








## EPCOS Application Guide



# Solutions for Circuit Protection



Complete Portfolio of CTVS, MOV, Gas Discharge Tubes, and PTC & NTC Thermistors

TDK Corporation is a worldwide leader in circuit protection devices providing a comprehensive portfolio of EPCOS products including multilayer varistors, metal oxide varistors, inrush current limiters, gas-filled surge arresters (GDT), and PTC & NTC thermistors. These components are essential in systems requiring high-performance ESD, over-voltage, over-current, and over-temperature protection if they are to live up to their potential in terms of lifetime, low maintenance costs and overall reliability. EPCOS protection devices provide effective and cost-efficient solutions for many markets including automotive, industrial, lighting, security, energy, healthcare, telecommunication and consumer. This application guide will help you select the right EPCOS protection devices for your specific application.



POSITIVE TEMPERATURE COEFFICIENT THERMISTORS (PTC)	OVERCURRENT PROTECTION TYPE		SERIES/TYPE	MAX VOLTAGE $V_{RMS}$	CURRENT RATING mA	RESISTANCE $\Omega$
	Leaded		B59xxxC...	15 to 1000	8 to 2100	0.3 to 7500
	Uncoated Rods		B59xxxB...	550 to 760	2.5 to 5	2400 to 5500
	Surface Mount		B59xxxP...	30 to 265	15 to 310	3.1 to 400
	TELECOM PROTECTION TYPE		SERIES/TYPE	CURRENT RATING A	RESISTANCE $\Omega$	SWITCHING TIMES
	Leaded Series		B59xxxG...	60 to 185	6 to 50	0.06 to 14
	Surface Mount		B59xxxT1120A062	90 to 180	9 to 50	0.05 to 4.4
	Telecom Pair Protector		B59...B110	90 to 170	10 to 50	0.04 to 3.8
	Leadless Disc		B59...B110	90 to 170	4.1 to 35	0.2 to 12
	HOUSED DEGAUSSING TYPE		SERIES/TYPE	MAX VOLTAGE $V_{RMS}$	RESISTANCE $\Omega$	DEMAG CURRENT APP
Mono		B59xxxJ...	270	7 to 14	18 to 25	
Dual		B59xxxT...	270	4.5 to 28	10 to 25	
Double Mono		B59xxxT...	270	2.25 to 4.5	40 to 48	
MOTOR START TYPE		SERIES/TYPE	MAX VOLTAGE $V_{RMS}$	MAX CURRENT A	SWITCHING TIMES	
Standard Series		B59xxxA...	4 to 12	180 to 400	0.30 to 0.55	
Low Power Consumption		B59xxxA...	180 to 355	6 to 12	0.25 to 0.45	
HEATING ELEMENTS		SERIES/TYPE	MAX VOLTAGE $V_{DC}$	REF TEMP $^{\circ}C$	RESISTANCE $\Omega$	
Metallized Round Disc		B590xxA...	30 to 265	0 to 270	9 to 6000	
Metallized Rectangular Disc		B59xxxR...	20 to 265	40 to 290	3.2 to 1300	
SWITCHING TYPE		SERIES/TYPE	MAX VOLTAGE $V_{RMS}$	CURRENT RATING mA	SWITCHING TIMES	
Housed Type		B59339A	80 to 265	16 to 150	0.5 to 2	
PTC SENSORS		SERIES/TYPE	MAX VOLTAGE $V_{DC}$	RESISTANCE $\Omega$	SWITCHING TIMES	
Level Sensor Series		B59020E...	24	135 to 140	2	
Level Sensor Stainless Steel Case		B59011D...	24	100 to 200	2	
Motor Protection Series		B59xxxM...	30	<100	<3	
Limit Temperature Leaded Series		B59100C..., B59008C...	30	<100	N/A	
Limit Temperature Probe Assembly		B59x01D...	30	<330	N/A	
Limit Temperature SMD Series		B59x01A...	32	110 to 10k	N/A	

NEGATIVE TEMPERATURE COEFFICIENT THERMISTORS (NTC)	SURFACE MOUNT TYPE		SERIES/TYPE	RESISTANCE $\Omega$	R TOLERANCE %	$B_{25/85} K$
	Standard Series		B57xxxV2...	47 to 680k	$\pm 1$ to $\pm 5$	3440 to 4548
	Automotive Series		B57xxxV5...	4.7k to 100k	$\pm 1$ to $\pm 5$	3435 to 4455
INRUSH CURRENT LIMITERS (ICL)		SERIES/TYPE	RESISTANCE $\Omega$	MAX CURRENT A	MAX POWER W	
Leaded NTC ICL		B57xxxS..., B57xxxP...	0.5 to 120	1.3 to 20	1.4 to 6.7	

GAS DISCHARGE TUBES (GDT)	SURGE ARRESTERS			SERIES/TYPE	SPARK-OVER VOLT $V_{sdcN}$
	2 Electrode Series		B88069...	90k to 7.5k	
	3 Electrode Series		B88069...	90 to 650	
	AC Power Series		B88069...	500 to 800	
SWITCHING SPARK GAPS			SERIES/TYPE	SPARK-OVER VOLT $V_{sdcN}$	
Commodity Series		B88069...	230 to 5k		
High Performance Series		B88069...	400 to 5.5k		

LEADED DISC TYPE		SERIES/TYPE	VOLTAGE RATING $V_{RMS}$	CURRENT RATING A	ENERGY RATING J
Standard Series		B722xxS0...	11 to 1100	100 to 8k	.03 to 410
Advanced Series		B722xxS2	130 to 680	800 to 10k	6.0 to 440
Advanced MP Series		B722xxP	130 to 680	3.5k to 12k	40 to 595
Superior Series		B72225S4	130 to 750	20k	185 to 1025
EnergetiQ Series		B722xxQ...	130 to 460	8k to 15k	75 to 380
Automotive Series		B722xxS1...	14 to 48	250 to 2k	0.9 to 37
Telecom Series		B722...S212	60 to 95	1.2k	4.8 to 7.6
HOUSED DISC TYPE		SERIES/TYPE	VOLTAGE RATING $V_{RMS}$	CURRENT RATING A	ENERGY RATING J
ThermoFuse Series		B722xxT...	130 to 1000	6k to 20k	50 to 700
Fail-Safe Series		B722xxF...	175 to 385	5k to 6k	70 to 136
BLOCK TYPE		SERIES/TYPE	VOLTAGE RATING $V_{RMS}$	CURRENT RATING A	ENERGY RATING J
High E Series		B722xxB...	75 to 1100	25k to 100k	190 to 6k
STRAP TYPE		SERIES/TYPE	VOLTAGE RATING $V_{RMS}$	CURRENT RATING A	ENERGY RATING J
High E Standard Series		B72240L...	130 to 750	40k	310 to 1200
High E Advanced Series		B72241L...	130 to 460	50k	310 to 960
High E Superior Series		B72242L...	250 to 460	65k	490 to 960
SURFACE MOUNT TYPE		SERIES/TYPE	VOLTAGE RATING $V_{RMS}$	CURRENT RATING A	ENERGY RATING J
CU Standard Series		B726xxM0xxxK...	11 to 300	100 to 1200	0.3 to 13
CU Telecom Series		B72660M...S172	60 to 95	1.2k	4.8 to 7.6
CU Automotive Series		B726xxM1...	14 to 30	100 to 250	0.4 to 2k

MULTILAYER VARISTORS (MLV)		SERIES/TYPE	VOLTAGE RATING $V_{RMS}$	CURRENT RATING A	ENERGY RATING J
Standard Series		B725xxT...	4 to 60	20 to 1200	0.1 to 12
Automotive Series		B725xxT...	14 to 30	5 to 1200	1 to 25
Controlled Capacitance Series		B725xxT5...	4 to 25	10 to 150	0.2 to 0.4
Low Capacitance Series		B725xxT2...	17	10 to 30	0.01 to 0.1
High-Speed Series		B72xxxT8...	4 to 25	1 to 5	0.03 to 0.05
Radio Frequency Series		B725xxT7...	4 to 14	NA	NA
CERADIODE		SERIES/TYPE	VOLTAGE RATING $V_{DC}$	CURRENT RATING A	ENERGY RATING J
Standard Series		B72xxxDxxxxA...	5.6 to 22	10 to 30	33 to 470
High-Speed Series		B72xxxDxxxxH...	5.6 to 30	0.6 to 10	0.6 to 10
LEADED TRANSIENT VOLTAGE/RFI SUPPRESSORS		SERIES/TYPE	VOLTAGE RATING $V_{RMS}$	CURRENT RATING A	ENERGY RATING J
SHCV Series		B725xxx3...	14 to 35	100 to 1200	220 to 4700
ESD/EMI FILTERS		SERIES/TYPE	CAPACITANCE pF	CUT-OFF FREQ MHZ	INSERTION LOSS dB
RC Filter Series		B728xxR...	15 to 50	80 to 290	-50 to -20
Feedthrough Type		B728xxF	270	10	-30 to -20

