

5W Baseplate cooled

DC-DC converters

The MTC05 is a COTS DC-DC converter developed specifically for the defense and avionics market. This product has a full military specification while offering the short lead-times and cost benefits of a COTS component.

The MTC05 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 well controlled outputs with no overshoot.

Comprehensive control functions such as voltage trim, remote sense, inhibit and frequency synchronization to an external source are standard features. When used in conjunction with the MTF input filter module the MTC05 complies to MIL-STD-461; MIL-STD-1275; MIL-STD-704



Features

- ▶ Regulated single outputs
- ▶ 10-50VDC input range
- ▶ Baseplate cooled
- ▶ 1.5kVDC isolation
- ▶ Remote sense
- ▶ Remote On/Off
- ▶ -40°C to +100°C operating temperature
- ▶ 3 year warranty

Applications



COTS



Industrial



Technology

Dimensions

32.0 x 19.3 x 8.7mm (1.26" x 0.76" x 0.34")

Models & ratings

Model number ⁽³⁾	Output power	Output voltage			Output current	Input current ⁽⁵⁾		Efficiency
		Nominal	Minimum ⁽¹⁾	Maximum ⁽¹⁾		No load	Full load	
MTC0528S3V3	4W	3.3VDC	3.3VDC	4.0VDC	1.21A	0.03A	0.18A	80%
MTC0528S05		5.0VDC	4.0VDC	6.0VDC ⁽²⁾	0.80A	0.02A	0.19A	77%
MTC0528S05-LT ⁽⁴⁾		5.0VDC	4.0VDC	6.0VDC ⁽²⁾	0.80A	0.02A	0.19A	77%
MTC0528S28	5W	28.0VDC	20.0VDC	30.0VDC	0.18A	0.02A	0.22A	78%

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. MTC0528S05-ESS.
4. Suffix '-LT' indicates -55°C extended operating range.
5. Vin = 28VDC.

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
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
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	
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	lout 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	450		500	kHz	
Inhibit	Off = TTL Low or short circuit, On = TTL High or open circuit				
Power density		0.93 (15.3)		W/cm ³ (W/in ³)	
Mean time between failure		1.7		Mhrs	MIL-HDBK-217F at +40°C, GF

Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Operating base plate	-40		+100	°C	-55°C to +100°C extended range '-LT'
Storage temperature	-55		+125	°C	
Operating humidity			95	%RH	240hrs MIL-STD-810D Method 507.2
Cooling	Conduction cooling through baseplate				
Operating altitude		21,336 (70,000)		metres (ft)	
Shock		100		g	MIL-STD-810D Method 516.3
Vibration	5		500	Hz	MIL-STD-810D Method 514.3
Bump		2000		Bumps	In each axis 40g MIL-STD-810D Method 516.3
Salt atmosphere		48		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	MIL-STD 461E/F/G CE102 DEF STAN 59-411 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)			

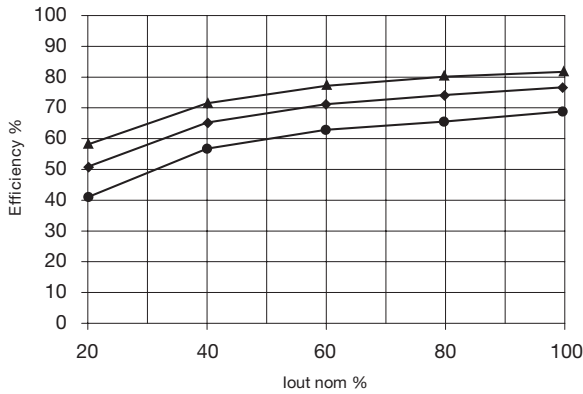
Safety approvals

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

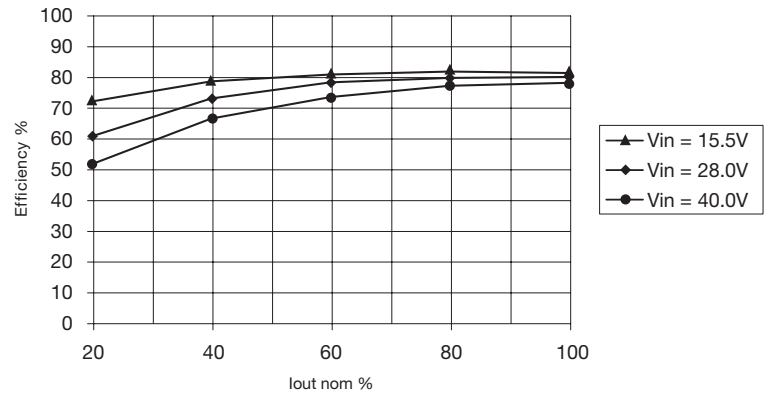
Application notes

Efficiency curves

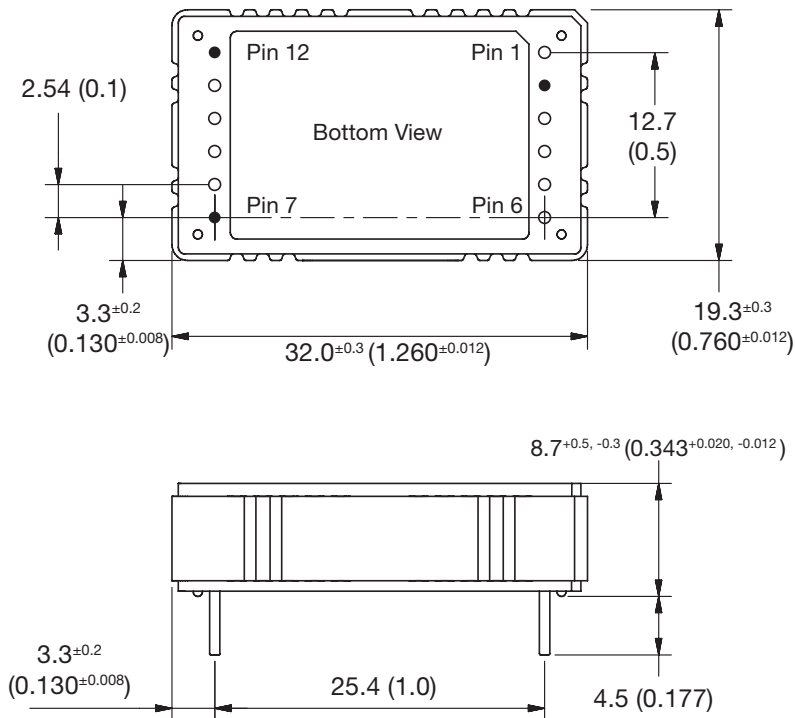
MTC0528S05



MTC0528S28



Mechanical details



Pin connections	
Pin	Function
1	Case
2	No Pin
3	-Vin
4	+Vin
5	Synchronization
6	Inhibit
7	No Pin
8	Adjust
9	+Sense
10	+Vout
11	-Vout
12	No Pin

Notes:

- Dimensions are in mm (inches)
- Tolerance: ±0.5mm (±0.02") except where indicated.
- Weight: 10g (0.02lb)

- 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.