

### RESISTOR BUILT-IN TYPE NPN TRANSISTOR

#### FEATURES

- Compact package
- Resistors built-in type
- Complementary to KN4xxx

#### ORDERING INFORMATION

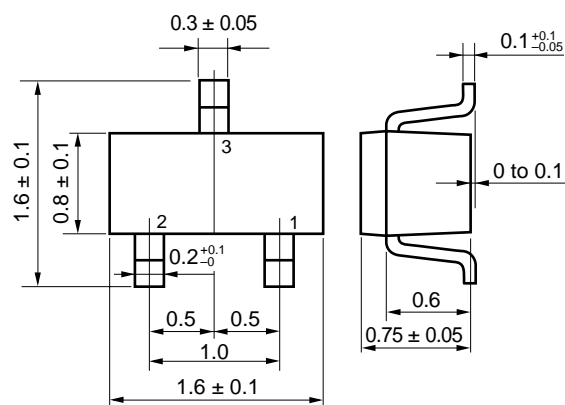
PART NUMBER	PACKAGE
KA4xxx	SC-75

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

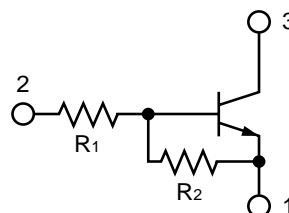
Collector to Base Voltage	V <sub>CBO</sub>	60	V
Collector to Emitter Voltage	V <sub>CEO</sub>	50	V
Emitter to Base Voltage	V <sub>EBO</sub>	5	V
Collector Current (DC)	I <sub>C</sub>	0.1	A
Collector Current (pulse) <sup>Note</sup>	I <sub>C(pulse)</sub>	0.2	A
Total Power Dissipation	P <sub>T</sub>	0.2	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
KA4A4M	A4	10.0	10.0	kΩ
KA4F4M	B4	22.0	22.0	kΩ
KA4L4M	C4	47.0	47.0	kΩ
KA4L3M	D4	4.7	4.7	kΩ
KA4L3N	E4	4.7	10.0	kΩ
KA4L3Z	F4	4.7		kΩ
KA4A3Q	G4	1.0	10.0	kΩ
KA4A4P	H4	10.0	47.0	kΩ
★ KA4F4N	X4	22.0	47.0	kΩ

PART NUMBER	MARK	R <sub>1</sub>	R <sub>2</sub>	UNIT
KA4L4L	K4	47.0	22.0	kΩ
KA4A4Z	Y4	10.0		kΩ
KA4F4Z	Z4	22.0		kΩ
KA4L4Z	N4	47.0		kΩ
KA4F3M	P4	2.2	2.2	kΩ
KA4F3P	Q4	2.2	10.0	kΩ
KA4F3R	R4	2.2	47.0	kΩ
KA4A4L	S4	10.0	4.7	kΩ
KA4L4K	T4	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>CB0</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.	
KA4A4M	35		100	80			-
KA4F4M	60		195	90			-
KA4L4M	85		340	95			-
KA4L3M	20		80	80			-
KA4L3N	35		100	80			-
KA4L3Z	135		600	100			-
KA4A3Q	35		100	80			-
KA4A4P	85		340	95			-
KA4F4N	85		340	95			-
KA4L4L	60		195	90			-
KA4A4Z	135		600	100			-
KA4F4Z	135		600	100			-
KA4L4Z	135		600	100			-
KA4F3M	8		50	50			-
KA4F3P	35		100	80			-
KA4F3R	85		340	95			-
KA4A4L	20		80	80			-
KA4L4K	35		100	80			-

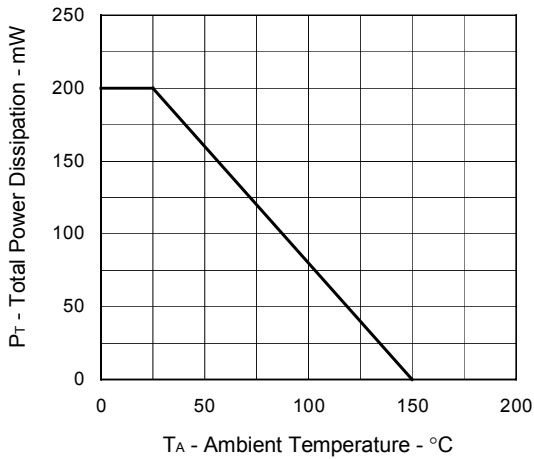
**Note 2**

PART NUMBER	V <sub>IL</sub>			V <sub>IH</sub>			UNIT
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	
KA4A4M			0.8	3.0			V
KA4F4M			0.8	4.0			V
KA4L4M			0.8	5.0			V
KA4L3M			0.8	3.0			V
KA4L3N			0.6	3.0			V
KA4L3Z			0.5	1.2			V
KA4A3Q			0.5	2.0			V
KA4A4P			0.5	3.0			V
KA4F4N			0.6	3.0			V
KA4L4L			0.9	6.0			V
KA4A4Z			0.5	2.0			V
KA4F4Z			0.5	3.0			V
KA4L4Z			0.5	4.0			V
KA4F3M			0.8	3.0			V
KA4F3P			0.5	2.0			V
KA4F3R			0.5	2.0			V
KA4A4L			0.9	6.0			V
KA4L4K			2.0	8.0			V

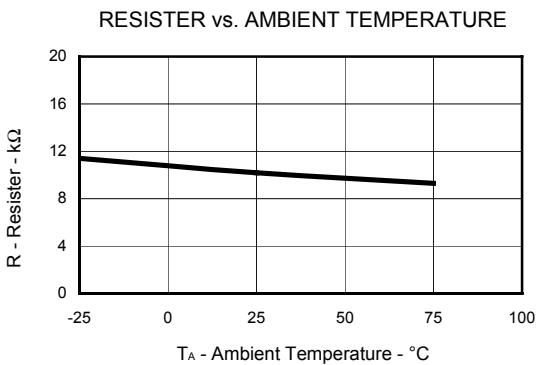
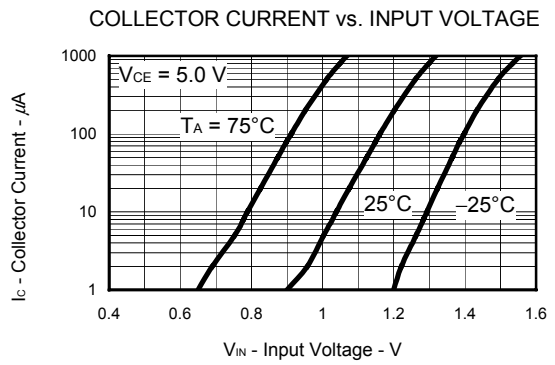
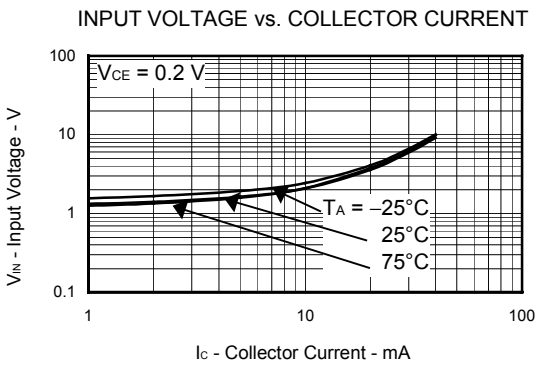
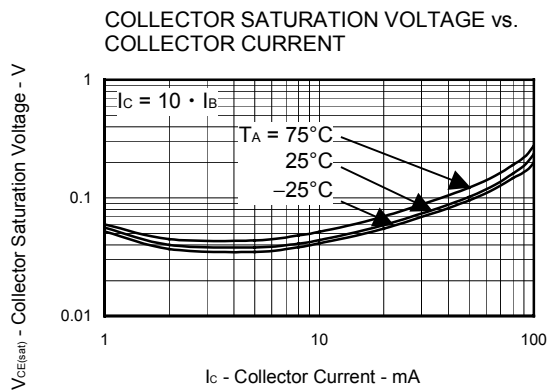
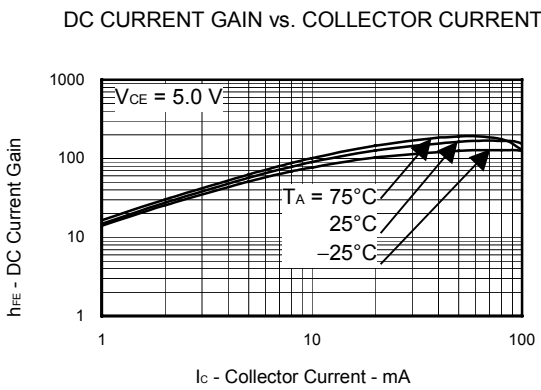
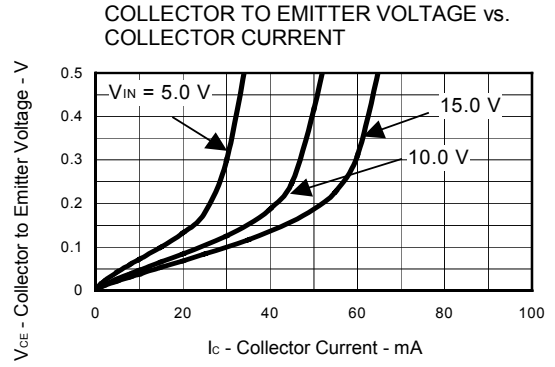
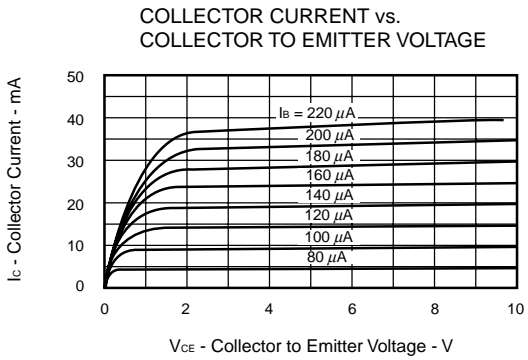
Note 3

PART NUMBER	R <sub>1</sub>			R <sub>2</sub>			UNIT
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	
KA4A4M	7.00	10.00	13.00	7.00	10.00	13.00	kΩ
KA4F4M	15.40	22.00	28.60	15.40	22.00	28.60	kΩ
KA4L4M	32.90	47.00	61.10	32.90	47.00	61.10	kΩ
KA4L3M	3.29	4.70	6.11	3.29	4.70	6.11	kΩ
KA4L3N	3.29	4.70	6.11	7.00	10.00	13.00	kΩ
KA4L3Z	3.29	4.70	6.11				kΩ
KA4A3Q	0.70	1.00	1.30	7.00	10.00	13.00	kΩ
KA4A4P	7.00	10.00	13.00	32.90	47.00	61.10	kΩ
KA4F4N	15.40	22.00	28.60	32.90	47.00	61.10	kΩ
KA4L4L	32.90	47.00	61.10	15.40	22.00	28.60	kΩ
KA4A4Z	7.00	10.00	13.00				kΩ
KA4F4Z	15.40	22.00	28.60				kΩ
KA4L4Z	32.90	47.00	61.10				kΩ
KA4F3M	1.54	2.20	2.86	1.54	2.20	2.86	kΩ
KA4F3P	1.54	2.20	2.86	7.00	10.00	13.00	kΩ
KA4F3R	1.54	2.20	2.86	32.90	47.00	61.10	kΩ
KA4A4L	7.00	10.00	13.00	3.29	4.70	6.11	kΩ
KA4L4K	32.90	47.00	61.10	7.00	10.00	13.00	kΩ

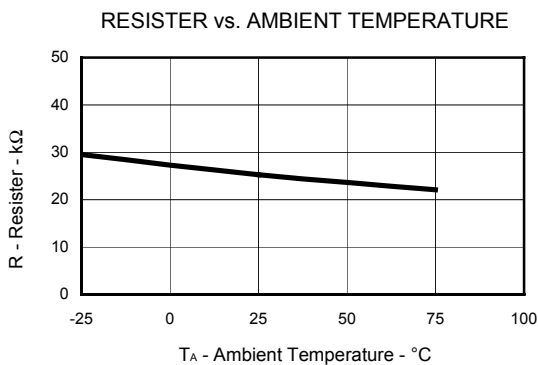
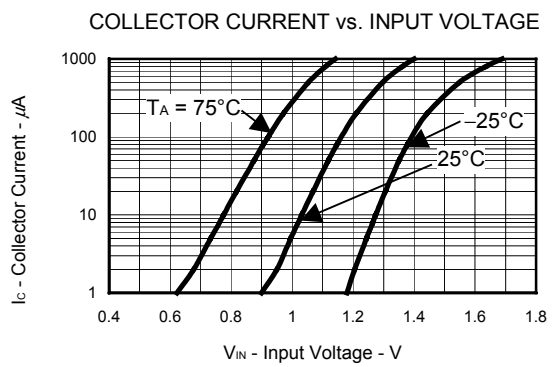
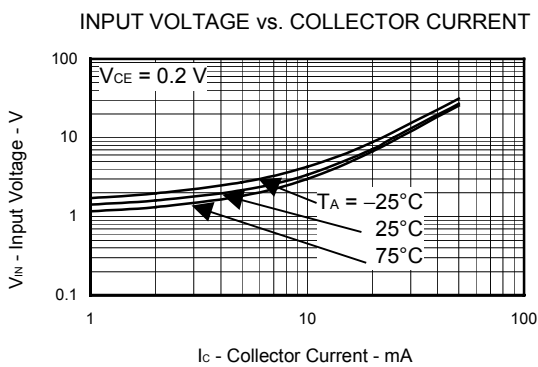
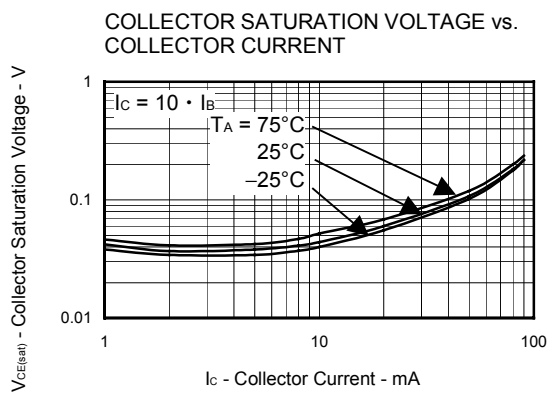
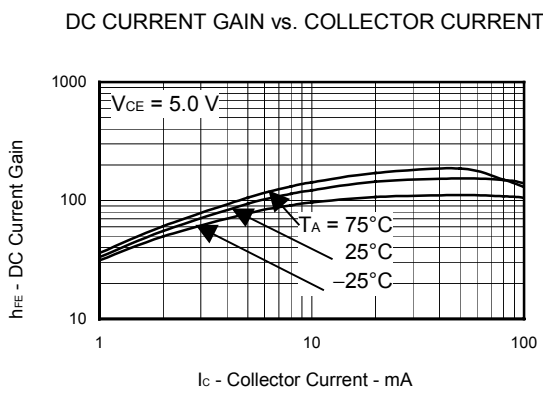
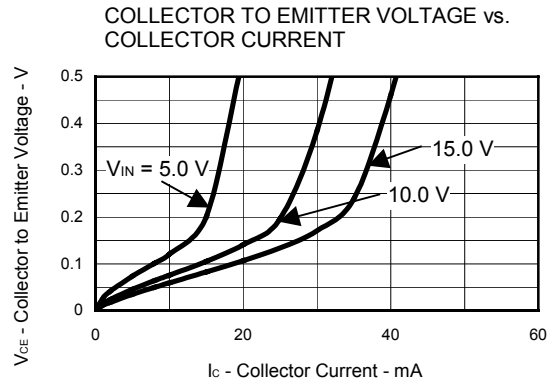
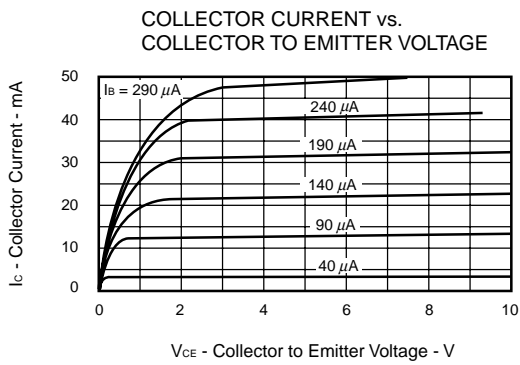
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



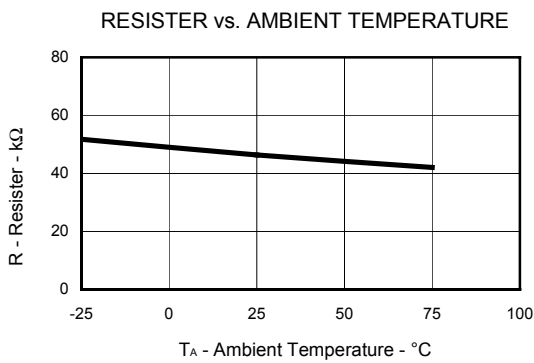
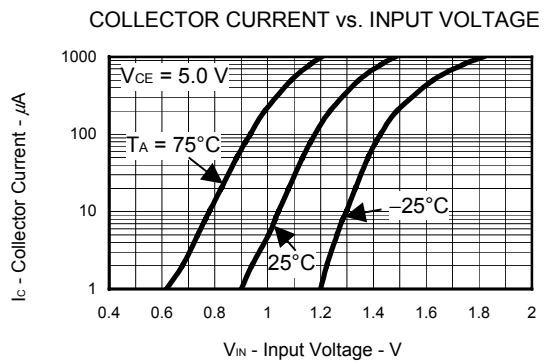
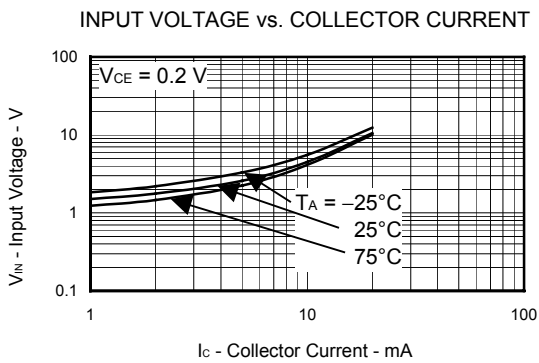
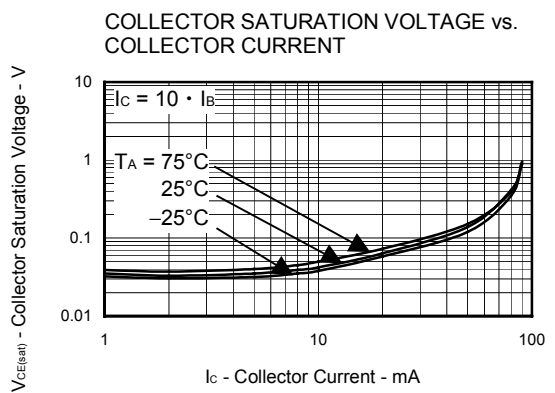
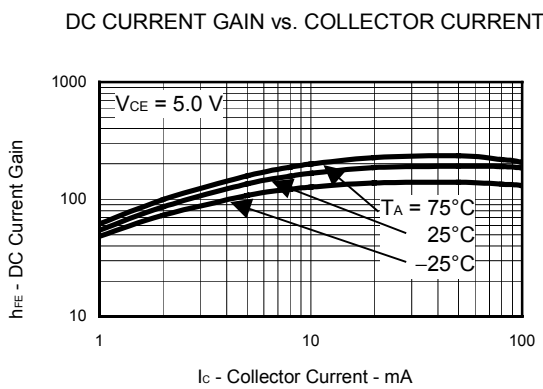
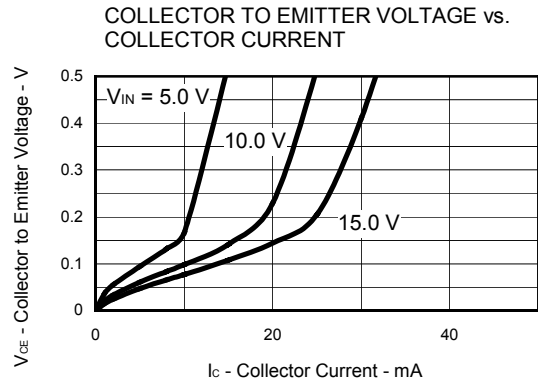
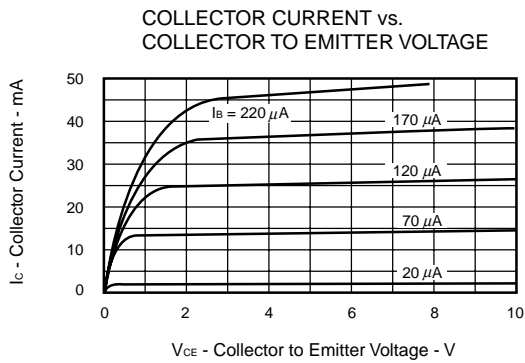
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**TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)**



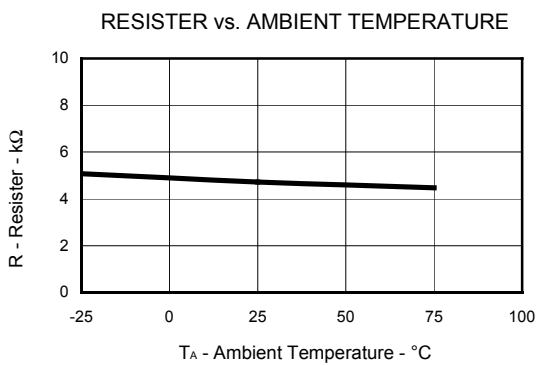
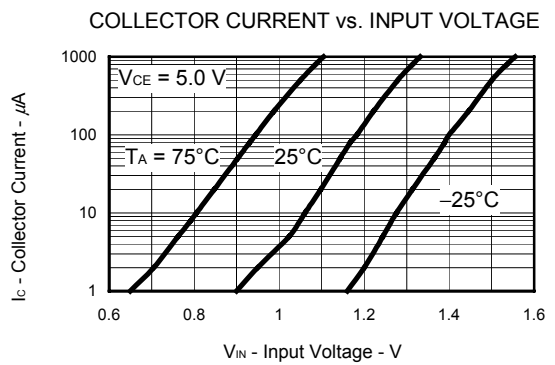
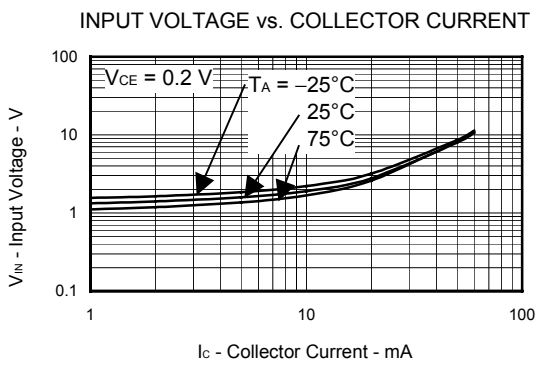
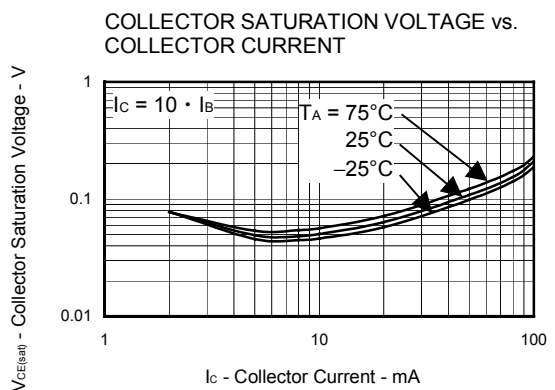
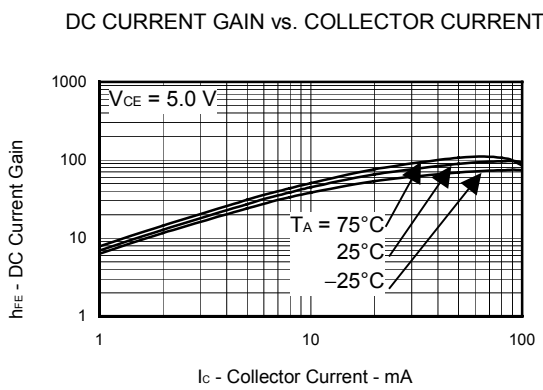
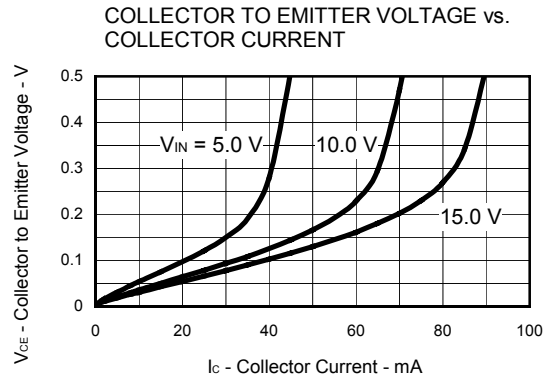
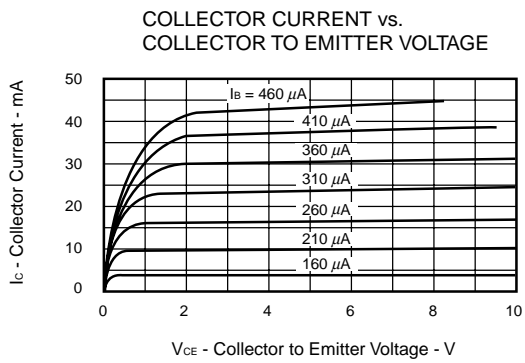
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TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)



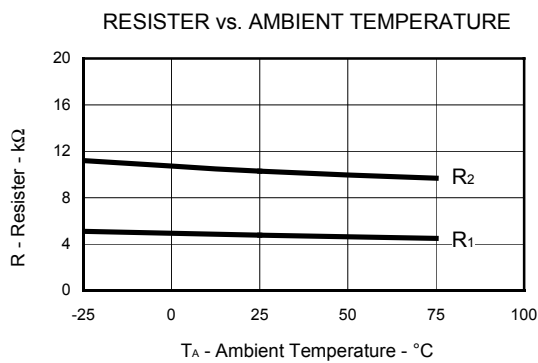
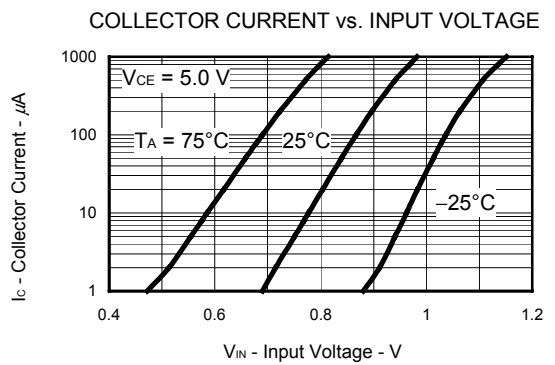
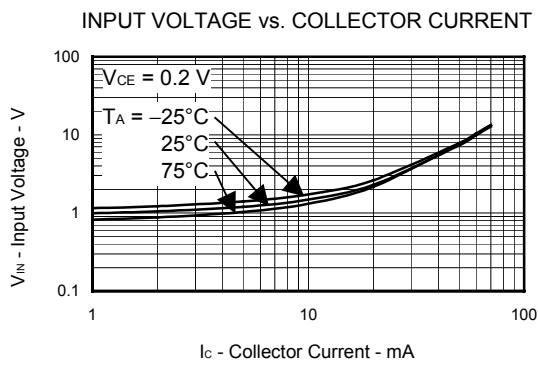
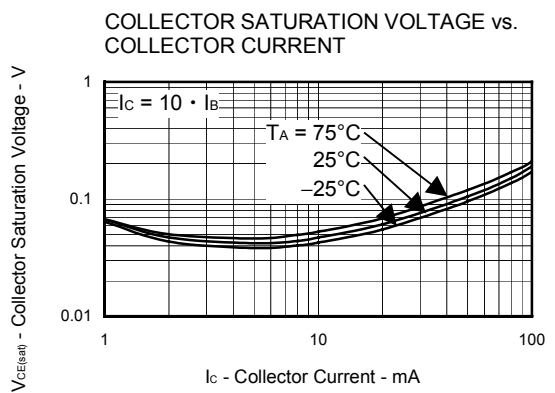
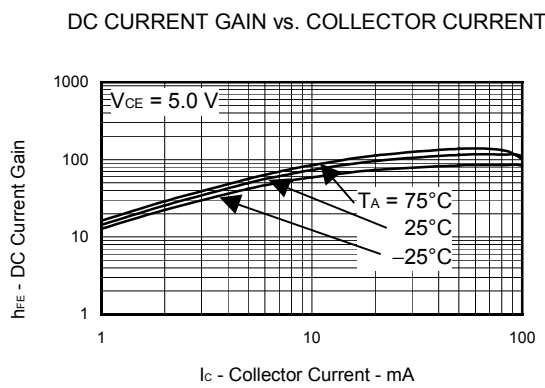
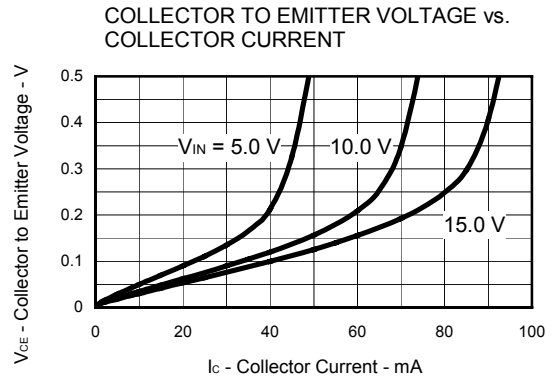
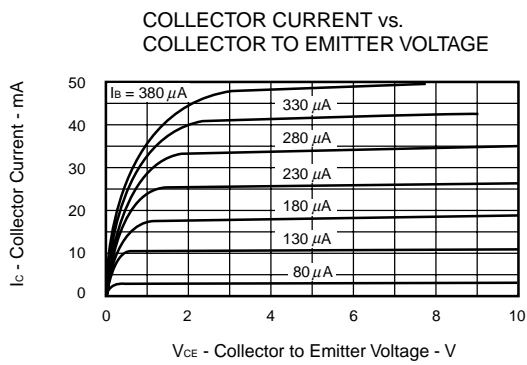
**[KA4L4M]**  
**TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)**



[KA4L3M]  
TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)

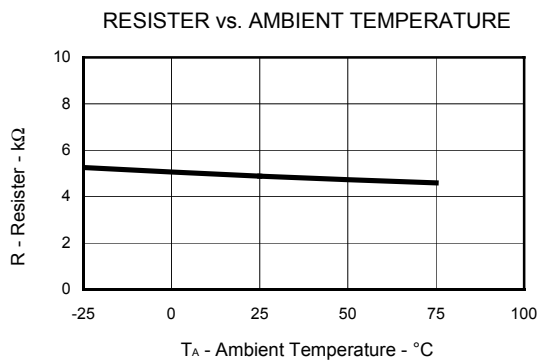
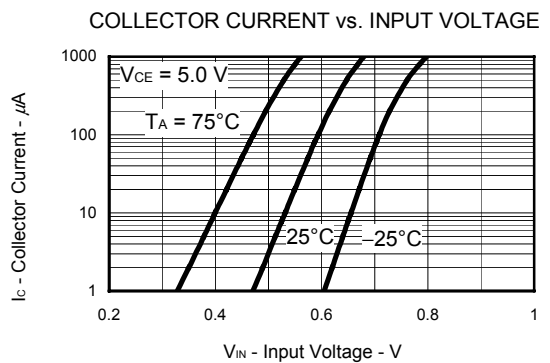
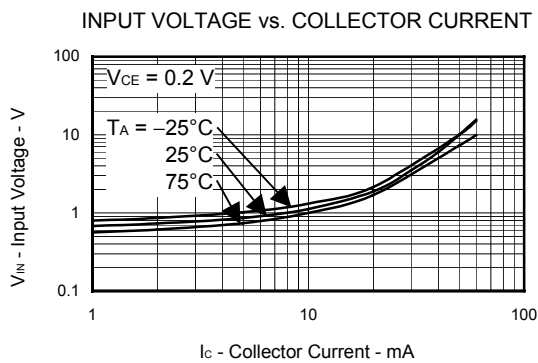
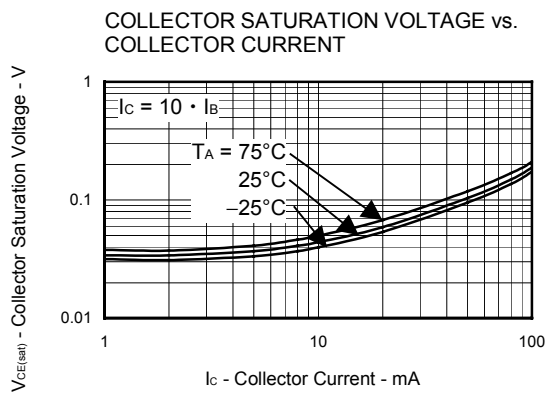
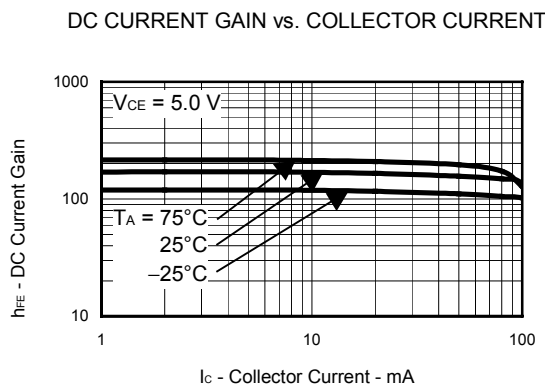
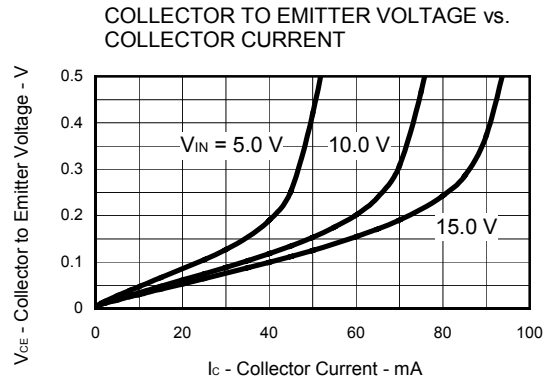
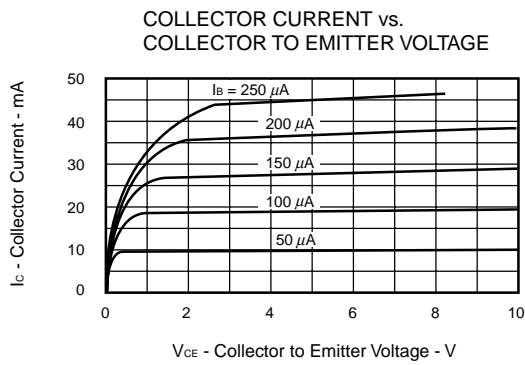


**[KA4L3N]**  
**TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)**

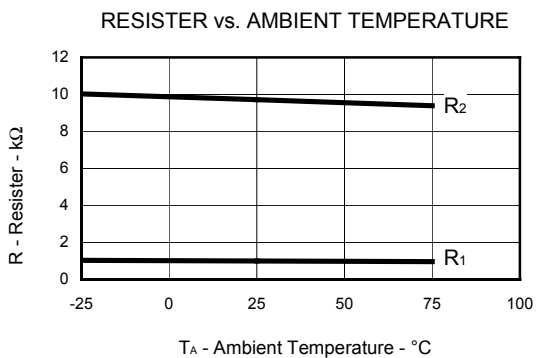
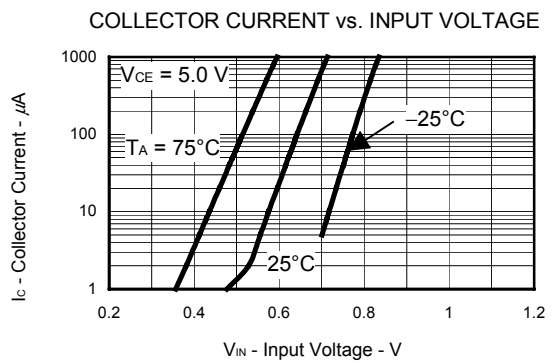
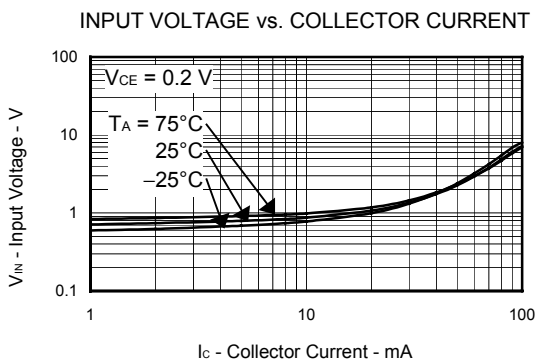
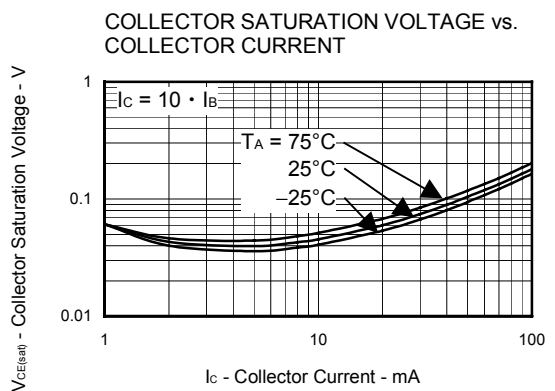
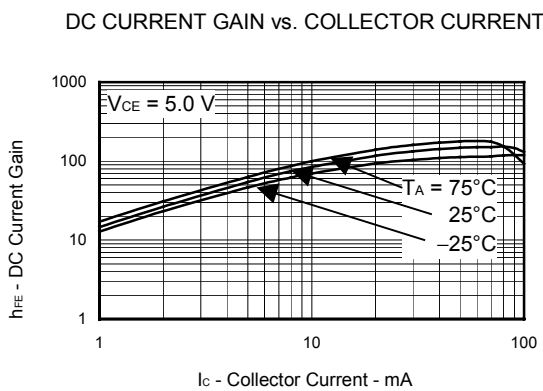
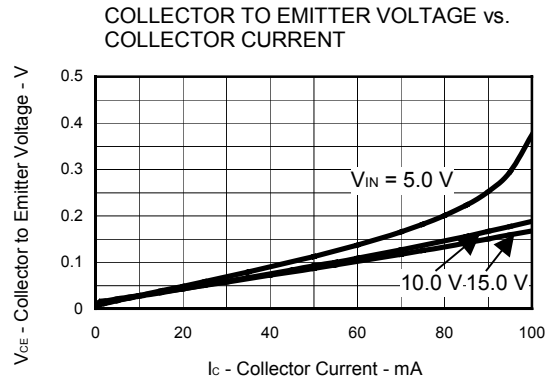
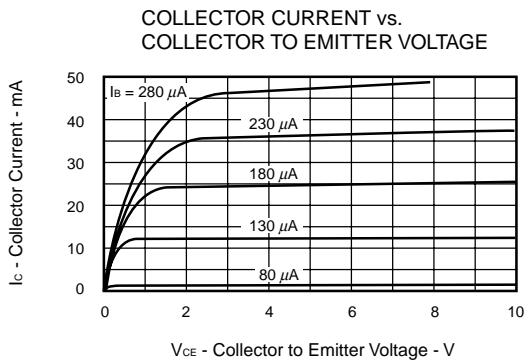




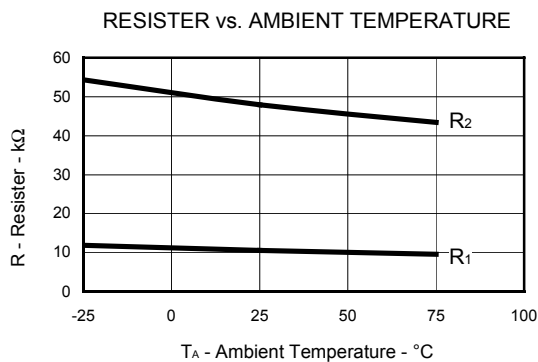
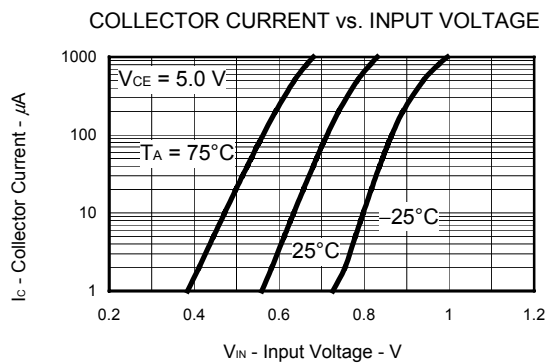
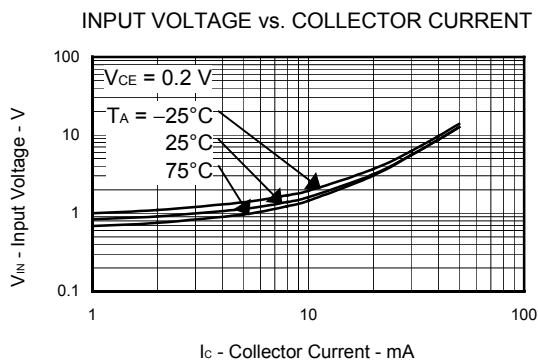
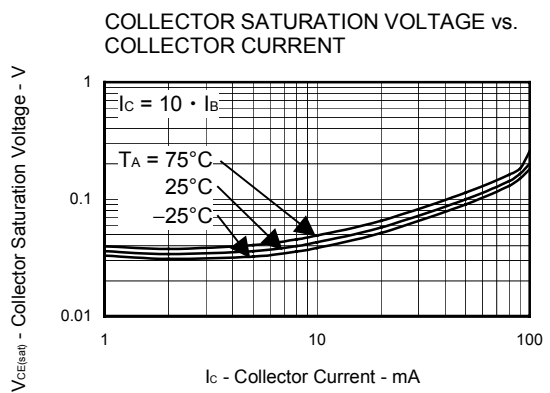
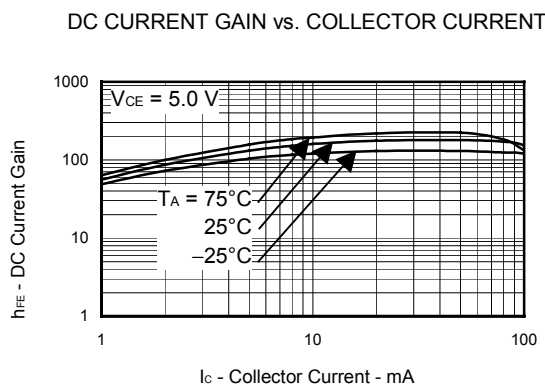
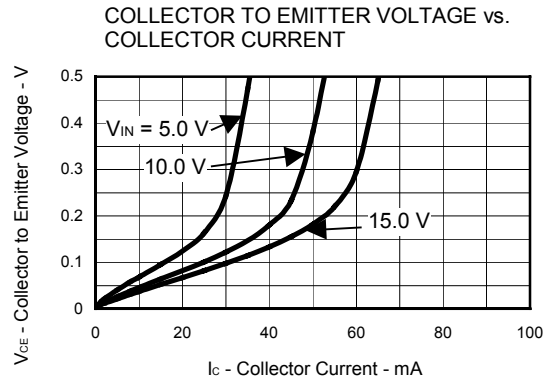
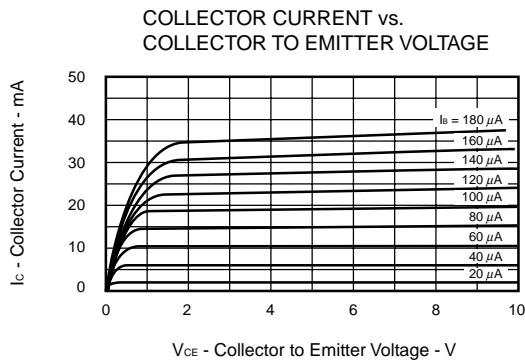
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TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)



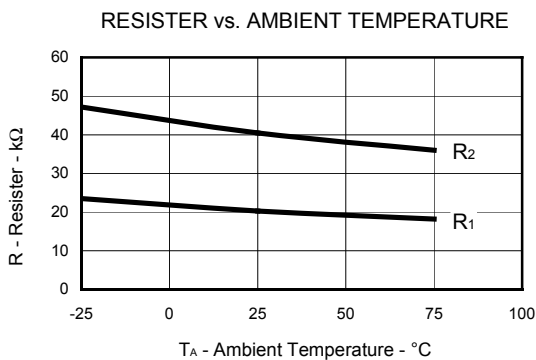
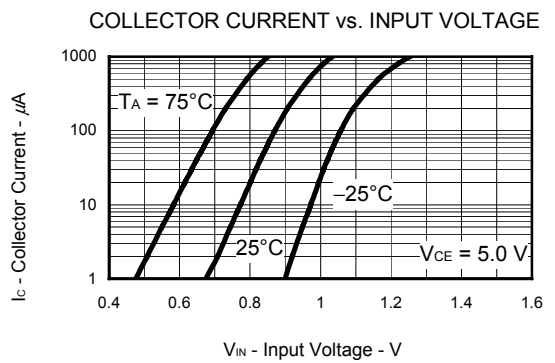
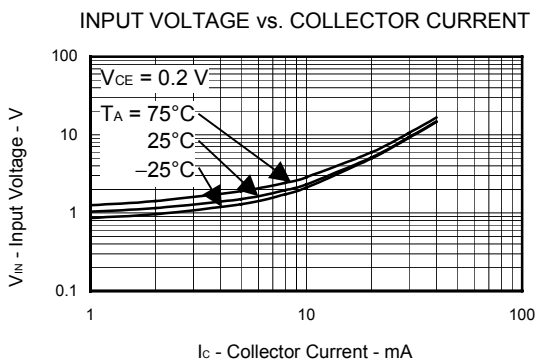
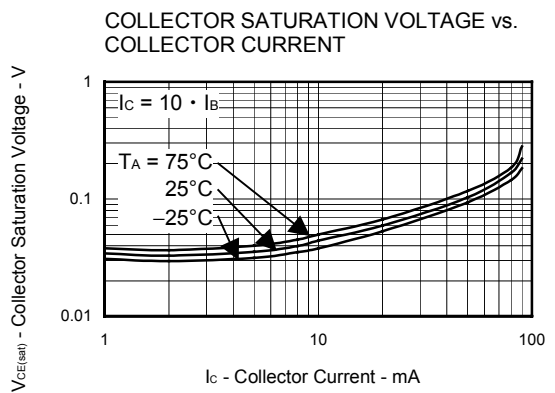
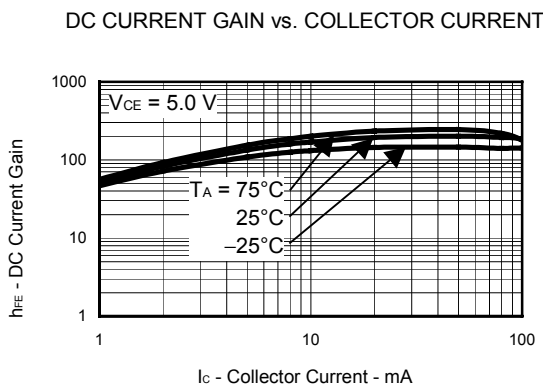
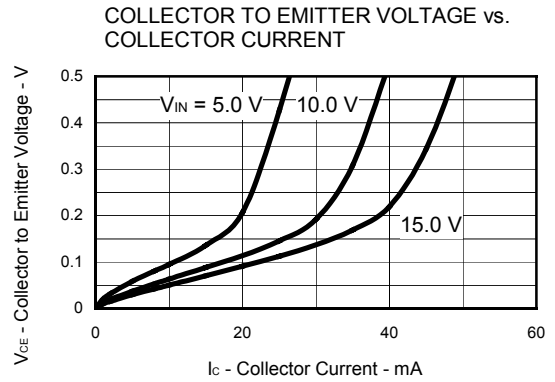
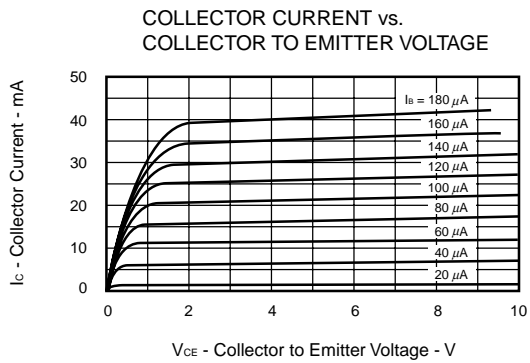
**[KA4A3Q]**  
**TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)**



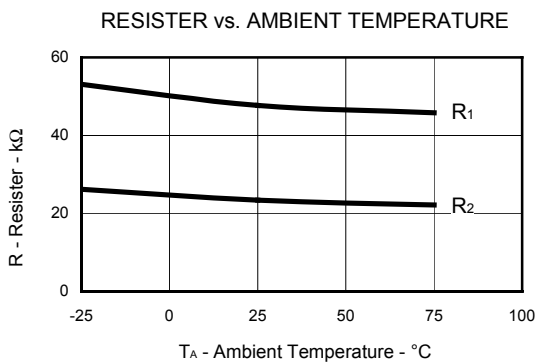
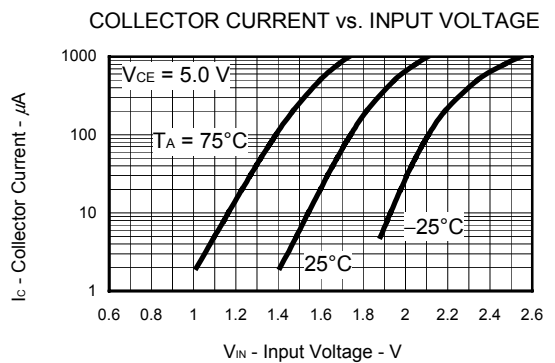
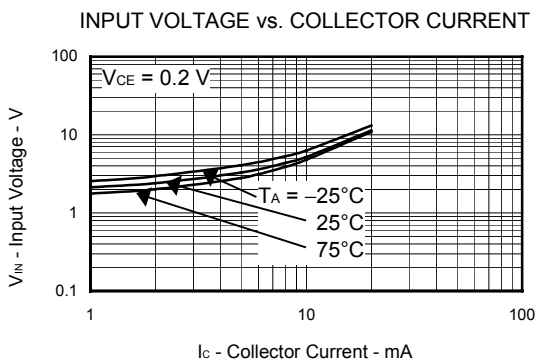
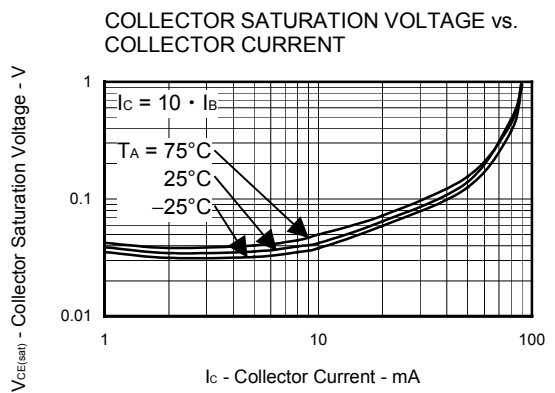
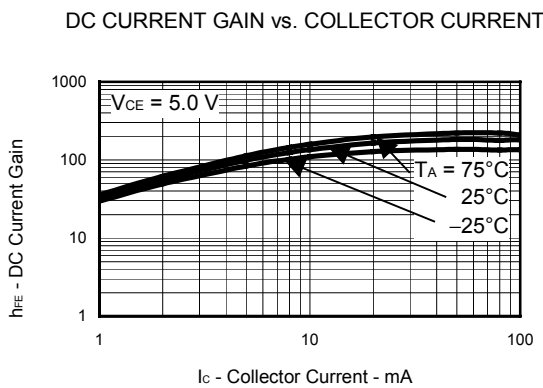
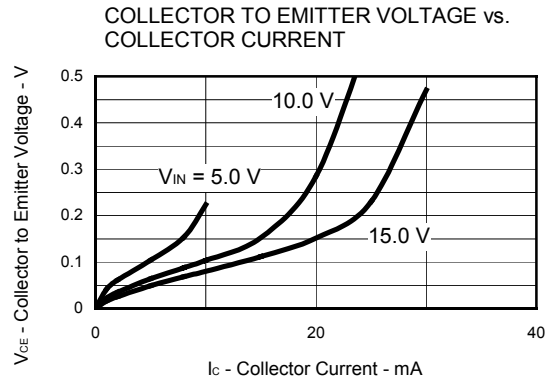
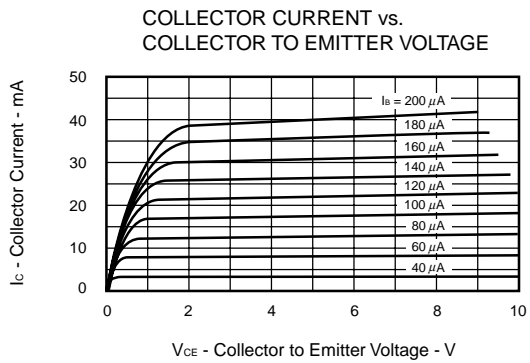
[KA4A4P]  
TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)



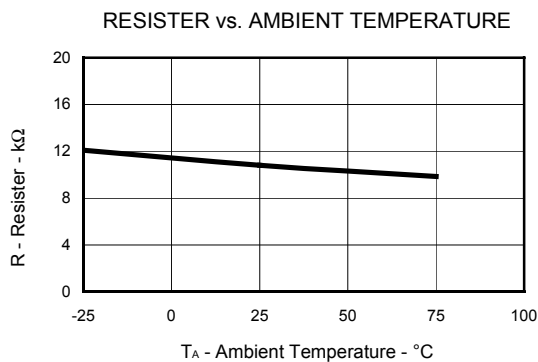
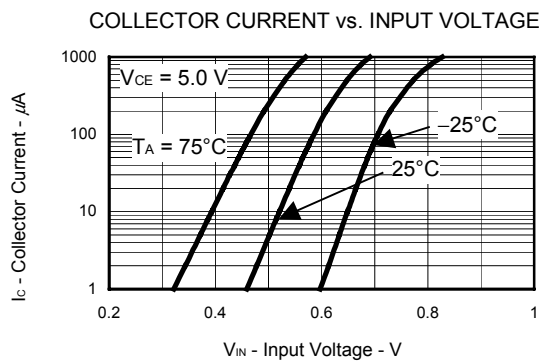
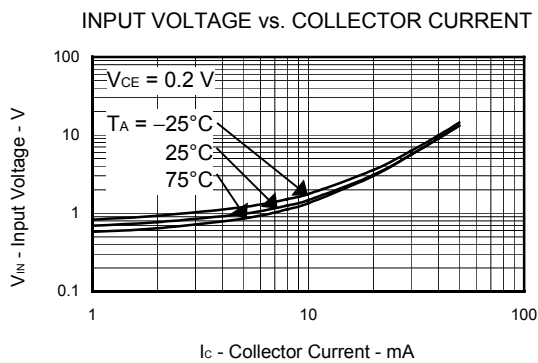
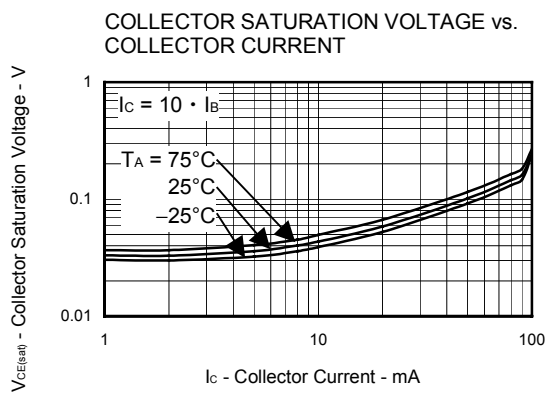
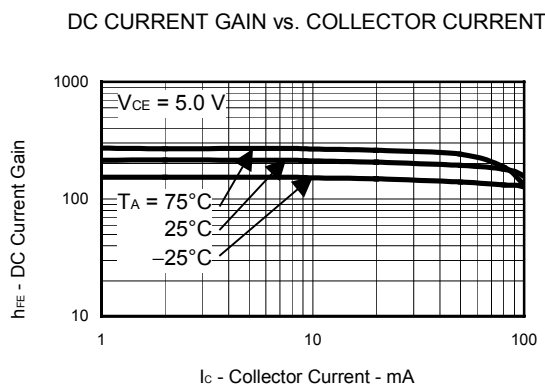
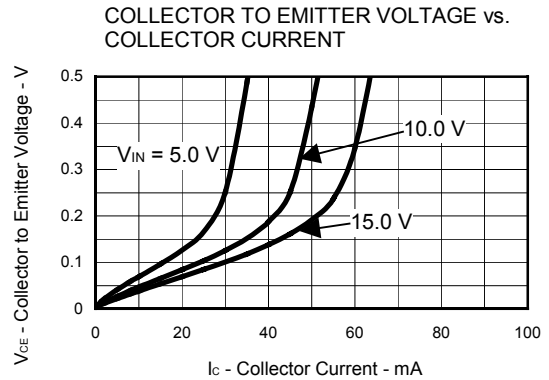
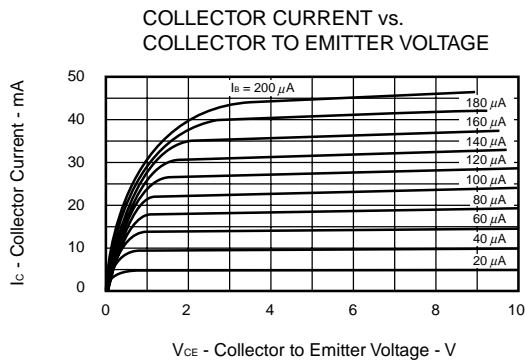
[KA4F4N]  
TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)



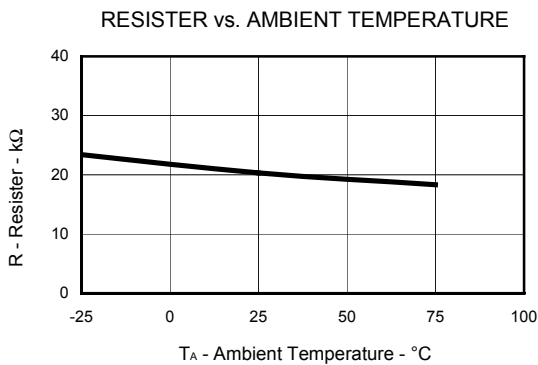
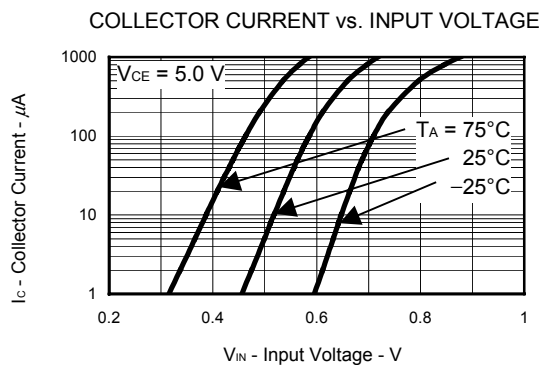
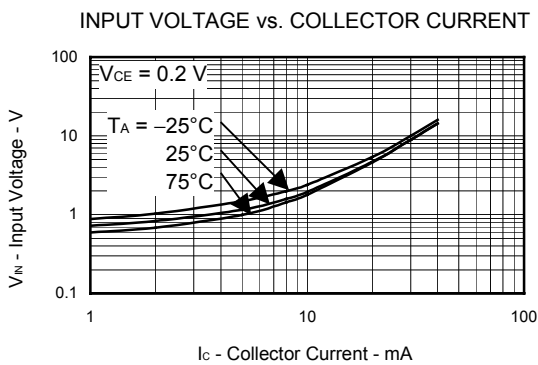
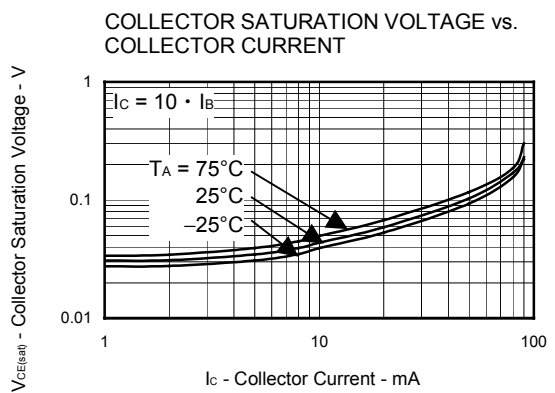
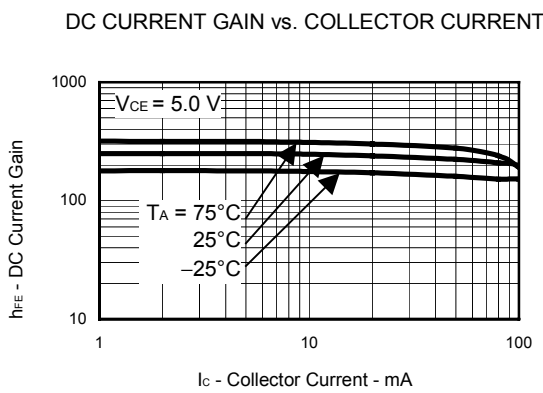
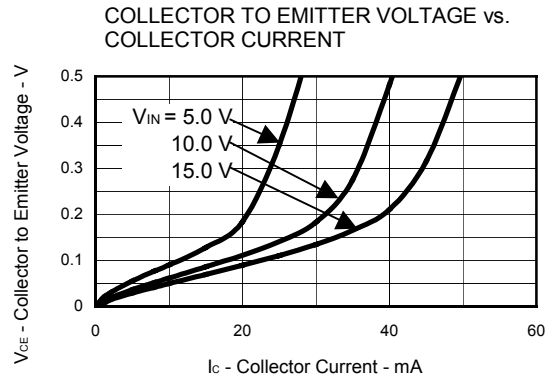
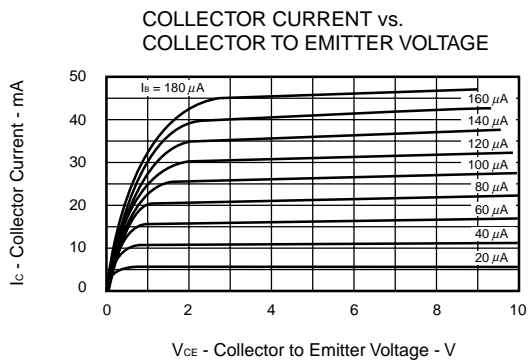
[KA4L4L]  
TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)



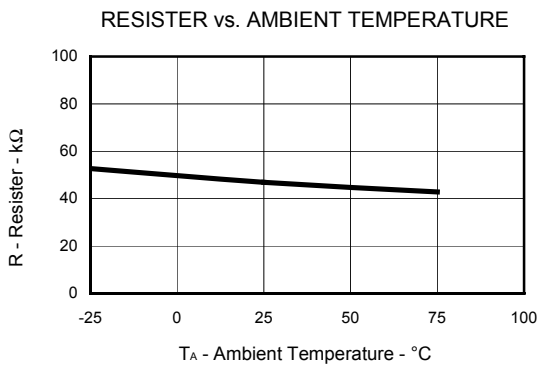
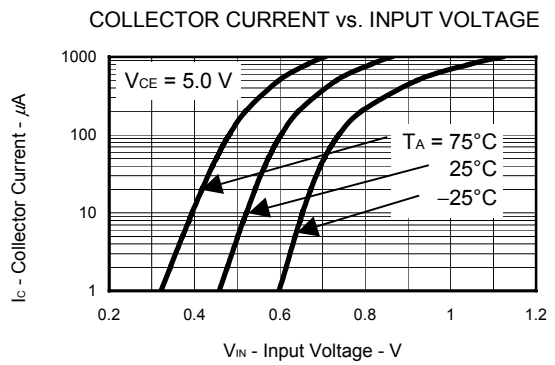
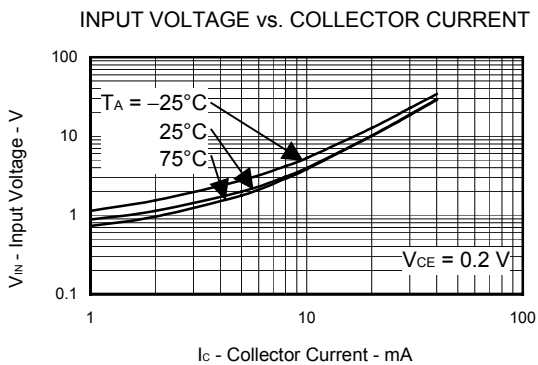
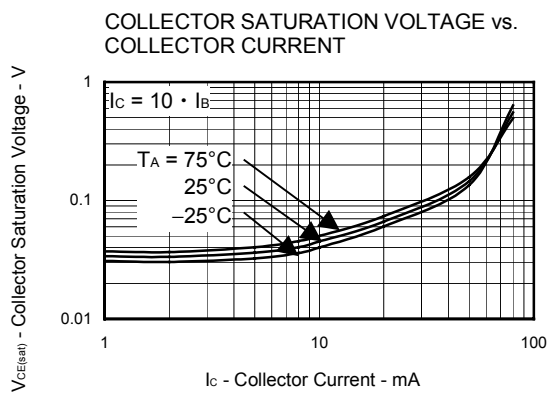
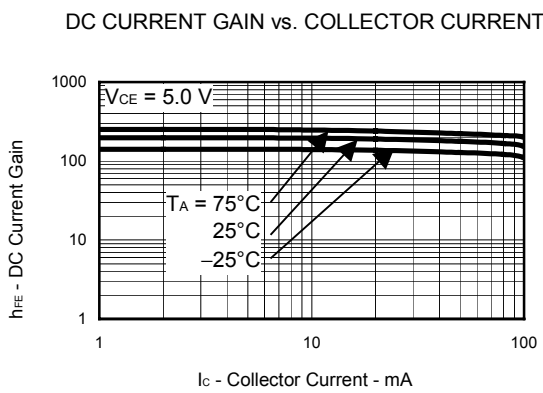
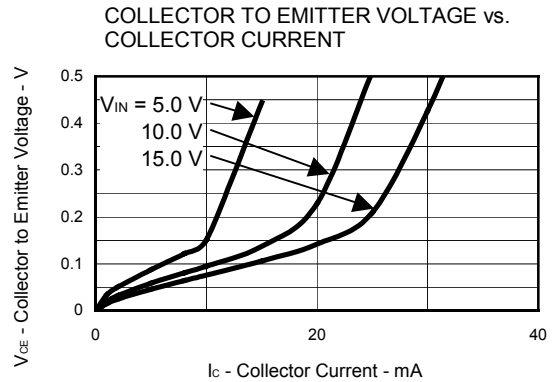
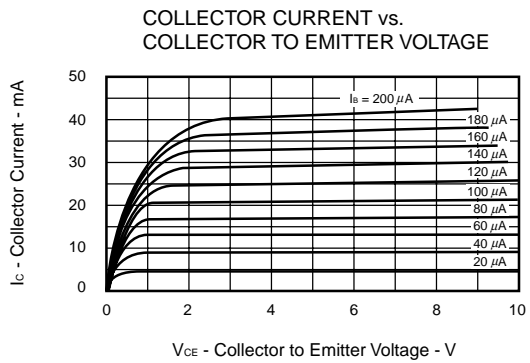
**[KA4A4Z]**  
**TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)**



[KA4F4Z]  
TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)

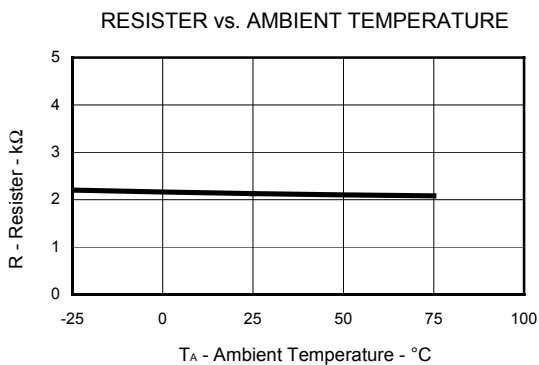
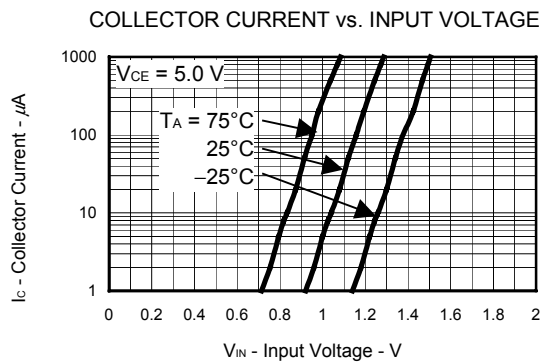
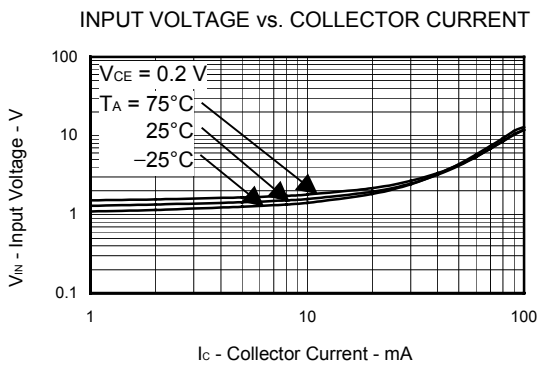
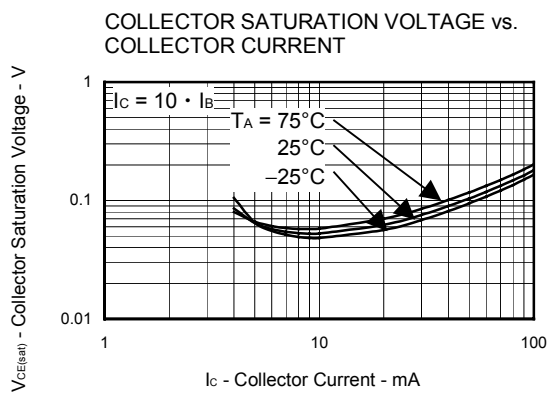
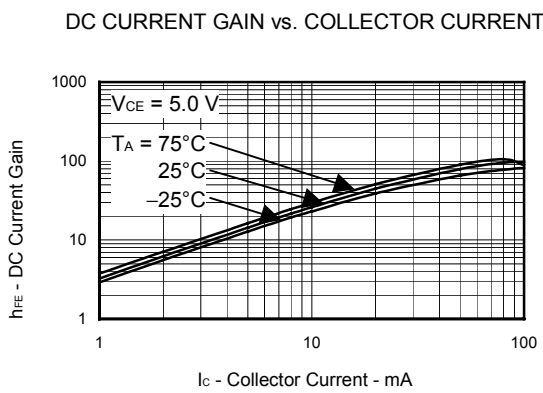
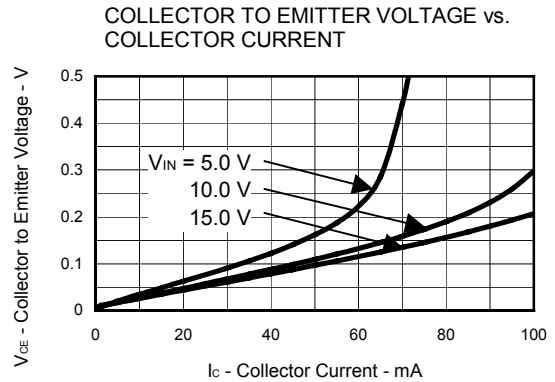
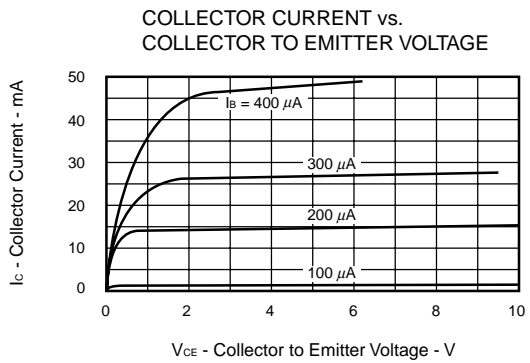


[KA4L4Z]  
TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)

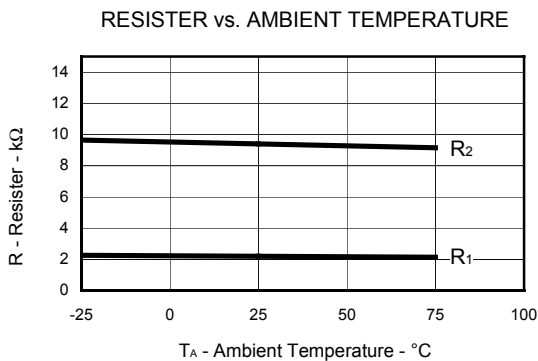
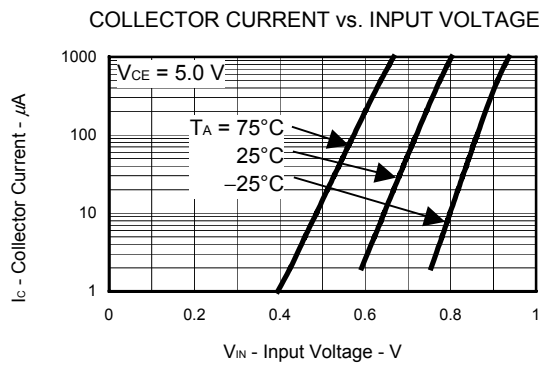
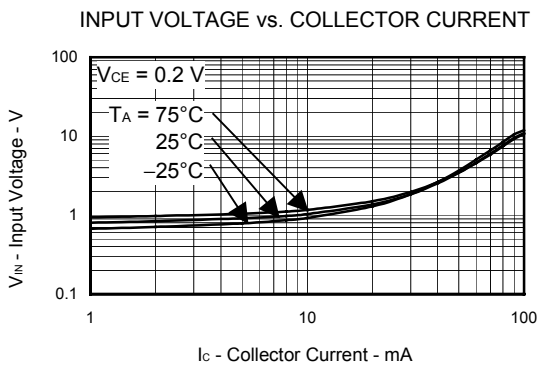
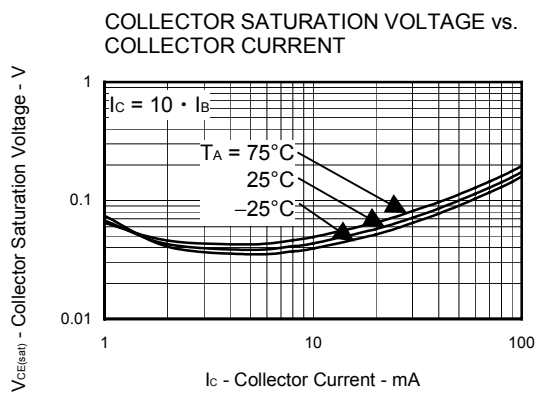
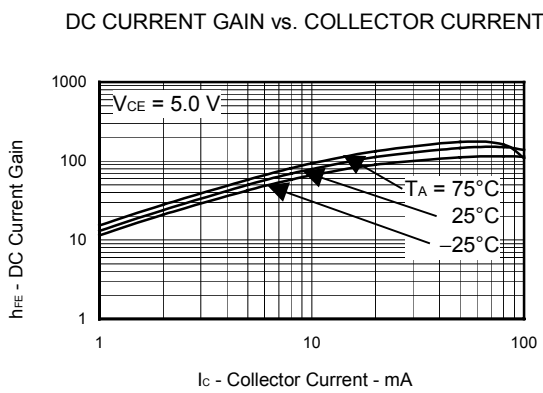
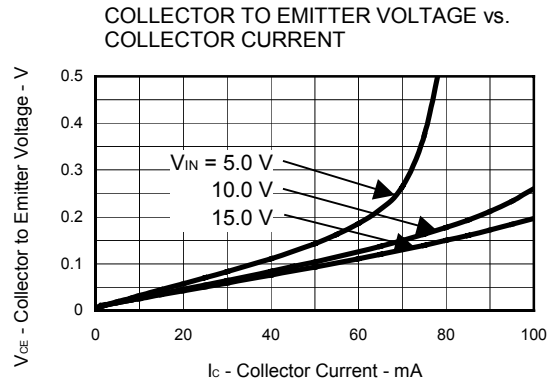
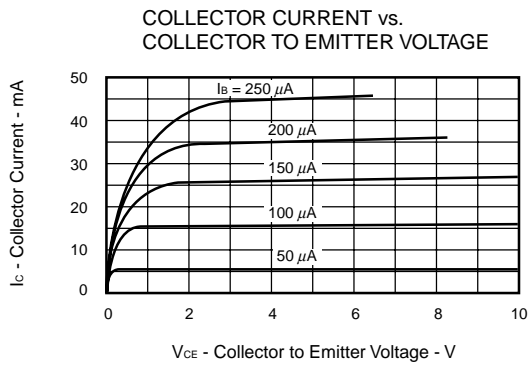




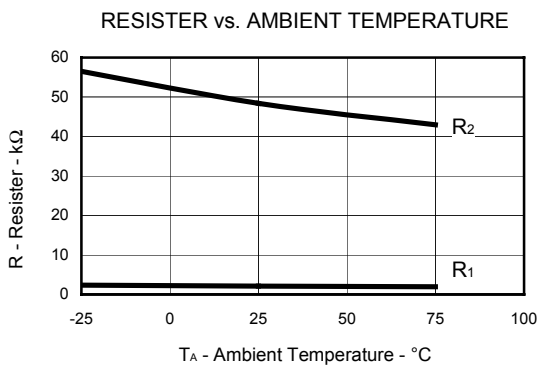
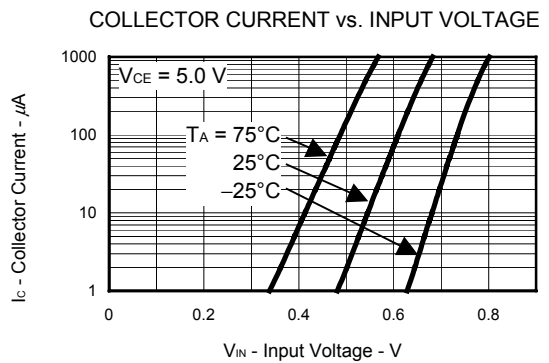
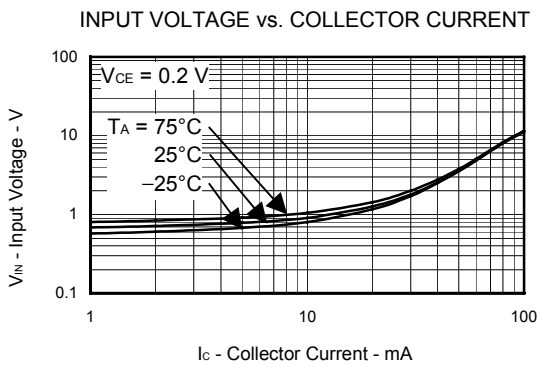
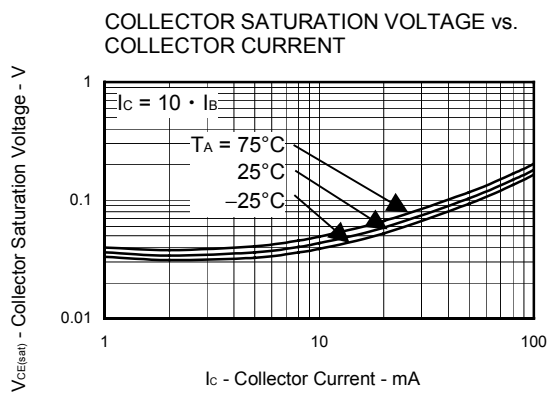
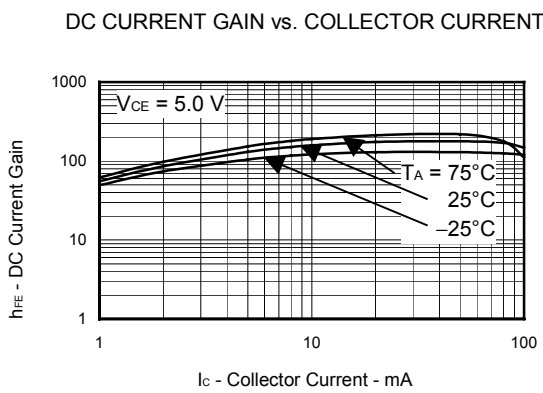
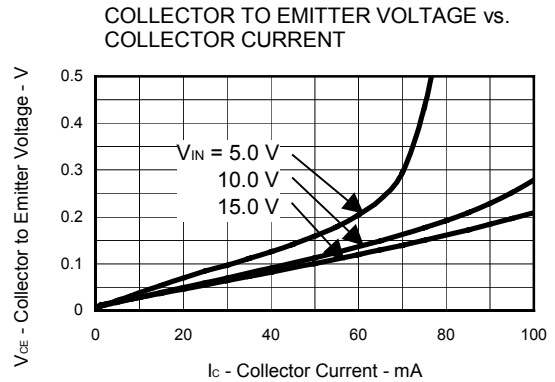
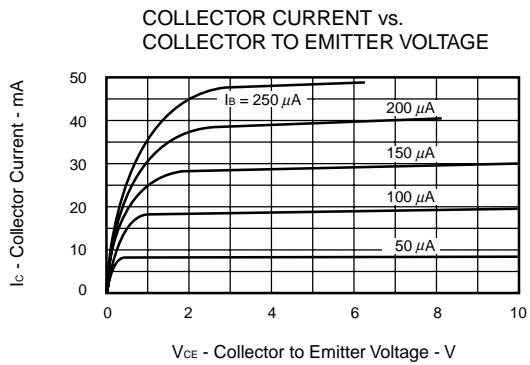
**[KA4F3M]**  
**TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)**



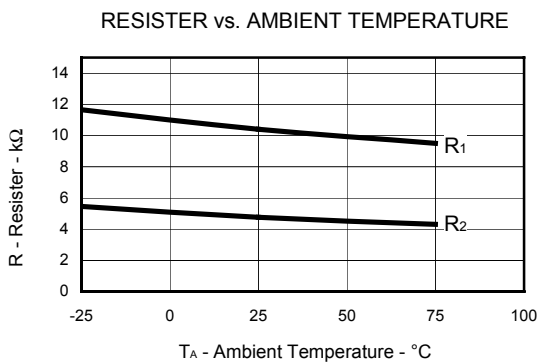
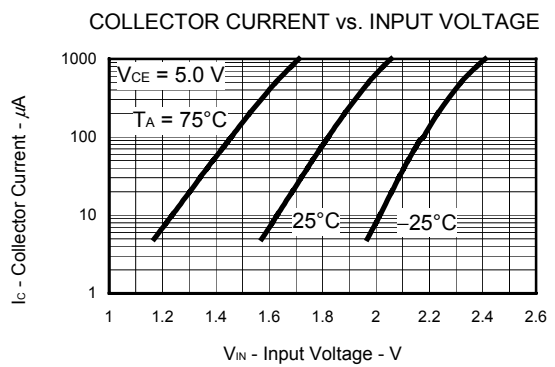
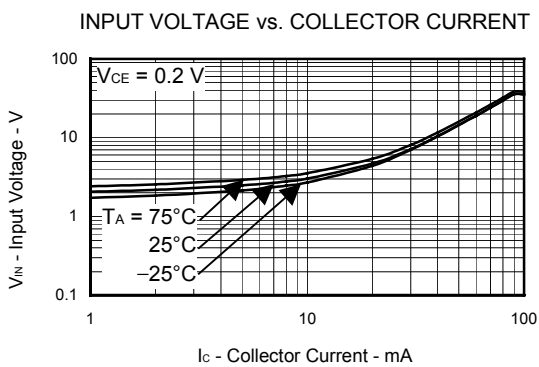
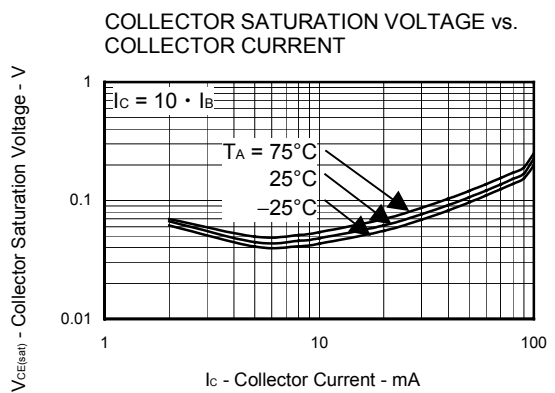
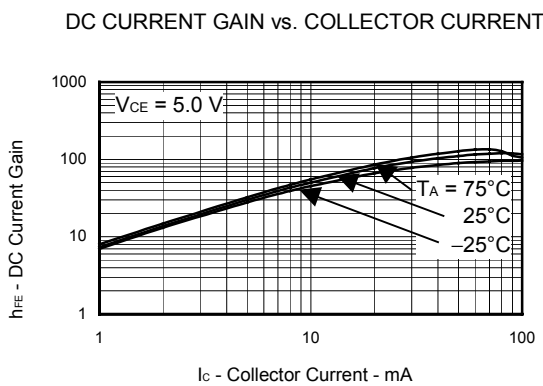
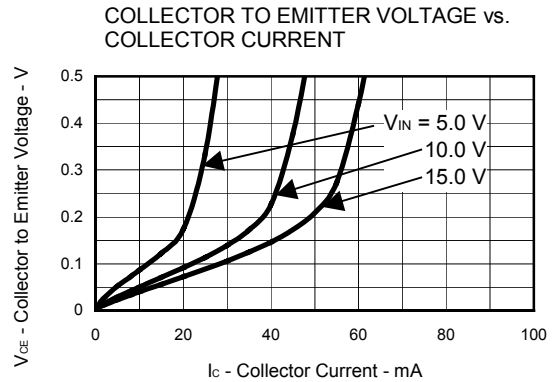
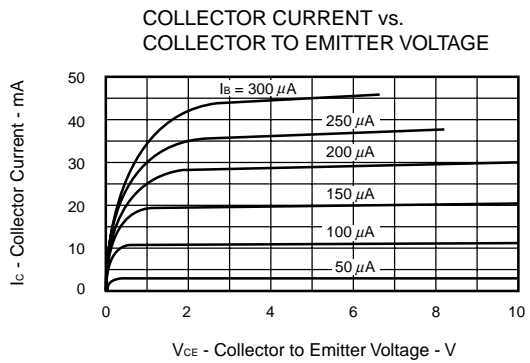
[KA4F3P]  
TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)



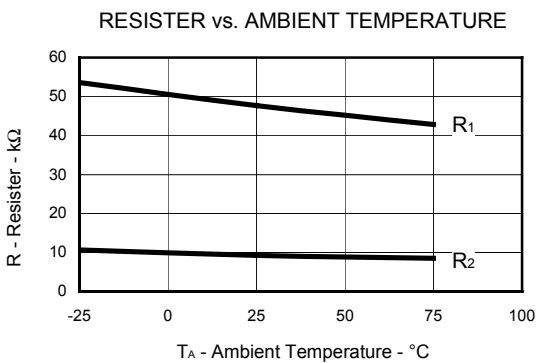
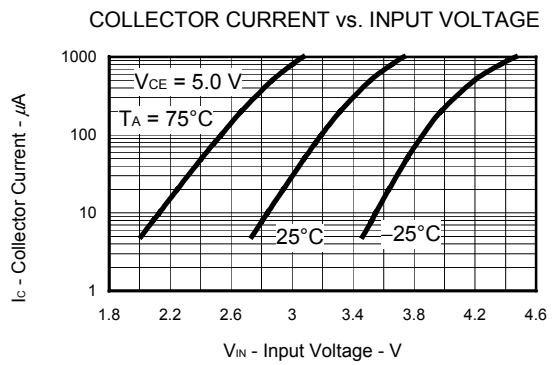
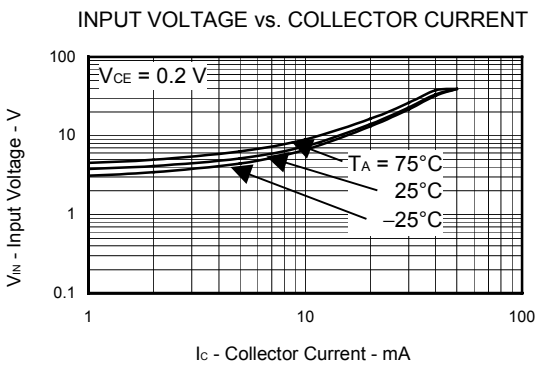
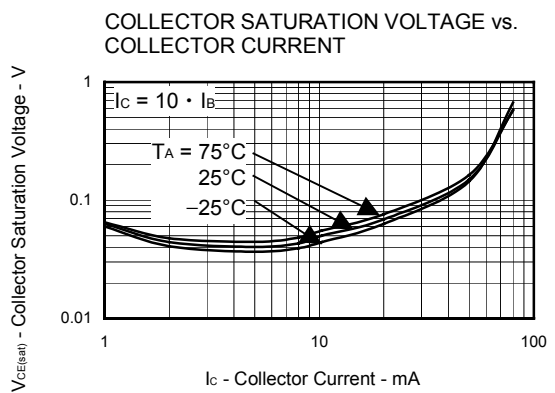
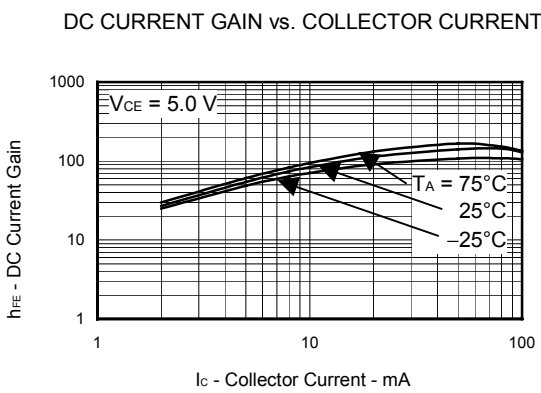
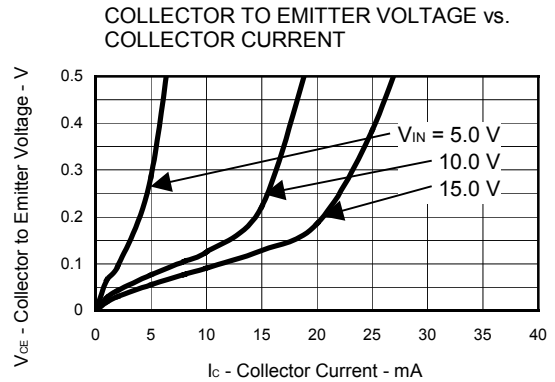
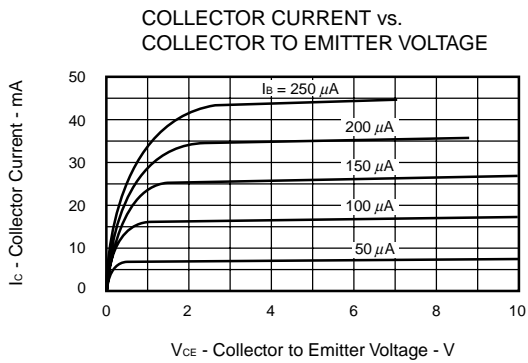
**[KA4F3R]**  
**TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)**



**[KA4A4L]**  
**TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)**



**[KA4L4K]**  
**TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)**



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