

**30W** Baseplate cooled

DC-DC converters

The MTC30 uses a forward converter design switching at 450kHz giving excellent size, efficiency and EMC performance. The input range is designed to provide short term operation over 10V to 50VDC to enable the converter to work at full power through the dips and surges commonly seen in vehicle and aircraft applications. A soft start circuit provides wellcontrolled outputs with no overshoot.

Comprehensive control functions such as voltage trim, remote sense, inhibit and frequency synchronization to an external source are standard features. The MTC30 contains an over temperature warning signal that gives user control over the temperature shutdown function of the converter. The internal filtering meets the conducted emission requirements of MIL-STD-461 without external components. When used in conjunction with the MTF input filter module the MTC30 complies to MIL-STD-461; MIL-STD-1275 and MIL-STD-704.



## Features

- ▶ Regulated single outputs 5V to 28VDC
- ▶ Regulated dual output  $\pm 15$ VDC
- ▶ 10V to 50VDC input range
- ▶ Baseplate cooled
- ▶ Designed for vetronic & avionic use
- ▶ MIL-STD-461 & DEF-STAN-59-411
- ▶ MIL-STD-1275 & DEF-STAN-61-5
- ▶ -40°C to +100°C operating temperature
- ▶ -55°C operation available on certain models
- ▶ 3 year warranty

## Applications



COTS



Industrial



Technology

## Dimensions

58.0 x 46.0 x 12.7mm (2.28 x 1.81 x 0.50")

## Models & ratings

Model number <sup>(3)</sup>	Output power	Output voltage			Output current	Input current <sup>(5)</sup>		Efficiency
		Nominal	Minimum <sup>(1)</sup>	Maximum <sup>(1)</sup>		No load	Full load	
MTC3028S05	25W	5.0VDC	4.0VDC	6.0VDC	5.00A	0.09A	1.08A	83%
MTC3028S05-LT <sup>(4)</sup>	25W	5.0VDC	4.0VDC	6.0VDC	5.00A	0.09A	1.08A	83%
MTC3028S12	32W	12.0VDC	9.0VDC	13.8VDC <sup>(2)</sup>	2.70A	0.05A	1.4A	81%
MTC3028S12-LT <sup>(4)</sup>	32W	12.0VDC	9.0VDC	13.8VDC <sup>(2)</sup>	2.70A	0.05A	1.41A	81%
MTC3028S28	35W	28.0VDC	20.0VDC	30.0VDC	1.25A	0.07A	1.51A	83%
MTC3028D15	30W <sup>(6)</sup>	$\pm 15.0$ VDC			$\pm 1.6$ A <sup>(6)</sup>	0.04A	1.33A	80%

### Notes:

1. Indicates maximum and minimum voltage adjustment (Maximum includes Remote Sense adjustment).
2. The full trim range is not available when the input is <15.5V.
3. For additional ESS screening, add the suffix '-ESS' to the model number e.g. MTC3028S05-ESS.

4. Suffix '-LT' indicates -55°C extended operating range.
5. Typical with  $V_{in} = 28$ VDC.
6. Max power 30 W must not be exceeded.

## Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Input voltage range	15.5		40	VDC	
Transient input range		10		VDC	10s
		50			1s
Turn on		<15.5		VDC	
Turn off		<10		VDC	
Input reverse voltage protection	None				
Max. input current	See models and ratings table				

## Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Output voltage	See models and ratings table				
Output voltage trim	See models and ratings table				
Minimum load	No minimum load required				
Line regulation		±1		%	Vout nominal (15.5-40.0Vin)
Load regulation		±1		%	Vout nominal
Cross regulation		±3		%	With 150mA min load (dual output only)
Output set tolerance		±100		mV	Or ±2% whichever is greater
Ripple and noise			75	mV pk-pk	≤5Vout, 20MHz bandwidth
			1	% pk-pk	>5Vout, 20MHz bandwidth
Overvoltage protection	110		120	%	
Overcurrent protection	105		150	%	At nominal input voltage
Short circuit protection	Trip and restart				
Overtemperature protection	102		107	°C	2°C to 5°C hysteresis
Remote sense		0.5		V	Single output only
Load step output transient		<±3		%	Vout nominal (25-75% load)
Line step recovery		500		µs	Within 1% of nominal value
Start up time		<100		ms	
Maximum capacitive load			300	µF	Iout maximum start up within 100ms

## General

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Efficiency	See models & ratings table				
Isolation: input to output		1500		VDC	
Isolation: input to case		1000		VDC	
Isolation: output to case		500		VDC	
Switching frequency		450		kHz	
Frequency synchronization	400		500	kHz	
Inhibit	Off = TTL Low or short circuit, On = TTL High or open circuit				
Power density		0.88 (14.5)		W/cm <sup>3</sup> (W/in <sup>3</sup> )	
Mean time between failure		740		kHrs	MIL-HDBK-217F at +40°C, GF

## Environmental

Characteristic	Minimu	Typica	Maximu	Unit	Notes & conditions
Operating base plate	<sup>m</sup> -40		<sup>m</sup> +100	<sup>s</sup> °C	-55°C to +100°C extended range '-LT'
Storage temperature	-55		+12	°C	
Operating humidity			<sup>5</sup> 95	%RH	240hrs MIL-STD-810D Method 507.2
Cooling	Conduction cooling through baseplate				
Operating altitude		21,336 (70,000)		metres (ft)	
Shock				g	MIL-STD-810D Method 516.3
Vibration	5		500	Hz	MIL-STD-810D Method 514.3
Bump		200		Bump	In each axis 40g MIL-STD-810D Method 516.3
Salt atmosphere		<sup>0</sup> 48		<sup>s</sup> Hrs	MIL-STD-810E Method 509.3

All standard products are stress-screened and electrically tested over the operating temperature range. See notes for option details.

## EMC: emissions

Phenomenon	Standard	Test level	Notes & conditions
Conducted	MIL-STD-461E/F/G DEF-STAN 59-411	CE102 DCE01/DCE02	MTF50 filter module required to meet these standards

## EMC: Immunity

Phenomenon	Standard	Test level	Criteria	Notes & conditions
ESD immunity	MIL-STD-704 A, MIL-STD-704 B-F, MIL-STD-1275A/B/C/D/E (MTF50 filter module required to meet these standards)			
Conducted susceptibility	MIL-STD-461E/F/G CS101, CS114,CS115,CS116, DEF-STAN 61-5 part 6 issue 5 (MTF50 filter module required to meet these standards)			

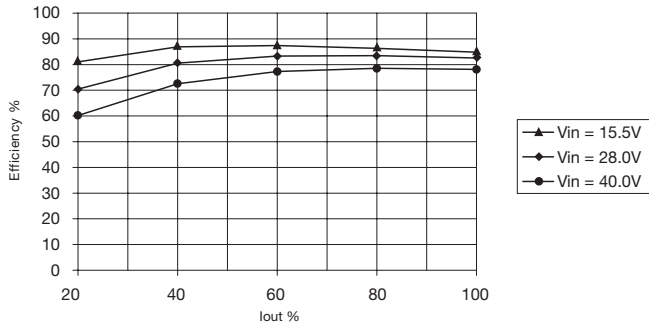
## Safety approvals

Safety agency	Standard	Test level	Notes & conditions
CE	Meets all applicable directives		
UKCA	Meets all applicable legislation		

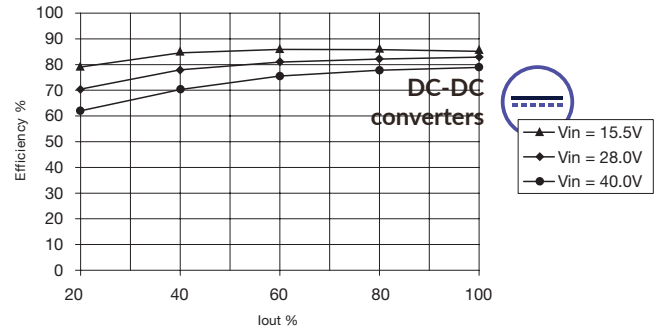
## Application notes

### Efficiency curves

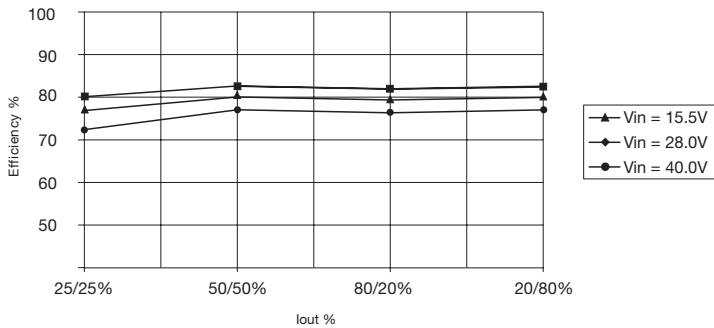
MTC3028S05



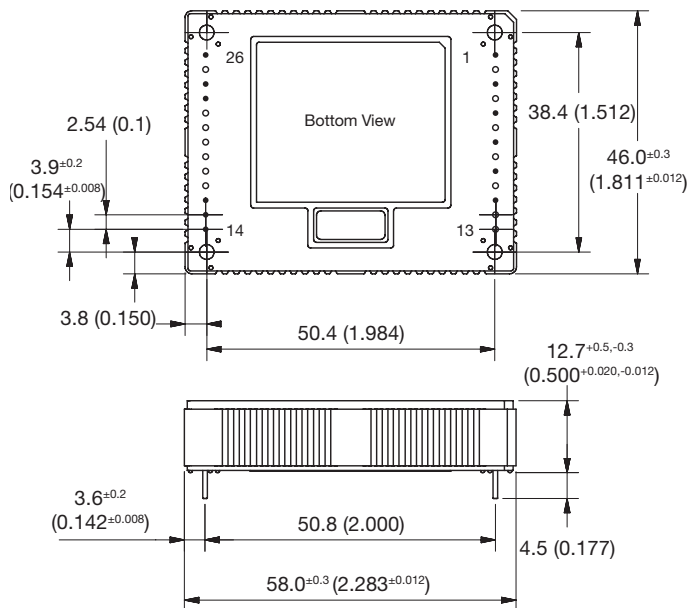
MTC3028S28



MTC3028D15



## Mechanical details



Pin connections		
Pin	Single output	Dual output
1	No Pin	No Pin
2	Case	Case
3	No Pin	No Pin
4	- Vin	- Vin
5	No Pin	No Pin
6	+ Vin	+ Vin
7	No Pin	No Pin
8	Synchronization	Synchronization
9	No Pin	No Pin
10	Inhibit	Inhibit
11	No Pin	No Pin
12	Thermal Warning (TW)	Thermal Warning (TW)
13	Signal GND (SGND)	No Pin
14	No Pin	No Pin
15	No Pin	No Pin
16	No Pin	No Pin
17	Adjust	No Pin
18	+ Sense	No Pin
19	+ Vout	+ Vout
20	+ Vout	+ Vout
21	- Vout	COM
22	- Vout	COM
23	No Pin	- Vout
24	No Pin	- Vout
25	- Sense	No Pin
26	No Pin	No Pin

### Notes:

- Dimensions are in mm (inches)
- Tolerance:  $\pm 0.5\text{mm}$  ( $\pm 0.02''$ ) except where indicated.
- Weight: 70g (0.15lb)

4. Materials & Finish:
- Pin: Diameter: 0.8 (0.032)  
Material: Cu Zn30 2.5µm Ni  
Finish: 0.2-0.5µm AU (HV 170-200)

- Case: Material: Aluminium (Al Mg Si 0.5)  
Finish: Chromated
- Nameplate: Non-conductive plastic

Specifications subject to change without notice.