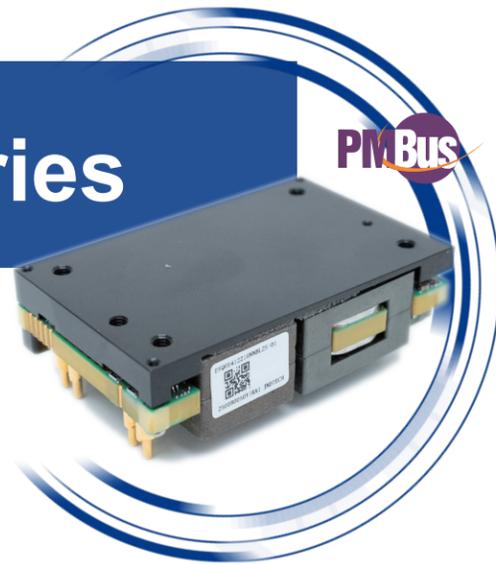




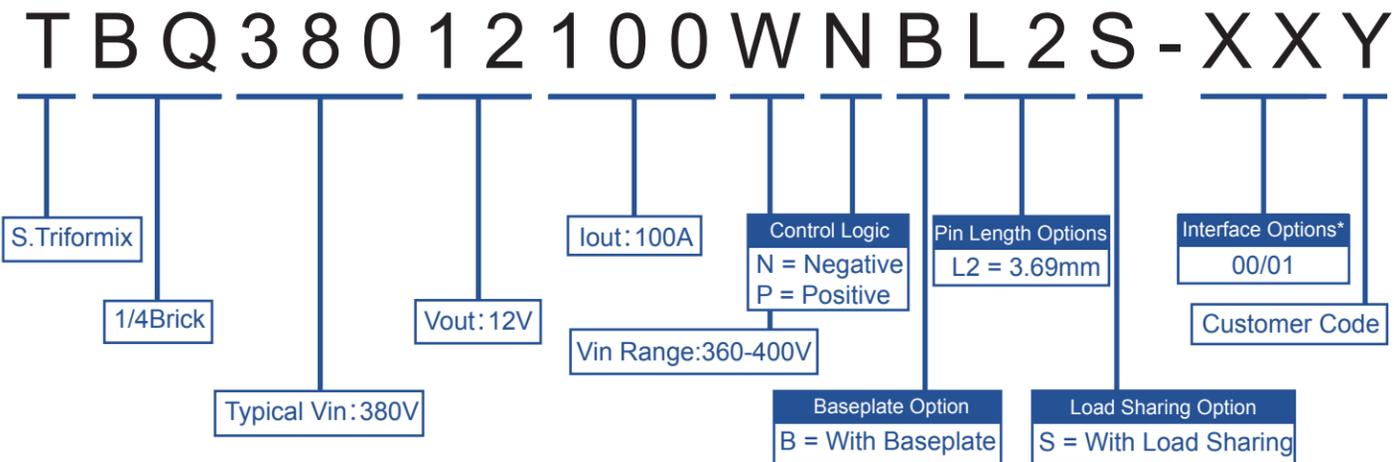
TBQ38012100W Series



01 Features

- Digital Quarter-Brick with PMBus interface
- 360-400Vin range, delivers up to 12Vo/100A
- High efficiency, typ. 97.1% at 380Vin, half load
- Configuration and monitoring via PMBus™
- Load sharing of two or more modules
- Baseplate included for improved thermal performance
- 4Pin Bus converter, No Sense & Trim Pins
- Remote control & power good
- Output short-circuit, output over voltage, & over temperature protection
- Designed to meet UL/IEC62368-1

02 Model Definition



*Interface Options: -01 means without Sense & Trim pins/with Digital interface, -00 means without Sense & Trim pins/without Digital interface

03 Key Parameters

Vin
360-400V

Efficiency
97.1%

Vout
12V

Pout
1200W

Isolation Voltage
4242V

04 Input Characteristics

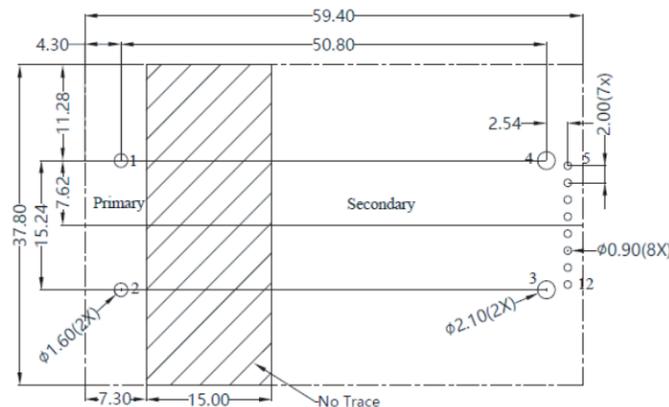
| | |
|---------------------------------------|-----------|
| Startup Threshold | 330-350 V |
| Undervoltage Shutdown | 300-320 V |
| Low Line Input Current | 3.5 A |
| Shut Down Input Current (Off, UV, OT) | 5 mA |

05 Output Characteristics

| | |
|---|----------------|
| Overvoltage Protection | 14 V |
| Output Current Range | 0-100 A |
| Overcurrent Protection | 130 A |
| Vin On to within 10% Vout steady state | 650-750 ms |
| Remote On to within 10% Vout steady state | 150-300 ms |
| Vout Rise Time | 48-60 ms |
| Dynamic Load Peak Deviation (0.1A/us) | ±530 mV |
| Dynamic Load Peak Deviation (1A/us) | ±720 mV |
| Ripple&Noise | 50-70 mV pk-pk |
| Maximum Output Capacitance | 2470-22000 µF |

06 Recommended Footprint / Pin Definition

Bird Eye View

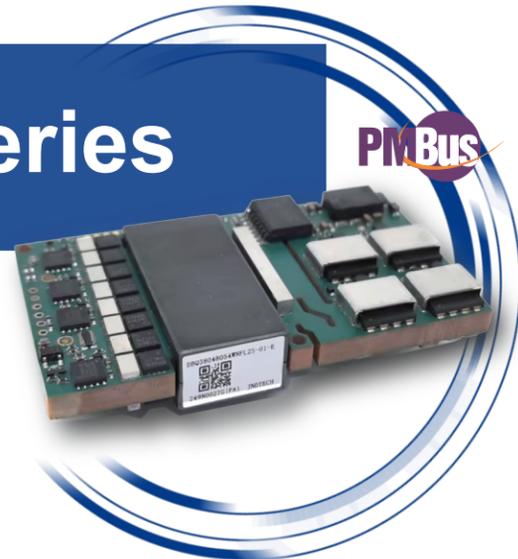


Dimension: 1/4 Brick 58.4*36.8*12.9/11.6mm

| | |
|-------------|------------------------------|
| 1 - Vin+ | Vin Positive Connection |
| 2 - Vin- | Vin Negative Connection |
| 3 - Vout- | Vout Negative Connection |
| 4 - Vout+ | Vout Positive Connection |
| 5 - Addr0 | PMBus™ Address Configuration |
| 6 - Addr1 | |
| 7 - Addr2 | |
| 8 - CLOCK | PMBus™ Clock Signal |
| 9 - PGood | Power Good Signal |
| 10 - DATA | PMBus™ Data Signal |
| 11 - ON/OFF | Remote ON/OFF Control |



TBQ38048054W Series

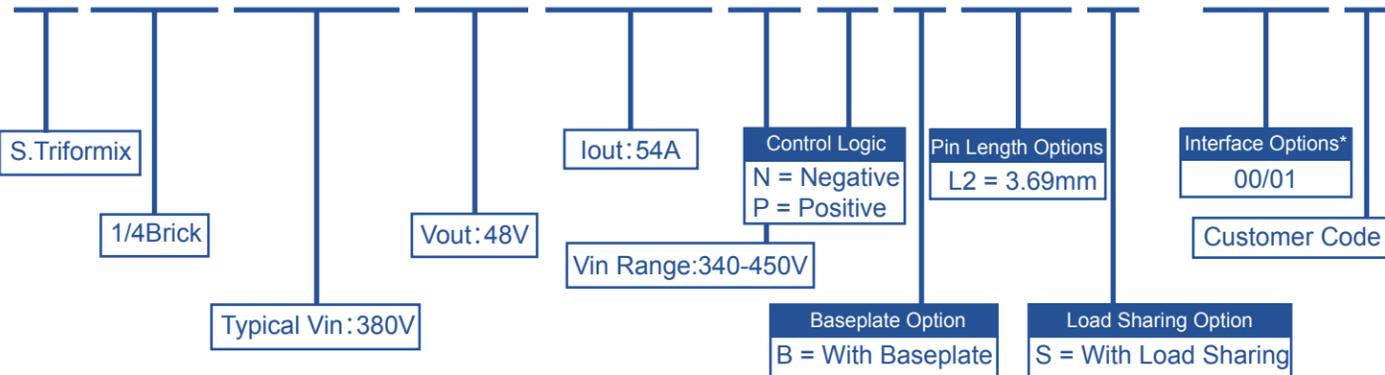


01 Features

- Digital Quarter-Brick with PMBus interface
- 340-450Vin range, delivers up to 48Vo/54A
- High efficiency, typ. 97.6% at 380Vin, half load
- Configuration and monitoring via PMBus™
- Load sharing of two or more modules
- Baseplate included for improved thermal performance
- 4Pin Bus converter, No Sense & Trim Pins
- Remote control & power good
- Output short-circuit, output over voltage, & over temperature protection

02 Model Definition

T B Q 3 8 0 4 8 0 5 4 W N B L 2 S - X X Y



*Interface Options: -01 means without Sense & Trim pins/with Digital interface, -00 means without Sense & Trim pins/without Digital interface

03 Key Parameters

Vin
340-450V

Efficiency
97.6%

Vout
48V

Pout
2500W

Isolation Voltage
4242V

04 Input Characteristics

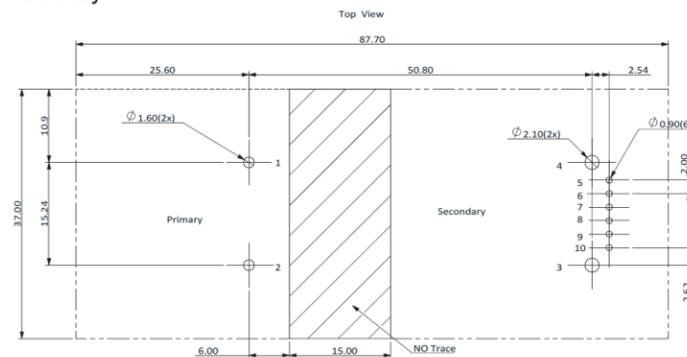
| | |
|---------------------------------------|-----------------------|
| Startup Threshold | 320 V |
| Undervoltage Shutdown | 300 V |
| Overvoltage Protection | 460 V |
| Low Line Input Current | 7.7 A |
| Shut Down Input Current (Off, UV, OT) | 10 mA |
| Input Reflected Ripple Current | 300 mA _{p-p} |

05 Output Characteristics

| | |
|---|-----------------|
| Overvoltage Protection | 58 V |
| Output Current Range | 46-61 A |
| Overpower Protection | 3300 W |
| Vin On to within 10% Vout steady state | 450 ms |
| Remote On to within 10% Vout steady state | 30 ms |
| Vout Rise Time | 130 ms |
| Dynamic Load Peak Deviation (0.1A/us) | ±270 mV |
| Dynamic Load Peak Deviation (1A/us) | ±300 mV |
| Ripple&Noise | 95-200 mV pk-pk |
| Maximum Output Capacitance | 100-2000 µF |

06 Recommended Footprint / Pin Definition

Bird Eye View



| | |
|-------------|------------------------------|
| 1 - Vin+ | Vin Positive Connection |
| 2 - Vin- | Vin Negative Connection |
| 3 - Vout- | Vout Negative Connection |
| 4 - Vout+ | Vout Positive Connection |
| 5 - Addr0 | PMBus™ Address Configuration |
| 6 - Addr1 | |
| 7 - CLOCK | PMBus™ Clock Signal |
| 8 - PGood | Power Good Signal |
| 9 - DATA | PMBus™ Data Signal |
| 10 - ON/OFF | Remote ON/OFF Control |

Dimension: 1/4 Brick 86.7/63.7*36.0*12.95/10.5mm



Non-Isolation Standard Brick Digital Power Product

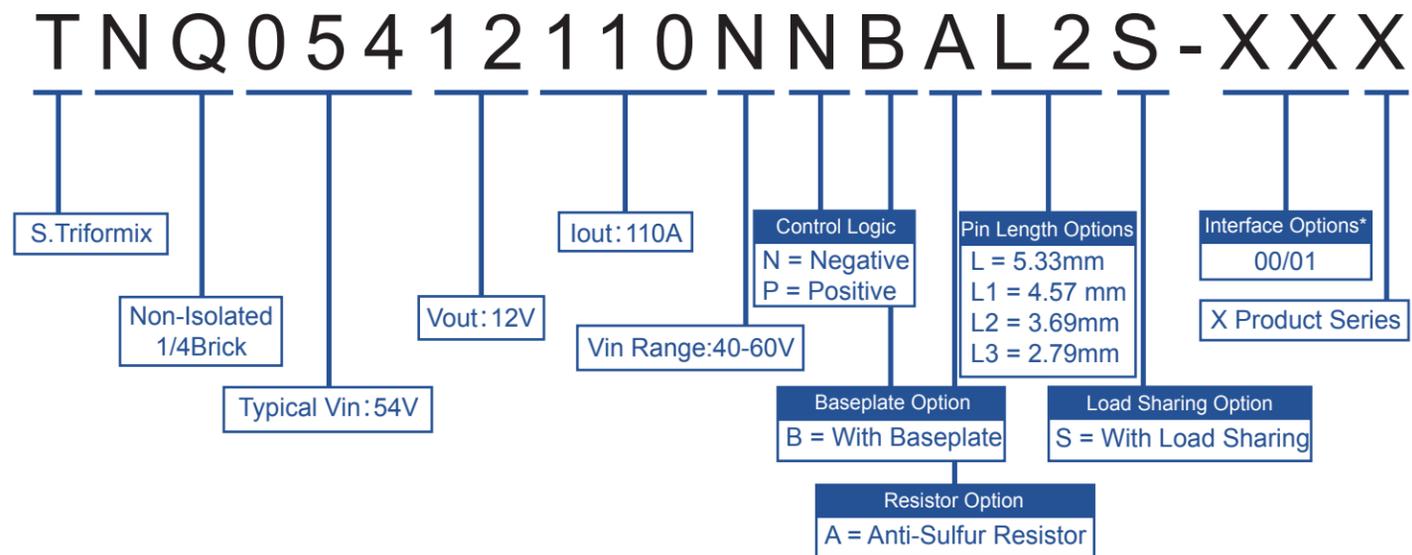
TNQ05412110-X Series



01 Features

- Digital Quarter-Brick with PMBus interface
- 40-60Vin range, delivers up to 1300W(12.24Vo, 110A)
- Max output power 1800W(12.24V/150A/20ms)
- High efficiency, typ. 97.7% at 54Vin, half load
- Configuration and monitoring via PMBus™
- Active load sharing of two or more modules
- Baseplate included for improved thermal performance
- MTBF 6.14M hours
- 7Pin Bus converter, No Sense & Trim Pins
- Remote control & power good
- Output short-circuit, output over voltage, & over temperature protection
- Designed to meet UL/IEC62368-1

02 Model Definition



*Interface Options: -01 means without Sense & Trim pins/with Digital interface, -00 means without Sense & Trim pins/without Digital interface

03 Key Parameters

| | | | |
|------------|--------|------|--------|
| Vin | 40-60V | Vout | 12.24V |
| Efficiency | 98.0% | Pout | 1300W |

04 Input Characteristics

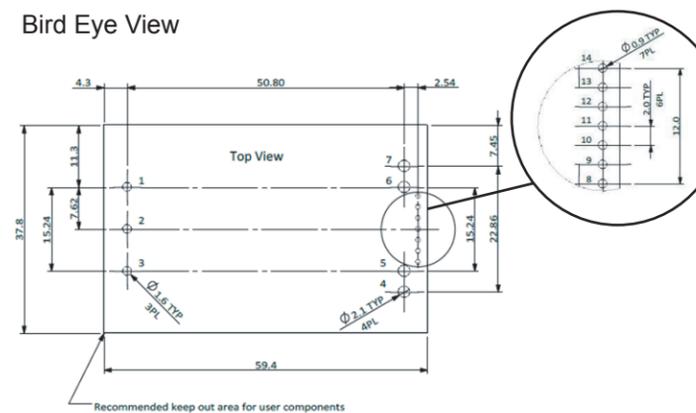
| | |
|---------------------------------------|-----------------------|
| Startup Threshold | 36-40 V |
| Undervoltage Shutdown | 34-38 V |
| Overvoltage Protection | 64 V |
| Low Line Input Current | 35 A |
| Shut Down Input Current (Off, UV, OT) | 25 mA |
| Input Reflected Ripple Current | 140 mA _{p-p} |

05 Output Characteristics

| | |
|---|-----------------|
| Overvoltage Protection | 14.2 V |
| Output Current Range | 0-110 A |
| Overcurrent Protection | 150 A |
| Vin On to within 10% Vout steady state | 300 ms |
| Remote On to within 10% Vout steady state | 100 ms |
| Vout Rise Time | 10 ms |
| Dynamic Load Response (1A/us) | 200 μSec |
| Dynamic Load Peak Deviation (1A/us) | 150 mV |
| Ripple&Noise | 40-200 mV pk-pk |
| Maximum Output Capacitance | 2000-20000 μF |

06 Recommended Footprint / Pin Definition

Bird Eye View



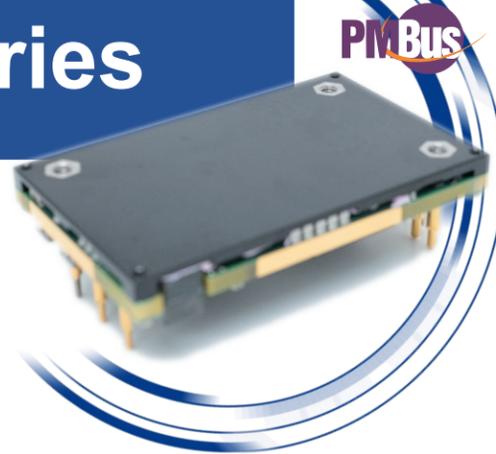
Dimension: 1/4 Brick 58.4*36.8*12.2mm

| | |
|----------------|------------------------------|
| 1 - Vin+ | Vin Positive Connection |
| 2 - ON/OFF | Remote ON/OFF Control |
| 3 - Vin- | Vin Negative Connection |
| 4,5 - Vout- | Vout Negative Connection |
| 6,7 - Vout+ | Vout Positive Connection |
| 8 - PGood | Power Good Signal |
| 9 - Sg_Gnd | Signal Ground |
| 10 - DATA | PMBus™ Data Signal |
| 11 - SMBALERT# | PMBus™ Alert Signal |
| 12 - CLOCK | PMBus™ Clock Signal |
| 13 - Addr1 | PMBus™ Address Configuration |
| 14 - ISHARE | Current Sharing Signal |



Non-Isolation Standard Brick Digital Power Product

TNQ05412130-X Series

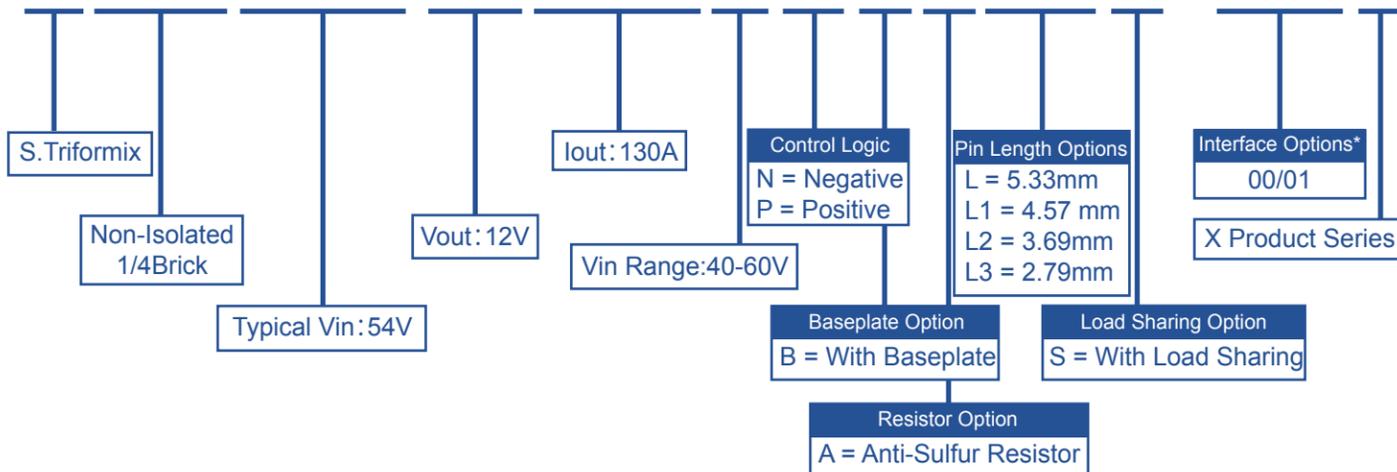


01 Features

- Digital Quarter-Brick with PMBus interface
- 40-60Vin range, delivers up to 1600W(12.24Vo, 130A)
- Max output power 2000W(12.24V/170A/250ms)
- High efficiency, typ. 98% at 54Vin, half load
- Configuration and monitoring via PMBus™
- Active load sharing of two or more modules
- Baseplate included for improved thermal performance
- MTBF 6.0M hours
- 7Pin Bus converter, No Sense & Trim Pins
- Remote control & power good
- Output short-circuit, output over voltage, & over temperature protection
- Designed to meet UL/IEC62368-1

02 Model Definition

TNQ05412130NNBAL2S-XXX



*Interface Options: -01 means without Sense & Trim pins/with Digital interface, -00 means without Sense & Trim pins/without Digital interface

03 Key Parameters

| | | | |
|------------|--------|------|--------|
| Vin | 40-60V | Vout | 12.24V |
| Efficiency | 98.0% | Pout | 1600W |

04 Input Characteristics

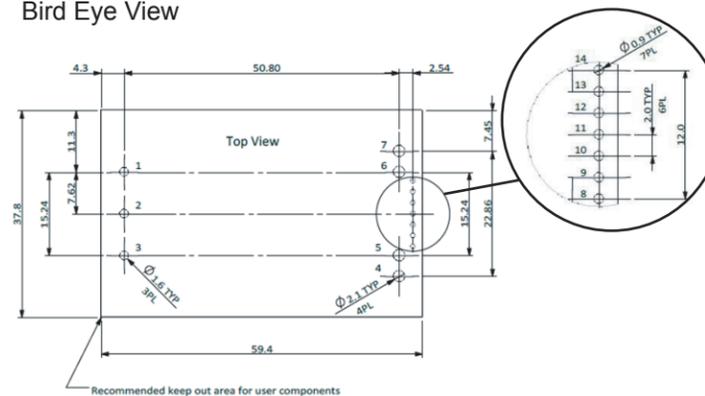
| | |
|---------------------------------------|-----------------------|
| Startup Threshold | 36-40 V |
| Undervoltage Shutdown | 34-38 V |
| Overvoltage Protection | 64 V |
| Low Line Input Current | 41.4 A |
| Shut Down Input Current (Off, UV, OT) | 25 mA |
| Input Reflected Ripple Current | 140 mA _{p-p} |

05 Output Characteristics

| | |
|---|-----------------|
| Overvoltage Protection | 14.2 V |
| Output Current Range | 0-130 A |
| Overcurrent Protection | 170 A |
| Vin On to within 10% Vout steady state | 320 ms |
| Remote On to within 10% Vout steady state | 120 ms |
| Vout Rise Time | 10 ms |
| Dynamic Load Response (1A/us) | 200 μSec |
| Dynamic Load Peak Deviation (1A/us) | 200 mV |
| Ripple&Noise | 40-200 mV pk-pk |
| Maximum Output Capacitance | 2000-20000 μF |

06 Recommended Footprint / Pin Definition

Bird Eye View



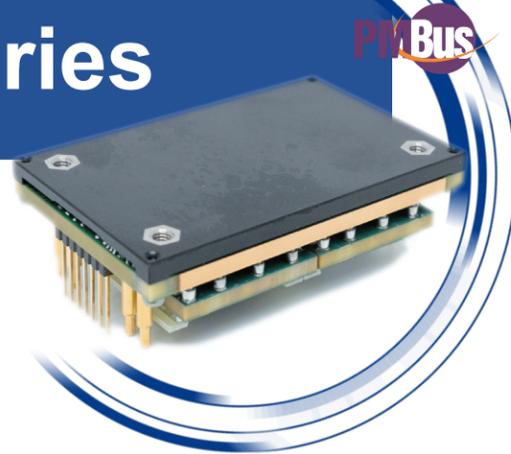
Dimension: 1/4 Brick 58.4*36.8*13.7mm

| | |
|----------------|------------------------------|
| 1 - Vin+ | Vin Positive Connection |
| 2 - ON/OFF | Remote ON/OFF Control |
| 3 - Vin- | Vin Negative Connection |
| 4, 5 - Vout- | Vout Negative Connection |
| 6, 7 - Vout+ | Vout Positive Connection |
| 8 - PGood | Power Good Signal |
| 9 - Sg_Gnd | Signal Ground |
| 10 - DATA | PMBus™ Data Signal |
| 11 - SMBALERT# | PMBus™ Alert Signal |
| 12 - CLOCK | PMBus™ Clock Signal |
| 13 - Addr1 | PMBus™ Address Configuration |
| 14 - ISHARE | Current Sharing Signal |



Non-Isolation Standard Brick Digital Power Product

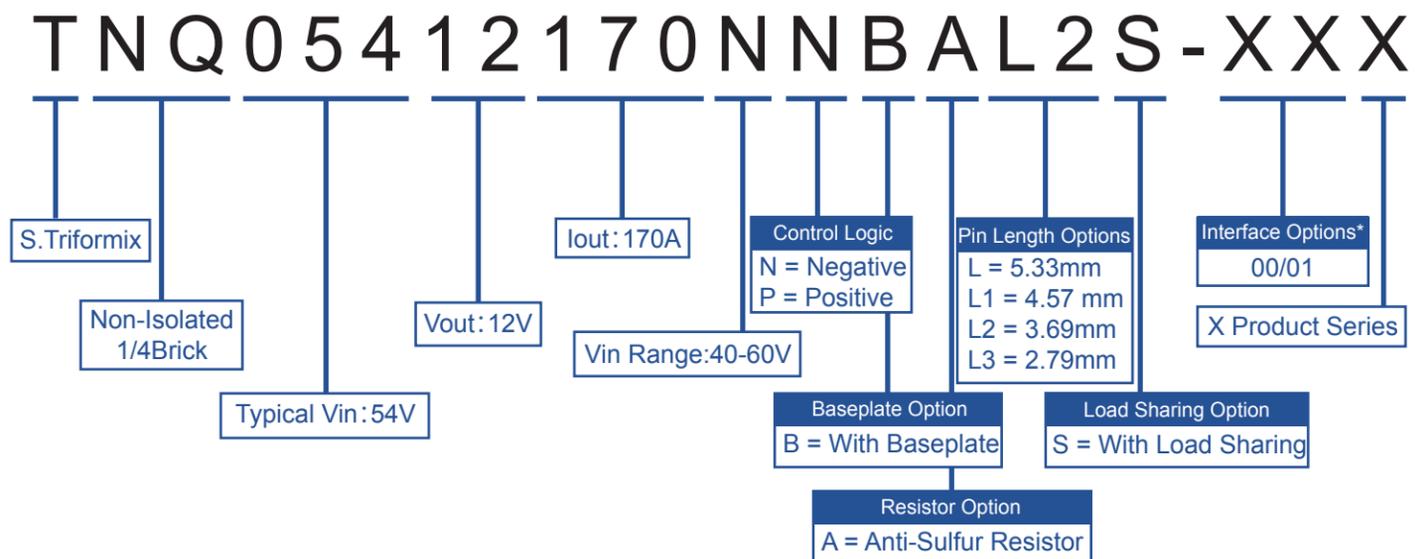
TNQ05412170-X Series



01 Features

- Digital Quarter-Brick with PMBus interface
- 40-60Vin range, delivers up to 2000W(12.24Vo, 170A)
- Max output power 3000W(12.24V/240A/2ms)
- High efficiency, typ.98.0% at 54Vin, half load
- Configuration and monitoring via PMBus™
- Active load sharing of two or more modules
- Baseplate included for improved thermal performance
- MTBF 4.4M hours
- Remote control & power good
- Output short-circuit, output over voltage, & over temperature protection
- Designed to meet UL/IEC62368-1

02 Model Definition



03 Key Parameters

| | | | |
|------------|--------|------|--------|
| Vin | 40-60V | Vout | 12.24V |
| Efficiency | 98.0% | Pout | 2000W |

04 Input Characteristics

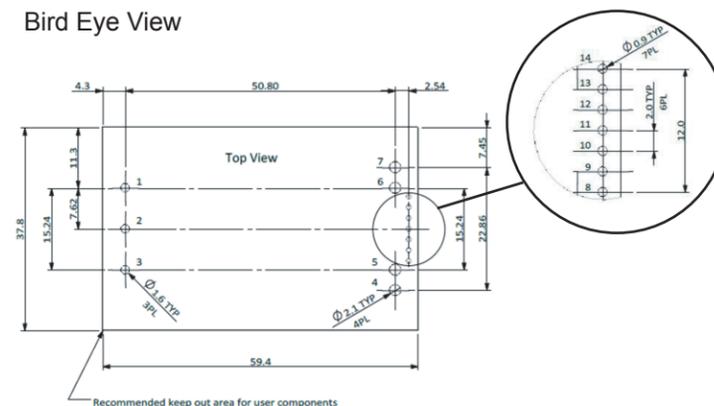
| | |
|---------------------------------------|-----------|
| Startup Threshold | 36-40 V |
| Undervoltage Shutdown | 34-38 V |
| Overvoltage Protection | 64 V |
| Low Line Input Current | 52 A |
| Shut Down Input Current (Off, UV, OT) | 25 mA |
| Input Reflected Ripple Current | 140 mAp-p |

05 Output Characteristics

| | |
|---|-----------------|
| Overvoltage Protection | 14.5 V |
| Output Current Range | 0-170 A |
| Overcurrent Protection | 240 A |
| Vin On to within 10% Vout steady state | 320 ms |
| Remote On to within 10% Vout steady state | 120 ms |
| Vout Rise Time | 40 ms |
| Dynamic Load Response (1A/us) | 300 µSec |
| Dynamic Load Peak Deviation (1A/us) | 150 mV |
| Ripple&Noise | 80-150 mV pk-pk |
| Maximum Output Capacitance | 3000-20000 µF |

06 Recommended Footprint / Pin Definition

Bird Eye View



Dimension: 1/4 Brick 58.4*36.8*13.9mm

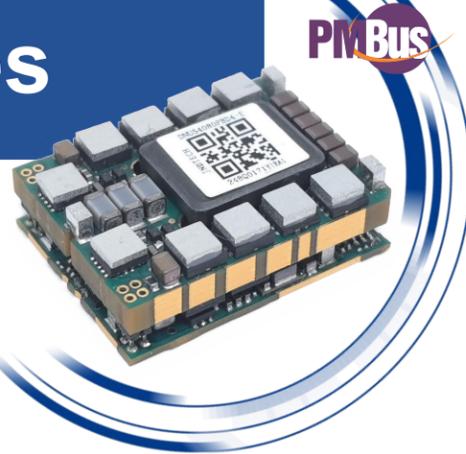
| | |
|----------------|------------------------------|
| 1 - Vin+ | Vin Positive Connection |
| 2 - ON/OFF | Remote ON/OFF Control |
| 3 - Vin- | Vin Negative Connection |
| 4, 5 - Vout- | Vout Negative Connection |
| 6, 7 - Vout+ | Vout Positive Connection |
| 8 - PGood | Power Good Signal |
| 9 - Sg_Gnd | Signal Ground |
| 10 - DATA | PMBus™ Data Signal |
| 11 - SMBALERT# | PMBus™ Alert Signal |
| 12 - CLOCK | PMBus™ Clock Signal |
| 13 - Addr1 | PMBus™ Address Configuration |
| 14 - ISHARE | Current Sharing Signal |

*Interface Options: -01 means without Sense & Trim pins/with Digital interface, -00 means without Sense & Trim pins/without Digital interface



Fixed Ratio Converter

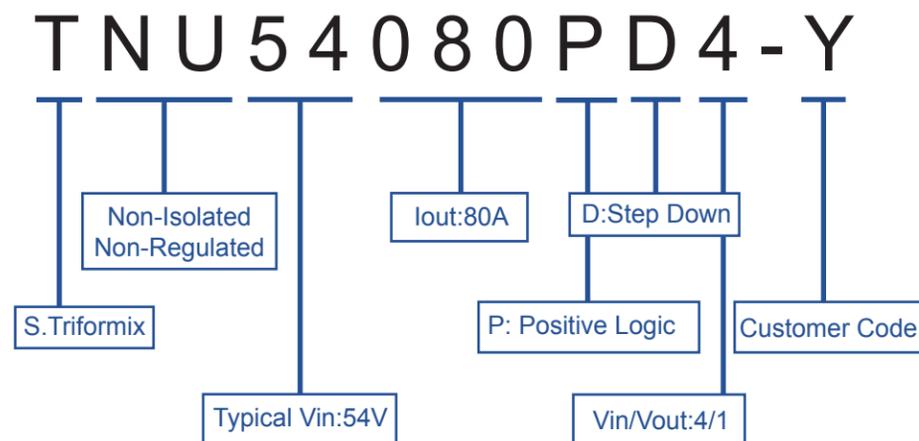
TNU54080PD4 Series



01 Features

- SMD package with PMBus interface
- 38-60Vin range, 1/4 voltage transformation ratio
- Delivers up to 1000W, peak power 3000W/1ms
- High efficiency, typ. 97.9% at 54Vin, half load
- Configuration and monitoring via PMBus™
- Pre-bias startup & parallel operation for high current applications
- Baseplate included for improved thermal performance
- Non-isolated & unregulated
- MTBF 5.81M hours
- Reflow process compatible
- Remote control & power good
- Output short-circuit, output over voltage, & over temperature protection
- Designed to meet UL/IEC62368-1

02 Model Definition



03 Key Parameters

| | | | |
|------------|--------|------|---------|
| Vin | 38-60V | Vout | 9.5-15V |
| Efficiency | 97.9% | Pout | 1000W |

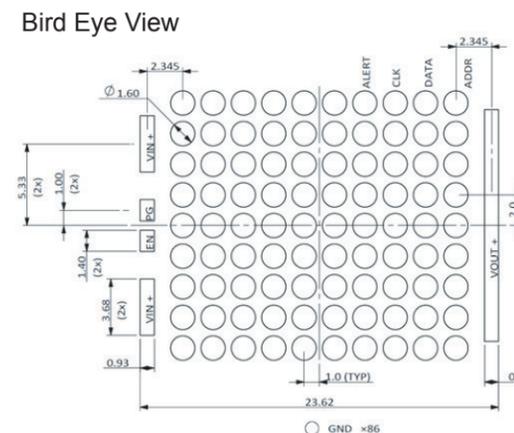
04 Input Characteristics

| | |
|---------------------------------------|-----------------------|
| Startup Threshold | 37-38 V |
| Undervoltage Shutdown | 34.5-36.5 V |
| Overvoltage Protection | 63-65 V |
| Low Line Input Current | 28.8 A |
| Shut Down Input Current (Off, UV, OT) | 40 mA |
| Input Reflected Ripple Current | 150 mA _{p-p} |

05 Output Characteristics

| | |
|---|----------------|
| Overvoltage Protection | 16 V |
| Output Current Range | 69-112 A |
| Output Overpower Protection | 1150-1450 W |
| Overcurrent Protection | 250-350 A |
| Vin On to within 10% Vout steady state | 78-98 ms |
| Remote On to within 10% Vout steady state | 3-10 ms |
| Vout Rise Time | 1.5-5 ms |
| Dynamic Load Response (0.1A/us) | 200-350 μSec |
| Dynamic Load Peak Deviation (0.1A/us) | ±150-250 mV |
| Dynamic Load Response (1A/us) | 200-350 μSec |
| Dynamic Load Peak Deviation (1A/us) | ±150-250 mV |
| Ripple&Noise | 20-35 mV pk-pk |
| Maximum Output Capacitance | 100-20000 μF |

06 Recommended Footprint / Pin Definition



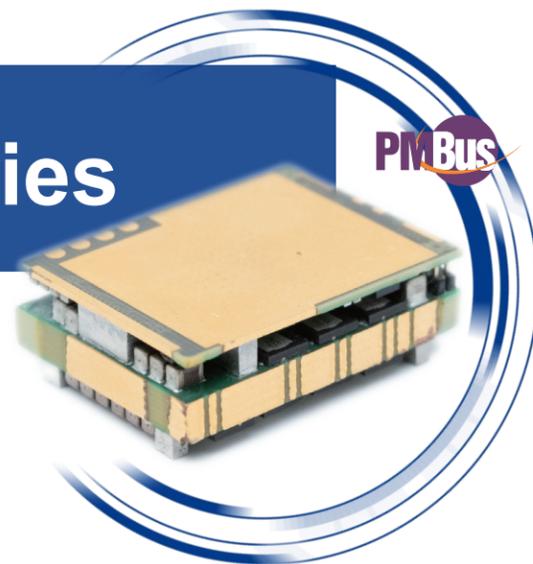
Dimension: 23.4*17.8*7.7mm

| | |
|-------------|------------------------------|
| 1, 4 - Vin+ | Vin Positive Connection |
| 2 - PG | Power Good Signal |
| 3 - EN | Remote ON/OFF Control |
| 5 - GND | Power Ground |
| 6 - Vout+ | Vout Positive Connection |
| 7 - ADDR | PMBus™ Address Configuration |
| 8 - DATA | PMBus™ Data Signal |
| 9 - CLK | PMBus™ Clock Signal |
| 10 - ALERT | Alert Signal |



Fixed Ratio Converter

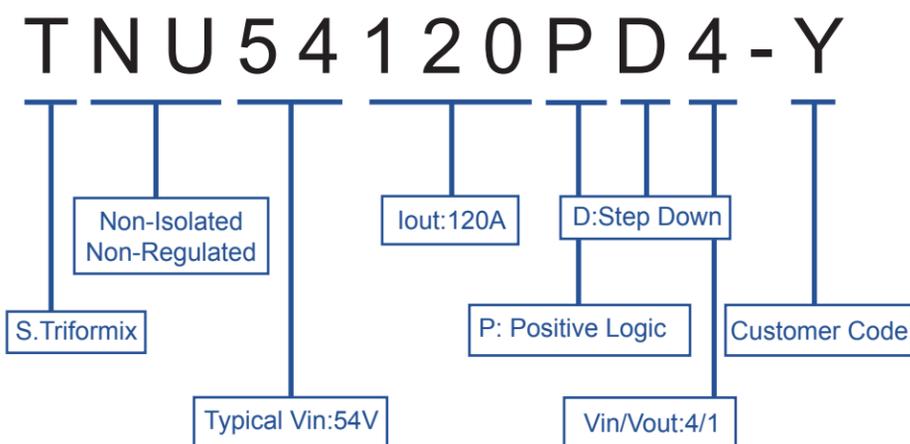
TNU54120PD4 Series



01 Features

- SMD package with PMBus interface
- 38-60Vin range, 1/4 voltage transformation ratio
- Delivers up to 1500W, peak power 3800W/1ms
- High efficiency, typ. 97.7% at 54Vin, half load
- Configuration and monitoring via PMBus™
- Pre-bias startup & parallel operation for high current applications
- Baseplate included for improved thermal performance
- Non-isolated & unregulated
- Reflow process compatible
- Remote control & power good
- Output short-circuit, output over voltage, & over temperature protection
- Designed to meet UL/IEC62368-1

02 Model Definition



03 Key Parameters

| | |
|---------------------|-----------------|
| Vin 38-60V | Vout 9.5-15V |
| Efficiency 98.2% | Pout 1500W |

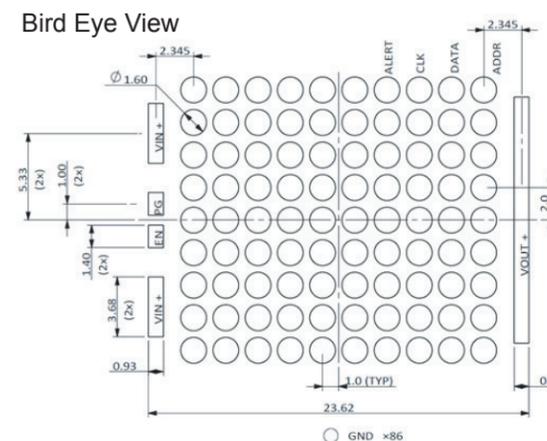
04 Input Characteristics

| | |
|---------------------------------------|-------------|
| Startup Threshold | 37-38 V |
| Undervoltage Shutdown | 34.5-36.5 V |
| Overvoltage Protection | 63-65 V |
| Low Line Input Current | 34 A |
| Shut Down Input Current (Off, UV, OT) | 40 mA |

05 Output Characteristics

| | |
|---|-----------------|
| Overvoltage Protection | 16 V |
| Output Current Range | 107-130 A |
| Output Overpower Protection | 1850-2150 W |
| Overcurrent Protection | 500 A |
| Vin On to within 10% Vout steady state | 78-98 ms |
| Remote On to within 10% Vout steady state | 5-10 ms |
| Vout Rise Time | 1.5-5 ms |
| Dynamic Load Response (0.1A/us) | 200 μSec |
| Dynamic Load Peak Deviation (0.1A/us) | ±150 mV |
| Dynamic Load Response (1A/us) | 100 μSec |
| Dynamic Load Peak Deviation (1A/us) | ±300 mV |
| Ripple&Noise | 80-100 mV pk-pk |
| Maximum Output Capacitance | 100-20000 μF |

06 Recommended Footprint / Pin Definition

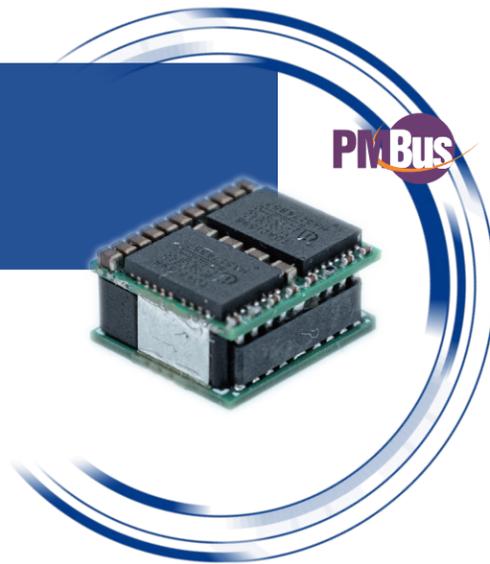


| | |
|-------------|------------------------------|
| 1, 4 - Vin+ | Vin Positive Connection |
| 2 - PG | Power Good Signal |
| 3 - EN | Remote ON/OFF Control |
| 5 - GND | Power Ground |
| 6 - Vout+ | Vout Positive Connection |
| 7 - ADDR | PMBus™ Address Configuration |
| 8 - DATA | PMBus™ Data Signal |
| 9 - CLK | PMBus™ Clock Signal |
| 10 - ALERT | Alert Signal |

Dimension: 23.4*17.8*7.7mm



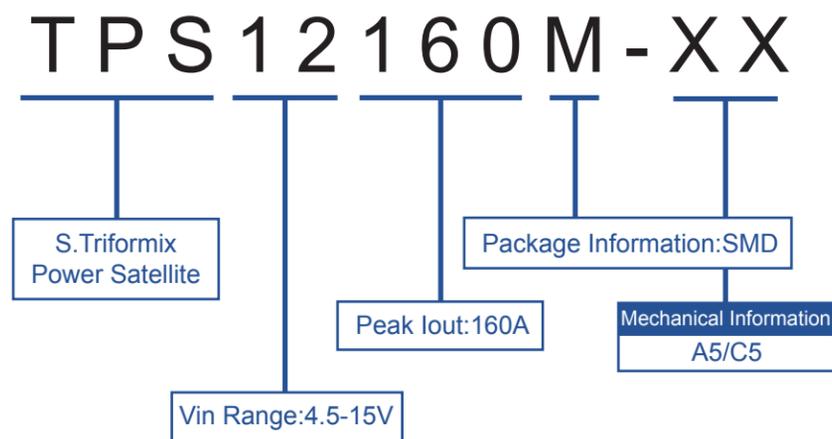
TPS12160M Series



01 Features

- 4.5 V -15 V input voltage range
- Small package: 10 x 9 x 4.8 mm (0.39 x 0.35 x 0.2 in)
- 100A Continuous / 160A peak output current
- 0.5 V–1.8 V output voltage range
- High efficiency up to 93.2%
- Output over current & over temperature protection

02 Model Definition



03 Key Parameters

Vin (A5)
4.5V-15V

Vin (C5)
4.5V-14V

Vout
0.5V-1.8V

Iout
160A

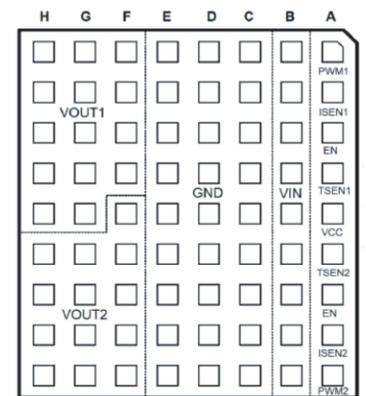
Efficiency
93.2%

04 Product Characteristics

| | |
|---------------------------------------|--------------|
| VCC - Driver and Logic Supply Voltage | 4.5-5.5 V |
| VO - Output Voltage Range | 0.5-1.8 V |
| VOac - Output Ripple&Noise | 15 mV pk-pk |
| fSW - Switching Frequency | 600-1000 kHz |
| LO - Output Inductance | 100 nH |
| IO - Output Current, Continuous | 50-100 A |

05 Recommended Footprint / Pin Definition

Bird Eye View



Dimension: 10x9X5mm

| | |
|-----------------------------|---|
| A1 - PWM1 | Pulse-Width Modulation Input, Pwithe 1 |
| A2 - ISEN1 | Current Sense Output, Pwithe 1 |
| A3, A7 - EN | Active High Enable Output (Both Pwithe 1) |
| A4 - TSEN1 | Temperature Sense and Fault Reporting, Pwithe 1 |
| A5 - VCC | Driver and Internal Circuitry Supply |
| A6 - TSEN2 | Temperature Sense and Fault Reporting, Pwithe 2 |
| A8 - ISEN2 | Current Sense Output, Pwithe 2 |
| A9 - PWM2 | Pulse-Width Modulation Input, Pwithe 2 |
| B1-B9 - VIN | Input Voltage |
| C1-C9, D1-D9, E1-E9 - GND | Power Ground and Digital Ground |
| F1-F4, G1-G5, H1-H5 - VOUT1 | Output Voltage, Pwithe 1 |
| F5-F9, G6-G9, H6-H9 - VOUT2 | Output Voltage, Pwithe 2 |