

APPLICATIONS

Wireless Network
Telecom/Datacom
Industry Control System
Measurement Equipment
Semiconductor Equipment

FEATURES

- 15 WATTS MAXIMUM OUTPUT POWER
- SINGLE OUTPUT UP TO 3.5A
- SMALL SIZE AND LOW PROFILE : 1.10 x 0.94 x 0.34 INCH
- HIGH EFFICIENCY UP TO 88%
- 2:1 WIDE INPUT VOLTAGE RANGE
- FIXED SWITCHING FREQUENCY
- INPUT TO OUTPUT ISOLATION (BASIC INSULATION)
- INDUSTRY STANDARD PIN-OUT FEC15 SERIES COMPATIBLE
- SURFACE-MOUNT OR THROUGH-HOLE
- COST EFFICIENT OPEN FRAME DESIGN
- -40°C to +85°C WIDE OPERATING TEMPERATURE
- CE MARK MEETS 2006/95/EC, 93/68/EEC AND 2004/108/EC
- UL60950-1, EN60950-1 AND IEC60950-1 LICENSED
- ISO9001 CERTIFIED MANUFACTURING FACILITIES
- COMPLIANT TO RoHS EU DIRECTIVE 2002/95/EC

OPTIONS

Positive logic Remote On/Off, SMD type, Without trim, without On/Off pin

DESCRIPTION

LED15 single output DC/DC converters provide up to 15 watts of output power in an industry standard package and footprint. All models feature a wide input range, comprehensively protected against over-current, over-voltage and input under-voltage protection conditions, and trimmable output voltage.

TECHNICAL SPECIFICATION

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

OUTPUT SPECIFICATIONS		
Output power		15Watts max.
Voltage accuracy		±1%
Minimum load		0%
Voltage adjustability (Note 6)		±10%
Line regulation	LL to HL at Full Load	±0.2%
Load regulation	No Load to Full Load	±0.2%
Ripple and noise	20MHz bandwidth (Measured with a 1µF M/C and a 10µF T/C)	5V,3.3V 15V,12V See table
Temperature coefficient		±0.02%/°C
Transient response recovery time	25% load step change ΔIo/Δt=0.1A/us	300µS
Over voltage protection (Voltage clamped)	3.3V output	3.7V-5.4V
	5V output	5.6V-7.0V
	12V output	13.5V-19.6V
	15V output	16.8V-20.5V
Output load protection		150%, max.
Short circuit protection		Hiccup & Automatics recovery
Output voltage overshoot		3%
GENERAL SPECIFICATIONS		
Efficiency		See table
Isolation voltage	Input to Output	2250Vdc, min.
Isolation resistance		10MΩ, min.
Isolation capacitance		1000pF, Typ.
Switching frequency	5V,3.3V	270KHz, Typ.
	15V,12V	470KHz, Typ.
Approvals and standard	IEC60950-1,UL60950-1,EN60950-1	
Dimensions	1.10 X 0.94 X 0.34 Inch (27.9 X 23.9 X 8.5 mm)	
Weight	10.5g(0.36oz)	
MTBF (Note 1)	BELLCORE TR-NWT-000332	2.200x10 ⁶ hrs
	MIL-HDBK-217F	1.314x10 ⁶ hrs

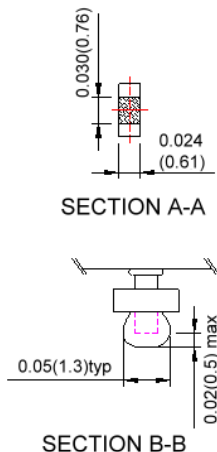
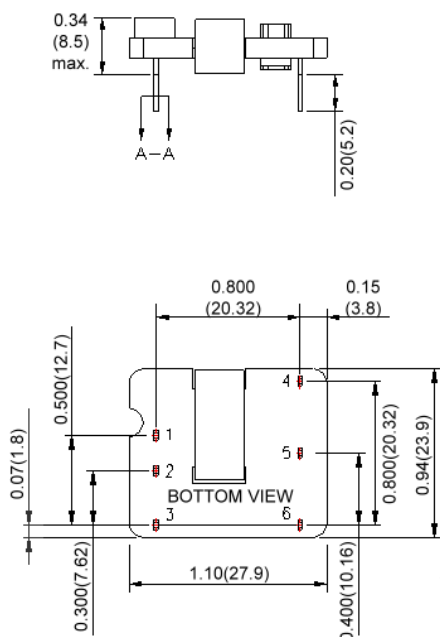
INPUT SPECIFICATIONS		
Input voltage range	24V nominal input	18-36Vdc
	48V nominal input	36-75Vdc
Input surge voltage 100mS max.	24V input	50Vdc
	48V input	100Vdc
Input reflected ripple current	12uH source impedance (π filter with 220µF & 33µF)	30mA _{p-p} , Typ.
Start up time	Nominal Vin Constant resistive load	Power up RemoteON/OFF
		30mS, max. 30mS, max.
Start-up voltage	24V input	17VDC
	48V input	33VDC
Shutdown voltage	24V input	14.5VDC
	48V input	30.5VDC
Remote ON/OFF (Note 7)	DC-DC ON	Open or 3V < Vr < 15V
Positive logic(Optional)	DC-DC OFF	Short or - 0.7V < Vr < 1.2V
	DC-DC ON	Short or - 0.7V < Vr < 1.2V
Negative logic(Standard)	DC-DC OFF	Open or 3V < Vr < 15V
	DC-DC ON	Open or 3V < Vr < 15V
Input current of remote control pin	Nominal Vin	-0.5mA ~ 1.0mA
Remote off state input current	Nominal Vin	20mA,Max.
ENVIRONMENTAL SPECIFICATIONS		
Operating ambient temperature (Note 8)	-40°C to +85°C (with derating)	
Storage temperature range	-55°C to +125°C	
Thermal shock	MIL-STD-810F	
Vibration	MIL-STD-810F	
Relative humidity	5% to 95% RH	
EMC CHARACTERISTICS		
EMI (Note 9)	EN55022	Class A
Radiated immunity	EN61000-4-3	10 V/m Perf. Criteria A
Fast transient (Note 10)	EN61000-4-4	± 2KV Perf. Criteria B
Surge (Note 10)	EN61000-4-5	± 1KV Perf. Criteria A
Conducted immunity	EN61000-4-6	10 Vr.m.s Perf. Criteria A

Model Number	Input Range	Output Voltage	Output Current		Output ⁽⁴⁾ Ripple & Noise	Input Current		Eff ⁽⁴⁾ (%)	Capacitor ⁽⁵⁾ Load max.
			Min. load	Full Load		No load ⁽³⁾	Full load ⁽²⁾		
LED15-24S3P3	18 - 36 VDC	3.3 VDC	0mA	3500mA	75mVp-p	20mA	587mA	86	1000μF
LED15-24S05	18 - 36 VDC	5 VDC	0mA	3000mA	75mVp-p	20mA	753mA	87	1000μF
LED15-24S12	18 - 36 VDC	12 VDC	0mA	1250mA	100mVp-p	15mA	753mA	87	330μF
LED15-24S15	18 - 36 VDC	15 VDC	0mA	1000mA	100mVp-p	15mA	744mA	88	220μF
LED15-48S3P3	36 - 75 VDC	3.3 VDC	0mA	3500mA	75mVp-p	15mA	297mA	85	1000μF
LED15-48S05	36 - 75 VDC	5 VDC	0mA	3000mA	75mVp-p	15mA	377mA	87	1000μF
LED15-48S12	36 - 75 VDC	12 VDC	0mA	1250mA	100mVp-p	10mA	377mA	87	330μF
LED15-48S15	36 - 75 VDC	15 VDC	0mA	1000mA	100mVp-p	10mA	372mA	88	220μF

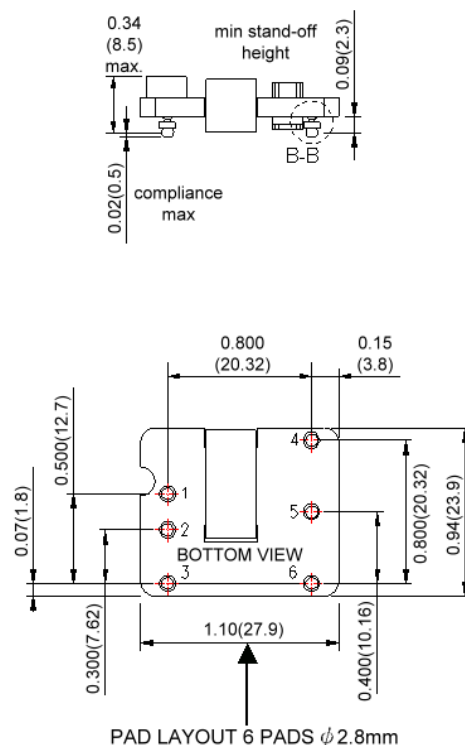
Note

1. BELLCORE TR-NWT-000332. Case 1: 50% Stress, Temperature at 40°C.
MIL-HDBK-217F Notice2 @Ta=25 °C, Full load(Ground, Benign, controlled environment)
2. Maximum value at nominal input voltage and full load.
3. Typical value at nominal input voltage and no load.
4. Typical value at nominal input voltage and full load.
5. Test by minimum Vin and constant resistive load.
6. Trimming allows the user to increase or decrease the output voltage set point of the module. This is accomplished by connecting an external resistor between the TRIM pin and either the +VOUT pin or the -VOUT pin.
7. The ON/OFF control pin voltage is reference to -Vin. The order number please see product standard table.
8. The power module operate in a variety of thermal environments; however, sufficient cooling should be provided to help ensure reliable operation.
9. The LED15 meets EN55022 class A and class B only with external components connected before the input pin to the converter.
10. An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5.
The filter capacitor Power Mate suggest: Nippon chemi-con KY series, 220μF/100V, ESR 48mΩ.

DIP TYPE

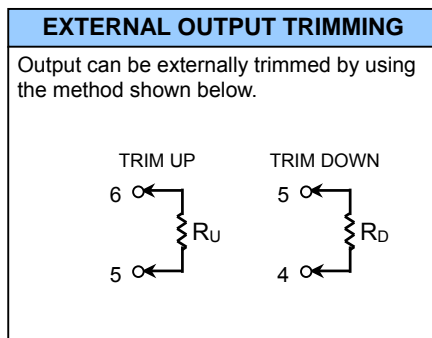


SMD TYPE

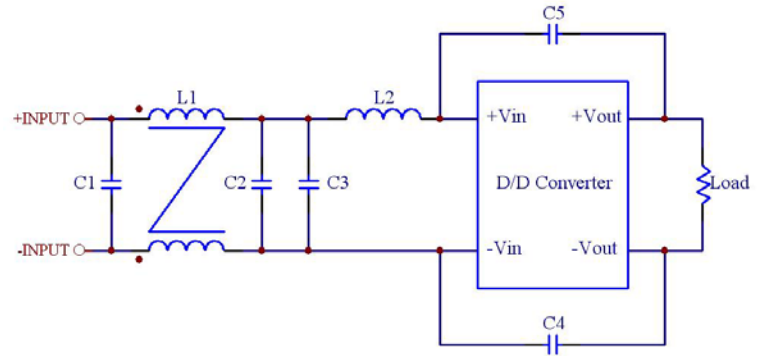
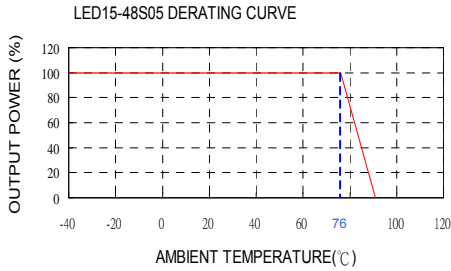


1. All dimensions in Inches (mm)
Tolerance: X.XX±0.02 (X.X±0.5)
X.XXX±0.01 (X.XX±0.25)
2. Pin pitch tolerance ±0.01(0.25)
3. Pin dimension tolerance ±0.004 (0.1)

PIN CONNECTION	
PIN	LED15 SERIES
1	+ INPUT
2	- INPUT
3	ON/OFF
4	+VOUT
5	TRIM
6	-VOUT



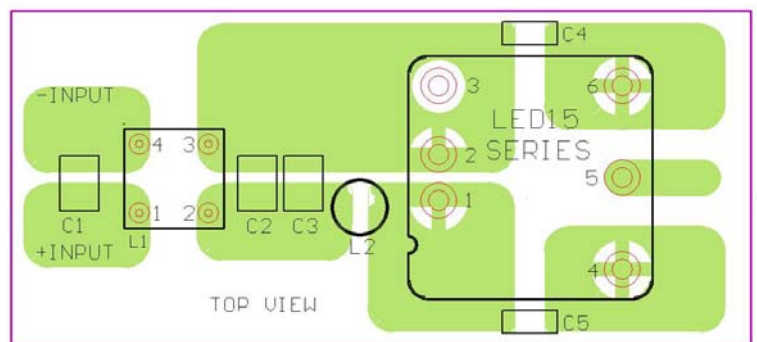
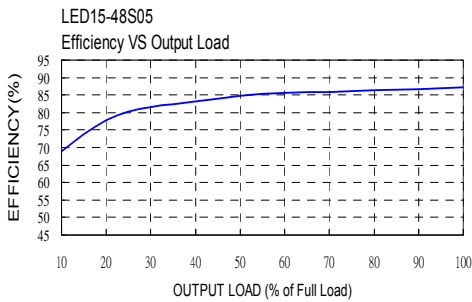
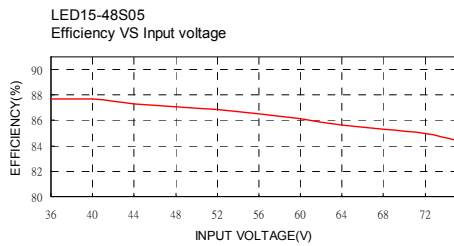
PRODUCT STANDARD TABLE	
Option	Suffix
Negative remote ON/OFF with DIP(Standard)	
Negative remote ON/OFF with SMT	-A
Positive remote ON/OFF with DIP	-B
Positive remote ON/OFF with SMT	-C
DIP type without ON/OFF pin	-D
SMT type without ON/OFF pin	-E
DIP type,negative remote ON/OFF without TRIM pin	-F
SMT type,negative remote ON/OFF without TRIM pin	-G
DIP type without ON/OFF&TRIM pin	-H
SMT type without ON/OFF&TRIM pin	-I
DIP type,positive remote ON/OFF without TRIM pin	-J
SMT type,positive remote ON/OFF without TRIM pin	-K



Recommended Filter for EN55022 Class B Compliance

The components used in the above figure, together with the manufacturers' part numbers for these components, are as follows:

	C1 & C2	C3	C4 & C5	L1	L2
LED15-24xxx	6.8μF/50V 1812 MLCC	6.8μF/50V 1812 MLCC	470pF/3KV 1808 MLCC	145μH Common Choke PMT-051	10μH SMD Inductor PMT-047
LED15-48xxx	2.2μF/100V 1812 MLCC	2.2μF/100V 1812 MLCC	470pF/3KV 1808 MLCC	145μH Common Choke PMT-051	18μH SMD Inductor PMT-046



Recommended EN55022 Class B Filter Circuit Layout