Breakout Board for AIC1508

APPLICABLE PARTS (INCLUDED)

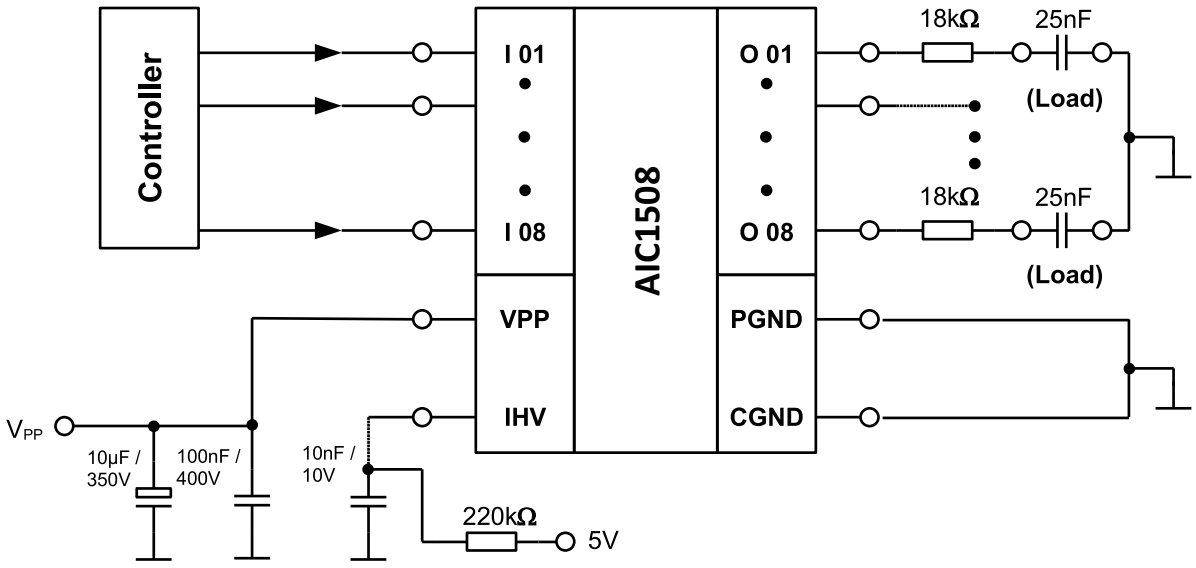
- AIC1508

DESCRIPTION

The AIC1508 breakout board can be used for evaluation of the AIC1508 high voltage parallel driver IC. The board is designed to give the user easy access to all the device input and output pins as well as banana jacks to provide the required voltage supplies. The surface mount jumper headers and test points for each individual channel make it easy for the user to configure the AIC1508 by hand. The AIC1508 is a rigid, low-cost general purpose high voltage driver IC with 8 high voltage push-pull out-puts. The outputs can drive capacitive and resistive loads. The maximum operating voltage is 300V, and each output has a source- sink capability of up to 40mA.

External output resistors can be used to limit the maximum power dissipation of the device, allowing the outputs to be run in parallel. The AIC1508 allows the use of an external resistor to set the switch-on time of the outputs and provides protected direct transistor gate inputs. The high voltage push-pull outputs are well protected against possible latch-up by using the bulk-drain diodes of the output MOSFETs and their full dielectric isolation.

Figure 1: Common Application Circuit



SINGLE CHANNEL DIAGRAM

Figure 2: Channel Layout

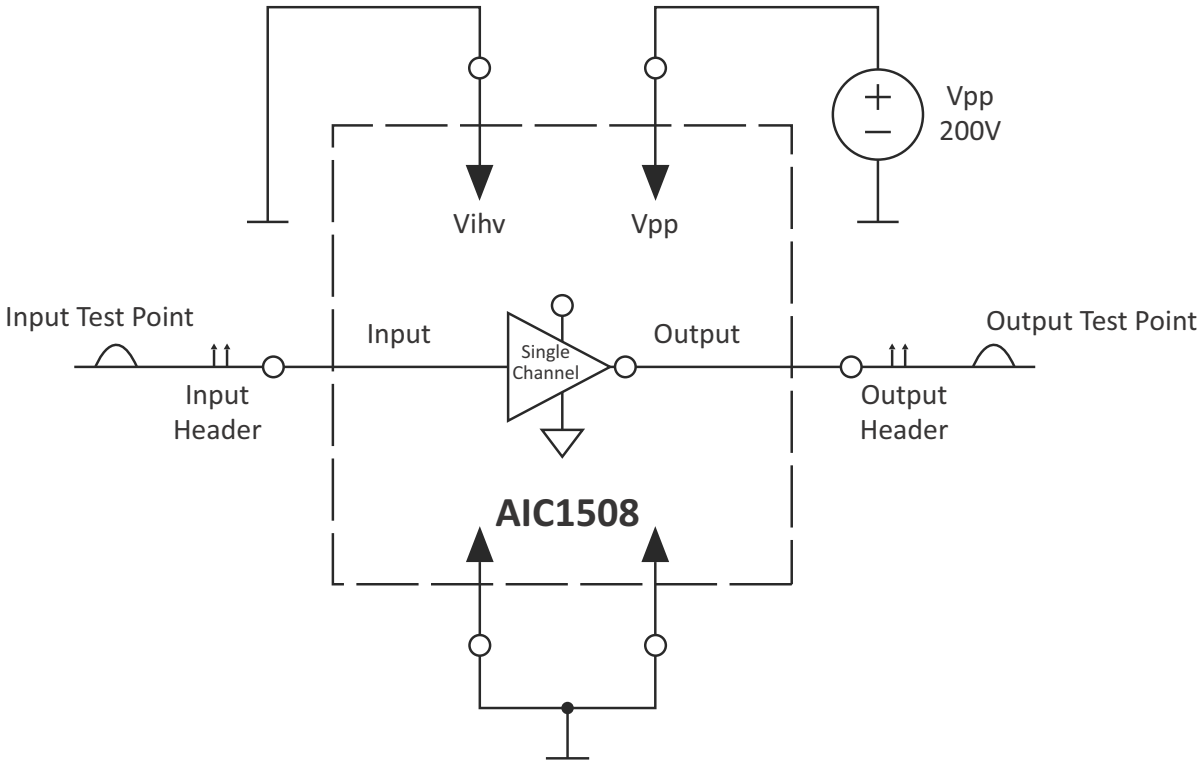
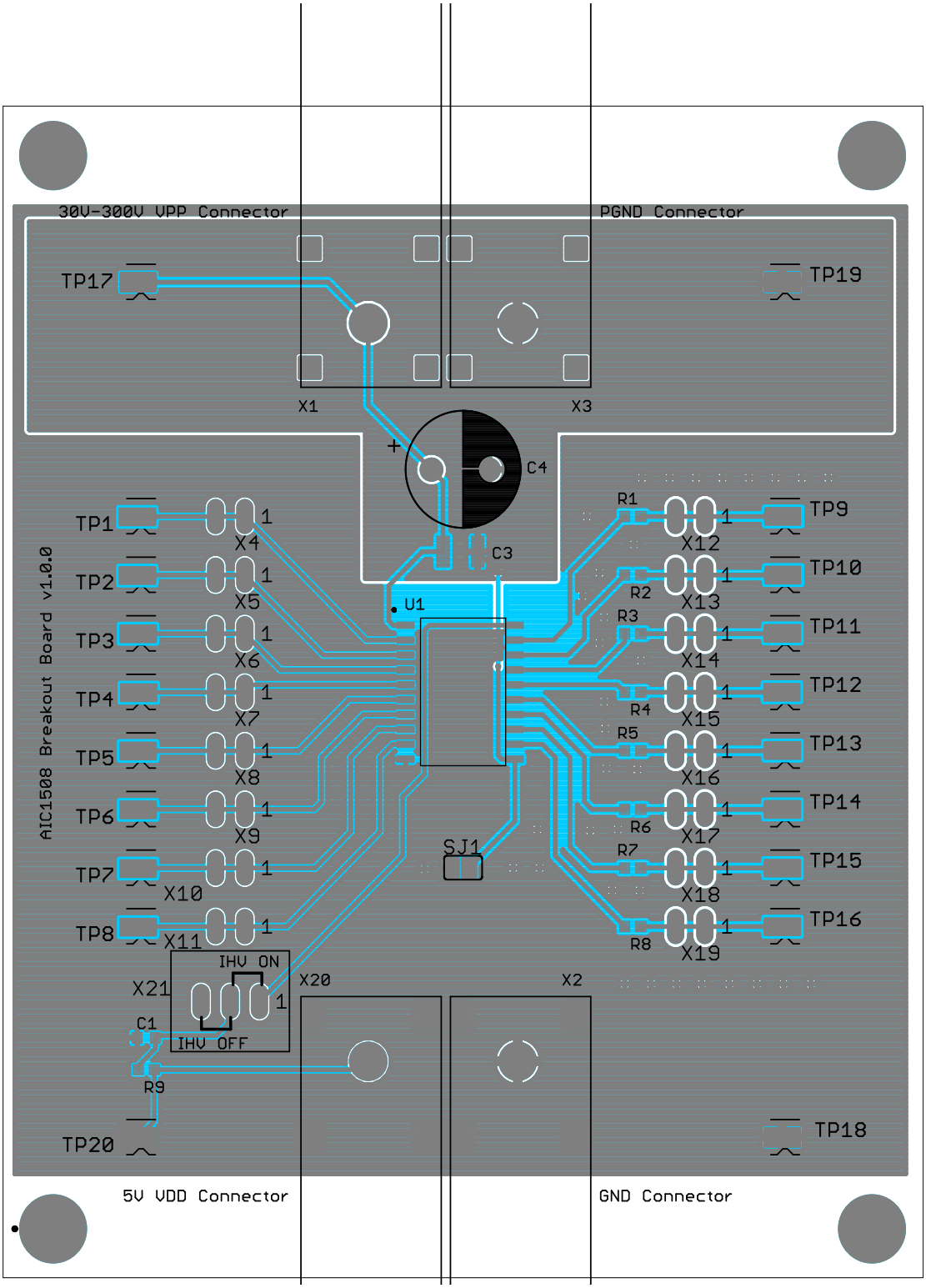


Figure 3: Board Layout



PINOUT AND DESCRIPTION TABLE

TP Number	Pin Number	Name	Description
TP17	1	VPP	Power supply of the 8 high voltage push-pull outputs
TP1	2	I01	Input 01
TP2	3	I02	Input 02
TP3	4	I03	Input 03
TP4	5	I04	Input 04
TP5	6	I05	Input 05
TP6	7	I06	Input 06
TP7	8	I07	Input 07
TP8	9	I08	Input 08
TP18	10	CGND	Capacitive ground (must connected to PGND)
TP19	11	PGND	Power ground of the 8 high voltage push-pull outputs
TP16	12	O08	High voltage push-pull output 08
TP15	13	O07	High voltage push-pull output 07
TP14	14	O06	High voltage push-pull output 06
TP13	15	O05	High voltage push-pull output 05
TP12	16	O04	High voltage push-pull output 04
TP11	17	O03	High voltage push-pull output 03
TP10	18	O02	High voltage push-pull output 02
TP9	19	O01	High voltage push-pull output 01
TP20	20	IHV	Input to connect an external resistor to adjust the switching speed of the high voltage push-pull outputs (if not necessary this pin can be left open)

PARTS LIST

Reference	Manufacturer Part #	Description	QTY
Capacitors			
C3	C1210C104KCRAC7800	CAP CER 0.1UF 500V X7R 1210	1
C1	C0603C103K8RACAUTO	CAP CER 10000PF 10V X7R 0603	1
C4	EEU-ED2V100	CAP ALUM 10UF 20% 350V RADIAL TH	1
Active Devices			
U1	AIC1508	Apex Microtechnology AIC1508	1
Resistors			
R1, R2, R3, R4, R5, R6, R7, R8	ERJ-PB3B1802V	RES SMD 18K OHM 0.1% 1/5W 0603	8
R9	ERJ-3EKF2203V	RES SMD 220K OHM 1% 1/10W 0603	1
SJ1	ERJ-6GEY0R00V	RES SMD 0 OHM JUMPER 1/8W 0805	1
Hardware			
X2, X3	SWEB 8094 Au / SW	4mm PCB Mounted Insulated Socket	2
X1, X20	SWEB 8094 Au / RT	4mm PCB Mounted Insulated Socket	2
X4, X5, X6, X7, X8, X9, X10, X11, X12, X13, X14, X15, X16, X17, X18, X19	TSW-102-07-G-S	CONN HEADER VERT 2POS 2.54MM	16
X21	TSW-103-07-G-S	TSW-103-07-G-S	1
TP17, TP20	5190TR	PC TEST POINT MINIATURE RED	2
TP19	5191TR	PC TEST POINT MINIATURE BLACK	1
TP9, TP10, TP11, TP12, TP13, TP14, TP15, TP16	5193TR	PC TEST POINT MINIATURE ORANGE	8
TP1, TP2, TP3, TP4, TP5, TP6, TP7, TP8	5196TR	PC TEST POINT MINIATURE GREEN	8
TP18	5197TR	PC TEST POINT MINIATURE BLUE	1
Standoff	2206	HEX STANDOFF #4-40 ALUM 1 1/2"	4
Standoff screw	91772A110	Passivated 18-8 Stainless Steel Pan Head Phillips Screw 4-40 Thread, 1/2" Long	4

AC CHARACTERISTICS

Conditions : T_{amb} = 25 °C ± 5K, V_{PP} = 200V, V_{IHV} = 0V; unless otherwise specified

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Propagation delay time, V_{IN} → low to high	t_{PLH}	V_{IN} = 0.0V - 5.0V C_L = 20pF (Figure 4)		1		µs
Propagation delay time, V_{IN} → high to low	t_{PHL}	V_{IN} = 5.0V – 0.0V C_L = 20pF (Figure 4)		15		µs
Output Fall time	t_{OFF}	V_{IN} = 0.0V – 5.0V C_L = 20pF (Figure 4)		1		µs
Output Rise time	t_{ON}	V_{IN} = 5.0V – 0.0V C_L = 20pF (Figure 4)		30		µs

WAVEFORMS AND TEST CIRCUIT

Figure 4: Switching Wave Forms

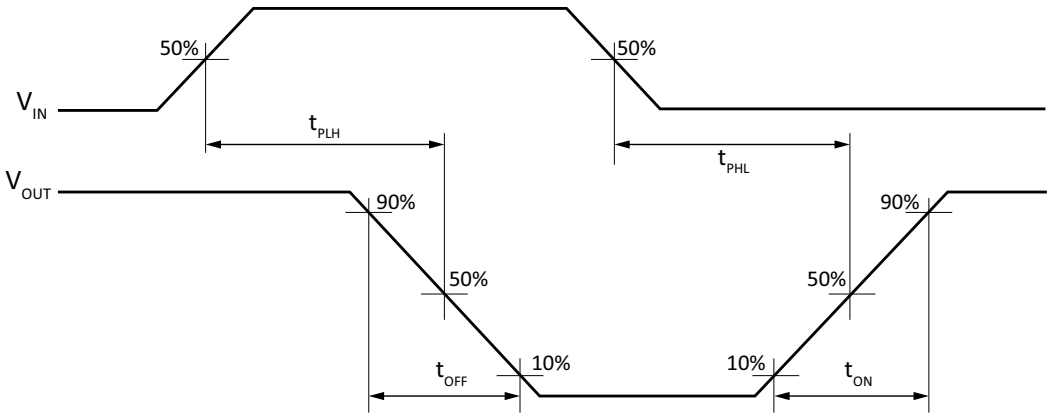


Figure 5: Test Circuit

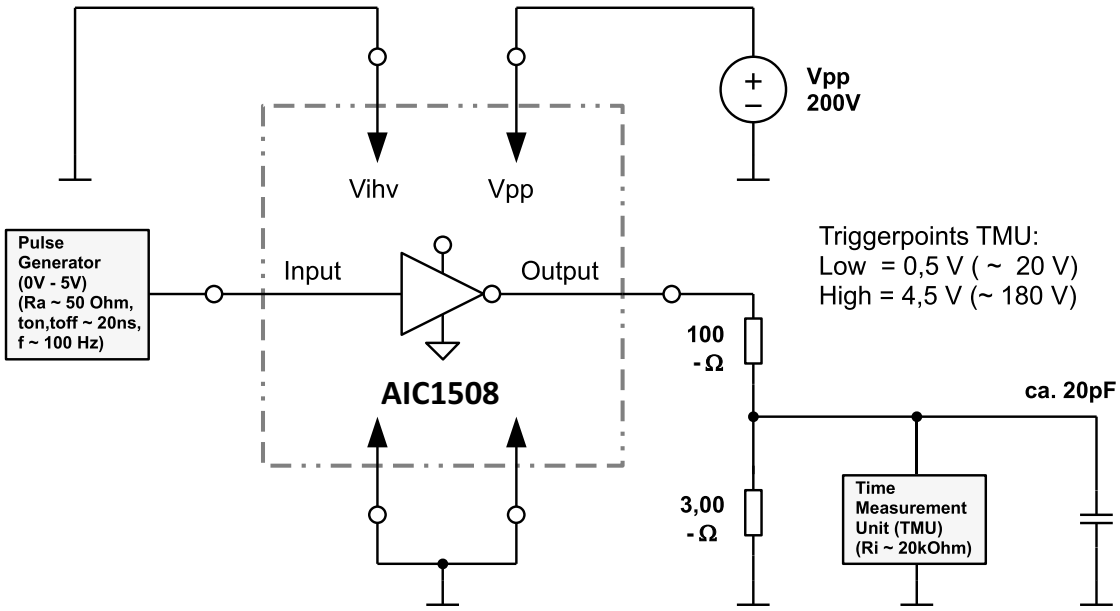
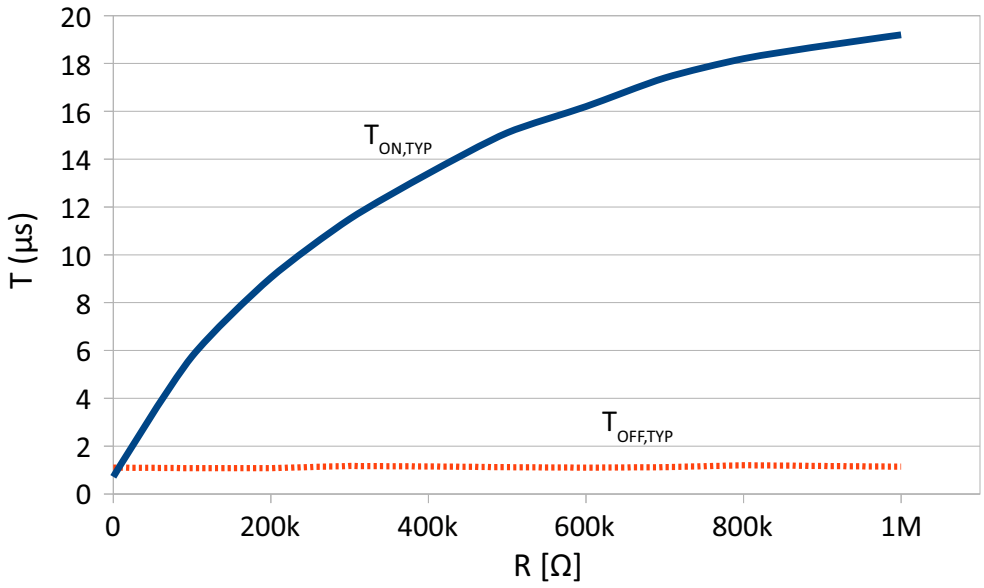


Figure 6: Dependence of rise - and fall time (t_{on}, t_{off}) on R_{IHV} at V_{DD} = 5V



APPLICATION

Figure 7: Example application with full bridge (basic circuit)

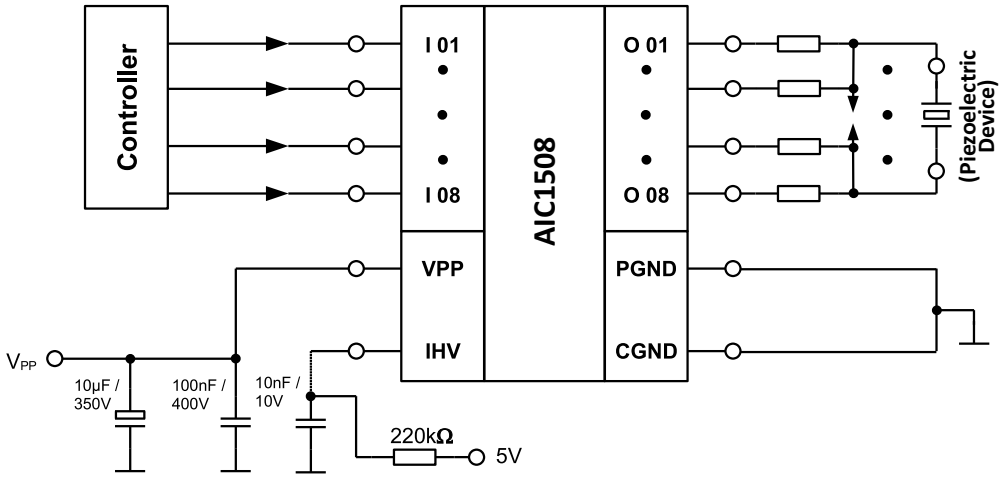


Figure 8: Example application with over current protection (basic circuit)

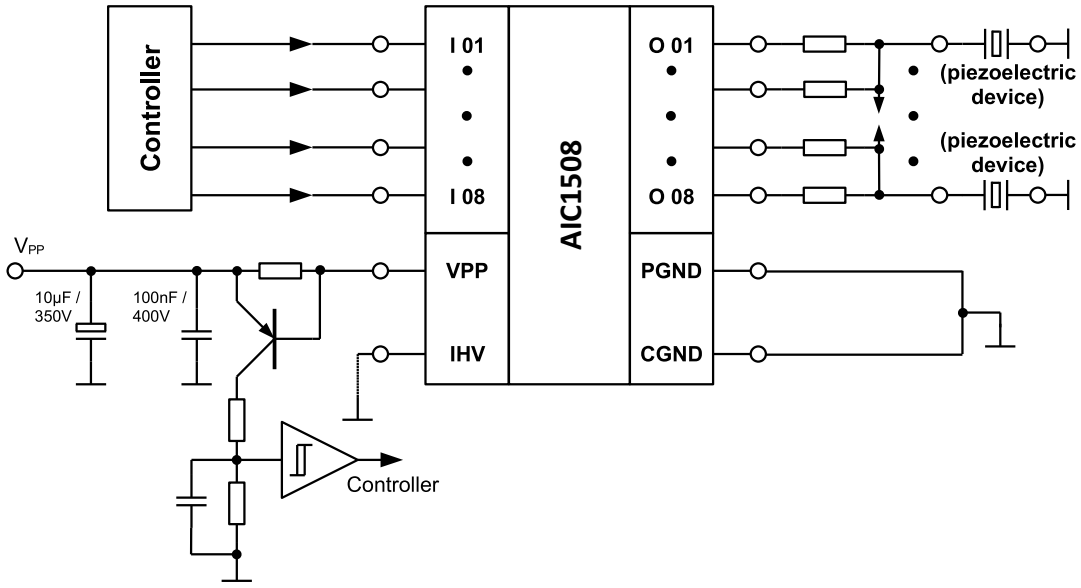
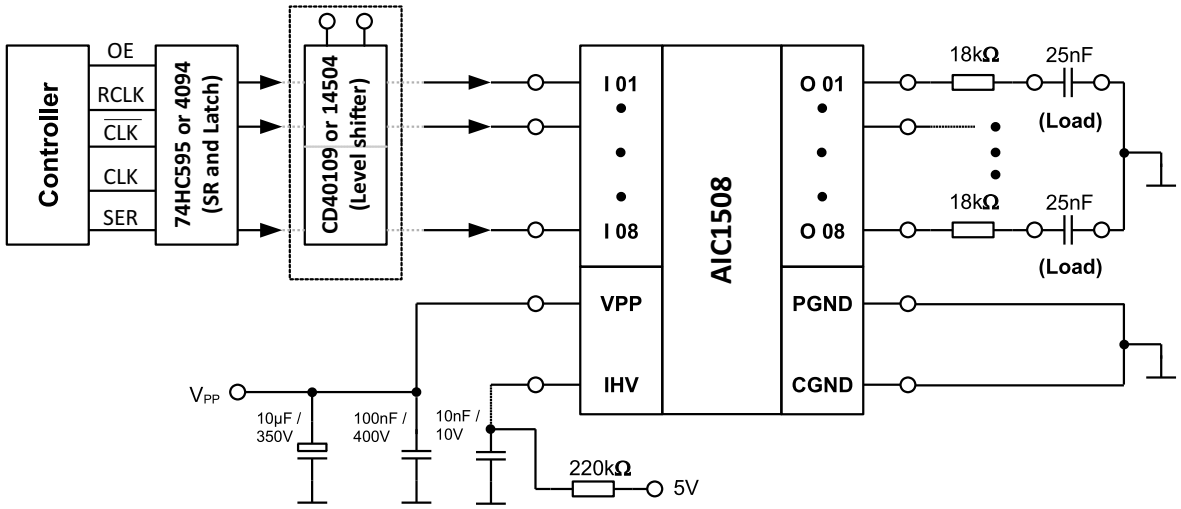


Figure 9: Example Application with controller with serial outputs (basic circuit)



ESD PROTECTION

The Requirements for Handling Electrostatic Discharge Sensitive Devices are described in the JEDEC standard JESD625-A. Please note the following recommendations:

- When handling the device, operators must be grounded by wearing a for the purpose designed grounded wrist strap with at least 1MΩ resistance and direct skin contact.
- Operators must at all times wear ESD protective shoes or the area should be surrounded by for ESD protection intended floor mats.
- Opening of the protective ESD package that the device is delivered in must only occur at a properly equipped ESD workbench. The tape with which the package is held together must be cut with a sharp cutting tool, never pulled or ripped off.
- Any unnecessary contact with the device or any unprotected conductive points should be avoided.
- Work only with qualified and grounded tools, measuring equipment, casing and workbenches.
- Outside properly protected ESD-areas the device or any electronic assembly that it may be part of should always be transported in EGB/ESD shielded packaging.

STORAGE CONDITIONS

The AIC1508 corresponds to moisture sensitivity classification MSL3, according to JEDEC standard J-STD-020, and should be handled and stored according to J-STD-033.