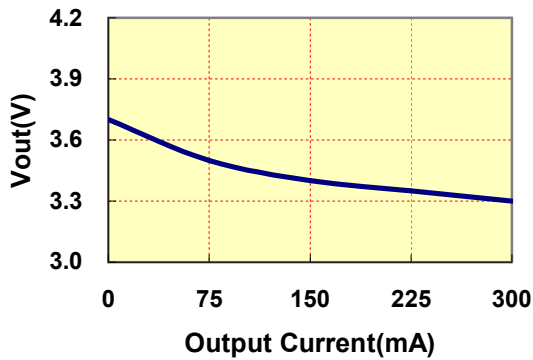
TWIN OUTPUT



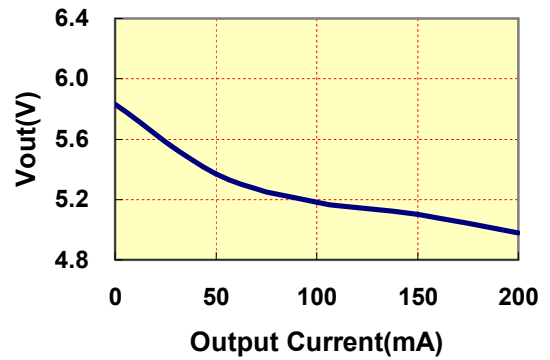
● TYPICAL PERFORMANCE CURVES

Specifications typical at TA=25°C, nominal input voltage, rated output current unless otherwise specified.

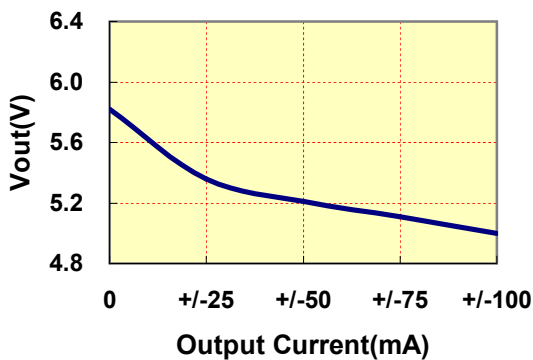
VOUT VS LOAD(3.3Vout Models)



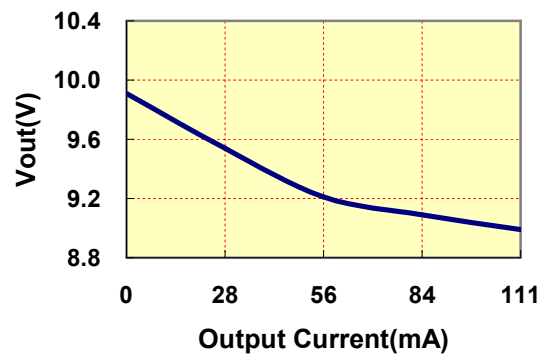
VOUT VS LOAD(5Vout Models)



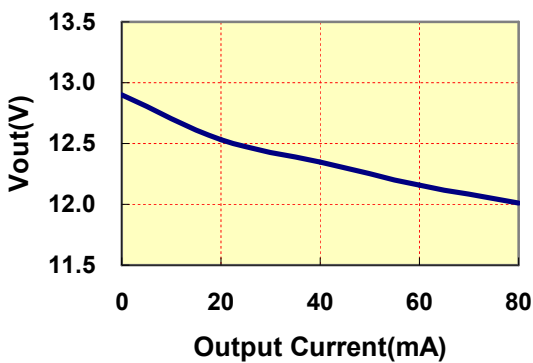
VOUT VS LOAD(+/-5Vout Models)



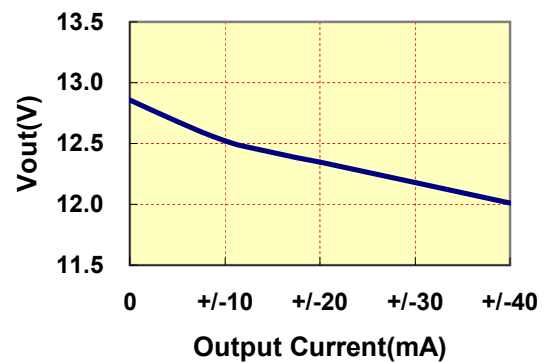
VOUT VS LOAD(9Vout Models)



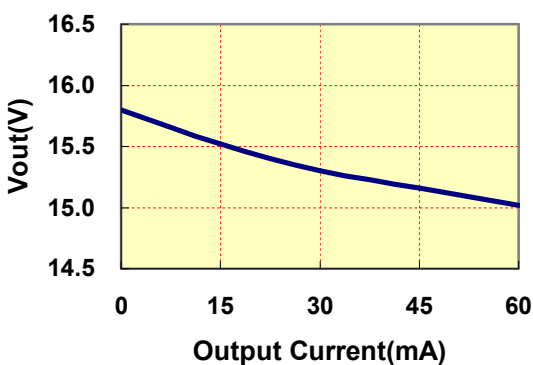
VOUT VS LOAD(12Vout Models)



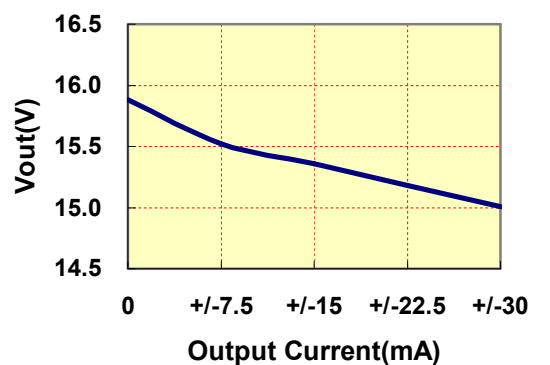
VOUT VS LOAD(+/- 12Vout Models)



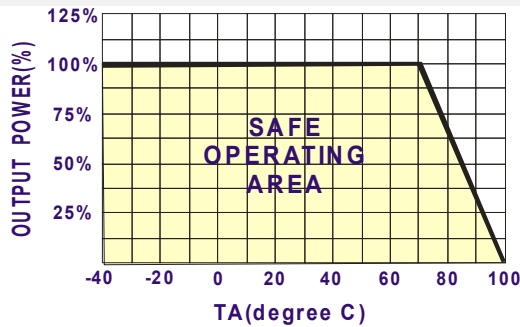
VOUT VS LOAD(15Vout Models)



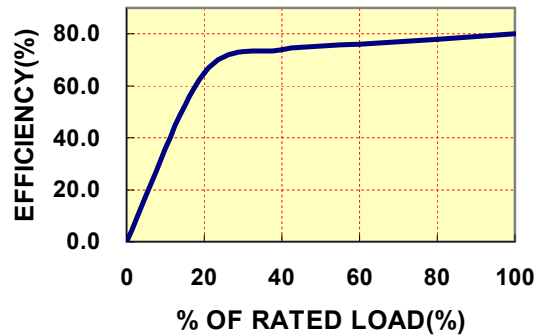
VOUT VS LOAD(+/- 15Vout Models)



DERATING CURVE



EFFICIENCY VS LOAD



● INPUT FUSE SELECTION GUIDE

| 4.5-5.5V INPUT VOLTAGE(VDC) | 10.8-13.2V INPUT VOLTAGE(VDC) | 21.6-26.4V INPUT VOLTAGE(VDC) |
|--------------------------------|----------------------------------|----------------------------------|
| 800mA Slow-Blow Type | 300mA Slow-Blow Type | 150mA Slow-Blow Type |

Note: Certain applications may require the installation of external fuse in front of the input.

PU SERIES APPLICATION NOTES:

EXTERNAL CAPACITANCE REQUIREMENTS:

Output filtering is required for operation. A minimum of 10uF is needed. Output capacitance may be increased for additional filtering, not to exceed 220uF.

To meet the reflected ripple requirements of the converter, an input impedance of less than 0.5ohm from DC to 250KHz is required.

We Can Offer EMC-Filter According To EN55011/22 Class B.

Negative Outputs:

A negative output voltage may be obtained by connecting the +OUT to circuit ground and connecting -OUT as the negative output.

FOR MORE INFORMATION CALL:

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E-mail: danube@ms10.hinet.net

Home Page

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