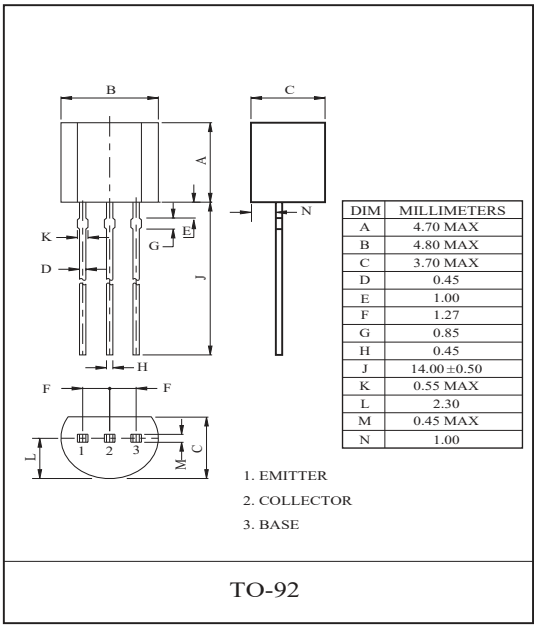
KRA101~KRA106

EPITAXIAL PLANAR PNP TRANSISTOR

SWITCHING APPLICATION.
INTERFACE CIRCUIT AND DRIVER CIRCUIT APPLICATION.

FEATURES

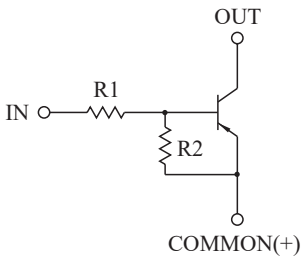
- With Built-in Bias Resistors.
- Simplify Circuit Design.
- Reduce a Quantity of Parts and Manufacturing Process.



DIM	MILLIMETERS
A	4.70 MAX
B	4.80 MAX
C	3.70 MAX
D	0.45
E	1.00
F	1.27
G	0.85
H	0.45
J	14.00±0.50
K	0.55 MAX
L	2.30
M	0.45 MAX
N	1.00

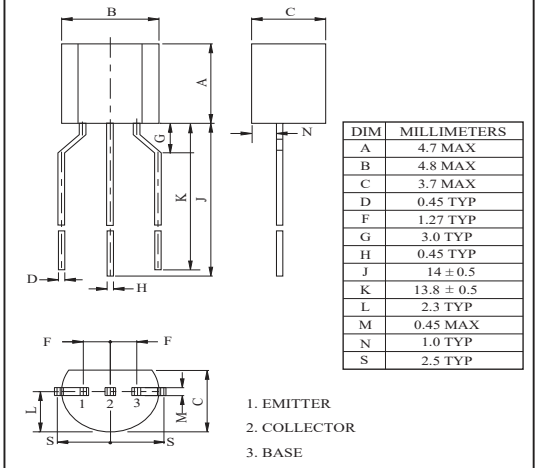
TO-92

EQUIVALENT CIRCUIT



BIAS RESISTOR VALUES

TYPE NO.	R1(kΩ)	R2(kΩ)
KRA101	4.7	4.7
KRA102	10	10
KRA103	22	22
KRA104	47	47
KRA105	2.2	47
KRA106	4.7	47



DIM	MILLIMETERS
A	4.7 MAX
B	4.8 MAX
C	3.7 MAX
D	0.45 TYP
F	1.27 TYP
G	3.0 TYP
H	0.45 TYP
J	14 ± 0.5
K	13.8 ± 0.5
L	2.3 TYP
M	0.45 MAX
N	1.0 TYP
S	2.5 TYP

TO-92 AT TAPING TYPE

MAXIMUM RATING (Ta=25℃)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Output Voltage	KRA101~106	V_O	-50	V
Input Voltage	KRA101	V_I	-20, 10	V
	KRA102		-30, 10	
	KRA103		-40, 10	
	KRA104		-40, 10	
	KRA105		-12, 5	
	KRA106		-20, 5	
Output Current	KRA101~106	I_O	-100	mA
Power Dissipation		P_D	625	mW
Junction Temperature		T_j	-55~150	℃
Storage Temperature Range		T_{stg}	-55~150	℃

ELECTRICAL CHARACTERISTICS (Ta=25℃)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Cut-off Current	KRA101~106	$I_{O(OFF)}$	V_O=-50V, V_I=0	-	-	-500	nA
DC Current Gain	KRA101	G_I	V_O=-5V, I_O=-10mA	30	55	-	
	KRA102			50	80	-	
	KRA103			70	120	-	
	KRA104			80	200	-	
	KRA105			80	200	-	
	KRA106			80	200	-	
Output Voltage	KRA101~106	$V_{O(ON)}$	I_O=-10mA, I_I=-0.5mA	-	-0.1	-0.3	V
Input Voltage (ON)	KRA101	$V_{I(ON)}$	V_O=-0.2V, I_O=-5mA	-	-1.5	-2.0	V
	KRA102			-	-1.8	-2.4	
	KRA103			-	-2.1	-3.0	
	KRA104			-	-2.8	-5.0	
	KRA105			-	-0.8	-1.1	
	KRA106			-	-0.9	-1.3	
Input Votlage (OFF)	KRA101~104	$V_{I(OFF)}$	V_O=-5V, I_O=-0.1mA	-1.0	-1.2	-	V
	KRA105~106			-0.5	-0.65	-	
Transition Frequency	KRA101~106	f_T*	V_O=-10V, I_O=-5mA	-	200	-	MHz
Input Current	KRA101	I_I	V_I=-5V	-	-	-1.8	mA
	KRA102			-	-	-0.88	
	KRA103			-	-	-0.36	
	KRA104			-	-	-0.18	
	KRA105			-	-	-3.6	
	KRA106			-	-	-1.8	
Input Resistor	KRA101	R1	-	3.29	4.7	6.11	kΩ
	KRA102			7	10	13	
	KRA103			15.4	22	28.6	
	KRA104			32.9	47	61.1	
	KRA105			1.54	2.2	2.86	
	KRA106			3.29	4.7	6.11	
Input Resistor	KRA101	R2	-	3.29	4.7	6.11	kΩ
	KRA102			7	10	13	
	KRA103			15.4	22	28.6	
	KRA104			32.9	47	61.1	
	KRA105			32.9	47	61.1	
	KRA106			32.9	47	61.1	

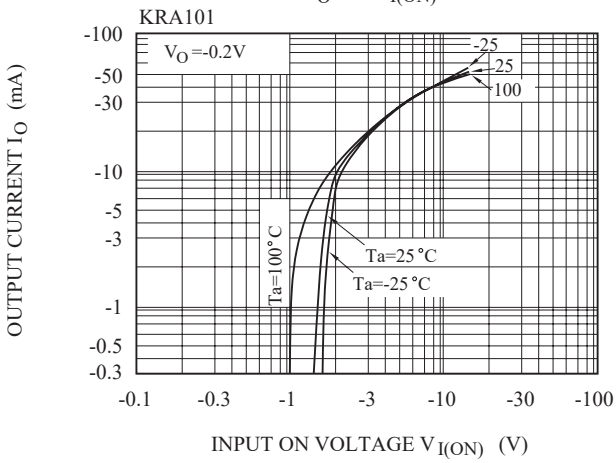
Note : *Characteristic of Transistor Only

ELECTRICAL CHARACTERISTICS (Ta=25℃)

CHARACTERISTIC			SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Switching Time	Rise Time	KRA101	t_r	V_O=-5V V_{IN}=-5V R_L=1kΩ	-	0.07	-	μS
		KRA102			-	0.06	-	
		KRA103			-	0.2	-	
		KRA104			-	0.24	-	
		KRA105			-	0.02	-	
		KRA106			-	0.07	-	
	Storage Time	KRA101	t_{stg}		-	1.1	-	
		KRA102			-	1.1	-	
		KRA103			-	1.1	-	
		KRA104			-	1.1	-	
		KRA105			-	1.1	-	
		KRA106			-	1.1	-	
	Fall Time	KRA101	t_f		-	0.15	-	
		KRA102			-	0.24	-	
		KRA103			-	0.38	-	
		KRA104			-	0.63	-	
		KRA105			-	0.1	-	
		KRA106			-	0.2	-	

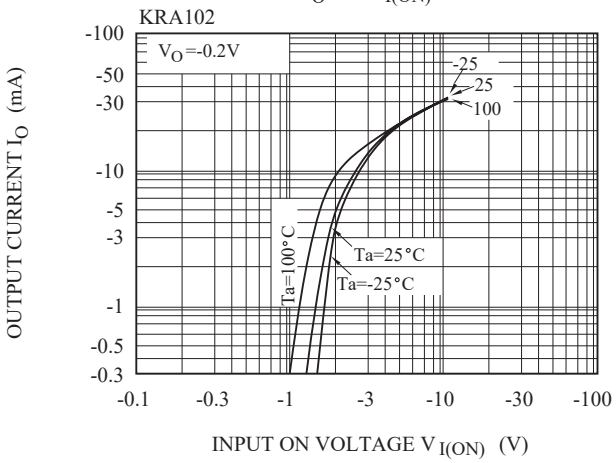
I_O - $V_{I(ON)}$

KRA101



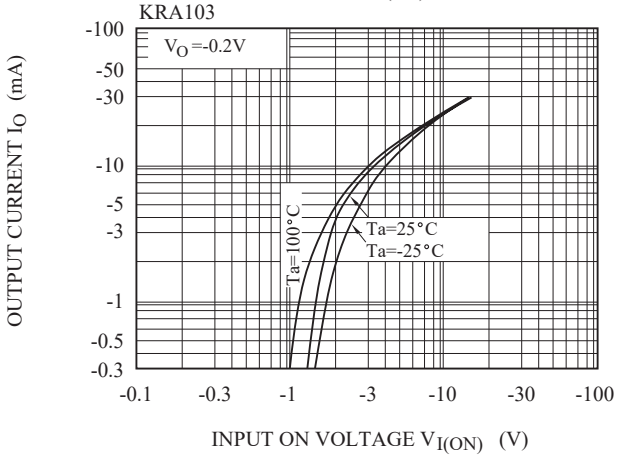
I_O - $V_{I(ON)}$

KRA102



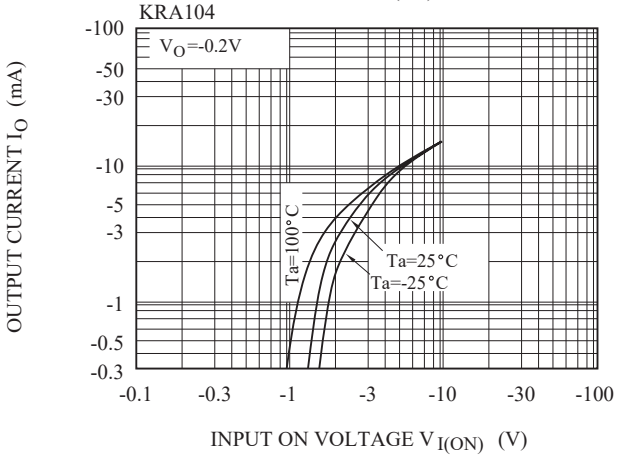
I_O - $V_{I(ON)}$

KRA103



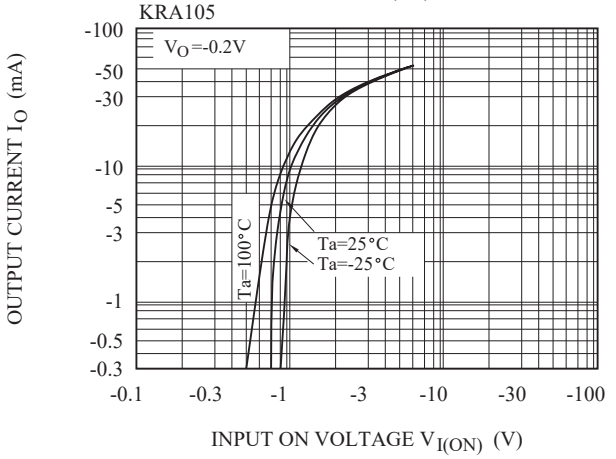
I_O - $V_{I(ON)}$

KRA104



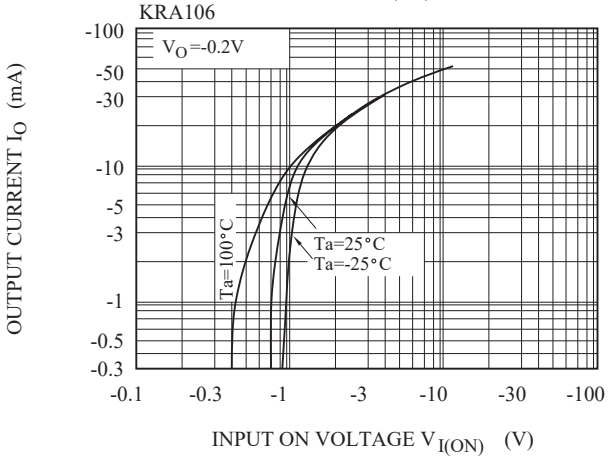
I_O - $V_{I(ON)}$

KRA105



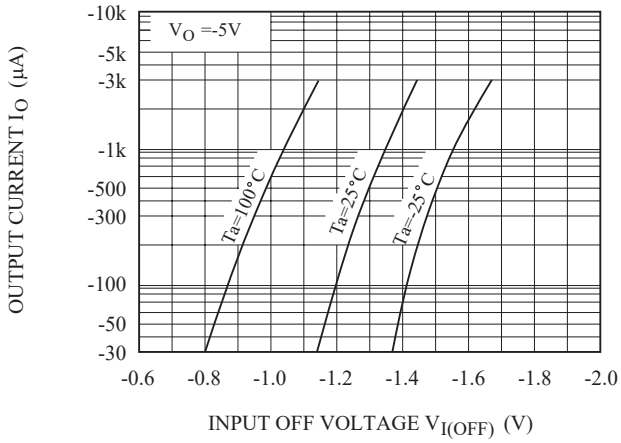
I_O - $V_{I(ON)}$

KRA106



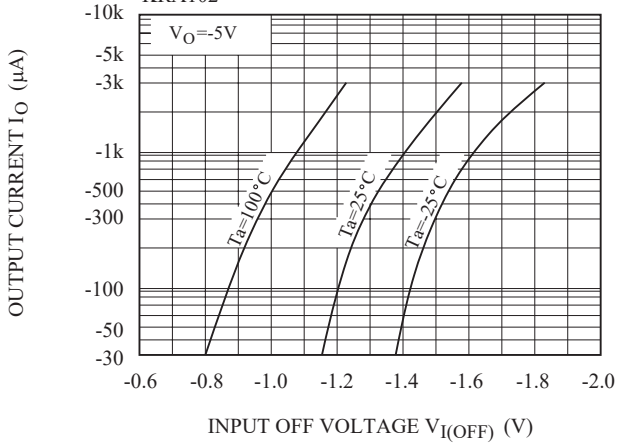
I_O - $V_{I(OFF)}$

KRA101



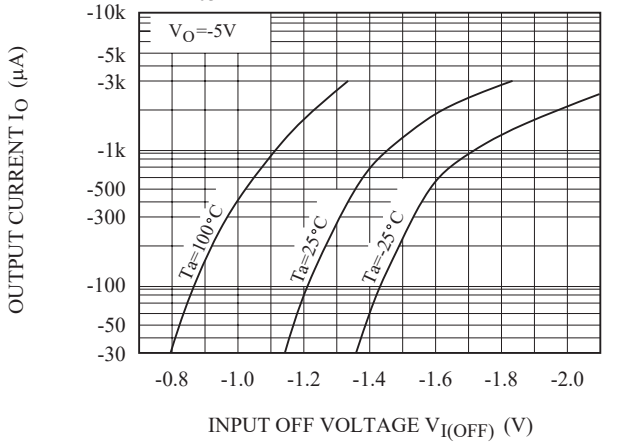
I_O - $V_{I(OFF)}$

KRA102



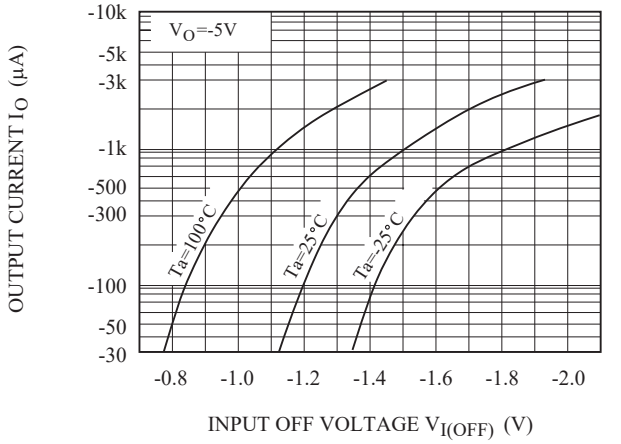
I_O - $V_{I(OFF)}$

KRA103



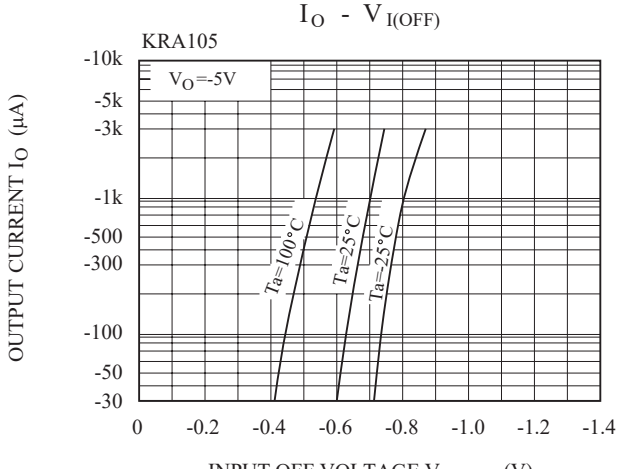
I_O - $V_{I(OFF)}$

KRA104



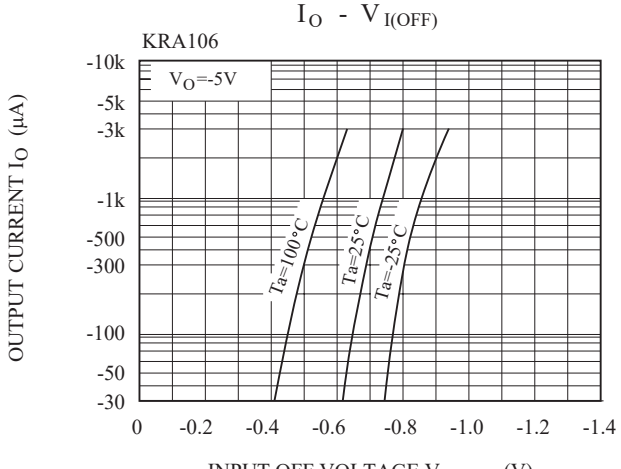
I_O - $V_{I(OFF)}$

KRA105



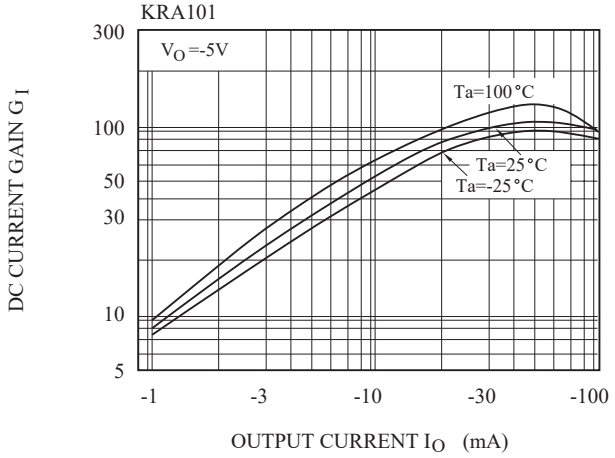
I_O - $V_{I(OFF)}$

KRA106



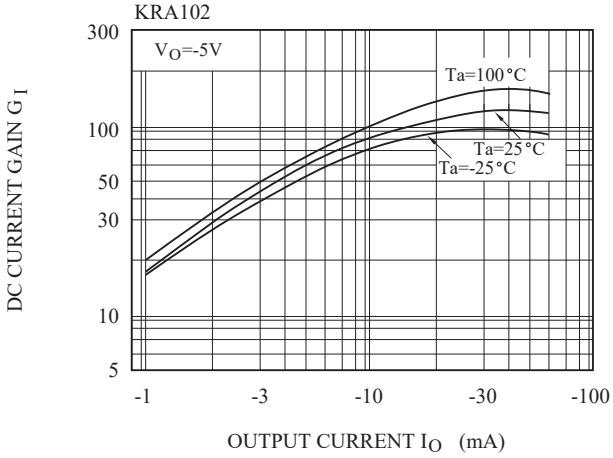
G_I - I_O

KRA101



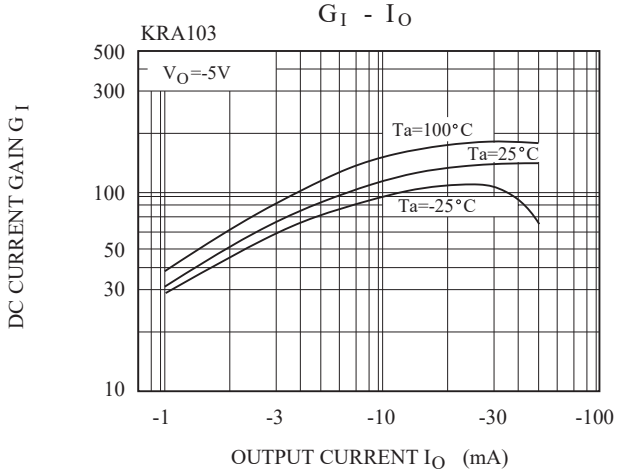
G_I - I_O

KRA102



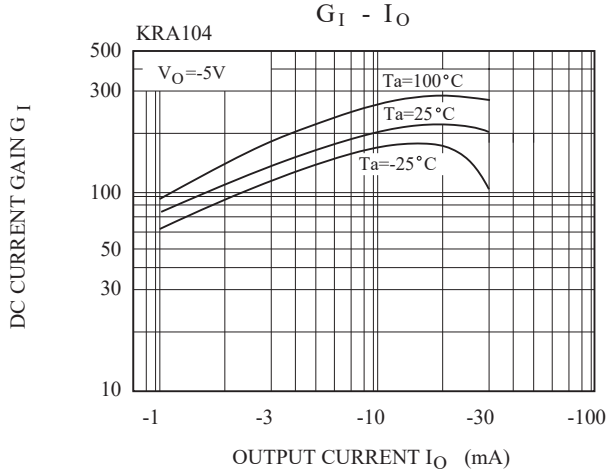
G_I - I_O

KRA103



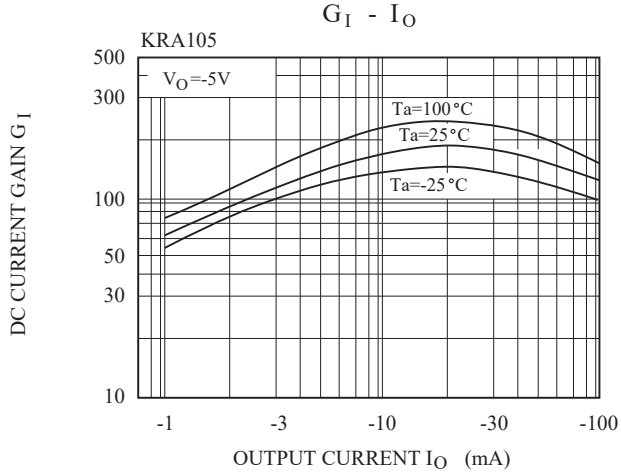
G_I - I_O

KRA104



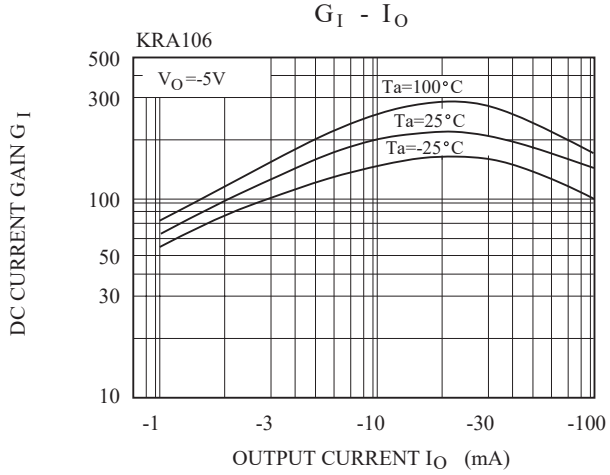
G_I - I_O

KRA105



G_I - I_O

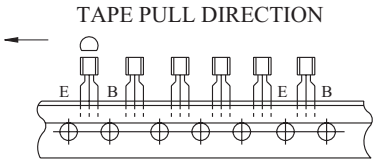
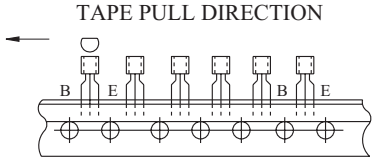
KRA106



<Table of contents>

1. Tape Infomation

(1) List of Packing Forms

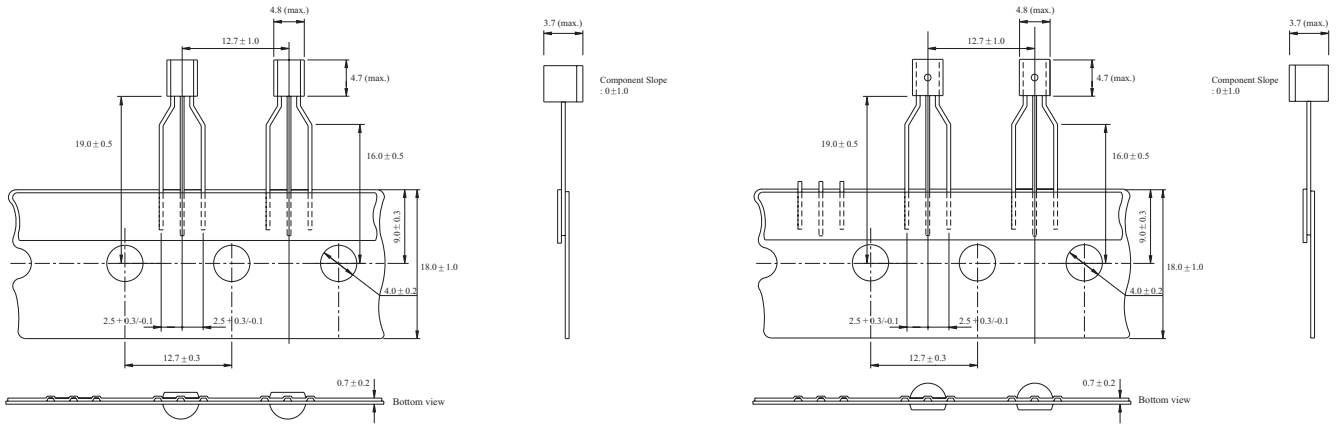
Item	Taping Spec.	Device	Dimension outline	Outline	Quantity
AMMO	AT				2,000pcs
	ATR				

(2) Taping specifications

Taping spec.	Package classification	Taping classification		Package quantity (pcs)
	AMMO packing	Taping in forward direction	Taping in reverse direction	
AT	○	○		2,000
ATR	○		○	2,000

*Spec. example : AT, R ① : Taping of AMMO PACK type ② : Reverse direction type
① ②

(3) Tape Dimension



2. Packing & Label Information

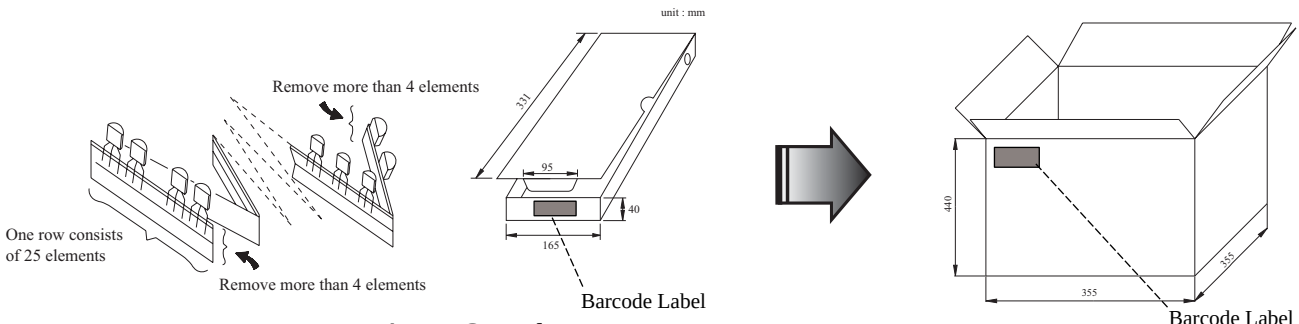
(1) Packing Quantity

Unit:pcs

AMMO pack	Carton Box
2,000	40,000

(2) Packing Method

Unit:mm



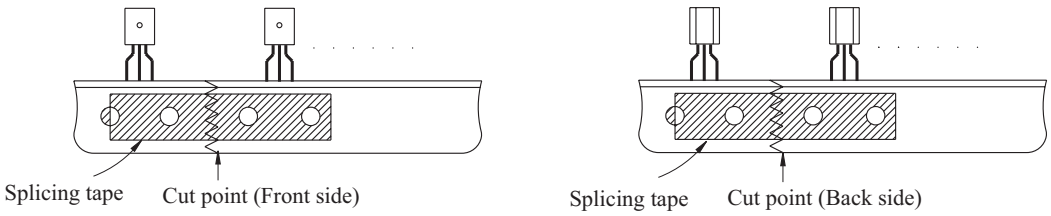
AMMO pack　　Carton box

* : Indicates the first-out electrode of lead.		
Example	E	Emitter first-out
	BC	Base,Collector first-out

· Fold the taping in zigzag for every 25 elements in the tape dimensions.
· Remove more than 4 elements at the beginning and ending of the taping

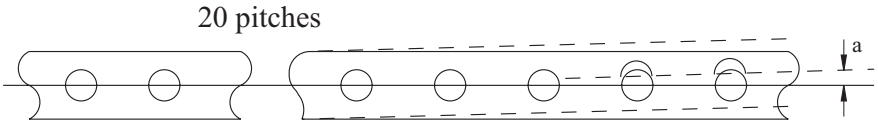
① Other standard

How to splice tape : a tape is cut and splicing tape as illustrated below.
(when a tape is completed or cut)



② Accuracy of spliced

Dimension of "a" must be less than 1mm/20 pitches.



③ Missing element

Missing element must be less than 3 continuous elements.

(3) Packing Materials

Item	Material
C-Tape	Kraft Paper
R-Tape	Crepe Paper
Inner Case	Inner Case

(4) Label Information

① Inner Case Label

② Carton Label

3. Ordering and Environment Information

(1) Ordering Information

- MOQ (Minimum Order Quantity) : 2,000pcs

(2) Environment Information

① Storage Environment
- Recommended storage conditions are as follows
  : Temperature : -5 to 35℃
  : Humidity : 20 to 85%RH

② Storage Period
- Specified storage period : 2 years