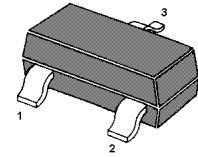
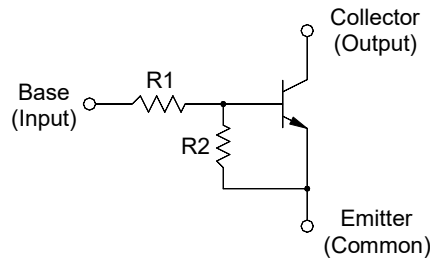


# KRC101S...KRC106S

## NPN Silicon Epitaxial Planar Digital Transistors

### Features

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



1.Base 2.Emitter 3.Collector  
SOT-23 Plastic Package

### Applications

- For switching and interface circuit and drive circuit applications

### Resistor Values

Type	R1 (KΩ)	R2 (KΩ)	Type	R1 (KΩ)	R2 (KΩ)
KRC101S	4.7	4.7	KRC104S	47	47
KRC102S	10	10	KRC105S	2.2	47
KRC103S	22	22	KRC106S	4.7	47

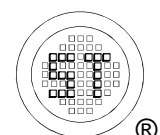
### Absolute Maximum Ratings ( $T_a = 25\text{ °C}$ )

Parameter		Symbol	Value	Unit
Collector Base Voltage		$V_{CBO}$	50	V
Collector Emitter Voltage		$V_{CEO}$	50	V
Input Voltage	KRC101S	$V_{IN}$	20, -10	V
	KRC102S		30, -10	
	KRC103S		40, -10	
	KRC104S		40, -10	
	KRC105S		12, -5	
	KRC106S		20, -5	
Collector Current		$I_c$	100	mA
Total Power Dissipation		$P_{tot}$	200	mW
Junction Temperature		$T_j$	150	°C
Storage Temperature Range		$T_{Stg}$	- 55 to + 150	°C

### Thermal Characteristics

Parameter	Symbol	Max.	Unit
Thermal Resistance from Junction to Ambient <sup>1)</sup>	$R_{\theta JA}$	625	°C/W

<sup>1)</sup> Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.

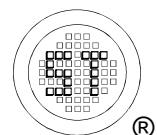


# KRC101S...KRC106S

## Characteristics at $T_a = 25\text{ }^\circ\text{C}$

Parameter	Symbol	Min.	Typ.	Max.	Unit
DC Current Gain at $V_{CE} = 5\text{ V}$ , $I_C = 10\text{ mA}$	KRC101S KRC102S KRC103S KRC104S KRC105S KRC106S	30 50 70 80 80 80	- - - - - -	- - - - - -	- - - - - -
Collector Base Breakdown Voltage at $I_C = 100\text{ }\mu\text{A}$	$V_{(BR)CBO}$	50	-	-	V
Collector Emitter Breakdown Voltage at $I_C = 1\text{ mA}$	$V_{(BR)CEO}$	50	-	-	V
Collector Emitter Cutoff Current at $V_{CE} = 50\text{ V}$	$I_{CEO}$	-	-	500	nA
Emitter Base Cutoff Current at $V_{EB} = 5\text{ V}$	KRC101S KRC102S KRC103S KRC104S KRC105S KRC106S	- - - - - -	- - - - - -	1.8 0.88 0.36 0.18 3.6 1.8	mA
Collector Emitter Saturation Voltage at $I_C = 10\text{ mA}$ , $I_B = 0.5\text{ mA}$	$V_{CE(SAT)}$	-	-	0.3	V
Input Voltage (ON) at $V_{CE} = 0.2\text{ V}$ , $I_C = 5\text{ mA}$	KRC101S KRC102S KRC103S KRC104S KRC105S KRC106S	- - - - - -	- - - - - -	2 2.4 3 5 1.1 1.3	V
Input Voltage (OFF) at $V_{CE} = 5\text{ V}$ , $I_C = 0.1\text{ mA}$	KRC101S~104S KRC105S~106S	1 0.5	- -	- -	V
Transition Frequency at $V_{CE} = 10\text{ V}$ , $I_C = 5\text{ mA}$	$f_T^{1)}$	-	200	-	MHz
Input Resistance	KRC101S KRC102S KRC103S KRC104S KRC105S KRC106S	3.29 7 15.4 32.9 1.54 3.29	4.7 10 22 47 2.2 4.7	6.11 13 28.6 61.1 2.86 6.11	K $\Omega$
Resistance Ratio	KRC101S~104S KRC105S KRC106S	0.8 17 8	1 21 10	1.2 26 12	- - -

1) Characteristic of transistor only.



# KRC101S...KRC106S

## Electrical Characteristics Curve (KRC101S)

Fig 1.  $V_{I(ON)}$  vs. Collector Current

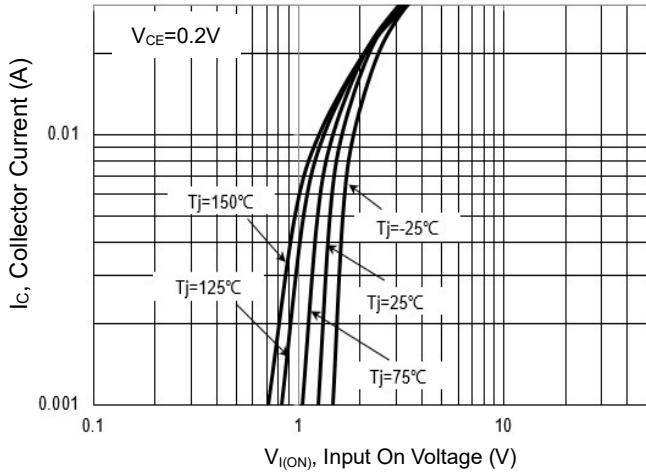


Fig 2.  $V_{I(off)}$  vs. Collector Current

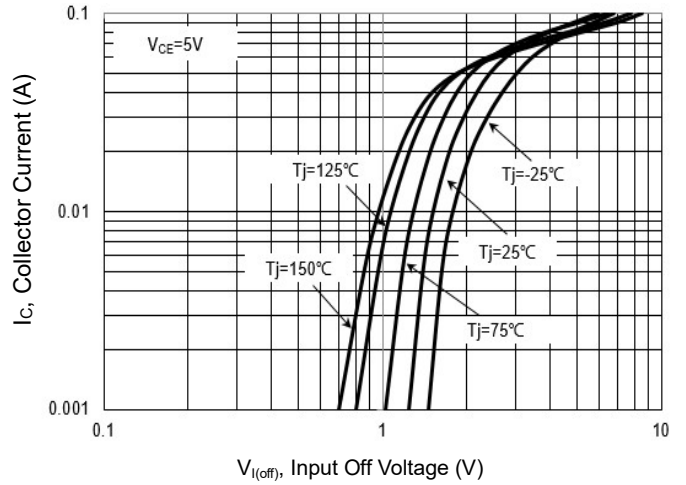


Fig 3. DC Current Gain vs. Collector Current

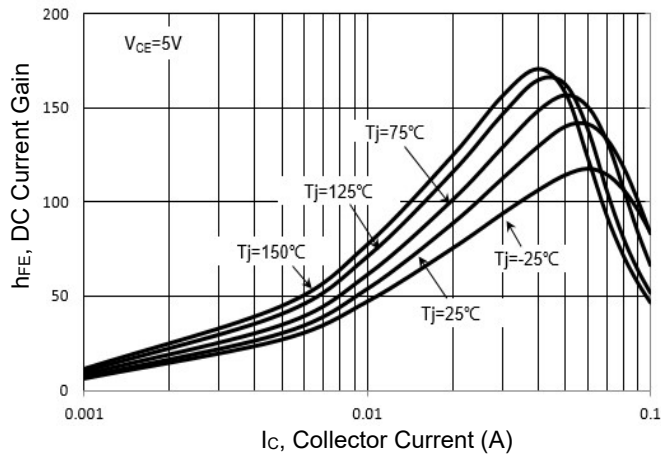
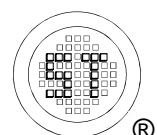
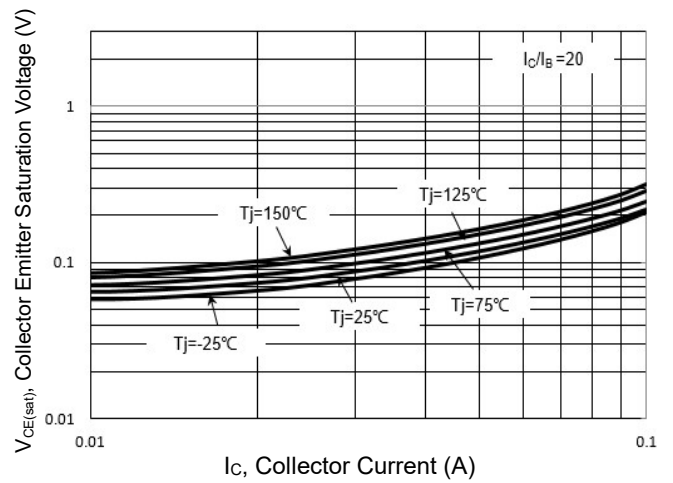


Fig 4.  $V_{CE(sat)}$  vs. Collector Current



# KRC101S...KRC106S

## Electrical Characteristics Curve (KRC102S)

Fig. 1. Collector Current vs. Input On Voltage

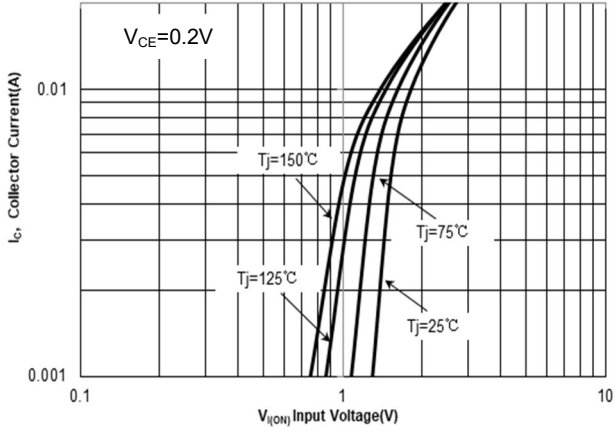


Fig. 2. Collector Current vs. Input Off Voltage

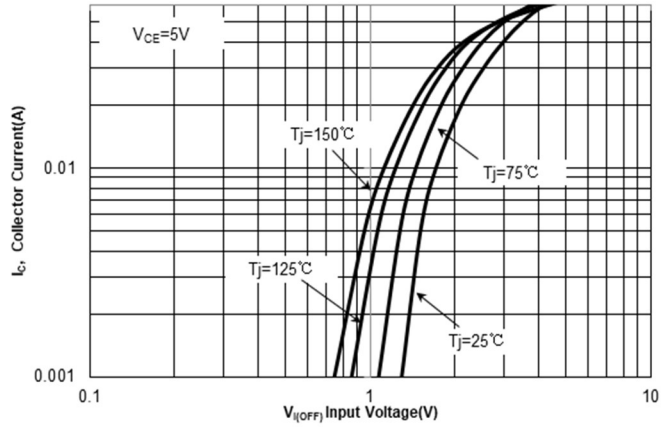


Fig. 3. DC Current Gain vs. Collector Current

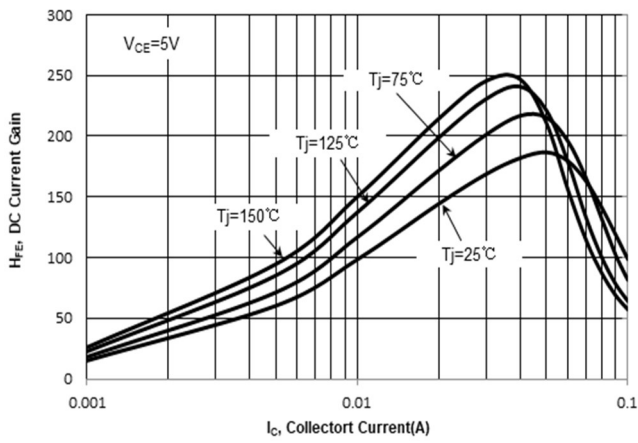
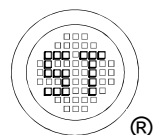
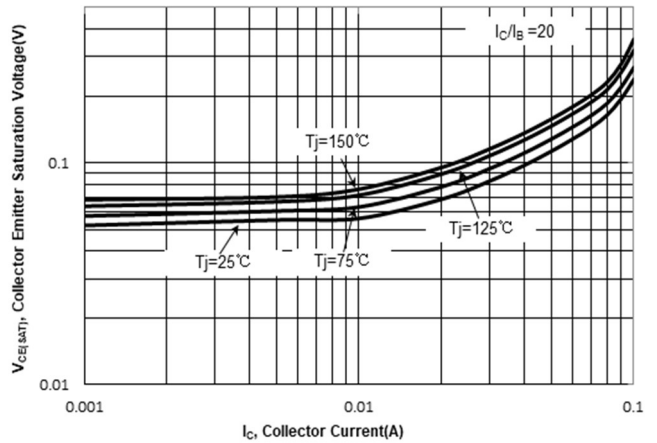


Fig. 4.  $V_{CE(SAT)}$  vs. Collector Current



# KRC101S...KRC106S

## Electrical Characteristics Curves (KRC103S)

Fig. 1  $V_{I(ON)}$  vs. Collector Current

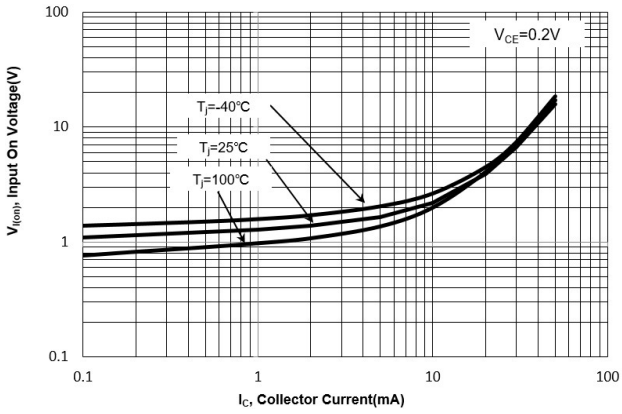


Fig. 2  $V_{I(off)}$  vs. Collector Current

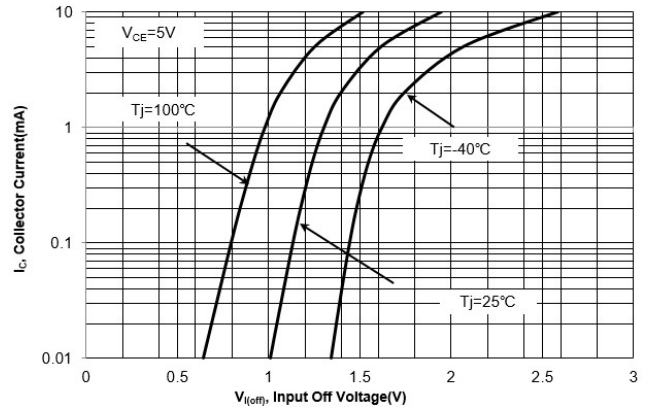


Fig. 3 DC Current Gain vs. Collector

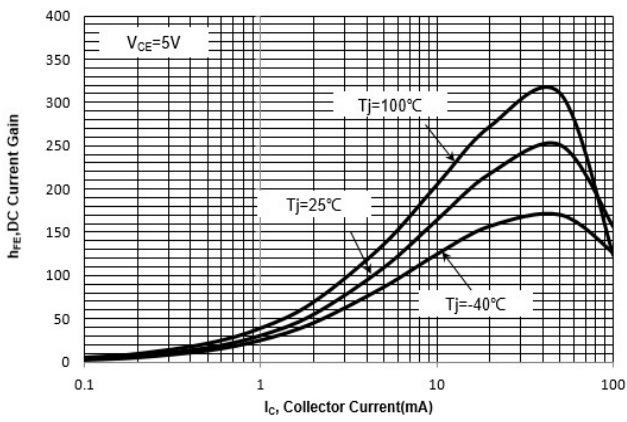
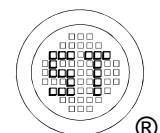
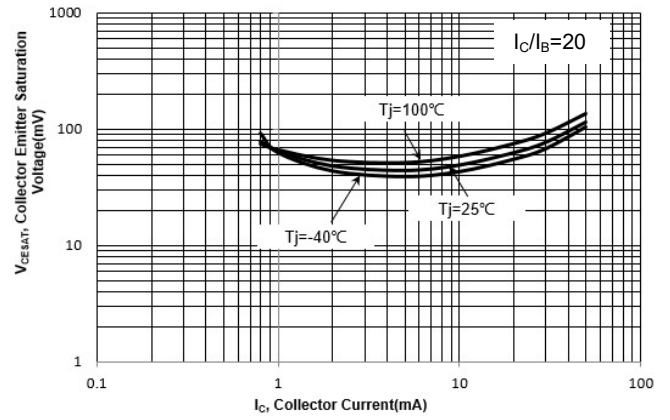


Fig. 4  $V_{CESAT}$  vs. Collector Current



# KRC101S...KRC106S

## Electrical Characteristics Curve (KRC104S)

Fig 1. Collector Current vs.  $V_{I(ON)}$

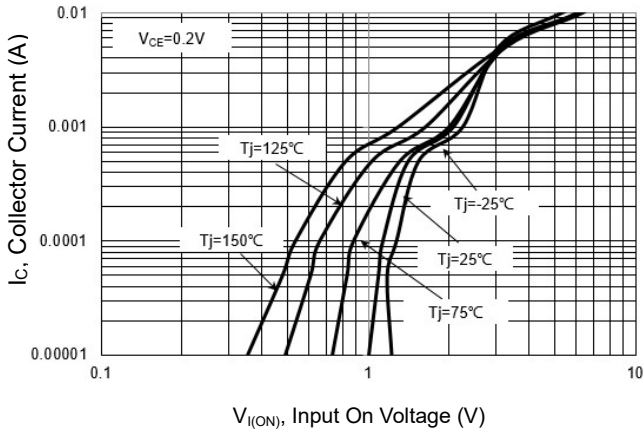


Fig 2. Collector Current vs.  $V_{I(off)}$

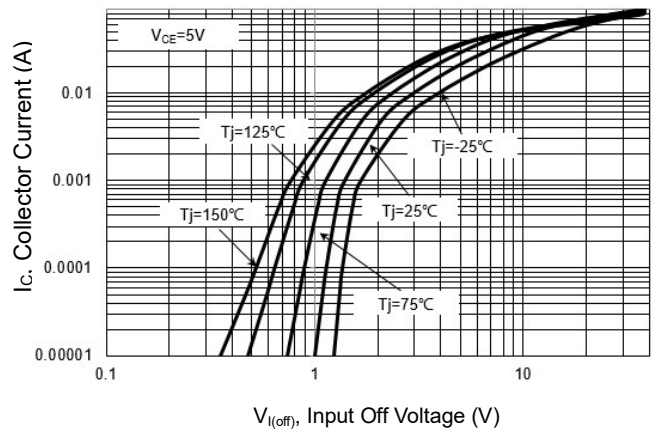


Fig 3. DC Current Gain vs. Collector Current

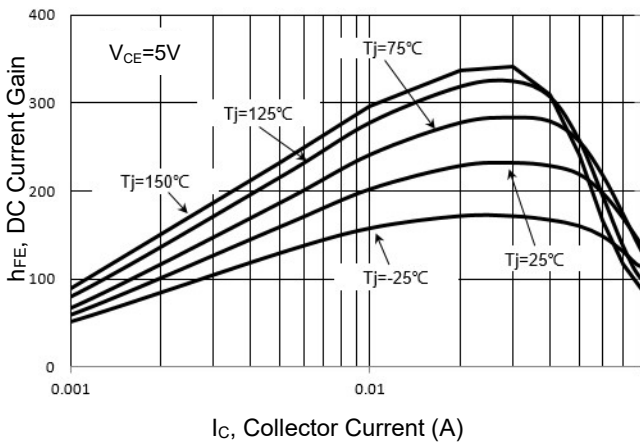
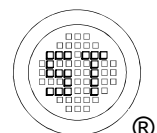
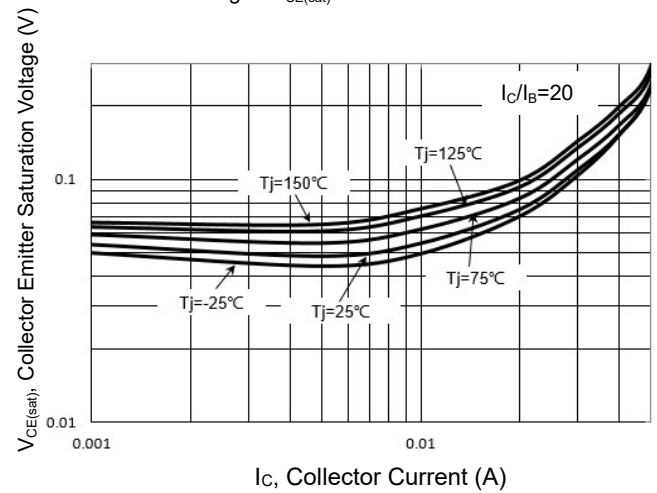


Fig 4.  $V_{CE(sat)}$  vs. Collector Current



# KRC101S...KRC106S

## Electrical Characteristics Curve (KRC105S)

Fig 1. Collector Current vs.  $V_{I(ON)}$

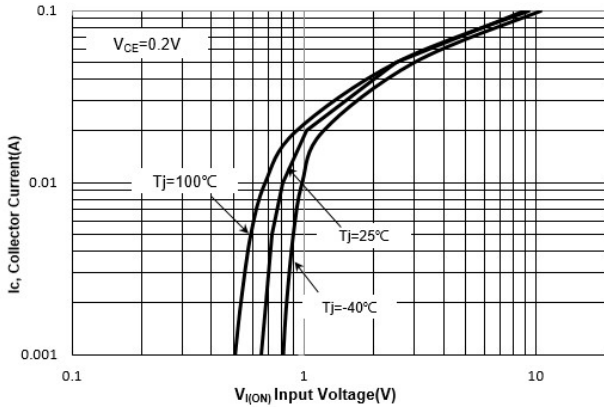


Fig 2. Collector Current vs.  $V_{I(off)}$

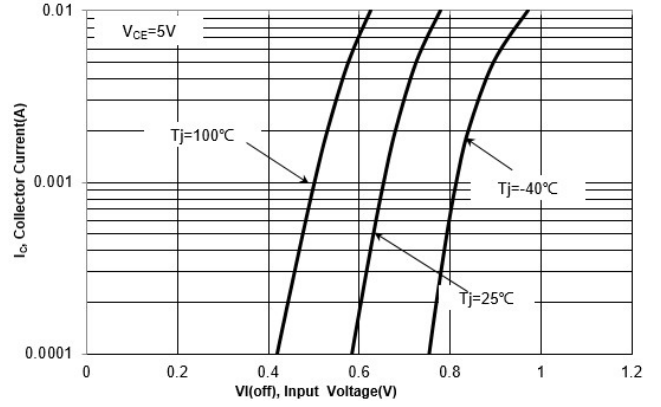


Fig 3. DC Current Gain vs. Collector Current

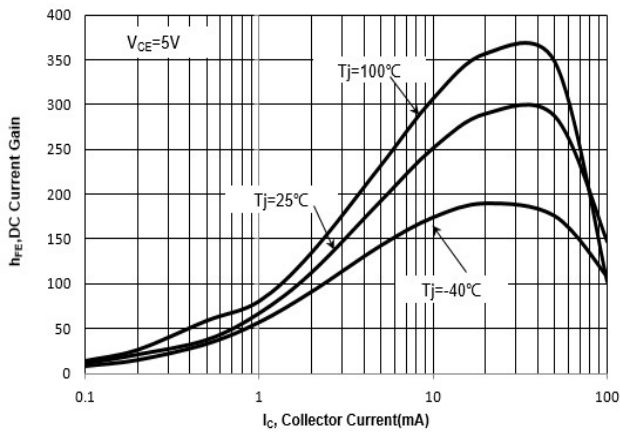
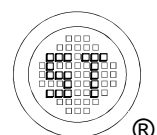
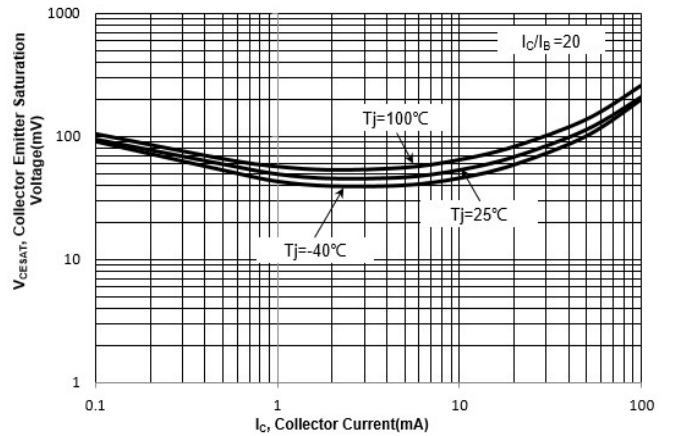


Fig 4.  $V_{CE(sat)}$  vs. Collector Current



# KRC101S...KRC106S

## Electrical Characteristics Curve (KRC106S)

Fig 1.  $V_{I(ON)}$  vs. Collector Current

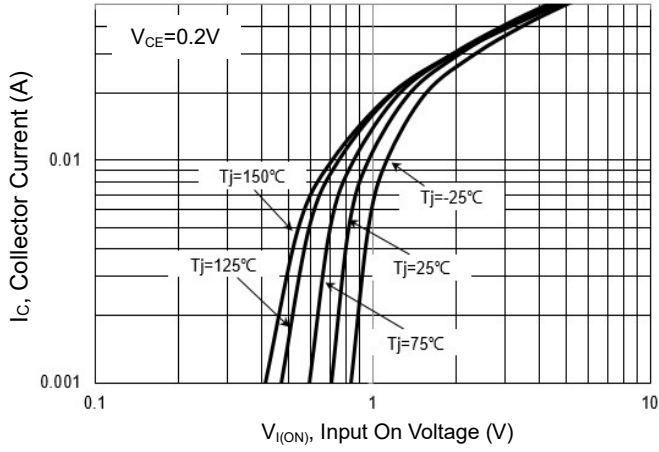


Fig 2.  $V_{I(off)}$  vs. Collector Current

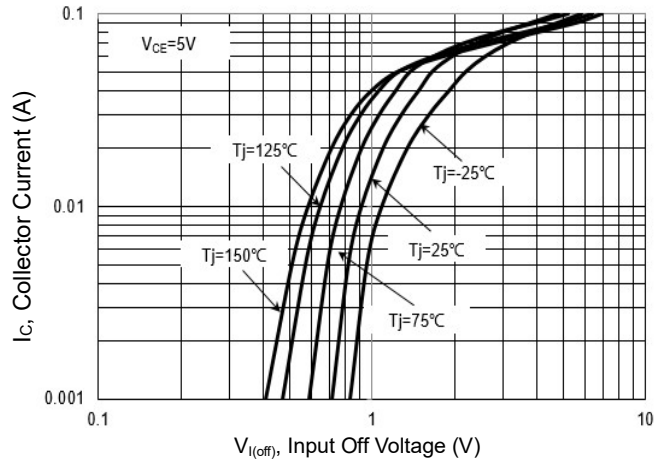


Fig 3. DC Current Gain vs. Collector Current

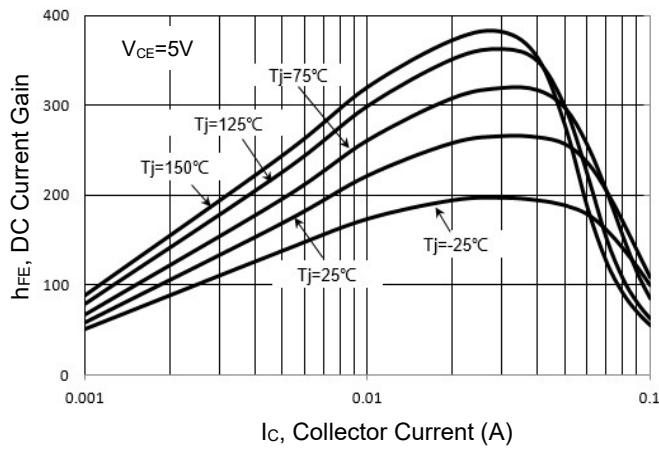
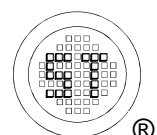
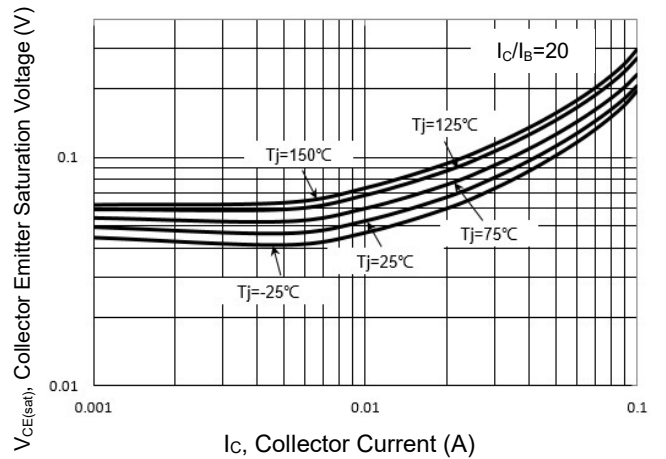


Fig 4.  $V_{CE(sat)}$  vs. Collector Current

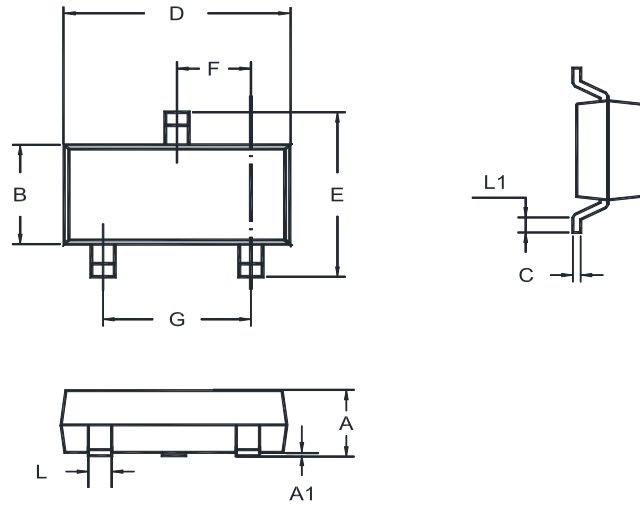




# KRC101S...KRC106S

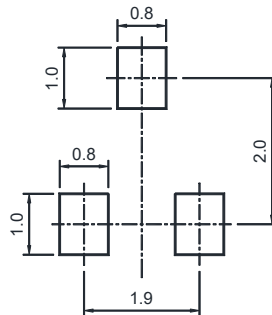
## Package Outline (Dimensions in mm)

SOT-23



Unit	A	A1	B	C	D	E	F	G	L	L1
mm	1.20	0.100	1.40	0.19	3.04	2.6	1.02	2.04	0.51	0.2
	0.89	0.013	1.20	0.08	2.80	2.2	0.89	1.78	0.37	MIN

## Recommended Soldering Footprint



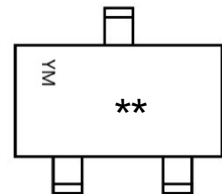
## Packing information

Package	Tape Width (mm)	Pitch		Reel Size		Per Reel Packing Quantity
		mm	inch	mm	inch	
SOT-23	8	4 ± 0.1	0.157 ± 0.004	178	7	3,000

## Marking information

"\*\*" = Part No.

Type	Marking	Type	Marking	Type	Marking
KRC101S	NA	KRC103S	NC	KRC105S	NE
KRC102S	NB	KRC104S	ND	KRC106S	NF



"YM" = Date Code Marking

"Y" = Year

"M" = Month

Font type: Arial

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