



MilCOTS™ Isolated Converters

Mil-COTS DC-DC Converters for Military/Aerospace Applications

The MilQor® series of Mil-COTS Isolated DC-DC converters brings SynQor's field proven high-efficiency synchronous rectifier technology to the Military/Aerospace industry. These "off-the-shelf" converters are compatible with the industry standard format, operate at a fixed frequency, and follow conservative component derating guidelines. MilQor products are designed and manufactured to comply with a wide range of military standards.

MCOTS Product Features

- High efficiency, up to 95% at full rated load current
- Fixed frequency switching provides predictable EMI
- No minimum load requirement
- Rugged design for harsh environments
- Full Feature option on some models
- Flanged baseplate available
- Industry standard pin-out configurations and standard footprints.
- Available: High-capacitance option for very large output capacitance and extreme transient applications
- -55°C to +100°C Operating Temperature

Compliance Features

Mil-COTS converters with Mil-COTS filters are designed to meet:

- MIL-HDBK-704
- RTCA/DO-160 Section 16, 17, 18
- MIL-STD-1275
- MIL-STD-461
- DEF-STAN 61-5 (part 6)/(5, 6)

Protection

- Input under-voltage lockout
- Output current limit and short circuit protection
- Active back bias limit
- Output over-voltage protection
- Thermal shutdown (not on DM Package Size)

Control

- On/Off control referenced to input side (Fully isolated Full Bricks)
- Remote sense for the output voltage
- Digital Output Current Sharing (HZ only)
- Output voltage trim range of:
 - (Half-Brick Zeta) +10% to -20%
 - (Quarter-Brick Exa) +10% to -50%
 - (Sixteenth Brick) +10% to -50%
 - +10% to -10%

9V
16V

MCOTS-28
Input Range: 16-40V
Transient: 16-50V
Max. Power: 510W
Efficiency: Up to 95%

MCOTS-28E
Input Range: 16-70V
Transient: 16-100V
Max. Power: 400W
Efficiency: Up to 95%

MCOTS-28V
Input Range: 9-40V
Transient: 9-55V
Max. Power: 250W
Efficiency: Up to 91%

MCOTS-28VE
Input Range: 9-70V
Transient: 9-100V
Max. Power: 250W
Efficiency: Up to 92%

MCOTS-48
Input Range: 34-75V
Transient: 34-100V
Max. Power: 600W
Efficiency: Up to 95%

55V

100V

MCOTS-150
Input Range: 90-210V
Transient: 90-250V
Max. Power: 150W
Efficiency: Up to 90%

155V

200V

95% Efficiency

MCOTS-270
Input Range: 155-425V
Transient: 155-475V
Max. Power: 600W
Efficiency: Up to 91%

MCOTS-270H
Input Range: 240-425V
Transient: 240-475V
Max. Power: 800W
Efficiency: Up to 92%

MCOTS-270N
Input Range: 240-280V
Transient: 200-350V
Max. Power: 400W
Efficiency: Up to 89%

300V

475V

Mil-COTS DC-DC Converters

Family	Product	Cont. Input Voltage	Output Voltage		Package Size/ (Performance Level)	Heatsink Option	Screening Level	Options
MCOTS	C: Converter	28: 16-40V	1R2: 1.2V	12: 12V	FZ: Full Brick (Zeta) FE: Full Brick (Exa) FP: Full Brick (Peta) FT: Full Brick (Tera) HZ: Half Brick (Zeta) HP: Half Brick (Peta) HT: Half Brick (Tera) QE: Quarter Brick (Exa) QT: Quarter Brick (Tera) SM: Sixteenth Brick (Mega) DM: Demi Brick (Mega)	N: Encased, Baseplate D: Encased, Non-Threaded Baseplate F: Encased, Flanged Baseplate	S: S-Grade M: M-Grade	[]: Standard F: Full Feature C: High-Capacitance FC: High-Capacitance & Full Feature
		28E: 16-70V	1R5: 1.5V	15: 15V				
		28V: 9-40V	1R8: 1.8V	24: 24V				
		28VE: 9-70V	2R5: 2.5V	28: 28V				
		48: 34-75V	3R3: 3.3V	36: 36V				
		150: 90-210V	05: 5.0V	40: 40V				
		270: 155-425V	07: 7.0V	48: 48V				
		270H: 240-425V	7R5: 7.5V	50: 50V				
		270N: 240-280V	08: 8.0V	135: 135V				
			10: 10V	270: 270V				

Example: MCOTS-C-28-05-HP-N-M For valid part numbers, refer to the website or contact your local sales representative.

See "Encased Package Configurations" on page 93 for package outlines.

Military Isolated DC-DC Converters

Single Output

Dual Output

MCOTS-28 Demi	Vout	3.3V	5.0V	12V	15V	28V	±5.0V	±12V	±15V
16-40Vin Cont. 50Vin 1s Trans. Absolute Max Vin = 60V	Demi Brick	15A 50W	10A 50W	4.0A 48W	3.3A 50W	1.8A 50W	10A 50W Total	4A 48W Total	3.3A 50W Total

MCOTS-28	Vout	1.2V	1.5V	1.8V	2.5V	3.3V	5V	7V	7.5V	12V	15V	24V	28V	40V	48V	50V	135V	270V
16-40Vin Cont. 50Vin 1s Trans. Absolute Max Vin = 60V	Full Brick Zeta																	3.7A 999W
	1/2 Brick Zeta						60A 300W			42A 504W	34A 510W	21A 504W	18A 504W	12.5A 500W		10A 500W	3.7A 500W	
	1/2 Brick Peta			60A 108W		50A 165W	40A 200W		27A 202W	16A 192W	13A 195W	8.33A 192W	7A 196W	5A 200W	4A 192W			
	1/4 Brick Exa						40A 200W			25A 300W	20A 300W		10.7A 300W			6A 300W		
	1/4 Brick Tera	40A 48W	40A 60W	40A 72W	40A 100W	30A 99W	24A 120W	17A 119W		10A 120W	8A 120W	5A 120W	4A 112W	3A 120W	2.5A 120W			
	1/16 Brick Mega	25A 30W	25A 38W	25A 45W	20A 50W	15A 50W	10A 50W	7A 49W		4A 48W								

MCOTS-28E	Vout	5V	9.6V	12V	15V	24V	28V	40V	50V
16-70Vin Cont. 100Vin 1s Trans. Absolute Max Vin = 100V	1/2 Brick Zeta	60A 300W	42A 403W	33A 396W	26A 390W	16A 384W	14A 392W	10A 400W	8A 400W

MCOTS-28E Demi	Vout	5V
16-70Vin Cont. 100Vin 1s Trans. Absolute Max Vin = 100V	Demi Brick	10A 50W

MCOTS-28V	Vout	1.8V	3.3V	5V	7V	7.5V	12V	15V	24V	28V	40V	48V	50V
9-40Vin Cont. 55Vin 1s Trans. Absolute Max Vin = 60V	1/2 Brick Zeta			50A 250W			21A 252W	17A 255W	10A 240W	9A 252W	6A 240W		5A 250W
	1/2 Brick Peta	60A 108W		36A 180W		24A 180W	15A 180W	12A 180W	7.5A 180W	6.5A 182W	4.5A 180W	3.7A 178W	
	1/4 Brick Tera	35A 63W	25A 83W	17A 85W	12A 84W		7A 84W	5.5A 83W	3.5A 84W	2.8A 78W		1.8A 86W	

MCOTS-28VE	Vout	1.8V	3.3V	5V	7V	7.5V	12V	15V	24V	28V	40V	48V	50V
9-70Vin Cont. 100Vin 1s Trans. Absolute Max Vin = 100V	1/2 Brick Zeta			50A 250W			21A 252W	17A 255W	10A 240W	9A 252W	6A 240W		5A 250W
	1/2 Brick Peta	55A 99W	45A 149W	32A 160W		22A 165W	13A 156W	11A 165W	6.7A 161W	5.8A 162W	4A 160W	3.4A 163W	
	1/4 Brick Tera	35A 63W	25A 83W	17A 85W	12A 84W		7A 84W	5.5A 83W	3.5A 84W	2.8A 78W		1.8A 86W	

MCOTS-48	Vout	1.2V	1.5V	1.8V	2.5V	3.3V	5V	7V	12V	15V	24V	28V	30V	40V	48V	50V
34-75Vin Cont. 100Vin 1s Trans. Absolute Max Vin = 100V	1/2 Brick Zeta						60A 300W		50A 600W	40A 600W	25A 600W	21.5A 602W		15A 600W		12A 600W
	1/2 Brick Peta	60A 72W	60A 90W	60A 108W	60A 150W	60A 198W	46A 230W	35A 245W	21A 252W	17A 255W	10.5A 252W	9A 252W		6.3A 252W	5.2A 250W	
	1/4 Brick Tera	40A 48W	40A 60W	40A 72W	40A 100W	30A 99W	25A 125W	20A 140W	12A 144W	10A 150W	6A 144W	5A 140W	5A 150W	3A 120W	3A 144W	
	1/16 Brick Mega	25A 30W	25A 38W	25A 45W	20A 50W	15A 50W	10A 50W	7A 49W	4A 48W	3A 45W						

MCOTS-150	Vout	5V	28V	48V
90-210Vin Cont. 250Vin 1s Trans. Absolute Max Vin = 250V	1/4 Brick Tera	30A 150W	5.35A 150W	3.1A 149W

MCOTS-270	Vout	3.3V	5V	6V	12V	15V	24V	28V	48V
155-425Vin Cont. 475Vin 1s Trans. Absolute Max Vin = 600V	Full Brick Tera		80A 400W		50A 600W	40A 600W	25A 600W	21.4A 599W	12.5A 600W
	1/2 Brick Tera	60A 198W	50A 250W	33A 198W	25A 300W	20A 300W	12.5A 300W	10.7A 300W	6.3A 302W
	1/4 Brick Tera	30A 99W	30A 150W	25A 150W	13A 156W	10A 150W	6.25A 150W	5.35A 150W	3.1A 149W

MCOTS-270	Vout	40V (10-40V)	60V (25-60V)
155-425Vin Cont. 475Vin 1s Trans. Absolute Max Vin = 600V	Full Brick Exa	60A 1000W	40A 1000W
	1/2 Brick Exa	35A 600W	25A 600W

MCOTS-270H	Vout	5V	6V	7V	12V	28V	36V
240-425Vin Cont. 475Vin 1s Trans. Absolute Max Vin = 600V	Full Brick Peta	100A 500W	110A 660W	90A 630W	66.7A 800W	28.6A 800W	22.2A 800W

MCOTS-270N	Vout	8V	10V	12V	28V
240-280Vin Cont. 200-350Vin 100ms Trans. Absolute Max Vin = 600V	1/2 Brick Tera	50A 400W	40A 400W	33A 396W	14.5A 406W



Product Screening

SCREENING	Process Description	S-Grade	M-Grade
Baseplate Operating Temperature		-55°C to +100°C	-55°C to +100°C
Storage Temperature		-65°C to +135°C	-65°C to +135°C
Pre-Cap Inspection	IPC-A-610 Class III	•	•
Temperature Cycling	MIL-STD-883F, Method 1010, Condition B, 10 Cycles		•
Burn-In	100°C Baseplate	12 hours	96 hours
Final Electrical Test	100%	25°C	-55°C, +25°C, +100°C
Final Visual Inspection	MIL-STD-883, Method 2009	•	•

Product Qualification

QUALIFICATION Test Name	Details	# Tested (# Failed)	Consistent with MIL-STD-883F Method
Life Testing	Visual, mechanical and electrical test before, during and after 1000 hour burn-in @ full load	15 (0)	Method 1005.8
Shock-Vibration	Visual, mechanical and electrical test before, during and after shock and vibration tests	5 (0)	MIL-STD 202, Methods 201A and 213B
Humidity	+85°C, 95% RH, 1000 hours, 2 minutes on 6 hours off	8 (0)	Method 1004.7
Temperature Cycling	500 cycles of -55°C to +100°C (30 minute dwell at each temperature)	10 (0)	Method 1010.8, Condition A
Solderability	15 pins	15 (0)	Method 2003
DMT	-65°C to +110°C across full line, and load specifications in 5°C steps	7 (0)	—
Altitude	70,000 feet (21 km)	2 (0)	—