50 Watts
MTC50 Series

- 10–40 VDC Input Range
- Designed for Vetronic & Avionic Use
- Magnetic Feedback Technology
- –55 °C to +100 °C Operation
- EMI Performance to MIL–STD 461F
- Immunity to MIL–STD 1275A/B/C/D
- 3 Year Warranty

Specification

Input

Input Voltage Range	• 10.0-40.0 VDC
Transient Input Range	• 50 VDC for 100 ms
Inrush Current	• <40 A at 28 VDC
Turn On	• >8.7 VDC
Turn Off	• <8.0 VDC
Input Reverse Voltage Protection	• None
Input Current	• See table

Output

Output Voltage	• See table
Output Voltage Trim	• -20%, +10% (±10% for 3.3 V version), see note 2
Minimum Load	• No minimum load required
Line Regulation	• ±1% Vout nominal
Load Regulation	• ±1% Vout nominal
Output Set Tolerance	• ±100 mV or ±2% (whichever is greater) at 50% load
Ripple & Noise	• ≤5 Vout: 50 mV pk-pk max, >5 Vout: 100 mV pk-pk, at max load and 20 MHz bandwidth
Overvoltage Protection	• 120-140% Vout max
Overcurrent Protection	• 110-140% at nominal input voltage, constant power down to 40-50% of nominal output voltage
Short Circuit Protection	• Continuous trip and restart (hiccup mode)
Maximum Capacitive Load	• 300 µF x Iout max for startup within 100 ms
Thermal Warning	• Active when internal temp is >105 °C
Remote Sense	• Compensates for 0.5 V total voltage drop
Transient Response	• ±4% max deviation recovery to within 1% in 500 µs for a 50% load change at 0.1 A/µs
Start Up Time	• <100 ms
Start Up Rise Time	• <20 ms
Temperature Coefficient	• 0.03%/°C
Remote On/Off	• On = >3.5 V or open circuit, Off = <1.8 V

General

Efficiency	• See table
Isolation	• 1500 VDC Input to Output 1000 VDC Input to Case 500 VDC Output to Case
Isolation Capacitance	• 2500 pF
Switching Frequency	• Fixed, 400 kHz typical
Frequency Synchronization	• 400-500 kHz
MTBF	• >1 MHrs to MIL-HDBK-217F at 25 °C, GF

Environmental

Case Temperature	• -40 °C to +100 °C (start up at -55 °C)
Operating Humidity	• 95% Relative Humidity 240h MIL-STD-810F Method 507.4
Storage Temperature	• -60 °C to +125 °C
Operating Altitude	• Tested to 70000 ft (21336 m), MIL-STD-810F Method 500.4
Shock	• 75 g MIL-STD-810F Method 516.5
Vibration	• 15 to 2000 Hz MIL-STD-810F Method 514.5, table 514.5-VIII
Bump	• 2000 Bumps in each axis 40 g MIL-STD-810F Method 516.5
Salt Atmosphere	• Two 48 hours cycles MIL-STD-810F Method 509.4

EMC

Conducted Emissions	• EN55022 Conducted Level B* MIL-STD 461F: CE102*
Immunity	• MIL-STD-704 B-F, MIL-STD-1275A/B/C/D*
Conducted Susceptibilty	• MIL-STD-461F CS101, CS114, CS115, CS116*

** When used in conjunction with standard EMI filter and surge protection modules, DSF and FSO series.*

Models and Ratings

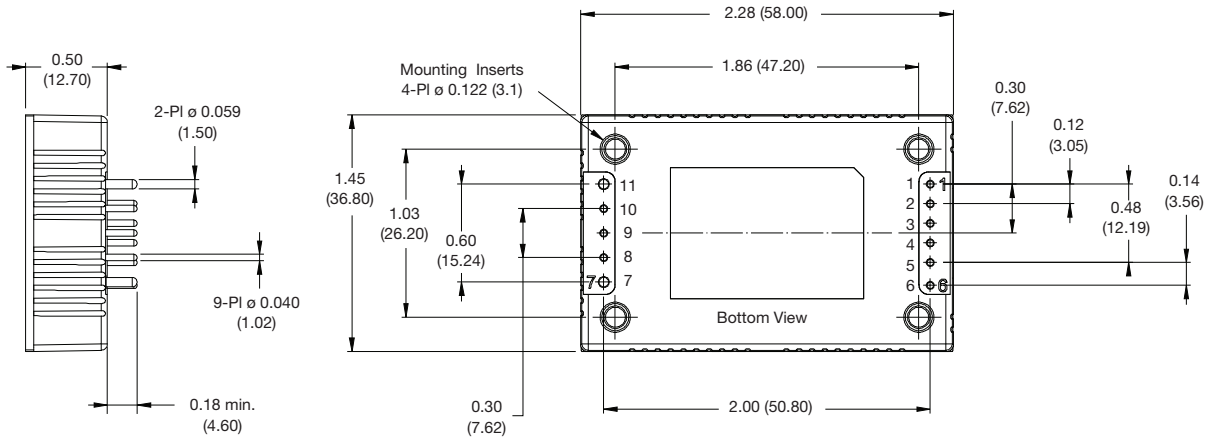
Output Power	Output Voltage	Output Current	Input Current[1]		Efficiency[1]	Model Number
			No Load	Full Load		
50 W	3.3 VDC	15.00 A	100 mA	2.44 A	82%	MTC5028S3V3
50 W	5.0 VDC	10.00 A	60 mA	2.15 A	83%	MTC5028S05
50 W	12.0 VDC	4.20 A	70 mA	2.13 A	84%	MTC5028S12
50 W	15.0 VDC	3.33 A	70 mA	2.13 A	84%	MTC5028S15
50 W	28.0 VDC	1.80 A	120 mA	2.15 A	83%	MTC5028S28

Notes

1. Typical and measured at 28 V input

2. Total of voltage trim and remote sense is +10% max.

Mechanical Details



Notes

1. Dimensions are in inches (mm)
2. Tolerance: ±0.02 inches (±0.5 mm)
3. Weight: 0.14 lb (62 g) approx
4. Materials & Finish:

Pin -	Material:	Copper
	Finish:	Nickel plated 2.5 µm Ni and gold plated 0.3 µm Au.
Mounting Hole Diameter -		0.126 (3.2) clearance hole
Baseplate -	Material:	Aluminium
Case -	Material:	Non-conductive plastic

Pin Connections			
Pin	Single Output	Pin	Single Output
1	+Vin	7	-Vout
2	Remote On/Off	8	-Sense
3	Synchronization	9	Trim
4	Thermal Warning (TW)	10	+Sense
5	-Vin	11	+Vout
6	Case		

Application Notes

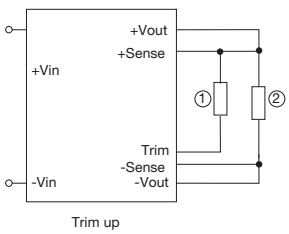
Remote On/Off: This is an active low signal referenced to -Vin. If >3.5V (or open circuit) is applied, the output is on. If <1.8V (or short circuit) is applied, the output is off. If module inhibit is not required, leave the pin floating.

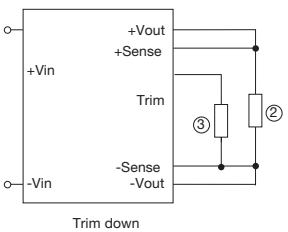
Thermal Warning (Tw): This is an open drain signal with source connected to –Vin. Transistor is off under normal conditions and is turned on when trip threshold is exceeded (typically 105 °C).

Thermal Shutdown: The output of the module can be optionally turned off under a high temperature condition by connecting the Thermal Warning (TW) pin directly to the Remote On/Off pin. Auto resetting.

Synchronization: The internal switching frequency can be synchronized to an external source within the range 400 to 500 kHz. If two modules or more are synchronized, they will run at the highest frequency. Connect synchronization pins directly together.

Output Trim: In order to trim the output voltage of the singles up or down, connect the trim resistor either between the trim pin and +sense for trimming-up or between trim pin and -sense for trimming-down. In order to trim the output voltage of the duals up or down, connect the trim resistor either between the trim pin and +Vout for trimming up or between trim pin and -Vout for trimming down. The trimming output voltage range is ±10% on 3V3 output voltage and -20% to +10% rated output voltage on others. See diagram & table right.





① = R Trim-up ② = R-Load ③ = R Trim-down

Trim up resistor=

$$R_{trim\text{-}up} = \left[\frac{A}{1 - \frac{Vnom}{Vrequired}} - C \right] k\Omega$$

Trim down resistor=

$$R_{trim\text{-}down} = \left[\frac{B}{\frac{Vnom}{Vrequired} - 1} - C \right] k\Omega$$

	S3V3	S05	S12	S15	S28
A	9.826	15	43.814	56.056	81.993
B	6	5	5.1	5.1	3.825
C	5.1	5.1	5.1	5.1	9.1