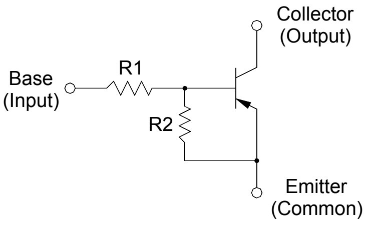
RA101S…RA106S

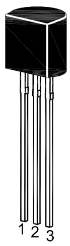
PNP Silicon Epitaxial Planar Transistor

for switching and interface circuit and drive circuit applications

Features

- With built-in bias resistors
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process





1. Emitter 2. Collector 3. Base
TO-92 Plastic Package

Resistor Values

Type	R1 (KΩ)	R2 (KΩ)
RA101S	4.7	4.7
RA102S	10	10
RA103S	22	22
RA104S	47	47
RA105S	2.2	47
RA106S	4.7	47

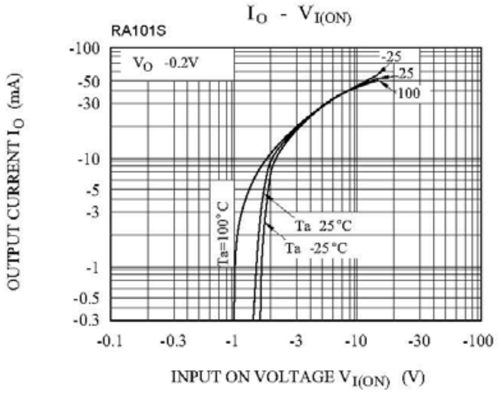
Absolute Maximum Ratings ($T_a = 25\ ^\circ C$)

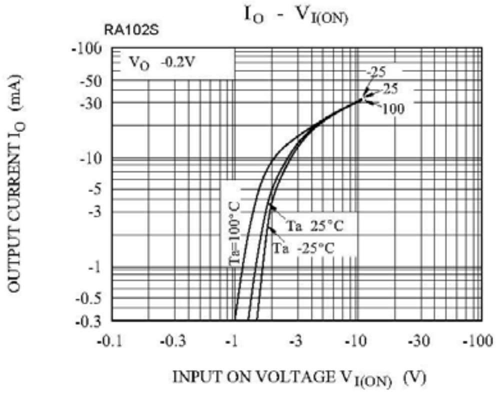
Parameter		Symbol	Value	Unit
Output Voltage		$-V_O$	50	V
Input Voltage	RA101S	$-V_I$	20, -10	V
	RA102S		30, -10	
	RA103S		40, -10	
	RA104S		40, -10	
	RA105S		12, -5	
	RA106S		20, -5	
Output Current		$-I_O$	100	mA
Total Power Dissipation		P_{tot}	200	mW
Junction Temperature		T_j	150	°C
Storage Temperature Range		T_{stg}	- 55 to + 150	°C

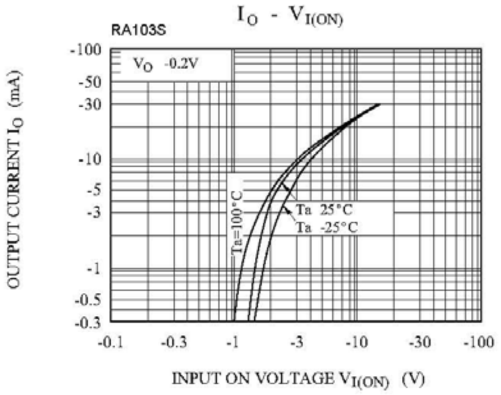
Characteristics at $T_a = 25\ ^{o}C$

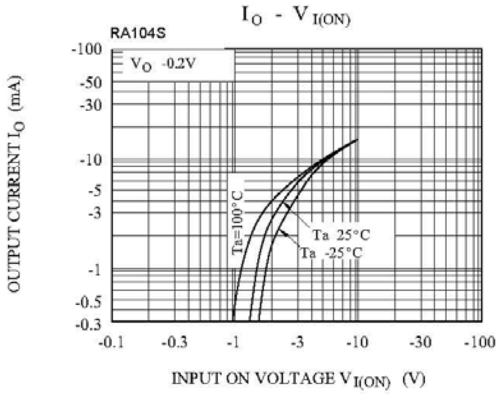
Parameter		Symbol	Min.	Typ.	Max.	Unit
DC Current Gain						
at $-V_O = 5$ V, $-I_O = 10$ mA	RA101S	G_I	30	-	-	-
	RA102S		50	-	-	-
	RA103S		70	-	-	-
	RA104S		80	-	-	-
	RA105S		80	-	-	-
	RA106S		80	-	-	-
Output Cutoff Current at $-V_O = 50$ V		$-I_{O(OFF)}$	-	-	500	nA
Input Current						
at $-V_I = 5$ V	RA101S	$-I_I$	-	-	1.8	mA
	RA102S		-	-	0.88	
	RA103S		-	-	0.36	
	RA104S		-	-	0.18	
	RA105S		-	-	3.6	
	RA106S		-	-	1.8	
Output Voltage at $-I_O = 10$ mA, $-I_I = 0.5$ mA		$-V_{O(ON)}$	-	-	0.3	V
Input Voltage (ON)						
at $-V_O = 0.2$ V, $-I_O = 5$ mA	RA101S	$-V_{I(ON)}$	-	-	2	V
	RA102S		-	-	2.4	
	RA103S		-	-	3	
	RA104S		-	-	5	
	RA105S		-	-	1.1	
	RA106S		-	-	1.3	
Input Voltage (OFF)						
at $-V_O = 5$ V, $-I_O = 0.1$ mA	RA101S~104S	$-V_{I(OFF)}$	1	-	-	V
	RA105S~106S		0.5	-	-	
Transition Frequency at $-V_O = 10$ V, $-I_O = 5$ mA		f_T (1)	-	200	-	MHz

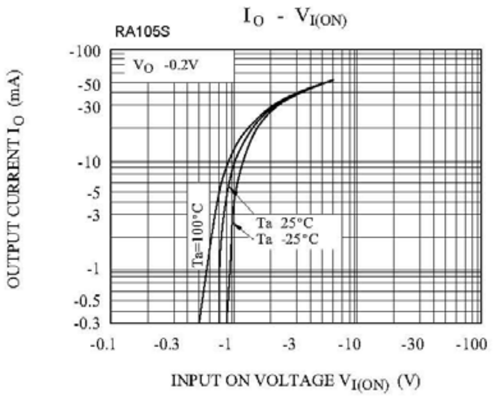
(1) Characteristic of transistor only.

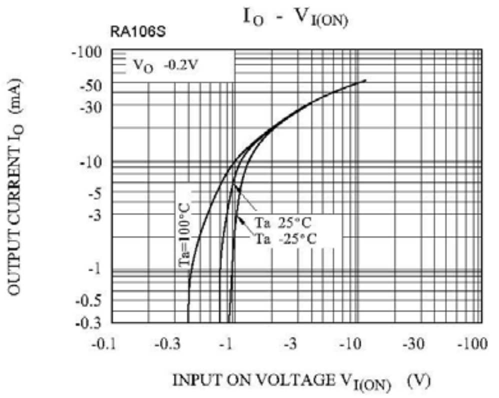

I_O - V_I(ON)
RA101S
V_O -0.2V
OUTPUT CURRENT I_O (mA)
-100
-50
-30
-10
-5
-3
-1
-0.5
-0.3
-0.1
-0.3
-1
-3
-10
-30
-100
INPUT ON VOLTAGE V_I(ON) (V)
-25
25
100
Ta=100°C
Ta 25°C
Ta -25°C

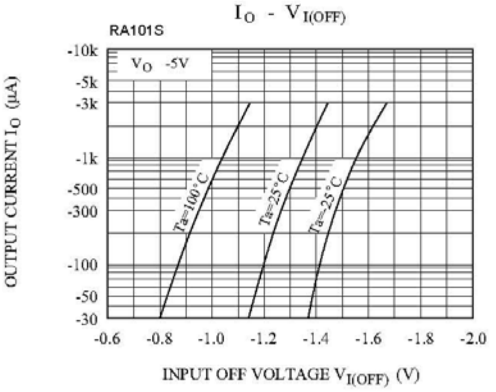

I_O - V_I(ON)
RA102S
V_O -0.2V
OUTPUT CURRENT I_O (mA)
-100
-50
-30
-10
-5
-3
-1
-0.5
-0.3
-0.1
-0.3
-1
-3
-10
-30
-100
INPUT ON VOLTAGE V_I(ON) (V)
-25
25
100
Ta=100°C
Ta 25°C
Ta -25°C

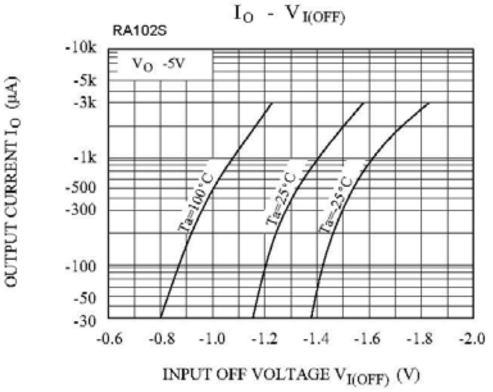

I_O - V_I(ON)
RA103S
V_O -0.2V
OUTPUT CURRENT I_O (mA)
-100
-50
-30
-10
-5
-3
-1
-0.5
-0.3
-0.1
-0.3
-1
-3
-10
-30
-100
INPUT ON VOLTAGE V_I(ON) (V)
Ta=100°C
Ta 25°C
Ta -25°C

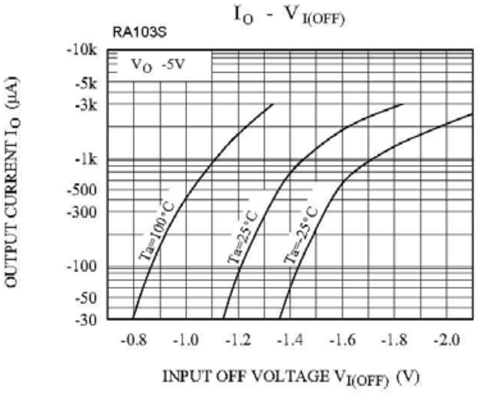

I_O - V_I(ON)
RA104S
V_O -0.2V
OUTPUT CURRENT I_O (mA)
-100
-50
-30
-10
-5
-3
-1
-0.5
-0.3
-0.1
-0.3
-1
-3
-10
-30
-100
INPUT ON VOLTAGE V_I(ON) (V)
Ta=100°C
Ta 25°C
Ta -25°C

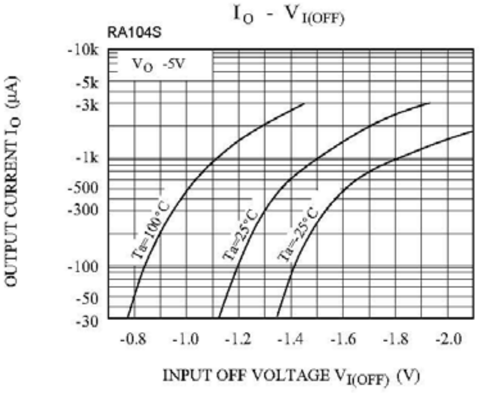

I_O - V_I(ON)
RA105S
V_O -0.2V
OUTPUT CURRENT I_O (mA)
-100
-50
-30
-10
-5
-3
-1
-0.5
-0.3
-0.1
-0.3
-1
-3
-10
-30
-100
INPUT ON VOLTAGE V_I(ON) (V)
Ta=100°C
Ta 25°C
Ta -25°C

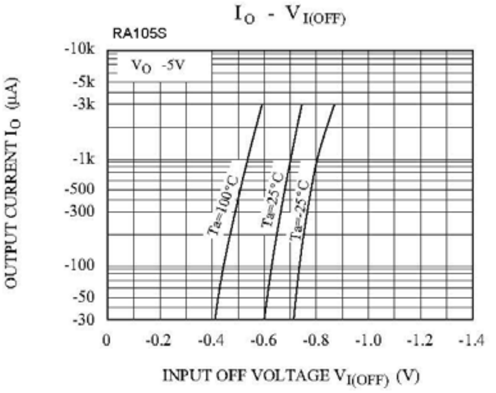

I_O - V_I(ON)
RA106S
V_O -0.2V
OUTPUT CURRENT I_O (mA)
-100
-50
-30
-10
-5
-3
-1
-0.5
-0.3
-0.1
-0.3
-1
-3
-10
-30
-100
INPUT ON VOLTAGE V_I(ON) (V)
Ta=100°C
Ta 25°C
Ta -25°C

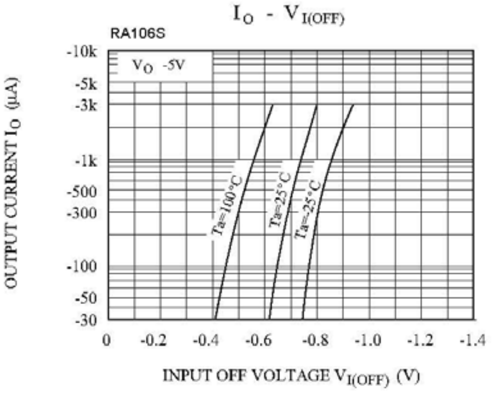

IO - VI(OFF)
RA101S
VO -5V
-10k
-5k
-3k
-1k
-500
-300
-100
-50
-30
Ta=100°C
Ta=25°C
Ta=-25°C
-0.6
-0.8
-1.0
-1.2
-1.4
-1.6
-1.8
-2.0
OUTPUT CURRENT IO (µA)
INPUT OFF VOLTAGE VI(OFF) (V)

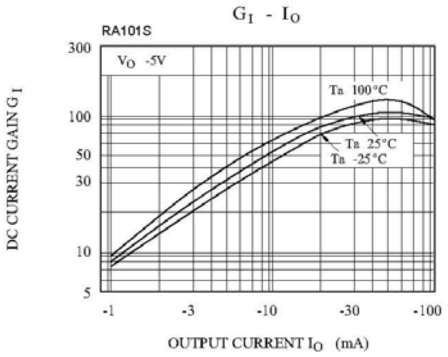

IO - VI(OFF)
RA102S
VO -5V
-10k
-5k
-3k
-1k
-500
-300
-100
-50
-30
Ta=100°C
Ta=25°C
Ta=-25°C
-0.6
-0.8
-1.0
-1.2
-1.4
-1.6
-1.8
-2.0
OUTPUT CURRENT IO (µA)
INPUT OFF VOLTAGE VI(OFF) (V)

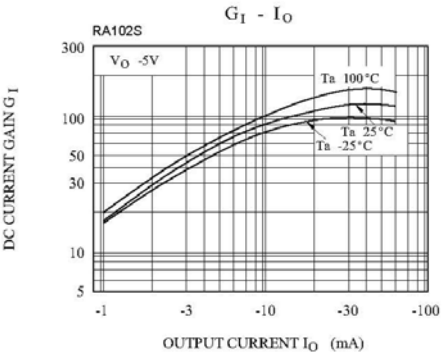

IO - VI(OFF)
RA103S
VO -5V
-10k
-5k
-3k
-1k
-500
-300
-100
-50
-30
Ta=100°C
Ta=25°C
Ta=-25°C
-0.8
-1.0
-1.2
-1.4
-1.6
-1.8
-2.0
OUTPUT CURRENT IO (µA)
INPUT OFF VOLTAGE VI(OFF) (V)

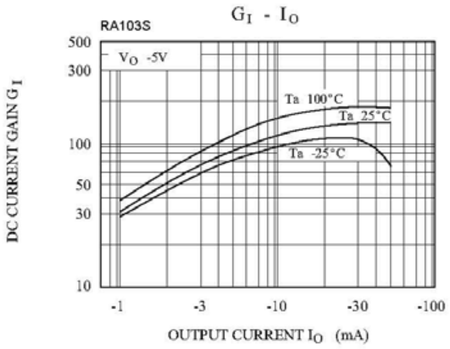

IO - VI(OFF)
RA104S
VO -5V
-10k
-5k
-3k
-1k
-500
-300
-100
-50
-30
Ta=100°C
Ta=25°C
Ta=-25°C
-0.8
-1.0
-1.2
-1.4
-1.6
-1.8
-2.0
OUTPUT CURRENT IO (µA)
INPUT OFF VOLTAGE VI(OFF) (V)

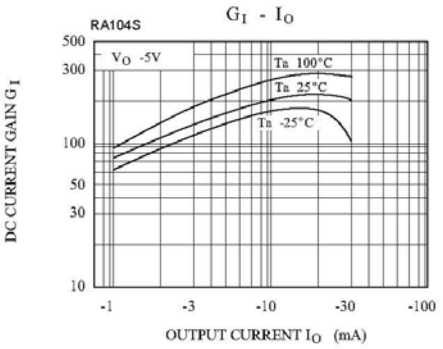

IO - VI(OFF)
RA105S
VO -5V
-10k
-5k
-3k
-1k
-500
-300
-100
-50
-30
Ta=100°C
Ta=25°C
Ta=-25°C
0
-0.2
-0.4
-0.6
-0.8
-1.0
-1.2
-1.4
OUTPUT CURRENT IO (µA)
INPUT OFF VOLTAGE VI(OFF) (V)

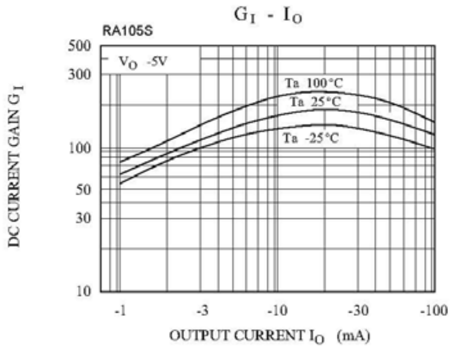

IO - VI(OFF)
RA106S
VO -5V
-10k
-5k
-3k
-1k
-500
-300
-100
-50
-30
Ta=100°C
Ta=25°C
Ta=-25°C
0
-0.2
-0.4
-0.6
-0.8
-1.0
-1.2
-1.4
OUTPUT CURRENT IO (µA)
INPUT OFF VOLTAGE VI(OFF) (V)

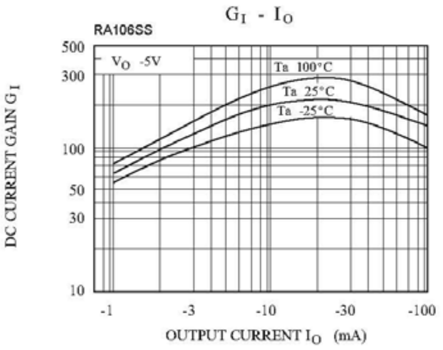

GI - IO
RA101S
VO -5V
Ta 100°C
Ta 25°C
Ta -25°C
DC CURRENT GAIN GI
300
100
50
30
10
5
-1
-3
-10
-30
-100
OUTPUT CURRENT IO (mA)

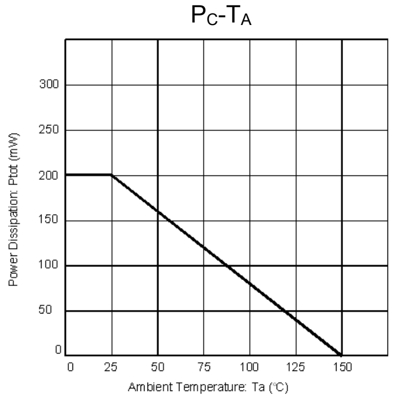

GI - IO
RA102S
VO -5V
Ta 100°C
Ta 25°C
Ta -25°C
DC CURRENT GAIN GI
300
100
50
30
10
5
-1
-3
-10
-30
-100
OUTPUT CURRENT IO (mA)


GI - IO
RA103S
VO -5V
Ta 100°C
Ta 25°C
Ta -25°C
DC CURRENT GAIN GI
500
300
100
50
30
10
-1
-3
-10
-30
-100
OUTPUT CURRENT IO (mA)


GI - IO
RA104S
VO -5V
Ta 100°C
Ta 25°C
Ta -25°C
DC CURRENT GAIN GI
500
300
100
50
30
10
-1
-3
-10
-30
-100
OUTPUT CURRENT IO (mA)


GI - IO
RA105S
VO -5V
Ta 100°C
Ta 25°C
Ta -25°C
DC CURRENT GAIN GI
500
300
100
50
30
10
-1
-3
-10
-30
-100
OUTPUT CURRENT IO (mA)


GI - IO
RA106SS
VO -5V
Ta 100°C
Ta 25°C
Ta -25°C
DC CURRENT GAIN GI
500
300
100
50
30
10
-1
-3
-10
-30
-100
OUTPUT CURRENT IO (mA)


PC-TA
Power Dissipation: Ptot (mW)
300
250
200
150
100
50
0
0
25
50
75
100
125
150
Ambient Temperature: Ta (°C)