

## RESISTOR BUILT-IN TYPE NPN TRANSISTOR

### FEATURES

- Compact package
- Resistors built-in type
- Complementary to GN4xxx

### ORDERING INFORMATION

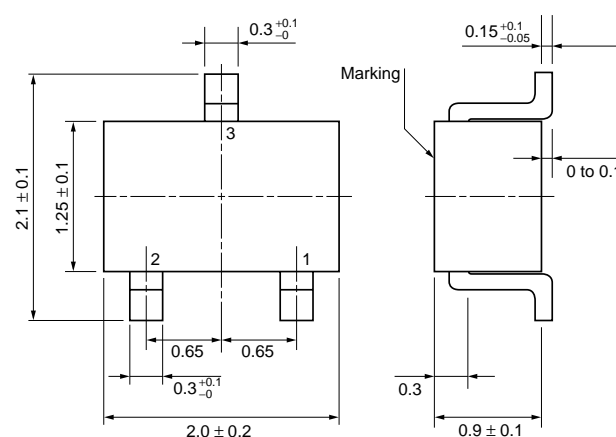
PART NUMBER	PACKAGE
GA4xxx	SC-70

### ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = 25°C)

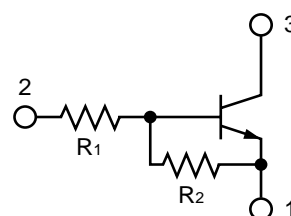
Collector to Base Voltage	V <sub>CBO</sub>	60	V
Collector to Emitter Voltage	V <sub>CEO</sub>	50	V
Emitter to Base Voltage	V <sub>EBO</sub>	5	V
Collector Current (DC)	I <sub>C</sub>	0.1	A
Collector Current (pulse) <sup>Note</sup>	I <sub>C(pulse)</sub>	0.2	A
Total Power Dissipation	P <sub>T</sub>	0.2	W
Junction Temperature	T <sub>j</sub>	150	°C
Storage Temperature	T <sub>stg</sub>	-55 to +150	°C

**Note** PW ≤ 10 ms, Duty Cycle ≤ 50%

### ★ PACKAGE DRAWING (Unit: mm)



### ★ EQUIVALENT CIRCUIT ★ PIN CONNECTION



- 1: Emitter  
2: Base  
3: Collector

PART NUMBER	MARK	R <sub>1</sub>	R <sub>2</sub>	UNIT
GA4A4M	AA1	10.0	10.0	kΩ
GA4F4M	AB1	22.0	22.0	kΩ
GA4L4M	AC1	47.0	47.0	kΩ
GA4L3M	AD1	4.7	4.7	kΩ
GA4L3N	AE1	4.7	10.0	kΩ
GA4L3Z	AF1	4.7		kΩ
GA4A3Q	AG1	1.0	10.0	kΩ
GA4A4P	AH1	10.0	47.0	kΩ
GA4F4N	AJ1	22.0	47.0	kΩ

PART NUMBER	MARK	R <sub>1</sub>	R <sub>2</sub>	UNIT
GA4L4L	AK1	47.0	22.0	kΩ
GA4A4Z	AL1	10.0		kΩ
GA4F4Z	AM1	22.0		kΩ
GA4L4Z	AN1	47.0		kΩ
GA4F3M	AP1	2.2	2.2	kΩ
GA4F3P	AQ1	2.2	10.0	kΩ
GA4F3R	AR1	2.2	47.0	kΩ
GA4A4L	AS1	10.0	4.7	kΩ
GA4L4K	AT1	47.0	10.0	kΩ

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Not all products and/or types are available in every country. Please check with an NEC Electronics sales representative for availability and additional information.

**ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)**

CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	I <sub>CBO</sub>	V <sub>CB</sub> = 50 V, I <sub>E</sub> = 0			100	nA
DC Current Gain	h <sub>FE1</sub>	V <sub>CE</sub> = 5.0 V, I <sub>C</sub> = 5.0 mA	<b>Note1</b>			-
	h <sub>FE2</sub>	V <sub>CE</sub> = 5.0 V, I <sub>C</sub> = 50 mA	<b>Note1</b>			-
Collector Saturation Voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> = 5.0 mA, I <sub>B</sub> = 0.25 mA			0.2	V
Low-level Input Voltage	V <sub>IL</sub>	V <sub>CE</sub> = 5.0 V, I <sub>C</sub> = 100 μA	<b>Note2</b>			V
High-level Input Voltage	V <sub>IH</sub>	V <sub>CE</sub> = 0.2 V, I <sub>C</sub> = 5.0 mA	<b>Note2</b>			V
Input Resistor	R <sub>1</sub>		<b>Note3</b>			kΩ
Emitter to Base Resistor	R <sub>2</sub>		<b>Note3</b>			kΩ

**Note 1**

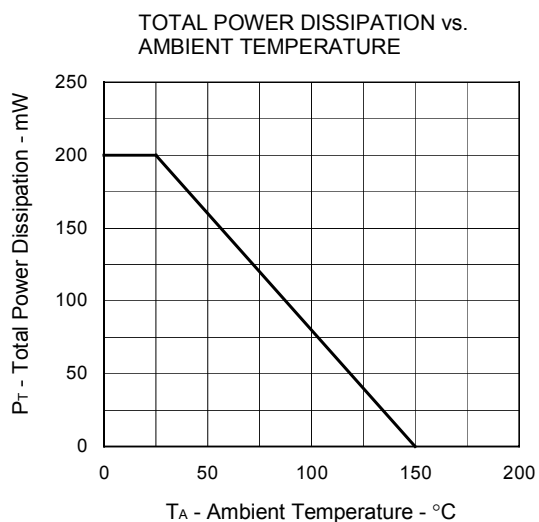
PART NUMBER	h <sub>FE1</sub>			h <sub>FE2</sub>			UNIT
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	
GA4A4M	35		100	80			-
GA4F4M	60		195	90			-
GA4L4M	85		340	95			-
GA4L3M	20		80	80			-
GA4L3N	35		100	80			-
GA4L3Z	135		600	100			-
GA4A3Q	35		100	80			-
GA4A4P	85		340	95			-
GA4F4N	85		340	95			-
GA4L4L	60		195	90			-
GA4A4Z	135		600	100			-
GA4F4Z	135		600	100			-
GA4L4Z	135		600	100			-
GA4F3M	8		50	50			-
GA4F3P	35		100	80			-
GA4F3R	85		340	95			-
GA4A4L	20		80	80			-
GA4L4K	35		100	80			-

**Note 2**

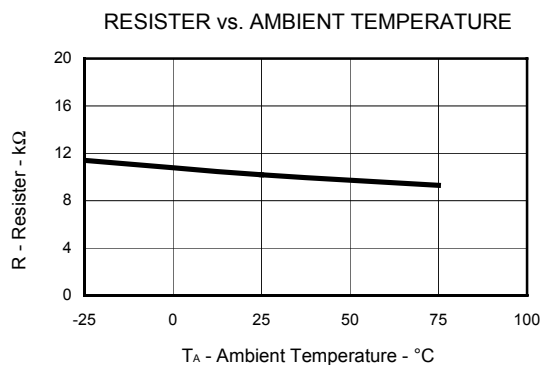
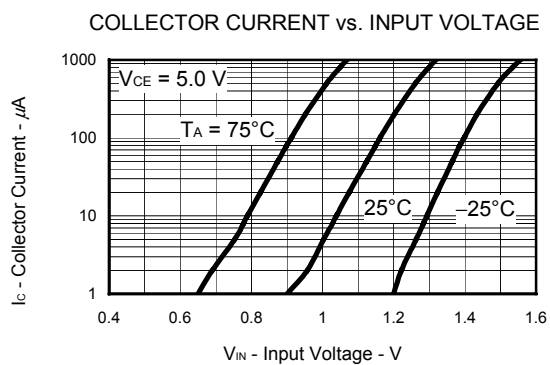
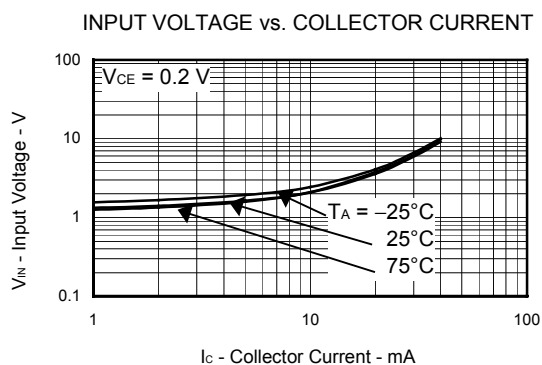
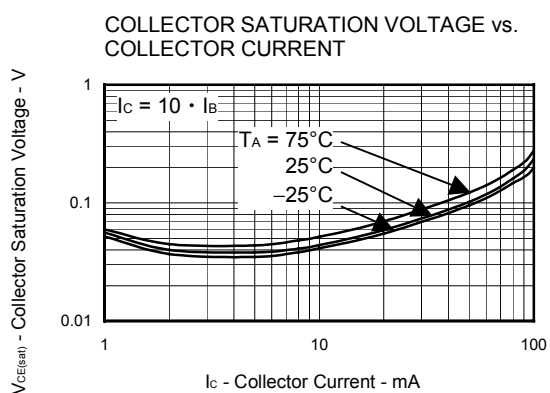
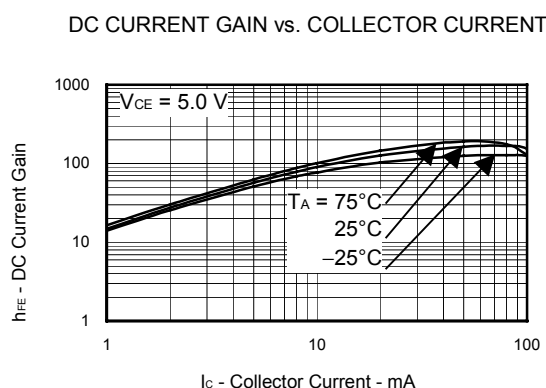
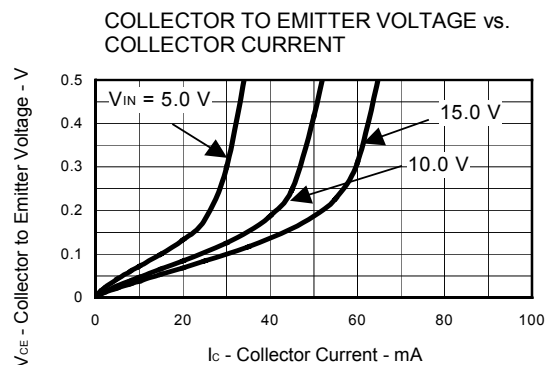
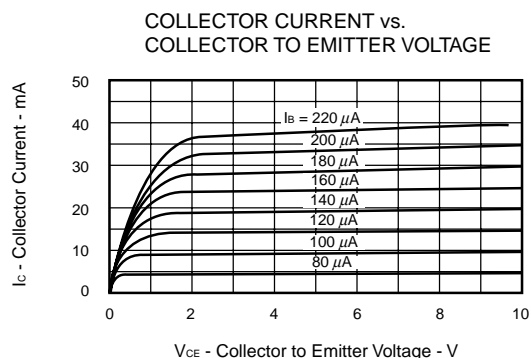
PART NUMBER	V <sub>IL</sub>			V <sub>IH</sub>			UNIT
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	
GA4A4M			0.8	3.0			V
GA4F4M			0.8	4.0			V
GA4L4M			0.8	5.0			V
GA4L3M			0.8	3.0			V
GA4L3N			0.6	3.0			V
GA4L3Z			0.5	1.2			V
GA4A3Q			0.5	2.0			V
GA4A4P			0.5	3.0			V
GA4F4N			0.6	3.0			V
GA4L4L			0.9	6.0			V
GA4A4Z			0.5	2.0			V
GA4F4Z			0.5	3.0			V
GA4L4Z			0.5	4.0			V
GA4F3M			0.8	3.0			V
GA4F3P			0.5	2.0			V
GA4F3R			0.5	2.0			V
GA4A4L			0.9	6.0			V
GA4L4K			2.0	8.0			V

**Note 3**

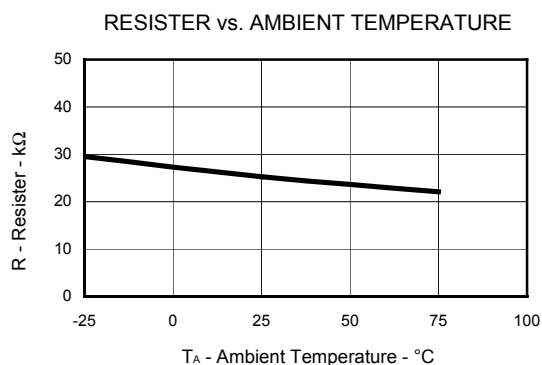
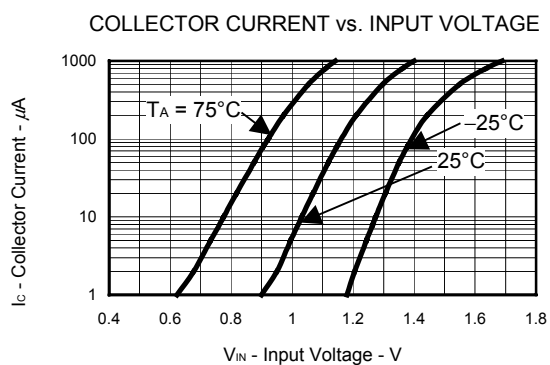
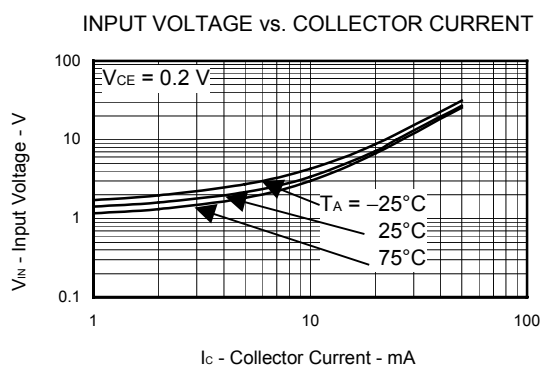
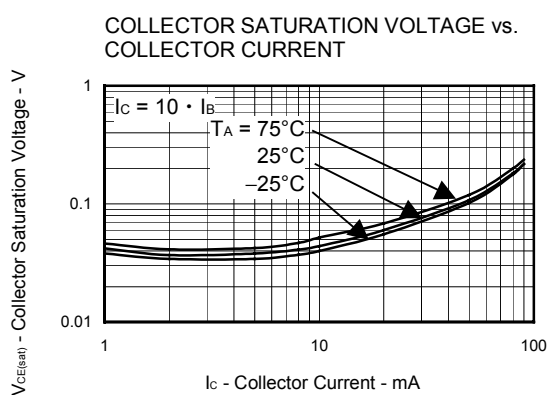
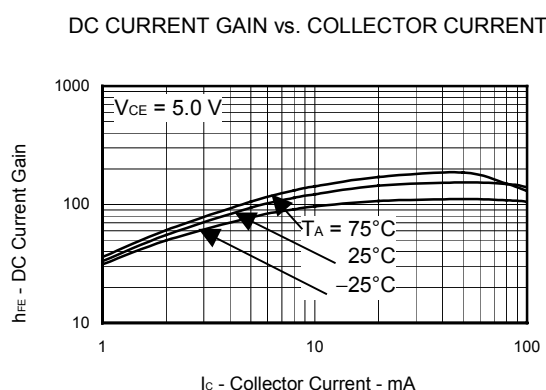
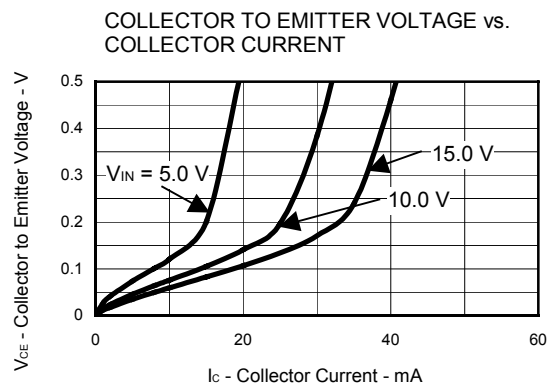
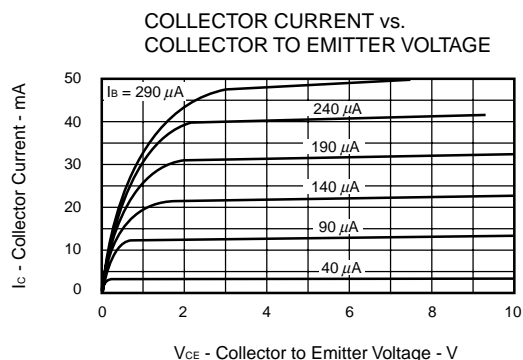
PART NUMBER	R <sub>1</sub>			R <sub>2</sub>			UNIT
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	
GA4A4M	7.00	10.00	13.00	7.00	10.00	13.00	kΩ
GA4F4M	15.40	22.00	28.60	15.40	22.00	28.60	kΩ
GA4L4M	32.90	47.00	61.10	32.90	47.00	61.10	kΩ
GA4L3M	3.29	4.70	6.11	3.29	4.70	6.11	kΩ
GA4L3N	3.29	4.70	6.11	7.00	10.00	13.00	kΩ
GA4L3Z	3.29	4.70	6.11				kΩ
GA4A3Q	0.70	1.00	1.30	7.00	10.00	13.00	kΩ
GA4A4P	7.00	10.00	13.00	32.90	47.00	61.10	kΩ
GA4F4N	15.40	22.00	28.60	32.90	47.00	61.10	kΩ
GA4L4L	32.90	47.00	61.10	15.40	22.00	28.60	kΩ
GA4A4Z	7.00	10.00	13.00				kΩ
GA4F4Z	15.40	22.00	28.60				kΩ
GA4L4Z	32.90	47.00	61.10				kΩ
GA4F3M	1.54	2.20	2.86	1.54	2.20	2.86	kΩ
GA4F3P	1.54	2.20	2.86	7.00	10.00	13.00	kΩ
GA4F3R	1.54	2.20	2.86	32.90	47.00	61.10	kΩ
GA4A4L	7.00	10.00	13.00	3.29	4.70	6.11	kΩ
GA4L4K	32.90	47.00	61.10	7.00	10.00	13.00	kΩ



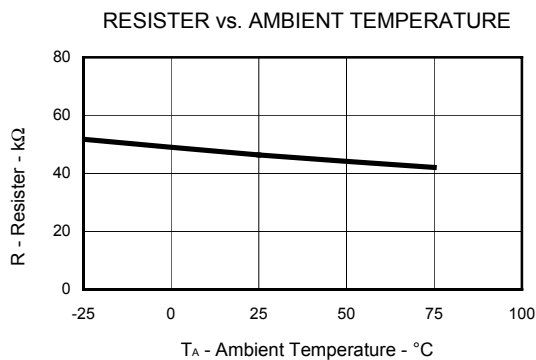
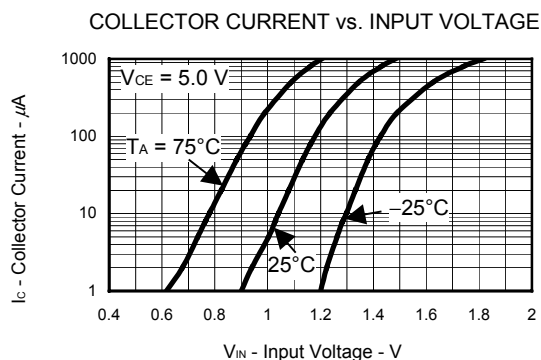
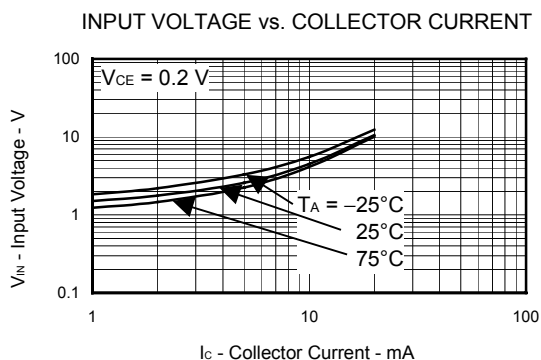
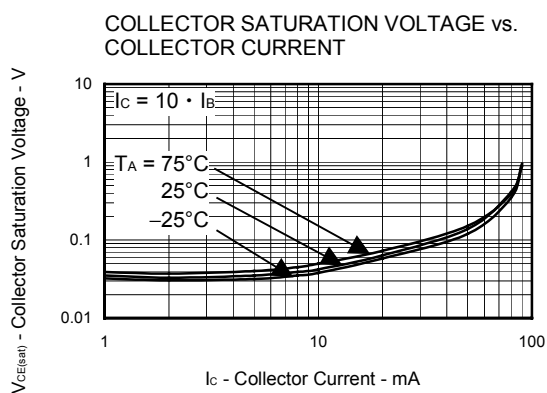
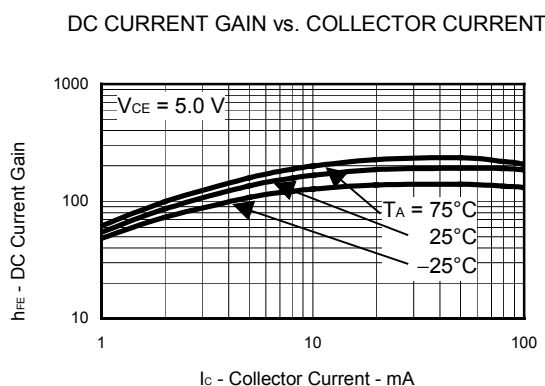
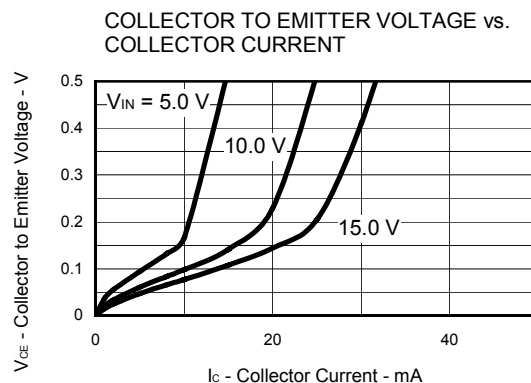
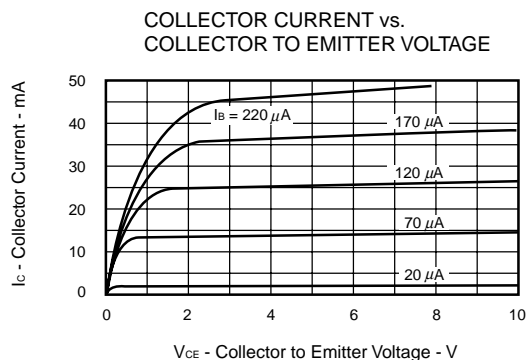
## [GA4A4M]

TYPICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ )

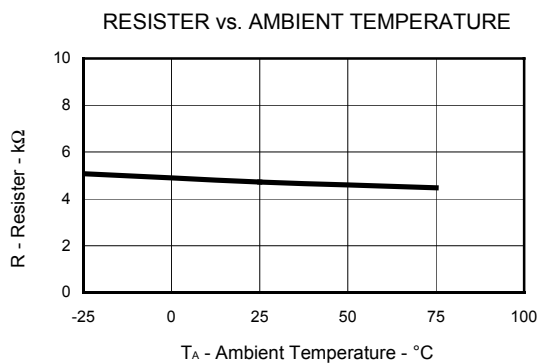
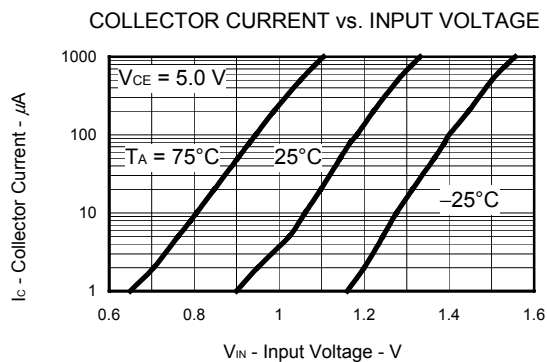
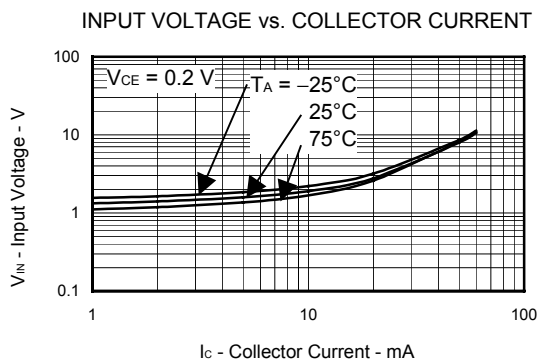
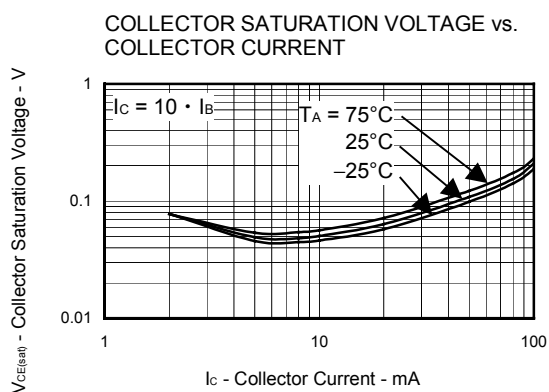
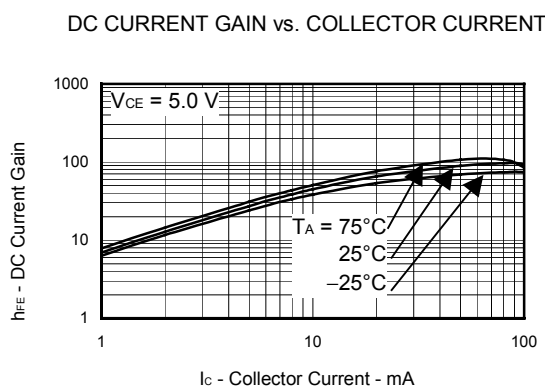
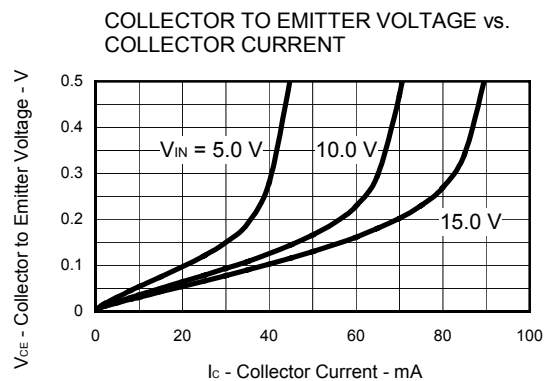
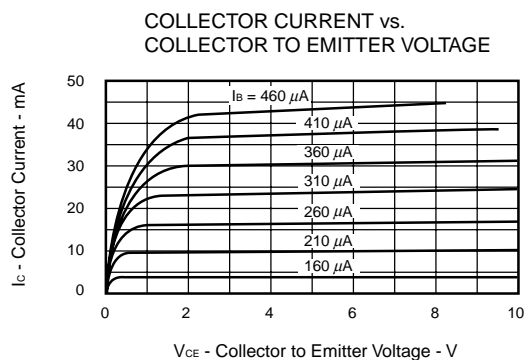
[GA4F4M]  
TYPICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ )



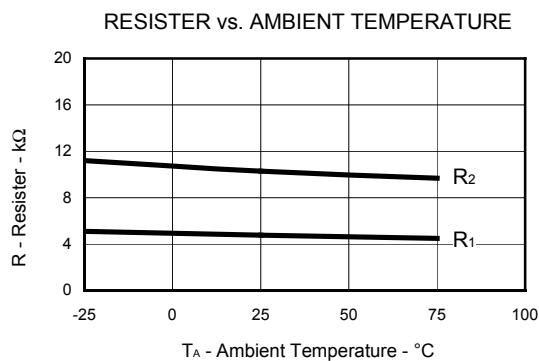
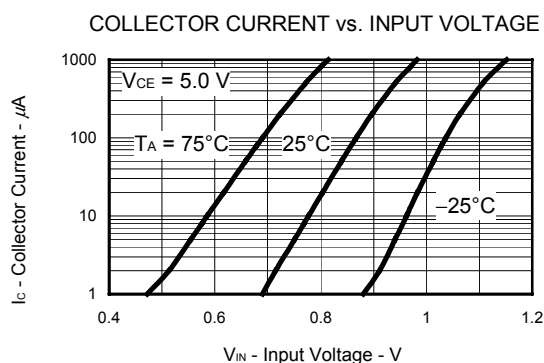
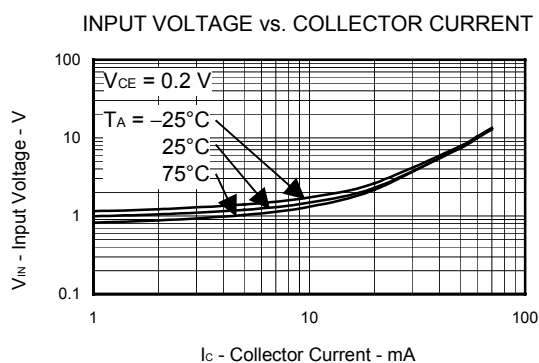
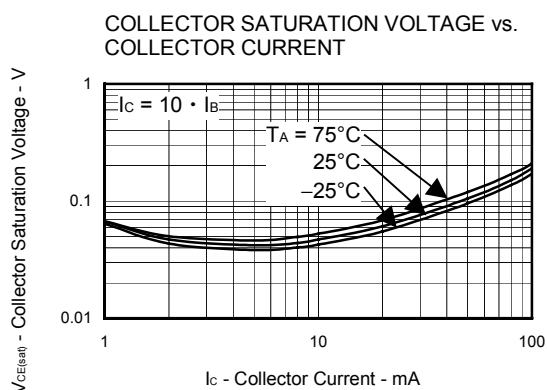
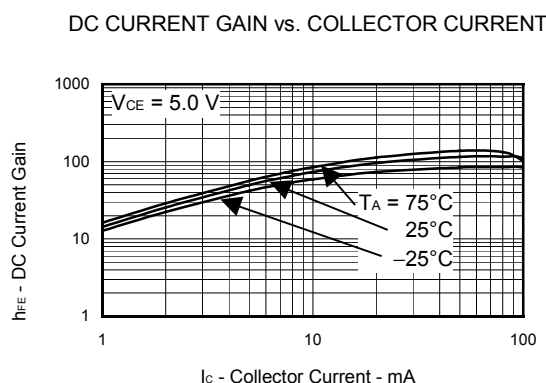
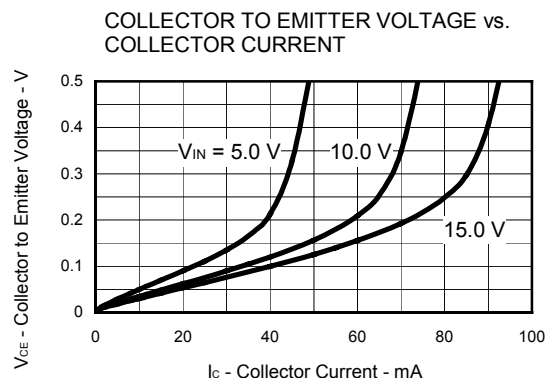
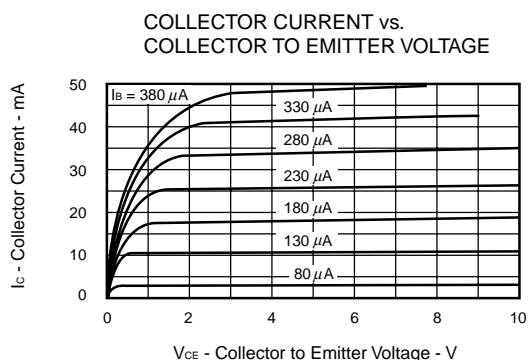
**[GA4L4M]**  
**TYPICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ )**



## [GA4L3M]

TYPICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ )

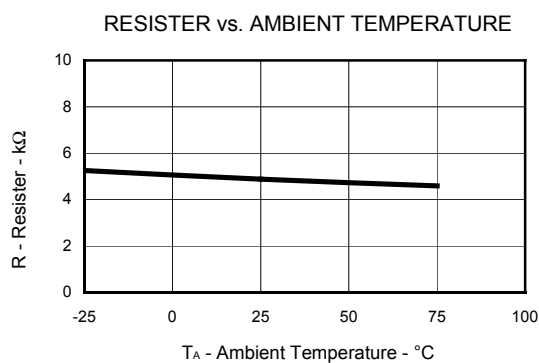
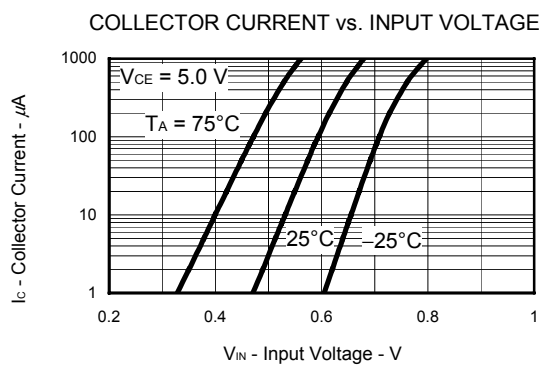
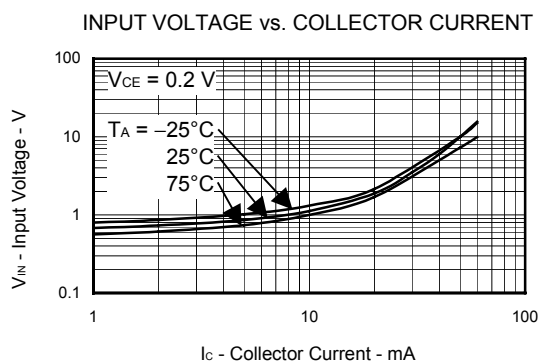
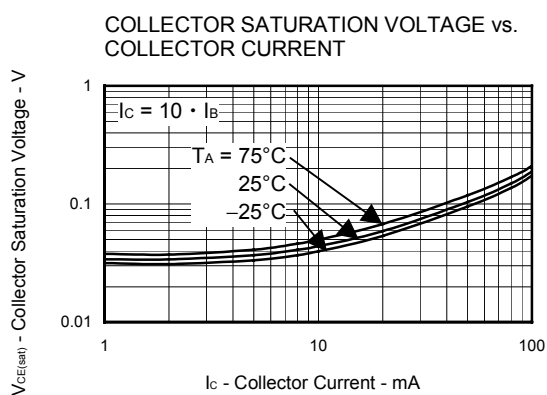
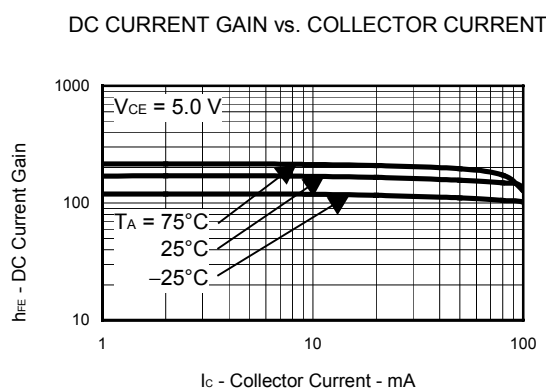
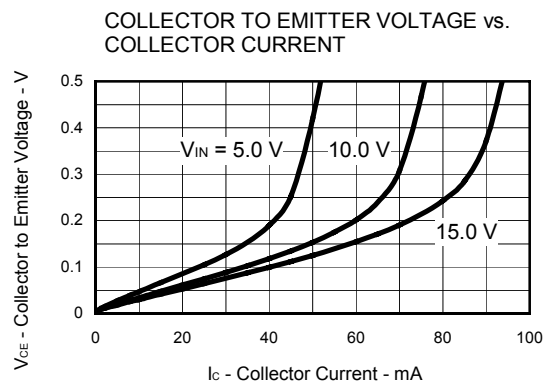
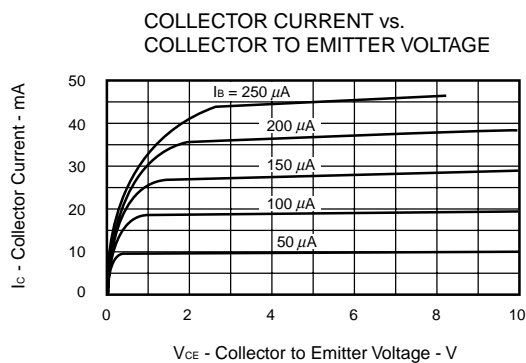
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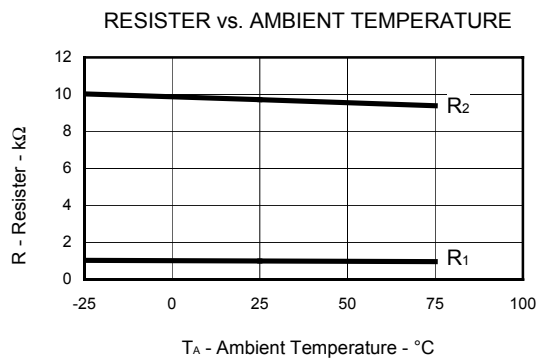
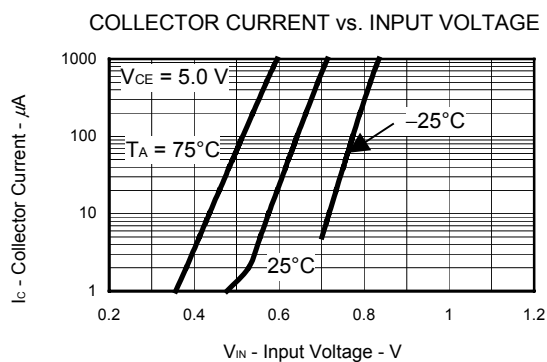
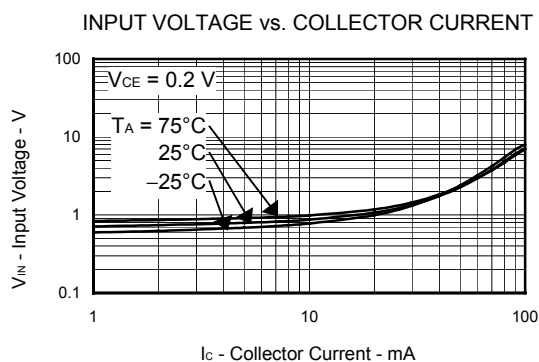
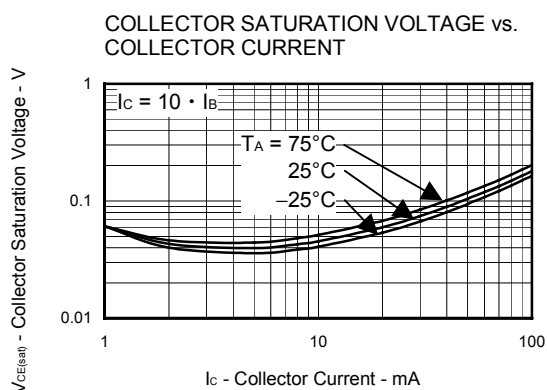
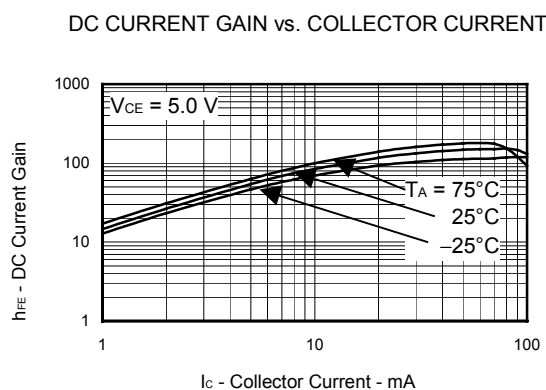
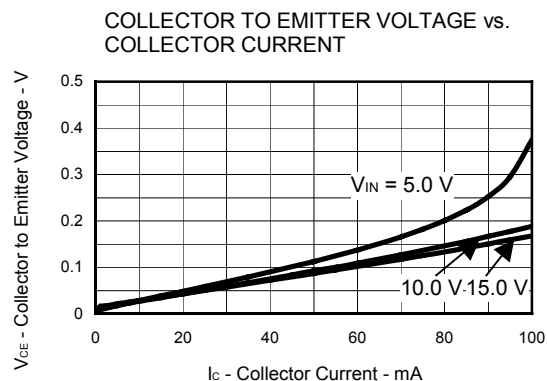
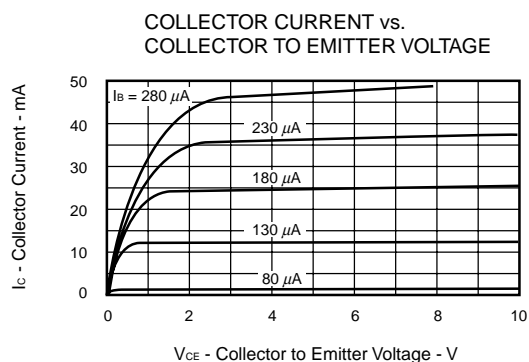


[GA4L3Z]

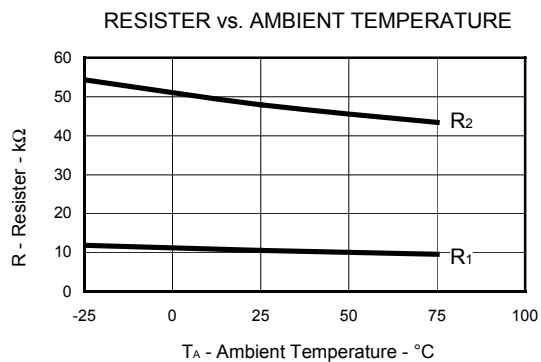
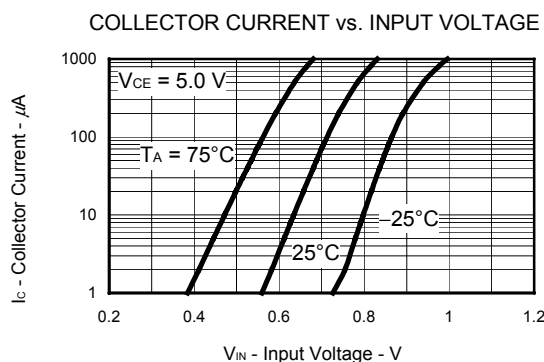
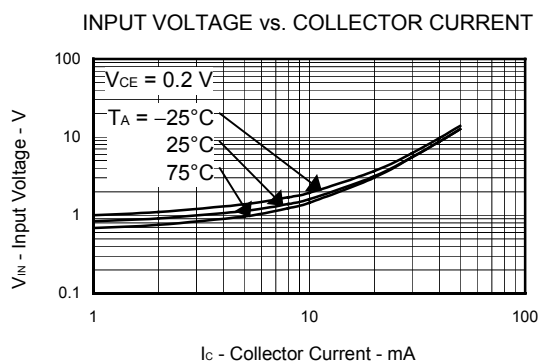
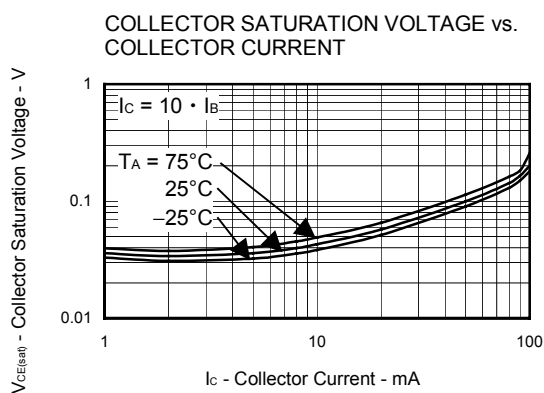
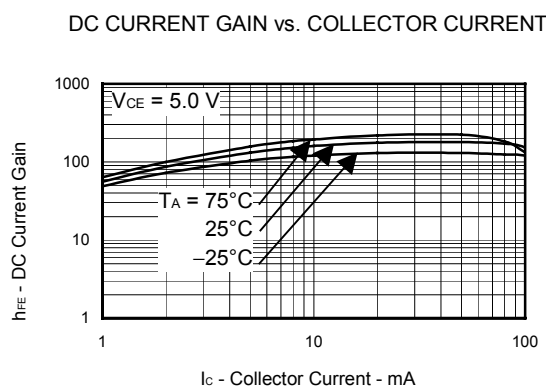
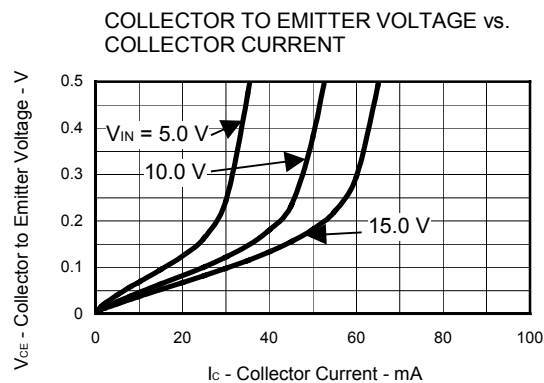
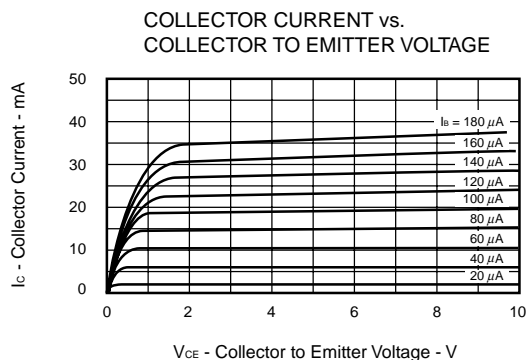
TYPICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ )



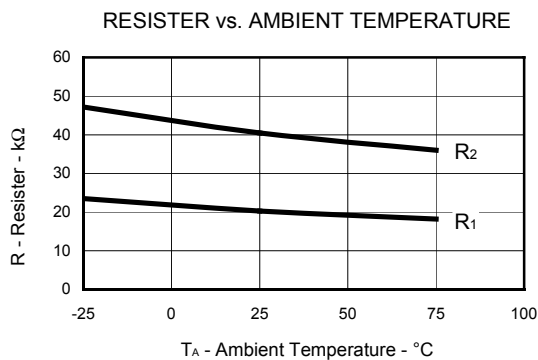
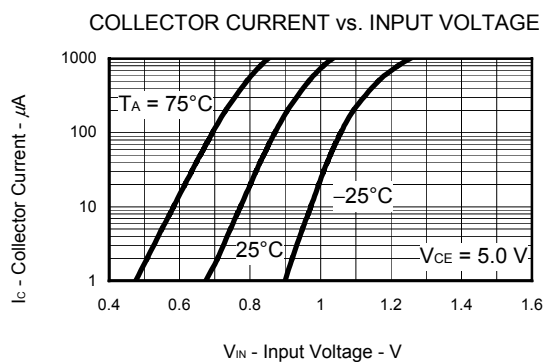
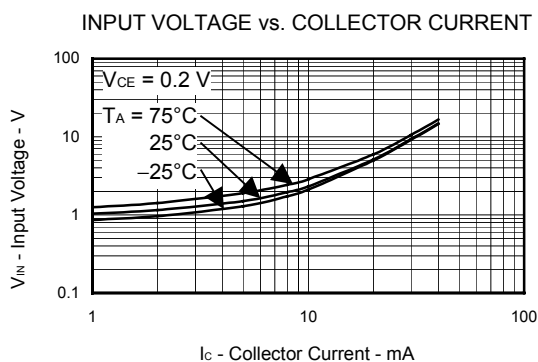
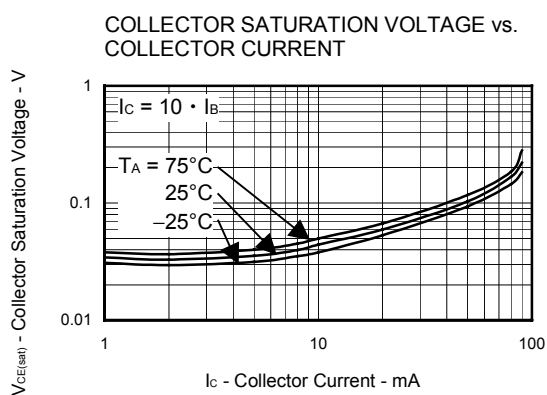
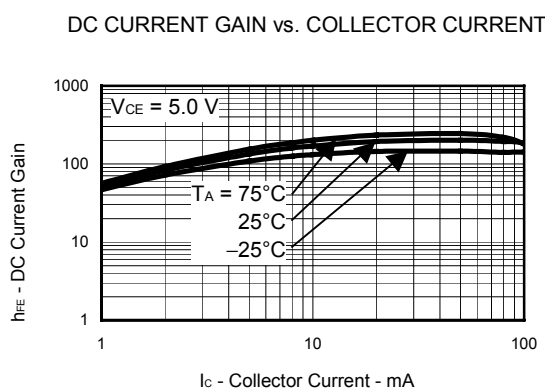
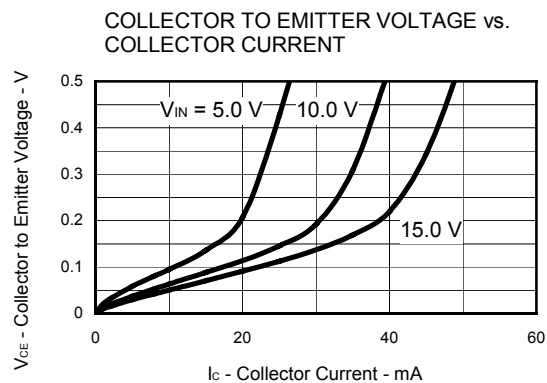
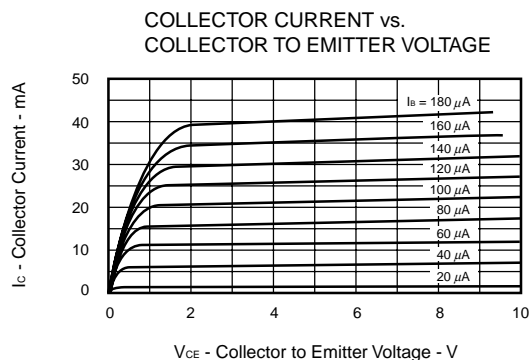
**[GA4A3Q]**  
**TYPICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ )**



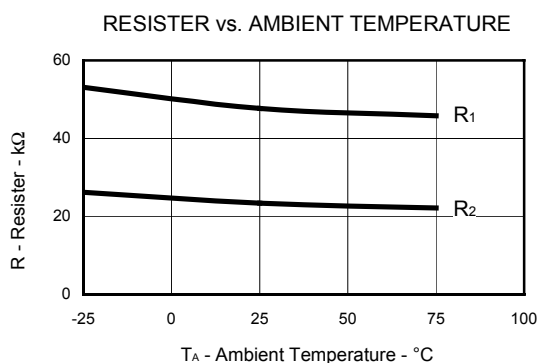
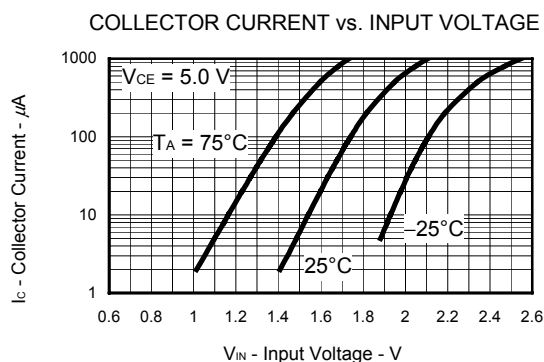
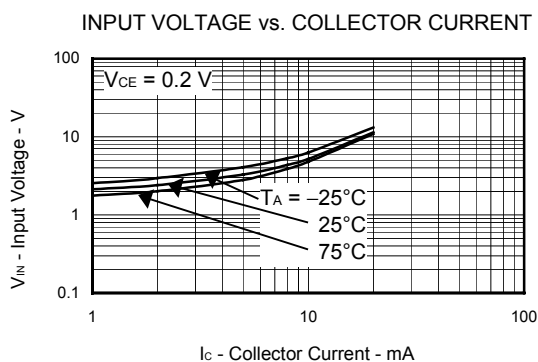
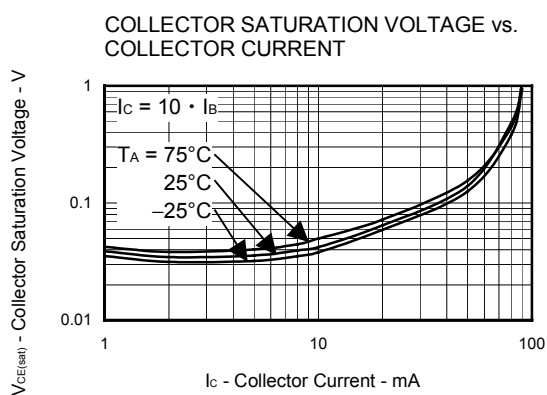
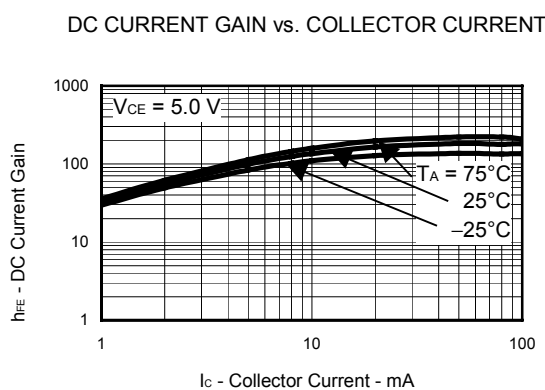
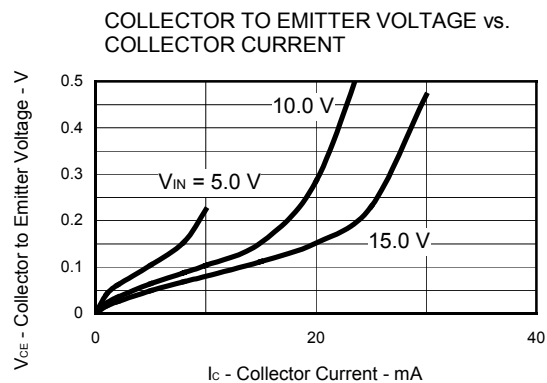
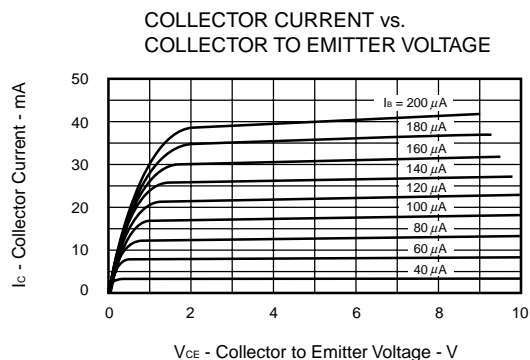
**[GA4A4P]**  
**TYPICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ )**



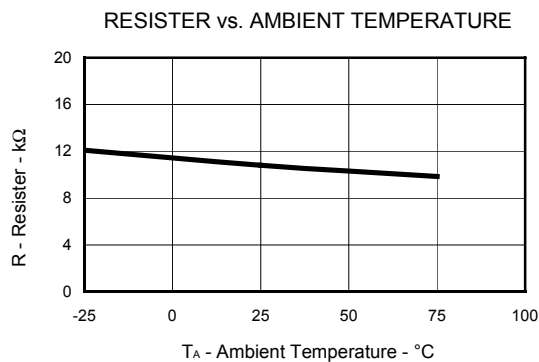
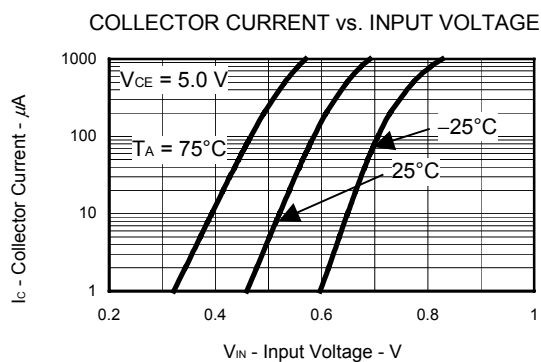
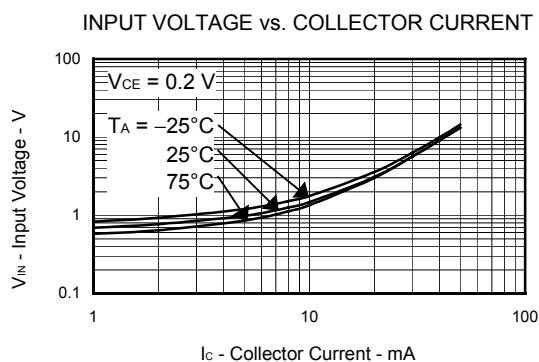
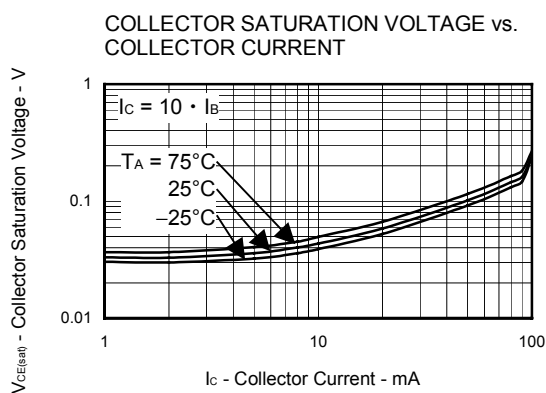
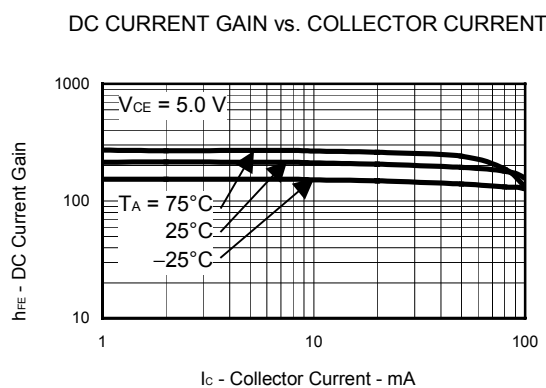
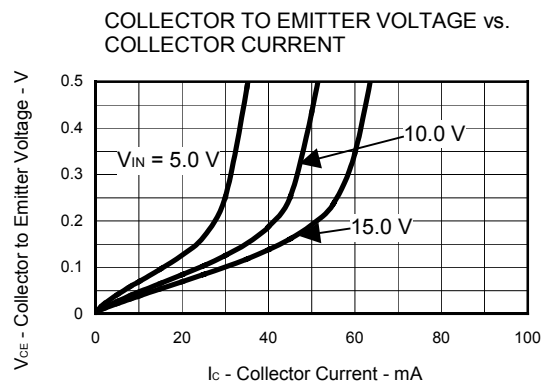
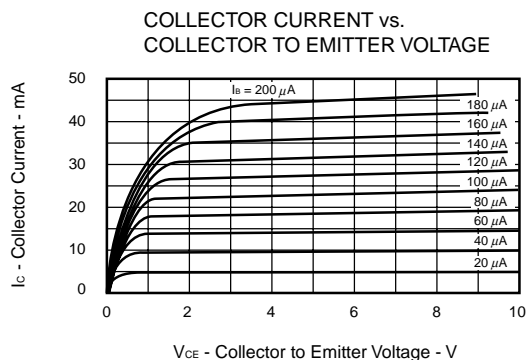
[GA4F4N]  
TYPICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ )



[GA4L4L]  
TYPICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ )

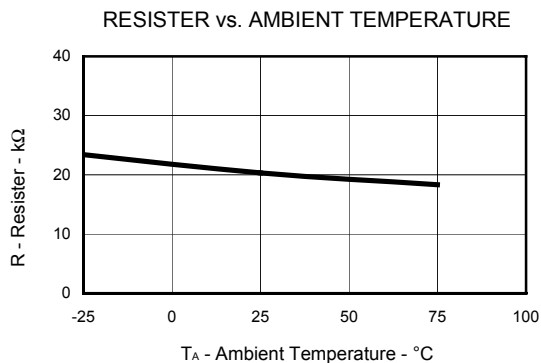
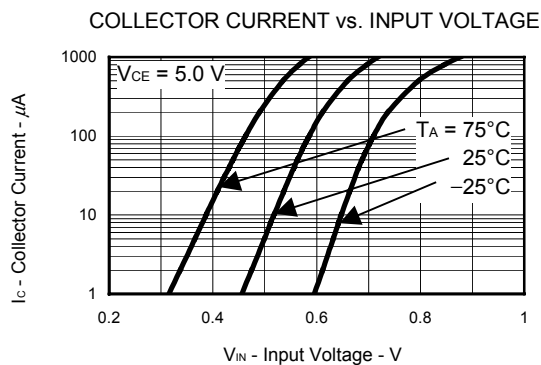
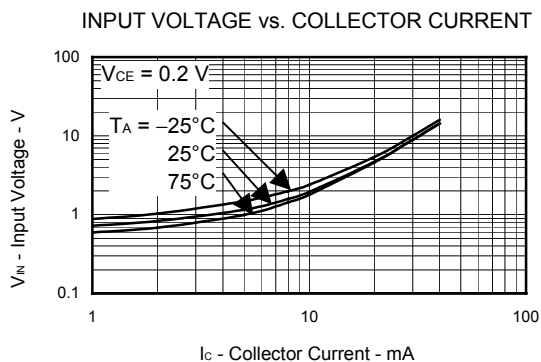
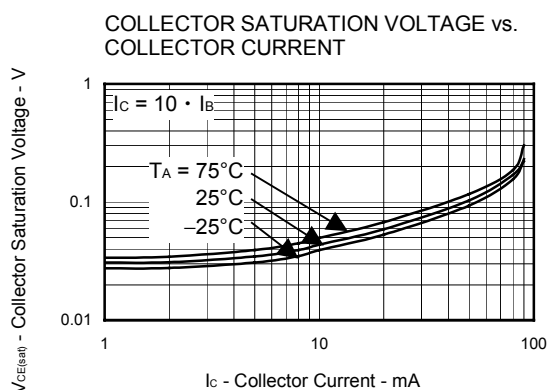
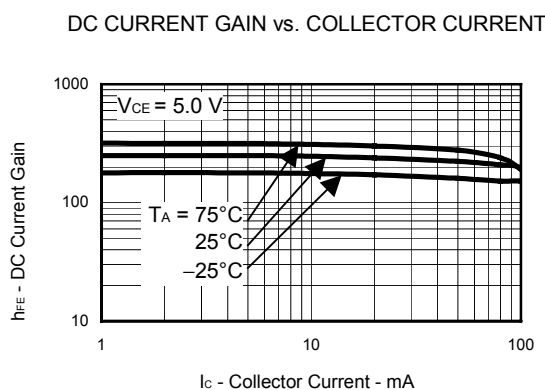
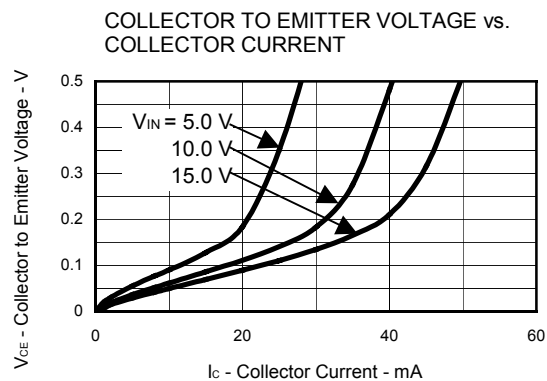
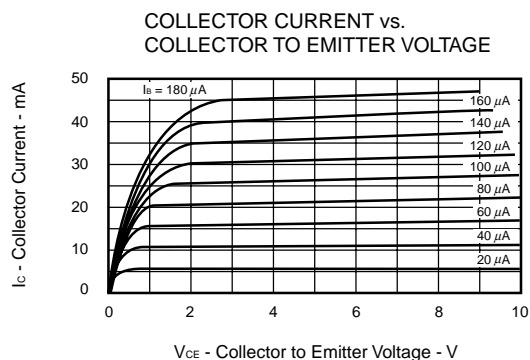


## [GA4A4Z]

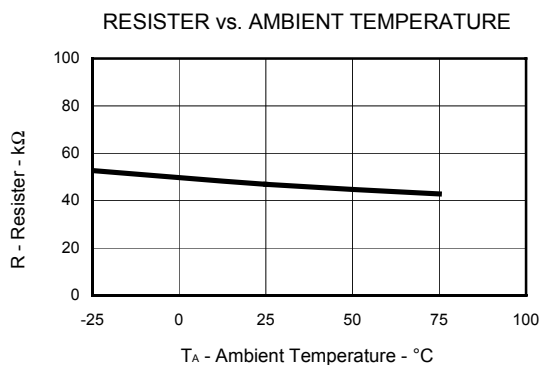
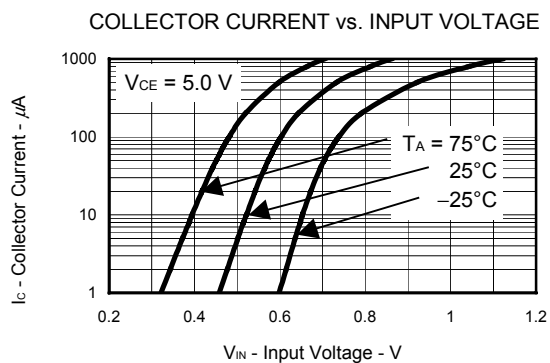
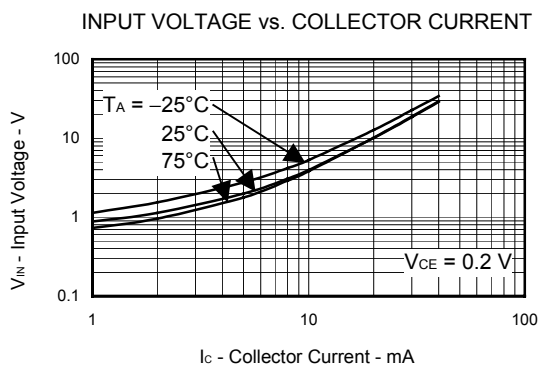
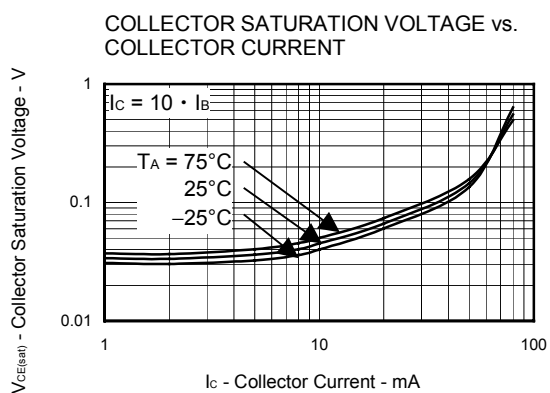
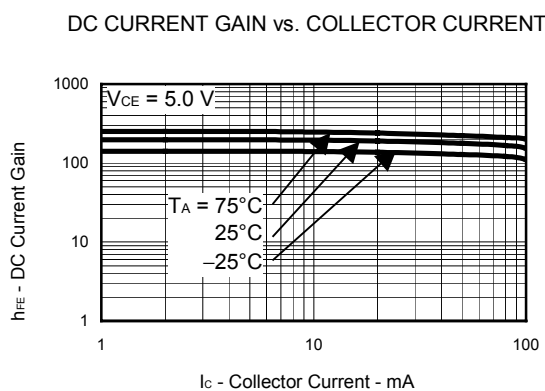
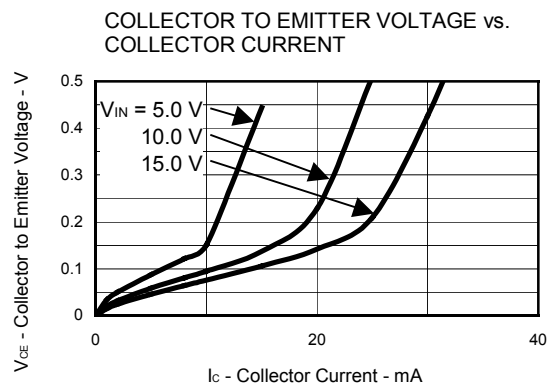
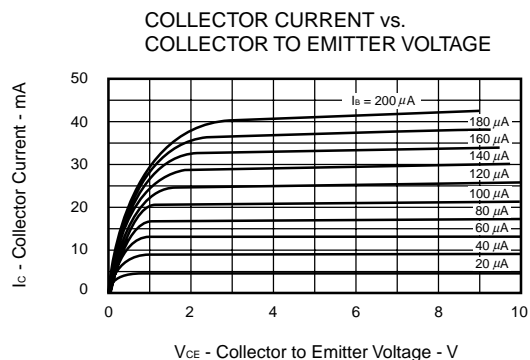
TYPICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ )

[GA4F4Z]

TYPICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ )

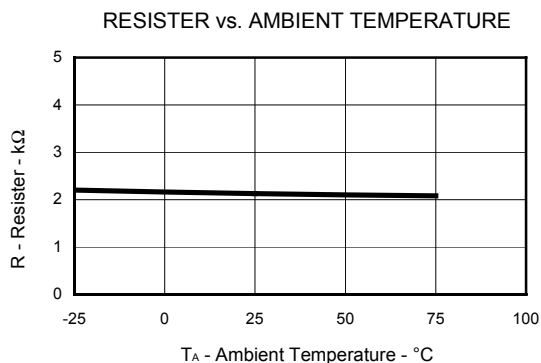
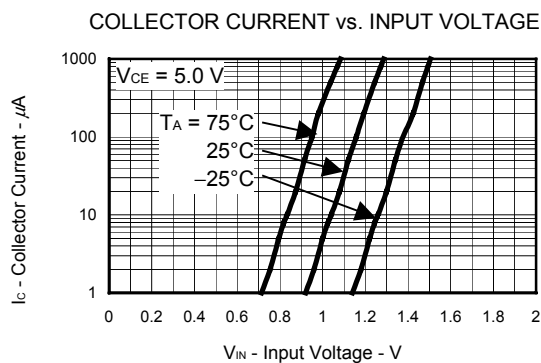
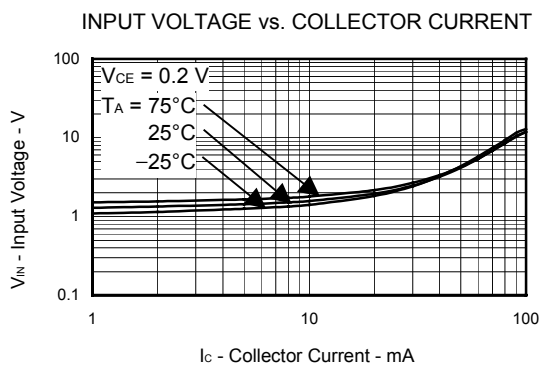
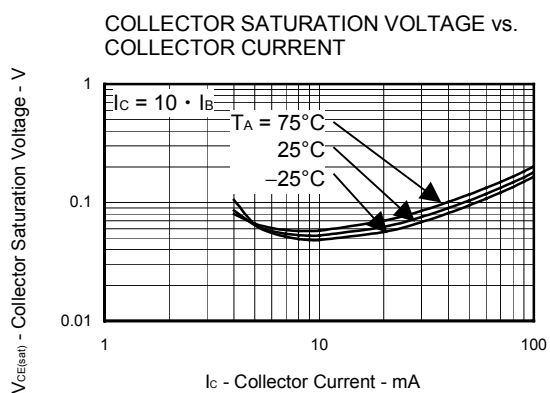
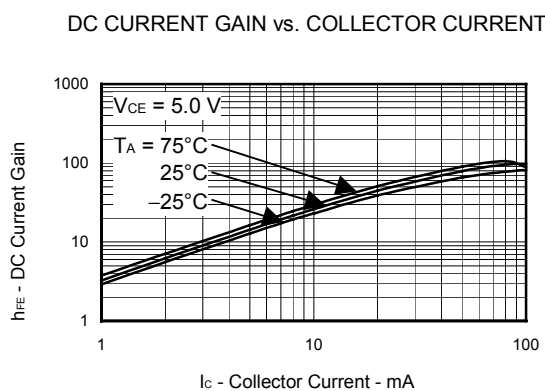
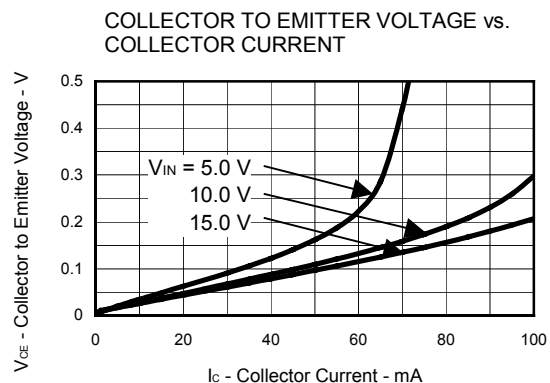
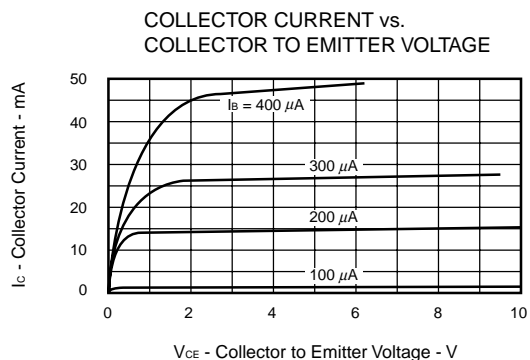


[GA4L4Z]  
TYPICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ )

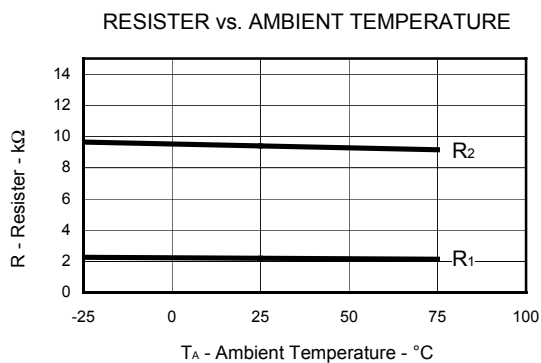
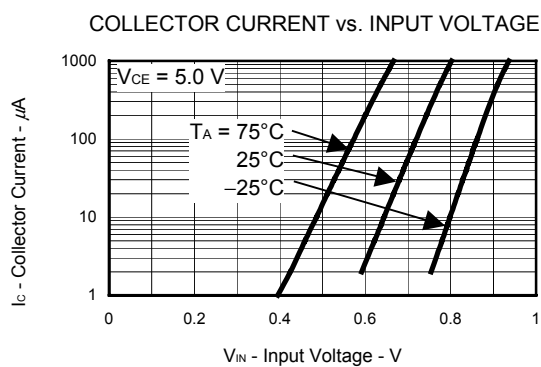
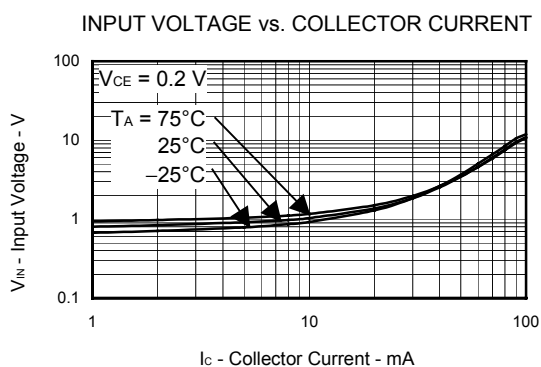
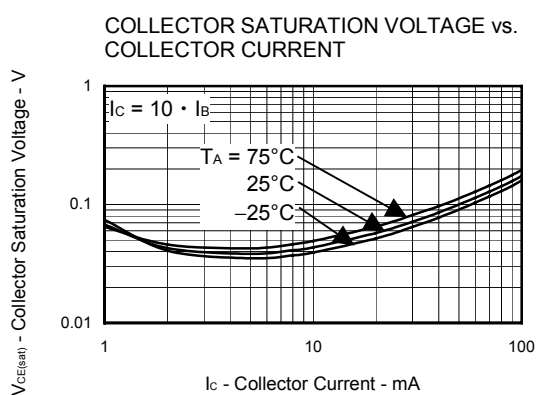
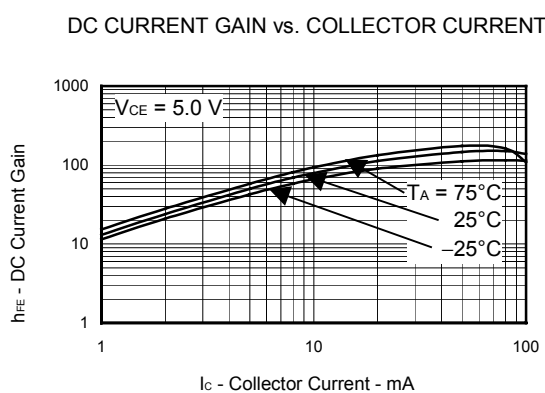
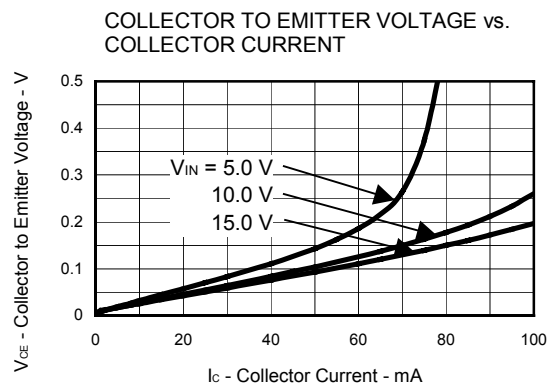
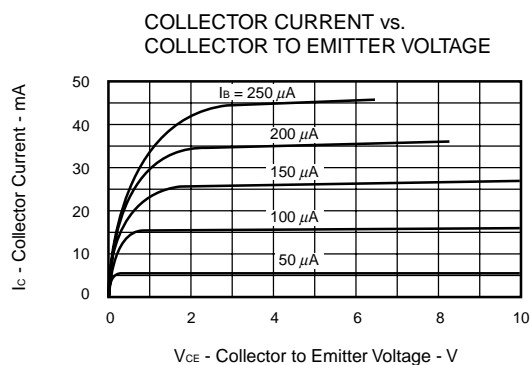




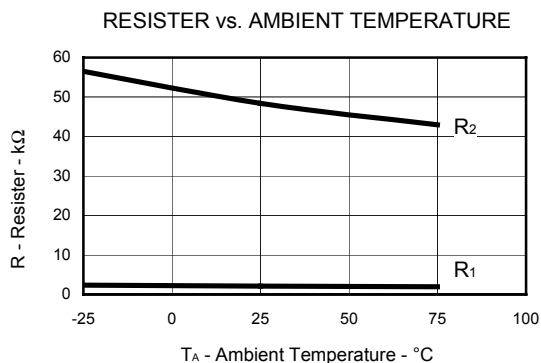
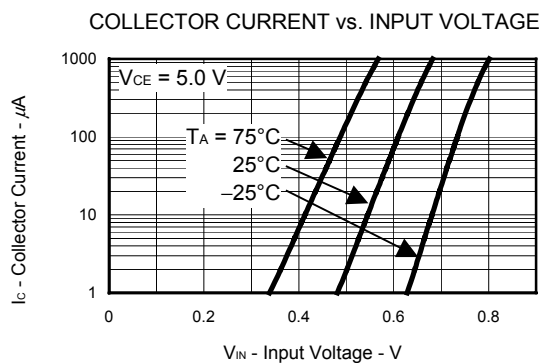
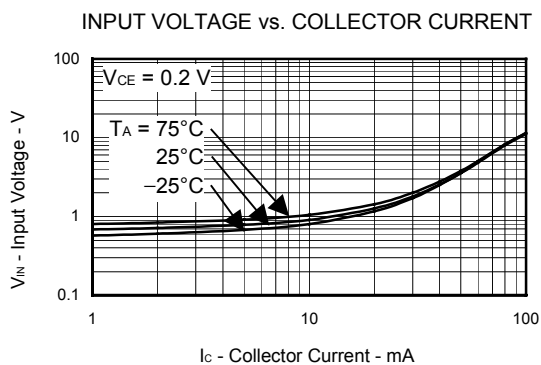
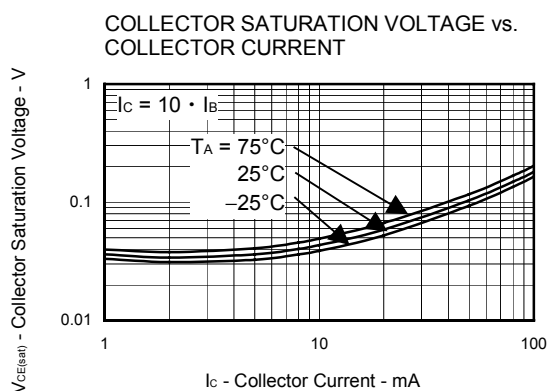
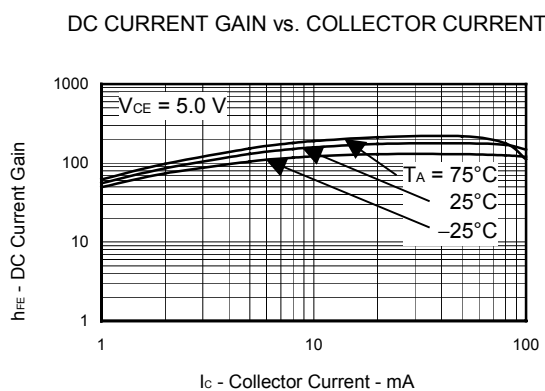
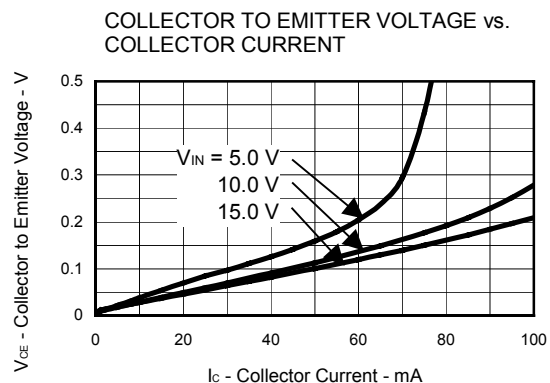
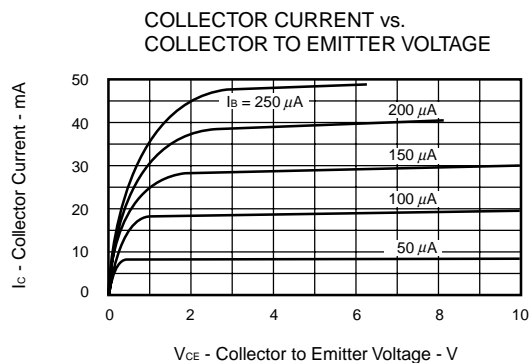
[GA4F3M]  
TYPICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ )



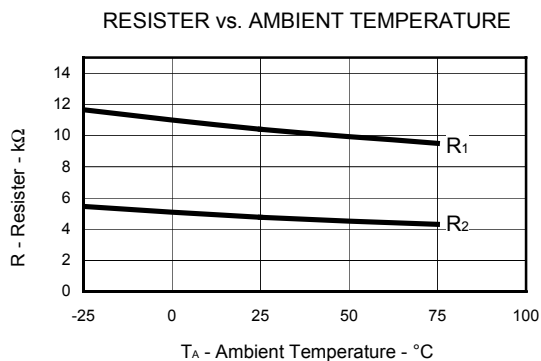
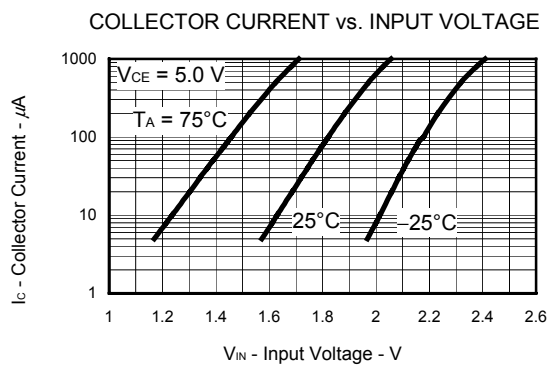
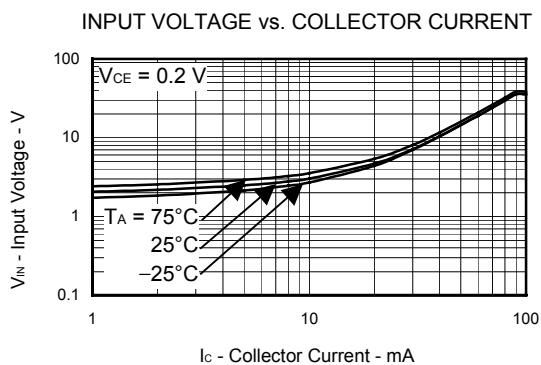
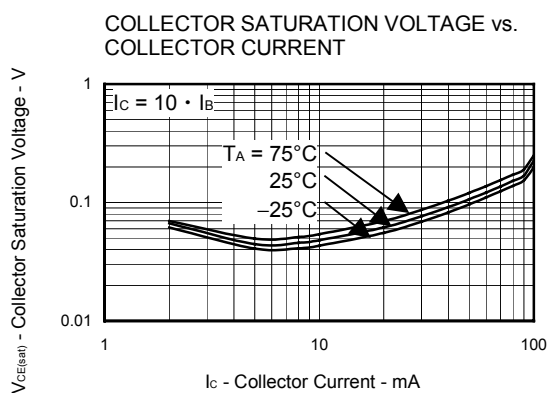
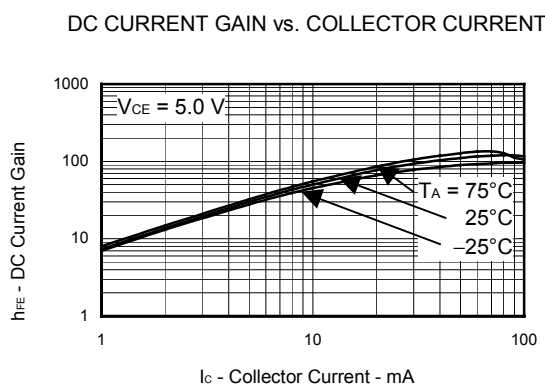
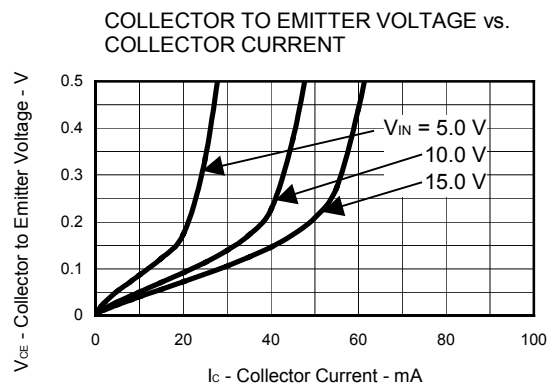
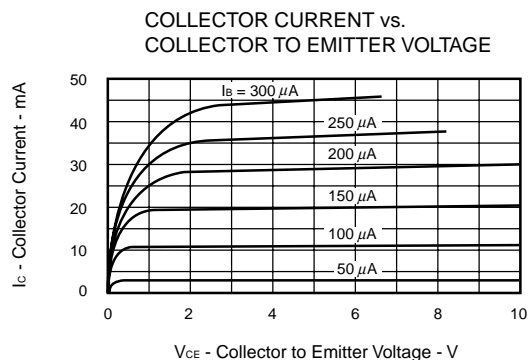
[GA4F3P]  
TYPICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ )



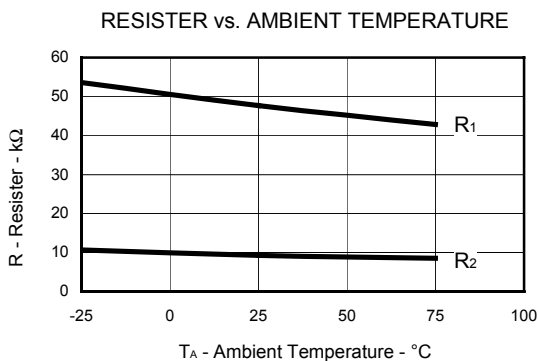
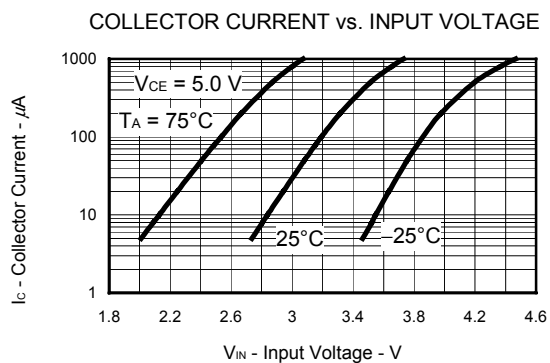
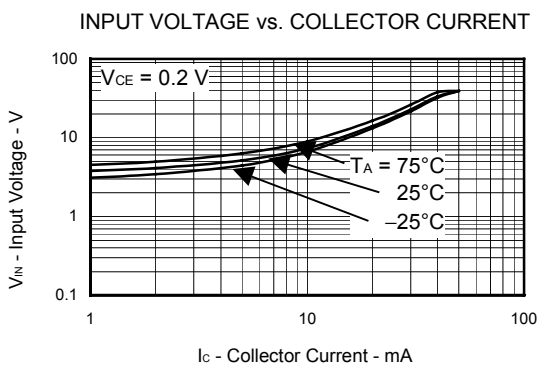
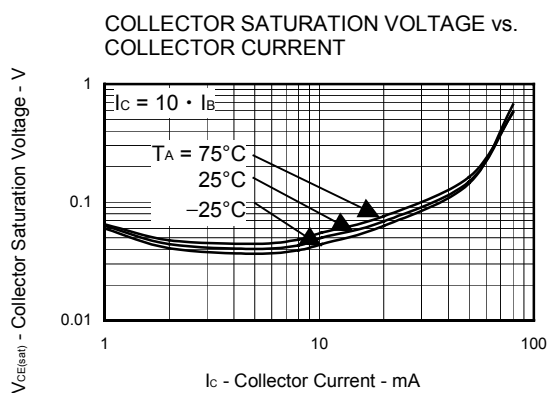
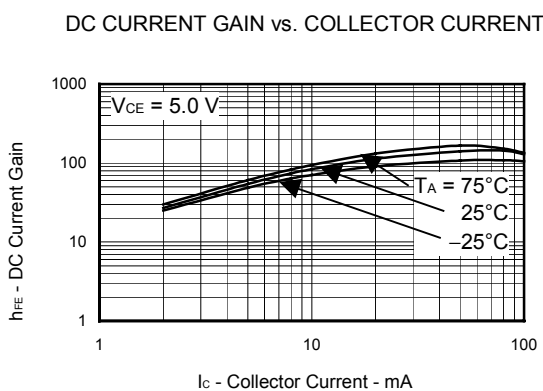
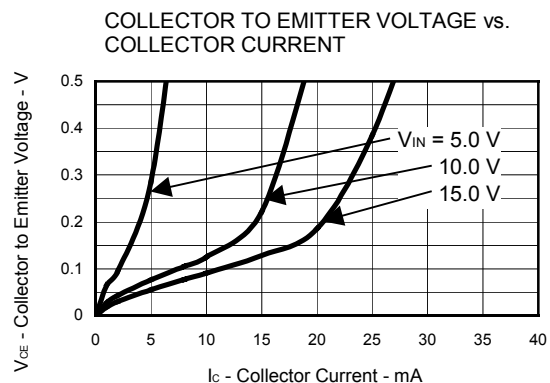
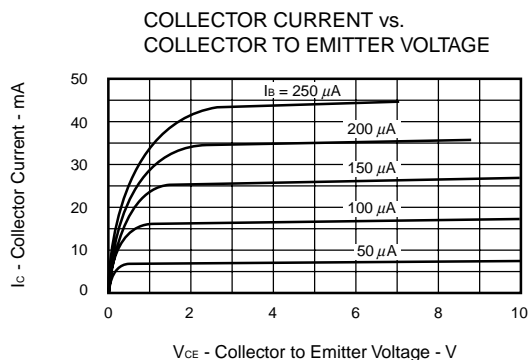
[GA4F3R]  
TYPICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ )



## [GA4A4L]

TYPICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ )

[GA4L4K]  
TYPICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ )



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