DC-DC Converter
SNE3 Series

3W Unregulated Single output

Features
- 4 Pin SIL Package
- 3000 VDC Isolation
- Low Ripple and Noise
- Efficiency up to 91%
- -40 ~ 90°C Operation Temperature Range
- Non-Conductive Black Plastic Case
- EMI Complies With EN55032 Class B

The SNE3 series is a family of cost effective 3W single output DC-DC converters. These converters achieve low cost and ultra-miniature SIP 4 pin size. Devices are encapsulated using flame retardant resin. The models operate from input voltage of 5, 12, 24 Vdc with output voltage of 5, 9, 12, 15 Vdc. High performance features include 3000Vdc input/output isolation, high efficiency operation and output voltage accuracy of ±3% maximum. Standard features include an input range of ±10% tolerance and low output noise and ripple.

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS	
Output Voltage accuracy	±3% ,max.
Line regulation	±1.2% / Per 1% Vin Change ,max.
Load regulation	(From 10% to 100% Load) ±10% ,max.
Ripple & noise (20 MHz bandwidth)(1)	100mVpk-pk ,max.
Temperature coefficient	±0.02%/°C
Capacitor load(2)	See table ,max.

ABSOLUTE MAXIMUM RATINGS(5)	
These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.	
Input Surge Voltage(100mS)	
5 Models	7 Vdc ,max.
12 Models	15 Vdc ,max.
24 Models	28 Vdc ,max.
Soldering Temperature	260°C ,max.

INPUT SPECIFICATIONS	
Intput Voltage Range	±10% ,max.
Input Current(Full-Load)	See table ,typ.
Input Current(No-Load)	See table ,max.
Input Filter	Capacitors
Input Reflected Ripple Current(3)	20mApk-pk ,typ.
Start up Time (Nominal Vin and constant resistive load)	20mS, typ.

GENERAL SPECIFICATIONS	
Efficiency	See table ,typ.
I/O Isolation Voltage(tested for 60 sec) Input/Output	3000Vdc
I/O Isolation Capacitance	65 pF ,Max.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	40~70kHz
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>6.7Mhrs@25°C
Safety Standard : (designed to meet)	IEC/UL/EN 60950-1 IEC/UL/EN 62368-1

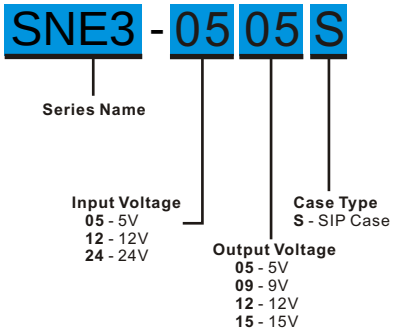
PHYSICAL SPECIFICATIONS	
Case Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	C5191R-H Solder-coated
Potting Material	Silicon (UL94V-0 rated)
Weight	2.2g,typ.
Dimensions	0.46"x0.29"x0.40"

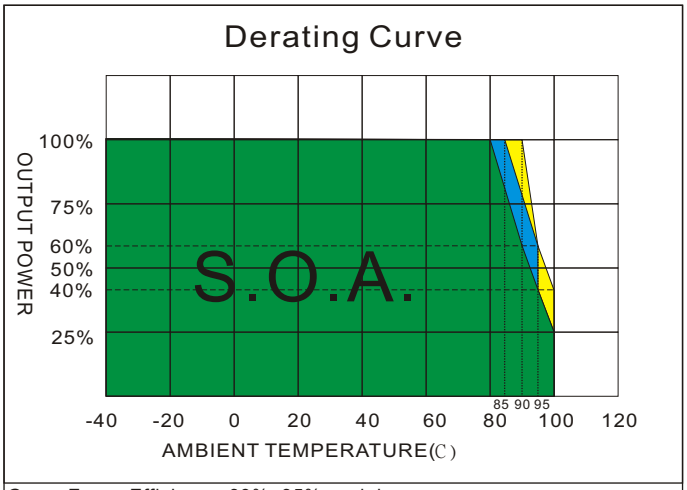
EMC SPECIFICATIONS		
Conducted Emissions (6)	EN55032	CLASS B
Radiated Emissions	EN55032	CLASS B
ESD	IEC 61000-4-2	Perf. Criteria A
RS	IEC 61000-4-3	Perf. Criteria A
EFT (7)	IEC 61000-4-4	Perf. Criteria A
Surge (7)	IEC 61000-4-5	Perf. Criteria A
CS	IEC 61000-4-6	Perf. Criteria A
PFMF	IEC 61000-4-8	Perf. Criteria A

ENVIRONMENT SPECIFICATIONS	
Operating Temperature	-40°C~ +100°C(See Derating Curve) -40°C ~ +90°C(For 100% Load)
Maximum Case Temperature	115°C
Storage Temperature	-55°C~125°C
Cooling(4)	Nature Convection

SNE3 Unregulated Single output

PART NUMBER STRUCTURE





Green Zone : Efficiency 83%~85% models
Blue Zone : Efficiency 87%~88% models
Yellow Zone : Others

MODEL SELECTION GUIDE

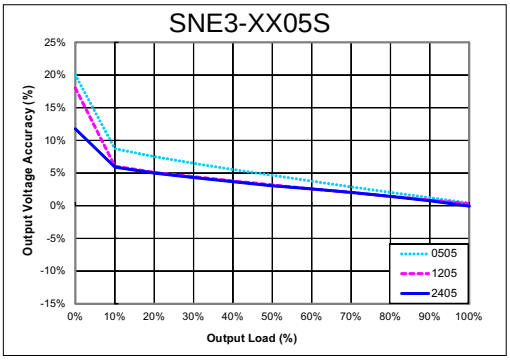
MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA, max.)	INPUT Current Full Load (mA, typ.)	OUTPUT Voltage (Vdc)	OUTPUT Current Full load (mA)	EFFICIENCY @FL (%, typ.)	Capacitor Load @FL (uF, max.)
SNE3-0505S	5 (4.5 ~ 5.5)	50	723	5	600	83	3300
SNE3-0509S	5 (4.5 ~ 5.5)	60	690	9	333	87	1200
SNE3-0512S	5 (4.5 ~ 5.5)	55	682	12	250	88	1000
SNE3-0515S	5 (4.5 ~ 5.5)	60	682	15	200	88	820
SNE3-1205S	12 (10.8 ~ 13.2)	25	294	5	600	85	3300
SNE3-1209S	12 (10.8 ~ 13.2)	30	281	9	333	89	1200
SNE3-1212S	12 (10.8 ~ 13.2)	30	278	12	250	90	1000
SNE3-1215S	12 (10.8 ~ 13.2)	30	275	15	200	91	820
SNE3-2405S	24 (21.6 ~ 26.4)	15	147	5	600	85	3300
SNE3-2409S	24 (21.6 ~ 26.4)	15	141	9	333	89	1200
SNE3-2412S	24 (21.6 ~ 26.4)	15	139	12	250	90	1000
SNE3-2415S	24 (21.6 ~ 26.4)	15	138	15	200	91	820

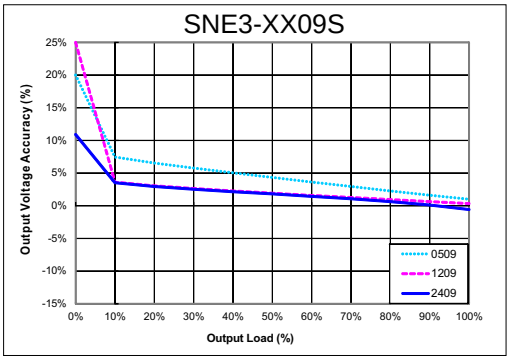
NOTE

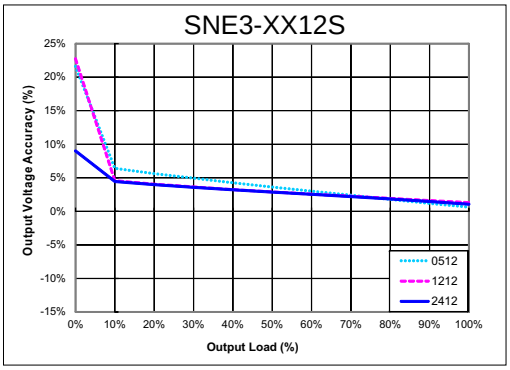
1. Ripple/Noise measured with a 10μF electrolytic capacitor and 0.1μF ceramic capacitor.
2. Tested by minimal Vin and constant resistive load.
3. Measured Input reflected ripple current with a simulated source inductance of 12μH and a source capacitor Cin(10μF, ESR<1.0Ω at 100KHz).
4. "Nature Convection" is usually about 30-65 LFM but is not equal to still air (0 LFM).
5. Exceeding the absolute ratings of the unit could cause damage. It is not allowed for continuous operating.
6. Input filter components are be required to help meet conducted emission class B, which application refer to the EMI Filter of design & feature configuration.
7. An external filter capacitor is required if the module has to meet IEC61000-4-4 and IEC61000-4-5.
   The filter capacitor SCHMID-M suggest: two electrolytic capacitors (Ruby-con BXF series, 100μF/250V) in parallel
8. Operation under no-load conditions will not damage these devices, however they may not meet all listed specifications.

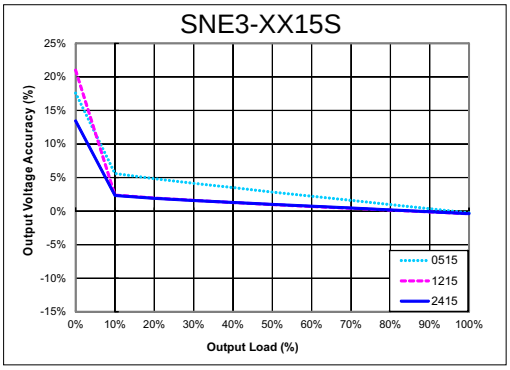
DERATING CURVE AND EFFICIENCY vs OUTPUT CURRENT CURVE

Accuracy vs. Load

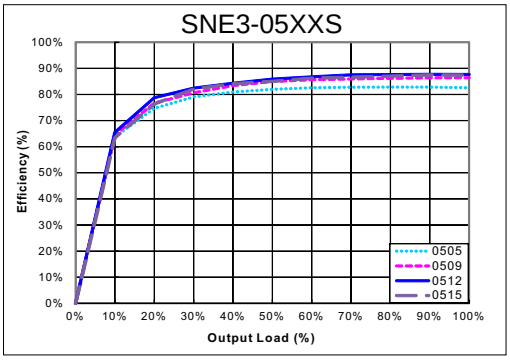


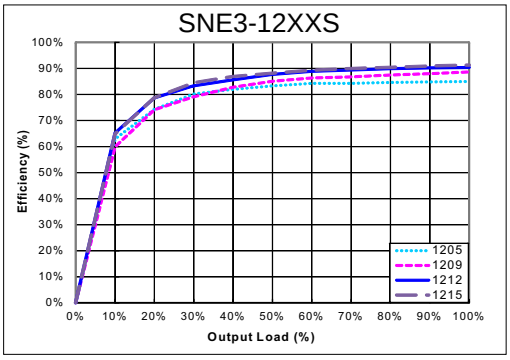


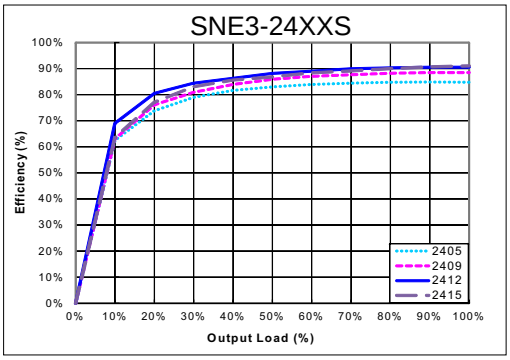




Efficiency vs. Load



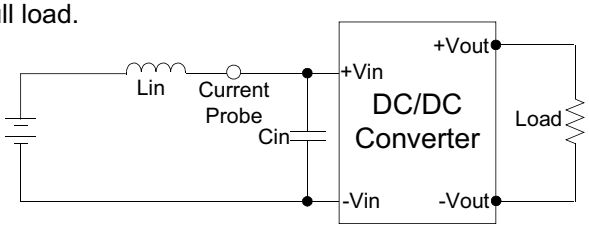




TEST CONFIGURATIONS

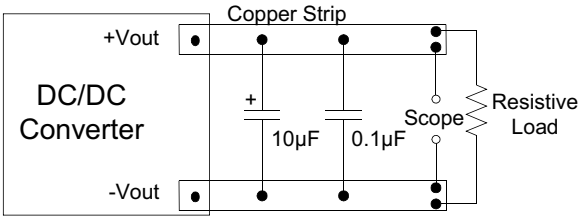
Input Reflected Ripple Current Test Step

Input reflected ripple current is measured through a source inductor Lin(12μH) and a source capacitor Cin(10μF, ESR<1.0Ω at 100kHz) at nominal input and full load.



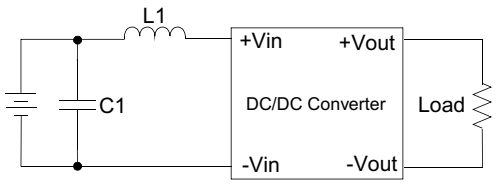
Output Ripple & Noise Measurement Test

Use a 10μF electrolytic capacitor and 0.1μF ceramic capacitor.
The Scope measurement bandwidth is 20MHz.



EMI Filter(Conducted Emissions)

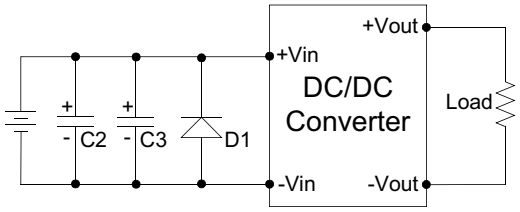
Input filter components (C1,L1) are used to help meet conducted emissions requirement for the module.
These components should be mounted as close as possible to the module; and all leads should be minimized to decrease radiated noise.



	C1	L1
SNE3-05XXS	1206,2.2μF,50V	2.2μH
SNE3-12XXS SNE3-24XXS	1206,4.7μF,50V	4.7μH

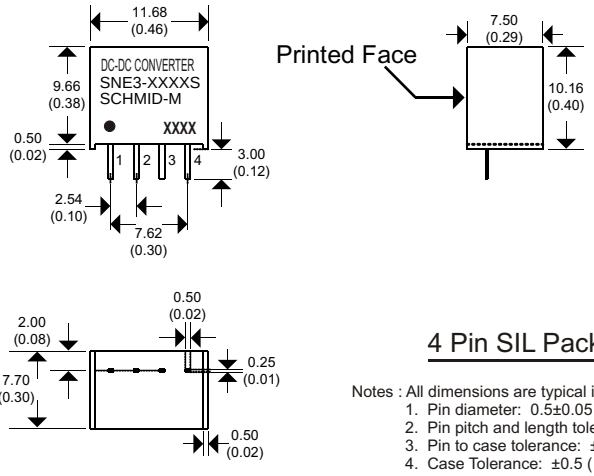
EFT/Surge Filter

Input components (C2、C3、D1) are used to help meet IEC61000-4-4 and IEC61000-4-5 .



	C2	C3	D1
SNE3-05XXS	100μF,250V	100μF,250V	SMDJ8.0A
SNE3-12XXS	100μF,250V	100μF,250V	SMDJ16A
SNE3-24XXS	100μF,250V	100μF,250V	SMDJ30A

MECHANICAL SPECIFICATIONS



4 Pin SIL Package

Notes : All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5±0.05 (0.02±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Pin to case tolerance: ±0.5 (±0.02)
4. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS	
PIN NUMBER	SINGLE
1	−V Input
2	+V Input
3	−V Output
4	+V Output