

To our customers,

Old Company Name in Catalogs and Other Documents

On April 1st, 2010, NEC Electronics Corporation merged with Renesas Technology Corporation, and Renesas Electronics Corporation took over all the business of both companies. Therefore, although the old company name remains in this document, it is a valid Renesas Electronics document. We appreciate your understanding.

Renesas Electronics website: <http://www.renesas.com>

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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(Note 2) “Renesas Electronics product(s)” means any product developed or manufactured by or for Renesas Electronics.

SILICON TRANSISTOR GN4xxx

RESISTOR BUILT-IN TYPE PNP TRANSISTOR

FEATURES

- Compact package
- Resistors built-in type
- Complementary to GA4xxx

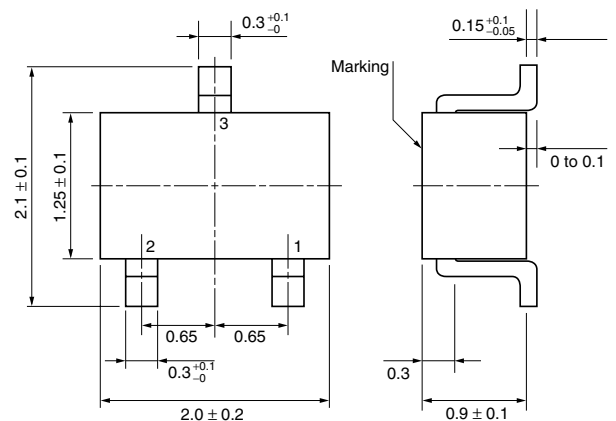
ORDERING INFORMATION

PART NUMBER	PACKAGE
GN4xxx	SC-70

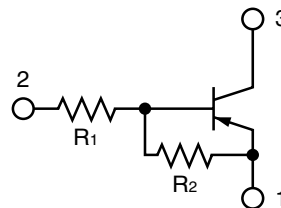
ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Collector to Base Voltage	V _{CB0}	-60	V
Collector to Emitter Voltage	V _{CE0}	-50	V
<R> Emitter to Base Voltage	V _{EBO}	Note1	V
Collector Current (DC)	I _c	-0.1	A
Collector Current (pulse)	I _{c(pulse)}	-0.2	A
Total Power Dissipation	P _T	0.15	W
Junction Temperature	T _j	150	°C
Storage Temperature	T _{stg}	-55 to +150	°C

PACKAGE DRAWING (Unit: mm)



EQUIVALENT CIRCUIT



PIN CONNECTION

- 1: Emitter
- 2: Base
- 3: Collector

<R> Note 1.

PART NUMBER	V _{EBO} (V)	MARK	R ₁ (kΩ)	R ₂ (kΩ)
GN4A4M	-10	NA1	10.0	10.0
GN4F4M	-10	NB1	22.0	22.0
GN4L4M	-10	NC1	47.0	47.0
GN4L3M	-10	ND1	4.7	4.7
GN4L3N	-5	NE1	4.7	10.0
GN4L3Z	-5	NF1	4.7	
GN4A3Q	-5	NG1	1.0	10.0
GN4A4P	-5	NH1	10.0	47.0
GN4F4N	-5	NJ1	22.0	47.0

PART NUMBER	V _{EBO} (V)	MARK	R ₁ (kΩ)	R ₂ (kΩ)
GN4L4L	-15	NK1	47.0	22.0
GN4A4Z	-5	NL1	10.0	
GN4F4Z	-5	NM1	22.0	
GN4L4Z	-5	NN1	47.0	
GN4F3M	-10	NP1	2.2	2.2
GN4F3P	-5	NQ1	2.2	10.0
GN4F3R	-5	NR1	2.2	47.0
GN4A4L	-15	NS1	10.0	4.7
GN4L4K	-25	NT1	47.0	10.0

Note 2. PW ≤ 10 ms, Duty Cycle ≤ 50%

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ELECTRICAL CHARACTERISTICS (T_A = 25°C)

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

Note 1.

PART NUMBER	h _{FE1}			h _{FE2}			UNIT
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	
GN4A4M	35		100	80			-
GN4F4M	60		195	90			-
GN4L4M	85		340	95			-
GN4L3M	20		80	80			-
GN4L3N	35		100	80			-
GN4L3Z	135		600	100			-
GN4A3Q	35		100	80			-
GN4A4P	85		340	95			-
GN4F4N	85		340	95			-
GN4L4L	60		195	90			-
GN4A4Z	135		600	100			-
GN4F4Z	135		600	100			-
GN4L4Z	135		600	100			-
GN4F3M	8		50	50			-
GN4F3P	35		100	80			-
GN4F3R	85		340	95			-
GN4A4L	20		80	80			-
GN4L4K	35		100	80			-

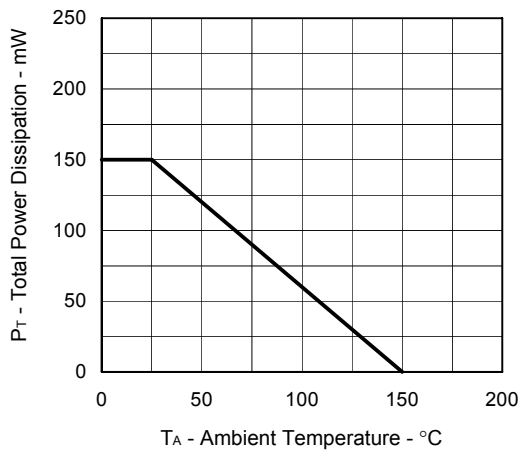
Note 2.

PART NUMBER	V _{IL}			V _{IH}			UNIT
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	
GN4A4M			-0.8	-3.0			V
GN4F4M			-0.8	-4.0			V
GN4L4M			-0.8	-5.0			V
GN4L3M			-0.8	-3.0			V
GN4L3N			-0.6	-3.0			V
GN4L3Z			-0.5	-1.2			V
GN4A3Q			-0.5	-2.0			V
GN4A4P			-0.5	-3.0			V
GN4F4N			-0.6	-3.0			V
GN4L4L			-0.9	-6.0			V
GN4A4Z			-0.5	-2.0			V
GN4F4Z			-0.5	-3.0			V
GN4L4Z			-0.5	-4.0			V
GN4F3M			-0.8	-3.0			V
GN4F3P			-0.5	-2.0			V
GN4F3R			-0.5	-2.0			V
GN4A4L			-0.9	-6.0			V
GN4L4K			-2.0	-8.0			V

Note 3.

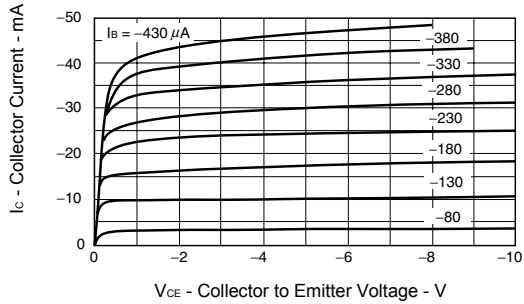
PART NUMBER	R ₁			R ₂			UNIT
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	
GN4A4M	7.00	10.00	13.00	7.00	10.00	13.00	kΩ
GN4F4M	15.40	22.00	28.60	15.40	22.00	28.60	kΩ
GN4L4M	32.90	47.00	61.10	32.90	47.00	61.10	kΩ
GN4L3M	3.29	4.70	6.11	3.29	4.70	6.11	kΩ
GN4L3N	3.29	4.70	6.11	7.00	10.00	13.00	kΩ
GN4L3Z	3.29	4.70	6.11				kΩ
GN4A3Q	0.70	1.00	1.30	7.00	10.00	13.00	kΩ
GN4A4P	7.00	10.00	13.00	32.90	47.00	61.10	kΩ
GN4F4N	15.40	22.00	28.60	32.90	47.00	61.10	kΩ
GN4L4L	32.90	47.00	61.10	15.40	22.00	28.60	kΩ
GN4A4Z	7.00	10.00	13.00				kΩ
GN4F4Z	15.40	22.00	28.60				kΩ
GN4L4Z	32.90	47.00	61.10				kΩ
GN4F3M	1.54	2.20	2.86	1.54	2.20	2.86	kΩ
GN4F3P	1.54	2.20	2.86	7.00	10.00	13.00	kΩ
GN4F3R	1.54	2.20	2.86	32.90	47.00	61.10	kΩ
GN4A4L	7.00	10.00	13.00	3.29	4.70	6.11	kΩ
GN4L4K	32.90	47.00	61.10	7.00	10.00	13.00	kΩ

TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE

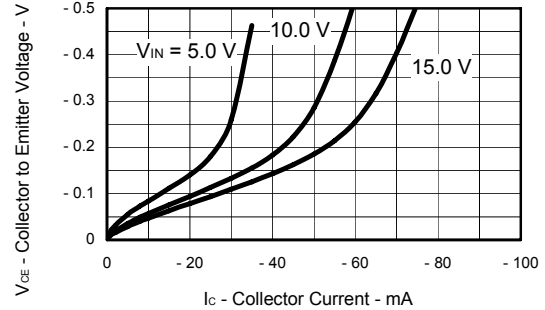


[GN4A4M]
TYPICAL CHARACTERISTICS (T_A = 25°C)

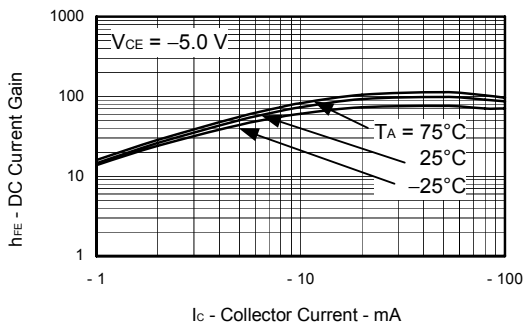
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



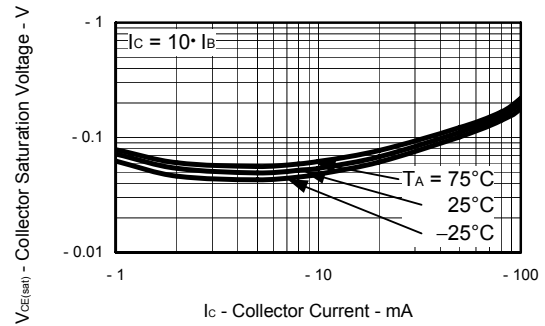
COLLECTOR TO EMITTER VOLTAGE vs. COLLECTOR CURRENT



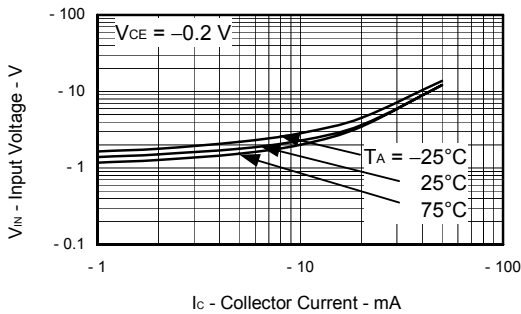
DC CURRENT GAIN vs. COLLECTOR CURRENT



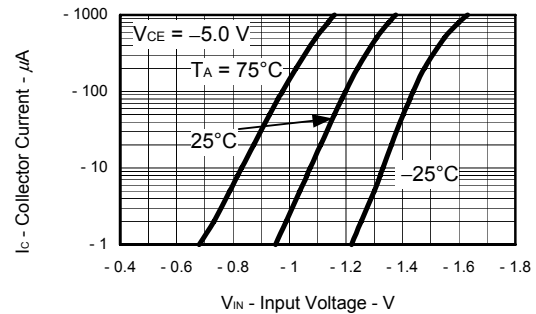
COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



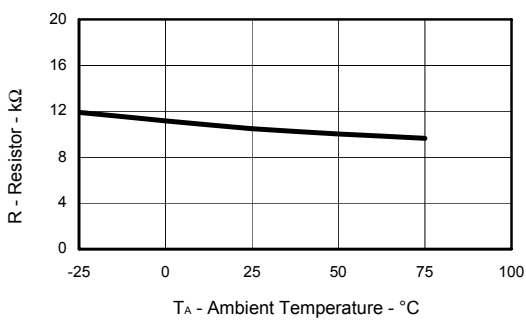
INPUT VOLTAGE vs. COLLECTOR CURRENT



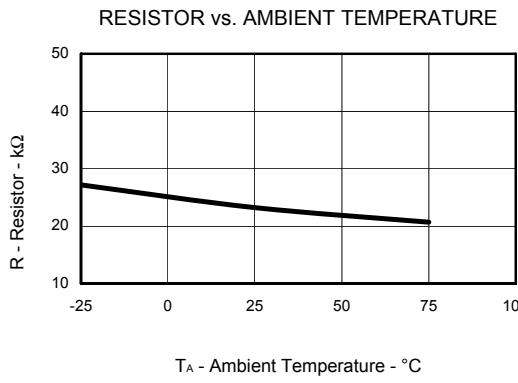
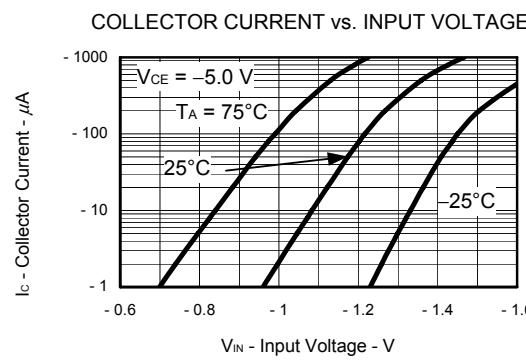
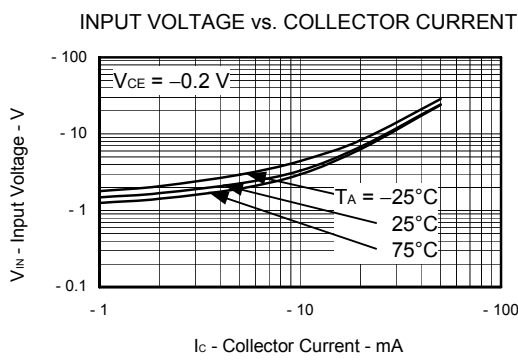
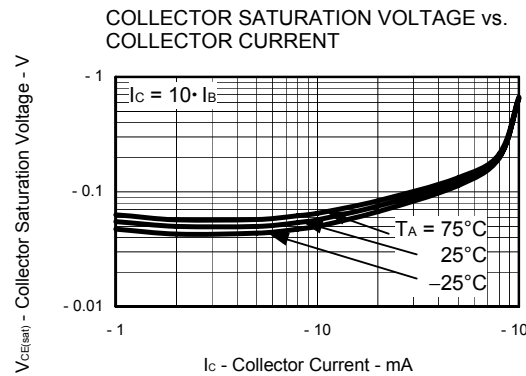
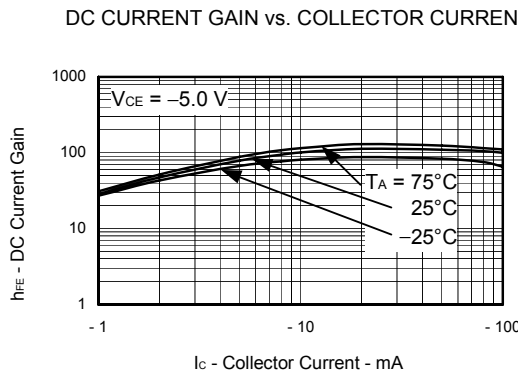
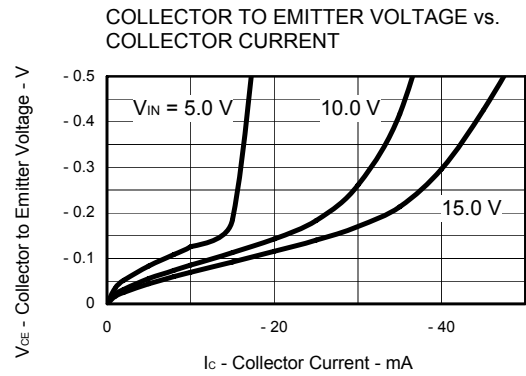
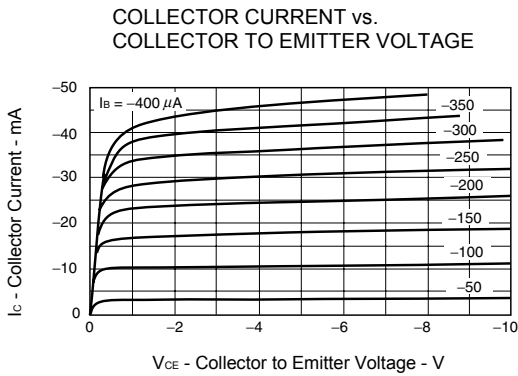
COLLECTOR CURRENT vs. INPUT VOLTAGE



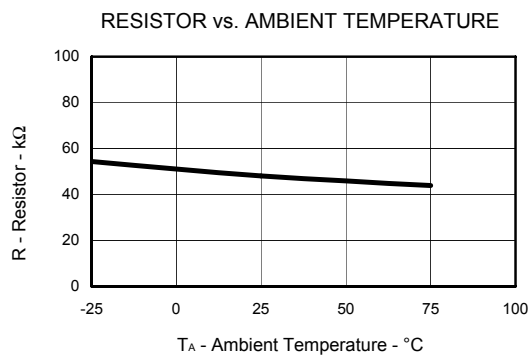
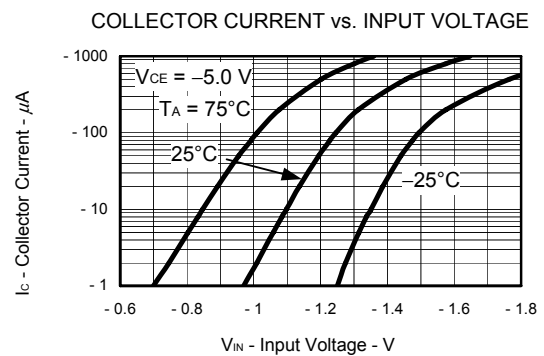
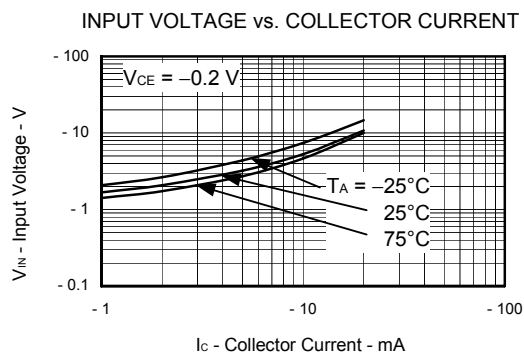
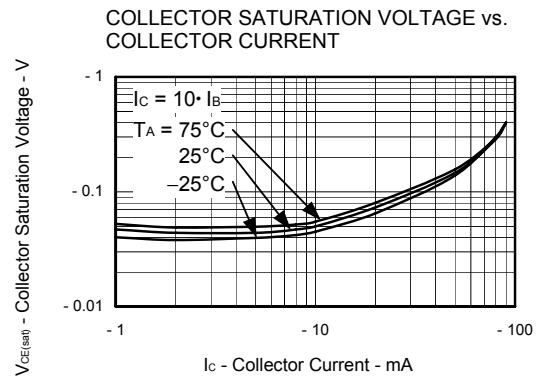
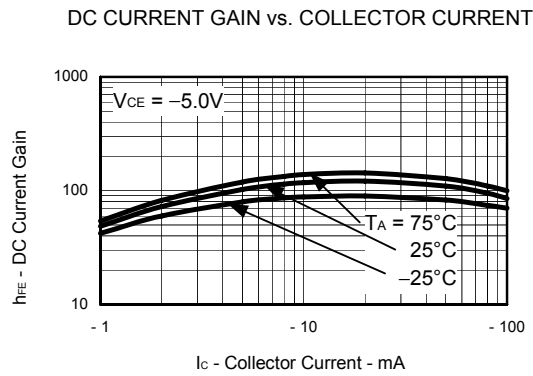
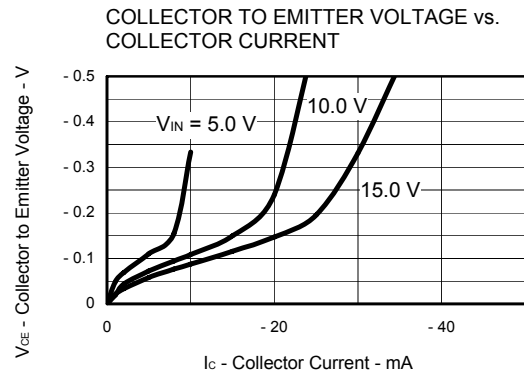
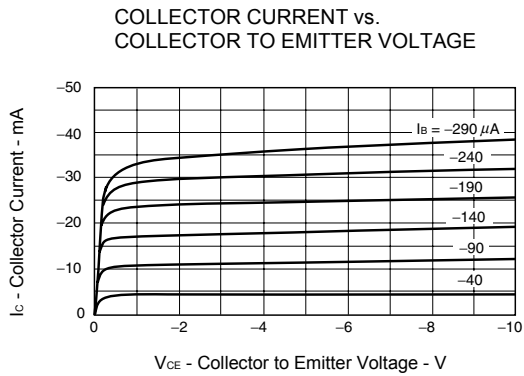
RESISTOR vs. AMBIENT TEMPERATURE



[GN4F4M]
TYPICAL CHARACTERISTICS (T_A = 25°C)

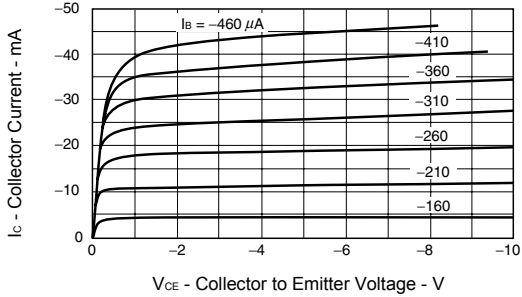


[GN4L4M]
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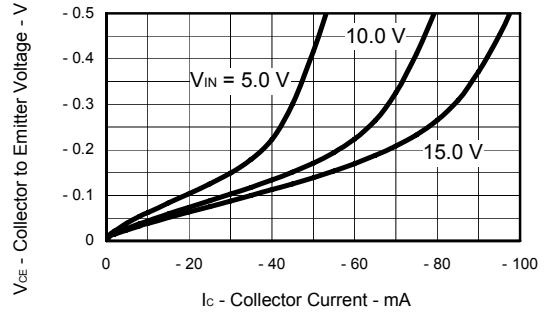


[GN4L3M]
TYPICAL CHARACTERISTICS (T_A = 25°C)

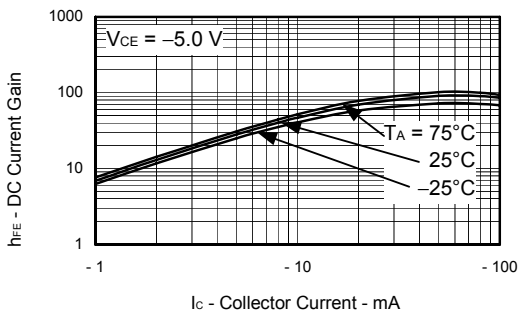
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



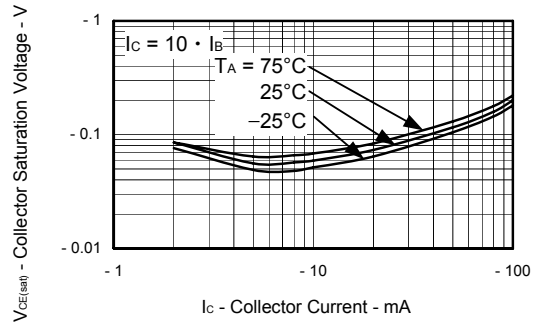
COLLECTOR TO EMITTER VOLTAGE vs. COLLECTOR CURRENT



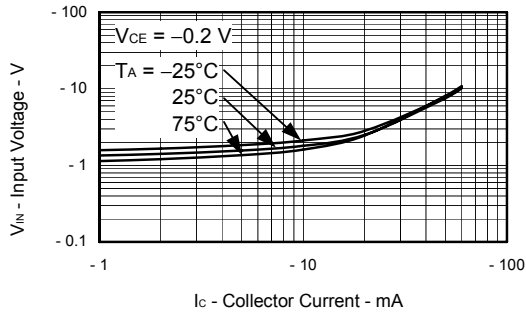
DC CURRENT GAIN vs. COLLECTOR CURRENT



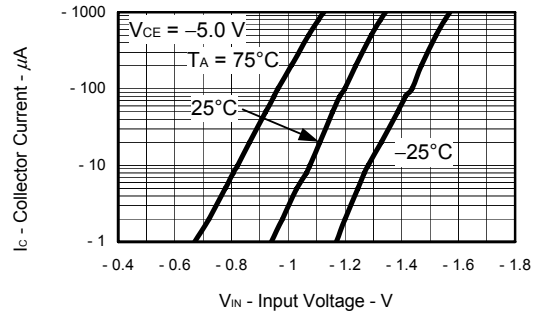
COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



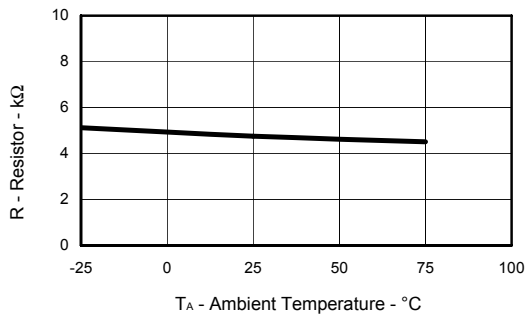
INPUT VOLTAGE vs. COLLECTOR CURRENT



COLLECTOR CURRENT vs. INPUT VOLTAGE

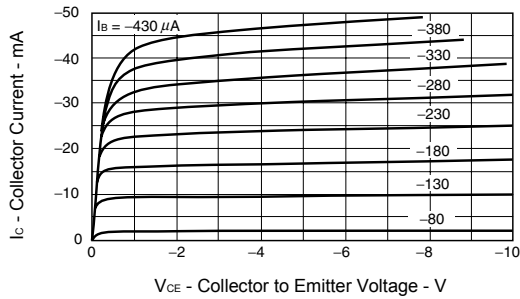


RESISTOR vs. AMBIENT TEMPERATURE

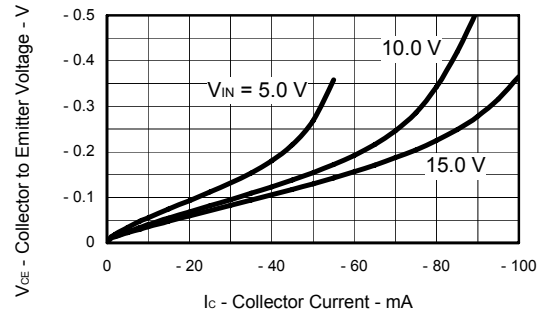


[GN4L3N]
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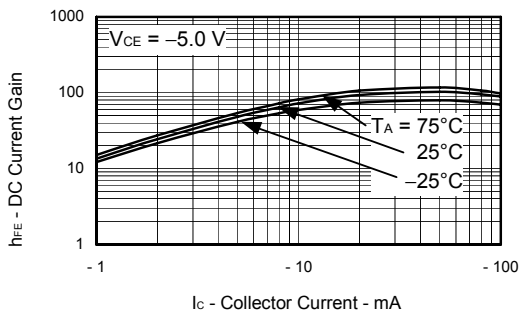
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



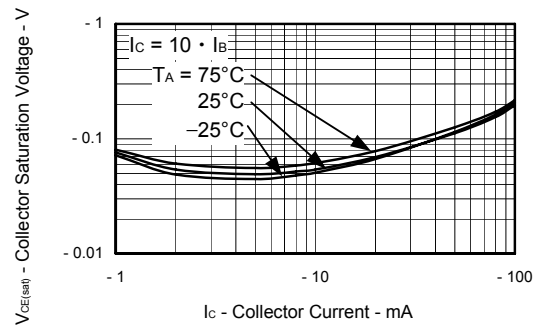
COLLECTOR TO EMITTER VOLTAGE vs. COLLECTOR CURRENT



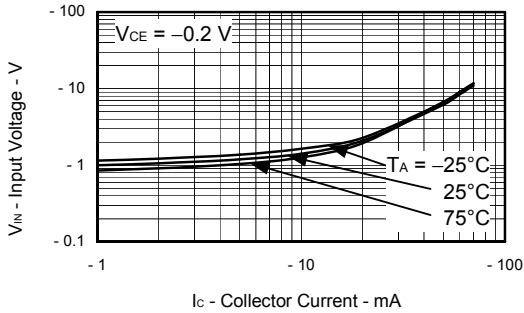
DC CURRENT GAIN vs. COLLECTOR CURRENT



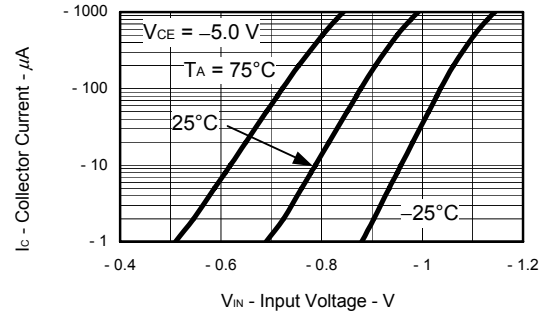
COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



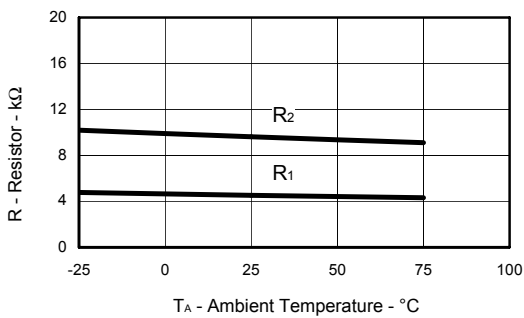
INPUT VOLTAGE vs. COLLECTOR CURRENT



COLLECTOR CURRENT vs. INPUT VOLTAGE

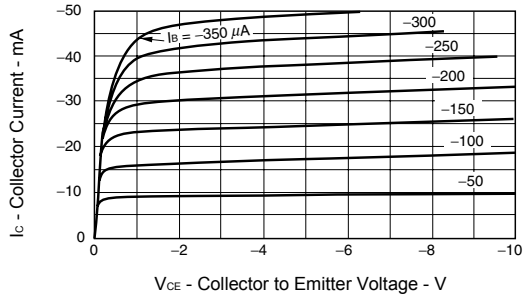


RESISTOR vs. AMBIENT TEMPERATURE

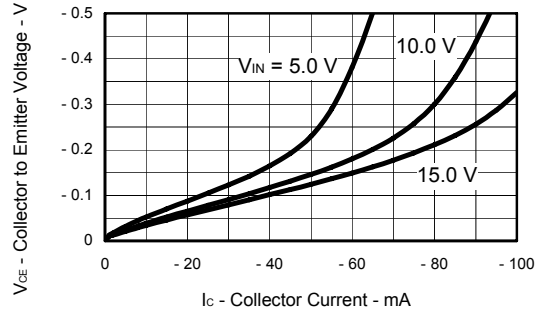


[GN4L3Z]
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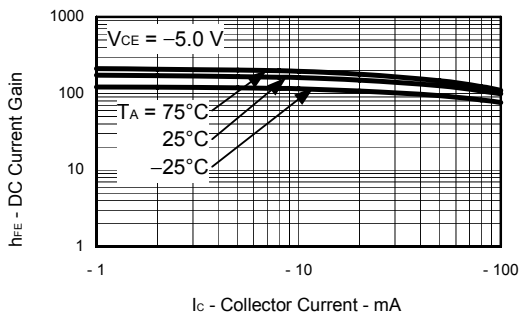
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



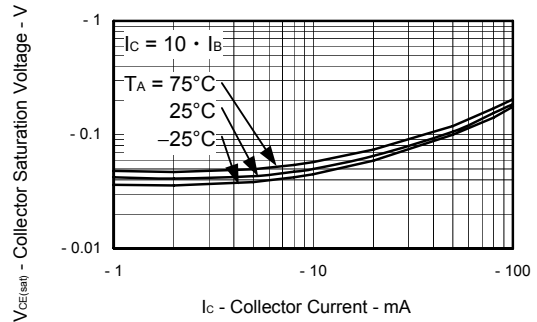
COLLECTOR TO EMITTER VOLTAGE vs. COLLECTOR CURRENT



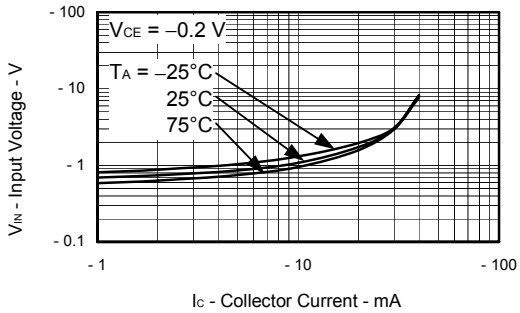
DC CURRENT GAIN vs. COLLECTOR CURRENT



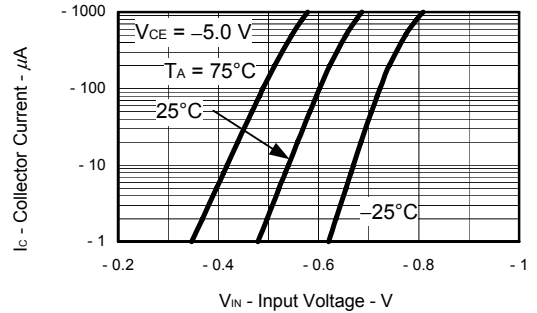
COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



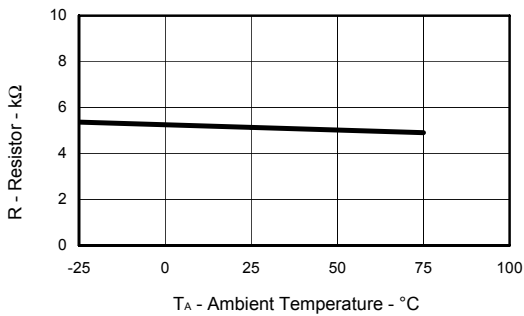
INPUT VOLTAGE vs. COLLECTOR CURRENT



COLLECTOR CURRENT vs. INPUT VOLTAGE

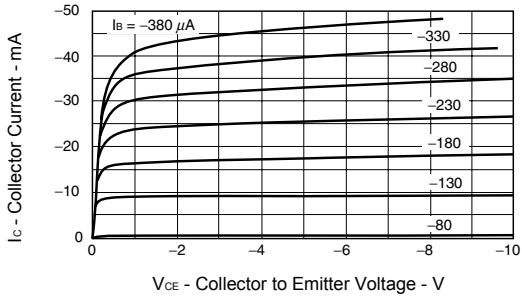


RESISTOR vs. AMBIENT TEMPERATURE

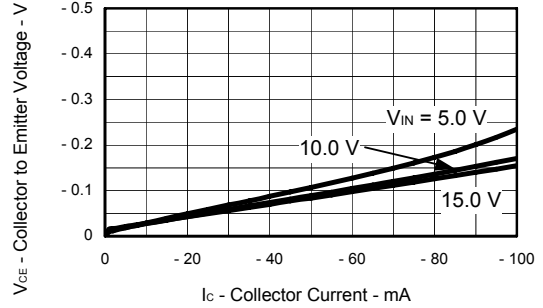


[GN4A3Q]
TYPICAL CHARACTERISTICS (T_A = 25°C)

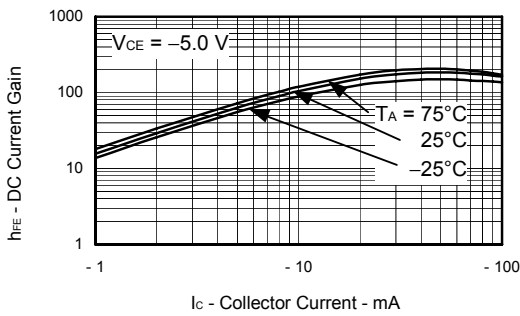
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



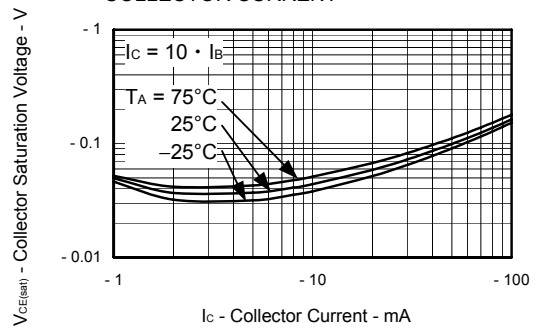
COLLECTOR TO EMITTER VOLTAGE vs. COLLECTOR CURRENT



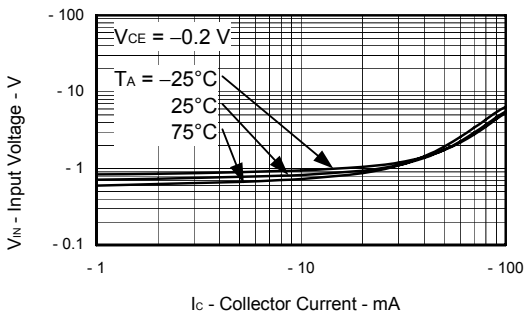
DC CURRENT GAIN vs. COLLECTOR CURRENT



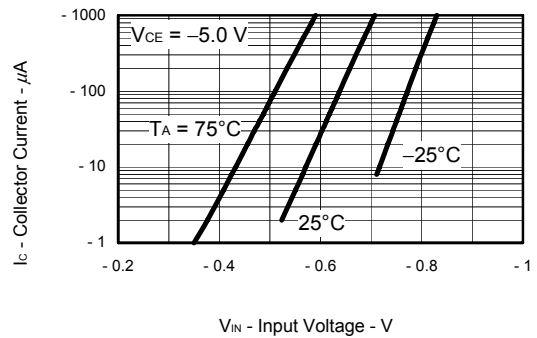
COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



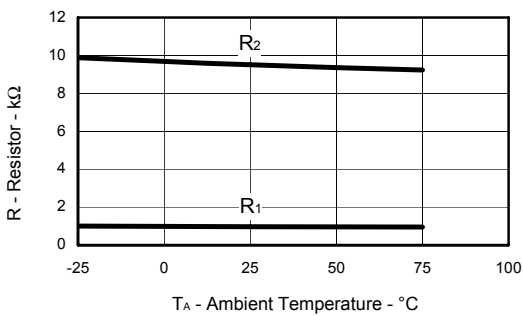
INPUT VOLTAGE vs. COLLECTOR CURRENT



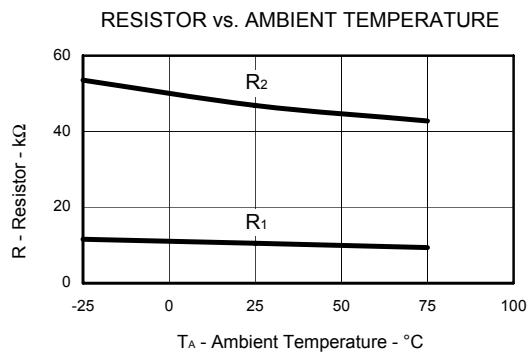
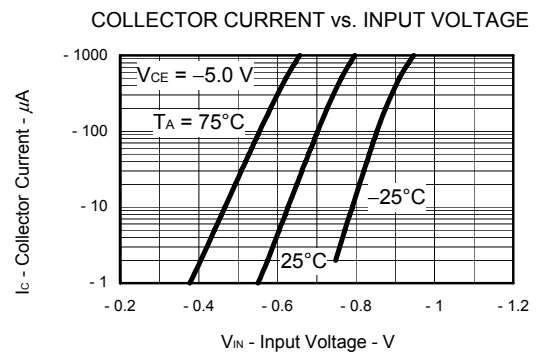
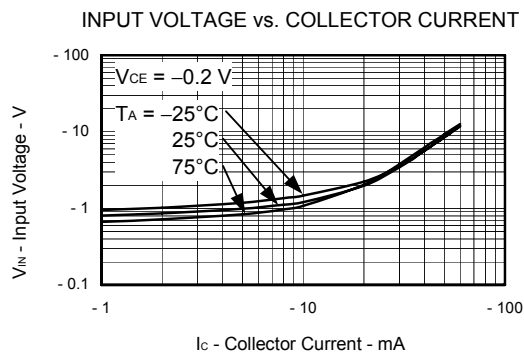
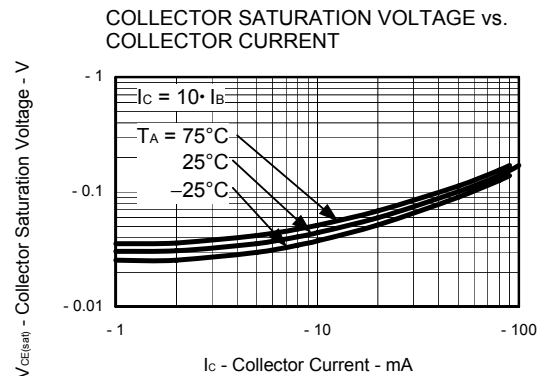
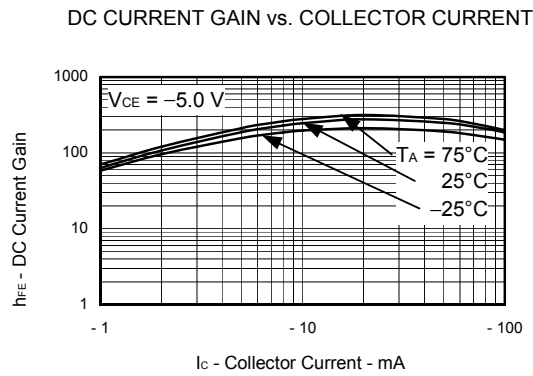
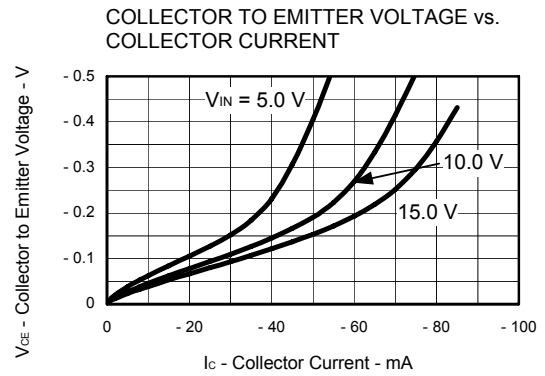
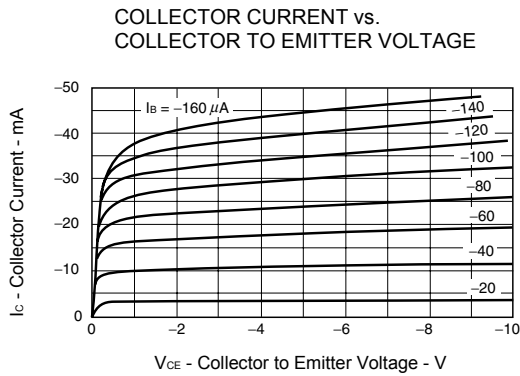
COLLECTOR CURRENT vs. INPUT VOLTAGE



RESISTOR vs. AMBIENT TEMPERATURE

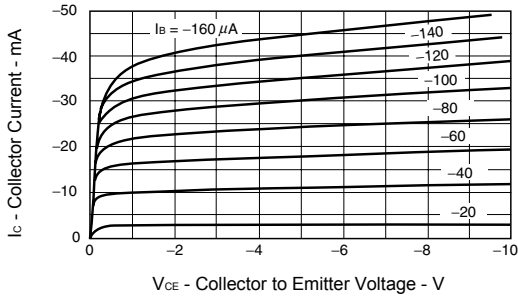


[GN4A4P]
TYPICAL CHARACTERISTICS (T_A = 25°C)

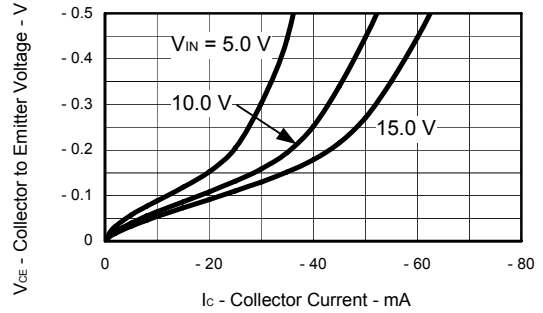


[GN4F4N]
TYPICAL CHARACTERISTICS (T_A = 25°C)

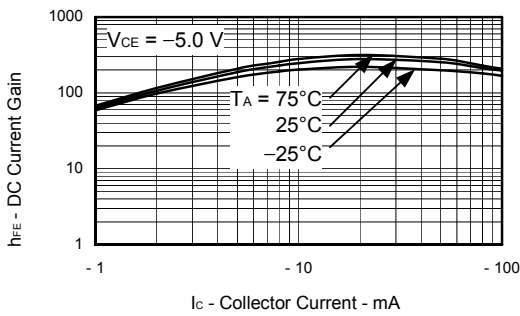
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



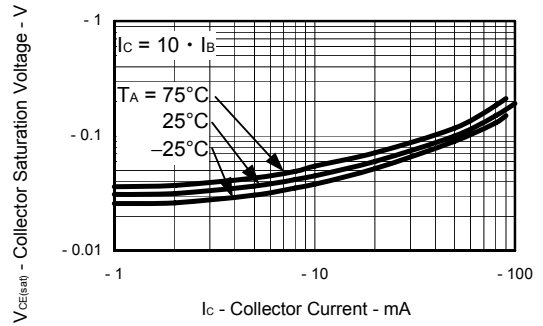
COLLECTOR TO EMITTER VOLTAGE vs. COLLECTOR CURRENT



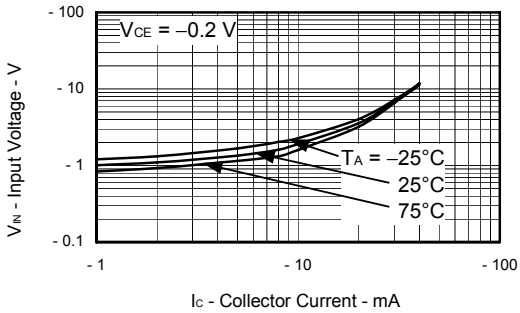
DC CURRENT GAIN vs. COLLECTOR CURRENT



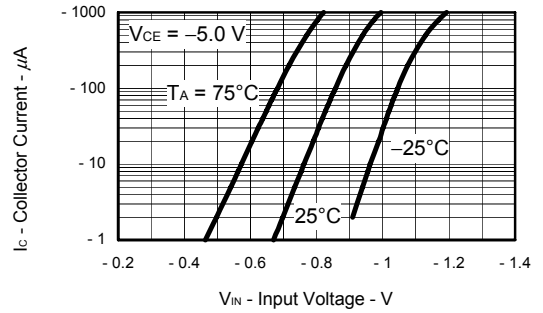
COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



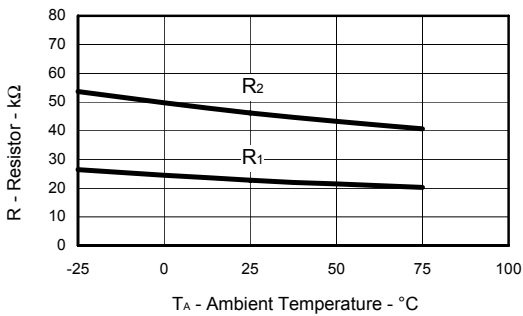
INPUT VOLTAGE vs. COLLECTOR CURRENT



COLLECTOR CURRENT vs. INPUT VOLTAGE

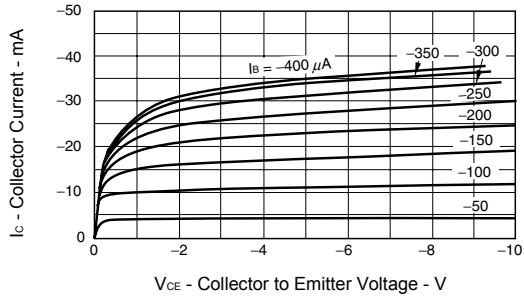


RESISTOR vs. AMBIENT TEMPERATURE

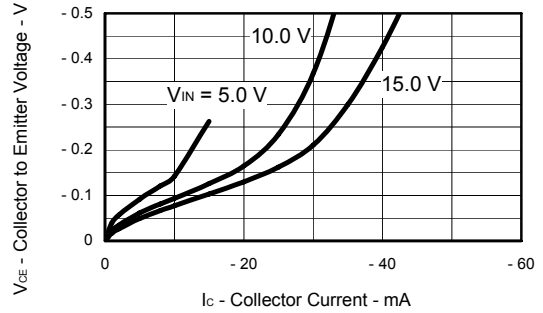


[GN4L4L]
TYPICAL CHARACTERISTICS (T_A = 25°C)

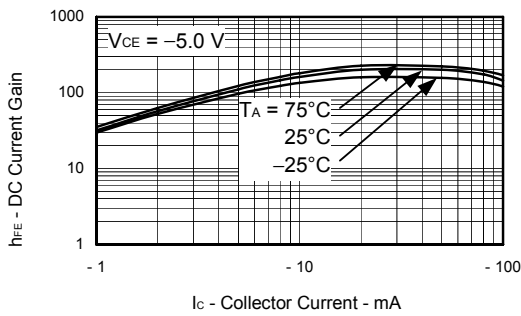
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



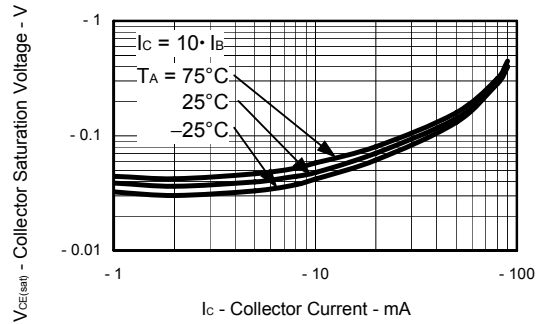
COLLECTOR TO EMITTER VOLTAGE vs. COLLECTOR CURRENT



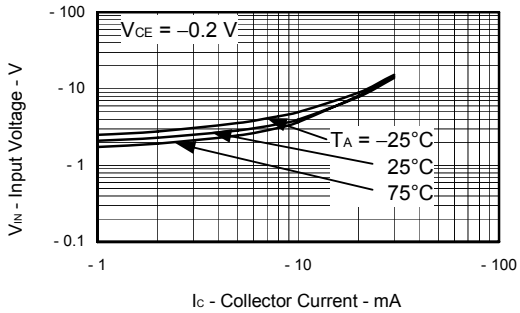
DC CURRENT GAIN vs. COLLECTOR CURRENT



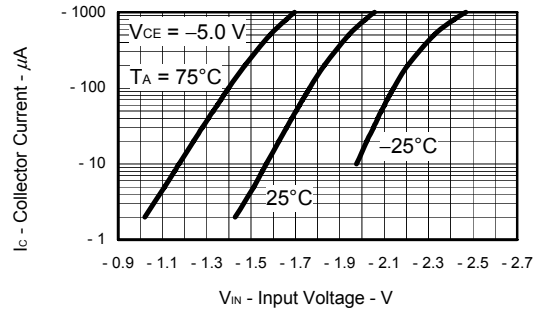
COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



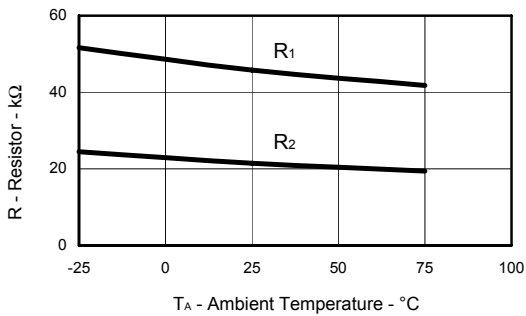
INPUT VOLTAGE vs. COLLECTOR CURRENT



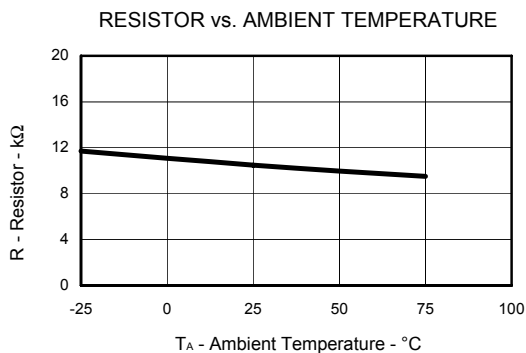
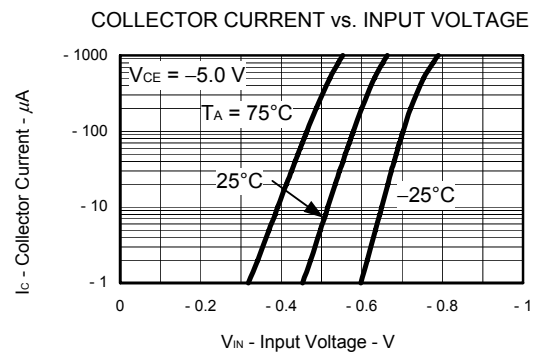
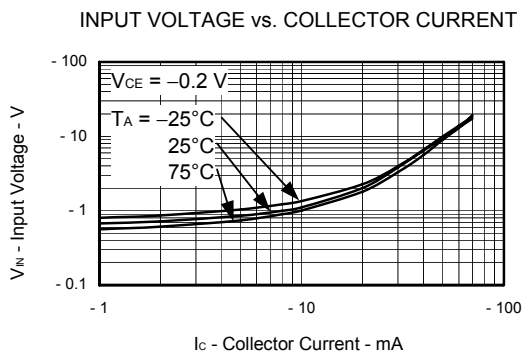
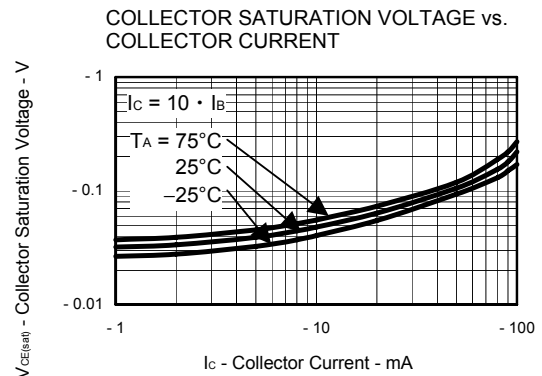
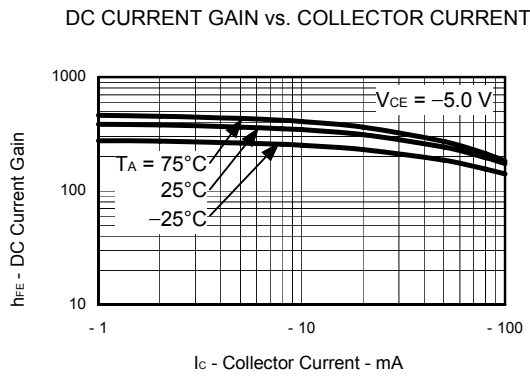
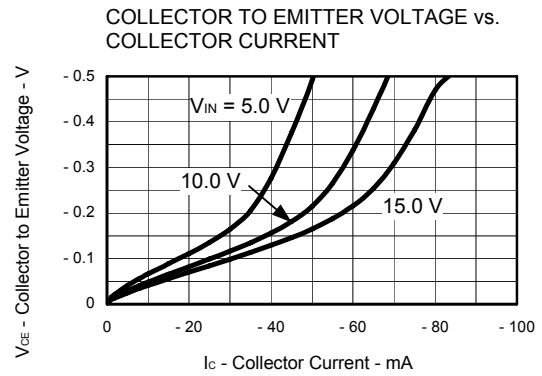
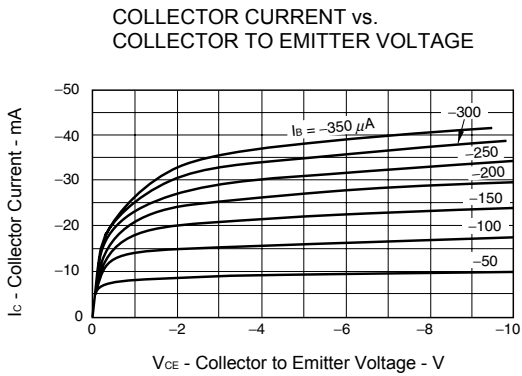
COLLECTOR CURRENT vs. INPUT VOLTAGE



RESISTOR vs. AMBIENT TEMPERATURE

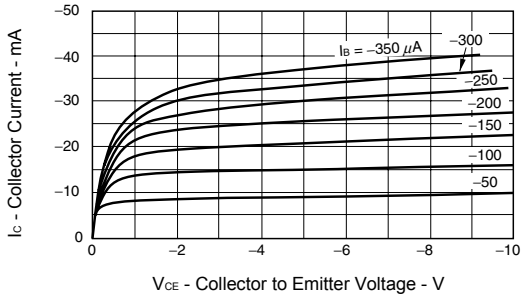


[GN4A4Z]
TYPICAL CHARACTERISTICS (T_A = 25°C)

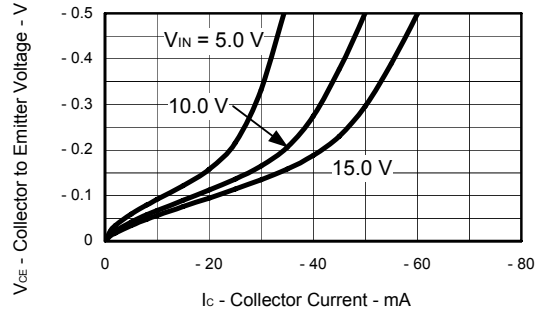


[GN4F4Z]
TYPICAL CHARACTERISTICS (T_A = 25°C)

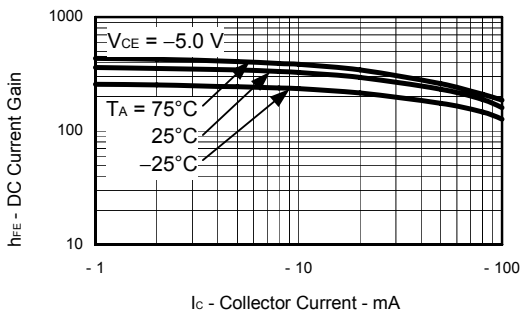
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



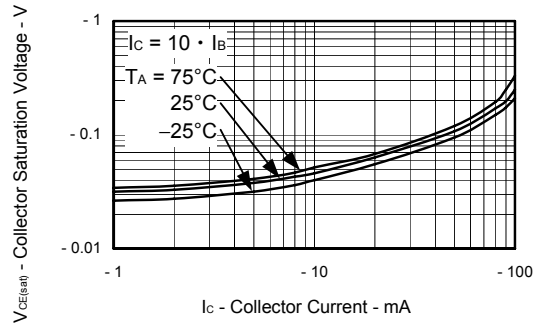
COLLECTOR TO EMITTER VOLTAGE vs. COLLECTOR CURRENT



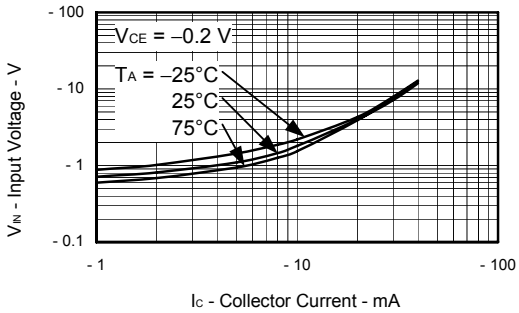
DC CURRENT GAIN vs. COLLECTOR CURRENT



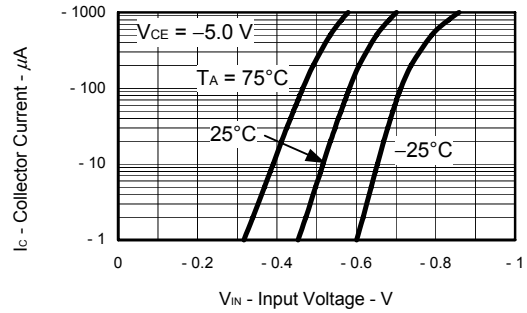
COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



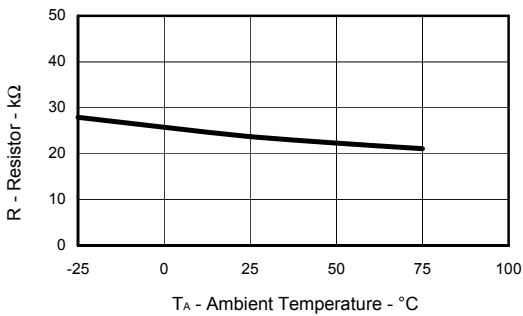
INPUT VOLTAGE vs. COLLECTOR CURRENT



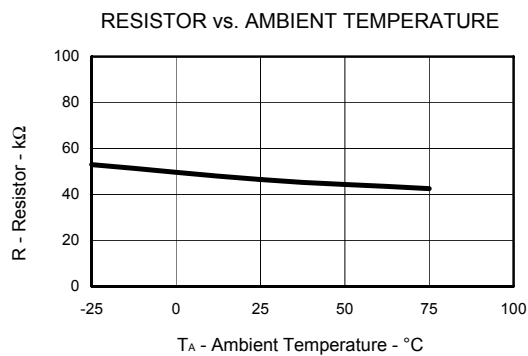
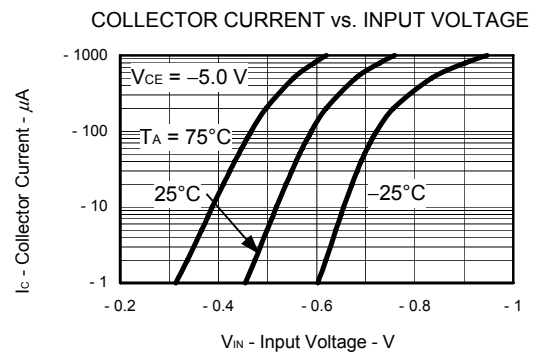
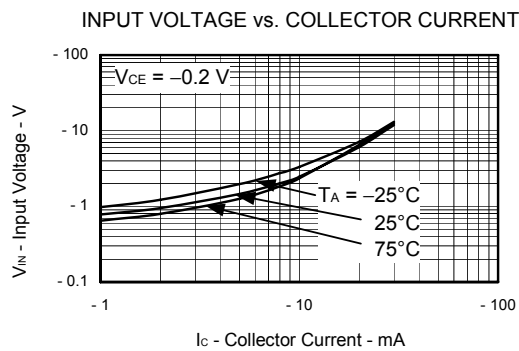
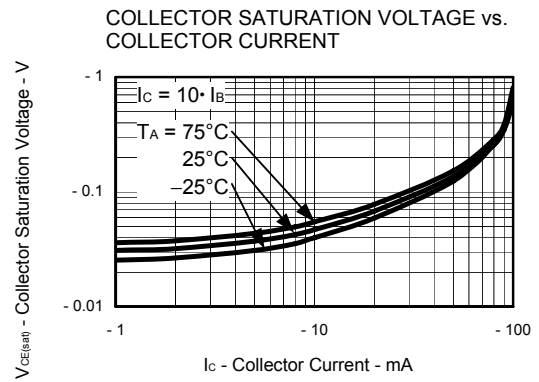
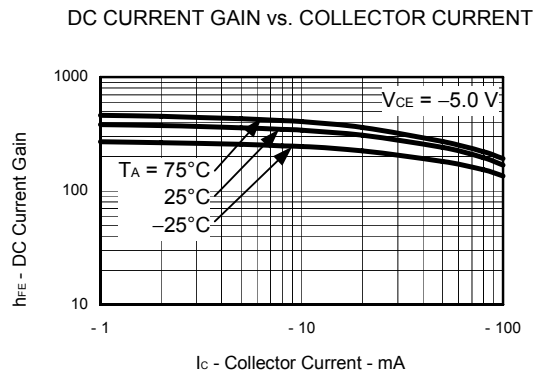
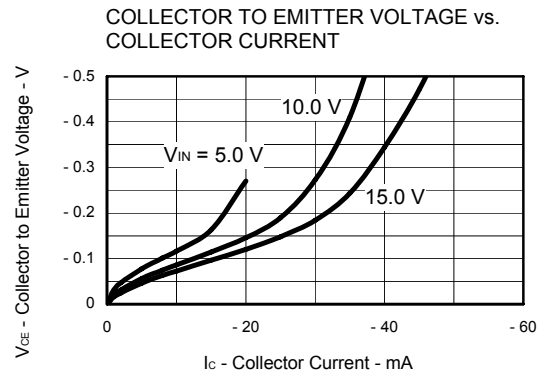
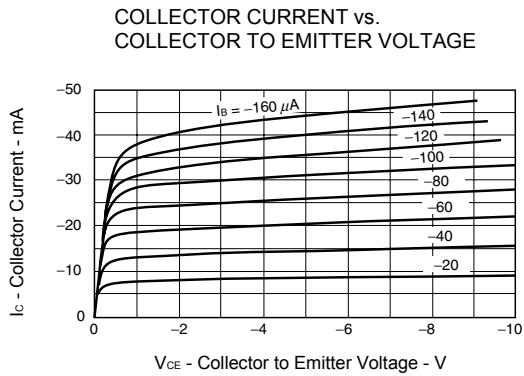
COLLECTOR CURRENT vs. INPUT VOLTAGE



RESISTOR vs. AMBIENT TEMPERATURE

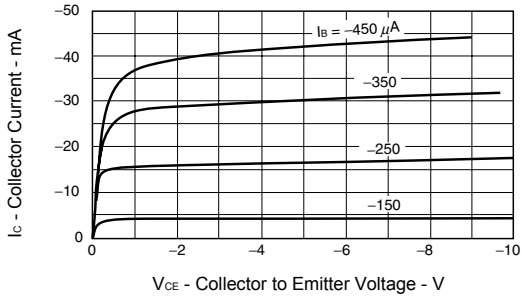


[GN4L4Z]
TYPICAL CHARACTERISTICS (T_A = 25°C)

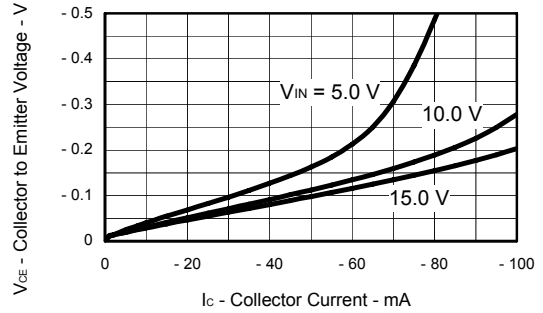


[GN4F3M]
TYPICAL CHARACTERISTICS (T_A = 25°C)

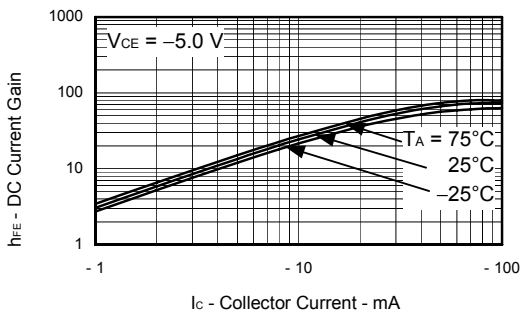
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



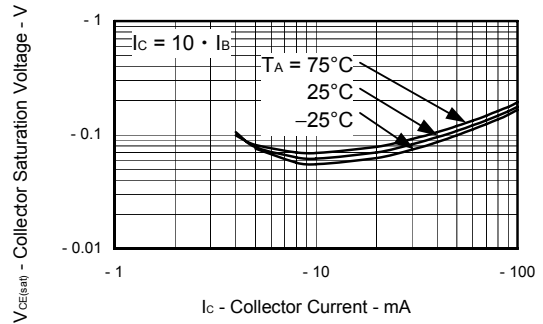
COLLECTOR TO EMITTER VOLTAGE vs. COLLECTOR CURRENT



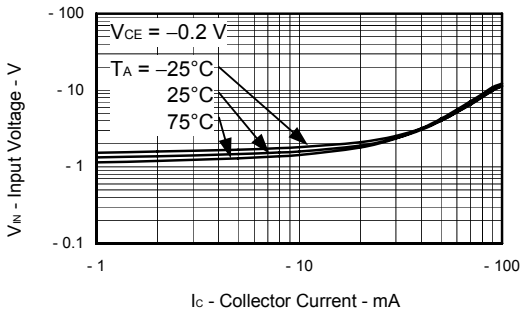
DC CURRENT GAIN vs. COLLECTOR CURRENT



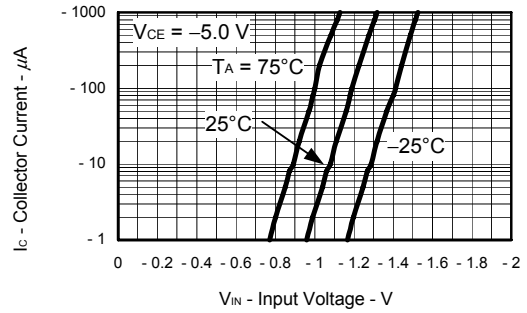
COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



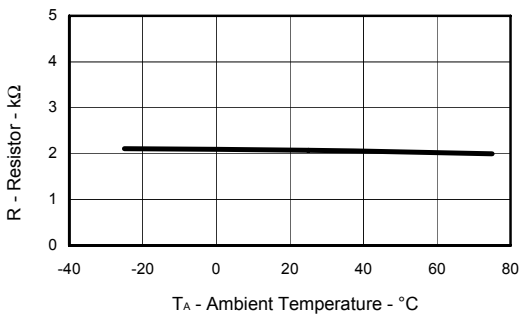
INPUT VOLTAGE vs. COLLECTOR CURRENT



COLLECTOR CURRENT vs. INPUT VOLTAGE

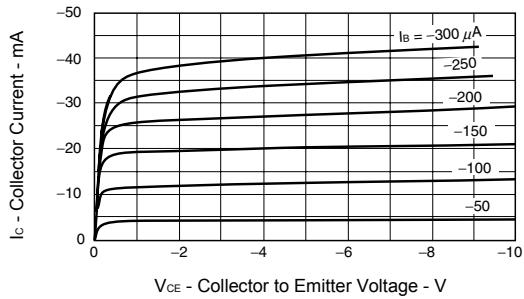


RESISTOR vs. AMBIENT TEMPERATURE

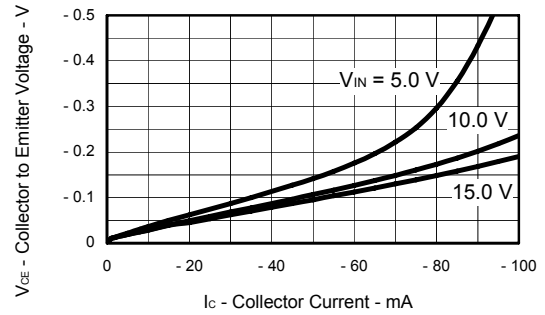


[GN4F3P]
TYPICAL CHARACTERISTICS (T_A = 25°C)

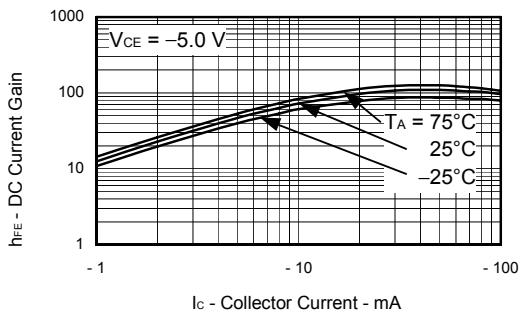
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



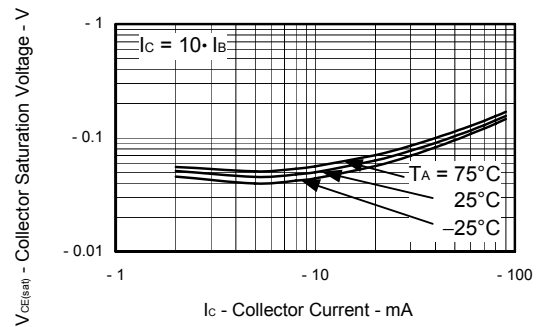
COLLECTOR TO EMITTER VOLTAGE vs. COLLECTOR CURRENT



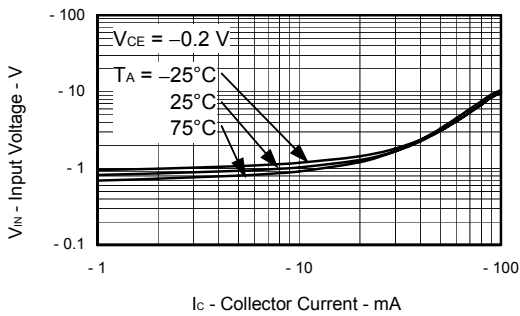
DC CURRENT GAIN vs. COLLECTOR CURRENT



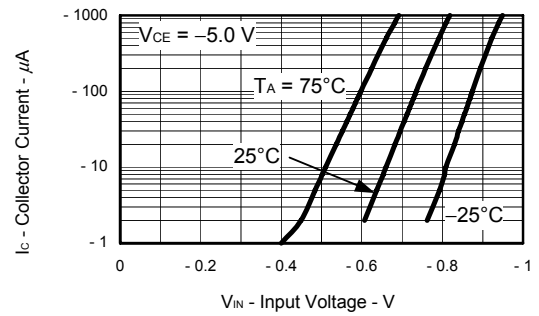
COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



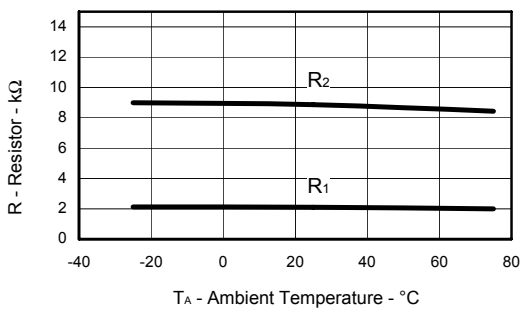
INPUT VOLTAGE vs. COLLECTOR CURRENT



COLLECTOR CURRENT vs. INPUT VOLTAGE

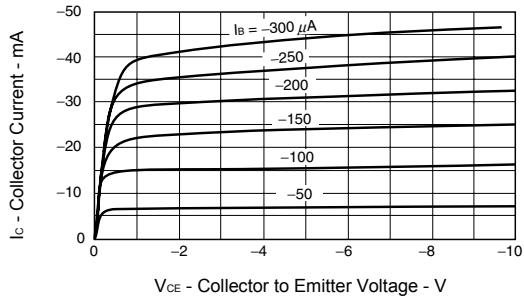


RESISTOR vs. AMBIENT TEMPERATURE

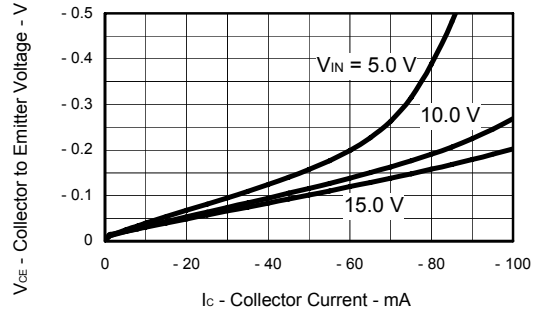


[GN4F3R]
TYPICAL CHARACTERISTICS (T_A = 25°C)

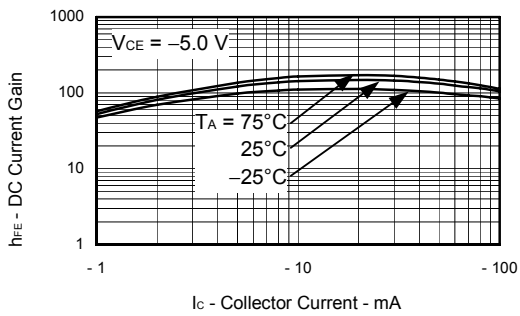
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



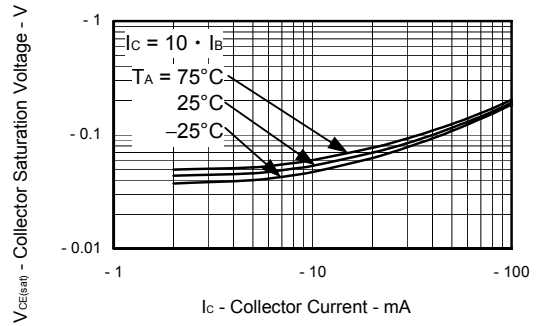
COLLECTOR TO EMITTER VOLTAGE vs. COLLECTOR CURRENT



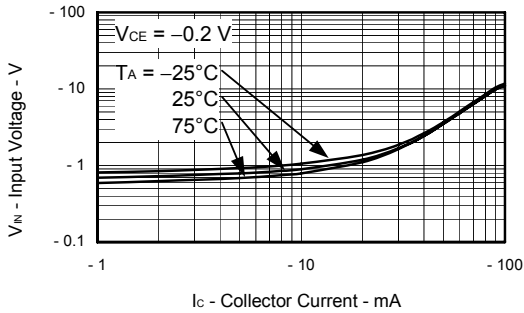
DC CURRENT GAIN vs. COLLECTOR CURRENT



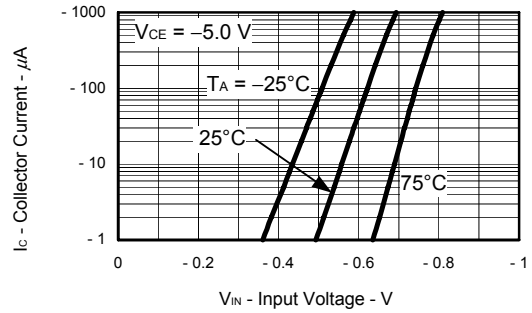
COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



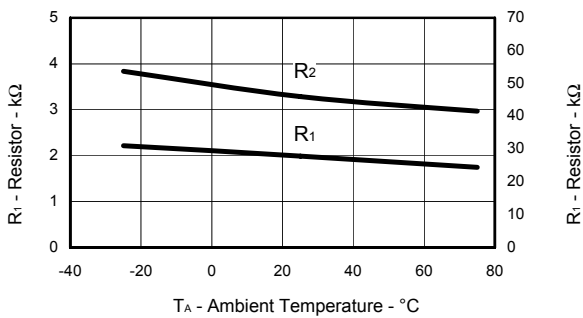
INPUT VOLTAGE vs. COLLECTOR CURRENT



COLLECTOR CURRENT vs. INPUT VOLTAGE

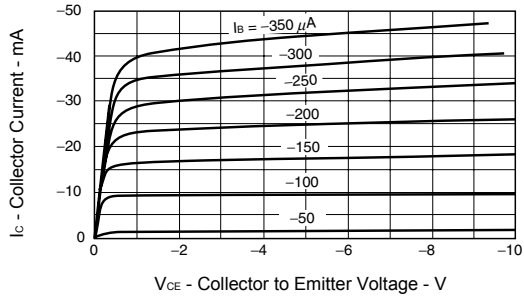


RESISTOR vs. AMBIENT TEMPERATURE

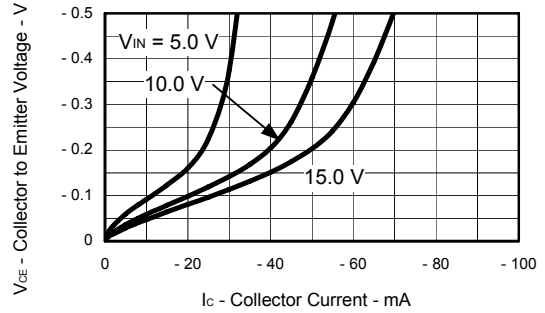


[GN4A4L]
TYPICAL CHARACTERISTICS (T_A = 25°C)

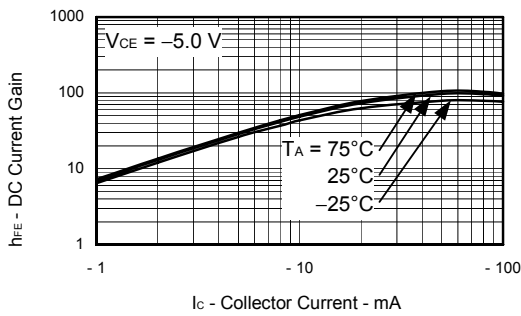
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



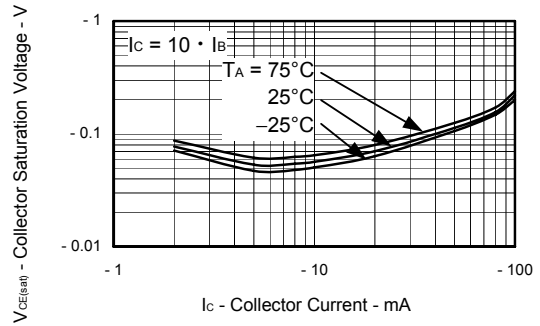
COLLECTOR TO EMITTER VOLTAGE vs. COLLECTOR CURRENT



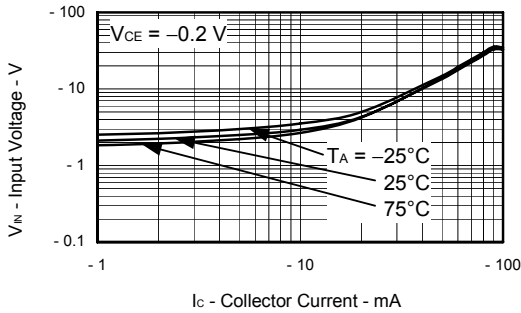
DC CURRENT GAIN vs. COLLECTOR CURRENT



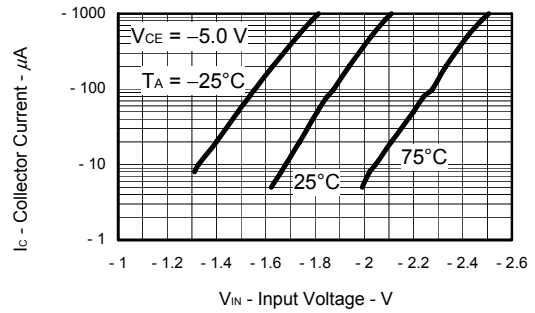
COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



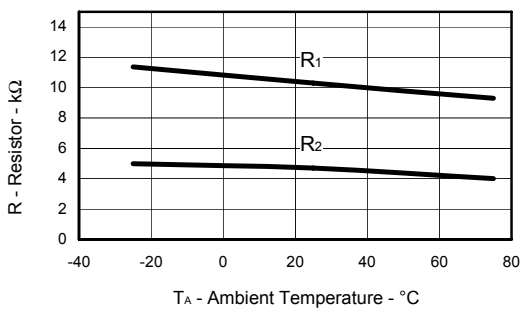
INPUT VOLTAGE vs. COLLECTOR CURRENT



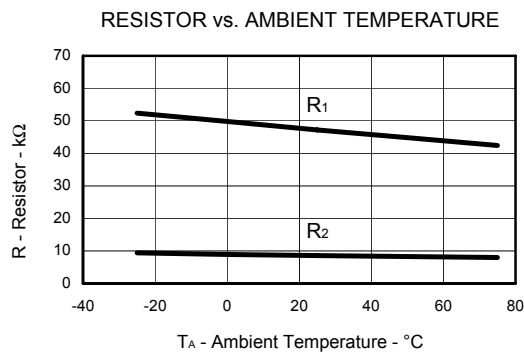
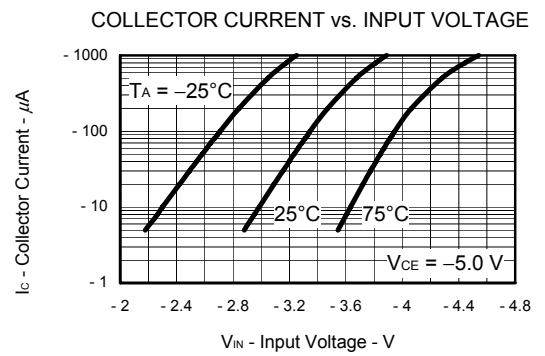
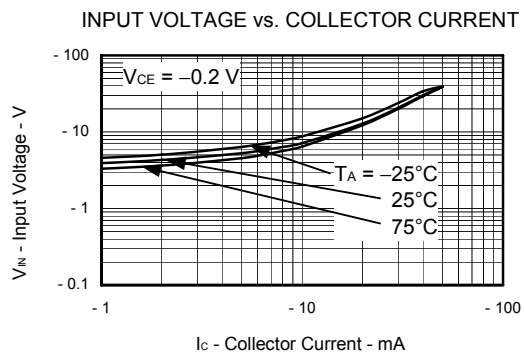
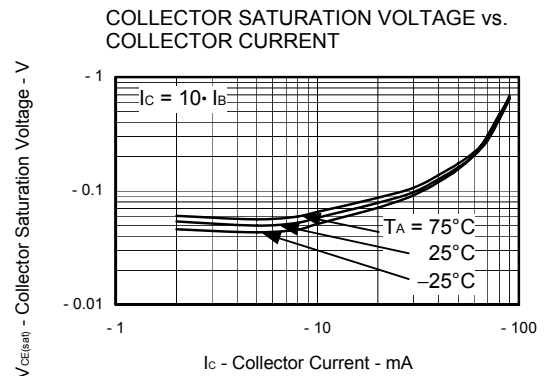
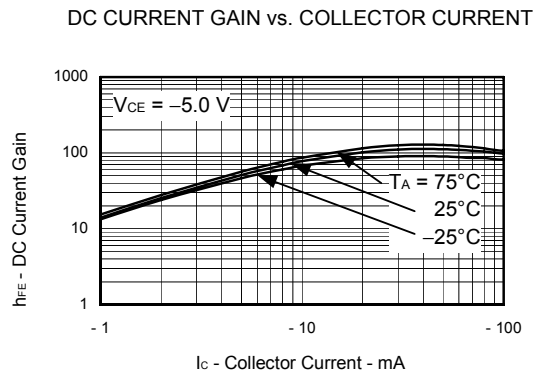
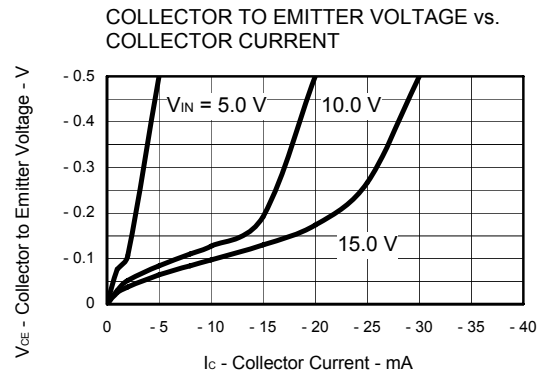
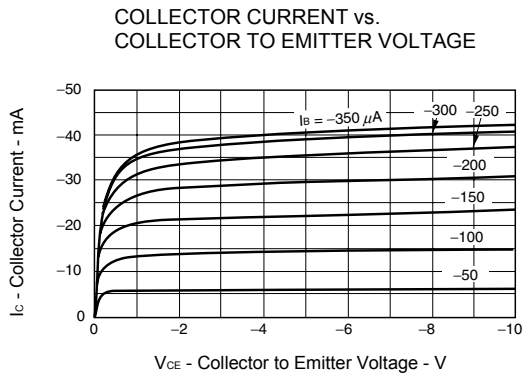
COLLECTOR CURRENT vs. INPUT VOLTAGE



RESISTOR vs. AMBIENT TEMPERATURE



[GN4L4K]
TYPICAL CHARACTERISTICS (T_A = 25°C)



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