

**FEATURES**

- 15 WATTS OUTPUT POWER
- OUTPUT CURRENT UP TO 4.5A
- STANDARD 2.0 X 1.0 X 0.4 INCH PACKAGE
- HIGH EFFICIENCY UP TO 88%
- 4:1 ULTRA WIDE INPUT VOLTAGE RANGE
- SIX-SIDED CONTINUOUS SHIELD
- FIXED SWITCHING FREQUENCY
- RAILWAY APPLICATION
- ISO9001 CERTIFIED MANUFACTURING FACILITIES
- COMPLIANT TO RoHS EU DIRECTIVE 2002/95/EC

**DESCRIPTION**

The MT15E-W series offer 15 watts of output power from a 2 x 1 x 0.4 inch package. The MT15E-W series with 4:1 ultra wide input voltage of 9-36 and 18-75 VDC.

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

OUTPUT SPECIFICATIONS			
Output power	15 Watts, max.		
Voltage accuracy	Full load and nominal Vin	± 1%	
Minimum load	0%		
Line regulation	LL to hl at Full load	Single	± 0.2%
		Dual	± 0.5%
Load regulation	No load to Full load	Single	± 0.5%
		Dual	± 1%
Cross regulation (Dual)	Asymmetrical load 25% / 100% FL		± 5%
Ripple and noise	20MHz bandwidth (Measured with a 0.1µF/50V MLCC)	See table	
Temperature coefficient	±0.02% / °C, max.		
Transient response recovery time	25% load step change	250µS	
Over voltage protection	3.3V output	3.9VDC	
	5V output	6.2VDC	
Zener diode clamp	12V output	15VDC	
	15V output	18VDC	
Over load protection	% of FL at nominal input	150%, typ.	
Short circuit protection	Hiccup, automatics recovery		
GENERAL SPECIFICATIONS			
Efficiency	See table		
Isolation voltage	Input to Output	1600VDC, min.	
	Input(Output) to case	1600VDC, min.	
Case grounding	Connect case to -Vin with decoupling Y Cap		
Isolation resistance	10 <sup>9</sup> ohms, min.		
Isolation capacitance	1500pF, max.		
Switching frequency	400KHz, typ.		
Case material	Nickel-coated copper		
Base material	FR4 PCB		
Potting material	Epoxy (UL94-V0)		
Dimensions	2.00 X 1.00 X 0.40 Inch (50.8 X 25.4 X 10.2 mm)		
Weight	27g (0.95oz)		
MTBF (Note 1)	BELLCORE TR-NWT-000332	1.819 x 10 <sup>6</sup> hrs	
	MIL-HDBK-217F	9.205 x 10 <sup>5</sup> hrs	

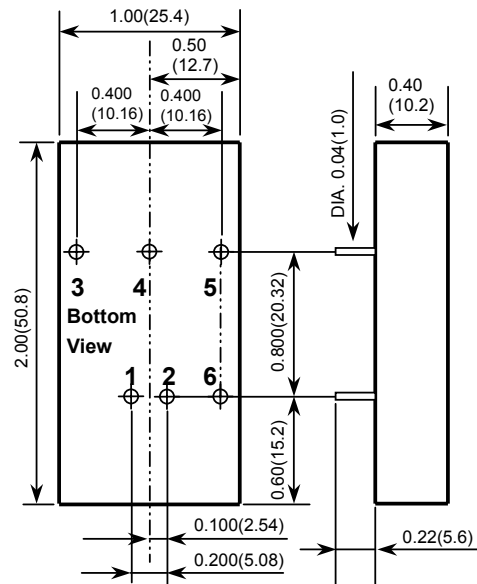
INPUT SPECIFICATIONS			
Input voltage range	24V nominal input	9 – 36VDC	
	48V nominal input	18 – 75VDC	
Input filter	Pi type		
Input surge voltage 1Sec max	24V input	50VDC	
	48V input	100VDC	
Input reflected ripple current	Nominal Vin and full load	20mA <sub>p-p</sub>	
Start up time	Nominal Vin and constant resistive load	Power up	20mS, typ.
Start-up voltage	24V input	9VDC	
	48V input	18VDC	
Shutdown voltage	24V input	7.5VDC	
	48V input	15VDC	
Remote ON/OFF (Option) (Note 6)			
(Positive logic)	DC-DC ON	Open or 3 V < Vr < 12V	
	DC-DC OFF	Short or 0V < Vr < 1.2V	
(Negative logic)	DC-DC ON	Short or 0V < Vr < 1.2V	
	DC-DC OFF	Open or 3 V < Vr < 12V	
Input current of Remote control pin	Nominal Vin	-0.5mA ~ + 0.5mA	
Remote off state input current	Nominal Vin	2.5mA	
ENVIRONMENTAL SPECIFICATIONS			
Operating ambient temperature (Note 7)	-40°C ~ +76°C (without derating)		
	+76°C ~ +105°C (with derating)		
Maximum case temperature	105°C		
Storage temperature range	-55°C ~ +125°C		
Thermal impedance (Note 8)	Nature convection	12°C/Watt	
	Nature convection with heat-sink	10°C/Watt	
Thermal shock	EN61373, MIL-STD-810F		
Vibration	EN61373, MIL-STD-810F		
Relative humidity	5% to 95% RH		
EMC CHARACTERISTICS			
EMI (Note 9)	EN55022, EN55011		Class B
ESD	EN61000-4-2	Air	± 8KV
		Contact	± 6KV
Radiated immunity	EN61000-4-3	10 V/m	Perf. Criteria A
Fast transient(Note 10)	EN61000-4-4	± 2KV Perf. Criteria B	
		± 1KV Perf. Criteria A	
Surge (Note 10)	EN61000-4-5	± 2KV Perf. Criteria B	
		± 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)		
MT15E-2433SI-W	9 – 36 VDC	3.3 VDC	0mA	4500mA	50mVp-p	50mA	755mA	86	14700µF
MT15E-2405SI-W	9 – 36 VDC	5 VDC	0mA	3000mA	50mVp-p	65mA	753mA	87	7200µF
MT15E-2451SI-W	9 – 36 VDC	5.1 VDC	0mA	3000mA	50mVp-p	65mA	768mA	87	7200µF
MT15E-2412SI-W	9 – 36 VDC	12 VDC	0mA	1250mA	75mVp-p	22mA	753mA	87	1250µF
MT15E-2415SI-W	9 – 36 VDC	15 VDC	0mA	1000mA	75mVp-p	22mA	753mA	87	800µF
MT15E-2405WI-W	9 – 36 VDC	± 5 VDC	0mA	± 1500mA	75mVp-p	55mA	753mA	87	± 3600µF
MT15E-2412WI-W	9 – 36 VDC	± 12 VDC	0mA	± 625mA	75mVp-p	30mA	744mA	88	± 625µF
MT15E-2415WI-W	9 – 36 VDC	± 15 VDC	0mA	± 500mA	75mVp-p	30mA	744mA	88	± 400µF
MT15E-4833SI-W	18 – 75 VDC	3.3 VDC	0mA	4500mA	50mVp-p	35mA	377mA	86	14700µF
MT15E-4805SI-W	18 – 75 VDC	5 VDC	0mA	3000mA	50mVp-p	35mA	372mA	88	7200µF
MT15E-4851SI-W	18 – 75 VDC	5.1 VDC	0mA	3000mA	50mVp-p	35mA	379mA	88	7200µF
MT15E-4812SI-W	18 – 75 VDC	12 VDC	0mA	1250mA	75mVp-p	15mA	377mA	87	1250µF
MT15E-4815SI-W	18 – 75 VDC	15 VDC	0mA	1000mA	75mVp-p	15mA	377mA	87	800µF
MT15E-4805WI-W	18 – 75 VDC	± 5 VDC	0mA	± 1500mA	75mVp-p	35mA	372mA	88	± 3600µF
MT15E-4812WI-W	18 – 75 VDC	± 12 VDC	0mA	± 625mA	75mVp-p	17mA	372mA	88	± 625µF
MT15E-4815WI-W	18 – 75 VDC	± 15 VDC	0mA	± 500mA	75mVp-p	17mA	372mA	88	± 400µF

Note:

- 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)
- Maximum value at nominal input voltage and full load.
- 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 -Vin.  
To order positive logic ON/OFF control add the suffix-P (Ex: MT15E-4805SI-W-P)  
To order negative logic ON/OFF control add the suffix-N (Ex: MT15E-4805SI-W-N)
- Operating ambient temperature:  
Converter can meet the railway T2 temperature requirement at full load. The operating temperature can up to Ta = 85°C as power derating from 100% to 80% for TX requirement.
- Heat sink is optional and P/N: 7G-0020C-F.
- EN55022 and EN50155  
1) To meet Class A with parallel an external capacitor to the input pins.  
Recommend : 24Vin : NA.  
48Vin : 1µF/100V 1210 MLCC.  
2) To meet Class B please refer to the suggestion filter in next page.
- An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5.  
The filter capacitor Kaga USA suggest: Nippon chemi-con KY series, 220µF/100V, ESR 48mΩ.

PIN CONNECTION		
PIN	SINGLE	DUAL
1	+ INPUT	+ INPUT
2	- INPUT	- INPUT
3	+ OUTPUT	+ OUTPUT
4	NO PIN	COMMON
5	- OUTPUT	- OUTPUT
6	CTRL (Option)	CTRL (Option)



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