



# 30 WATT SINGLE & DUAL OUTPUT

1" x 2" x 0.40" Package

Isolated, Wide Input (2:1)

DC/DC Converters

## FEATURES

- 30 Watts Output Power
- 1.5V, 1.8V, 2.5V, 3.3V, 5, 12, 15, +/-5, +/-12, +/-15Vdc Output
- UL 60950-1, EN-60950, IEC 60950-1
- -40°C to +85°C Operating Temp. Range (with derating)
- Low Profile Package (1.0" x 2.0" x 0.4")
- Input/Output Isolation (1500Vdc min.)
- High Efficiency to 89% @ FL
- Short Circuit & Over-Voltage Protection
- 6-Sided Continuous Metal Shielding
- Epoxy Encapsulated
- RoHS Compliant

LWA30 Series

## Specifications

All specifications are typical at nominal input, full load and 25°C, unless otherwise noted.

### INPUT SPECIFICATIONS

Input voltage range	.....9-18VDC
12V nominal input	.....18-36VDC
24V nominal input	.....36-72VDC
48V nominal input	.....Pi type
Input filter	.....(12V input - 25VDC) (24V input - 50VDC)
Input surge voltage	.....100mS max. (48V input - 100VDC)
Input reflected ripple current	.....Nominal Vin and full load .....20mV p-p
Start up time	.....Nominal Vin and .....Power up .....30ms, typ.
.....constant resistive load	.....Remote ON/OFF .....30ms, typ.
Start-up voltage	.....(12V input - 9VDC) (24V input - 18VDC) (48V input - 36VDC)
Shutdown Voltage	.....(12V input - 8VDC) (24V input - 18VDC) (48V input - 36VDC)
Remote ON/OFF (Note 6)	.....(Standard)DC-DC ON .....Open or 3V<Vr<12V
(Positive logic)	.....DC-DC OFF .....Short or OV<Vr<1.2V
(Negative logic)	.....(Option) DC-DC ON .....Short or 0V<Vr<1.2V
.....DC-DC OFF	.....Open or 3V<Vr<12V
Input current of Remote control pin	.....Nominal Vin .....-0.5mA - +0.5mA
Remote off state input current	.....Nominal Vin .....3mA

### OUTPUT SPECIFICATIONS

Output power	.....30 Watts, max.
Voltage accuracy	.....Full load and nominal Vin .....±1%
Voltage adjustability	.....Single output .....±10%
.....Minimum load	.....0%
Line regulation	.....LL to HL at Full Load .....±0.2%
.....Single	.....±0.5%
Load regulation	.....No Load to Full Load Dual .....±1%
Cross regulation	.....(Dual) Asymmetrical load 25% /100% FL .....±5%
Ripple and noise	.....20MHz bandwidth .....1.5-5.1Vo 100mVp-p
.....(Measured with a 1µF/50V MLCC) 12-15Vo 150mVp-p	
Temperature coefficient	.....±0.02%/°C, max
Transient response recovery time	.....25% load step change .....250µS
(1.5V Output 2.0V) (2.5V Output 3.3V) (3.3V Output 3.9V)	
Over voltage protection	.....5.0V & 5.1V & ±5V Output .....6.2V
Zener diode clamp	.....12V & ±12V Output .....15V
.....15V & ±15VOutput	.....18V
Over load protection	.....% of FL at nominal input .....150% typ.
Short circuit protection	.....Hiccup, automatic recovery

### GENERAL SPECIFICATIONS

Efficiency	.....See table
.....Input to Output	.....1600VDC, min
Isolation voltage	.....Input (Output) to Case .....1600VDC, min
Case grounding	.....Connect case to -Vin with decoupling Y Cap
Isolation resistance	.....10 to the nine ohms, min
Isolation capacitance	.....1500pF, max.
Switching frequency	.....430KHz typ.
Design meets safety standard	.....IEC60950-1, UL60950-1 EN60950-1
Case material	.....Nickel-coated copper
Base material	.....FR4 PCB
Potting material	.....Epoxy (UL94-VO)
Dimensions	.....2.00x1.00x0.40Inch .....(50.8x25.4x10.2mm)
Weight	.....30.5g(1.07oz)
.....BELLCORE-TR-NWT-000332	.....3.173 x 10 <sup>6</sup> hrs.
.....MIL-HDBK-217F	.....5.548x10 <sup>5</sup> hrs.
MTBF (Note 1)	

### ENVIRONMENTAL SPECIFICATIONS

Operating ambient temperature	.....-40°C to +85°C (with derating)
Over temperature protection	.....115°C, typ.
Maximum case temperature	.....+105°C
Storage temperature range	.....-55°C to + 125°C
Thermal impedance (Note 7)	.....Nature convection .....12°C/Watt
.....Nature convection with heat -sink	.....10°C/Watt
Thermal shock	.....MIL-STD-810F
Vibration	.....MIL-STD-810F
Relative humidity	.....5% to 95% RH

### EMC CHARACTERISTICS

EMI (Note 8)	.....EN55022 ..... Class A
ESD	.....EN61000-4-2 .....Air .....±8KV
.....Contact	.....±6KV .....Perf. Criteria A
Radiated immunity	.....EN61000-4-3 .....10V/m .....Perf. Criteria A
Fast transient (Note 9)	.....EN61000-4-4 .....±2KV .....Perf. Criteria A
Surge (Note 9)	.....EN61000-4-5 .....±1KV .....Perf. Criteria A
Conducted immunity	.....EN61000-4-6 .....10 Vr.m.s .....Perf. Criteria A

Selection Guide

(Continued)

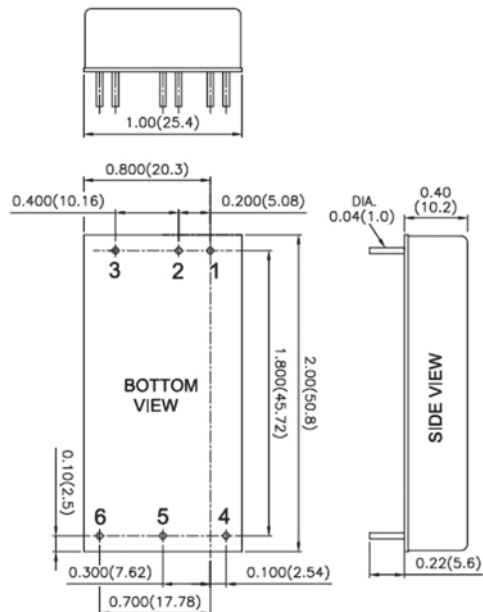
Model Number	Input Range (VDC)	Output Voltage (VDC)	Output Current		Output Ripple & Noise (mVp-p)	Input Current		Efficiency(4) %	Capacitor(5) Load Max
			Min. Load (mA)	Full Load (mA)		No Load (3) (mA)	Full Load (2) (mA)		
LWA30-12S1.5	9-18	1.5	0	8500	100	70	1416	79	20000µF
LWA30-12S2.5	9-18	2.5	0	8000	100	100	2083	84	20000µF
LWA30-12S3.3	9-18	3.3	0	8000	100	90	2716	85	20000µF
LWA30-12S5	9-18	5.0	0	6000	100	130	3012	87	14400µF
LWA30-12S5.1	9-18	5.1	0	6000	100	130	3072	87	14400µF
LWA30-12S12	9-18	12	0	2500	150	90	2941	89	3000µF
LWA30-12S15	9-18	15	0	2000	150	80	2941	89	2000µF
LWA30-24S1.5	18-36	1.5	0	8500	100	50	700	85	20000µF
LWA30-24S2.5	18-36	2.5	0	8000	100	50	1028	87	20000µF
LWA30-24S3.3	18-36	3.3	0	8000	100	50	1325	88	20000µF
LWA30-24S5	18-36	5.0	0	6000	100	75	1453	90	14400µF
LWA30-24S5.1	18-36	5.1	0	6000	100	75	1482	90	14400µF
LWA30-24S12	18-36	12	0	2500	150	40	1437	91	3000µF
LWA30-24S15	18-36	15	0	2000	150	30	1437	91	2000µF
LWA30-48S1.5	36-75	1.5	0	8500	100	45	350	80	20000µF
LWA30-48S2.5	36-75	2.5	0	8000	100	45	514	85	20000µF
LWA30-48S3.3	36-75	3.3	0	8000	100	30	663	87	20000µF
LWA30-48S5	36-75	5.0	0	6000	100	45	727	90	14400µF
LWA30-48S5.1	36-75	5.1	0	6000	100	45	750	89	14400µF
LWA30-48S12	36-75	12	0	2500	150	40	718	91	3000µF
LWA30-48S15	36-75	15	0	2000	150	40	718	91	2000µF
LWA30-12-5	9-18	±5	0	±3000	100	90	3012	87	±3000µF
LWA30-12-12	9-18	±12	0	±1250	150	50	3012	87	±2000µF
LWA30-12-15	9-18	±15	0	±1000	150	40	3012	87	±1300µF
LWA30-24-5	18-36	±5	0	±3000	100	70	1453	90	±3000µF
LWA30-24-12	18-36	±12	0	±1250	150	30	1471	89	±2000µF
LWA30-24-15	18-36	±15	0	±1000	150	30	1453	90	±1300µF
LWA30-24-5	36-75	±5	0	±3000	100	35	727	90	±3000µF
LWA30-24-12	36-75	±12	0	±1250	150	30	744	88	±2000µF
LWA30-24-15	36-75	±15	0	±1000	150	20	735	89	±1300µF

NOTES:

- Bellcore TR-NWT-00032, Case: 50% Stress, Temperature at 40°C. MIL-STD-217F Notice 2 @ Ta = 25°C, Full load (Ground, Benign, controlled environment).
- Maximum value at nominal input voltage.
- Typical value at nominal input voltage and no load.
- Typical value at nominal input voltage and full load.
- Test by minimum Vin and constant resistive load.
- The ON/OFF control pin voltage is referenced to -Input.
- Heat sink is optional and P/N: 7G-0020A-F
- The LWA30 series can meet EN55022 Class A with parallel an external capacitor to the input pins. Recommend: 12 Vin : 10µF/25V X7R 1812 MLCC. 24 Vin : 4.7µF/50V X7R 1812 MLCC. 48 Vin : 2.2µ /100V X7R 1812 MLCC.
- An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5. The filter capacitor suggested: Nippon chemi-con KY series, 220µ F/100V, ESR48mΩ

Mechanical Specifications

PIN CONNECTION		
PIN	SINGLE	DUAL
1	+INPUT	+INPUT
2	-INPUT	-INPUT
3	CTRL	CTRL
4	+OUTPUT	+OUTPUT
5	-OUTPUT	-OUTPUT
6	TRIM	-OUTPUT



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