M40A Series 40W 4:1 Regulated Single & Dual output



Features

- Wide 4:1 Input Range
- Full SMD Technology
- 1600 VDC Isolation
- Efficiency up to 92%
- -40 ~ 85°C Operation Temperature Range
- Adjustable Output Voltage
- Remote On/Off Control (CTRL)
- Continuous Short Circuit Protection
- Over Current Protection
- Over Voltage Protection
- Over Temperature Protection
- Soft Start



The M40A series is a family of cost effective 40W single & dual output DC-DC converters. These converters combine nickle-coated copper package in a 2"x2" case with high performance features such as Active Clamp Technology, continuous short circuit protection with automatic restart and tight line / load regulation. Devices are encapsulated using flame retardant resin. Input voltages of 24 and 48 with output voltage of 3.3, 5, 12, 15, \pm 12, \pm 15Vdc. High performance features include high efficiency operation up to 92% and output voltage accuracy of \pm 1% maximum.

ALL SPECIFICATIONS ARE TYPICAL AT 25°C, NOMINAL INPUT AND FULL LOAD UNLESS OTHERWISE NOTED.

Output Voltage Accuracy±1%Output Voltage Adjustability (Trim) (1)±10%, max.Maximum Output CurrentSee tableLine Regulation±0.5%, max.Load Regulation (Dual, lo=1% to 100%)±0.5%, max.Load Regulation (Dual output) (2)±5%Ripple&Noise (3)3.3V&5.0V output:50mVpk-pk, max.Dual output:150mVpk-pk, max.Dual output:150mVpk-pk, max.All other output:75mVpk-pk, max.3.3V output3.9VOver Voltage Protection12V output12V output15V(Zener diode clamp)15V output418V±12V output±12V output±18VOver Load ProtectionIndefinite(hiccup) (Automatic Recovery)Short Circuit ProtectionIndefinite(hiccup) (Automatic Recovery)Temperature Coefficient±0.02%/°CCapacitive Load (4)See tableTransient Recovery Time (5)250us, typ.Transient Recovery Time (5)250us, typ.Transient Response Deviation(5)±3%, max.INPUT SPECIFICATIONSInput Voltage RangeInput Voltage RangeSee tableUnder Voltage LockoutPi Type1nput Current(Full-Load)See table, typ.Input Current(Full-Load)See table, typ.Input Current(Full-Load)See table, typ.Input Current(Full-Load)See table, typ.Input Reflected Ripple Current 6)20mApk-pk, typ.Remote On/Off (CTRL)(7) ON: 3.0 12Vdc or open circuit OFF: 0 1.2Vdc or Short circuit pin2	OUTPUT SPECIFICA	TIONS			
Output Voltage Adjustability (Trim) (1)±10%, max.Maximum Output CurrentSee tableLine Regulation±0.5%, max.Load Regulation (Single, lo=0% to 100%)±0.5%, max.Load Regulation (Dual, lo=1% to 100%)±1.0%, max.Cross Regulation (Dual Output) (2)±5%Ripple&Noise (3)3.3V&5.0V output:50mVpk-pk, max.Dual output:150mVpk-pk, max.All other output:75mVpk-pk, max.3.3V output3.9V5V output6.2VOver Voltage Protection12V output15V±15V±12V output±18VOver Load Protection130% of FL, typ.Short Circuit ProtectionIndefinite(hiccup)(Automatic Recovery)150.02%/°CCapacitive Load (4)See tableTransient Recovery Time (5)250us, typ.Transient Recovery Time (5)250us, typ.24V ModesModule ON / OFF8.6Vdc / 7.9Vdc, typ.48V ModesModule ON / OFF9.78V ModesModule ON / OFF10put FilterPi TypeInput Current(No-Load)See table10put FilterPi TypeInput Current(No-Load)See table, max.10put Reflected Ripple Current(6)20mApk-pk, typ.Remote On/Off (CTRL)(7)ON: 3.0 12Vdc or open circuit OFF: 0 1.2Vdc or open circuit OFF: 0 1.2Vdc or Short circuit pin2 and pin 3 OFF idle current: 5.0 mA, typ.PirtyRelecter LSPECIFICATIONSCase Material ON: 3.0 12Vdc or open circuit OFF: 0 1.2Vdc	Output Voltage Accuracy	±1%			
Maximum Output CurrentSee tableLine Regulation±0.5%, max.Load Regulation (Single, lo=0% to 100%)±0.5%, max.Load Regulation (Dual, lo=1% to 100%)±1.0%, max.Cross Regulation (Dual Output) (2)±5%Ripple&Noise (3)3.3V&5.0V output:50mVpk-pk, max.Dual output:150mVpk-pk, max.All other output:75mVpk-pk, max.3.3V output6.2VOver Voltage Protection12V output15V±12V output±12V output±15V±15V output±18VOver Load Protection130% of FL, typ.Short Circuit Protection130% of FL, typ.Short Circuit Protection130% of FL, typ.Short Circuit Protection130% of FL, typ.Imperature Coefficient±0.02%/°CCapacitive Load (4)See tableTransient Response Deviation(5)±3%, max.INPUT SPECIFICATIONSIndefinite(hiccup)Input Voltage RangeSee tableUnder Voltage Lockout24V Modes Module ON / OFF24V Modes Module ON / OFF8.6Vdc / 7.9Vdc, typ.48V Modes Module ON / OFF8.6Vdc / 7.9Vdc, typ.Input Current(No-Load)See table, max.Input Reflected Ripple Current(6)20mApk-pk, typ.Input Current(Full-Load)See table, max.Input Reflected Ripple Current(6)20mApk-pk, typ.Remote On/Off (CTRL)(7)ON: 3.0 12Vdc or open circuit OFF: 0 1.2Vdc or Short circuit pin2 and pin 3 OFF idle current: 5.0 mA, typ.PhySICAL SPECIFICATIONSNickel-coat			±10%, max.		
Line Regulation ±0.5%, max. Load Regulation (Single, lo=0% to 100%) ±0.5%, max. Load Regulation (Dual, lo=1% to 100%) ±1.0%, max. Cross Regulation (Dual Output) (2) ±5% Ripple&Noise (3) 3.3V&5.0V output: 50mVpk-pk, max. Dual output: 150mVpk-pk, max. All other output: 75mVpk-pk, max. All other output: 75mVpk-pk, max. All other output: 75mVpk-pk, max. All other output: 75mVpk-pk, max. SV output 6.2V Over Voltage Protection 12V output 15V (Zener diode clamp) 15V output 18V ±12V output ±15V ±12V output ±15V 215V output ±18V Over Load Protection 130% of FL, typ. Short Circuit Protection 130% of FL, typ. Short Circuit Protection 130% of FL, typ. Transient Recovery Time (5) 250us, typ. Transient Recovery Time (5) ±3%, max. INPUT SPECIFICATIONS Input Voltage Lockout 24V Modes Module ON / OFF 8.6Vdc / 7.9Vdc, typ. 48V Modes Module ON / OFF 17.8Vdc / 16Vdc, typ. Start up Time 25mS, typ. (Nominal Vin and constant resistive load) Input Current(No-Load) See table, typ. Input Current(No-Load) See table, typ. PHYSICAL SPECIFICATIONS Case Material Olom Arby. PHYSICAL SPECIFICATIONS Case Material Olom Brass Solder-coated Copper Pin Material OP1.0mm Brass Solder-coated Copper Pin Material OP1.0mm Brass Solder-coated Copper Pin Material OP1.0mm Brass Solder-coated Copper Phy Kight Sec Solag			See table		
Load Regulation (Dual, Jo=1% to 100%)±1.0%, max.Cross Regulation (Dual Output) (2)±5%Ripple&Noise (3)3.3V&5.0V output:50mVpk-pk, max.Dual output:150mVpk-pk, max.All other output:75mVpk-pk, max.3.3V output3.9V5V output6.2VOver Voltage Protection12V output±12V output±15V±12V output±18VOver Load Protection130% of FL, typ.Short Circuit Protection130% of FL, typ.Short Circuit Protection130% of FL, typ.Short Circuit Protection110definite(hiccup) (Automatic Recovery)Temperature Coefficient±0.02%/°CCapacitive Load (4)See tableTransient Recovery Time (5)250us, typ.Transient Response Deviation(5)±3%, max.INPUT SPECIFICATIONSInput Voltage RangeInput Voltage Lockout25mS, typ.24V ModesModule ON / OFF8.6Vdc / 7.9Vdc, typ.48V Modes25mS, typ.Input FilterPi TypeInput Current(No-Load)See table, max.Input Current(No-Load)See table, max.Input Reflected Ripple Current (6)20mApk-pk, typ.Case MaterialNickel-coated CopperPHYSICAL SPECIFICATIONSOFF: 0, 1.2Vdc or open circuit OFF: 0, 1.2Vdc or open circuit OFF: 0, 1.2Vdc or open circuit Pi TypeInput Reflected Ripple Current (6)See table, max.OFF: 0, 1.2Vdc or open circuit OFF: 0, 1.2Vdc or open circuit OFF: 0, 1.2Vdc or open circuit <b< td=""><td colspan="2"></td><td>±0.5%, max.</td></b<>			±0.5%, max.		
Cross Regulation (Dual Output) (2)±5%Ripple&Noise (3)3.3V&5.0V output:50mVpk-pk, max.Dual output:150mVpk-pk, max.All other output:75mVpk-pk, max.3.3V output3.9V5V output6.2VOver Voltage Protection12V output12V output15V(Zener diode clamp)15V output±12V output±15V±12V output±15V±12V output±15V±15V output±15V±15V output±18V±12V output±18VOver Load ProtectionIndefinite(hiccup) (Automatic Recovery)Temperature Coefficient±0.02%°CCapacitive Load (4)See tableTransient Recovery Time (5)250us, typ.Transient Response Deviation(5)±3%, max.INPUT SPECIFICATIONSInput Voltage RangeSee tableUnder Voltage Lockout24V Modes24V ModesModule ON / OFF8.6Vdc / 7.9Vdc, typ.48V ModesSee table, typ.Input FilterPi TypeInput Current(No-Load)See table, max.Input Current(Full-Load)See table, max.Input Reflected Ripple Current(6)20mApk-pk, typ.Case MaterialNickel-coated CopperPHYSICAL SPECIFICATIONSEable, max.Case MaterialNickel-coated CopperPin Material\$0.10mm Brass Solder-coatedPotting Material\$0.10mm Brass Solder-coatedPotting MaterialEpoxy (UL94V-0 rated)Weight	Load Regulation(Single,	lo=0% to 100%	± 0.5%, max.		
Ripple&Noise (3)3.3V&5.0V output: Dual output:50mVpk-pk, max. 150mVpk-pk, max.All other output:150mVpk-pk, max.3.3V output3.9V5V output6.2VOver Voltage Protection12V output12V output15V(Zener diode clamp)15V output±12V output±15V±12V output±118VOver Load Protection130% of FL, typ.Short Circuit Protection130% of FL, typ.Short Circuit Protection130% of FL, typ.Short Circuit ProtectionIndefinite(hiccup) (Automatic Recovery)Temperature Coefficient±0.02%/°CCapacitive Load (4)See tableTransient Recovery Time (5)250us, typ.Transient Response Deviation(5)±3%, max.INPUT SPECIFICATIONSInput Voltage RangeUnder Voltage Lockout24V Modes Module ON / OFF24V Modes Module ON / OFF8.6Vdc / 7.9Vdc, typ.48V Modes Module ON / OFF17.8Vdc / 16Vdc, typ.48V Modes Module ON / OFF20mApk-k, typ.Input FilterPi TypeInput Current(No-Load)See table, max.Input Reflected Ripple Current(6)20mApk-k, typ.Remote On/Off (CTRL)(7) ON: 3.0 12Vdc or open circuit OFF: 0 1.2Vdc or Short circuit pin2 and pin 3 OFF idle current: 5.0 mA, typ.PHYSICAL SPECIFICATIONSCase MaterialNickel-coated CopperPin Material01.0mm Brass Solder-coatedPotting MaterialQ1.0mm Brass Solder-coatedPotting MaterialEpoxy (UL94	Load Regulation(Dual, lo	=1% to 100%)	±1.0%, max.		
Dual output:150mVpk-pk, max.All other output:75mVpk-pk, max.3.3V output3.9V5V output6.2VOver Voltage Protection12V output(Zener diode clamp)15V output15V output18V±12V output±15V±12V output±18VOver Load Protection130% of FL, typ.Short Circuit ProtectionIndefinite(hiccup)(Automatic Recovery)100 (Automatic Recovery)Temperature Coefficient±0.02%/°CCapacitive Load (4)See tableTransient Recovery Time (5)250us, typ.Transient Response Deviation(5)±3%, max.INPUT SPECIFICATIONSIndefinite(hiccup)Inder Voltage Lockout24V Modes24V ModesModule ON / OFF8.6Vdc / 7.9Vdc, typ.48V ModesSee tableInput Current(No-Load)See table, typ.Input Current(No-Load)See table, max.Input Reflected Ripple Current (6)20mApk-pk, typ.Remote On/Off (CTRL)(7)ON: 3.0 12Vdc or open circuit OFF: 0 1.2Vdc or Short circuit pin2 and pin 3 OFF idle current: 5.0 mA, typ.PHYSICAL SPECIFICATIONSCase MaterialCase Material01.0mm Brass Solder-coated Potting MaterialPotting Material€poxy (UL94V-0 rated)Weight65.0g	Cross Regulation (Dual C	output) (2)	±5%		
All other output:75mVpk-pk, max.3.3V output3.9V5V output6.2VOver Voltage Protection12V output12V output15V(Zener diode clamp)15V output±12V output±15V±12V output±15V±15V output±18VOver Load Protection130% of FL, typ.Short Circuit ProtectionIndefinite(hiccup) (Automatic Recovery)Temperature Coefficient±0.02%/°CCapacitive Load (4)See tableTransient Recovery Time (5)250us, typ.Transient Response Deviation(5)±3%, max.INPUT SPECIFICATIONS1004/20, typ.Input Voltage RangeSee tableUnder Voltage Lockout24V Modes24V ModesModule ON / OFF48V ModesModule ON / OFF10put FilterPi TypeInput Current(No-Load)See table, typ.Input FilterPi TypeInput Current(No-Load)See table, typ.Input Reflected Ripple Current(6)20mApk-pk, typ.OFF idle current: 5.0 mA, typ.OFF idle current: 5.0 mA, typ.PHYSICAL SPECIFICATIONSCase MaterialCase Material0ickel-coated CopperPin Material01.0mm Brass Solder-coatedPotting Material01.0mm Brass Solder-coatedPotting Material65.0g	Ripple&Noise (3) 3.3V&	5.0V output:	50mVpk-pk, max.		
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5V output6.2VOver Voltage Protection12V output15V(Zener diode clamp)15V output18V±12V output±15V±12V output±15V±12V output±18VOver Load Protection130% of FL, typ.Short Circuit ProtectionIndefinite(hiccup)(Automatic Recovery)(Automatic Recovery)Temperature Coefficient±0.02%/°CCapacitive Load (4)See tableTransient Recovery Time (5)250us, typ.Transient Response Deviation(5)±3%, max.INPUT SPECIFICATIONSInput Voltage RangeUnder Voltage LockoutSee tableUnder Voltage LockoutSee tableValve ModesModule ON / OFF24V ModesModule ON / OFF24V ModesModule ON / OFF24V ModesModule ON / OFF24V ModesModule ON / OFF25mS, typ.(Nominal Vin and constant resistive load)Input FilterPi TypeInput Current(No-Load)See table, max.Input Current(No-Load)See table, max.Input Reflected Ripple Current(6)20mApk-pk, typ.Remote On/Off (CTRL)(7)ON: 3.0 12Vdc or open circuit OFF: 0 1.2Vdc or open	All	other output:	75mVpk-pk, max.		
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(Zener diode clamp)15V output18V±12V output±15V±12V output±15V±15V output±18VOver Load Protection130% of FL, typ.Short Circuit ProtectionIndefinite(hiccup) (Automatic Recovery)Temperature Coefficient±0.02%/°CCapacitive Load (4)See tableTransient Recovery Time (5)250us, typ.Transient Response Deviation(5)±3%, max.INPUT SPECIFICATIONSInput Voltage RangeSee tableUnder Voltage Lockout24V Modes24V ModesModule ON / OFF48V ModesModule ON / OFF48V ModesModule ON / OFF48V ModesModule ON / OFF1nput FilterPi TypeInput Current(No-Load)See table, typ.Input Current(No-Load)See table, typ.Input Current(Full-Load)See table, typ.Input Reflected Ripple Current(6)20mApk-pk, typ.ON: 3.0 12Vdc or open circuit OFF: 0 1.2Vdc or Short circuit pin2 and pin 3 OFF idle current: 5.0 mA, typ.PHYSICAL SPECIFICATIONSCase MaterialNickel-coated CopperPin MaterialΦ1.0mm Brass Solder-coatedPotting MaterialEpoxy (UL94V-0 rated)Weight65.0g		5V output	6.2V		
±12V output±15V±15V output±15V±15V output±18VOver Load Protection130% of FL, typ.Short Circuit ProtectionIndefinite(hiccup) (Automatic Recovery)Temperature Coefficient±0.02%/°CCapacitive Load (4)See tableTransient Recovery Time (5)250us, typ.Transient Response Deviation(5)±3%, max.INPUT SPECIFICATIONSInput Voltage RangeSee tableUnder Voltage Lockout24V Modes24V ModesModule ON / OFF8.6Vdc / 7.9Vdc, typ.48V ModesModule ON / OFF17.8Vdc / 16Vdc, typ.18ut up Time25mS, typ.(Nominal Vin and constant resistive load)Input FilterInput Gurrent(No-Load)See table, typ.Input Current(No-Load)See table, typ.Input Reflected Ripple Current(6)20mApk-pk, typ.0N: 3.0 12Vdc or open circuit OFF: 0 1.2Vdc or Short circuit pin2 and pin 3 OFF idle current: 5.0 mA, typ.PHYSICAL SPECIFICATIONSCase MaterialNickel-coated CopperPin Material01.0mm Brass Solder-coatedPotting Material41.0mm Brass Solder-coatedPotting MaterialEpoxy (UL94V-0 rated)Weight65.0g		12V output	15V		
±15V output±18VOver Load Protection130% of FL, typ.Short Circuit ProtectionIndefinite(hiccup) (Automatic Recovery)Temperature Coefficient±0.02%/°CCapacitive Load (4)See tableTransient Recovery Time (5)250us, typ.Transient Response Deviation(5)±3%, max.INPUT SPECIFICATIONSInput Voltage RangeSee tableUnder Voltage Lockout24V Modes24V ModesModule ON / OFF48V ModesModule ON / OFF48V Modes25mS, typ.Input Filter25mS, typ.Input FilterPi TypeInput Current(No-Load)See table, max.Input Reflected Ripple Current(6)20mApk-pk, typ.N: 3.0 12Vdc or open circuit OFF: 0 1.2Vdc or Short circuit pin2 and pin 3 OFF idle current: 5.0 mA, typ.PHYSICAL SPECIFICATIONSCase MaterialNickel-coated CopperPin MaterialΦ1.0mm Brass Solder-coatedPotting MaterialEpoxy (UL94V-0 rated)Weight65.0g	(Zener diode clamp)	15V output	18V		
Over Load Protection130% of FL, typ.Short Circuit ProtectionIndefinite(hiccup) (Automatic Recovery)Temperature Coefficient±0.02%/°CCapacitive Load (4)See tableTransient Recovery Time (5)250us, typ.Transient Response Deviation(5)±3%, max.INPUT SPECIFICATIONSInput Voltage RangeSee tableUnder Voltage Lockout24V Modes Module ON / OFF8.6Vdc / 7.9Vdc, typ.48V Modes Module ON / OFF17.8Vdc / 16Vdc, typ.1nput FilterPi TypeInput Current(No-Load)See table, max.Input Current(No-Load)See table, max.Input Reflected Ripple Current(6)20mApk-pk, typ.Remote On/Off (CTRL)(7) OFF: 0 1.2Vdc or open circuit OFF: 0 1.2Vdc or Short circuit pin2 and pin 3 OFF idle current: 5.0 mA, typ.PHYSICAL SPECIFICATIONSCase MaterialNickel-coated CopperPin MaterialФ1.0mm Brass Solder-coatedPotting MaterialEpoxy (UL94V-0 rated)Weight65.0g		±12V output	±15V		
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International of the second	Over Load Protection		130% of FL, typ.		
Capacitive Load (4)See tableTransient Recovery Time (5)250us, typ.Transient Response Deviation(5)±3%, max.INPUT SPECIFICATIONSInput Voltage RangeSee tableUnder Voltage Lockout24V ModesModule ON / OFF8.6Vdc / 7.9Vdc, typ.24V ModesModule ON / OFF17.8Vdc / 16Vdc, typ.48V ModesModule ON / OFF17.8Vdc / 16Vdc, typ.48V ModesModule ON / OFF17.8Vdc / 16Vdc, typ.Start up Time25mS, typ.(Nominal Vin and constant resistive load)Input FilterInput FilterPi TypeInput Current(No-Load)See table, typ.Input Current(Full-Load)See table, max.Input Reflected Ripple Current(6)20mApk-pk, typ.Remote On/Off (CTRL)(7)ON: 3.0 12Vdc or open circuit OFF: 0 1.2Vdc or Short circuit pin2 and pin 3 OFF idle current: 5.0 mA, typ.PHYSICAL SPECIFICATIONSCase MaterialNickel-coated CopperPin MaterialФ1.0mm Brass Solder-coatedPotting MaterialEpoxy (UL94V-0 rated)Weight65.0g	Short Circuit Protection				
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Transient Response Deviation(5)±3%, max.INPUT SPECIFICATIONSInput Voltage RangeSee tableUnder Voltage Lockout24V ModesModule ON / OFF8.6Vdc / 7.9Vdc, typ.24V ModesModule ON / OFF17.8Vdc / 16Vdc, typ.24V ModesModule ON / OFF17.8Vdc / 16Vdc, typ.24V ModesModule ON / OFF17.8Vdc / 16Vdc, typ.25mS, typ.(Nominal Vin and constant resistive load)Input FilterInput FilterPi TypeInput Current(No-Load)See table, typ.Input Current(Full-Load)See table, max.Input Reflected Ripple Current(6)20mApk-pk, typ.Remote On/Off (CTRL)(7)ON: 3.0 12Vdc or open circuit OFF: 0 1.2Vdc or Short circuit pin2 and pin 3 OFF idle current: 5.0 mA, typ.PHYSICAL SPECIFICATIONSCase MaterialNickel-coated CopperPin MaterialФ1.0mm Brass Solder-coatedPotting MaterialEpoxy (UL94V-0 rated)Weight65.0g	Capacitive Load (4)		See table		
INPUT SPECIFICATIONS Input Voltage Range See table Under Voltage Lockout 24V Modes Module ON / OFF 8.6Vdc / 7.9Vdc, typ. 24V Modes Module ON / OFF 17.8Vdc / 16Vdc, typ. 48V Modes Module ON / OFF 17.8Vdc / 16Vdc, typ. Start up Time 25mS, typ. (Nominal Vin and constant resistive load) Input Filter Pi Type Input Filter Pi Type Input Current(No-Load) See table, typ. Input Current(Full-Load) See table, max. Input Reflected Ripple Current(6) 20mApk-pk, typ. Remote On/Off (CTRL)(7) ON: 3.0 12Vdc or open circuit OFF: 0 1.2Vdc or Short circuit pin2 and pin 3 OFF idle current: 5.0 mA, typ. OFF idle current: 5.0 mA, typ. PHYSICAL SPECIFICATIONS Case Material Nickel-coated Copper Pin Material Ф1.0mm Brass Solder-coated Potting Material Epoxy (UL94V-0 rated) Weight 65.0g	Transient Recovery Time	(5)	250us, typ.		
Input Voltage RangeSee tableUnder Voltage Lockout24V ModesModule ON / OFF8.6Vdc / 7.9Vdc, typ.24V ModesModule ON / OFF17.8Vdc / 16Vdc, typ.48V ModesModule ON / OFF17.8Vdc / 16Vdc, typ.48V ModesModule ON / OFF17.8Vdc / 16Vdc, typ.Start up Time25ms, typ.(Nominal Vin and constant resistive load)25ms, typ.Input FilterPi TypeInput Current(No-Load)See table, typ.Input Current(Full-Load)See table, max.Input Reflected Ripple Current(6)20mApk-pk, typ.Remote On/Off (CTRL)(7)ON: 3.0 12Vdc or open circuit OFF: 0 1.2Vdc or Short circuit pin2 and pin 3 OFF idle current: 5.0 mA, typ.PHYSICAL SPECIFICATIONSCase MaterialNickel-coated CopperPin MaterialФ1.0mm Brass Solder-coatedPotting MaterialEpoxy (UL94V-0 rated)Weight65.0g	Transient Response Deviation(5)		±3%, max.		
Under Voltage Lockout24V ModesModule ON / OFF8.6Vdc / 7.9Vdc, typ.48V ModesModule ON / OFF17.8Vdc / 16Vdc, typ.Start up Time25mS, typ.(Nominal Vin and constant resistive load)Input FilterPi TypeInput Current(No-Load)See table, typ.Input Current(Full-Load)See table, max.Input Reflected Ripple Current(6)20mApk-pk, typ.Remote On/Off (CTRL)(7)ON: 3.0 12Vdc or open circuit OFF: 0 1.2Vdc or Short circuit pin2 and pin 3 OFF idle current: 5.0 mA, typ.PHYSICAL SPECIFICATIONSCase MaterialNickel-coated CopperPin MaterialФ1.0mm Brass Solder-coatedPotting MaterialEpoxy (UL94V-0 rated)Weight65.0g	INPUT SPECIFICATIO	ONS			
Under Voltage Lockout24V ModesModule ON / OFF8.6Vdc / 7.9Vdc, typ.48V ModesModule ON / OFF17.8Vdc / 16Vdc, typ.Start up Time25mS, typ.(Nominal Vin and constant resistive load)Input FilterPi TypeInput Current(No-Load)See table, typ.Input Current(Full-Load)See table, max.Input Reflected Ripple Current(6)20mApk-pk, typ.Remote On/Off (CTRL)(7)ON: 3.0 12Vdc or open circuit OFF: 0 1.2Vdc or Short circuit pin2 and pin 3 OFF idle current: 5.0 mA, typ.PHYSICAL SPECIFICATIONSCase MaterialNickel-coated CopperPin MaterialФ1.0mm Brass Solder-coatedPotting MaterialEpoxy (UL94V-0 rated)Weight65.0g	Input Voltage Range		See table		
48V Modes Module ON / OFF 17.8Vdc / 16Vdc, typ. Start up Time 25mS, typ. (Nominal Vin and constant resistive load) Input Filter Input Filter Pi Type Input Current(No-Load) See table, typ. Input Current(Full-Load) See table, max. Input Reflected Ripple Current(6) 20mApk-pk, typ. Remote On/Off (CTRL)(7) ON: 3.0 12Vdc or open circuit OFF: 0 1.2Vdc or Short circuit pin2 and pin 3 OFF idle current: 5.0 mA, typ. PHYSICAL SPECIFICATIONS Case Material Potting Material Ф1.0mm Brass Solder-coated Potting Material Epoxy (UL94V-0 rated) Weight 65.0g					
48V ModesModule ON / OFF17.8Vdc / 16Vdc, typ.Start up Time25mS, typ.(Nominal Vin and constant resistive load)Input FilterInput FilterPi TypeInput Current(No-Load)See table, typ.Input Current(Full-Load)See table, max.Input Reflected Ripple Current(6)20mApk-pk, typ.Remote On/Off (CTRL)(7)ON: 3.0 12Vdc or open circuit OFF: 0 1.2Vdc or Short circuit pin2 and pin 3 OFF idle current: 5.0 mA, typ.PHYSICAL SPECIFICATIONSCase MaterialNickel-coated CopperPin MaterialФ1.0mm Brass Solder-coatedPotting MaterialEpoxy (UL94V-0 rated)Weight65.0g	24V Modes Mo	dule ON / OFF	8.6Vdc / 7.9Vdc. tvp.		
Start up Time25mS, typ.(Nominal Vin and constant resistive load)Input FilterPi TypeInput Current(No-Load)See table, typ.Input Current(Full-Load)See table, max.Input Reflected Ripple Current(6)20mApk-pk, typ.Remote On/Off (CTRL)(7)ON: 3.0 12Vdc or open circuit OFF: 0 1.2Vdc or Short circuit pin2 and pin 3 OFF idle current: 5.0 mA, typ.PHYSICAL SPECIFICATIONSCase MaterialNickel-coated Copper Pin MaterialPotting MaterialEpoxy (UL94V-0 rated) 65.0g	48V Modes Mo	dule ON / OFF			
(Nominal Vin and constant resistive load) Input Filter Pi Type Input Current(No-Load) See table, typ. Input Current(Full-Load) See table, max. Input Reflected Ripple Current(6) 20mApk-pk, typ. Remote On/Off (CTRL)(7) ON: 3.0 12Vdc or open circuit OFF: 0 1.2Vdc or Short circuit pin2 and pin 3 OFF idle current: 5.0 mA, typ. PHYSICAL SPECIFICATIONS Case Material Nickel-coated Copper Pin Material Φ1.0mm Brass Solder-coated Potting Material Epoxy (UL94V-0 rated) Weight 65.0g	Start up Time				
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Input Current(Full-Load)See table, max.Input Reflected Ripple Current(6)20mApk-pk, typ.Remote On/Off (CTRL)(7)ON: 3.0 12Vdc or open circuitOFF: 0 1.2Vdc or Short circuit pin2 and pin 3OFF idle current: 5.0 mA, typ.PHYSICAL SPECIFICATIONSCase MaterialPotting MaterialΦ1.0mm Brass Solder-coatedPotting MaterialEpoxy (UL94V-0 rated)Weight65.0g	and the second	,	Pi Type		
Input Current(Full-Load)See table, max.Input Reflected Ripple Current(6)20mApk-pk, typ.Remote On/Off (CTRL)(7)ON: 3.0 12Vdc or open circuit OFF: 0 1.2Vdc or Short circuit pin2 and pin 3 OFF idle current: 5.0 mA, typ.PHYSICAL SPECIFICATIONSCase MaterialNickel-coated CopperPin MaterialΦ1.0mm Brass Solder-coatedPotting MaterialEpoxy (UL94V-0 rated)Weight65.0g	Input Current(No-Load)		See table, typ.		
Remote On/Off (CTRL)(7) ON: 3.0 12Vdc or open circuit OFF: 0 1.2Vdc or Short circuit pin2 and pin 3 OFF idle current: 5.0 mA, typ. PHYSICAL SPECIFICATIONS Case Material Nickel-coated Copper Pin Material Φ1.0mm Brass Solder-coated Potting Material Epoxy (UL94V-0 rated) Weight 65.0g			See table, max.		
ON: 3.0 12Vdc or open circuit OFF: 0 1.2Vdc or Short circuit pin2 and pin 3 OFF idle current: 5.0 mA, typ. PHYSICAL SPECIFICATIONS Case Material Nickel-coated Copper Pin Material Ф1.0mm Brass Solder-coated Potting Material Epoxy (UL94V-0 rated) Weight 65.0g	Input Reflected Ripple Cu	rrent(6)	20mApk-pk, typ.		
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Case MaterialNickel-coated CopperPin MaterialΦ1.0mm Brass Solder-coatedPotting MaterialEpoxy (UL94V-0 rated)Weight65.0g			. ,		
Pin MaterialΦ1.0mm Brass Solder-coatedPotting MaterialEpoxy (UL94V-0 rated)Weight65.0g	PHYSICAL SPECIFIC	ATIONS			
Potting MaterialEpoxy (UL94V-0 rated)Weight65.0g	Case Material		Nickel-coated Copper		
Weight 65.0g	Pin Material		Φ1.0mm Brass Solder-coated		
танана и станана и с Станана и станана и ст					
			Epoxy (UL94V-0 rated)		
Dimensions 2.00"x2.00"x0.40"	Potting Material		· · · /		

GENERAL SPECIFICATIONS	
Efficiency	See table, typ.
I/O Isolation Voltage(60sec)	
Input/Output	1600Vdc
Case/Input & Output	1600Vdc
Isolation Resistance	1000 MΩ, min.
Isolation Capacitance	2500 pF, max.
Switching frequency	270kHz, typ.
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>151 khrs
Safety Standard	IEC/EN 60950-1, 62368-1
-	UL/cUL 60950-1 , 62368-1
Safety Approvals	EN 60950-1, 62368-1

EMC CHARACTERISTICS					
Radiated Emissions(8)	EN55032	CLASSA			
Conducted Emissions(8)	EN55032	CLASSA			
ESD	IEC 61000-4-2	Perf. Criteria A			
RS	IEC 61000-4-3	Perf. Criteria A			
EFT(9)	IEC 61000-4-4	Perf. Criteria A			
Surge (9)	IEC 61000-4-5	Perf. Criteria A			
CS	IEC 61000-4-6	Perf. Criteria A			
PFMF	IEC 61000-4-8	Perf. Criteria A			
ENVIRONMENTAL SPECIFICATIONS					
Operating Ambient Temperature	-40°C ~ +85	5°C(See Derating Curve)			
	-40°C ~	+55°C(For 100% load)			
Maximum Case Temperature		105°C			
Storage Temperature -55°C ~ +					
Over Temperature Protection (Case	e)	110°C, typ.			
Cooling		Nature Convection			

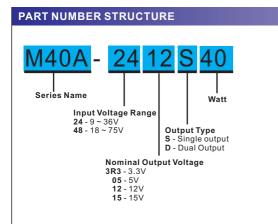
ABSOLUTE SPECIFICATIONS (10) These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

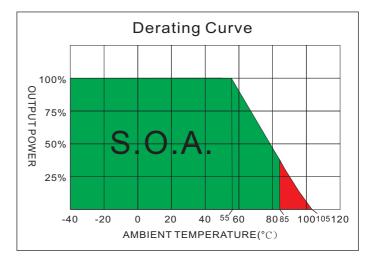
Input Surge Voltage(100mS)	
24 Models	50 Vdc, max.
48 Models	100 Vdc, max.
Soldering Temperature	260°C, max.

 $(1.5 mm \ from \ case \ 10 sec \ max.)$



M40A - 40W 4:1 Regulated Single & Dual output





MODEL SELECTION GUIDE

	INPUT	INPUT	Current	OUTPUT	OUTPU ⁻	T Current		
MODEL NUMBER	Voltage Range	No-Load	Full Load	Voltage	Min. load	Full load	EFFICIENCY	Capacitor
	(Vdc)	(mA)	(mA)	(Vdc)	(mA)	(mA)	@FL(%)	Load(uF)
M40A-243R3S40	9-36	80	1598	3.3	0	10000	89	25000
M40A-2405S40	9-36	100	1893	5	0	8000	91	13000
M40A-2412S40	9-36	50	1925	12	0	3350	90	2300
M40A-2415S40	9-36	50	1904	15	0	2650	90	1500
M40A-483R3S40	18-75	60	799	3.3	0	10000	89	25000
M40A-4805S40	18-75	60	936	5	0	8000	92	13000
M40A-4812S40	18-75	30	963	12	0	3350	90	2300
M40A-4815S40	18-75	30	941	15	0	2650	91	1500
M40A-2412D40	9-36	60	1919	12	0	1650	89	1200
M40A-2415D40	9-36	60	1962	15	0	1350	89	750
M40A-4812D40	18-75	30	948	12	0	1650	90	1200
M40A-4815D40	18-75	30	970	15	0	1350	90	750

NOTE

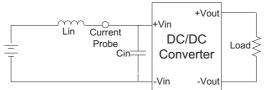
- 1. For the Single output: Maximum output deviation is 10% inclusive of remote sense and trim. If remote sense is not being used,
- the +sense should be connected to its corresponding +OUTPUT and likewise the -sense should be connected to its corresponding -OUTPUT. 2. One load is 25% to 100% load, the other load is 100% load, the output voltage variable rate is within $\pm 5\%$.
- 3. Measured with 20MHz bandwidth and 1.0uF ceramic capacitor.
- 4. Tested by minimal Vin and constant resistive load.
- 5. Tested by normal Vin and 25% load step change (75%-50%-25% of Io).
- 6. Measured Input reflected ripple current with a simulated source inductance of 12uH.
- 7. The remote on/off control pin is referenced to -Vin(pin2).
- 8. The M40A-40W series can meet EN55032 Class A With an external filter in parallel with the input pins .
- 9. An external filter capacitor is required if the module has to meet IEC61000-4-4 and IEC61000-4-5.
- The filter capacitor Motien suggest: Nippon chemi-con KY series, 220uF/100V.
- Exceeding the absolute ratings of the unit could cause damage. It is not allowed for continuous operating.



TEST CONFIGURATIONS

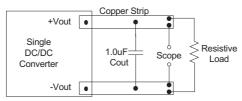
Input Reflected Ripple Current Test Step

Input reflected ripple current is measured through a source inductor Lin(12uH) and a source capacitor Cin(47uF, ESR<1.0 Ω at 100KHz) at nominal input and full load.



Output Ripple & Noise Measurement Test

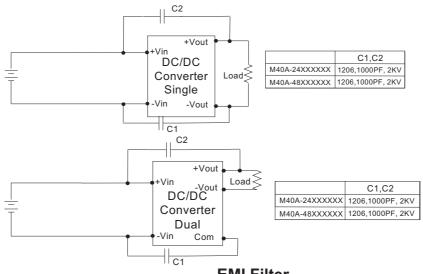
Use a capacitor Cout(1.0uF) measurement. The Scope measurement bandwidth is 0-20MHz.



EMI Filter

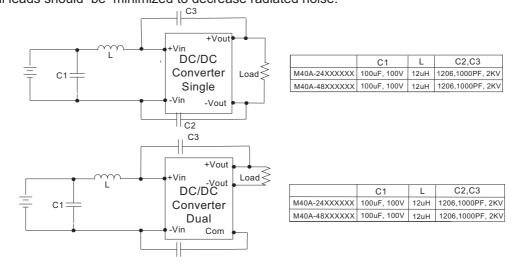
Input filter components (C1,C2) are used to help meet radiated emissions requirement for the module. These components should be mounted as close as possible to the module;

And all leads should be minimized to decrease radiated noise.



EMI Filter

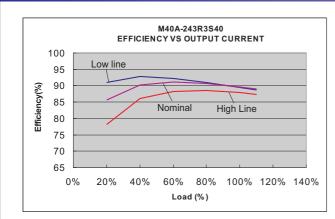
Input filter components (C1,C2,C3, L) are used to help meet conducted emissions requirement for the module. These components should be mounted as close as possible to the module; And all leads should be minimized to decrease radiated noise.

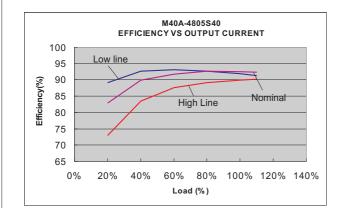




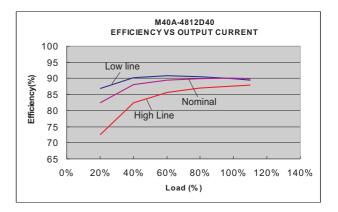
M40A - 40W 4:1 Regulated Single & Dual output

ELECTRICAL CHARACTERISTIC CURVES

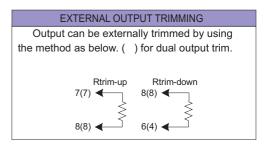




M40A-2415S40 EFFICIENCY VS OUTPUT CURRENT 100 95 Low line 90 Efficiency(%) 85 High Line 80 Nominal 75 70 65 0% 20% 40% 60% 80% 100% 120% 140% Load (%)



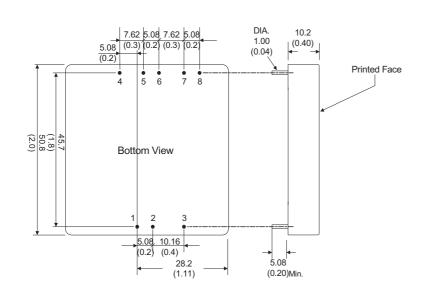
PIN CONNECTIONS PIN NUMBER SINGLE DUAL +Vin +Vin 1 2 -Vin -Vin CTRL CTRL 3 4 +Vout -Sense 5 +Sense Com 6 +Vout Com 7 -Vout -Vout 8 Trim Trim





Last Update :30.SEP.2020

MECHANICAL SPECIFICATIONS



All dimensions are typical in millimeters (inches).

- 1. Pin diameter: 1.0 ±0.05 (0.04 ±0.002)
- 2. Pin pitch and length tolerance:: ±0.35 (±0.014)
- 3. Case Tolerance: ±0.5 (±0.02)

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