

Brief Application Guide

Basic Control Circuit

Passive solutions to support motor controllers

TDK Corporation offers a wide range of EPCOS and TDK brand components ideally suited for the design and development of control circuits. These components include a wide range of general passive devices including signal inductors, signal transformers, magnetics, chokes, common mode filters, aluminum electrolytic capacitors, film capacitors, SMD varistors and surge arresters. Together with TDK's other group companies; EPCOS, InvenSense, Micronas and Tronics, a full range of sensors and sensor systems are available for controlling specific applications.

Magnetics

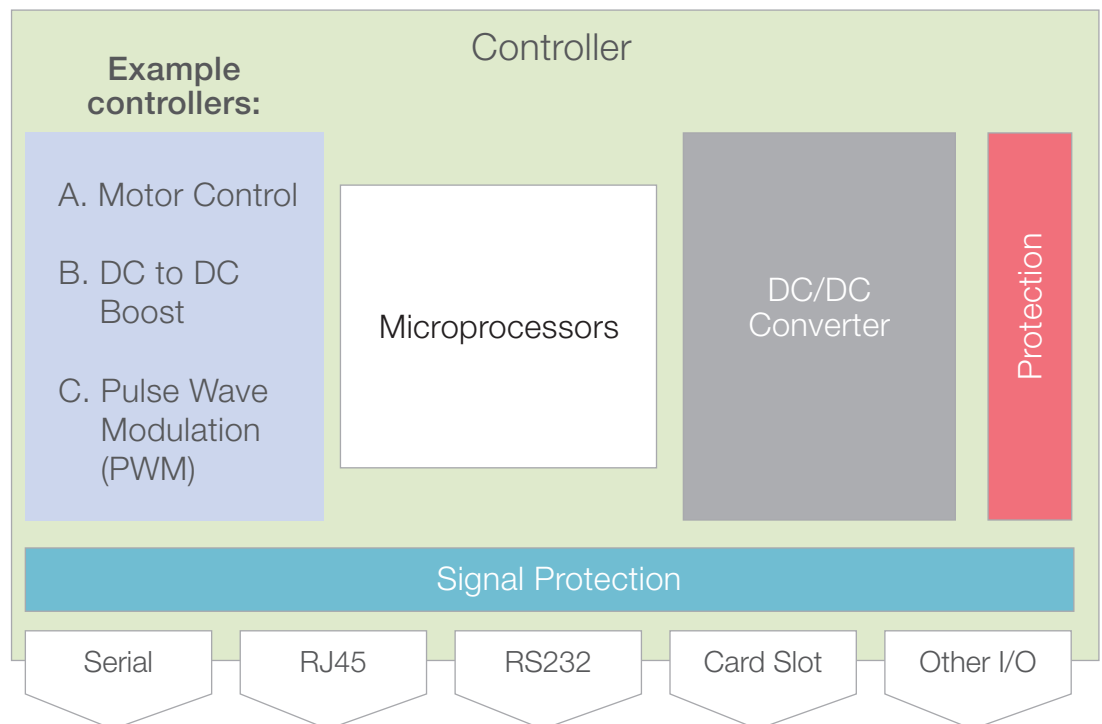
- Signal Inductors
- Common Mode Filters
- Signal Transformers
- Inductors
- Chokes

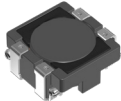
Capacitors

- Aluminum Electrolytic single-ended
- Aluminum Electrolytic snap-in
- Ceramic Capacitors
- Film Capacitors - general
- Film Capacitors - Performance

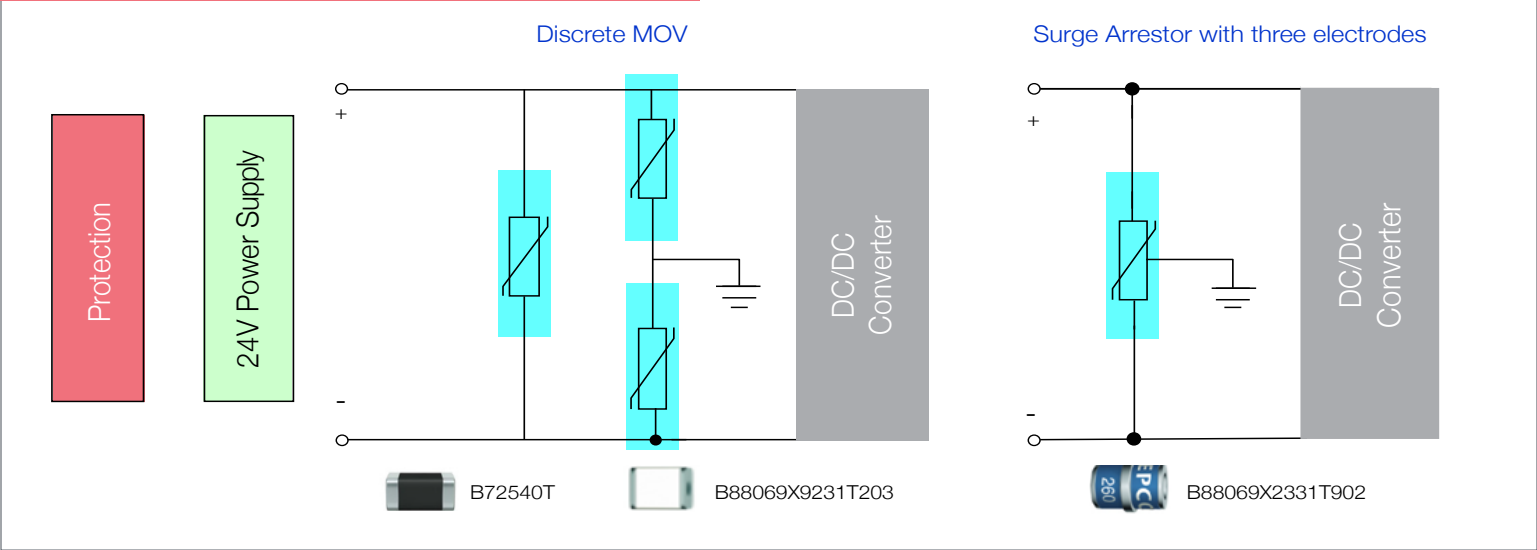
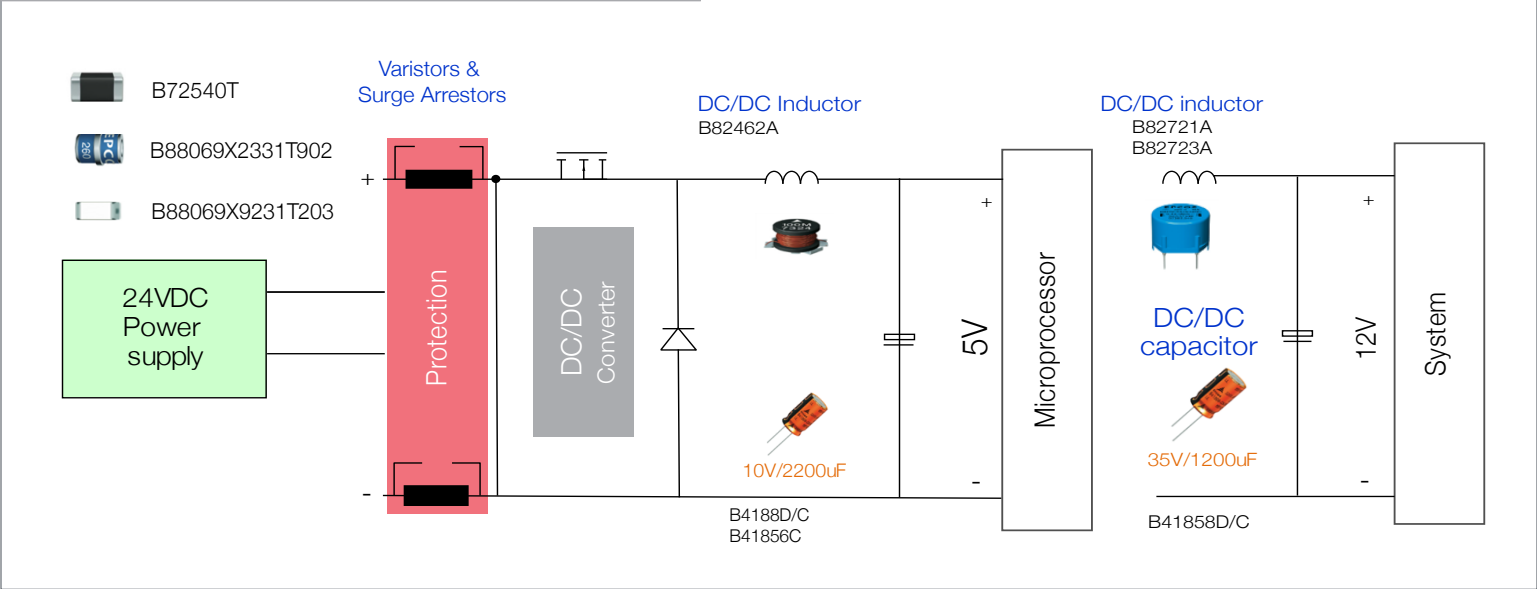
Protection Devices

- Varistors SMD
- Surge Arresters

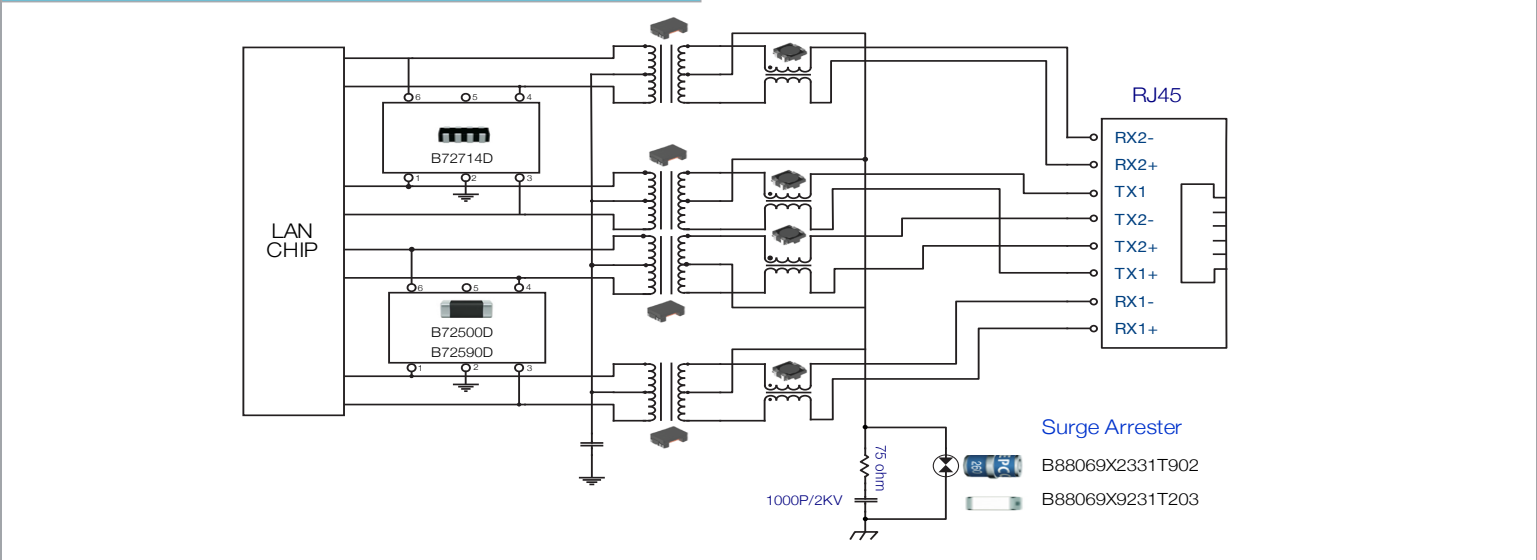


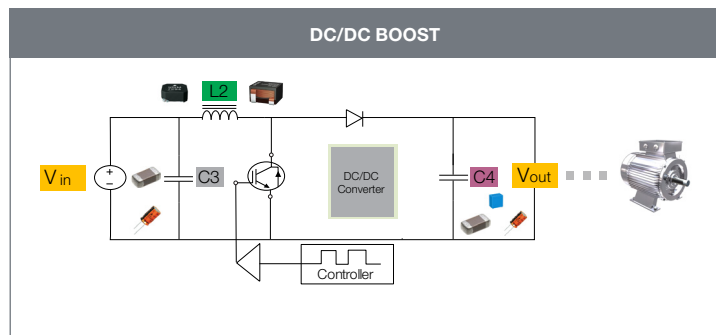
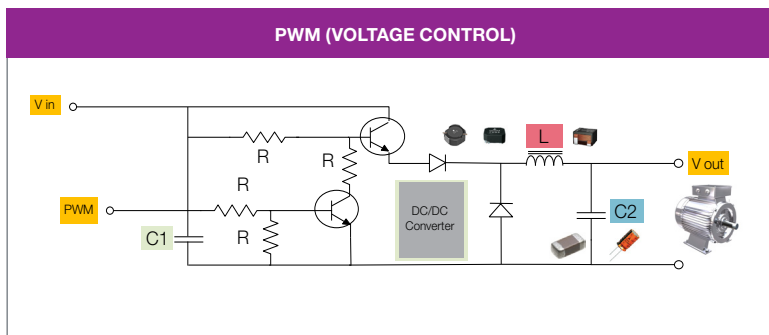
SERIES	TECHNICAL DATA	FEATURES	SERIES TYPE	GENERAL	SIGNAL	PROTECTION	DC/DC
SIGNAL INDUCTORS							
	L_R : 1 ... 4.7 μ H I_R : 0.7 ... 1.15 A $R_{25^\circ\text{C}}$: 100 m Ω ... 250 m Ω	- Temperature range up to +145 °C - High Q factor - High resonance frequency - Qualified to AEC-Q200 - Suitable for lead-free reflow soldering - RoHS-compatible	B82422H1102K000 B82422H1152K000 B82422H1222K000 B82422H1332K000 B82422H1472K000	•	•		•
COMMON MODE FILTERS							
	$R_{25^\circ\text{C}}$: 6 m Ω ... 1.6 Ω I_R : 330 mA ... 8 A V_R : 20 ... 80 V DC	- Excellent common mode impedance and noise suppression in a compact case - Low profile and small size	ACM2520-801-3P-T002 ACM4520-421-2P-T000 ACM4520-901-2P-T000 ACM4520V-421-2P-T00 ACM4520V-901-2P-T00 ACM1211-701-2PL-TL01		•		•
SIGNAL TRANSFORMERS							
	L_R : 150 ... 200 μ H C_R : 25 ... 35 μ F 1CT : 1 CT	- ALT Series, wound chip, pulse transformers developed for LAN - Compatible with 10BASE-T, 100BASE-TX, and 1000BASE-T - High-quality product, auto wound - Conforms to the RoHS Directive	ALT3232M-151-T001 ALT4532M-171-T001 ALT4532M-201-T001		•		
POWER INDUCTORS							
	L_R : 10 ... 47 μ H I_R : 0.54 ... 1.15 A $R_{25^\circ\text{C}}$: 140 m Ω ... 640 m Ω	- Temperature range up to +150 °C - High rated current - Low DC resistance - Suitable for lead-free reflow soldering - Qualified to AEC-Q200 - RoHS-compatible	B82462A4473K000 B82462A4103M000 B82462A4153K000 B82462A4223K000 B82462A4333K000	•			•
CHOKES							
	L_R : 2.5 μ H ... 1 mH $I_{R_{\text{max}}}$: 2 ... 8 A V_R : 250 V AC	- High resonance frequency from special winding technique - Suitable for wave soldering - Design complies with EN, VDE and UL standards - RoHS-compatible - Powerline common mode	B82721A2252N020 B82721A2602N020 B82721A2202N001 B82721A2262N001 B82721A2362N001 B82721A2402N020 B82723A2602N001 B82723A2802N001	•			•
ALUMINUM ELECTROLYTIC CAPACITOR							
	C_R : 1000 ... 2700 μ F I_R : 2 ... 2.858 A V_R : 10 ... 35 V DC	- Very low impedance at high frequency. - Long useful life. - High ripple current capability. - RoHS-compatible.	B41888D3228M000 B41888C3278M000 B41888C4228M000 B41856C4228M000 B41858C7128M000 B41858D7108M000				•
PROTECTION DEVICES – VARISTOR SMD							
	C_R : 800 ... 8800 μ F I_{max} : 800A ... 4.5 kA V_R : 5.6 ... 85 V DC T: -55 - 125°C	- EIA 1210 - 2220 chip size - UL approval to UL1449 - Bidirectional protection - Low leakage current - Long-term ESD stability - RoHS-compatible - Stable performance at high temp w/o derating	B72540T0400K062 B72530U1450K062 B72540T6500S162 B72540T6500K062 B72540T0600K062			•	
	C_R : 0.6 ... 10 μ F V_R : 5.6 ... 16 V DC	- EIA 0402 chip size, SOD-723 - Hi-speed series, low capacitance - RoHS-compatible	B72590D0050H260 B72590D0150H060 B72590D0160H060		•		
	C_R : 0.6 ... 3 μ F V_R : 5.6 ... 16 V DC	- EIA 0603 chip size, SOD-523 - Hi-speed series, low capacitance - RoHS-compatible	B72500D0050H160 B72500D0160H060		•		
	C_R : 3 ... 10 μ F V_R : 16 V DC	0508 chip size, 4-fold array 0612 chip size, 4-fold array	B72714D0160H060 B72724D0160H062		•		
SURGE ARRESTERS							
	C_R : < 0.8 μ F I_{max} : 2 kA, 10x 8x20 μ s V_{BD} : 90 V DC	- EIA 1812 surface mount 2 electrode arrester	B88069X9231T203		•	•	
	C_R : < 1.5 μ F I_{max} : 10 kA, 10x 8/20 μ s V_{BD} : 90 V DC	- Surface mount 3 electrode arrester	B88069X2331T902			•	

BASIC CIRCUIT



SIGNAL (SIGNAL PROTECTION)





SERIES	TECHNICAL DATA	FEATURES	SERIES TYPE	C1	C2	L	C3	C4	L2
--------	----------------	----------	-------------	----	----	---	----	----	----

CERAMIC CAPACITORS									
	General, High Cap, Mid/High Voltage	C_R : 10nF ... 100μF V_R : 4 ... 2000V	• 0201 to 3025 sizes	C	•	•		•	•
			• Crack Mitigation	CKG		•			

FILM CAPACITORS - DC									
	General (stacked/wound)	C_R : 0.0010 ... 220 μF, V_R : 50 ... 630 V DC	• High pulse strength, high contact reliability	B3252x	•				
	High pulse (wound)	C_R : 1.0...40000 nF, V_R : 250 ... 2000 V DC	• High pulse strength, high contact reliability	B3265x		•			
	MKP DC link - high power	C_R : 1.0...40000 nF, V_R : 250 ... 2000 V DC	• High CV product, compact, good self-healing properties, High reliability, over-voltage capability	B3267x		•			
	MKP DC link - high density	C_R : 1.5 ... 480 μF, V_R : 450 ... 1400 V DC	• Low losses with high current capability	B3277x		•			
	MKP DC link - THB series	C_R : 1.5 ... 120 μF, V_R : 450 ... 1100 V DC	• For severe ambient conditions	B3277xH		•			
	Power Factor Correction	C_R : 0.068 ... 2.2 μF, V_R : 450 ... 630 V DC	• Very high ripple and peak current, high frequency • AC operation capability	B3267xP		•			
	MKP DC Link (125°C)	C_R : 1.0 ... 50 μF, V_R : 630 ... 840 V DC	• Over-voltage capability, low losses with high current capability	B3277xP		•			

FILM CAPACITORS - AC									
	EMI suppression	C_R : 0.01 ... 30 μF, V_R : 305 V AC	• Very small, self - healing properties	B3292x		•			•
	MKP AC filtering	C_R : 1.0 ... 70 μF, V_R : 250 ... 310 V AC	• Optimized AC voltage performance	B3275x		•			•
	EMI suppression (MKP)	C_R : 0.001 ... 1.0 μF, V_R : 300 V AC	• Very small, self - healing properties	B3202x		•			•

ALUMINIUM ELECTROLYTIC CAPACITORS - SINGLE ENDED									
	Low ESR, compact (135°C)	C_R : 270 ... 12000 μF, V_R : 25 ... 75 V DC	• Ultra compact design, high ripple current capability	B41897	•				•
	Very low impedance (105°C)	C_R : 22 ... 10000 μF, V_R : 10 ... 100 V DC	• Very low impedance at high frequency, very low ESR	B41858	•				•
		C_R : 47 ... 3300 μF, V_R : 16 ... 100 V DC		B41859	•				•
	Low impedance (105°C)	C_R : 22 ... 2200 μF, V_R : 16 ... 100 V DC	• Very low impedance at high frequency	B41856	•				•
	High ripple current (125°C)	C_R : 330 ... 6800 μF, V_R : 25 ... 75 V DC	• High operating temperature capability, High ripple current capability	B41895	•				•
	Extended useful life (105°C)	C_R : 4.7 ... 68 μF, V_R : 350 ... 450 V DC	• Extra long useful life (12000 to 15000h/105°C)	B43890		•			
	Long useful life (105°C)	C_R : 3.3 ... 330 μF, V_R : 160 ... 450 V DC	• Very long useful life (8000 to 10000h/ 105°C)	B43888		•			

ALUMINIUM ELECTROLYTIC CAPACITORS - SNAP-IN									
	Very compact (85°C)	C_R : 100 ... 3300 μF, V_R : 200... 450 V DC	• Extremely high CV, very compact	B43630	•				
	Ultra compact (105°C)	C_R : 82 ... 3300 μF, V_R : 200 ... 450 V DC		B43640	•				

MAGNETICS									
	SMT Power Inductors	I_R : 0.11...11 A, L_R : 0.33...1000μH	• Wound, unshielded, shielded	B82477 B82559			•		•
				B82464			•		
				B82472					•
	Inductor for Power Curcuits	L_R : 1...470μH	• Wound, shielded	CLF			•		•