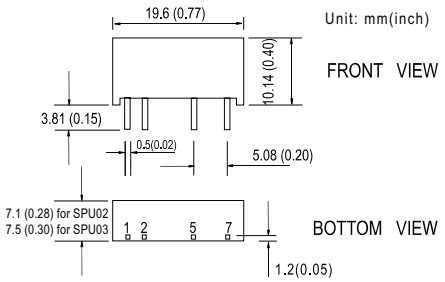
DC/DC Converter

2~3W Module Type

2~3W DC-DC Unregulated Single Output

- 3000VDC I/O isolation
- Internal SMD technology
- Built-in EMI filter
- Protection: Short circuit
- Cooling by free air convection
- Non-conductive plastic case
- Single in line package
- 100% full load burn-in test
- Low cost, high reliability
- 2 years warranty

Mechanism



Pin Configuration

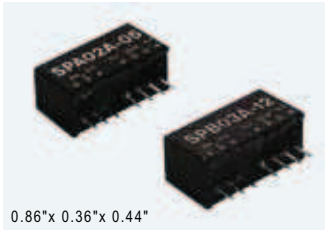
Pin No.	Output
1	+Vin
2	-Vin
5	-Vout
7	+Vout

Voltage set point accuracy ... ±2% (max.)
Line regulation .....±1.2% (max.) for 1% input variation
Load regulation .....±8% (max.)@20~100% load
Efficiency ..... 83% (typical) for SPU02; 88% (typical) for SPU03
Short circuit protection ..... Momentary
Switching frequency ..... 100kHz (min.) for SPU02; 60kHz (min.) for SPU03
I/O isolation voltage ..... 3000VDC (min.)
I/O isolation resistance .....100MΩ (min.)
Isolation capacitance .....80pF (max.)
Working temperature ..... -40~+71°C (refer to output derating curve) for SPU02
-40~+90°C (refer to output derating curve) for SPU03
Storage temperature ..... -40°C to +105°C
Temp. Coefficient ..... ±0.03% / °C (max.)
Case material ..... non-conductive plastic
EMC ..... Compliance to EN55022 Class B,
EN61000-4-2,3,4,5,6,8, FCC part15 Class B

Model No.	Input (VDC)	Output (VDC)	Current (mA)	R&N (mVp-p)
SPU02L-05	5±10%	5	400	100
SPU02L-12	5±10%	12	167	100
SPU02L-15	5±10%	15	133	100
SPU02M-05	12±10%	5	400	100
SPU02M-12	12±10%	12	167	100
SPU02M-15	12±10%	15	133	100
SPU02N-05	24±10%	5	400	100
SPU02N-12	24±10%	12	167	100
SPU02N-15	24±10%	15	133	100

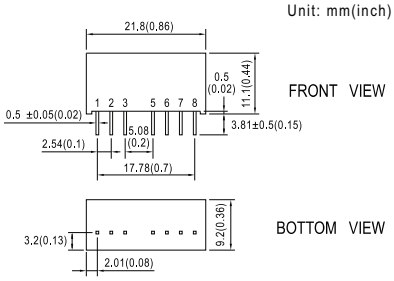
Model No.	Input (VDC)	Output (VDC)	Current (mA)	R&N (mVp-p)
SPU03L-05	5±10%	5	600	50
SPU03L-12	5±10%	12	250	50
SPU03L-15	5±10%	15	200	50
SPU03M-05	12±10%	5	600	50
SPU03M-12	12±10%	12	250	50
SPU03M-15	12±10%	15	200	50
SPU03N-05	24±10%	5	600	50
SPU03N-12	24±10%	12	250	50
SPU03N-15	24±10%	15	200	50

2~3W DC-DC Regulated Single Output



- 2:1 wide input range
- 4:1 wide input range (option) for SPA02
- 1000VDC I/O isolation
- 3000VDC I/O isolation (option) for SPA02
- Built-in remote ON/OFF control
- Built-in EMI filter
- Protection: Short circuit / Overload
- Cooling by free air convection
- Non-conductive plastic case
- Single in line package
- 100% full load burn-in test
- Modified models available: output 3.3V / 9V
- 2 years warranty

Mechanism



Pin Configuration

Pin No.	Output
1	-Vin
2	+Vin
3	R.C.
5	N.C.
6	+Vout
7	-Vout
8	N.C.

Voltage set point accuracy .... ±2% (max.)
Line regulation ..... ±0.5% (max.)
Load regulation ..... ±0.5% (max.)@10~100% load
Efficiency .....82% (typical)
Short circuit protection .....Continuous, auto-recovery
Overload protection ..... 150%~250%, auto-recovery
Switching frequency ..... 100KHz (min.)
I/O isolation voltage .....1000VDC (min.)
I/O isolation resistance ..... 100MΩ (min.)
Isolation capacitance ..... 80pF (max.)
Working temperature .....-40~+85°C(refer to output derating curve)
Storage temperature .....-40°C to +105°C
Temp. Coefficient ..... ±0.03% / °C (max.)
Case material .....non-conductive plastic
EMC .....Compliance to EN55022 Class B,
EN61000-4-2,3,4,5,6,8, FCC part15 Class B

Model No.	Input (VDC)	Output (VDC)	Current (mA)	R&N (mVp-p)
SPA02E-05	4.5~9	5	400	60
SPA02E-12	4.5~9	12	150	60
SPA02E-15	4.5~9	15	120	60
SPA02A-05	9~18	5	400	60
SPA02A-12	9~18	12	167	60
SPA02A-15	9~18	15	133	60
SPA02B-05	18~36	5	400	60
SPA02B-12	18~36	12	167	60
SPA02B-15	18~36	15	133	60
SPA02C-05	36~72	5	400	60
SPA02C-12	36~72	12	167	60
SPA02C-15	36~72	15	133	60

Model No.	Input (VDC)	Output (VDC)	Current (mA)	R&N (mVp-p)
SPB03E-05	4.5~9	5	600	50
SPB03E-12	4.5~9	12	250	60
SPB03E-15	4.5~9	15	200	60
SPB03A-05	9~18	5	600	50
SPB03A-12	9~18	12	250	60
SPB03A-15	9~18	15	200	60
SPB03B-05	18~36	5	600	50
SPB03B-12	18~36	12	250	60
SPB03B-15	18~36	15	200	60
SPB03C-05	36~72	5	600	50
SPB03C-12	36~72	12	250	60
SPB03C-15	36~72	15	200	60

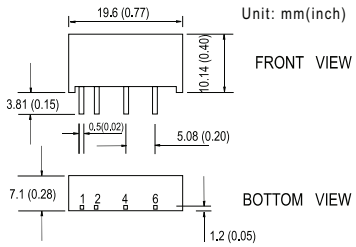
DC/DC Converter

1W Module Type

1W DC-DC Regulated Single Output

- 1000VDC I/O isolation
- Internal SMD technology
- Built-in EMI filter
- Protection: Short circuit / Overload
- Cooling by free air convention
- Non-conductive plastic case
- Single in line package
- 100% full load burn-in test
- Low cost, high reliability
- 2 years warranty

Mechanism



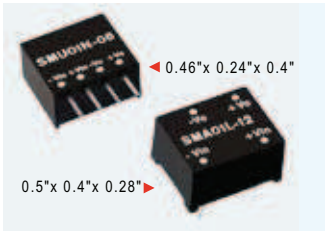
Pin Configuration

Pin No.	Output
1	+Vout
2	-Vin
4	-Vout
6	+Vout

Voltage set point accuracy ... ±2% (typical)
Line regulation ..... ±1% (max.)
Load regulation ..... ±1% (max.)@10~100% load
Efficiency ..... 65% (typical)
Overload protection ..... >110% hiccup mode, auto-recovery
Short circuit protection ..... Continuous, auto-recovery
Switching frequency ..... 50kHz (min.)
I/O isolation voltage ..... 1000VDC (min.)
I/O isolation resistance ..... 100MΩ (min.)
Isolation capacitance ..... 80pF (max.)
Working temperature ..... -25~+71°C (refer to output derating curve)
Storage temperature ..... -25°C to +105°C
Temp. Coefficient ..... ±0.03% / °C (max.)
Case material ..... non-conductive plastic
EMC ..... Compliance to EN55022 Class B, EN61000-4-2,3,4,5,6,8, FCC part15 Class B

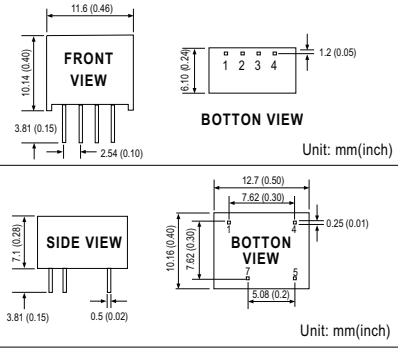
Model No.	Input (VDC)	Output (VDC)	Current (mA)	R&N (mVp-p)
SPR01L-05	5±10%	5	200	100
SPR01L-09	5±10%	9	100	100
SPR01L-12	5±10%	12	84	100
SPR01L-15	5±10%	15	67	100
SPR01M-05	12±10%	5	200	100
SPR01M-09	12±10%	9	100	100
SPR01M-12	12±10%	12	84	100
SPR01M-15	12±10%	15	67	100
SPR01N-05	24±10%	5	200	100
SPR01N-09	24±10%	9	100	100
SPR01N-12	24±10%	12	84	100
SPR01N-15	24±10%	15	67	100
SPR01O-05	48±10%	5	200	100
SPR01O-09	48±10%	9	100	100
SPR01O-12	48±10%	12	84	100
SPR01O-15	48±10%	15	67	100

1W DC-DC Unregulated Single Output



- 1500VDC I/O isolation
- Operating temperature range -40~85°C without derating
- Internal SMD technology
- Built-in EMI filter
- Protection: Short circuit
- Cooling by free air convention
- Non-conductive plastic case
- Dual in line package for SMA01
- 100% full load burn-in test
- Industry standard pinout
- 2 years warranty

Mechanism



Pin Configuration

SMU01

Pin No.	Output
1	-Vin
2	+Vin
3	-Vout
4	+Vout

SMA01

Pin No.	Output
1	-Vin
4	+Vin
5	+Vout
7	-Vout

Voltage set point accuracy ..... ±2% (max.)
Line regulation ..... ±1.2% (max.) for 1% input variation
Load regulation ..... ±8% (max.)@20~100% load
Input reflected ripple 100mVp-p
Efficiency ..... 80% (typical)
Short circuit protection ..... Momentary
Switching frequency ..... 100kHz (min.)
I/O isolation voltage ..... 1500VDC (min.)
I/O isolation resistance ..... 100MΩ (min.)@ 500VDC
Isolation capacitance ..... 80pF (max.)
Working temperature ..... -40~+85°C (no derating)
Storage temperature ..... -40°C to +105°C
EMC ..... Compliance to EN55022 Class B, EN61000-4-2,3,4,5,6,8, FCC part15 Class B

Model No.	Input (VDC)	Output (VDC)	Current (mA)	R&N (mVp-p)
SMU01L-05	5±10%	5	200	100
SMU01L-09	5±10%	9	110	100
SMU01L-12	5±10%	12	84	100
SMU01L-15	5±10%	15	67	100
SMU01M-05	12±10%	5	200	100
SMU01M-09	12±10%	9	110	100
SMU01M-12	12±10%	12	84	100
SMU01M-15	12±10%	15	67	100
SMU01N-05	24±10%	5	200	100
SMU01N-09	24±10%	9	110	100
SMU01N-12	24±10%	12	84	100
SMU01N-15	24±10%	15	67	100

Model No.	Input (VDC)	Output (VDC)	Current (mA)	R&N (mVp-p)
SMA01L-05	5±10%	5	200	100
SMA01L-09	5±10%	9	110	100
SMA01L-12	5±10%	12	84	100
SMA01L-15	5±10%	15	67	100
SMA01M-05	12±10%	5	200	100
SMA01M-09	12±10%	9	110	100
SMA01M-12	12±10%	12	84	100
SMA01M-15	12±10%	15	67	100
SMA01N-05	24±10%	5	200	100
SMA01N-09	24±10%	9	110	100
SMA01N-12	24±10%	12	84	100
SMA01N-15	24±10%	15	67	100

DC/DC Converter

1W Module Type

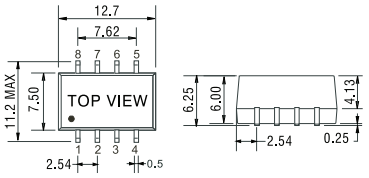
1W DC-DC Unregulated Single Output

0.50"x 0.30"x 0.24"

- 1000VDC I/O isolation
- Internal SMD technology
- Protection: Short circuit
- Cooling by free air convection
- Non-conductive plastic case
- SMD package style
- 100% full load burn-in test
- Low cost, high reliability
- 1 year warranty

Mechanism

Unit: mm(inch)



Pin Configuration

Pin No.	Output
1	-Vin
2	+Vin
3	NC
4	-Vout
5	+Vout
6	NC
7	NC
8	NC

Voltage set point accuracy ..... ±8% (max.)
Line regulation ..... ±1.2% (max.) for 1% input variation
Load regulation ..... ±8% (max.)@20~100% load
Input reflected ripple 100mVp-p
Efficiency ..... 75% (typical)
Short circuit protection .....Momentary
Switching frequency .....100kHz (typical)
I/O isolation voltage ..... 1000VDC (min.)
I/O isolation resistance ..... 100MΩ (min.)@ 500VDC
Working temperature ..... -40°C to +85°C
Storage temperature .....-40°C to +105°C
Temp. Coefficient ..... ±0.03% / °C (max.)
Case material ..... non-conductive plastic
Safety standards ..... UL60950-1 approved

Model No.	Input (VDC)	Output (VDC)	Current (mA)	R&N (mVp-p)
SBT01L-05	5±10%	5	200	100
SBT01L-09	5±10%	9	111	100
SBT01L-12	5±10%	12	84	100
SBT01L-15	5±10%	15	67	100
SBT01M-05	12±10%	5	200	100
SBT01M-09	12±10%	9	111	100
SBT01M-12	12±10%	12	84	100
SBT01M-15	12±10%	15	67	100

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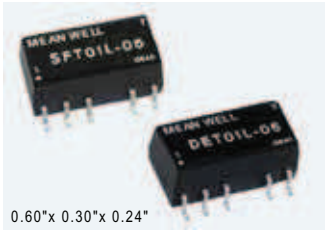
1W DC-DC Unregulated Single and Dual Output

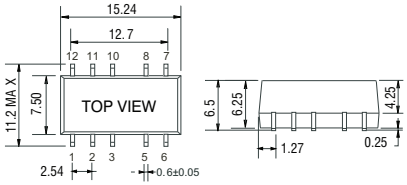


0.60"x 0.30"x 0.24"

- 3000VDC I/O isolation
- Internal SMD technology
- Protection: Short circuit
- Cooling by free air convection
- Non-conductive plastic case
- SMD package style
- 100% full load burn-in test
- Low cost, high reliability
- 1 year warranty

Mechanism

Unit: mm(inch)



Pin Configuration

Pin No.	Output	
	Single	Dual
1	-Vin	-Vin
2	+Vin	+Vin
3	NC	NC
5	-Vout	COM
6	NC	-Vout
7	NC	NC
8	+Vout	+Vout
10	NC	NC
11	NC	NC
12	NC	NC

Voltage set point accuracy .....±8% (max.)
Line regulation ..... ±1.2% (max.) for 1% input variation
Load regulation ..... ±8% (max.)@20~100% load
Efficiency ..... 79% (typical)
Short circuit protection .....Momentary
Switching frequency ..... 100kHz (typical)
I/O isolation voltage ..... 3000VDC (min.)
I/O isolation resistance ..... 100MΩ (min.)@ 500VDC
Working temperature ..... -40°C to +85°C
Storage temperature .....-40°C to +105°C
Temp. Coefficient ..... ±0.03% / °C (max.)
Case material ..... non-conductive plastic
Safety standards ..... UL60950-1, CSA C22.2 approved

Model No.	Input (VDC)	Output (VDC)	Current (mA)	R&N (mVp-p)
SFT01L-05	5±10%	5	200	100
SFT01L-09	5±10%	9	111	100
SFT01L-12	5±10%	12	84	100
SFT01L-15	5±10%	15	67	100
SFT01M-05	12±10%	5	200	100
SFT01M-09	12±10%	9	111	100
SFT01M-12	12±10%	12	84	100
SFT01M-15	12±10%	15	67	100

Model No.	Input (VDC)	Output (VDC)	Current (mA)	R&N (mVp-p)
DET01L-05	5±10%	±5	±100	100
DET01L-09	5±10%	±9	±56	100
DET01L-12	5±10%	±12	±42	100
DET01L-15	5±10%	±15	±33	100
DET01M-05	12±10%	±5	±100	100
DET01M-09	12±10%	±9	±56	100
DET01M-12	12±10%	±12	±42	100
DET01M-15	12±10%	±15	±33	100

DC/DC Converter

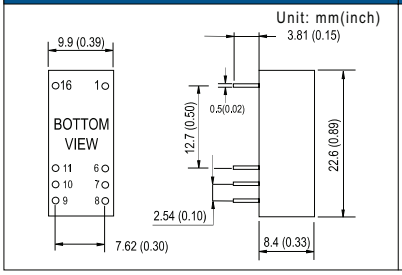
0.5~1W Module Type

0.5W DC-DC Regulated Single Output

0.89"x 0.39"x 0.33"

- 1000VDC I/O isolation
- Internal SMD technology
- Built-in EMI filter
- Protection: Short circuit
- Cooling by free air convection
- Non-conductive plastic case
- Dual in line package
- 100% full load burn-in test
- Low cost, high reliability
- 2 years warranty

Mechanism



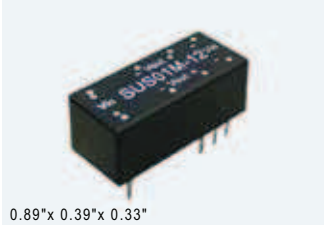
Pin Configuration

Pin No.	Output
1 & 16	+Vin
6 & 11	-Vout
7 & 10	+Vout
8 & 9	-Vin

Voltage set point accuracy.... ±2% (typical)
Line regulation ..... ±1% (max.)
Load regulation ..... ±1% (max.)@10~100% load
Input reflected ripple 120mVp-p
Efficiency ..... 60% (typical)
Short circuit protection ..... continuous, auto-recovery
Switching frequency ..... 50kHz (min.)
I/O isolation voltage ..... 1000VDC (min.)
I/O isolation resistance ..... 100MΩ (min.)@ 500VDC
Isolation capacitance ..... 80pF (max.)
Working temperature ..... -25°C to +60°C (no derating), +71°C@80% load
Storage temperature ..... -25°C to +105°C
Temp. Coefficient ..... ±0.03% / °C (max.)
Case material ..... non-conductive plastic

Model No.	Input (VDC)	Output (VDC)	Current (mA)	R&N (mVp-p)
SRS-0505	5±10%	5	100	100
SRS-0509	5±10%	9	56	100
SRS-0512	5±10%	12	42	100
SRS-0515	5±10%	15	34	100
SRS-1205	12±10%	5	100	100
SRS-1209	12±10%	9	56	100
SRS-1212	12±10%	12	42	100
SRS-1215	12±10%	15	34	100
SRS-2405	24±10%	5	100	100
SRS-2409	24±10%	9	56	100
SRS-2412	24±10%	12	42	100
SRS-2415	24±10%	15	34	100
SRS-4805	48±10%	5	100	100
SRS-4809	48±10%	9	56	100
SRS-4812	48±10%	12	42	100
SRS-4815	48±10%	15	34	100

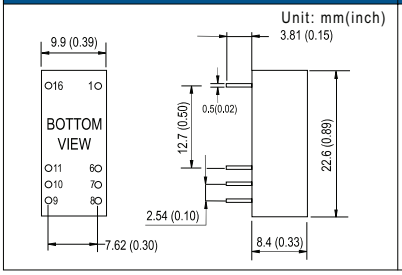
1W DC-DC Unregulated Single Output



0.89"x 0.39"x 0.33"

- 1000VDC I/O isolation
- Internal SMD technology
- Built-in EMI filter
- Protection: Short circuit
- Cooling by free air convection
- Non-conductive plastic case
- Dual in line package
- 100% full load burn-in test
- Low cost, high reliability
- 2 years warranty

Mechanism



Pin Configuration

Pin No.	Output
1 & 16	+Vin
6 & 11	-Vout
7 & 10	+Vout
8 & 9	-Vin

Voltage set point accuracy ...±2% (max.)
Line regulation ..... ±1.2% (max.) for 1% input variation
Load regulation ..... ±8% (max.)@20~100% load
Input reflected ripple 120mVp-p
Efficiency ..... 83% (typical)
Short circuit protection ..... Momentary
Switching frequency ..... 50kHz (min.)
I/O isolation voltage ..... 1000VDC (min.)
I/O isolation resistance ..... 100MΩ (min.)@ 500VDC
Isolation capacitance ..... 80pF (max.)
Working temperature ..... -25°C to +60°C (no derating), +71°C@80% load
Storage temperature ..... -25°C to +105°C
Temp. Coefficient ..... ±0.03% / °C (max.)
Case material ..... non-conductive plastic

Model No.	Input (VDC)	Output (VDC)	Current (mA)	R&N (mVp-p)
SUS01L-05	5±10%	5	200	100
SUS01L-09	5±10%	9	111	100
SUS01L-12	5±10%	12	84	100
SUS01L-15	5±10%	15	67	100
SUS01M-05	12±10%	5	200	100
SUS01M-09	12±10%	9	111	100
SUS01M-12	12±10%	12	84	100
SUS01M-15	12±10%	15	67	100
SUS01N-05	24±10%	5	200	100
SUS01N-09	24±10%	9	111	100
SUS01N-12	24±10%	12	84	100
SUS01N-15	24±10%	15	67	100
SUS01O-05	48±10%	5	200	100
SUS01O-09	48±10%	9	111	100
SUS01O-12	48±10%	12	84	100
SUS01O-15	48±10%	15	67	100