











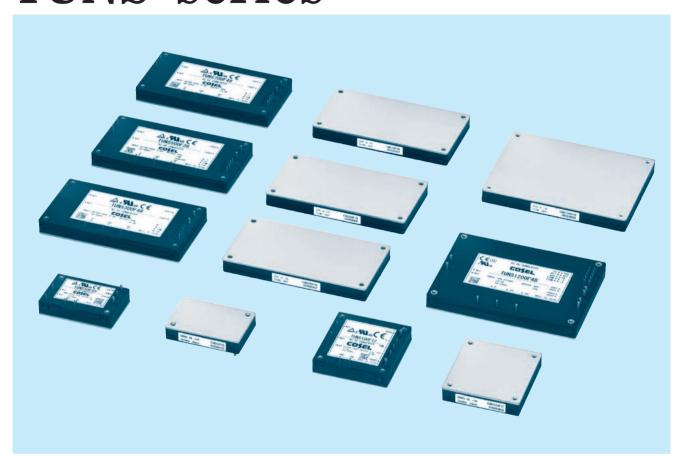








TUNS-series



Feature

AC-DC Power Module Type Converter

Harmonic attenuator (Complies with IEC61000-3-2 class A)

Thin and small size

Built-in overcurrent, overvoltage and thermal protection circuits

Mounting hole (M3 tapped)

<TUNS50F/100F/300F/500F/700F>

Universal input 85 - 264VAC

Peak current (TUNS500F)

<TUNS1200F>

Wide input 85 - 305VAC

For medical electric equipment

Constant current regulation

Output voltage can be varied to near 0V

Parallel operation possible

CE marking

Low voltage directive RoHS Directive

UKCA marking

Electrical Equipment Safety Regulations RoHS Regulations

Safety Approval

UL60950-1, C-UL, EN62368-1 (TUNS50F/100F/300F/500F/700F) UL62368-1, C-UL, EN62368-1 (TUNS1200F) ANSI/AAMI ES60601-1, EN60601-1 3rd (TUNS1200F)

■ 5-year warranty

Optional parts

Heat sink

50 F 05



- ①Series name ②Single output ③Output wattage ④Universal Input
- ⑤Output voltage
- (a) Optional
 T: with Mounting hole
 (\$\phi 3.4 \text{ thru})

- *Avoid short circuit between +BC and -BC. It may cause the failure of inside components.
- *Keep TRM open, if output voltage adjustment is not necessary.

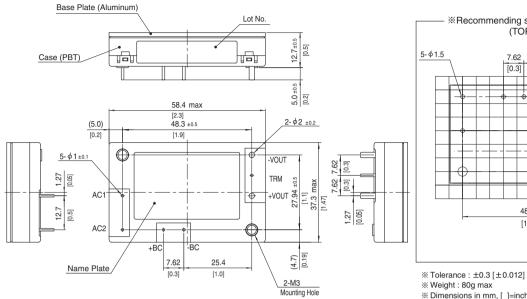
| MODEL | TUNS50F05 | TUNS50F12 | TUNS50F24 |
|-----------------------|-----------|-----------|-----------|
| MAX OUTPUT WATTAGE[W] | 50.0 | 50.4 | 50.4 |
| DC OUTPUT | 5V 10A | 12V 4.2A | 24V 2.1A |

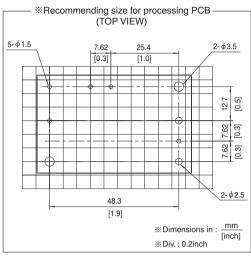
| REMOTE ON/OFF Not provided | | MODEL | | TUNS50F05 | TUNS50F12 | TUNS50F24 | | |
|---|-------------------|---------------------------------------|-------------------|---|---|--|--|--|
| CHRENT A | | VOLTAGE[V] | | AC85 - 264 1 ϕ (Refer to "Derating") | | | | |
| PREQUENCY IX SO/60 (47 - 63) | | CUDDENTIAL | ACIN 100V | 0.67typ (lo=100%) | | | | |
| POWER FACTOR (0=10%) ACM 100V 79typ 83typ 84typ 86typ | | CORRENT[A] | ACIN 200V | 0.35typ (lo=100%) | | | | |
| PPICIENCY *S ACM 2009 altyp 84typ 84typ 86typ | | FREQUENCY[Hz] | | 50/60 (47 - 63) | | | | |
| POWER FACTOR (b=1009) ACN 1009 0.95typ 36typ | INDUT | EFFICIENCY[9/] | ACIN 100V | 79typ | 83typ | 84typ | | |
| POWER FACTOR (Io-100%) ACIN 200V 0.901yp | INFOI | EFFICIENCI[%] | ACIN 200V | 81typ | 84typ | 86typ | | |
| INRUSH CURRENT Limited by external components (Thermistor) | | DOWED EACTOR (In-100%) | ACIN 100V | 0.95typ | | | | |
| LEAKAGE CURRENT[ma] 0.75max (ACIN 240V 60Hz, Io=100%, According to IEC62368-1) | | FOWER PACTOR (10=100 /6) | ACIN 200V | 0.90typ | | | | |
| VOLTAGE[V] 5 | | INRUSH CURRENT | | , | | | | |
| CURRENT[A] | | | T[mA] | , | ; | _ | | |
| LINE REGULATION[mV] 10max 24max 48max 48ma | | VOLTAGE[V] | | 5 | | | | |
| COLIFICATION TOLIFICATION TOL | | | | 10 | | 2.1 | | |
| OUTPUT RIPPLE[mVp-p] | | | | 10max | 24max | 48max | | |
| OUTPUT 40 to 0.0 st. 120 max 150 max 150 max 150 max 380 max RIPPLE NOISE[mVp-p] 0b st00 st. 120 max 280 max 380 max 150 max TEMPERATURE REGULATION[m] 0b st00 st. 20 max 200 max 200 max 250 max TEMPERATURE REGULATION[m] 0b st00 st. 20 max 120 max 240 max 480 max DRIFT[mV] s2 20 max 120 max 480 max 90 max PROTECTION OUTPUT VOLTAGE ADJUSTMENIT RANGET/INDIVIDE A 40 st. 6 s. 00 10 st. 20 st. 2 | | LOAD REGULATION | | | | | | |
| OUTPUT HEREBULATION[MI] 10 m/s 120 max 150 max | | | | | | | | |
| OUTPUT RIPPLE NOISE[mVp-p] 0b+100C+1 120max 150max 150max 150max A (do 00 0+1) 40 to 00 0+1 200max 200max 250max TEMPERATURE REGULATION[m] 10+460C 360max 460max TEMPERATURE REGULATION[m] 40 to 400C 100max 240max 480max DRIFT[mV] 42 20max 240max 480max JOUTPUT VOLTAGE ADJUSTMENT RANGE[V] 4.50 -6.00 10.80 - 13.20 21.60 - 26.40 OUTPUT VOLTAGE SETTING[V] 4.97 - 5.13 11.91 - 12.29 23.62 - 24.38 WORK CURRENT PROTECTION OVERVOLTAGE PROTECTION[V] 4.97 - 5.13 11.91 - 12.29 23.62 - 24.38 OVER CURRENT PROTECTION OVERVOLTAGE PROTECTION[V] 6.30 - 7.00 13.90 - 16.35 27.60 - 32.40 REMOTE SENSING Not provided REMOTE SENSING Not provided INPUT-FG AC3,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (20±15°C) OUTPUT FG AC2,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (20±15°C) | | RIPPLE[mVp-p] | -40 to 0°C *1 | 120max | | 150max | | |
| RIPLE NOISE[mVp-p] | | | 0 to 15% Load * 1 | 200max | 280max | 380max | | |
| RIPPLE NOISE[mVp-p] | OUTPUT | | 0 to +100℃*1 | 120max | 150max | 150max | | |
| TEMPERATURE REGULATION m V | 0011 01 | RIPPLE NOISE[mVp-p] | -40 to 0°C *1 | 200max | 200max | 250max | | |
| TEMPERATURE REGULATION(INV) 40 to +100° 100 max 240 max 480 max 90 max | | | 0 to 15% Load * 1 | 280max | | 460max | | |
| DRIFT[mV] 40 to 100 to 100 max 240 max 480 max 490 max | | TEMPERATURE REGULATION(mV) | | 50max | 120max | 240max | | |
| OUTPUT VOLTAGE ADJUSTMENT RANGE[V] | | TERRI ETITATORE REGOLETION (IIIT) | -40 to +100℃ | | | 480max | | |
| OUTPUT VOLTAGE ADJUSIMENT RANGELY 4.50 - 6.00 10.80 - 13.20 21.60 - 26.40 | | DRIFT[mV] | *2 | | | 90max | | |
| 1.80 - 6.00 10.80 - 13.20 21.60 - 26.40 | | OUTPUT VOLTAGE ADJUSTMEN | IT RANGE[V] | | | | | |
| OVERCURRENT PROTECTION OVERVOLTAGE PROTEC | | | | | | | | |
| PROTECTION CIRCUIT AND CIRCUIT | | | | 1 1 1 | | 23.62 - 24.38 | | |
| CIRCUIT AND OTHERS OVERVOLINGE PROTECTION(V) (8.30 - 7.00 (13.90 - 16.35) (27.50 - 32.40) REMOTE SENSING Not provided INPUT-OUTPUT AC3,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (20±15°C) INPUT-FG AC2,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (20±15°C) OUTPUT-FG AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (20±15°C) OPERATINGTEMP,HUMID.AND ALTITUDE -40 to +100°C (On aluminum base plate), 20 - 95%RH (Non condensing) (Refer to "Derating"), 3,000m (10,000 feet) max STORAGE TEMP,HUMID.AND ALTITUDE -40 to +100°C, 20 - 95%RH (Non condensing), 9,000m (30,000 feet) max VIBRATION 10 - 55Hz, 49.0m/s² (5G), 3minutes period, 60minutes each along X, Y and Z axis IMPACT 196.1m/s² (20G), 11ms, once each along X, Y and Z axis SAFETY AND AGENCY APPROVALS UL60950-1, C-UL (CSA60950-1), EN62368-1 NOSE REGULATIONS HARMONIC ATTENUATOR Complies with IEC61000-3-2 (Class A) *3 CASE SIZE/WEIGHT 58.4×12.7×37.3mm [2.3×0.5×1.47 inches] (W×H×D) / 80g max | DROTECTION | | | · · · · · · · · · · · · · · · · · · · | , | | | |
| Not provided REMOTE SENSING Not provided REMOTE ON/OFF Not provided | | | CTION[V] | | 13.90 - 16.35 | 27.60 - 32.40 | | |
| INPUT-OUTPUT AC3,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (20±15°C) | OTHERS | | | · · · · · · · · · · · · · · · · · · · | | | | |
| INPUT-FG AC2,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (20±15°C) | | | | · · · | | | | |
| OUTPUT-FG AC500V 1minute, Cutoff current = 100mA, DC500V 50M \(\Omega\$ min (20±15°C) \) PENVIRONMENT ENVIRONMENT ENVIR | | | | · · · · · · · · · · · · · · · · · · · | , , | | | |
| ENVIRONMENT ENVIR | ISOLATION | | | | | | | |
| STORAGETEMP,HUMID.AND ALTITUDE -40 to +100°C, 20 - 95%RH (Non condensing), 9,000m (30,000 feet) max VIBRATION 10 - 55Hz, 49.0m/s² (5G), 3minutes period, 60minutes each along X, Y and Z axis IMPACT 196.1m/s² (20G), 11ms, once each along X, Y and Z axis SAFETY AND AGENCY APPROVALS UL60950-1, C-UL (CSA60950-1), EN62368-1 NOISE REGULATIONS HARMONIC ATTENUATOR Complies with IEC61000-3-2 (Class A) *3 CASE SIZE/WEIGHT 58.4×12.7×37.3mm [2.3×0.5×1.47 inches] (W×H×D) / 80g max COOLING METHOD Conduction cooling (e.g. heat radiation from the aluminum base plate to the attached heat sink) | | | | | | | | |
| VIBRATION 10 - 55Hz, 49.0m/s² (5G), 3minutes period, 60minutes each along X, Y and Z axis IMPACT 196.1m/s² (20G), 11ms, once each along X, Y and Z axis SAFETY AND AGENCY APPROVALS UL60950-1, C-UL (CSA60950-1), EN62368-1 NOISE REGULATIONS HARMONIC ATTENUATOR Complies with IEC61000-3-2 (Class A) *3 CASE SIZE/WEIGHT COOLING METHOD Conduction cooling (e.g. heat radiation from the aluminum base plate to the attached heat sink) | | . , . | | | 7, 0, 1 | to "Derating"), 3,000m (10,000 feet) max | | |
| IMPACT 196.1m/s² (20G), 11ms, once each along X, Y and Z axis AGENCY APPROVALS UL60950-1, C-UL (CSA60950-1), EN62368-1 NOISE REGULATIONS HARMONIC ATTENUATOR Complies with IEC61000-3-2 (Class A) *3 CASE SIZE/WEIGHT COOLING METHOD Conduction cooling (e.g. heat radiation from the aluminum base plate to the attached heat sink) | ENVIRONMENT | · · · · · · · · · · · · · · · · · · · | ALTITUDE | 9/1 1 1 | | | | |
| SAFETY AND AGENCY APPROVALS UL60950-1, C-UL (CSA60950-1), EN62368-1 NOSE REGULATIONS HARMONIC ATTENUATOR COMPlies with IEC61000-3-2 (Class A) *3 CASE SIZE/WEIGHT COOLING METHOD CONDUCTION Conduction cooling (e.g. heat radiation from the aluminum base plate to the attached heat sink) | | | | , , , , , | | ∠ axis | | |
| NOISE REGULATIONS HARMONIC ATTENUATOR Complies with IEC61000-3-2 (Class A) *3 CASE SIZE/WEIGHT 58.4×12.7×37.3mm [2.3×0.5×1.47 inches] (W×H×D) / 80g max COOLING METHOD Conduction cooling (e.g. heat radiation from the aluminum base plate to the attached heat sink) | | _ | | | | | | |
| OTHERS CASE SIZE/WEIGHT 58.4×12.7×37.3mm [2.3×0.5×1.47 inches] (W×H×D) / 80g max COOLING METHOD Conduction cooling (e.g. heat radiation from the aluminum base plate to the attached heat sink) | | | | , | | | | |
| COOLING METHOD Conduction cooling (e.g. heat radiation from the aluminum base plate to the attached heat sink) | NUISE REGULATIONS | | | • | | | | |
| COOLING METHOD Conduction cooling (e.g. heat radiation from the aluminum base plate to the attached heat sink) | OTHERS | | | L L | , , , | | | |
| | | | | 0,0 | n from the aluminum base plate to the | attached heat sink) | | |

- Refer to instruction manual for measuring method of electric characteristics.
- Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25°C, with the input voltage held constant at the rated input/output.
- Please contact us about another class.





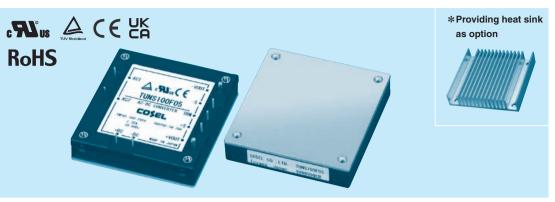




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TUNS100F

100 F 05



- ①Series name ②Single output ③Output wattage ④Universal Input
- ⑤Output voltage
- (a) Optional
 T: with Mounting hole
 (\$\phi 3.4 \text{ thru})

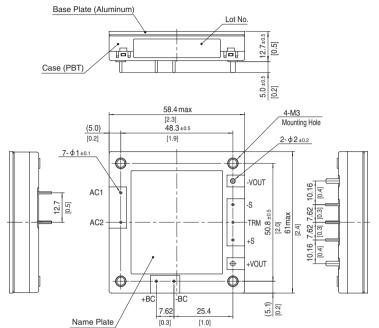
- *Avoid short circuit between +BC and -BC. It may cause the failure of inside components.
- *Keep TRM open, if output voltage adjustment is not necessary.
- *If remote sensing is not necessary, connect between +Vout & +S and between -Vout & -S.

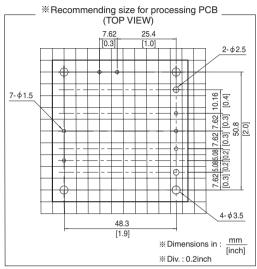
| MODEL | TUNS100F05 | TUNS100F12 | TUNS100F24 |
|-----------------------|------------|------------|------------|
| MAX OUTPUT WATTAGE[W] | 100.0 | 100.8 | 100.8 |
| DC OUTPUT | 5V 20A | 12V 8.4A | 24V 4.2A |

| | MODEL | | TUNS100F05 | TUNS100F12 | TUNS100F24 | | |
|------------------------|--|-------------------|--|--|---------------------|--|--|
| | VOLTAGE[V] | | AC85 - 264 1 φ (Refer to "Derating") | | | | |
| | OUDDENTIAL | ACIN 100V | 1.3typ (lo=100%) | | | | |
| | CURRENT[A] | ACIN 200V | 0.7typ (lo=100%) | | | | |
| | FREQUENCY[Hz] | | 50/60 (47 - 63) | | | | |
| INPUT | EFFICIENCY[0/] | ACIN 100V | 82typ | 83typ | 84typ | | |
| INPUT | EFFICIENCY[%] | ACIN 200V | 85typ | 85typ | 86typ | | |
| | DOWER FACTOR (In 1000) | ACIN 100V | 0.95typ | | | | |
| | POWER FACTOR (Io=100%) | ACIN 200V | 0.90typ | | | | |
| | INRUSH CURRENT | | Limited by external components (The | rmistor) | | | |
| | LEAKAGE CURREN | T[mA] | 0.75max (ACIN 240V 60Hz, lo=100% | , According to IEC62368-1) | | | |
| | VOLTAGE[V] | | 5 | 12 | 24 | | |
| | CURRENT[A] | | 20 | 8.4 | 4.2 | | |
| | LINE REGULATION[| mV] | 10max | 24max | 48max | | |
| | LOAD REGULATION | [mV] | 10max | 24max | 48max | | |
| | | 0 to +100℃*1 | 80max | 120max | 120max | | |
| | RIPPLE[mVp-p] | -40 to 0°C *1 | 120max | 150max | 150max | | |
| | | 0 to 15% Load * 1 | 160max | 240max | 240max | | |
| ОИТРИТ | | 0 to +100℃*1 | 120max | 150max | 150max | | |
| OUIPUI | RIPPLE NOISE[mVp-p] | -40 to 0°C *1 | 200max | 200max | 250max | | |
| | | 0 to 15% Load * 1 | 240max | 300max | 300max | | |
| | TEMPERATURE REGULATION[mV] | 0 to +65°C | 50max | 120max | 240max | | |
| | TEMPERATURE REGULATION[IIV] | -40 to +100℃ | 100max | 240max | 480max | | |
| | DRIFT[mV] | *2 | 20max | 40max | 90max | | |
| | OUTPUT VOLTAGE ADJUSTMEN | IT DANCEIVI | Fixed (TRM pin open), adjustable by | external resistor or external signal | | | |
| | OUTPUT VOLTAGE ADJUSTIMEN | II NANGE[V] | 4.50 - 6.00 | 10.80 - 13.20 | 21.60 - 26.40 | | |
| | OUTPUT VOLTAGE SET | TING[V] | 4.97 - 5.13 | 11.91 - 12.29 | 23.62 - 24.38 | | |
| | OVERCURRENT PROT | ECTION | Works over 105% of rating and recover | ers automatically | | | |
| PROTECTION CIRCUIT AND | OVERVOLTAGE PROTEC | CTION[V] | 6.30 - 7.00 | 13.90 - 16.35 | 27.60 - 32.40 | | |
| OTHERS | REMOTE SENSING | | Provided | | | | |
| 01112110 | REMOTE ON/OFF | | Not provided | | | | |
| | INPUT-OUTPUT | | AC3,000V 1minute, Cutoff current = 1 | I0mA, DC500V 50M Ω min (20±15 $^{\circ}$ C) | | | |
| ISOLATION | INPUT-FG | | AC2,000V 1minute, Cutoff current = 1 | 10mA, DC500V 50M Ω min (20±15 $^{\circ}$ C) | | | |
| | OUTPUT-FG | | AC500V 1minute, Cutoff current = 10 | 0mA, DC500V 50MΩ min (20±15℃) | | | |
| | OPERATING TEMP., HUMID. AND | ALTITUDE | -40 to +100℃ (On aluminum base plate), 20 - 95%RH (Non condensing) (Refer to "Derating"), 3,000m (10,000 feet) max | | | | |
| ENVIRONMENT | STORAGE TEMP., HUMID. AND | ALTITUDE | -40 to +100°C, 20 - 95%RH (Non con | densing), 9,000m (30,000 feet) max | | | |
| FIANIDOMNIENI | VIBRATION | | 10 - 55Hz, 49.0m/s² (5G), 3minutes p | eriod, 60minutes each along X, Y and | Z axis | | |
| | IMPACT | | 196.1m/s² (20G), 11ms, once each al | ong X, Y and Z axis | | | |
| SAFETY AND | AGENCY APPROVALS | | UL60950-1, C-UL (CSA60950-1), EN | 62368-1 | | | |
| NOISE REGULATIONS | HARMONIC ATTENU | JATOR | Complies with IEC61000-3-2 (Class A | A) *3 | | | |
| OTHERS | CASE SIZE/WEIGHT | | 58.4×12.7×61.0mm [2.3×0.5×2.4 | inches] (W×H×D) / 120g max | | | |
| OTHERS | COOLING METHOD | | Conduction cooling (e.g. heat radiatio | n from the aluminum base plate to the | attached heat sink) | | |
| sted Defende | y to instruction manual for managing method of closely is physician. | | | | | | |

- Refer to instruction manual for measuring method of electric characteristics.
- Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25°C, with the input voltage held constant at the rated input/output.
- Please contact us about another class.







- % Tolerance : ±0.3 [±0.012]
 % Weight : 120g max
- * Dimensions in mm, []=inches
- ** Mounting hole screwing torque : 0.49N · m (5.0kgf · cm) max

TUNS300F

300



- Series name
 Single output
 Output wattage
- 4 Universal Input
- ⑤Output voltage
- (a) Optional
 T: with Mounting hole
 (\$\phi 3.4 \text{ thru})
- Y1: Outputvoltage adjustment
- range ±20% (Only 48V) R1: with Remote ON/OFF
- (Negative logic control)
 R2: with Remote ON/OFF (Negative logic and Low
- standby power)
 R3: with Remote ON/OFF (Positive logic control)
- N1: Auto restart from thermal protection

- *Avoid short circuit between +BC/R and -BC. It may cause the failure of inside components.
- *Keep TRM open, if output voltage adjustment is not necessary.
- *If remote sensing is not necessary, connect between +Vout & +S and between -Vout & -S.

| MODEL | TUNS300F12 | TUNS300F28 | TUNS300F48 |
|-----------------------|------------|------------|------------|
| MAX OUTPUT WATTAGE[W] | 300 | 308 | 312 |
| DC OUTPUT | 12V 25A | 28V 11A | 48V 6.5A |

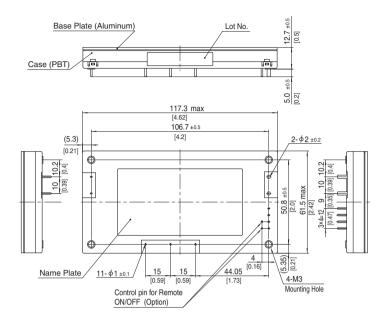
| | MODEL | | TUNS300F12 | TUNS300F28 | TUNS300F48 | | |
|------------------------|-----------------------------|---------------|--|---|--|--|--|
| | VOLTAGE[V] | | AC85 - 264 1 φ | | | | |
| | CUDDENTIAL | ACIN 100V | 3.6typ (lo=100%) | | | | |
| | CURRENT[A] ACIN 200 | | 1.8typ (lo=100%) | | | | |
| | FREQUENCY[Hz] | , | 50/60 (47 - 63) | | | | |
| INPUT | EFFICIENCY[0/1 | ACIN 100V | 84typ | 87typ | 87typ | | |
| INPUT | EFFICIENCY[%] | ACIN 200V | 86typ | 89typ | 90typ | | |
| | POWER FACTOR (Io=100%) | ACIN 100V | 0.96typ | | | | |
| | POWER FACTOR (IO=100%) | ACIN 200V | .93typ | | | | |
| | INRUSH CURRENT | | Limited by external resistance | | | | |
| | LEAKAGE CURREN | T[mA] | 0.75max (ACIN 240V 60Hz, lo=100% | , According to IEC62368-1) | | | |
| | VOLTAGE[V] | | 12 | 28 | 48 | | |
| | CURRENT[A] | | 25 | 11 | 6.5 | | |
| | LINE REGULATION[| mV] | 24max | 56max | 96max | | |
| | LOAD REGULATION | [mV] | 24max | 56max | 96max | | |
| | RIPPLE[mVp-p] | 0 to +100℃*1 | 120max | 180max | 250max | | |
| | niPPLE[iiivp-p] | -40 to 0°C *1 | 150max | 200max | 300max | | |
| OUTPUT | RIPPLE NOISE[mVp-p] | 0 to +100℃*1 | 150max | 200max | 300max | | |
| OUIFUI | NIPPLE NOISE[IIIVP-P] | -40 to 0°C *1 | 200max | 300max | 450max | | |
| | TEMPERATURE REGULATION(mV) | 0 to +65°C | 120max | 280max | 480max | | |
| | | -40 to +100℃ | 240max | 560max | 960max | | |
| | DRIFT[mV] | *2 | 40max | 90max | 180max | | |
| | OUTPUT VOLTAGE ADJUSTMEN | IT DANGEIVI | Fixed (TRM pin open), adjustable by | external resistor or external signal | | | |
| | OUTFUT VOLINGE ADJUSTIMEN | II NANGE[V] | 9.60 - 14.40 | 22.40 - 33.60 | 38.40 - 52.80 (-Y1 Option : 38.4 - 57.6) | | |
| | OUTPUT VOLTAGE SET | TING[V] | 11.91 - 12.29 | 27.56 - 28.44 | 47.24 - 48.76 | | |
| DDOTECTION | OVERCURRENT PROT | ECTION | Works over 105% of rating and recove | ers automatically | | | |
| PROTECTION CIRCUIT AND | OVERVOLTAGE PROTE | CTION[V] | 15.00 - 16.80 | 35.00 - 39.20 | 55.20 - 64.80 (-Y1 Option : 60.0 - 67.2) | | |
| OTHERS | REMOTE SENSING | | Provided | | | | |
| | REMOTE ON/OFF | | Optional (External power supply is red | | | | |
| | INPUT-OUTPUT · RO | *4 | AC3,000V 1minute, Cutoff current = 1 | | | | |
| ISOLATION | INPUT-FG | | | 0mA, DC500V 50M Ω min (20±15 $^{\circ}$ C) | | | |
| ICOLATION | OUTPUT · RC-FG | *4 | 710000 V Tillinato, Outon ourront = 10 | | | | |
| | OUTPUT-RC | *4 | 7.0100V Trimitate, Outon current = 10011/1, DC 100V Tolviss Trimit (20±10-0) | | | | |
| | OPERATING TEMP., HUMID. AND | ALTITUDE | -40 to +100℃ (On aluminum base plate), 20 - 95%RH (Non condensing) (Refer to "Derating"), 3,000m (10,000 feet) max | | | | |
| ENVIRONMENT | STORAGE TEMP., HUMID. AND | ALTITUDE | -40 to +100°C, 20 - 95%RH (Non condensing), 9,000m (30,000 feet) max | | | | |
| | VIBRATION | | , , , , , | eriod, 60minutes each along X, Y and | Z axis | | |
| | IMPACT | | 196.1m/s² (20G), 11ms, once each along X, Y and Z axis | | | | |
| SAFETY AND | AGENCY APPROVALS | | UL60950-1, C-UL (CSA60950-1), EN | | | | |
| NOISE REGULATIONS | HARMONIC ATTENU | | Complies with IEC61000-3-2 (Class A | · | | | |
| OTHERS | CASE SIZE/WEIGHT | | 117.3×12.7×61.5mm [4.62×0.5×2 | | | | |
| | COOLING METHOD | | Conduction cooling (e.g. heat radiatio | n from the aluminum base plate to the | attached heat sink) | | |

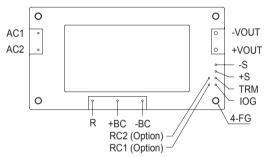
- Refer to instruction manual for measuring method of electric characteristics.
- Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25°C, with the input voltage held constant at the rated input/output.
- Please contact us about another class.
 "RC" is applicable when remote control (optional) is added.

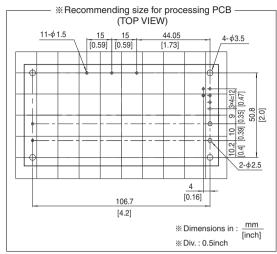








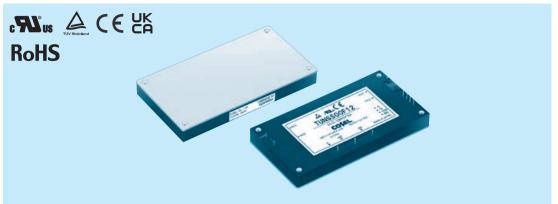




- ** Tolerance : ±0.3 [± 0.012]
- * Weight : 190g max
- ※ Dimensions in mm, []=inches
- Mounting hole screwing torque: 0.49N · m (5.0kgf · cm) max

TUNS500F

500 F §



- Series name
 Single output
 Output wattage
- 4 Universal Input
- ⑤Output voltage
- (a) Optional
 T: with Mounting hole
 (\$\phi 3.4 \text{ thru})
- Y1: Outputvoltage adjustment
- range ±20% (Only 48V) R1: with Remote ON/OFF
- (Negative logic control) R2: with Remote ON/OFF (Negative logic and Low standby power)
- R3: with Remote ON/OFF (Positive logic control)
- N1: Auto restart from thermal protection

- *Avoid short circuit between +BC/R and -BC. It may cause the failure of inside components.
- *Keep TRM open, if output voltage adjustment is not necessary.
- *If remote sensing is not necessary, connect between +Vout & +S and between -Vout & -S.

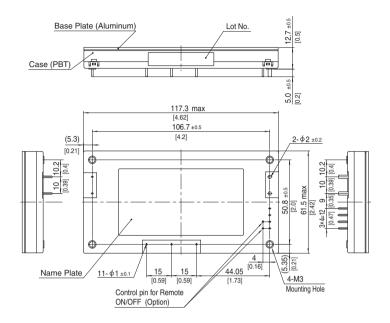
| MODEL | TUNS500F12 | TUNS500F28 | TUNS500F48 |
|-----------------------|--------------------|--------------------|----------------------|
| MAX OUTPUT WATTAGE[W] | 504 | 504 | 504 |
| DC OUTPUT | 12V 42A (Peak 55A) | 28V 18A (Peak 24A) | 48V 10.5A (Peak 14A) |

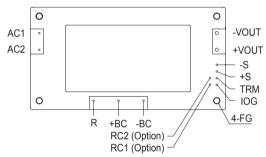
| | MODEL | | TUNS500F12 | TUNS500F28 | TUNS500F48 | | |
|------------------------|-----------------------------|---------------|--|--|--|--|--|
| | VOLTAGE[V] | | AC85 - 264 1 φ | | | | |
| | OUDDENTIAL | ACIN 100V | 6.0typ (Io=100%) | | | | |
| | CURRENT[A] | ACIN 200V | 3.0typ (lo=100%) | | | | |
| | FREQUENCY[Hz] | | 50/60 (47 - 63) | | | | |
| INDUT | EFFICIENCY[%] | ACIN 100V | 84typ | 87typ | 88typ | | |
| INPUT | EFFICIENCI[%] | ACIN 200V | 86typ | 90typ | 90.5typ | | |
| | DOWED FACTOR (In 1009/) | | 0.96typ | | | | |
| | POWER FACTOR (lo=100%) | ACIN 200V | 0.93typ | | | | |
| | INRUSH CURRENT | | Limited by external resistance | | | | |
| | LEAKAGE CURREN | T[mA] | 0.75max (ACIN 240V 60Hz, lo=100% | , According to IEC62368-1) | | | |
| | VOLTAGE[V] | | 12 | 28 | 48 | | |
| | CURRENT[A] | *3 | 42 (Peak 55) | 18 (Peak 24) | 10.5 (Peak 14) | | |
| | LINE REGULATION[| mV] | 24max | 56max | 96max | | |
| | LOAD REGULATION | [mV] | 24max | 56max | 96max | | |
| | DIDDI ElmVn n3 | 0 to +100℃*1 | 120max | 180max | 250max | | |
| | RIPPLE[mVp-p] | -40 to 0°C *1 | 150max | 200max | 300max | | |
| OUTPUT | RIPPLE NOISE[mVp-p] | 0 to +100°C*1 | 150max | 200max | 300max | | |
| OUIPUI | RIPPLE NOISE[IIIVP-P] | -40 to 0°C *1 | 200max | 300max | 450max | | |
| | TEMPERATURE REGULATION[mV] | 0 to +65°C | 120max | 280max | 480max | | |
| | | -40 to +100℃ | 240max | 560max | 960max | | |
| | DRIFT[mV] | *2 | 40max | 90max | 180max | | |
| | OUTPUT VOLTAGE ADJUSTMEN | IT DANCEIVI | Fixed (TRM pin open), adjustable by external resistor or external signal | | | | |
| | OUTPUT VOLIAGE ADJUSTIMEN | II NANGE[V] | 9.60 - 14.40 | 22.40 - 33.60 | 38.40 - 52.80 (-Y1 Option : 38.4 - 57.6) | | |
| | OUTPUT VOLTAGE SET | TING[V] | 11.91 - 12.29 | 27.56 - 28.44 | 47.24 - 48.76 | | |
| DDOTECTION | OVERCURRENT PROT | ECTION | Works over 101% of peak current and | d recovers automatically | | | |
| PROTECTION CIRCUIT AND | OVERVOLTAGE PROTEC | CTION[V] | 15.00 - 16.80 | 35.00 - 39.20 | 55.20 - 64.80 (-Y1 Option : 60.0 - 67.2) | | |
| OTHERS | REMOTE SENSING | | Provided | | | | |
| 01112110 | REMOTE ON/OFF | | Optional (External power supply is re | quired) | | | |
| | INPUT-OUTPUT · RO | *5 | AC3,000V 1minute, Cutoff current = 1 | 10mA, DC500V 50M Ω min (20±15 $^{\circ}$ C) | | | |
| ISOLATION | INPUT-FG | | AC2,000V 1minute, Cutoff current = 1 | 10mA, DC500V 50M Ω min (20±15 $^{\circ}$ C) | | | |
| ISOLATION | OUTPUT · RC-FG | *5 | AC500V 1minute, Cutoff current = 10 | 0mA, DC500V 50M Ω min (20±15 $^{\circ}$ C) | | | |
| | OUTPUT-RC | *5 | AC100V 1minute, Cutoff current = 100mA, DC100V 10M Ω min (20±15 $^{\circ}$ C) | | | | |
| | OPERATING TEMP., HUMID. AND | ALTITUDE | -40 to +100℃ (On aluminum base plate), 20 - 95%RH (Non condensing) (Refer to "Derating"), 3,000m (10,000 feet) max | | | | |
| ENVIRONMENT | STORAGE TEMP., HUMID. AND | ALTITUDE | -40 to +100℃, 20 - 95%RH (Non con | | | | |
| LIAN IN CUINIEN I | VIBRATION | | , , , , , | eriod, 60minutes each along X, Y and | Z axis | | |
| | IMPACT | | 196.1m/s² (20G), 11ms, once each al | | | | |
| SAFETY AND | AGENCY APPROVAL | | UL60950-1, C-UL (CSA60950-1), EN | | | | |
| NOISE REGULATIONS | HARMONIC ATTENU | JATOR | Complies with IEC61000-3-2 (Class A | , | | | |
| OTHERS | CASE SIZE/WEIGHT | | 117.3×12.7×61.5mm [4.62×0.5×2 | 2.42 inches] (WXHXD) / 190g max | | | |
| UIILAU | COOLING METHOD | | Conduction cooling (e.g. heat radiation from the aluminum base plate to the attached heat sink) | | | | |

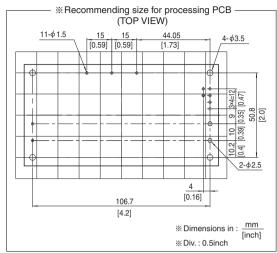
- Refer to instruction manual for measuring method of electric characteristics.
- Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25°C, with the input voltage held constant at the rated input/output.
- () means peak current. Avoid operating with peak current continuously. It may cause failure of the components inside the product. There are limitation of available condition of the peak current, such as peak time, duty etc. (Refer to the instruction manual in detail.)
- Please contact us about another class.
- "RC" is applicable when remote control (optional) is added.











- ** Tolerance : ±0.3 [± 0.012]
- * Weight : 190g max
- ※ Dimensions in mm, []=inches
- Mounting hole screwing torque: 0.49N · m (5.0kgf · cm) max

TUNS700F

700 F



- *Avoid short circuit between +BC/R and -BC. It may cause the failure of inside components.
- *Keep TRM open, if output voltage adjustment is not necessary.
- *If remote sensing is not necessary, connect between +Vout & +S and between -Vout & -S.

- ①Series name
 ②Single output
 ③Output wattage
 ④Universal Input
 ⑤Output voltage
 ⑥Optional
 T: with Mounting hole
 (\$\phi 3.4\text{ thru})
 Y1: Outputvoltage adjustment
 range ±20% (Only 48V)
 R1: with Remote ON/OFF
 (Negative logic control)

 - (Negative logic control)
 R2: with Remote ON/OFF
 (Negative logic and Low standby power)
 R3: with Remote ON/OFF

 - (Positive logic control)
 P: Parallel operation
 (Output voltage trimming disabled,
 Remote sensing disabled)

| MODEL | TUNS700F12 | TUNS700F28 | TUNS700F48 |
|-----------------------|------------|------------|------------|
| MAX OUTPUT WATTAGE[W] | 700.8 | 700.0 | 700.8 |
| DC OUTPUT | 12V 58.4A | 28V 25A | 48V 14.6A |

SPECIFICATIONS

| | MODEL | | TUNS700F12 | TUNS700F28 | TUNS700F48 | |
|-------------|----------------------------|----------------|--|--|--|--|
| | VOLTAGE[V] | | AC85 - 264 1 φ | | | |
| | CURRENT[A] | ACIN 100V | 8.6typ (lo=100%) | | | |
| | CORRENT[A] | ACIN 200V | 4.1typ (lo=100%) | | | |
| | FREQUENCY[Hz] | | 50/60 (47 - 63) | | | |
| INPUT | EFFICIENCY[%] | ACIN 100V | 83typ | 86typ | 87typ | |
| INFUI | EFFICIENCI[%] | ACIN 200V | 86typ | 89typ | 90typ | |
| | POWER FACTOR | | 0.96typ | | | |
| | (lo=100%) | ACIN 200V | 0.93typ | | | |
| | INRUSH CURRENT | | Limited by external resistance | | | |
| | LEAKAGE CURRENT | Γ[mA] | 0.75max (ACIN 240V 60Hz, lo=100% | | | |
| | VOLTAGE[V] | | 12 | 28 | 48 | |
| | CURRENT[A] | | 58.4 | 25 | 14.6 | |
| | LINE REGULATION[mV] | | 24max | 56max | 96max | |
| | LOAD REGULATION | | 24max | 56max | 96max | |
| | RIPPLE[mVp-p] | 0 to +100°C *1 | 120max | 180max | 250max | |
| | IIII I EE[IIIVP-P] | -40 to 0°C *1 | 150max | 200max | 300max | |
| ОИТРИТ | RIPPLE NOISE[mVp-p] | 0 to +100°C *1 | 150max | 200max | 300max | |
| OUTFUT | HIFFEE NOISE[IIIVP-P] | -40 to 0°C *1 | 200max | 300max | 450max | |
| | TEMPERATURE REGULATION[mV] | 0 to +65°C | 120max | 280max | 480max | |
| | | -40 to +100℃ | 240max | 560max | 960max | |
| | DRIFT[mV] | *2 | 40max | 90max | 180max | |
| | OUTPUT VOLTAGE ADJUSTMEN | T | | Fixed (TRM pin open), adjustable by external resistor or external signal | | |
| | RANGE[V] | | 9.60 - 14.40 | 22.40 - 33.60 | 38.40 - 52.80 (-Y1 Option : 38.4 - 57.6) | |
| | OUTPUT VOLTAGE SET | | 11.91 - 12.29 | 27.56 - 28.44 | 47.24 - 48.76 | |
| PROTECTION | OVERCURRENT PROT | | Works over 105% of rating and recove | | | |
| CIRCUIT AND | UVERVULIAGE PROTECTIONIVI | | 15.00 - 16.80 | 35.00 - 39.20 | 55.20 - 64.80 (-Y1 Option : 60.0 - 67.2) | |
| OTHERS | | | Provided | | | |
| UITERS | REMOTE ON/OFF | | Optional (External power supply is red | quired) | | |
| MODEL | | | TUNS700F12-P | TUNS700F28-P | TUNS700F48-P | |
| MAX OUTPL | JT WATTAGE[W] | | 700.8 | 700.0 | 700.8 | |
| DC OUTPUT | | | 12V 58.4A | 28V 25A | 48V 14.6A | |

| | MODEL | | TUNS700F12-P | TUNS700F28-P | TUNS700F48-P | |
|----------------|-------------------------------|-------------------|--|---------------|---------------|--|
| VOLTAGE[V] | | AC85 - 264 1 φ | • | · | | |
| | CURRENT[A] | ACIN 100V | 8.6typ (lo=100%) | | | |
| | CURRENT[A] | ACIN 200V | 4.1typ (lo=100%) | | | |
| | FREQUENCY[Hz] | | 50/60 (47 - 63) | | | |
| INPUT | EFFICIENCY[%] | ACIN 100V | 83typ | 86typ | 87typ | |
| INFOI | EFFICIENCI[/6] | ACIN 200V | 86typ | 89typ | 90typ | |
| | POWER FACTOR ACIN 100V | | 0.96typ | | | |
| | (lo=100%) | ACIN 200V | 0.93typ | | | |
| INRUSH CURRENT | | | Limited by external resistance | | | |
| | LEAKAGE CURRE | NT[mA] | 0.75max (ACIN 240V 60Hz, lo=100%, According to IEC62368-1) | | | |
| | VOLTAGE[V] | | 12 | 28 | 48 | |
| | CURRENT[A] | | 58.4 | 25 | 14.6 | |
| | VOLTAGE ACCUR | | +5, -3 | +5, -3 | +5, -3 | |
| | | 0 to +100°C *1 | 240max | 360max | 600max | |
| OUTPUT | RIPPLE[mVp-p] | -40 to 0°C *1 | 300max | 400max | 700max | |
| | | 0 to +30% Load *1 | 360max | 540max | 900max | |
| | 1 | 0 to +100°C *1 | 300max | 400max | 700max | |
| | RIPPLE NOISE[mVp-p] -40 to 0℃ | -40 to 0°C *1 | 400max | 600max | 1000max | |
| | | 0 to +30% Load *1 | 450max | 600max | 1000max | |
| PROTECTION | OVERCURRENT PRO | | Works over 105% of rating and reco | | | |
| CIRCUIT AND | OVERVOLTAGE PROT | ECTION[V] | 15.00 - 16.80 | 35.00 - 39.20 | 55.20 - 64.80 | |
| OTHERS | REMOTE ON/OFF | | Optional (External power supply is r | equired) | | |



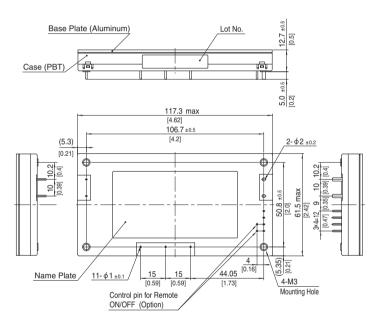


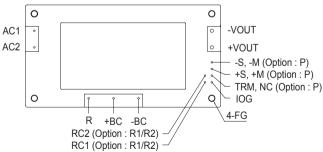
GENERAL SPECIFICATIONS

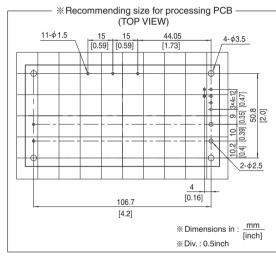
| | INPUT-OUTPUT · RC *4 | AC3,000V 1minute, Cutoff current = 10mA, DC500V 50M Ω min (20±15 $^{\circ}$ C) |
|-------------------|--------------------------------------|--|
| ISOLATION | INPUT-FG | AC2,000V 1minute, Cutoff current = 10mA, DC500V 50M Ω min (20±15 $^{\circ}$ C) |
| ISOLATION | OUTPUT · RC-FG *4 | AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (20±15°C) |
| | OUTPUT-RC *4 | AC100V 1minute, Cutoff current = 100mA, DC100V 10MΩ min (20±15°C) |
| | OPERATING TEMP., HUMID. AND ALTITUDE | -40 to +100℃ (On aluminum base plate), 20 - 95%RH (Non condensing) (Refer to "Derating"), 3,000m (10,000 feet) max |
| ENVIRONMENT | STORAGE TEMP., HUMID. AND ALTITUDE | -40 to +100°C, 20 - 95%RH (Non condensing), 9,000m (30,000 feet) max |
| LIVINONWENT | VIBRATION | 10 - 55Hz, 49.0m/s² (5G), 3minutes period, 60minutes each along X, Y and Z axis |
| | IMPACT | 196.1m/s² (20G), 11ms, once each along X, Y and Z axis |
| SAFETY AND | AGENCY APPROVALS | UL60950-1, C-UL (CSA60950-1), EN62368-1 |
| NOISE REGULATIONS | HARMONIC ATTENUATOR | Complies with IEC61000-3-2 (Class A) *3 |
| OTHERS | CASE SIZE/WEIGHT | 117.3×12.7×61.5mm [4.62×0.5×2.42 inches] (W×H×D) / 190g max |
| OTHERS | COOLING METHOD | Conduction cooling (e.g. heat radiation from the aluminum base plate to the attached heat sink) |

- Refer to instruction manual for measuring method of electric characteristics.

 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25°C, with the input voltage held constant at the rated input/output.
- Please contact us about another class
- "RC" is applicable when remote control (optional) is added.



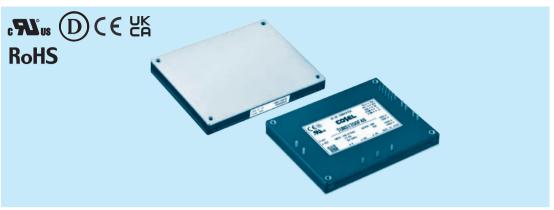




- % Tolerance : ±0.3 [±0.012] * Weight: 190g max
- ※ Dimensions in mm, []=inches
- Mounting hole screwing torque: 0.49N · m (5.0kgf · cm) max

TUNS1200F

1200 F



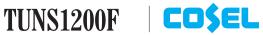
- Series name
 Single output
 Output wattage
- 4 Universal Input
- ⑤Output voltage
- (a) Optional
 T: with Mounting hole
 (\$\phi 3.4 \text{ thru})
- Y1: Outputvoltage adjustment range ±20% (Only 48V)
 R3: with Remote ON/OFF
- (Positive logic control) N1: Auto restart from thermal protection

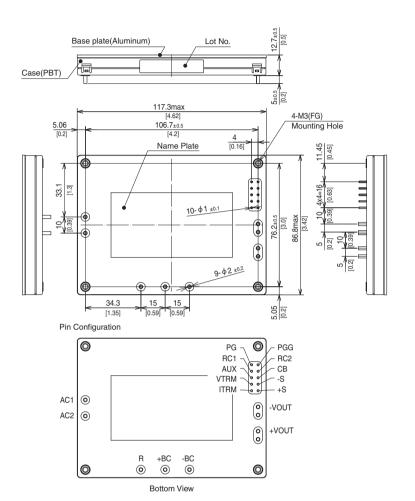
- *Avoid short circuit between +BC/R and -BC. It may cause the failure of inside components.
- *Keep VTRM open, if output voltage adjustment is not necessary.
- \star Keep ITRM open, if output current adjustment is not necessary.
- *If remote sensing is not necessary, connect between +Vout & +S and between -Vout & -S.

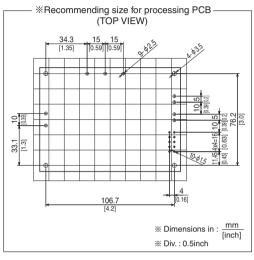
| MODEL | TUNS1200F12 | TUNS1200F28 | TUNS1200F48 | TUNS1200F65 |
|-----------------------|-------------|-------------|-------------|-------------|
| MAX OUTPUT WATTAGE[W] | 1008 | 1204 | 1200 | 1202.5 |
| DC OUTPUT | 12V 84A | 28V 43A | 48V 25A | 65V 18.5A |

| | MODEL | | TUNS1200F12 | TUNS1200F28 | TUNS1200F48 | TUNS1200F65 | | | | |
|-------------------|------------------------------------|------------------|--|-------------------------------|--------------------------------|--------------------------|--|--|--|--|
| | VOLTAGE[V] | | AC85 - 305V 1 φ | | | | | | | |
| | OUDDENITIAL | ACIN 100V | 12typ | 14typ | 14typ | 14typ | | | | |
| | CURRENT[A] | ACIN 200V | 5.9typ | 6.7typ | 6.6typ | 6.7typ | | | | |
| | FREQUENCY[Hz] | | 50/60 (47 - 63) | | | | | | | |
| NPUT | EFFICIENCY[9/] | ACIN 100V | 85typ | 89typ | 90typ | 89typ | | | | |
| NPUI | EFFICIENCY[%] | ACIN 200V | 87typ | 91typ | 92typ | 91typ | | | | |
| | DOWED FACTOR (In 1009/) | ACIN 100V | 0.98typ | | | | | | | |
| | POWER FACTOR (Io=100%) | ACIN 200V | 0.95typ | | | | | | | |
| | INRUSH CURRENT | | Limited by external resistance | | | | | | | |
| | LEAKAGE CURRENT | T[mA] | 0.5max (ACIN 240V 60Hz, Io=100%, According to IEC60601-1) | | | | | | | |
| | VOLTAGE[V] | | 12 | 28 | 48 | 65 | | | | |
| | CURRENT[A] | | 84 | 43 | 25 | 18.5 | | | | |
| | LINE REGULATION[I | mV] | 24max | 56max | 96max | 130max | | | | |
| | LOAD REGULATION | [mV] | 24max | 56max | 96max | 130max | | | | |
| | DIDDI ElmVa al | 0 to +100℃*1 | 150max | 180max | 250max | 350max | | | | |
| | RIPPLE[mVp-p] | -40 to 0°C *1 | 180max | 200max | 300max | 400max | | | | |
| OLITBUIT | DIDDLE MOIOEL-W1 | 0 to +100℃*1 | 180max | 200max | 300max | 400max | | | | |
| DUTPUT | RIPPLE NOISE[mVp-p] | -40 to 0°C *1 | 200max | 300max | 450max | 450max | | | | |
| | TEMPERATURE REQUIRATIONS VO | 0 to +80°C *1 | 120max | 280max | 480max | 650max | | | | |
| | TEMPERATURE REGULATION[mV] | -40 to +100℃ * 1 | 240max | 560max | 960max | 1300max | | | | |
| | DRIFT[mV] | *2 | 40max | 90max | 180max | 240max | | | | |
| | OUTPUT VOLTAGE ADJUSTMENT RANGE[V] | | Fixed (VTRM pin open), adjustable by external resistor or external signal | | | | | | | |
| | | | 9.60 - 14.40 | 22.40 - 33.60 | 38.40 - 52.80 (Y1:38.4 - 57.6) | 52.00 - 78.00 | | | | |
| | OUTPUT VOLTAGE SETTING[V] | | 11.91 - 12.29 | 27.56 - 28.44 | 47.24 - 48.76 | 63.96 - 66.04 | | | | |
| | OVERCURRENT PROT | ECTION | Works over 105% of rating and recovers automatically | | | | | | | |
| PROTECTION | OVERVOLTAGE PROTEC | CTION[V] | 15.00 - 16.80 35.00 - 39.20 55.20 - 60.00 (Y1:60.0 - 67.2) 81.25 - 91.00 | | | | | | | |
| CIRCUIT AND | REMOTE SENSING | | Provided | | | | | | | |
| JINENS | REMOTE ON/OFF | | Provided | | | P | | | | |
| | INPUT-OUTPUT | | AC3,000V 1minute, Cutoff current = 10mA, DC500V 50M Ω min (20±15 $^{\circ}$ C) 2MOOP | | | | | | | |
| | INPUT-FG | | AC2,000V 1minute, Cutoff current = 10mA, DC500V 50M Ω min (20±15 $^{\circ}$ C) 1MOOP | | | | | | | |
| SOLATION | OUTPUT-FG | | TUNS1200F12/28/48 : AC500V 1minute, Cutoff current = 100mA, DC500V 50M Ω min (20±15 $^{\circ}$ C) TUNS1200F65 : AC1,200V 1minute, Cutoff current = 10mA, DC500V 50M Ω min (20±15 $^{\circ}$ C) 1MOOP | | | | | | | |
| | OUTPUT-RC, PG | | AC100V 1minute, Cutoff current = 100mA, DC100V 10M Ω min (20±15 $^{\circ}$ C) | | | | | | | |
| | OPERATING TEMP., HUMID. AND | ALTITUDE | | | | | | | | |
| | STORAGE TEMP., HUMID. AND | ALTITUDE | -40 to +100°C, 20 - 95%RH (Non condensing), 9,000m (30,000 feet) max | | | | | | | |
| NVIRONMENT | VIBRATION | | 10 - 55Hz, 49.0m/s² (5G), 3minutes period, 60minutes each along X, Y and Z axis | | | | | | | |
| | IMPACT | | 196.1m/s² (20G), 11ms, once each along X, Y and Z axis | | | | | | | |
| SAFETY AND | AGENCY APPROVAL | 9 | UL62368-1, EN62368-1, C-L | JL (equivalent to CAN/CSA-C | 22.2 No.62368-1), ANSI/AAMI | ES60601-1, EN60601-1 3rd | | | | |
| NOISE REGULATIONS | AGENCY APPHOVALS | | C-UL (equivalent to CAN/CSA-C22.2 No.60601-1), Complies with IEC60601-1-2 4th | | | | | | | |
| IOIOL NEGULATIONS | HARMONIC ATTENU | IATOR | Complies with IEC61000-3-2 (Class A) *3 | | | | | | | |
| OTHERS | CASE SIZE/WEIGHT | | 117.3×12.7×86.8mm [4.6 | 2×0.5×3.42 inches] (W×H | X D) / 280g max | | | | | |
| OEIIO | COOLING METHOD | | Conduction cooling (e.g. hea | at radiation from the aluminu | m base plate to the attached h | neat sink) | | | | |

- Refer to instruction manual for measuring method of electric characteristics.
- *2 *3 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25°C, with the input voltage held constant at the rated input/output.
- Please contact us about another class.



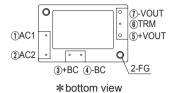




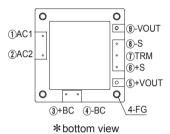
- % Tolerance : ±0.3 [±0.012]
- * Weight: 280g max
- Dimensions in mm, []=inches
- Mounting hole screwing torque: 0.49N · m (5.0kgf · cm) max

Pin Configuration

TUNS50F

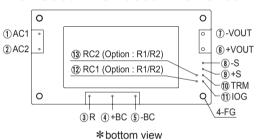


TUNS100F

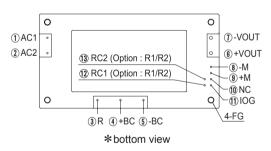


No. Pin Connection Function AC1 AC input 2 (2) AC2 3 3 +BC +BC output 4 -BC -BC output 4 +VOUT +DC output (5) (5) -DC output 7 9 -VOUT -S Remote sensing (-) 8 **(6)** +S Remote sensing (+) **6** (7) TRM Adjustment of output voltage FG Mounting hole (FG)

TUNS300F/TUNS500F/TUNS700F



■ TUNS700F□□-P (OPTION)

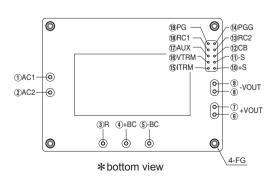


| No. | Pin Connection | Function | | | | |
|-----|-------------------|---|--|--|--|--|
| 1 | AC1 | AC input | | | | |
| 2 | AC2 | AC Iliput | | | | |
| 3 | R | External resistor for inrush current protection | | | | |
| 4 | +BC | +BC output | | | | |
| (5) | -BC | -BC output | | | | |
| 6 | +VOUT | +DC output | | | | |
| 1 | -VOUT | -DC output | | | | |
| 8 | -S | Remote sensing (-) | | | | |
| 9 | +S | Remote sensing (+) | | | | |
| 10 | TRM | Adjustment of output voltage | | | | |
| 11) | IOG | Inverter operation monitor | | | | |
| 12 | RC1 | Remote ON/OFF (Option) | | | | |
| 13 | RC2 | | | | | |
| _ | FG | Mounting hole (FG) | | | | |

| No. | Pin Connection | Function | | | |
|-----|-------------------|---------------------------------|--|--|--|
| 8 | -M | Output valtage maniter terminal | | | |
| 9 | +M | Output voltage monitor terminal | | | |
| 10 | NC | No connection | | | |

Other than the above are the same as standard products.

TUNS1200F



| No. | Pin Connection | Function | | | | | |
|----------|-------------------|---|--|--|--|--|--|
| 1) | AC1 | AC imput | | | | | |
| 2 | AC2 | AC input | | | | | |
| 3 | R | External resistor for inrush current protection | | | | | |
| 4 | +BC | +BC output | | | | | |
| ⑤ | -BC | -BC output | | | | | |
| 67 | +VOUT | +DC output | | | | | |
| 89 | -VOUT | -DC output | | | | | |
| 10 | +S | Remote sensing (+) | | | | | |
| 11) | -S | Remote sensing (-) | | | | | |
| 12 | CB | Current balance | | | | | |
| 13 | RC2 | Remote ON/OFF ground | | | | | |
| 14) | PGG | Power good output ground | | | | | |
| 15 | ITRM | Adjustment of output current | | | | | |
| 16 | VTRM | Adjustment of output voltage | | | | | |
| 17) | AUX | Auxiliary output | | | | | |
| 18 | RC1 | Remote ON/OFF | | | | | |
| 19 | PG | Power good output | | | | | |
| _ | FG | Mounting hole (FG) | | | | | |



Implementation • Mounting Method

Mounting method

- ■Use with the conduction cooling (e.g. heat dissipation from the aluminum base plate to the attached heat sink).
- ■Use a heat sink that larger than the power supply and has a large thickness so that the alminum base plate can be cooled uniformly.
- ■The unit can be mounted in any direction. When two or more power supplies are used side by side, position them with proper intervals to allow enough air ventilation. Aluminum base plate temperature of each power supply should not exceed the temperature range shown in
- ■Avoid placing the AC input line pattern layout underneath the unit. It will increase the line conducted noise. Make sure to leave an ample distance between the line pattern layout and the unit. Also avoid placing the DC output line pattern underneath the unit because it may increase the output noise. Lay out the pattern away from the unit.
- ■Avoid placing the signal line pattern layout underneath the unit because the power supply might become unstable. Lay out the pattern away from the unit.
- ■High-frequency noise radiates directly from the unit to the atmosphere. Therefore, design the shield pattern on the printed circuit board and connect it to FG or -BC. The shield pattern prevents noise radiation.
- ■When a heat sink cannot be fixed on the base plate side, order the power module with "-T"option. A heat sink can be mounted by affixing a M3 tap on the heat sink. Please make sure a mounting hole will be connected to a grounding capacitor CY.

| | Mounting hole |
|---------------|---------------|
| Standard | M3 tapped |
| Optional : -T | φ 3.4 thru |

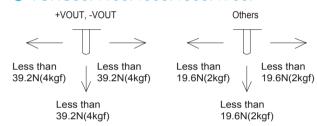
Stress onto the pins

- ■When too much stress is applied to the pins may damage internal connections. Avoid applying stress in excess of that shown in right figure.
- ■The pins are soldered onto the internal PCB. Therefore, Do not bend or pull the leads with excessive force.
- ■Mounting hole diameter of PCB should be 3.5mm to reduce the stress to the pins.
- ■Fix the unit on PCB (fixing fittings) by screws to reduce the stress to the pins. Be sure to mount the unit first, then solder the unit.

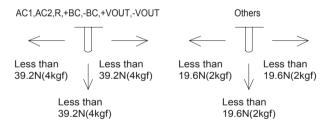
Soldering temperature

■Flow soldering : 260°C for up to 15 seconds. ■Soldering iron (26W) : 450°C for up to 5 seconds.

TUNS50F/100F/300F/500F/700F



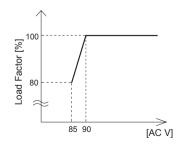
TUNS1200F



Derating

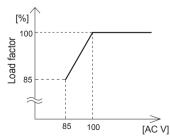
Input voltage derating curve

TUNS50F/100F



TUNS700F/1200F

*TUNS1200F12 has no input voltage derating.



TUNS300F/500F

*TUNS300F/500F has no input voltage derating.

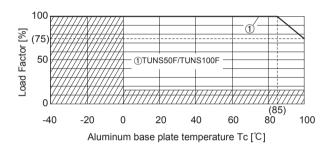
Derating

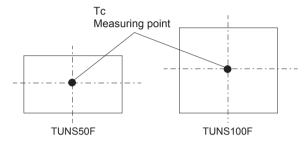
Output voltage derating curve

- ■Use the power modules with conduction cooling (e.g. heat dissipation from the aluminum base plate to the attached heat sink).

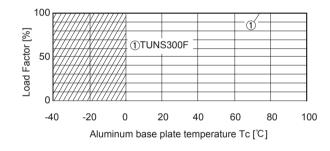
 Below shows the derating curves with respect to the aluminum base plate temperature. Note that operation within the hatched areas will cause a significant level of ripple and ripple noise.
- ■Please measure the temperature on the aluminum base plate edge side when you cannot measure the temperature of the center part of the aluminum base plate. In this case, please take 5deg temperature margin from the derating characteristics shown in below. Please reduce the temperature fluctuation range as much as possible when the up and down of the temperature are frequently generated. Contact us for more information on cooling methods.

TUNS50F/100F

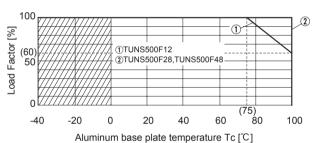




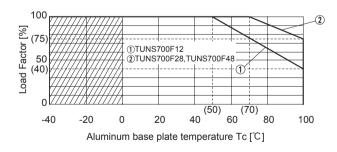
TUNS300F

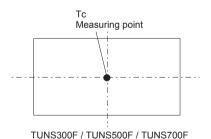


TUNS500F

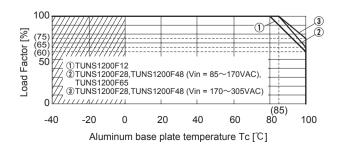


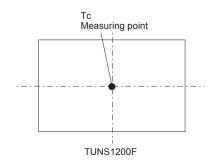
TUNS700F





TUNS1200F







Instruction Manual

◆ It is neccessary to read the "Instruction Manual" and "Before using our product" before you use our product.

https://www.cosel.co.jp/redirect/catalog/en/TUNS/ Instruction Manual Before using our product https://en.cosel.co.jp/technical/caution/index.html





Basic Characteristics Data

| Model | Circuit method | Switching frequency [kHz] | Input current [A] *1 | Inrush current protection circuit | PCB/Pattern | | | Series/Parallel operation availability | |
|-----------|-----------------------|---------------------------------|-----------------------------------|--|-------------|-----------------|-----------------|--|--------------------|
| | | | | | Material | Single sided | Double sided | Series operation | Parallel operation |
| TUNS50F | Active filter | 80-600 | 0.67 | Thermistor | Aluminum | Yes | | Yes | *2 |
| | Flyback converter | 100-300 | | | | | | | |
| TUNS100F | Active filter | 80-600 | 1 2 | Thermistor | Aluminum | Yes | | Yes | * 2 |
| 10113100F | Forward converter | 300 | 1.3 | | | | | | |
| TUNS300F | Active filter | 100 | 3.6 | SCR | Aluminum | Yes | | Yes | * 2 |
| | Half-bridge converter | 400 | | | | | | | |
| TUNS500F | Active filter | 100 | 6.0 | SCR | Aluminum | Yes | | Yes | *2 |
| | Half-bridge converter | 400 | | | | | | | |
| TUNS700F | Active filter | 100 | 8.6 | SCR | Aluminum | Yes | | Vac | *2 |
| | Half-bridge converter | 400 | | | | | | Yes | |
| TUNS1200F | Active filter | 100 | 14 | SCR | Aluminum | Yes | | Yes | Yes |
| | Full-bridge converter | 400 | | | | | | res | |

^{*1} The value of input current is at ACIN 100V and rated load.

^{*2} Refer to instruction manual.