

## FEATURES

- 12 WATTS OUTPUT POWER
- OUTPUT CURRENT UP TO 3.5A
- STANDARD 1.25 X 0.80 X 0.40 INCH
- HIGH EFFICIENCY UP TO 88%
- 2:1 WIDE INPUT VOLTAGE RANGE
- FIVE-SIDED CONTINUOUS SHIELD
- FIXED SWITCHING FREQUENCY (400KHz)
- STANDARD 24 PIN DIP PACKAGE
- I/O ISOLATION 1600 VDC
- ISO9001 CERTIFIED MANUFACTURING FACILITIES
- COMPLIANT TO RoHS EU DIRECTIVE 2002/95/EC

## DESCRIPTION

The MT12A series offer 12 watts of output power from a package in an IC compatible 24pin DIP configuration. MT12A series have 2:1 wide input voltage of 9-18, 18-36 and 36-75VDC. The MT12A have features 1600VDC of isolation, short circuit protection and as well as five sided shielding.

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

OUTPUT SPECIFICATIONS			
Output power	12 Watts, max.		
Voltage accuracy	Full load and nominal Vin	±1.2%	
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 (DIP)	± 0.5%
		Dual (DIP)	± 1%
		(2.5Vo only)	± 1%
Cross regulation (Dual)	Asymmetrical load 25% / 100% FL	± 5%	
Ripple and noise	20MHz bandwidth	See table	
Temperature coefficient	±0.02% / °C, max.		
Transient response recovery time	25% load step change	250µS	
Over voltage protection	2.5V output	3.9VDC	
	3.3V output	3.9VDC	
	Zener diode clamp	5.1V output	
	(only single)	12V output	15VDC
		15V output	18VDC
Over load protection	% of FL at nominal input	150%, typ.	
Short circuit protection	Continuous, automatics recovery		
GENERAL SPECIFICATIONS			
Efficiency	See table		
Isolation voltage	Input to Output	1600VDC, min.	
	Input(Output) to Case DIP	1600VDC, min.	
Isolation resistance	10 <sup>9</sup> ohms, min.		
Isolation capacitance	1200pF, max.		
Switching frequency	400KHz, typ.		
Case material	Nickel-coated copper		
Base material	Non-conductive black plastic		
Potting material	Epoxy (UL94-V0)		
Dimensions	1.25 X 0.80 X 0.40 Inch (31.8 X 20.3 X 10.2 mm)		
Weight	18g (0.62oz)		
MTBF (Note 1)	BELLCORE TR-NWT-000332	2.750 x 10 <sup>6</sup> hrs	
	MIL-HDBK-217F	7.575 x 10 <sup>5</sup> hrs	

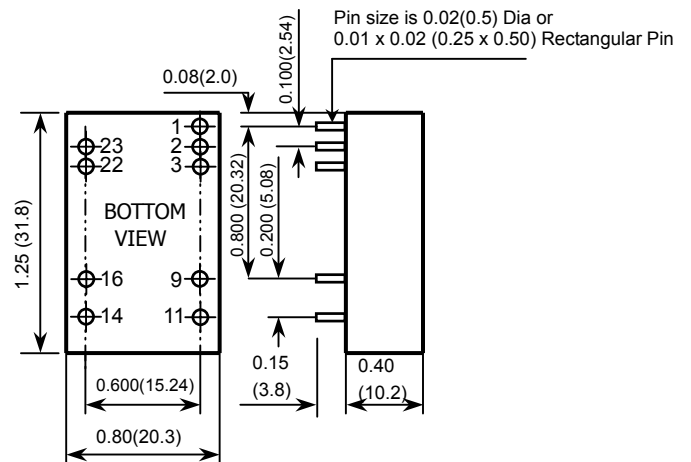
INPUT SPECIFICATIONS			
Input voltage range	12V nominal input	9 – 18VDC	
	24V nominal input	18 – 36VDC	
	48V nominal input	36 – 75VDC	
Input surge voltage	12V input	36VDC	
	24V input	50VDC	
	48V input	100VDC	
100mS max			
Input reflected ripple current	Nominal Vin and full load	20mA <sub>p-p</sub>	
Start up time	Nominal Vin and constant resistive load	Power up	450mS, max.
Start-up voltage	12V input	9VDC	
	24V input	18VDC	
	48V input	36VDC	
Shutdown voltage	12V input	8VDC	
	24V input	16VDC	
	48V input	33VDC	
Remote ON/OFF (Note 6) (Positive logic)	DC-DC ON	Open or 3.0V < Vr < 12V	
	DC-DC OFF	Short or 0V < Vr < 1.2V	
	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	-40°C to +85°C (with derating)		
Maximum case temperature	100°C		
Storage temperature range	-55°C to +105°C		
Thermal impedance	Nature convection	20°C/Watt	
Thermal shock	MIL-STD-810F		
Vibration	MIL-STD-810F		
Relative humidity	5% to 95% RH		
EMC CHARACTERISTICS			
EMI (Note 7)	EN55022	Class A	
ESD	EN61000-4-2	Air	± 8KV
		Contact	± 6KV
Radiated immunity	EN61000-4-3	10 V/m	Perf. Criteria A
Fast transient (Note 8)	EN61000-4-4	± 2KV	Perf. Criteria A
Surge (Note 8)	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)		
MT12A-1225SI	9 – 18 VDC	2.5 VDC	0mA	3500mA	85mVp-p	50mA	935mA	82	2000µF
MT12A-1233SI	9 – 18 VDC	3.3 VDC	0mA	3500mA	85mVp-p	60mA	1203mA	84	2000µF
MT12A-1205SI	9 – 18 VDC	5.1 VDC	0mA	2400mA	85mVp-p	53mA	1244mA	86	2000µF
MT12A-1212SI	9 – 18 VDC	12 VDC	0mA	1000mA	85mVp-p	15mA	1219mA	86	430µF
MT12A-1215SI	9 – 18 VDC	15 VDC	0mA	800mA	85mVp-p	17mA	1219mA	86	300µF
MT12A-1205WI	9 – 18 VDC	± 5 VDC	0mA	± 1200mA	85mVp-p	24mA	1282mA	82	± 1250µF
MT12A-1212WI	9 – 18 VDC	± 12 VDC	0mA	± 500mA	85mVp-p	19mA	1205mA	87	± 200µF
MT12A-1215WI	9 – 18 VDC	± 15 VDC	0mA	± 400mA	85mVp-p	24mA	1205mA	87	± 120µF
MT12A-2425SI	18 – 36 VDC	2.5 VDC	0mA	3500mA	85mVp-p	36mA	461mA	83	2000µF
MT12A-2433SI	18 – 36 VDC	3.3 VDC	0mA	3500mA	85mVp-p	36mA	594mA	85	2000µF
MT12A-2405SI	18 – 36 VDC	5.1 VDC	0mA	2400mA	85mVp-p	35mA	614mA	87	2000µF
MT12A-2412SI	18 – 36 VDC	12 VDC	0mA	1000mA	85mVp-p	16mA	602mA	87	430µF
MT12A-2415SI	18 – 36 VDC	15 VDC	0mA	800mA	85mVp-p	17mA	602mA	87	300µF
MT12A-2405WI	18 – 36 VDC	± 5 VDC	0mA	± 1200mA	85mVp-p	15mA	633mA	83	± 1250µF
MT12A-2412WI	18 – 36 VDC	± 12 VDC	0mA	± 500mA	85mVp-p	15mA	595mA	88	± 200µF
MT12A-2415WI	18 – 36 VDC	± 15 VDC	0mA	± 400mA	85mVp-p	18mA	595mA	88	± 120µF
MT12A-4825SI	36 – 75 VDC	2.5 VDC	0mA	3500mA	85mVp-p	10mA	231mA	83	2000µF
MT12A-4833SI	36 – 75 VDC	3.3 VDC	0mA	3500mA	85mVp-p	14mA	297mA	85	2000µF
MT12A-4805SI	36 – 75 VDC	5.1 VDC	0mA	2400mA	85mVp-p	23mA	307mA	87	2000µF
MT12A-4812SI	36 – 75 VDC	12 VDC	0mA	1000mA	85mVp-p	11mA	301mA	87	430µF
MT12A-4815SI	36 – 75 VDC	15 VDC	0mA	800mA	85mVp-p	5mA	301mA	87	300µF
MT12A-4805WI	36 – 75 VDC	± 5 VDC	0mA	± 1200mA	85mVp-p	6mA	316mA	83	± 1250µF
MT12A-4812WI	36 – 75 VDC	± 12 VDC	0mA	± 500mA	85mVp-p	6mA	297mA	88	± 200µF
MT12A-4815WI	36 – 75 VDC	± 15 VDC	0mA	± 400mA	85mVp-p	6mA	297mA	88	± 120µF

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 of standard type.
- 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.
- The MT12A series can meet EN55022 Class A with parallel an external capacitor to the input pins.  
Recommend: 12Vin : 6.8µF/50V 1812 MLCC .  
24Vin : 4.7µF/50V 1812 MLCC .  
48Vin : 2.2µF/100V 1812 MLCC.
- 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.

DIP PIN CONNECTION					
PIN	SINGLE	DUAL	PIN	SINGLE	DUAL
1	CTRL	CTRL			
2	- INPUT	- INPUT	23	+ INPUT	+ INPUT
3	- INPUT	- INPUT	22	+ INPUT	+ INPUT
9	NC	COMMON	16	- OUTPUT	COMMON
11	NC	- OUTPUT	14	+ OUTPUT	+ OUTPUT



- 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)