

700mA LED PROTECTOR

DESCRIPTION

The A720 is a two terminal LED protector with low dropout voltage rated for 700mA bypass current. Low operation current at monitoring mode and high bypass current capability at triggered mode. Build-in reverse diode for bypass reversed supply voltage.

The A720 is designed for parallel connection with high power LED. It bypasses LED driving current when LED at open circuit condition. It also bypasses LED driving current at reverse connected driving current to LED.

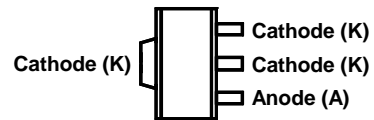
FEATURES

- 5V Protection Trigger Voltage
- 700mA Bypass Current Capability
- 1.6V Bypass Dropout Voltage at 700mA
- 700mA Reverse Current Capability
- 8KV HBM ESD Protection
- SOT-89 Package Available.

APPLICATIONS

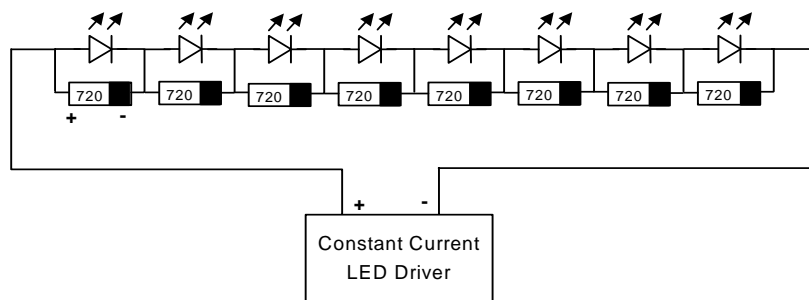
- LED Lighting
- High Power LED Protection

PACKAGE PIN OUT



SOT-89
(Top View)

TYPICAL APPLICATION



ORDER INFORMATION

N	SOT-89
	3-pin
A720NGT (Green)	
<p>Note: Part Number: A 7 2 0 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p>Package Type. N: SOT-89 ← <input type="checkbox"/> → Packing. T: Tape & Reel <input type="checkbox"/> → Package Process. G: Green</p>	

ABSOLUTE MAXIMUM RATINGS (Note)

Input Voltage, V_{AK}	40V
Bypass Current, I_{AK}	750mA
Maximum Operating Junction Temperature, T_J	150°C
Operating Temperature, T_{opr}	-40°C to 85°C
Storage Temperature Range	-65°C to 150°C
Lead Temperature (soldering, 10 seconds)	260°C
Note: Exceeding these ratings could cause damage to the device. All voltages are with respect to Ground. Currents are positive into, negative out of the specified terminal.	

PIN DESCRIPTION

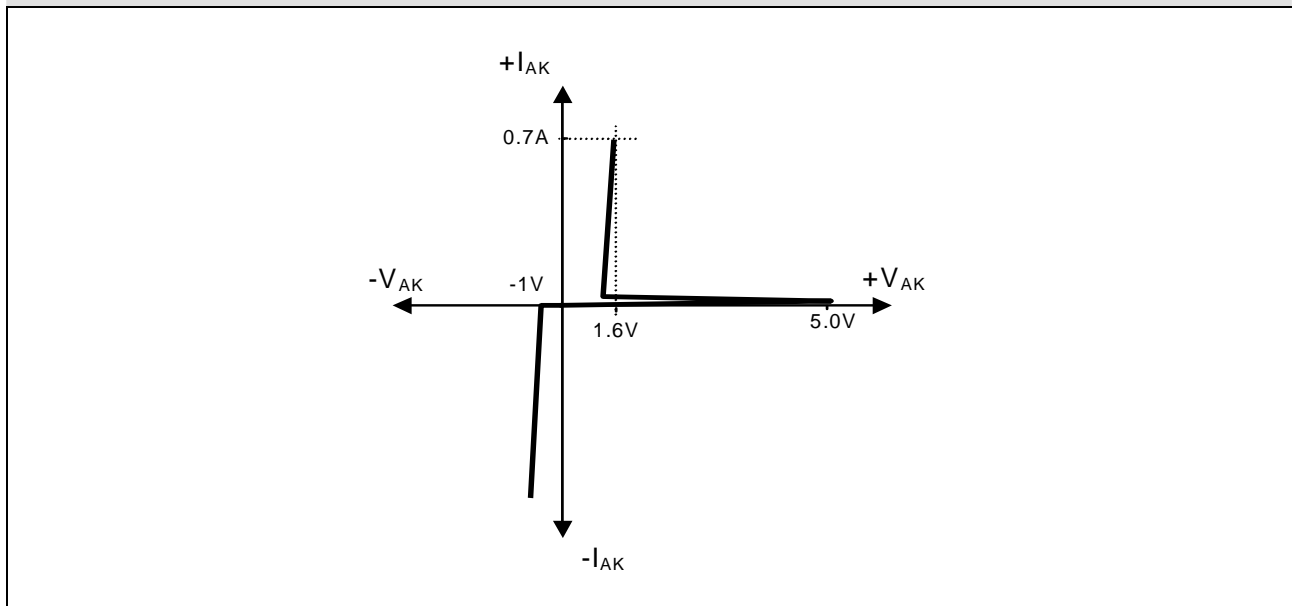
Pin Number	Pin Name	Pin Function
1	Anode (A)	Connected to LED's anode.
2, 3	Cathode (K)	Connected to LED's cathode.
Exposed Pad	Heat Pad	Connected to cathode (K) to the enhance power dissipation ability.

THERMAL RESISTANCE

Package	SOT-89	Note: $T_J = T_A + (P_D \times \theta_{JA}) = T_C + (P_D \times \theta_{JT})$ θ_{JA} : Thermal Resistance - Junction to Ambience. θ_{JT} : Thermal Resistance - Junction to Tab. T_J : Junction Temperature. T_A : Ambient Temperature. T_C : Case (Tab) Temperature. P_D : Power Consumption.
θ_{JA} (°C /W)	175	
θ_{JT} (°C /W)	35	

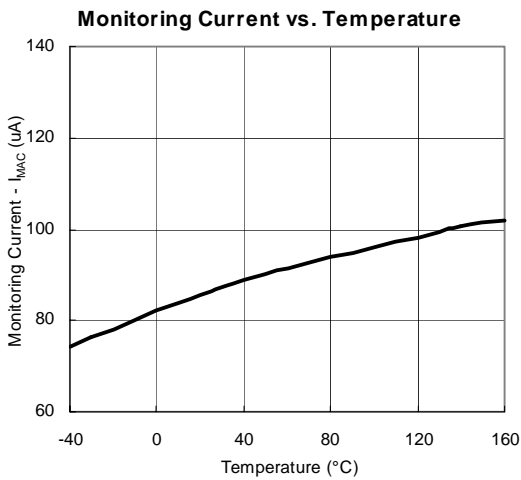
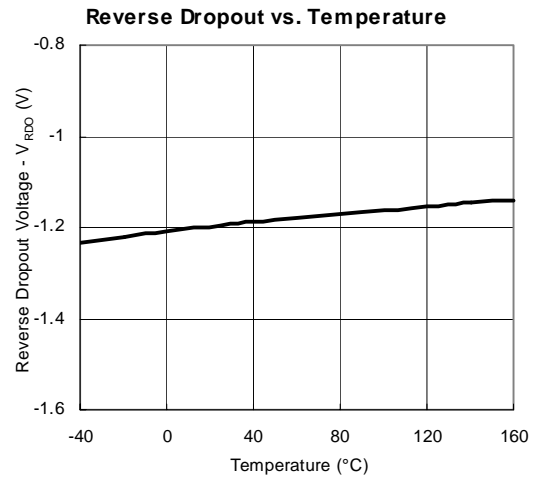
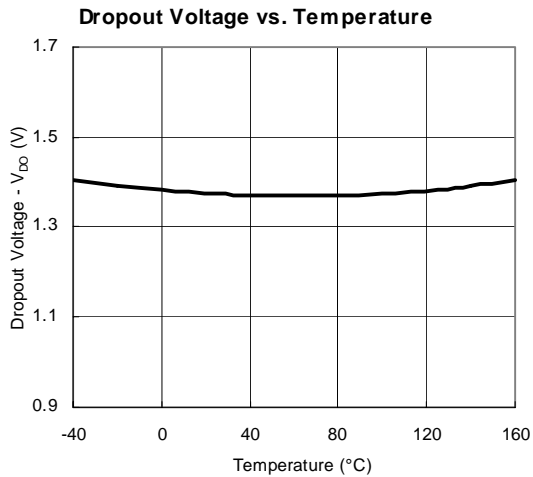
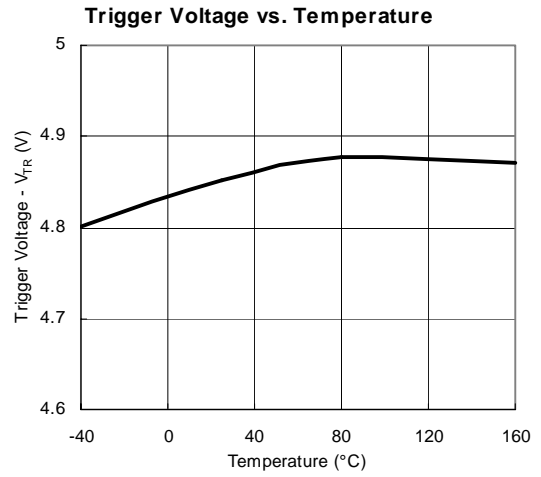
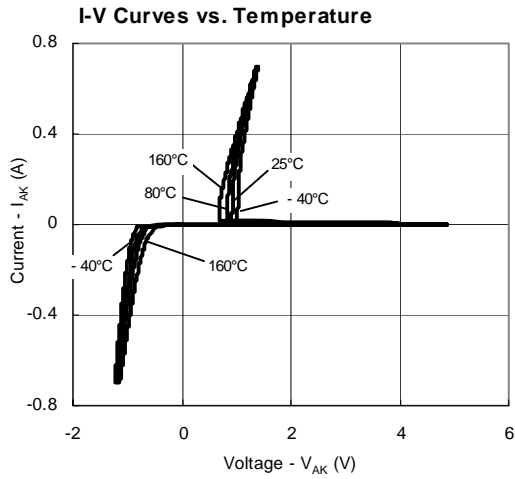
RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Min.	Typ.	Max.	Units
Input Voltage	V_{AK}			38	V
Bypass Current (with adequate heat sinking)	I_{BP}			700	mA
Reverse Current	I_R			700	mA
Operating ambient temperature range	T_A	-40		85	°C
Operating junction temperature	T_J			125	°C

I-V CURVE

ELECTRICAL CHARACTERISTICS

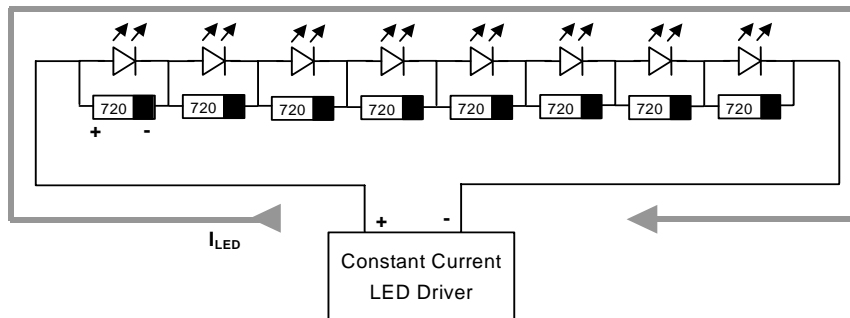
Unless otherwise specified, $T_A=25^\circ C$, and are for DC characteristics only. (Low duty cycle pulse testing techniques are used which maintains junction and case temperatures equal to the ambient temperature.)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Trigger Voltage	V_{TR}		4.65	4.9	5.15	V
Drop-out Voltage	V_{DO}	$I_{AK} = 700mA$		1.6	1.8	V
Reverse Drop-out Voltage	V_{RDO}	$I_R = 700mA$		1.6	1.8	V
Monitoring Current	I_{MAC}	$V_{AK} = 3.5V$		100	150	uA
Break-over Current	I_{BAC}				20	mA
Trigger Delay Time	t_D	$I_{AK} = 500mA$		300		nS

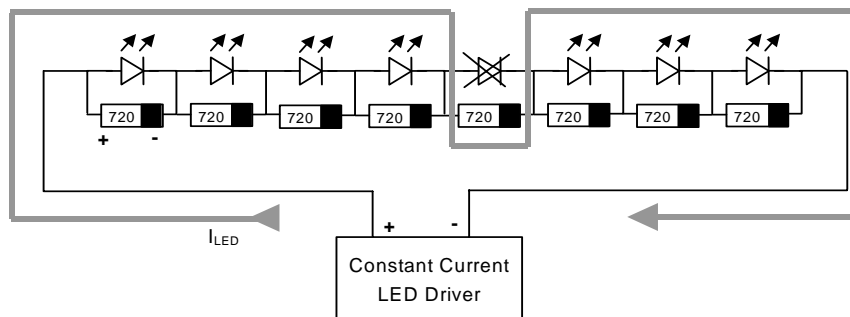
CHARACTERISTIC CURVES


APPLICATION INFORMATION
Monitoring Mode:

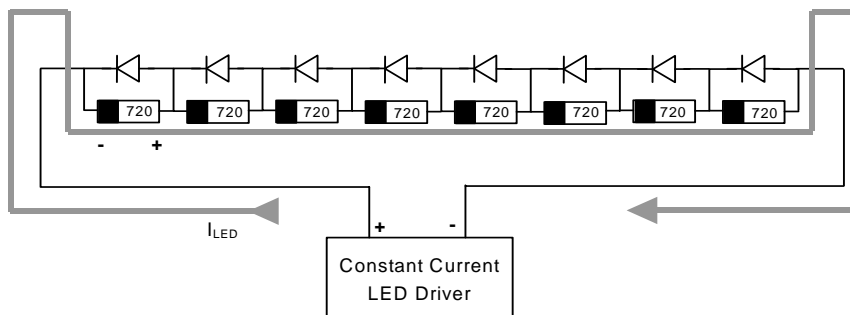
The forward voltage drop (V_F) of all LEDs should be less than 4V, which is lower than A720 trigger voltage 5.0V. All A720 at monitoring mode would only sink $\sim 100\mu\text{A}$ current from the system.

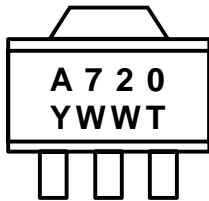

Triggered Mode:

Any LED may become open circuit because of LED damage or wiring problem. When it happens, the voltage drop across adjacent A720 starts to increase, and then A720 will be triggered when the voltage drop reaches 5V. The dropout voltage on A720 will be around 1.6V when conducting 700mA and the LED current I_{LED} will be bypassed to next LED. All LEDs will work well except the abnormal LED bypassed.

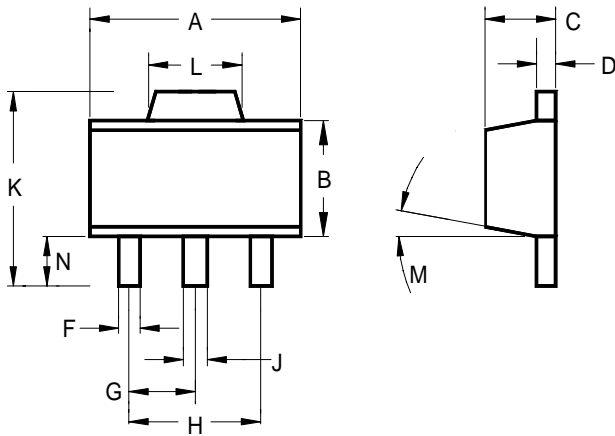

Reverse Mode:

When the LED string was reversed connected to the driver, the A720 build-in reverse protection diode was turned-on to bypass the current. Such that the reverse voltage on LEDs was reduced to prevent LED damage.



PACKAGE
Top Marking for SOT-89


Y : Year Code
WW : Week Code
T : Trace Code

3-Pin Surface Mount SOT-89


SYMBOLS	MILLIMETERS	
	MIN	MAX
A	4.40	4.60
B	2.29	2.60
C	1.40	1.60
D	0.35	0.44
F	0.32	0.52
G	1.40	1.60
H	2.90	3.10
J	0.40	0.58
K	3.94	4.25
L	1.35	1.83
M	0°	10°
N	0.81	1.20

REVISION HISTORY

Version	Revision Summary			
	No.	Applicable Section(s)	Description	Page(s)
A Aug. 2009	1	All	Initial release to formal version.	1 ~ 7
B Jan. 2010	1	Absolute Maximum Ratings	Add the rating for “Bypass Current”.	2
	2	Characteristics Curves	Add the “Monitoring Current vs. Temperature” curve.	4
	3	Package	Revise the Top Marking diagram and dimension.	6

IMPORTANT NOTICE

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