

SL2-2W Series



2W Unregulated Single & Dual output

Features

- SIP7 Package
- 5200 VDC High Isolation
- Efficiency up to 88%
- Long Term Short Circuit Protection
- Operation Temperature Range -40 ~ 80°C max.
- Low coupling capacitance
- Dedicated for IGBT applications



PART NUMBER STRUCTURE

SL2 - 12 15 SS
(1) (2) (3) (4)

(1) Series

(2) Input Voltage Range

05 - 4.5-5.5 V
12 - 10.8-13.2 V
15 - 13.5-16.5 V
24 - 21.6-26.4 V

(4) Output Type

SS - Single Output
S - Dual Output

(3) Output Voltage

3R3 - 3.3 V
05 - 5.0 V
09 - 9.0 V
12 - 12 V
15 - 15 V

SL2 - 12 15 09 S
(1) (2) (3) (4) (5)

(1) Series

(2) Input Voltage Range

05 - 4.5-5.5 V
12 - 10.8-13.2 V
15 - 13.5-16.5 V
24 - 21.6-26.4 V

(4) - Output Voltage

09 - 9.0 V

(5) Output Type

S - Dual Output

(3) +Output Voltage

15 - 15 V

SL2-2W Series



ALL SPECIFICATIONS ARE TYPICAL AT 25°C, NOMINAL INPUT AND FULL LOAD UNLESS OTHERWISE NOTED

Model Number	Input Voltage Range (VDC)	Input Current		Output Voltage (VDC)	Output Current Full Load (mA)	Efficiency @FL (% , typ.)	Capacitive Load @ FL (µF, max.)
		No-Load (mA, max.)	Full Load (mA, typ.)				
SL2-053R3SS	4.5-5.5	40	418	3.3	500	79	1000
SL2-0505SS	4.5-5.5	40	482	5	400	83	470
SL2-0509SS	4.5-5.5	40	471	9	222	85	470
SL2-0512SS	4.5-5.5	40	465	12	167	86	220
SL2-0515SS	4.5-5.5	40	460	15	133	87	220
SL2-123R3SS	10.8-13.2	30	176	3.3	500	78	1000
SL2-1205SS	10.8-13.2	30	201	5	400	83	470
SL2-1209SS	10.8-13.2	30	196	9	222	85	470
SL2-1212SS	10.8-13.2	30	194	12	167	86	220
SL2-1215SS	10.8-13.2	30	194	15	133	86	220
SL2-153R3SS	13.5-16.5	25	141	3.3	500	78	1000
SL2-1505SS	13.5-16.5	25	163	5	400	82	470
SL2-1509SS	13.5-16.5	25	157	9	222	85	470
SL2-1512SS	13.5-16.5	25	155	12	167	86	220
SL2-1515SS	13.5-16.5	25	155	15	133	86	220
SL2-243R3SS	21.6-26.4	20	89	3.3	500	77	1000
SL2-2405SS	21.6-26.4	20	104	5	400	80	470
SL2-2409SS	21.6-26.4	20	100	9	222	83	470
SL2-2412SS	21.6-26.4	20	98	12	167	85	220
SL2-2415SS	21.6-26.4	20	99	15	133	84	220
SL2-0505S	4.5-5.5	40	488	±5	±200	82	±220
SL2-0509S	4.5-5.5	40	465	±9	±111	86	±220
SL2-0512S	4.5-5.5	40	455	±12	±83.3	88	±100
SL2-0515S	4.5-5.5	40	460	±15	±66.7	87	±100
SL2-051509S	4.5-5.5	40	465	+15/-9	+66.7/-111	86	+100/-220
SL2-1205S	10.8-13.2	30	201	±5	±200	83	±220
SL2-1209S	10.8-13.2	30	194	±9	±111	86	±220
SL2-1212S	10.8-13.2	30	194	±12	±83.3	86	±100
SL2-1215S	10.8-13.2	30	194	±15	±66.7	86	±100
SL2-121509S	10.8-13.2	30	194	+15/-9	+66.7/-111	86	+100/-220
SL2-1505S	13.5-16.5	25	163	±5	±200	82	±220
SL2-1509S	13.5-16.5	25	159	±9	±111	84	±220
SL2-1512S	13.5-16.5	25	155	±12	±83.3	86	±100
SL2-1515S	13.5-16.5	25	155	±15	±66.7	86	±100
SL2-151509S	13.5-16.5	25	157	+15/-9	+66.7/-111	85	+100/-220
SL2-2405S	21.6-26.4	20	102	±5	±200	82	±220
SL2-2409S	21.6-26.4	20	99	±9	±111	84	±220
SL2-2412S	21.6-26.4	20	99	±12	±83.3	84	±100
SL2-2415S	21.6-26.4	20	97	±15	±66.7	86	±100
SL2-241509S	21.6-26.4	20	99	+15/-9	+66.7/-111	84	+100/-220

INPUT SPECIFICATIONS					
Parameter	Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range	5 V Input	4.5	5	5.5	VDC
	12 V Input	10.8	12	13.2	
	15 V Input	13.5	15	16.5	
	24 V Input	21.6	24	26.4	
Input Filter		Capacitor			
Input Reflected Ripple Current (1)			20		mApk-pk
Start up Time	Nominal Vin and constant resistive load		20		ms
Recommended input fuse (slow blow)	5 V Input	1			A
	12 V Input	0.4			
	15 V Input	0.3			
	24 V Input	0.2			
Note :					
1. Measured with a simulated source inductance of 12μH and a source capacitor Cin (47μF, ESR<1.0Ω at 100kHz).					

OUTPUT SPECIFICATIONS					
Parameter	Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy		-5		+5	%
Line Regulation	For 1% Vin Change	-1.2		+1.2	%
Load Regulation	From 20% to 100% Load	SL2-053R3SS		12	%
		SL2-0505SS		10	
		Other Output		10	
Cross Regulation	Asymmetrical Load 25% / 100% for Dual Output	-5		+5	%
Ripple & Noise (1)	20MHz bandwidth			150	mVpk-pk
Short Circuit Protection		Indefinite (Automatic Recovery)			
Temperature Coefficient		-0.03		+0.03	%/°C
Maximum Capacitive Load	Minimum Vin and constant resistive load	See Table			
Note : 1. Measured with a 0.1μF MLCC and 10μF electrolytic capacitor.					

ABSOLUTE MAXIMUM RATINGS					
Parameter	Conditions	Min.	Typ.	Max.	Unit
Input Surge Voltage (1000 ms)	5 V Input			9	VDC
	12 V Input			18	
	15 V Input			20	
	24 V Input			30	
Soldering Temperature	1.5mm from case 10sec max.			260	°C
Note : These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.					

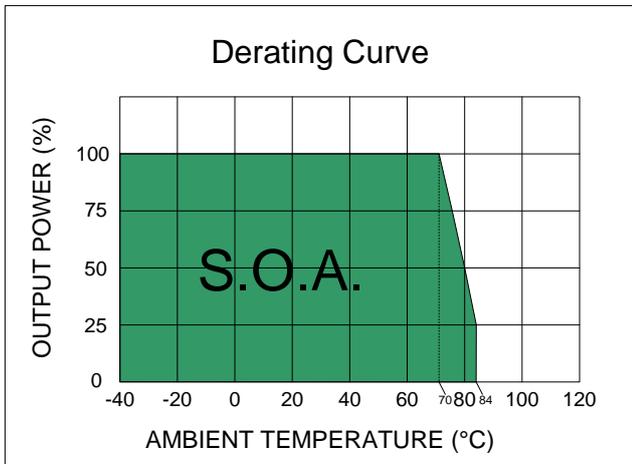
GENERAL SPECIFICATIONS					
Parameter	Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-output, and rated for 60sec	5200			VDC
Isolation Resistance	Input-output	1000			MΩ
Isolation Capacitance	Input-output		7		pF
Switching Frequency		50			kHz
MTBF	MIL-HDBK-217 F @ 25°C	3.3			M hours
Safety Standard	IEC / EN / UL 62368-1	Designed to meet			
Environmental compliance		RoHS			

ENVIRONMENT SPECIFICATIONS					
Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating Ambient Temperature	See the Derating Curve	-40		80	°C
Maximum Case Temperature				100	°C
Thermal Impedance	Output 3.3VDC Model	42.7			°C/W
	Efficiency = 80% ~ 82%	62.3			
	Efficiency = 83% ~ 88%	45.6			
Storage Humidity				95	% rel. H
Storage Temperature		-55		125	°C
Cooling	Natural Convection	30-65 LFM			

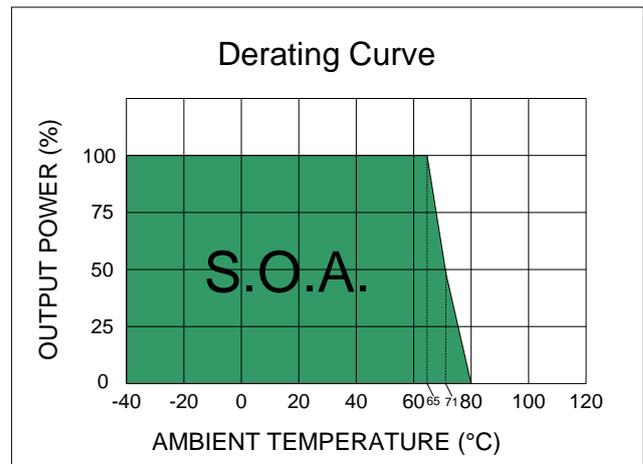
EMC SPECIFICATIONS			
Parameter	Standard	Condition	Criterion
Conducted Emissions	EN55032	with external components	B
Radiated Emissions	EN55032		B
ESD	IEC 61000-4-2	Air: ±8kV / Indirect: ±6kV	A
RS	IEC 61000-4-3	20V/m	A
EFT	IEC 61000-4-4	±2.0kV with external components	A
Surge	IEC 61000-4-5	±2.0kV with external components	A
CS	IEC 61000-4-6	10Vrms	A
PFMF	IEC 61000-4-8	30A/m	A

PHYSICAL SPECIFICATIONS	
Parameter	Value
Case Material	Nonconductive Black Plastic (UL94V-0 rated)
Pin Material	Tinned copper
Potting Material	Epoxy (UL94V-0 rated)
Weight	2.7 g, typ.
Dimensions	0.76" x 0.28" x 0.39"

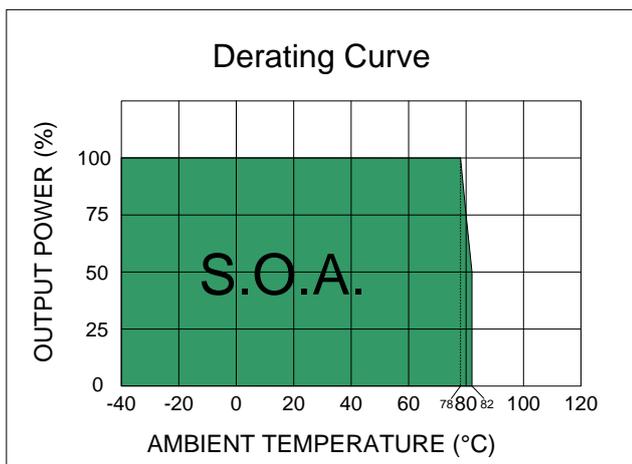
ELECTRICAL CHARACTERISTIC CURVES



Output 3.3VDC Model



Efficiency = 80% ~ 82%

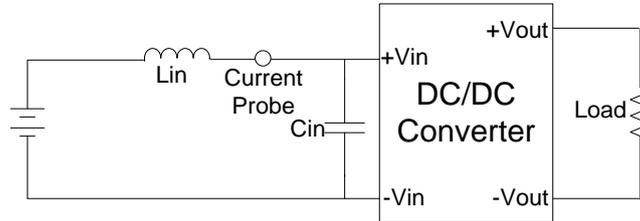


Efficiency = 83% ~ 88%

TEST CONFIGURATIONS

Input Reflected Ripple Current Test Step

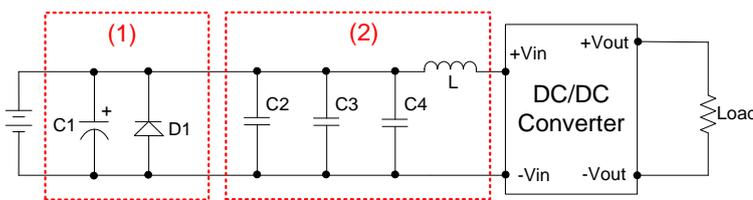
Input reflected ripple current is measured with a source inductor L_{in} ($12\mu\text{H}$) and a source capacitor C_{in} ($47\mu\text{F}$, $\text{ESR} < 1.0\Omega$ at 100kHz) at nominal input and full load.



DESIGN & FEATURE CONFIGURATIONS

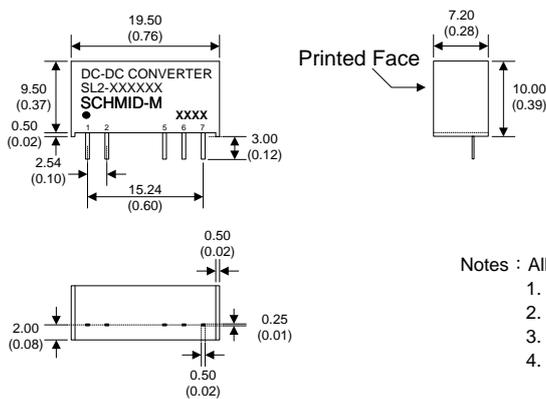
EMC Filter

The part (1) Circuit is used to meet Surge & EFT test, and the part (2) Circuit is used to meet EMI test.



	C1	D1	C2	C3, C4	L
SL2-05XXXX	NIPPON Chemi-con KY series 330 μF , 50V	SMDJ9.0A	MLCC 4.7 μF , 16V		6.8 μH
SL2-12XXXX		SMDJ13A	MLCC 22 μF , 25V		
SL2-15XXXX		SMDJ18A			
SL2-24XXXX	NIPPON Chemi-con KY series 1000 μF , 35V	SMDJ24A	MLCC 10 μF , 35V	MLCC 10 μF , 35V	10 μH

MECHANICAL SPECIFICATIONS



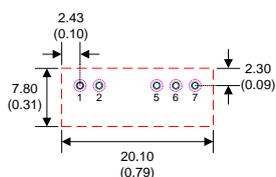
- Notes : All dimensions are typical in millimeters (inches).
1. Pin dimension tolerance: ± 0.05 (± 0.002)
 2. Pin pitch and length tolerance: ± 0.35 (± 0.014)
 3. Pin to case tolerance: ± 0.5 (± 0.02)
 4. Case Tolerance: ± 0.5 (± 0.02)

PIN CONNECTIONS

PIN NUMBER	SINGLE	DUAL
1	+Vin	+Vin
2	-Vin	-Vin
5	-Vout	-Vout
6	N.P.	COM
7	+Vout	+Vout

N.P. : No PIN

RECOMMENDED FOOTPRINT DETAILS



- Notes : 1. All dimensions are typical in millimeters (inches).
- Through hole (black) 1-7: $\varnothing 0.80$ (0.031)
 - Top view pad (green) 1-7: $\varnothing 1.00$ (0.039)
 - Bottom view pad (pink) 1-7: $\varnothing 1.60$ (0.063)