Industrial Line – T40A Series

40W SINGLE, DUAL & TRIPLE OUTPUT HIGH PERFORMANCE DC/DC

Features

- Offer single, dual, dual positive (total output current 8A) and triple output
- 2:1 wide input voltage range
- International safety standard approval
- Six-sided continuous shield
- High efficiency up to 90%
- Standard 2" x 2" x 0.4" package
- Fixed switching frequency

Specifications

INPUT

Voltage range	12V nominal input		9-18VDC
	24V nominal input		18-36VDC
	48V nominal input		36-75VDC
Under voltage lockout	12V input	DC-DC ON	9VDC
		DC-DC OFF	8VDC
	24V input	DC-DC ON	17.8VDC
		DC-DC OFF	16VDC
	48V input	DC-DC ON	36VDC
		DC-DC OFF	34VDC
Input filter	L-C type.		
Input voltage variation	5V/ms, max , dv/dt (complies with ETS300 132 part 4.4).		
Input surge voltage 100mS max	12V input		36VDC.
	24V input		50VDC.
	48V input		100VDC.
Reflected ripple[6]	40mA p-p, nominal Vin and full load.		
Start up time	Power up 25mS typ. Remote on/off 25mS typ. Nominal Vin and constant resistive load.		
Remote ON/OFF[7]	Positive logic: DC/DC ON: Open or 3.5V < Vr < 12V DC/DC OFF: Short or 0V < Vr < 1.2V Remote off input current: 2.5mA, nominal Vin.		

OUTPUT

Power	40W max.	
Voltage accuracy FL and nominal Vin	Single/dual	±1%
	Triple Main	±1%
	Auxiliary	±5%
Voltage adjustability[1]	±10%, single and dual output only (not including dual positive and triple).	
Min load[2]	Single and dual positive	0%
	Dual and triple	10% of FL
Line regulation LL to HL at full load	Single and dual positive	±0.5%
	Triple (main)	±1%
	Triple (auxiliary)	±5%
Load regulation[3] 10% to 100% FL	Single:	±0.5%
	Dual	±1%
	Triple (main)	±2%
	Triple (auxiliary)	±5%
Load cross regulation[4]	Triple (main)	±1%
	Dual/triple (auxiliary)	±5%

Ripple and noise[5]	At 20MHz bandwidth, see table (measured with a 0.1uF/50V MLCC).	
Temperature coefficient	±0.02%/°C max.	
Transient response	250uS,recovery time 25% load step change.	
Overload protection	1.5V output	3.9V
	1.8V output	3.9V
	2.5V output	3.9V
	3.3V output	3.9V
	5V output	6.2V
	12V output	15V
	15V output	18V
	(zener diode clamp).	
Overload protection	150% max, % of FL at nominal input.	
Short circuit protection	Hiccup, automatics recovery.	

ENVIRONMENTAL

Operating temperature	–40°C to +85°C (with derating).
Max case temperature	+100°C.
Storage temperature	–55°C to +105°C.
Overtemp. protection	115°C typ.
Thermal impedance	Nature convection: 9.2°C/W. Heat-sink with 20LFM: 7.6°C/W. Heat-sink with 500LFM: 2.8°C/W.
Thermal shock	MIL-STD-810D.
Vibration	10-55Hz, 10G, 30 minutes along x, y and z.
Relative humidity	5-95% RH.

GENERAL

Efficiency	See table.
Isolation voltage	1600VDC min, input to output. 1600VDC min, input (output) to case.
Isolation resistance	10^9 ohms, min.
Isolation capacitance	1000pF, max.
Switching frequency	300KHz typ.
Case material.	Nickel-coated copper.
Base material	Non-conductive black FR4.
Potting material	Epoxy (UL94-V0).
Dimensions	50.8 x 50.8 x 10.2 mm.
Weight	60g.
MTBF[9]	1.398 x 10^5 hrs.

STANDARDS

Safety standards	IEC60950-1, UL60950-1, EN60950-1.
EMC	EN55022, EN61000-4-2, -3, -4, -5, -6.

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MODEL NUMBER	INPUT RANGE	OUTPUT VOLTAGE	OUPUT CURRENT	OUTPUT RIPPLE&NOISE	INPUT[13] CURRENT	EFFICIENCY[14]	CAPACITOR[15] LOAD MAX
PME40-12S1P5	9 - 18VDC	1.5VDC	8000mA	50mV p-p	1250mA	84%	45000uF
PME40-12S1P8	9 - 18VDC	1.8VDC	8000mA	50mV p-p	1538mA	82%	37700uF
PME40-12S2P5	9 - 18VDC	2.5VDC	8000mA	50mV p-p	2083mA	84%	27000uF
PME40-12S3P3	9 - 18VDC	3.3VDC	8000mA	50mV p-p	2683mA	86%	21000uF
PME40-12S05	9 - 18VDC	5VDC	8000mA	50mV p-p	4065mA	86%	13600uF
PME40-12S12	9 - 18VDC	12VDC	3333mA	75mV p-p	4065mA	86%	2360uF
PME40-12S15	9 - 18VDC	15VDC	2666mA	75mV p-p	4015mA	87%	1510uF
PME40-12D12	9 - 18VDC	±12VDC	±1800mA	120mV p-p	4444mA	85%	±1200uF
PME40-12D15	9 - 18VDC	±15VDC	±1400mA	150mV p-p	4321mA	85%	±750uF
PME40-12D3305	9 - 18VDC	3.3/5VDC	4A/4A (total 8A)[12]	100mV p-p	3416mA	85%	11000/6800uF
PME40-12T3312	9 - 18VDC	3.3/±12VDC	6000mA/±400mA	50/75mV p-p	3063mA	84%	13000/±330uF
PME40-12T3315	9 - 18VDC	3.3/±15VDC	6000mA/±300mA	50/75mV p-p	3000mA	84%	13000/±110uF
PME40-12T0512	9 - 18VDC	5/±12VDC	6000mA/±400mA	50/75mV p-p	4024mA	86%	6800/±330uF
PME40-12T0515	9 - 18VDC	5/±15VDC	6000mA/±300mA	50/75mV p-p	3963mA	86%	6800/±110uF
PME40-24S1P5	18 - 36VDC	1.5VDC	8000mA	50mV p-p	649mA	81%	45000uF
PME40-24S1P8	18 - 36VDC	1.8VDC	8000mA	50mV p-p	759mA	83%	37700uF
PME40-24S2P5	18 - 36VDC	2.5VDC	8000mA	50mV p-p	1016mA	86%	27000uF
PME40-24S3P3	18 - 36VDC	3.3VDC	8000mA	50mV p-p	1325mA	87%	21000uF
PME40-24S05	18 - 36VDC	5VDC	8000mA	50mV p-p	1961mA	89%	13600uF
PME40-24S12	18 - 36VDC	12VDC	3333mA	75mV p-p	2048mA	88%	2360uF
PME40-24S15	18 - 36VDC	15VDC	2666mA	75mV p-p	1985mA	89%	1510uF
PME40-24DS12	18 - 36VDC	±12VDC	±1800mA	120mV p-p	2169mA	87%	±1200uF
PME40-24D15	18 - 36VDC	±15VDC	±1400mA	150mV p-p	2108mA	87%	45000uF
PME40-24D3305	18 - 36VDC	3.3/5VDC	4A/4A (total 8A)[12]	100mV p-p	1689mA	86%	±750uF
PME40-24T3312	18 - 36VDC	3.3/±12VDC	6000mA/±400mA	50/75mV p-p	1512mA	85%	11000/6800uF
PME40-24T3315	18 - 36VDC	3.3/±15VDC	6000mA/±300mA	50/75mV p-p	1481mA	85%	13000/±330uF
PME40-24T0512	18 - 36VDC	5/±12VDC	6000mA/±400mA	50/75mV p-p	1989mA	87%	6800/±330uF
PME40-24T0515	18 - 36VDC	5/±15VDC	6000mA/±300mA	50/75mV p-p	1958mA	87%	6800/±110uF
PME40-48S1P5	36 - 75VDC	1.5VDC	8000mA	50mV p-p	321mA	82%	45000uF
PME40-48S1P8	36 - 75VDC	1.8VDC	8000mA	50mV p-p	375mA	84%	37700uF
PME40-48S2P5	36 - 75VDC	2.5VDC	8000mA	50mV p-p	508mA	86%	27000uF
PME40-48S3P3	36 - 75VDC	3.3VDC	8000mA	50mV p-p	655mA	88%	21000uF
PME40-48S05	36 - 75VDC	5VDC	8000mA	50mV p-p	969mA	90%	13600uF
PME40-48S12	36 - 75VDC	12VDC	3333mA	75mV p-p	1000mA	89%	2360uF
PME40-48S15	36 - 75VDC	15VDC	2666mA	75mV p-p	992mA	89%	1510uF
PME40-48D12	36 - 75VDC	±12VDC	±1800mA	120mV p-p	1084mA	87%	±1200uF
PME40-48D15	36 - 75VDC	±15VDC	±1400mA	150mV p-p	1054mA	87%	±750uF
PME40-48D3305	36 - 75VDC	3.3/5VDC	4A/4A (total 8A)[12]	100mV p-p	823mA	88%	11000/6800uF
PME40-48T3312	36 - 75VDC	3.3/±12VDC	6000mA/±400mA	50/75mV p-p	747mA	86%	13000/±330uF
PME40-48T3315	36 - 75VDC	3.3/±15VDC	6000mA/±300mA	50/75mV p-p	732mA	86%	13000/±110uF
PME40-48T0512	36 - 75VDC	5/±12VDC	6000mA/±400mA	50/75mV p-p	982mA	88%	6800/±330uF
PME40-48T0515	36 - 75VDC	5/±15VDC	6000mA/±300mA	50/75mV p-p	967mA	88%	6800/±110uF

Notes:

1) *For the single output: Maximum output deviation is 10% inlcusive of remote sense and trim. If remote sense is not being used, the +Vsense should be connected to its corresponding +OUTPUT and likewise the sense should be connected to its corresponding -OUTPUT.*
2) *The dual and triple output required a minimum 10% loading on the output to maintain specified regulation. Operation under no-load condition will not damage these devices, however they may not meet all listed specification.*
3) *Load regulation for triple output: Main output (V1): 10 to 100% with 10% to 100% balanced on auxiliaries. Auxiliary outputs (V2 and V3): 10% to 100% balanced on all outputs.*
4) *Cross regulation for dual output: asymmetrical load 25%/100% FL. Cross regulation for triple output: Main output 100% load, auxiliary 100%, other auxiliary 25% to 100%. Auxiliary outputs (V2 and V3): main output 100% load, auxiliary 100%, other auxiliary 25% to 100% or main output 25%, auxiliary 25%, other auxiliary 25% to 100%.*
5) *The models of ?????? are specified with a 1uF ceramic output capacitors.*
6) *Please add an external filter at converter input terminals when measuring input reflected ripple, as Fig 1. L: Simulated source impedance of 12µH. C: Nippon chemi-con KMF series 220µF/100V.*
7) *The ON/OFF control pin voltage is referenced to -Vin.*
8) *Switching frequency for dual output: master (5Vo) 300KHz slave (3.3Vo) 500KHz.*
9) *BELLCORE TR-NWT-000332. Case 1: 50% stress, temperature at 40°C (ground fixed and controlled environment).*
10) *Heat sink is optional and P/N: 7G-0026A.*
11) *An external filter capacitor is required for EMC testing. The capacitor should be capable of handling 1A ripple current for 12V/24V/48V models. Powerbox suggest Nippon chemi-con KFM series, 220µF/100V, ESR 90mΩ.*
12) *Any condition of dual output (3.3V/5V) rated Iout current, not to exceed 8A of total output currents. The product safety approval pending.*
13) *Maximum value at nominal input voltage and full load.*
14) *Typical value at nominal input voltage and full load.*
15) *Test by minimum Vin and constant resistive load.*

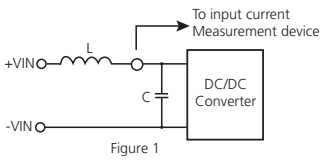

Figure 1

Industrial Line – T40A Series

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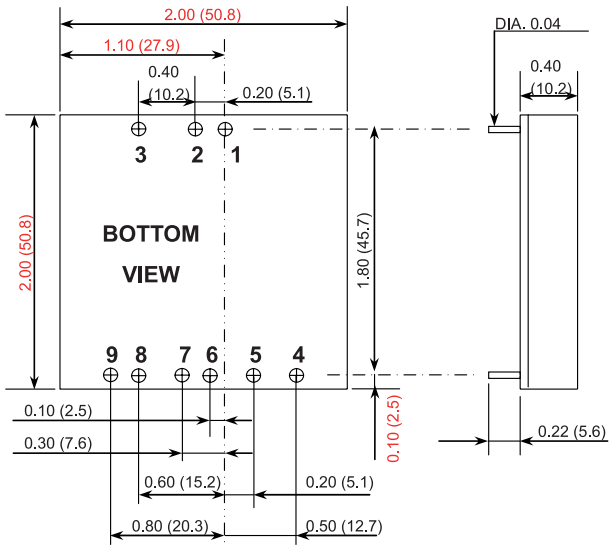
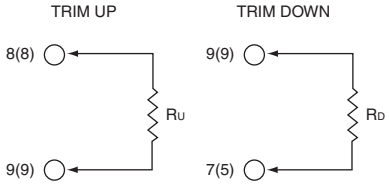


1. All dimensions in Inches (mm)
   Tolerance: X.XX±0.02 (X.X±0.5)
2. Pin pitch tolerance ±0.014(0.35)

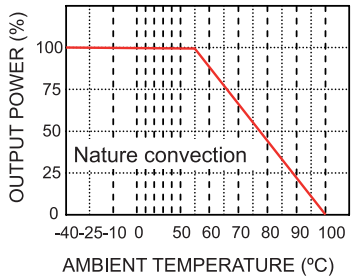
PIN CONNECTION				
PIN	SINGLE	DUAL	DUAL POSITIVE	TRIPLE
1	+INPUT	+INPUT	+INPUT	+INPUT
2	–INPUT	–INPUT	–INPUT	–INPUT
3	CTRL	CTRL	CTRL	CTRL
4	NC	NO PIN	3.3V	+AUX
5	–SENSE (note 1)	+VO	3.3V RTN (COM)	COMMON
6	+SENSE (note 1)	COM	NC	–AUX
7	+OUTPUT	COM	NC	+OUTPUT
8	–OUTPUT	–VO1	5V	–OUTPUT (COM)
9	TRIM	TRIM	5V RTN (COM)	NC

EXTERNAL OUTPUT TRIMMING

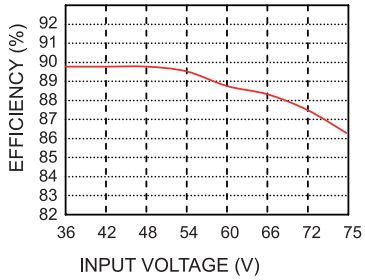
Output can be externally trimmed by using the method shown below. ( ) for dual output trim.



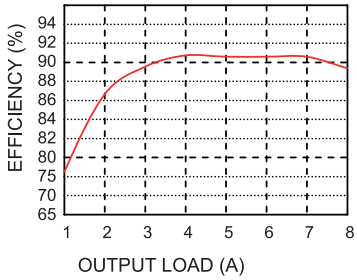
PME40-48S05
Derating Curve



PME40-48S05
Efficiency VS Input voltage



PME40-48S05
Efficiency VS Output load



Specifications are subject to change without notice.