

#### 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 7V+10.5kΩ	14~25V P-MOS
KID65003AP/AF	2.7kΩ	TTL, 5V C-MOS
KID65004AP/AF	10.5kΩ	6~15V P-MOS, C-MOS

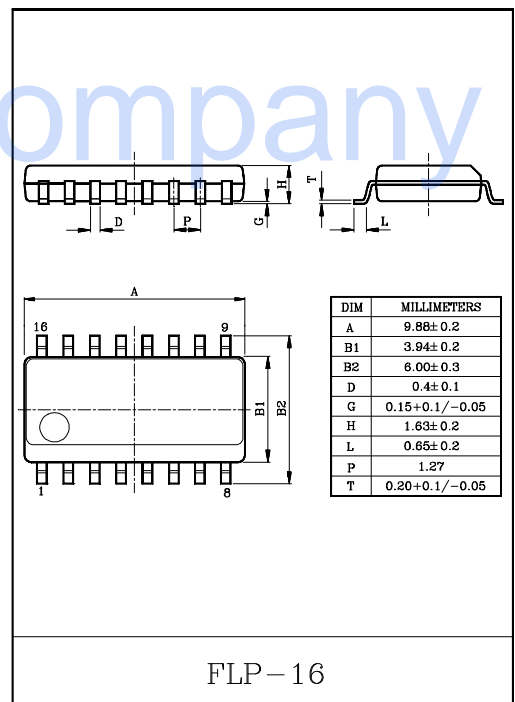
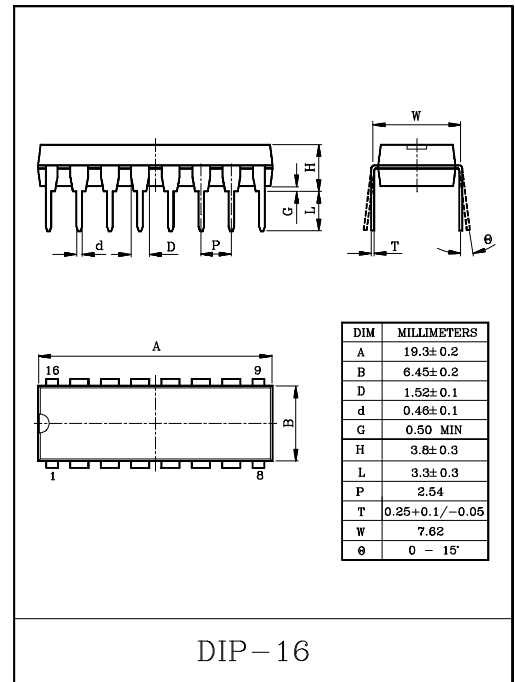
#### DESCRIPTION:

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)

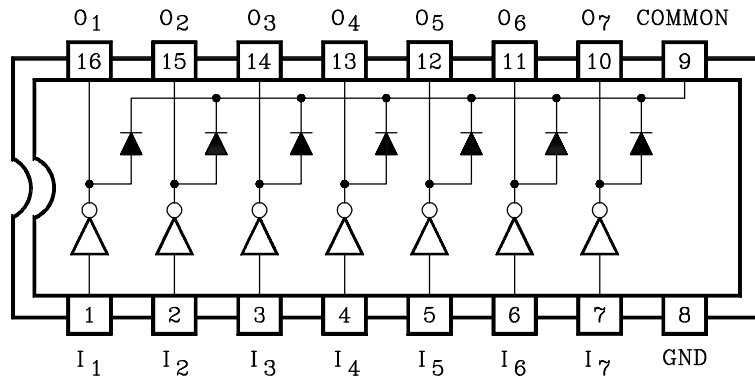
CHARACTERISTIC		SYMBOL	RATING	UNIT
Output Sustaining Voltage		$V_{CE(SUS)}$	50	V
Output Current		$I_{OUT}$	500	mA
Input Voltage		$V_{IN}^*$	-0.5~+30	V
Input Current		$I_{IN}^{**}$	25	mA
Clamp Diode	Reverse Voltage	$V_R$	50	V
	Forward Current	$I_F$	500	mA
GND Terminal Current		$I_{GND}$	2.8	A
Power Dissipation	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



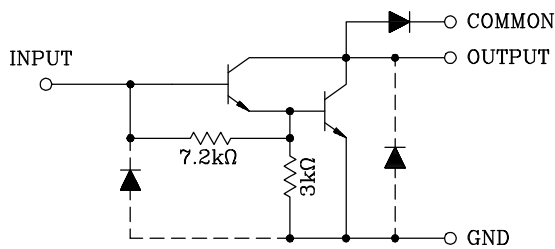
# KID65001AP/AF ~ KID65004AP/AF

## PIN CONNECTION (TOP VIEW)

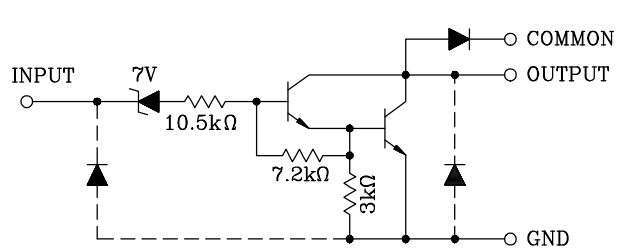


## SCHEMATICS (EACH DRIVER)

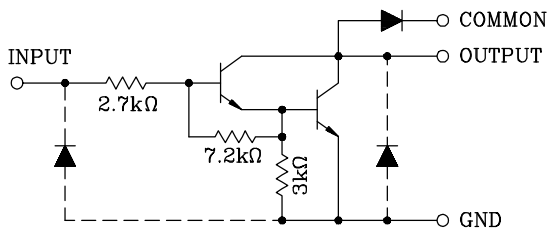
KID65001AP/AF



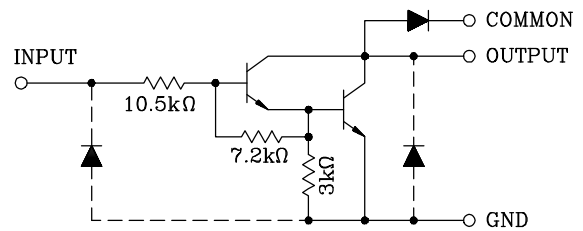
KID65002AP/AF



KID65003AP/AF



KID65004AP/AF



# KID65001AP/AF ~ KID65004AP/AF

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

CHARACTERISTIC		SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
Output Sustaining Voltage		V <sub>CE(SUS)</sub>		0	-	50	V
Output Current		I <sub>OUT</sub>	T <sub>PW</sub> =25ms, DF=10%, 7 Circuits	0	-	400	mA
			T <sub>PW</sub> =25ms, DF=30%, 7 Circuits	0	-	200	
Input Voltage		V <sub>IN</sub>	Except KID65001AP/AF	0	-	30	V
Input Current		I <sub>IN</sub>	Only KID65001AP/AF	0	-	5	mA
Clamp Diode Reverse Voltage		V <sub>R</sub>		-	-	50	V
Clamp Diode Forward Current		I <sub>F</sub>		-	-	400	mA
Power Dissipation	AP	P <sub>D</sub>	Ta=Topr(max) *	-	-	0.52	W
	AF			-	-	0.32	

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

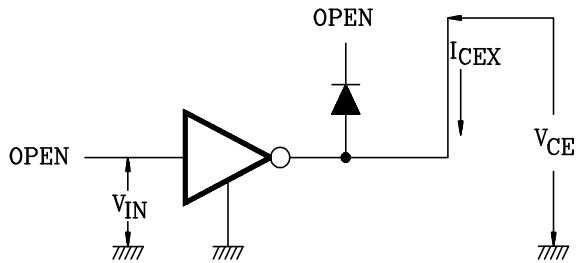
## ELECTRICAL CHARACTERISTICS (Ta=25°C, unless otherwise noted)

CHARACTERISTICS		SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Leak Current		I <sub>CEX</sub>	1	V <sub>CE</sub> =50V, Ta=25°C	-	-	50	μA
				V <sub>CE</sub> =50V, Ta=85°C	-	-	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 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°C	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	
	KID65004AP/AF			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	
	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°C	-	-	50	μA
				V <sub>R</sub> =50V, Ta=85°C	-	-	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 C <sub>L</sub> =15pF	-	0.1	-	μS
Turn-OFF Delay		t <sub>OFF</sub>			-	0.2	-	

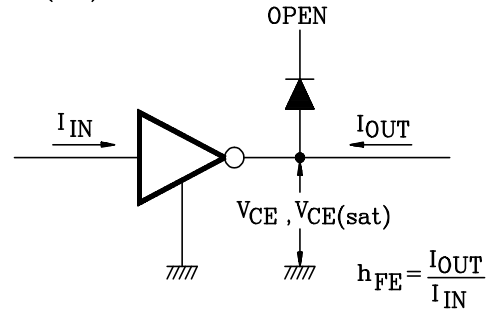
# KID65001AP/AF ~ KID65004AP/AF

## TEST CIRCUIT

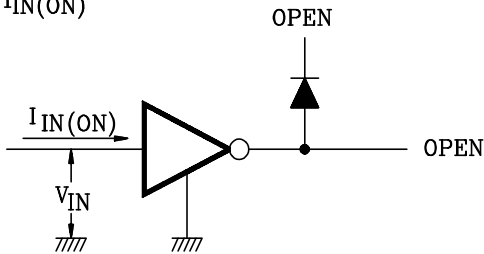
1.  $I_{CEX}$



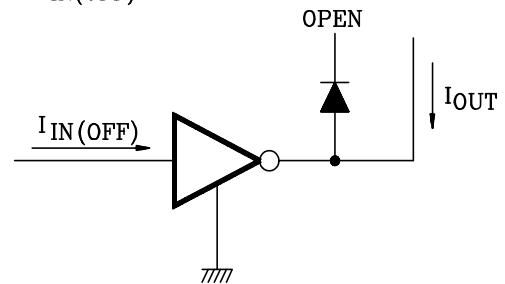
2.  $V_{CE(sat)}$ ,  $h_{FE}$



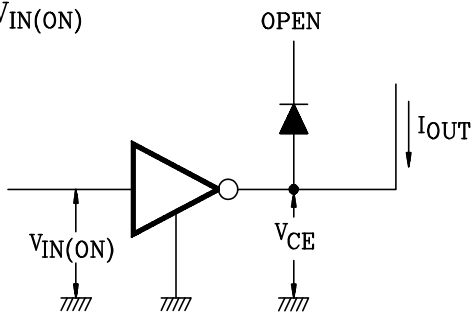
3.  $I_{IN(ON)}$



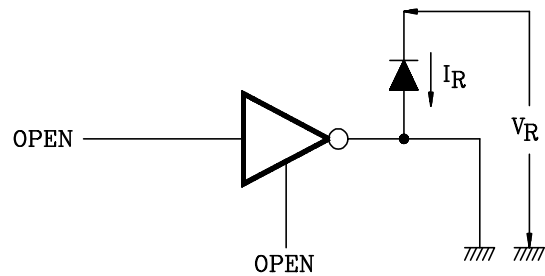
4.  $I_{IN(OFF)}$



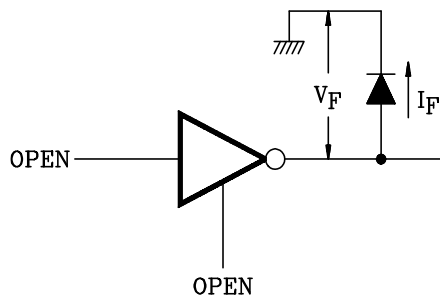
5.  $V_{IN(ON)}$



6.  $I_R$

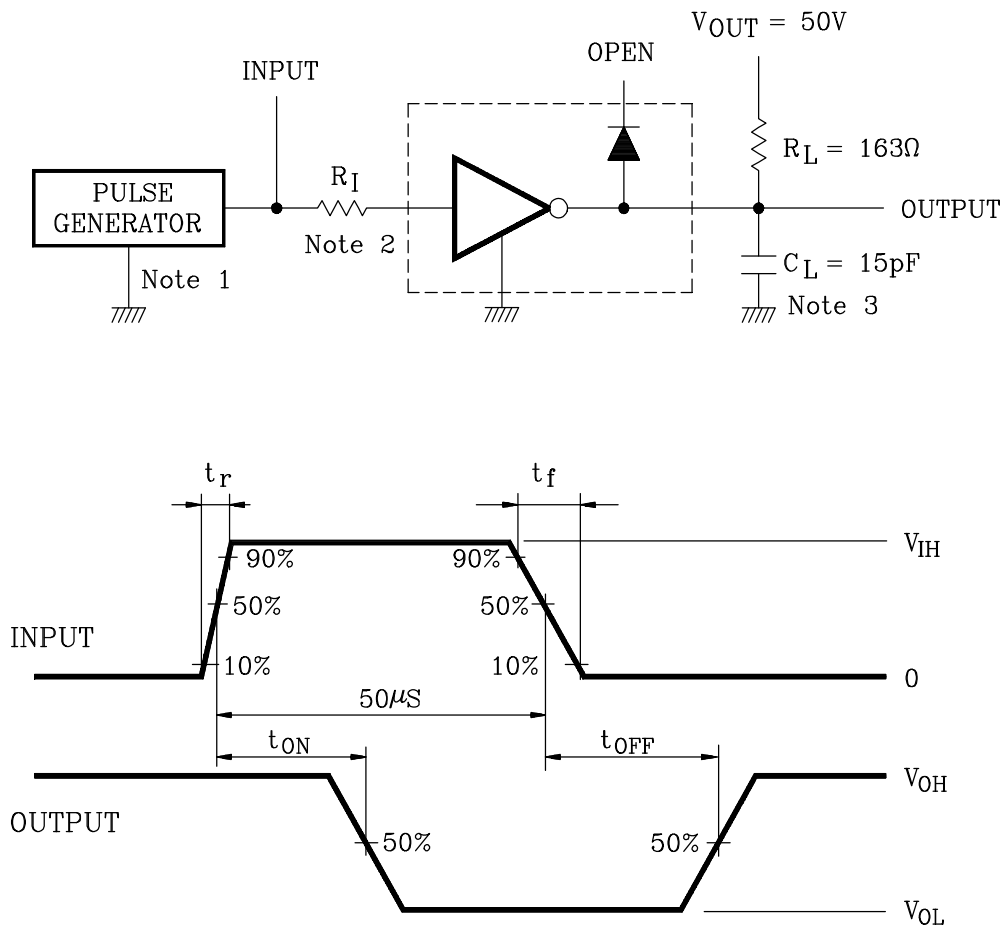


7.  $V_F$



# KID65001AP/AF ~ KID65004AP/AF

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



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

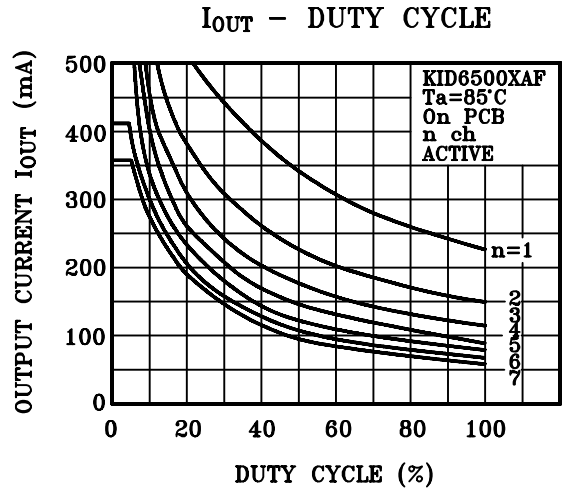
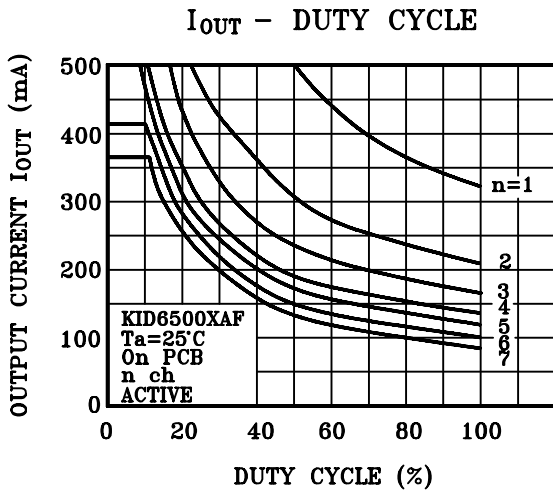
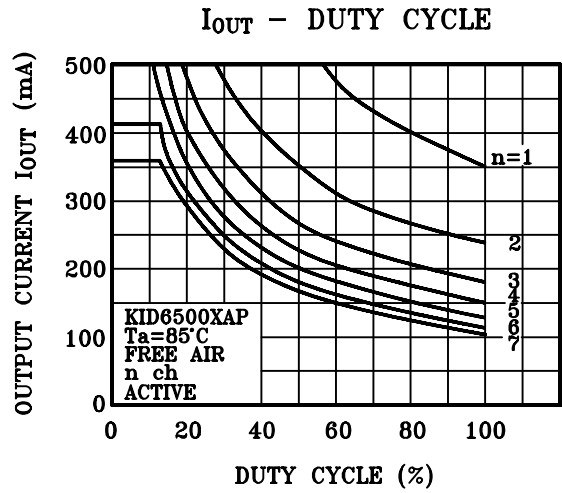
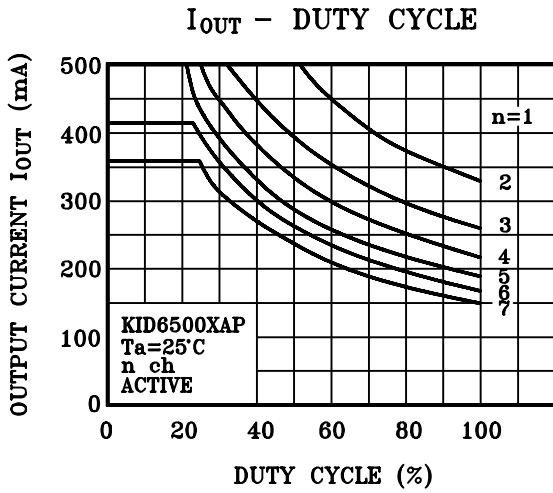
2. See below

Input Conditions

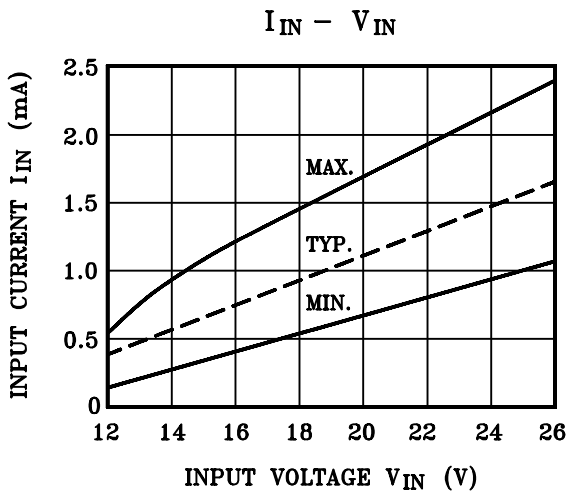
Type Number	$R_I$	$V_{IH}$
KID65001AP/AF	$2.7\text{k}\Omega$	3V
KID65002AP/AF	0	13V
KID65003AP/AF	0	3V
KID65004AP/AF	0	8V

3.  $C_L$  includes probe and Jig capacitance.

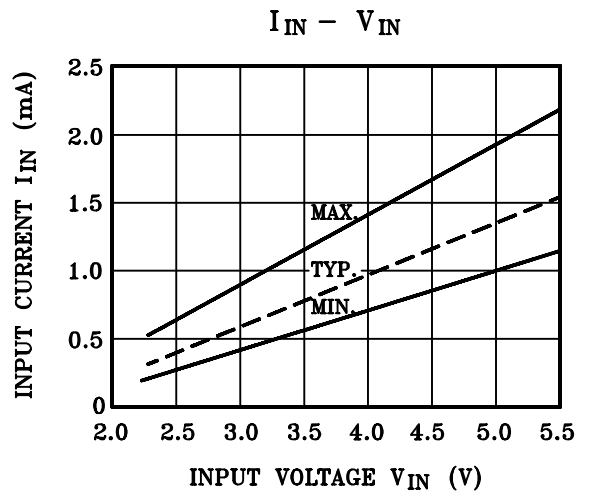
# KID65001AP/AF ~ KID65004AP/AF



## KID65002AP/AF



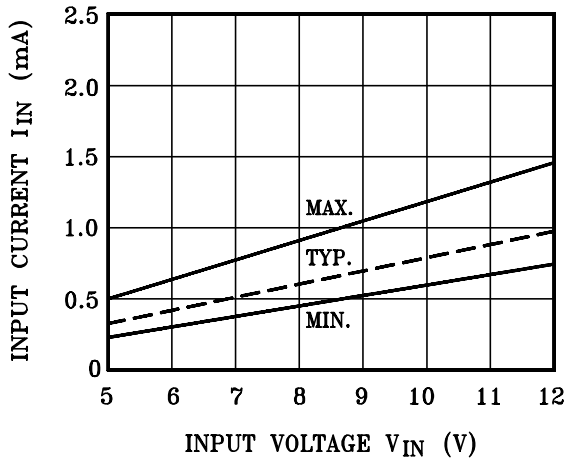
## KID65003AP/AF



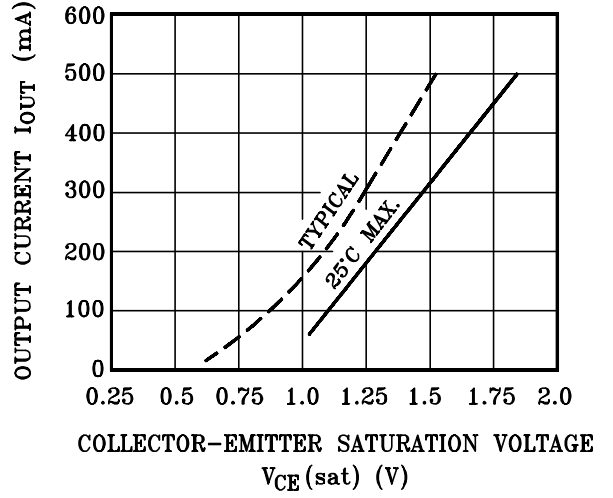
# KID65001AP/AF ~ KID65004AP/AF

KID65004AP/AF

$I_{IN} - V_{IN}$



$I_{OUT} - V_{CE(sat)}$



$P_D - T_a$

