

### 7 CIRCUIT DARLINGTON TRANSISTOR ARRAY

#### FEATURES

- Output Current : 500mA Max.
- High Sustaining Voltage Outputs : 50V Min.
- Output Clamp Diodes
- Inputs Compatible With Various Types of Logic.
- PKG Type AP : DIP-16Pin, AF : FLP-16Pin

| TYPE          | INPUT RESISTOR                   | DESIGNATION        |
|---------------|----------------------------------|--------------------|
| KID65001AP/AF | No (External)                    | General Purpose    |
| KID65002AP/AF | Zener Diode<br>7V+10.5k $\Omega$ | 14~25V P-MOS       |
| KID65003AP/AF | 2.7k $\Omega$                    | TTL, 5V C-MOS      |
| KID65004AP/AF | 10.5k $\Omega$                   | 6~15V P-MOS, C-MOS |

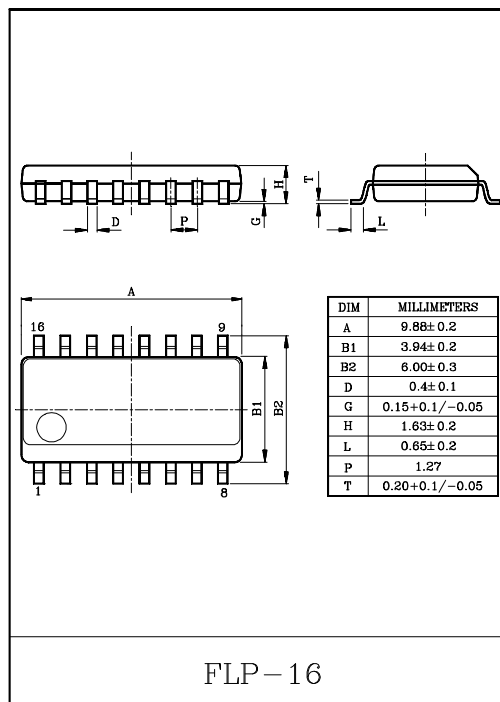
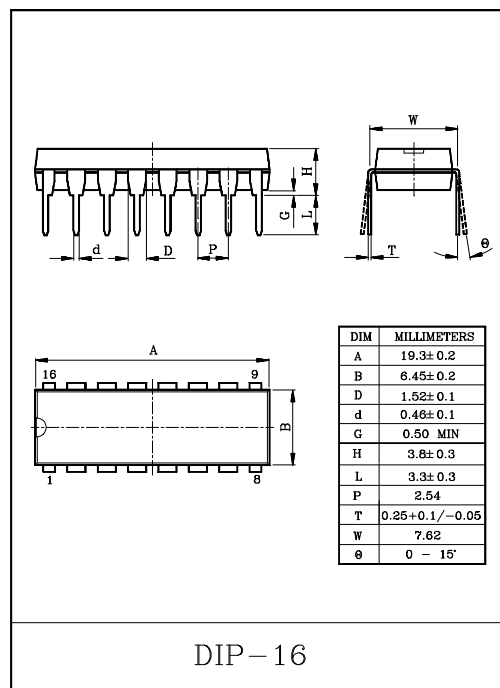
#### DESCRIPTION:

The KID65001AP/AF Series are high-voltage, high-current darlington transistor array comprised of seven NPN darlington pairs. All units feature internal clamp diodes for switching inductive loads.

#### MAXIMUM RATINGS (Ta=25°C, unless otherwise noted)

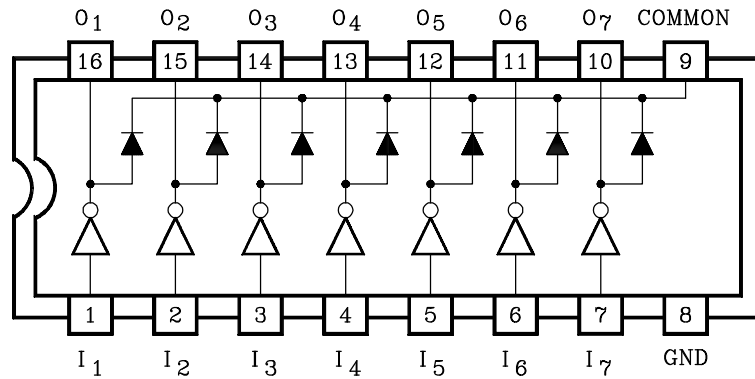
| CHARACTERISTIC            |                 | SYMBOL        | RATING   | UNIT |
|---------------------------|-----------------|---------------|----------|------|
| Output Sustaining Voltage |                 | $V_{CE(SUS)}$ | 50       | V    |
| Output Current            |                 | $I_{OUT}$     | 500      | mA   |
| Input Voltage             |                 | $V_{IN}^*$    | -0.5~+30 | V    |
| Input Current             |                 | $I_{IN}^{**}$ | 25       | mA   |
| Clamp Diode               | Reverse Voltage | $V_R$         | 50       | V    |
|                           | Forward Current | $I_F$         | 500      | mA   |
| GND Terminal Current      |                 | $I_{GND}$     | 2.8      | A    |
| Power Dissipation         | AP              | $P_D$         | 1.47     | W    |
|                           | AF              |               | 0.54     | W    |
| Operating Temperature     |                 | $T_{opr}$     | -40~85   | °C   |
| Storage Temperature       |                 | $T_{stg}$     | -55~150  | °C   |

\*Except KID65001AP/AF, \*\*Only KID65001AP/AF



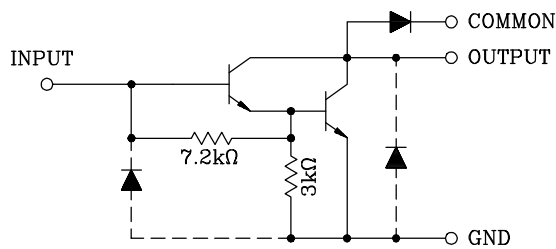
# KID65001AP/AF ~ KID65004AP/AF

## PIN CONNECTION (TOP VIEW)

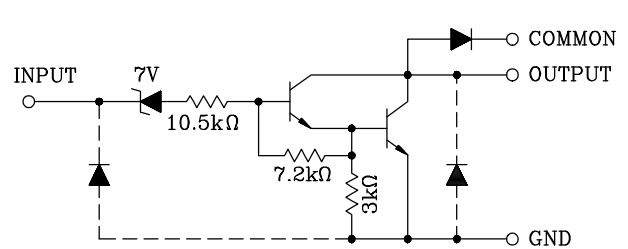


## SCHEMATICS (EACH DRIVER)

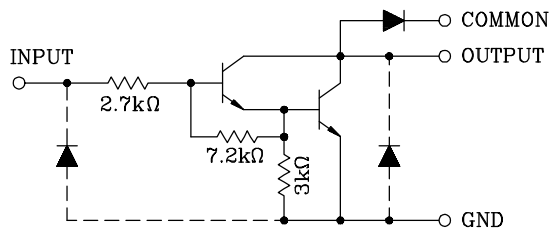
KID65001AP/AF



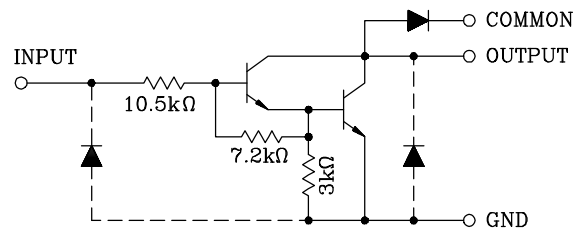
KID65002AP/AF



KID65003AP/AF



KID65004AP/AF



# KID65001AP/AF ~ KID65004AP/AF

## RECOMMENDED OPERATING CONDITIONS (Ta=-40~85℃)

| CHARACTERISTIC              | SYMBOL        | CONDITION                          | MIN. | TYP. | MAX. | UNIT |
|-----------------------------|---------------|------------------------------------|------|------|------|------|
| Output Sustaining Voltage   | $V_{CE(SUS)}$ |                                    | 0    | -    | 50   | V    |
| Output Current              | $I_{OUT}$     | $T_{PW}=25ms$ , DF=10%, 7 Circuits | 0    | -    | 400  | mA   |
|                             |               | $T_{PW}=25ms$ , DF=30%, 7 Circuits | 0    | -    | 200  |      |
| Input Voltage               | $V_{IN}$      | Except KID65001AP/AF               | 0    | -    | 30   | V    |
| Input Current               | $I_{IN}$      | Only KID65001AP/AF                 | 0    | -    | 5    | mA   |
| Clamp Diode Reverse Voltage | $V_R$         |                                    | -    | -    | 50   | V    |
| Clamp Diode Forward Current | $I_F$         |                                    | -    | -    | 400  | mA   |
| Power Dissipation           | AP            | $P_D$                              | -    | -    | 0.52 | W    |
|                             | AF            |                                    | -    | -    | 0.32 |      |

\* : on glass epoxy PCB (30×30×1.6mm Cu50%)

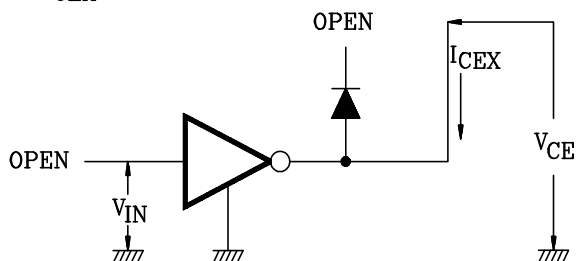
## ELECTRICAL CHARACTERISTICS (Ta=25℃, unless otherwise noted)

| CHARACTERISTICS                         |               | SYMBOL               | TEST<br>CIRCUIT | TEST CONDITION                                                      | MIN. | TYP. | MAX. | UNIT |
|-----------------------------------------|---------------|----------------------|-----------------|---------------------------------------------------------------------|------|------|------|------|
| Output Leak<br>Current                  |               | I <sub>CEX</sub>     | 1               | V <sub>CE</sub> =50V, Ta=25℃                                        | —    | —    | 50   | μA   |
|                                         |               |                      |                 | V <sub>CE</sub> =50V, Ta=85℃                                        | —    | —    | 100  |      |
|                                         | KID65002AP/AF |                      |                 | V <sub>CE</sub> =50V, V <sub>IN</sub> =6V                           | —    | —    | 500  |      |
|                                         | KID65004AP/AF |                      |                 | V <sub>CE</sub> =50V, V <sub>IN</sub> =1V                           | —    | —    | 500  |      |
| Collector-Emitter<br>Saturation Voltage |               | V <sub>CE(sat)</sub> | 2               | I <sub>OUT</sub> =350mA, I <sub>IN</sub> =500μA                     | —    | 1.3  | 1.6  | V    |
|                                         |               |                      |                 | I <sub>OUT</sub> =200mA, I <sub>IN</sub> =350μA                     | —    | 1.1  | 1.3  |      |
|                                         |               |                      |                 | I <sub>OUT</sub> =100mA, I <sub>IN</sub> =250μA                     | —    | 0.9  | 1.1  |      |
| Input Current                           | KID65002AP/AF | I <sub>IN(ON)</sub>  | 3               | V <sub>IN</sub> =17V                                                | —    | 0.82 | 1.25 | mA   |
|                                         | KID65003AP/AF |                      |                 | V <sub>IN</sub> =3.85V                                              | —    | 0.93 | 1.35 |      |
|                                         | KID65004AP/AF |                      |                 | V <sub>IN</sub> =5V                                                 | —    | 0.35 | 0.5  |      |
|                                         |               |                      |                 | V <sub>IN</sub> =12V                                                | —    | 1.0  | 1.45 |      |
|                                         |               | I <sub>IN(OFF)</sub> | 4               | I <sub>OUT</sub> =500μA, Ta=85℃                                     | 50   | 65   | —    | μA   |
| Input Voltage                           | KID65002AP/AF | V <sub>IN(ON)</sub>  | 5               | V <sub>CE</sub> =2V, I <sub>OUT</sub> =300mA                        | —    | —    | 13   | V    |
|                                         | KID65003AP/AF |                      |                 | V <sub>CE</sub> =2V, I <sub>OUT</sub> =200mA                        | —    | —    | 2.4  |      |
|                                         |               |                      |                 | V <sub>CE</sub> =2V, I <sub>OUT</sub> =250mA                        | —    | —    | 2.7  |      |
|                                         |               |                      |                 | V <sub>CE</sub> =2V, I <sub>OUT</sub> =300mA                        | —    | —    | 3.0  |      |
|                                         |               |                      |                 | V <sub>CE</sub> =2V, I <sub>OUT</sub> =125mA                        | —    | —    | 5.0  |      |
|                                         |               |                      |                 | V <sub>CE</sub> =2V, I <sub>OUT</sub> =200mA                        | —    | —    | 6.0  |      |
|                                         |               |                      |                 | V <sub>CE</sub> =2V, I <sub>OUT</sub> =275mA                        | —    | —    | 7.0  |      |
|                                         | KID65004AP/AF |                      |                 | V <sub>CE</sub> =2V, I <sub>OUT</sub> =350mA                        | —    | —    | 8.0  |      |
| DC Current Transfer Ratio               |               | h <sub>FE</sub>      | 2               | V <sub>CE</sub> =2V, I <sub>OUT</sub> =350mA                        | 1000 | —    | —    |      |
| Clamp Diode Reverse Current             |               | I <sub>R</sub>       | 6               | V <sub>R</sub> =50V, Ta=25℃                                         | —    | —    | 50   | μA   |
|                                         |               |                      |                 | V <sub>R</sub> =50V, Ta=85℃                                         | —    | —    | 100  |      |
| Clamp Diode Forward Voltage             |               | V <sub>F</sub>       | 7               | I <sub>F</sub> =350mA                                               | —    | —    | 2.0  | V    |
| Input Capacitance                       |               | C <sub>IN</sub>      |                 |                                                                     | —    | 15   | —    | pF   |
| Turn-ON Delay                           |               | t <sub>ON</sub>      | 8               | V <sub>OUT</sub> =50V, R <sub>L</sub> =163Ω<br>C <sub>L</sub> =15pF | —    | 0.1  | —    | μS   |
| Turn-OFF Delay                          |               | t <sub>OFF</sub>     |                 |                                                                     | —    | 0.2  | —    |      |

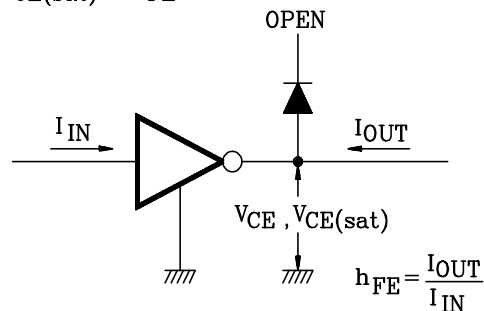
# KID65001AP/AF ~ KID65004AP/AF

## TEST CIRCUIT

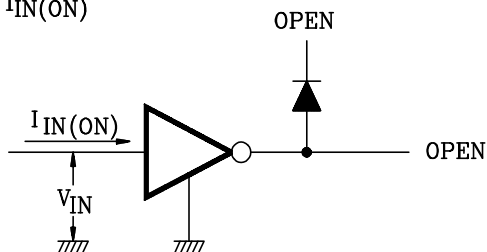
1.  $I_{CEX}$



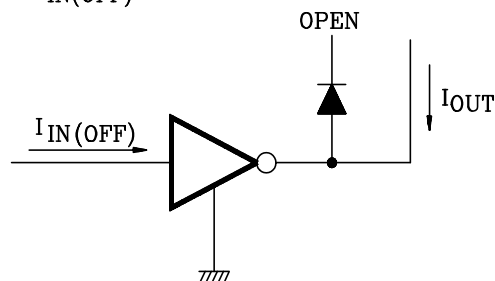
2.  $V_{CE(sat)}$ ,  $h_{FE}$



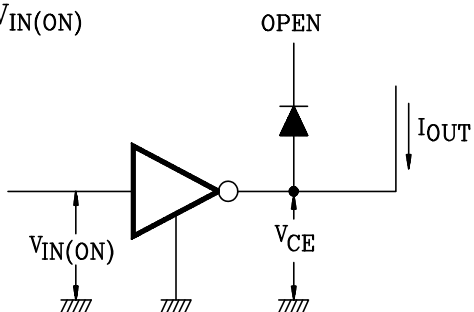
3.  $I_{IN(ON)}$



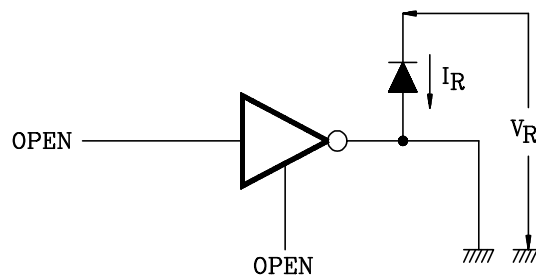
4.  $I_{IN(OFF)}$



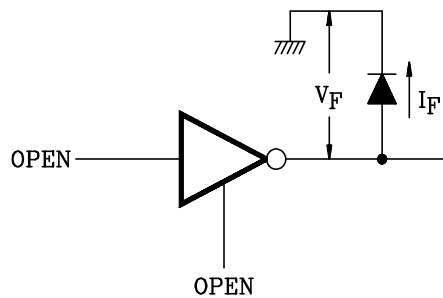
5.  $V_{IN(ON)}$



6.  $I_R$

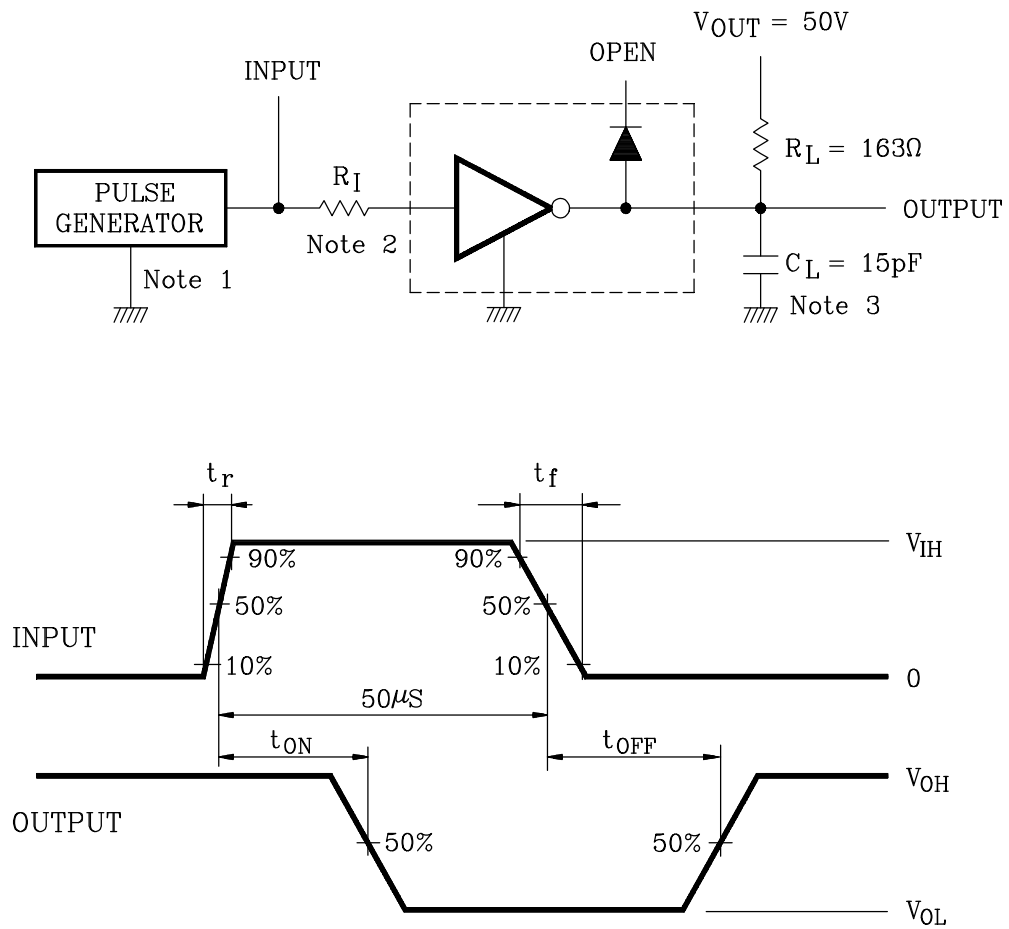


7.  $V_F$



# KID65001AP/AF ~ KID65004AP/AF

8.  $t_{ON}, t_{OFF}$



Notes : 1. Pulse Width  $50\mu S$ , Duty Cycle 10%  
Output Impedance  $50\Omega$ ,  $t_r \leq 5ns$ ,  $t_f \leq 10ns$

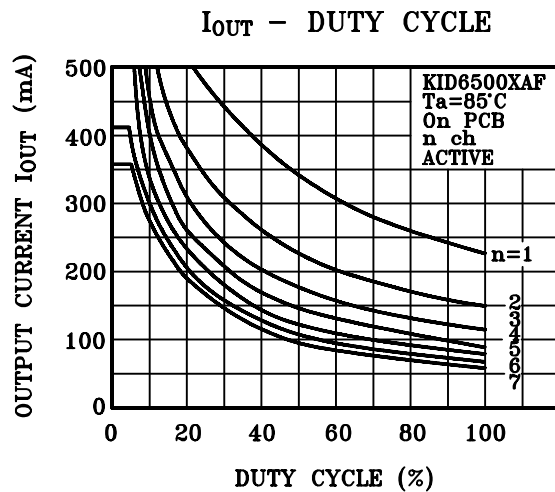
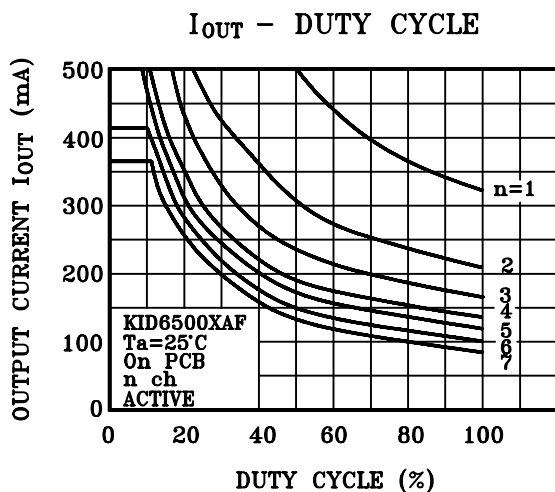
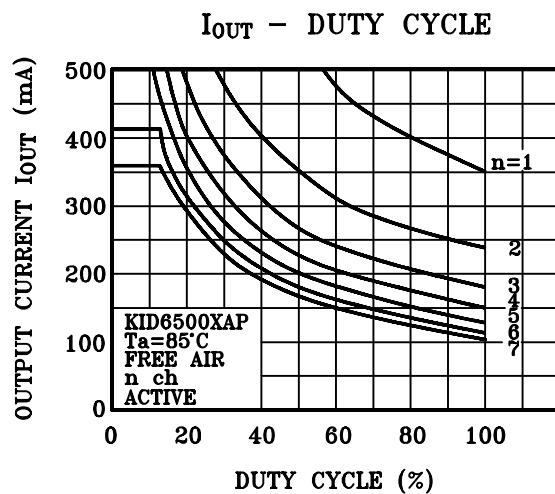
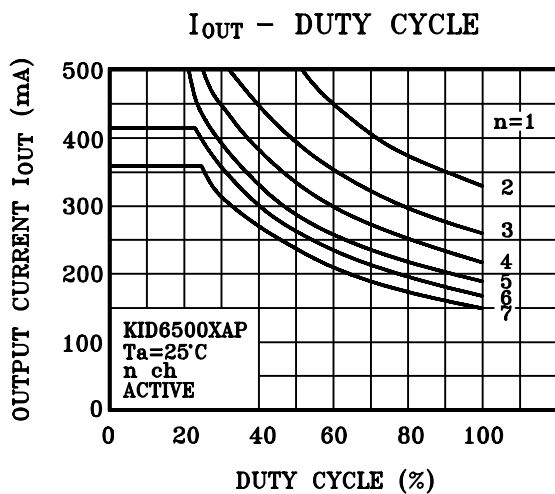
2. See below

Input Conditions

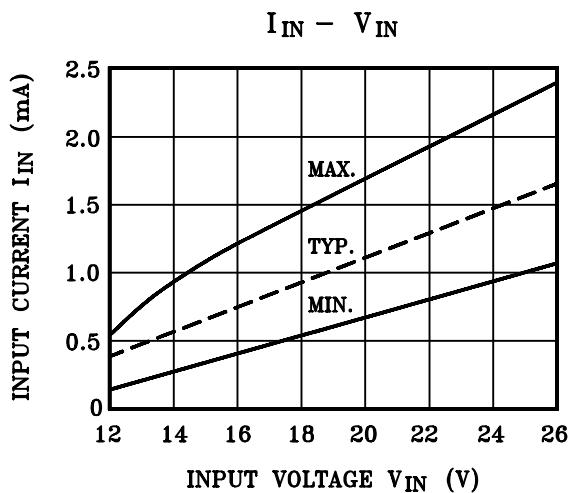
| Type Number   | $R_I$        | $V_{IH}$ |
|---------------|--------------|----------|
| KID65001AP/AF | $2.7k\Omega$ | 3V       |
| KID65002AP/AF | 0            | 13V      |
| KID65003AP/AF | 0            | 3V       |
| KID65004AP/AF | 0            | 8V       |

3.  $C_L$  includes probe and Jig capacitance.

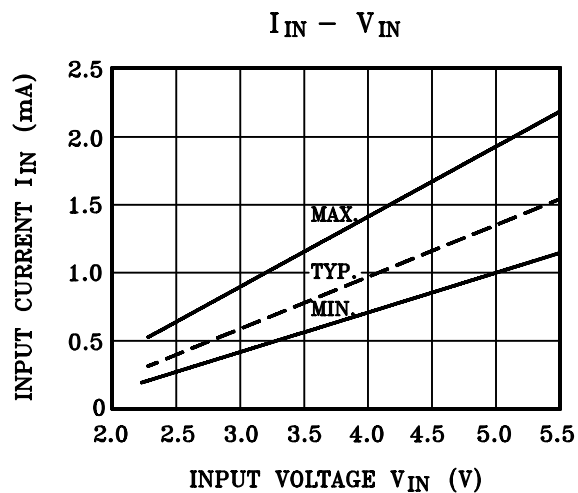
# KID65001AP/AF ~ KID65004AP/AF



KID65002AP/AF



KID65003AP/AF



# KID65001AP/AF ~ KID65004AP/AF

KID65004AP/AF

