To our customers,

Old Company Name in Catalogs and Other Documents

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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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SILICON TRANSISTOR
GN4xxx

RESISTOR BUILT-IN TYPE PNP TRANSISTOR

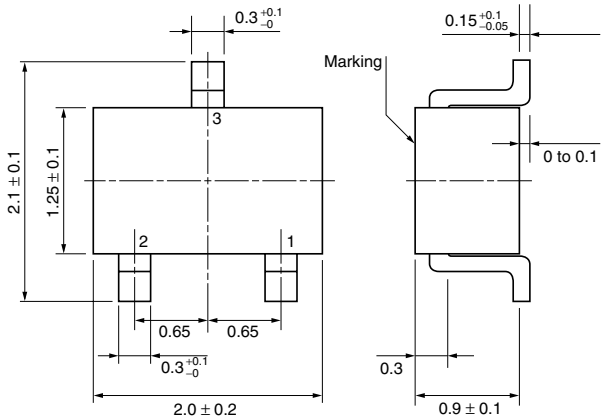
FEATURES

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

ORDERING INFORMATION

PART NUMBER	PACKAGE
GN4xxx	SC-70

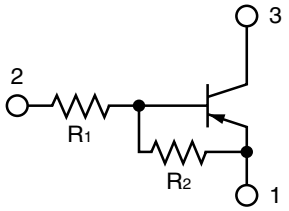
PACKAGE DRAWING (Unit: mm)



ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

	Collector to Base Voltage	V_{CBO}	–60	V
	Collector to Emitter Voltage	V_{CEO}	–50	V
<R>	Emitter to Base Voltage	V_{EBO}	**Note1**	V
	Collector Current (DC)	I_C	–0.1	A
	Collector Current (pulse) **Note2**	$I_{C(pulse)}$	–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

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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The mark <R> shows major revised points.
The revised points can be easily searched by copying an "<R>" in the PDF file and specifying it in the "Find what:" field.

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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} = –50 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.

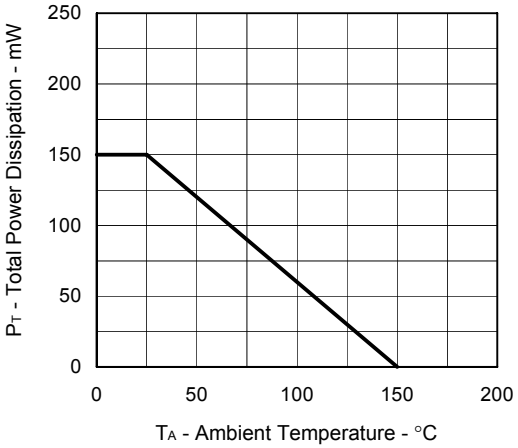
PART NUMBER	V_{IL}			V_{IH}			UNIT
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	
GN4A4M			–0.8	–3.0			V
GN4F4M			–0.8	–4.0			V
GN4L4M			–0.8	–5.0			V
GN4L3M			–0.8	–3.0			V
GN4L3N			–0.6	–3.0			V
GN4L3Z			–0.5	–1.2			V
GN4A3Q			–0.5	–2.0			V
GN4A4P			–0.5	–3.0			V
GN4F4N			–0.6	–3.0			V
GN4L4L			–0.9	–6.0			V
GN4A4Z			–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

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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

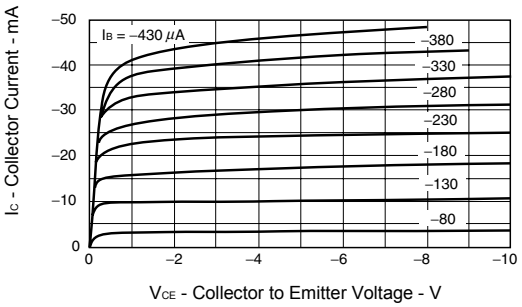
TOTAL POWER DISSIPATION vs.
AMBIENT TEMPERATURE



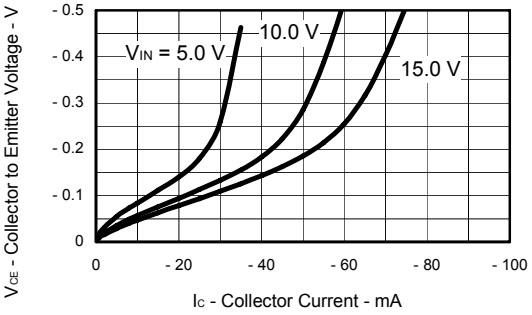
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[GN4A4M]
TYPICAL CHARACTERISTICS (T_A = 25°C)

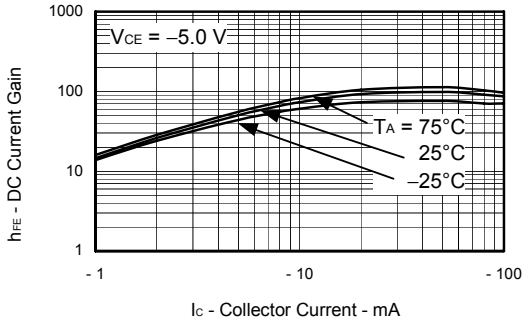
COLLECTOR CURRENT vs.
COLLECTOR TO EMITTER VOLTAGE



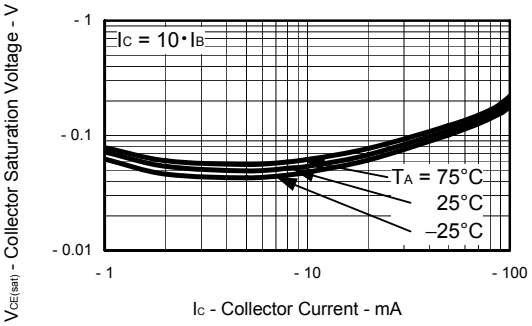
COLLECTOR TO EMITTER VOLTAGE vs.
COLLECTOR CURRENT



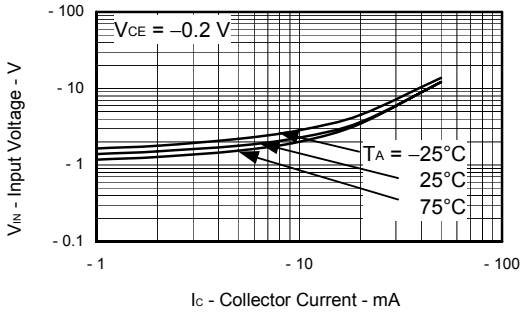
DC CURRENT GAIN vs. COLLECTOR CURRENT



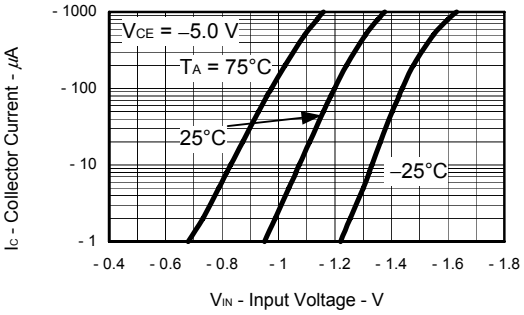
COLLECTOR SATURATION VOLTAGE vs.
COLLECTOR CURRENT



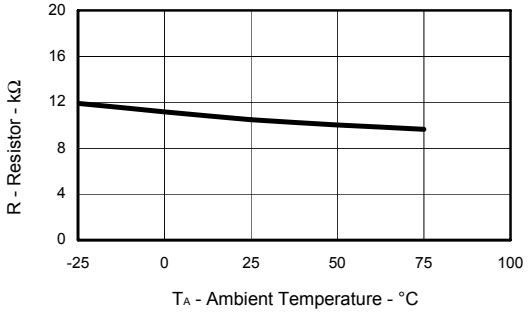
INPUT VOLTAGE vs. COLLECTOR CURRENT



COLLECTOR CURRENT vs. INPUT VOLTAGE



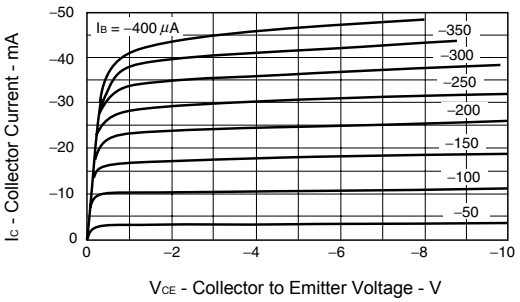
RESISTOR vs. AMBIENT TEMPERATURE



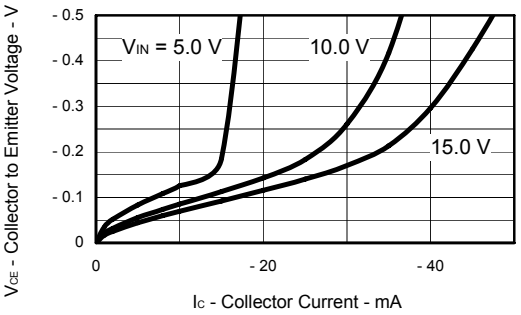
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[GN4F4M]
TYPICAL CHARACTERISTICS (T_A = 25°C)

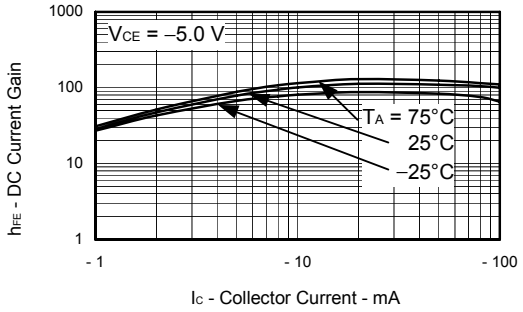
COLLECTOR CURRENT vs.
COLLECTOR TO EMITTER VOLTAGE



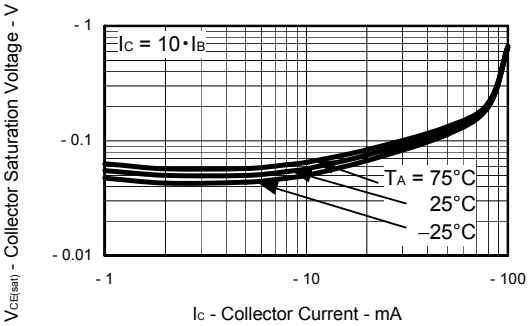
COLLECTOR TO EMITTER VOLTAGE vs.
COLLECTOR CURRENT



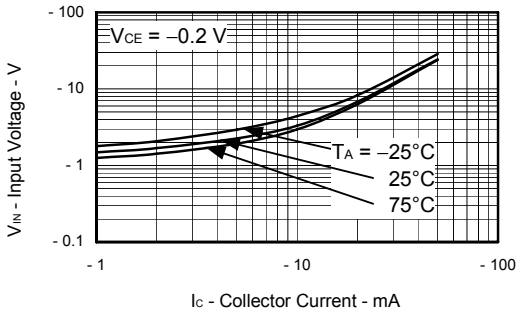
DC CURRENT GAIN vs. COLLECTOR CURRENT



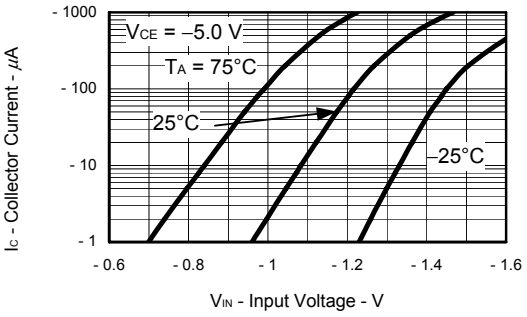
COLLECTOR SATURATION VOLTAGE vs.
COLLECTOR CURRENT



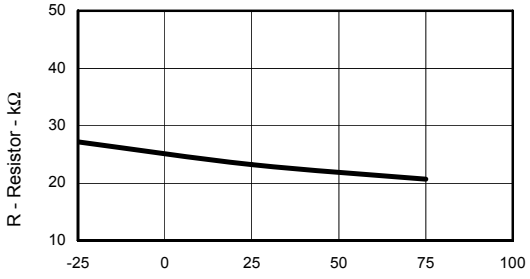
INPUT VOLTAGE vs. COLLECTOR CURRENT



COLLECTOR CURRENT vs. INPUT VOLTAGE



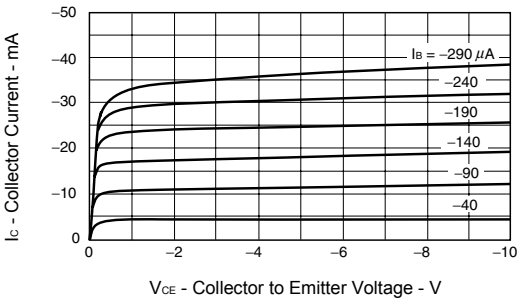
RESISTOR vs. AMBIENT TEMPERATURE



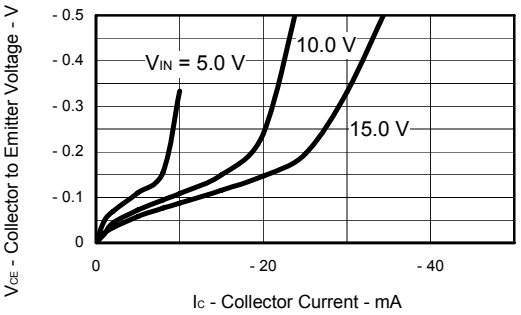
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[GN4L4M]
TYPICAL CHARACTERISTICS (T_A = 25°C)

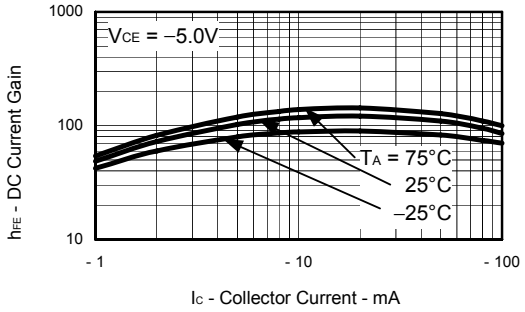
COLLECTOR CURRENT vs.
COLLECTOR TO EMITTER VOLTAGE



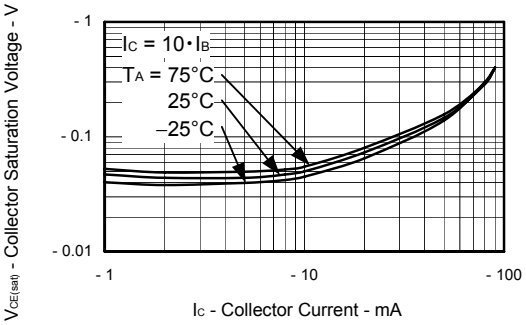
COLLECTOR TO EMITTER VOLTAGE vs.
COLLECTOR CURRENT



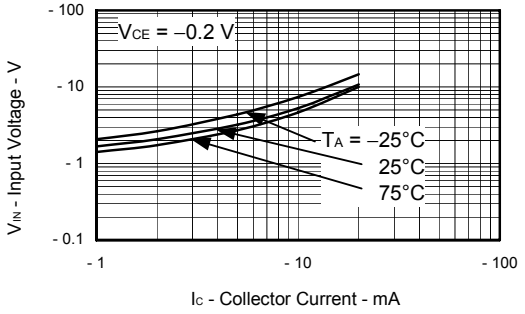
DC CURRENT GAIN vs. COLLECTOR CURRENT



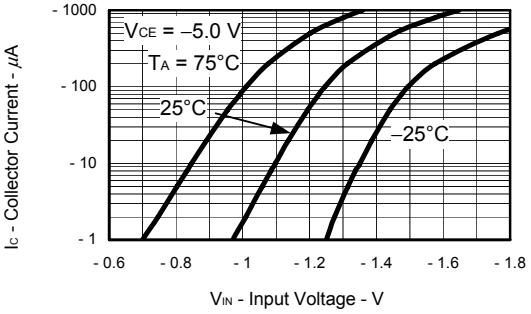
COLLECTOR SATURATION VOLTAGE vs.
COLLECTOR CURRENT



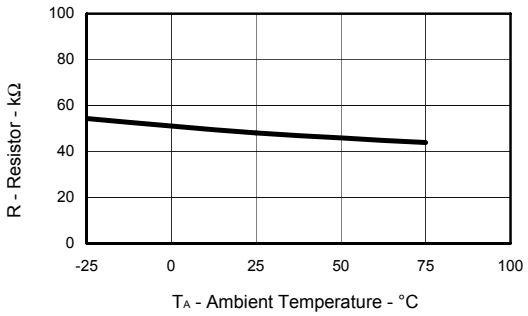
INPUT VOLTAGE vs. COLLECTOR CURRENT



COLLECTOR CURRENT vs. INPUT VOLTAGE



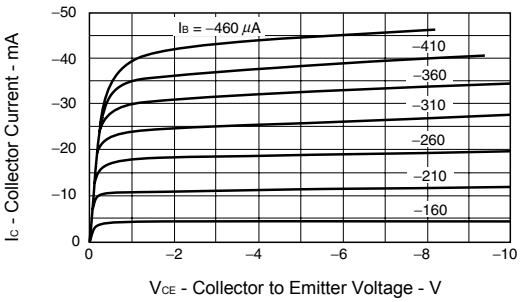
RESISTOR vs. AMBIENT TEMPERATURE



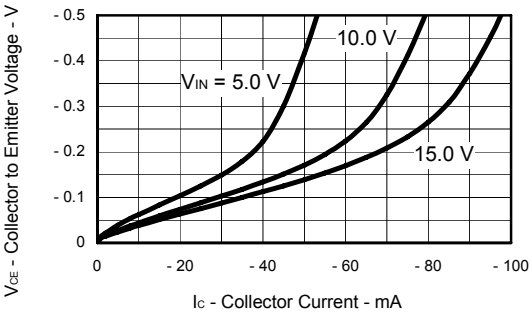
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[GN4L3M]
TYPICAL CHARACTERISTICS (T_A = 25°C)

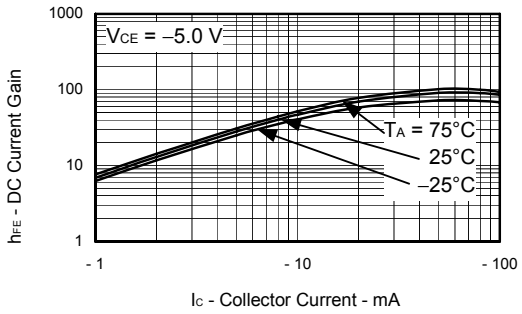
COLLECTOR CURRENT vs.
COLLECTOR TO EMITTER VOLTAGE



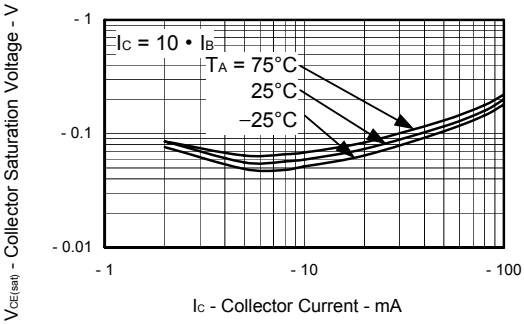
COLLECTOR TO EMITTER VOLTAGE vs.
COLLECTOR CURRENT



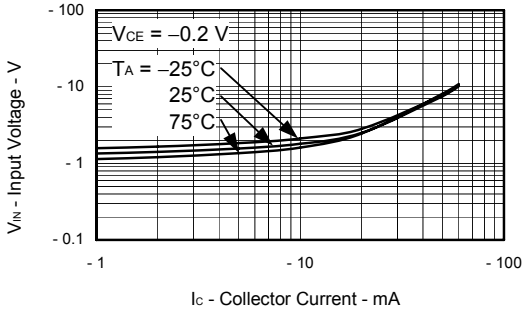
DC CURRENT GAIN vs. COLLECTOR CURRENT



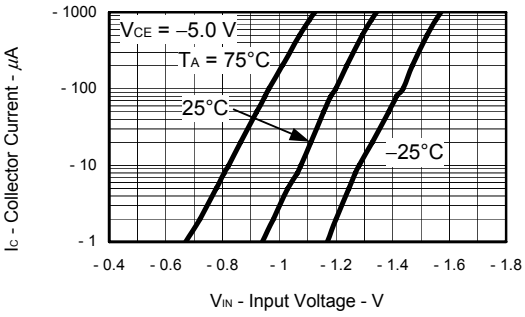
COLLECTOR SATURATION VOLTAGE vs.
COLLECTOR CURRENT



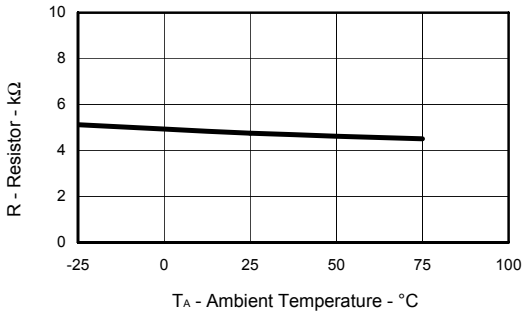
INPUT VOLTAGE vs. COLLECTOR CURRENT



COLLECTOR CURRENT vs. INPUT VOLTAGE



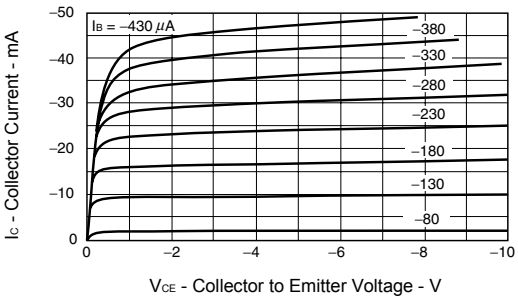
RESISTOR vs. AMBIENT TEMPERATURE



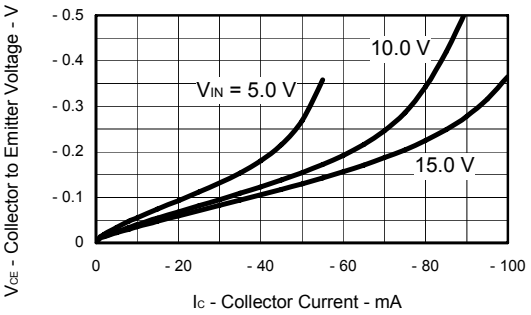
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[GN4L3N]
TYPICAL CHARACTERISTICS (T_A = 25°C)

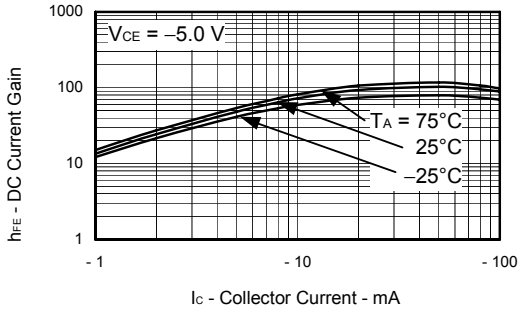
COLLECTOR CURRENT vs.
COLLECTOR TO EMITTER VOLTAGE



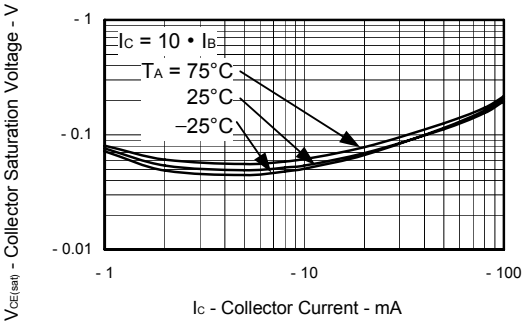
COLLECTOR TO EMITTER VOLTAGE vs.
COLLECTOR CURRENT



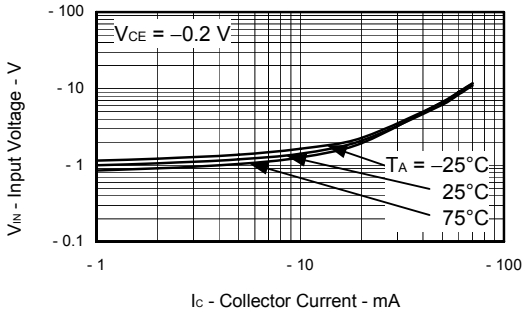
DC CURRENT GAIN vs. COLLECTOR CURRENT



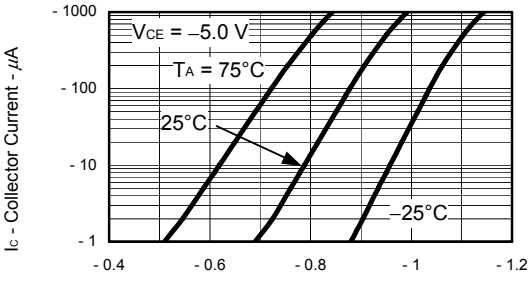
COLLECTOR SATURATION VOLTAGE vs.
COLLECTOR CURRENT



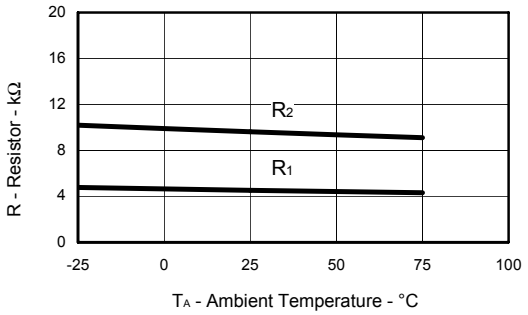
INPUT VOLTAGE vs. COLLECTOR CURRENT



COLLECTOR CURRENT vs. INPUT VOLTAGE



RESISTOR vs. AMBIENT TEMPERATURE

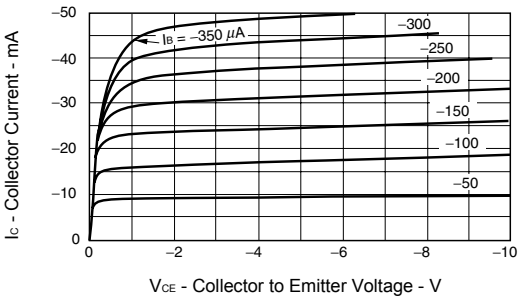


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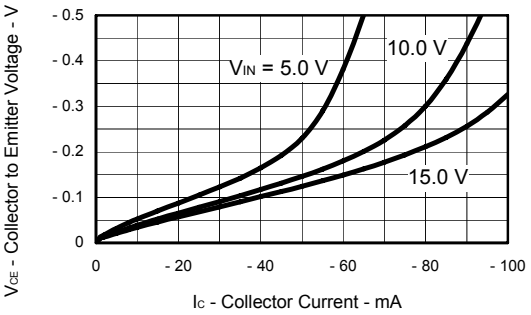
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TYPICAL CHARACTERISTICS (T_A = 25°C)

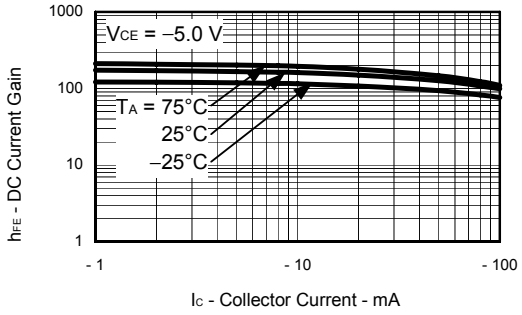
COLLECTOR CURRENT vs.
COLLECTOR TO EMITTER VOLTAGE



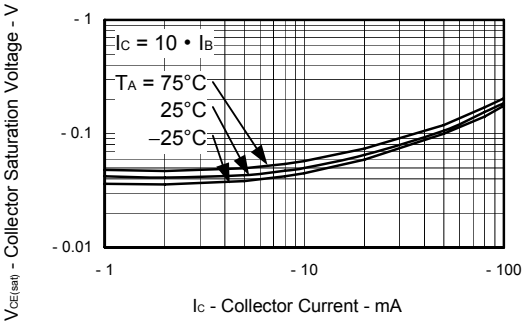
COLLECTOR TO EMITTER VOLTAGE vs.
COLLECTOR CURRENT



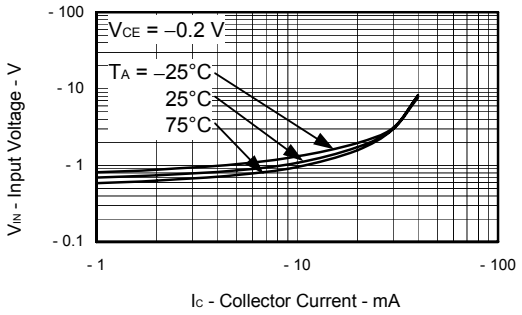
DC CURRENT GAIN vs. COLLECTOR CURRENT



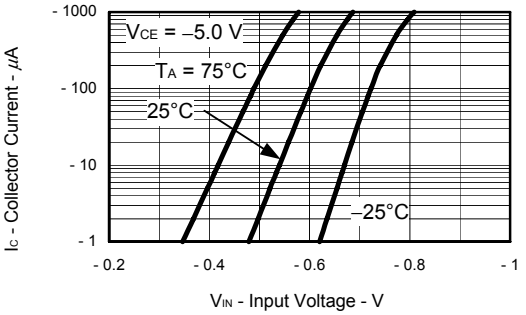
COLLECTOR SATURATION VOLTAGE vs.
COLLECTOR CURRENT



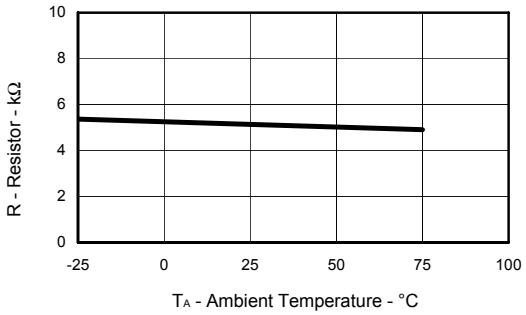
INPUT VOLTAGE vs. COLLECTOR CURRENT



COLLECTOR CURRENT vs. INPUT VOLTAGE



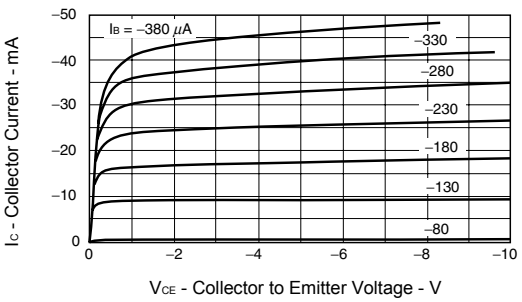
RESISTOR vs. AMBIENT TEMPERATURE



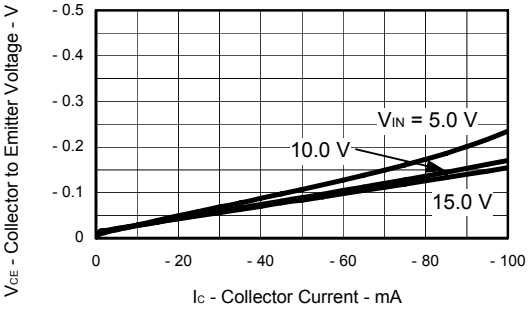
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[GN4A3Q]
TYPICAL CHARACTERISTICS (T_A = 25°C)

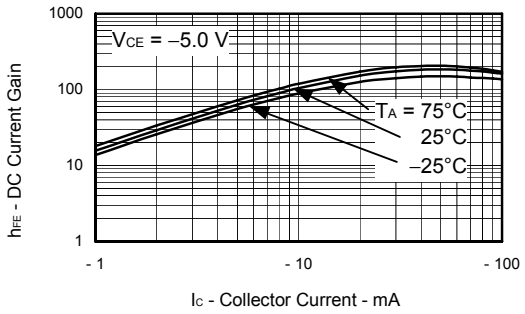
COLLECTOR CURRENT vs.
COLLECTOR TO EMITTER VOLTAGE



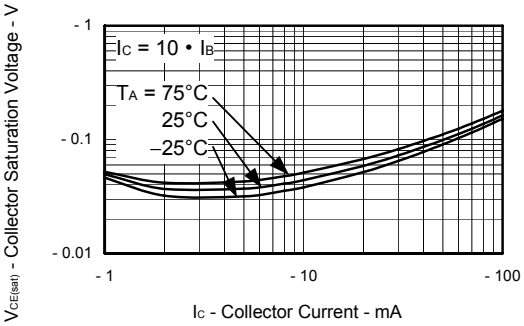
COLLECTOR TO EMITTER VOLTAGE vs.
COLLECTOR CURRENT



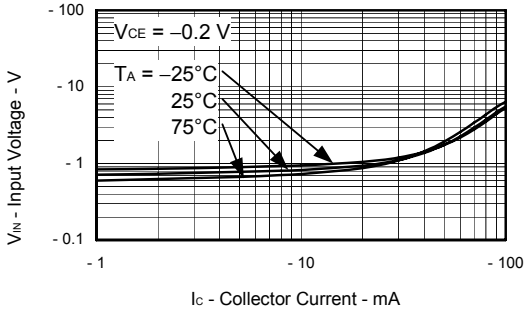
DC CURRENT GAIN vs. COLLECTOR CURRENT



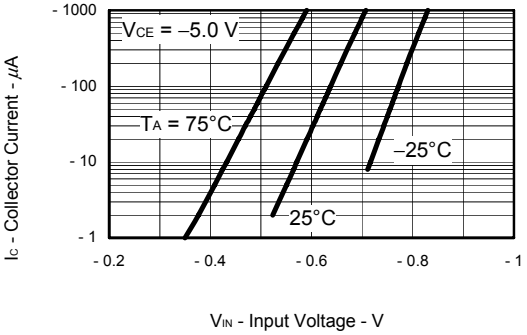
COLLECTOR SATURATION VOLTAGE vs.
COLLECTOR CURRENT



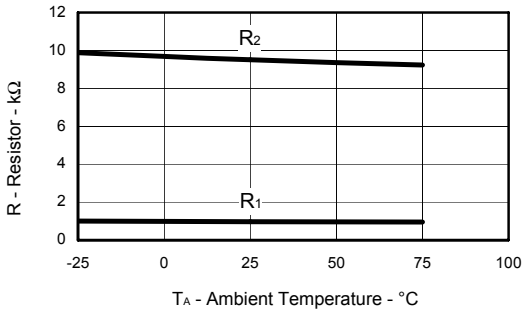
INPUT VOLTAGE vs. COLLECTOR CURRENT



COLLECTOR CURRENT vs. INPUT VOLTAGE



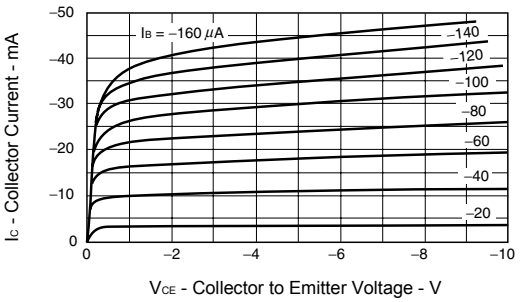
RESISTOR vs. AMBIENT TEMPERATURE



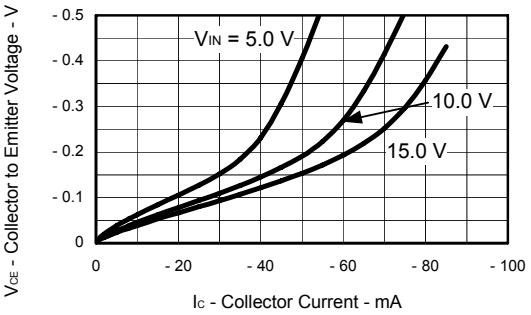
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[GN4A4P]
TYPICAL CHARACTERISTICS (T_A = 25°C)

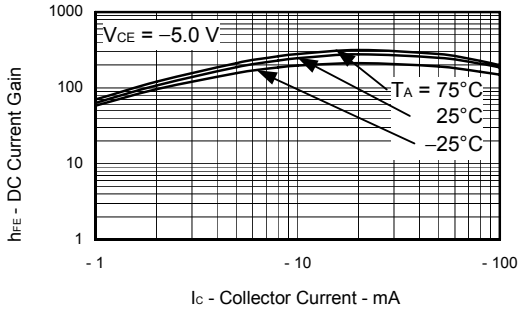
COLLECTOR CURRENT vs.
COLLECTOR TO EMITTER VOLTAGE



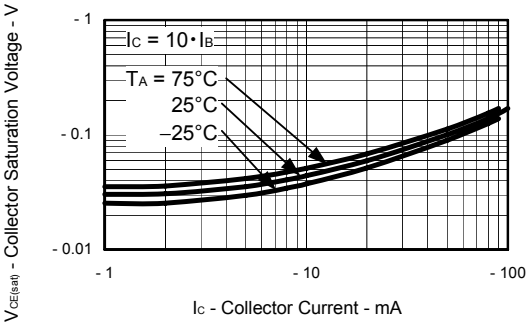
COLLECTOR TO EMITTER VOLTAGE vs.
COLLECTOR CURRENT



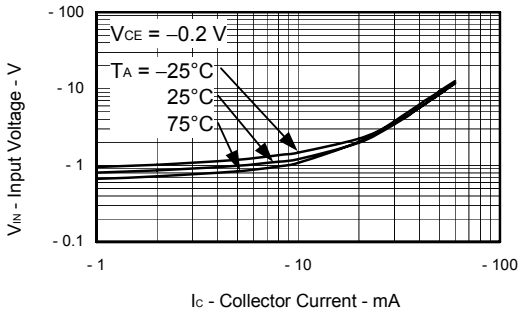
DC CURRENT GAIN vs. COLLECTOR CURRENT



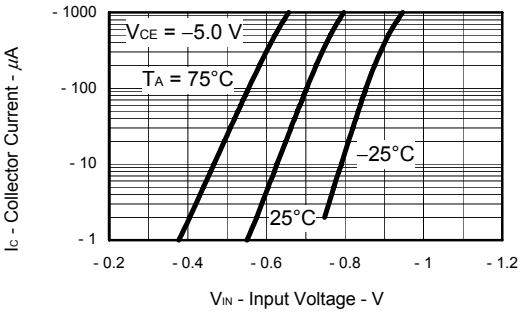
COLLECTOR SATURATION VOLTAGE vs.
COLLECTOR CURRENT



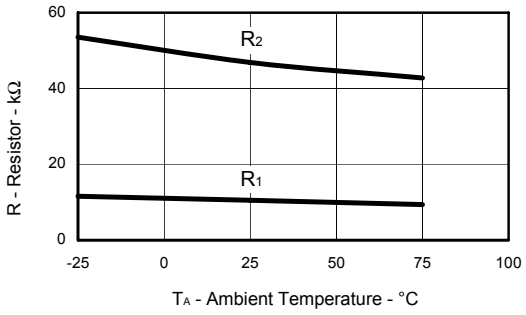
INPUT VOLTAGE vs. COLLECTOR CURRENT



COLLECTOR CURRENT vs. INPUT VOLTAGE



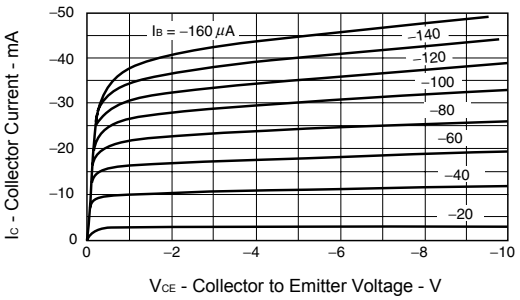
RESISTOR vs. AMBIENT TEMPERATURE



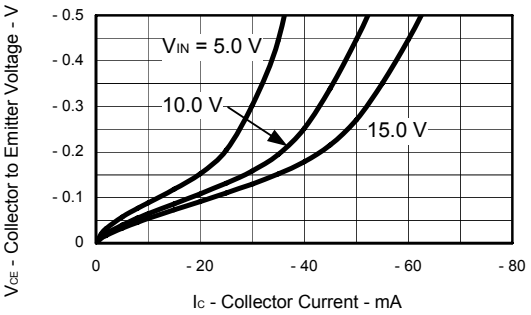
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[GN4F4N]
TYPICAL CHARACTERISTICS (T_A = 25°C)

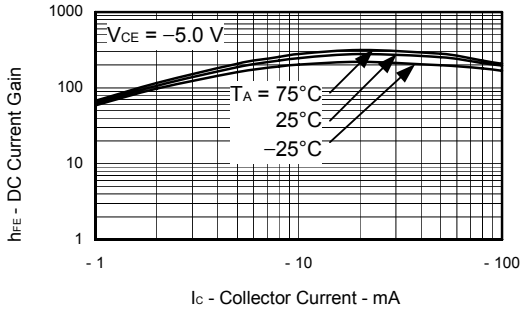
COLLECTOR CURRENT vs.
COLLECTOR TO EMITTER VOLTAGE



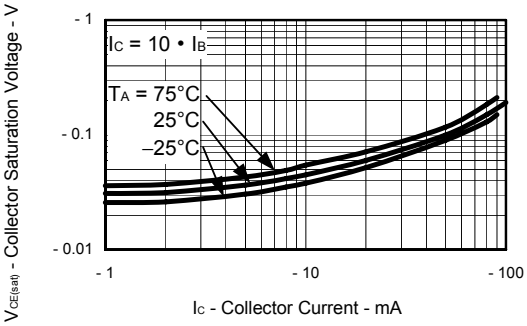
COLLECTOR TO EMITTER VOLTAGE vs.
COLLECTOR CURRENT



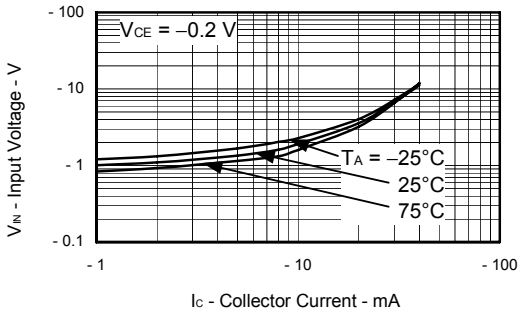
DC CURRENT GAIN vs. COLLECTOR CURRENT



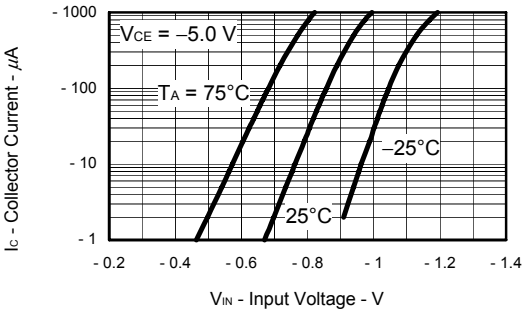
COLLECTOR SATURATION VOLTAGE vs.
COLLECTOR CURRENT



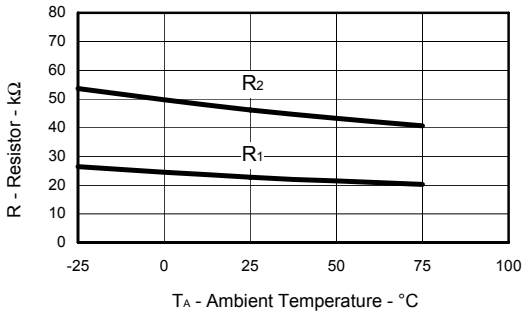
INPUT VOLTAGE vs. COLLECTOR CURRENT



COLLECTOR CURRENT vs. INPUT VOLTAGE



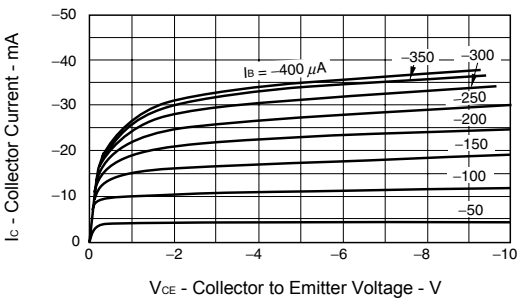
RESISTOR vs. AMBIENT TEMPERATURE



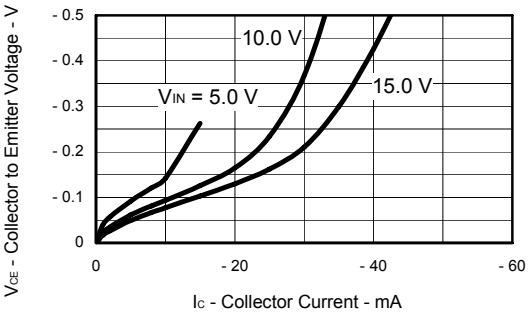
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[GN4L4L]
TYPICAL CHARACTERISTICS (T_A = 25°C)

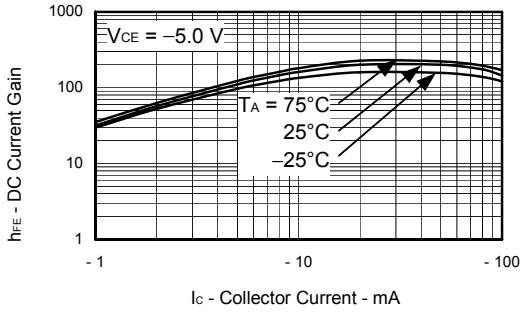
COLLECTOR CURRENT vs.
COLLECTOR TO EMITTER VOLTAGE



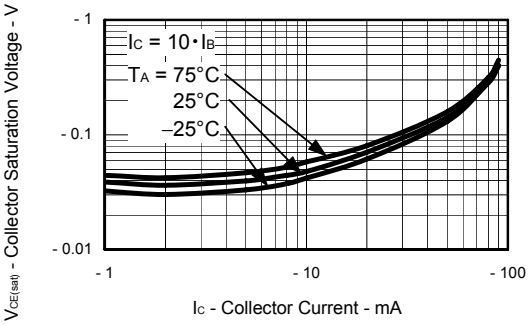
COLLECTOR TO EMITTER VOLTAGE vs.
COLLECTOR CURRENT



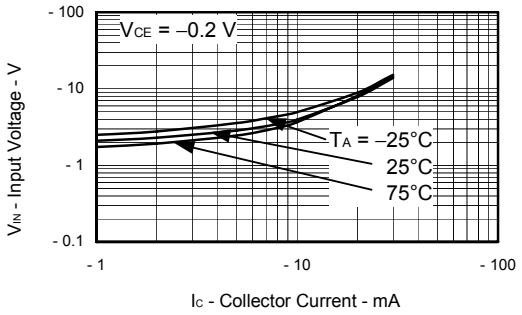
DC CURRENT GAIN vs. COLLECTOR CURRENT



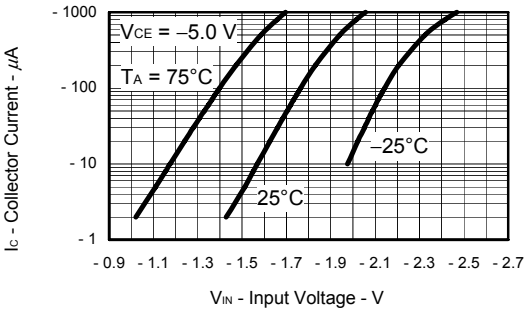
COLLECTOR SATURATION VOLTAGE vs.
COLLECTOR CURRENT



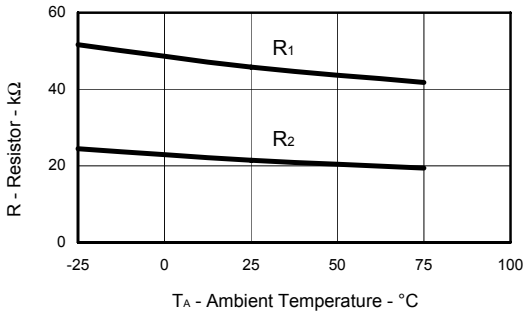
INPUT VOLTAGE vs. COLLECTOR CURRENT



COLLECTOR CURRENT vs. INPUT VOLTAGE



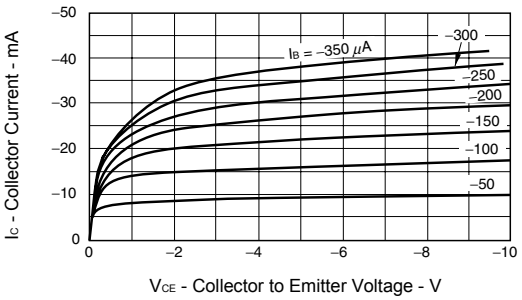
RESISTOR vs. AMBIENT TEMPERATURE



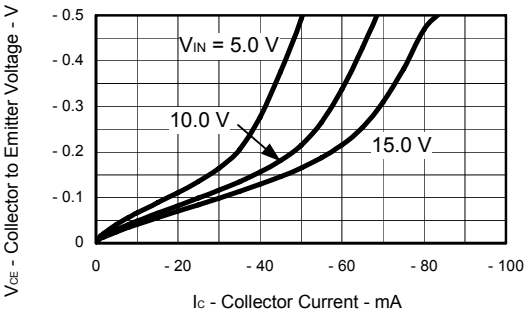
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[GN4A4Z]
TYPICAL CHARACTERISTICS (T_A = 25°C)

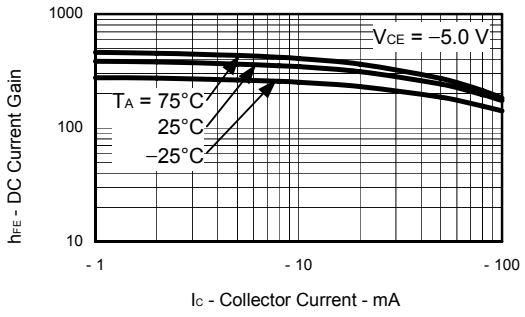
COLLECTOR CURRENT vs.
COLLECTOR TO EMITTER VOLTAGE



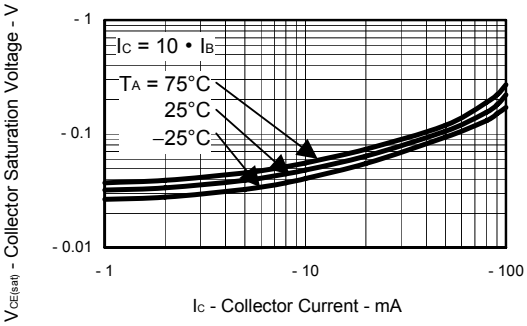
COLLECTOR TO EMITTER VOLTAGE vs.
COLLECTOR CURRENT



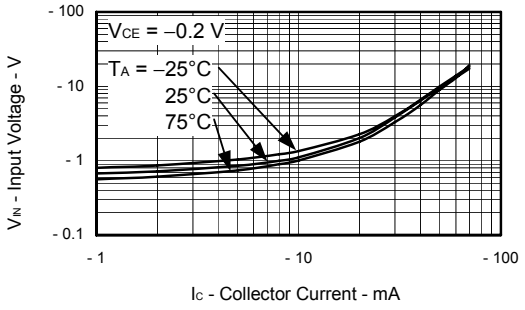
DC CURRENT GAIN vs. COLLECTOR CURRENT



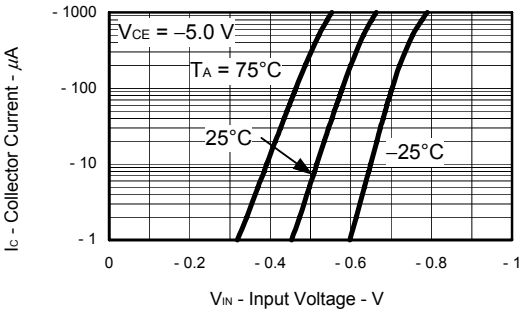
COLLECTOR SATURATION VOLTAGE vs.
COLLECTOR CURRENT



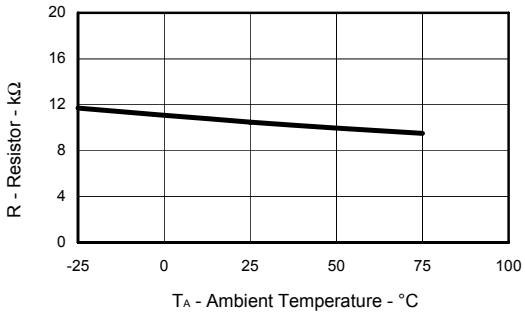
INPUT VOLTAGE vs. COLLECTOR CURRENT



COLLECTOR CURRENT vs. INPUT VOLTAGE



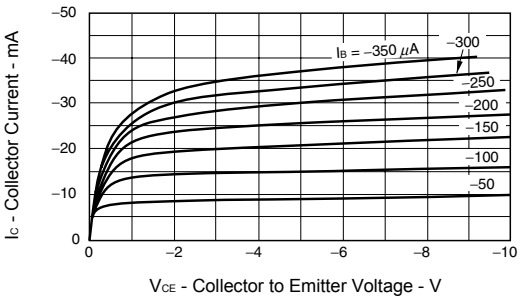
RESISTOR vs. AMBIENT TEMPERATURE



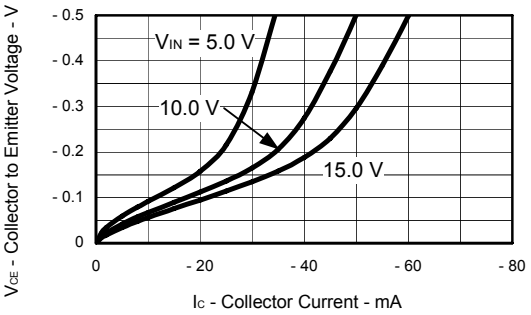
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[GN4F4Z]
TYPICAL CHARACTERISTICS (T_A = 25°C)

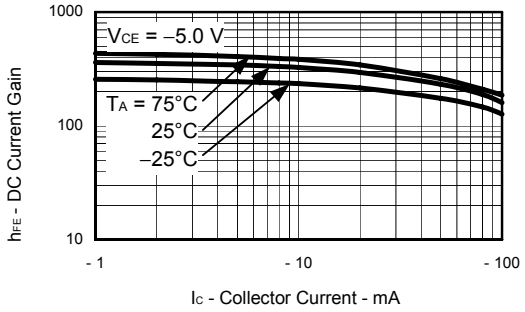
COLLECTOR CURRENT vs.
COLLECTOR TO EMITTER VOLTAGE



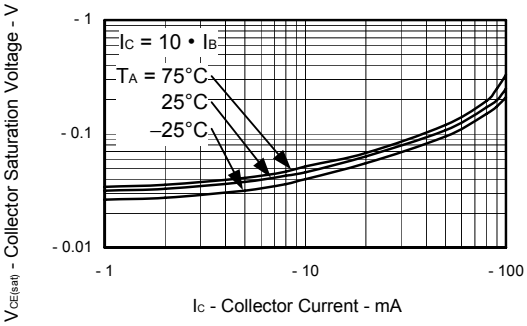
COLLECTOR TO EMITTER VOLTAGE vs.
COLLECTOR CURRENT



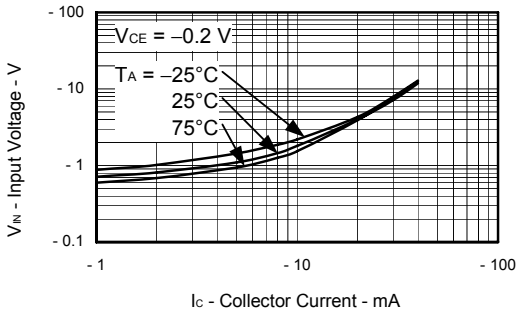
DC CURRENT GAIN vs. COLLECTOR CURRENT



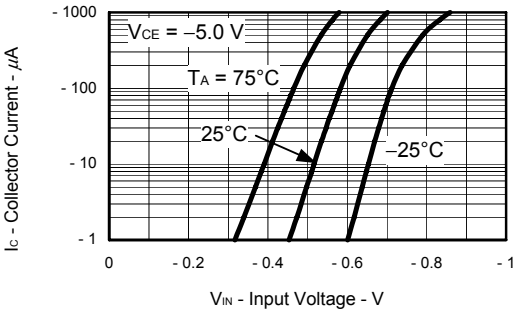
COLLECTOR SATURATION VOLTAGE vs.
COLLECTOR CURRENT



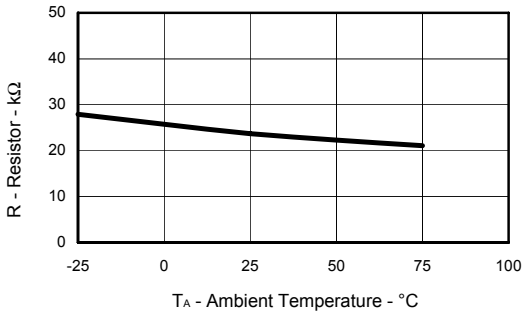
INPUT VOLTAGE vs. COLLECTOR CURRENT



COLLECTOR CURRENT vs. INPUT VOLTAGE



RESISTOR vs. AMBIENT TEMPERATURE

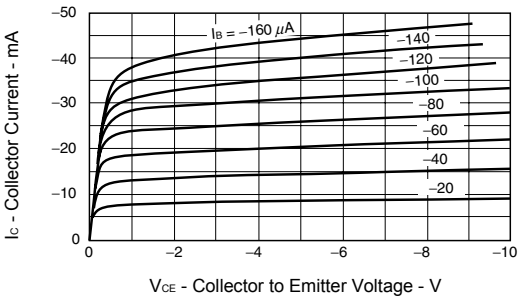


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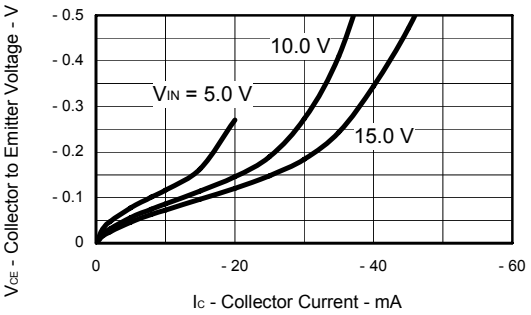
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TYPICAL CHARACTERISTICS (T_A = 25°C)

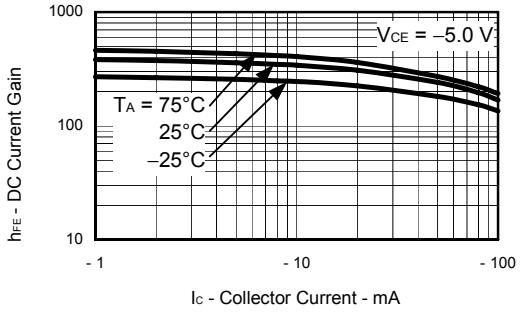
COLLECTOR CURRENT vs.
COLLECTOR TO EMITTER VOLTAGE



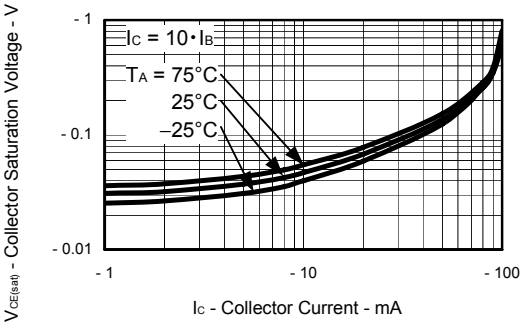
COLLECTOR TO EMITTER VOLTAGE vs.
COLLECTOR CURRENT



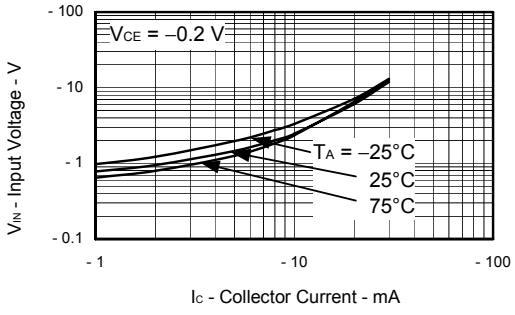
DC CURRENT GAIN vs. COLLECTOR CURRENT



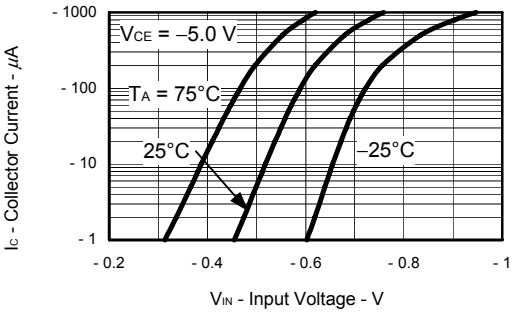
COLLECTOR SATURATION VOLTAGE vs.
COLLECTOR CURRENT



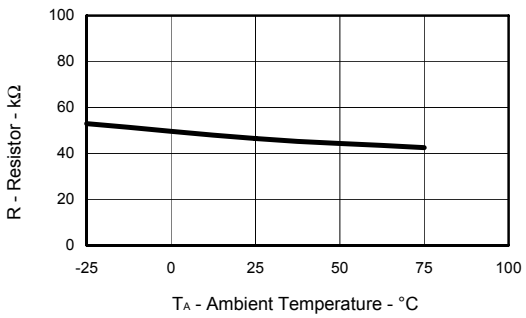
INPUT VOLTAGE vs. COLLECTOR CURRENT



COLLECTOR CURRENT vs. INPUT VOLTAGE



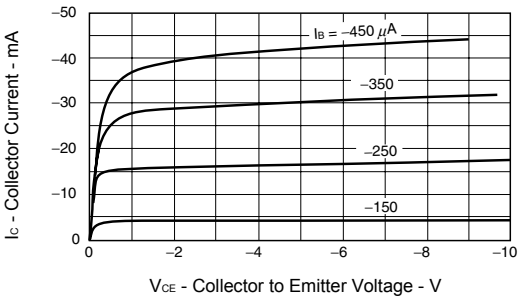
RESISTOR vs. AMBIENT TEMPERATURE



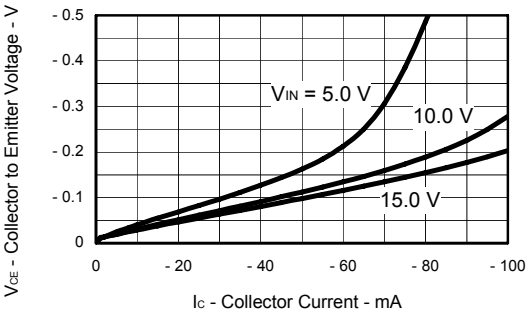
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[GN4F3M]
TYPICAL CHARACTERISTICS (T_A = 25°C)

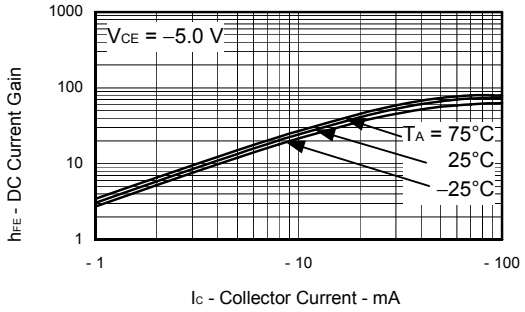
COLLECTOR CURRENT vs.
COLLECTOR TO EMITTER VOLTAGE



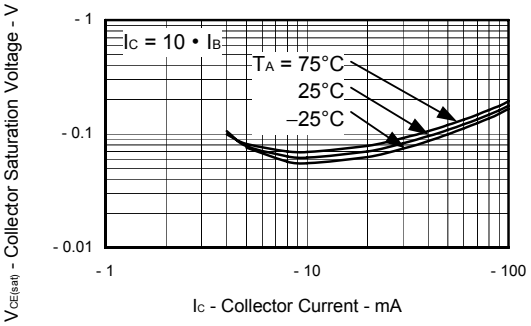
COLLECTOR TO EMITTER VOLTAGE vs.
COLLECTOR CURRENT



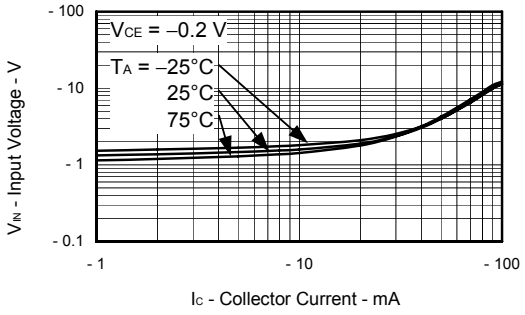
DC CURRENT GAIN vs. COLLECTOR CURRENT



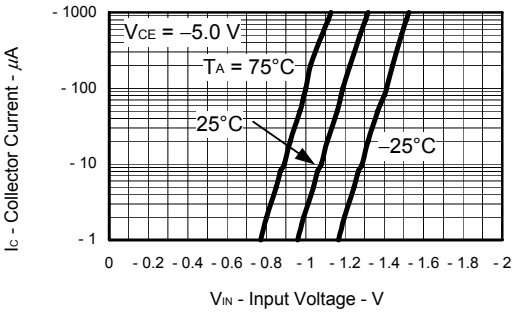
COLLECTOR SATURATION VOLTAGE vs.
COLLECTOR CURRENT



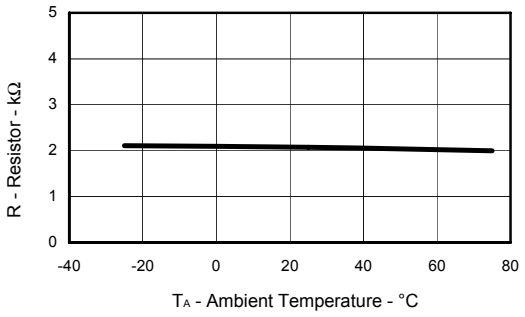
INPUT VOLTAGE vs. COLLECTOR CURRENT



COLLECTOR CURRENT vs. INPUT VOLTAGE



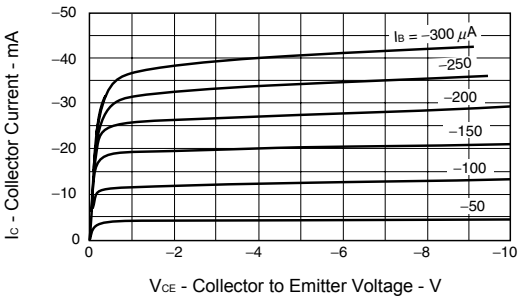
RESISTOR vs. AMBIENT TEMPERATURE



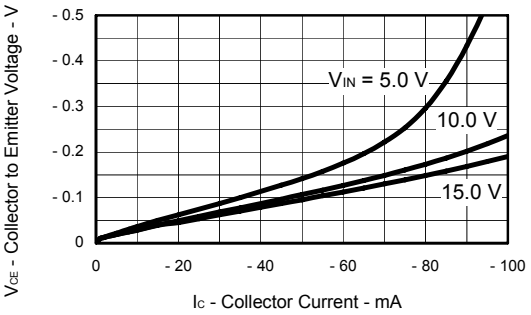
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[GN4F3P]
TYPICAL CHARACTERISTICS (T_A = 25°C)

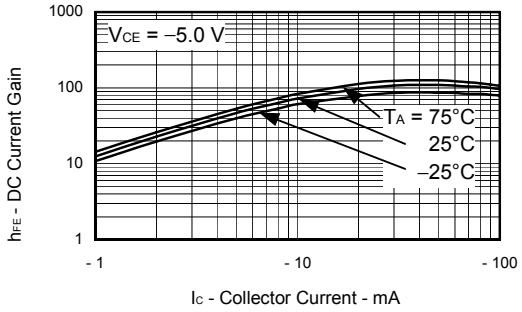
COLLECTOR CURRENT vs.
COLLECTOR TO EMITTER VOLTAGE



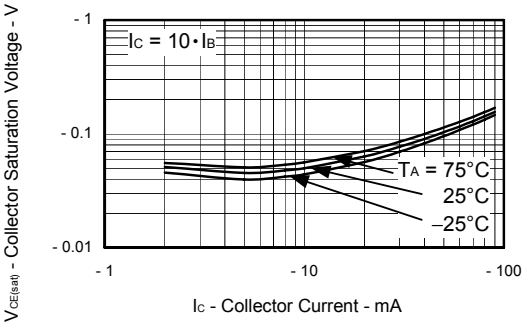
COLLECTOR TO EMITTER VOLTAGE vs.
COLLECTOR CURRENT



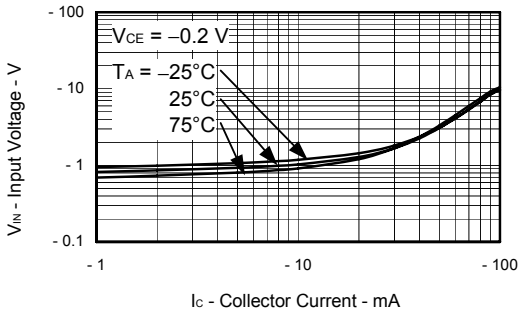
DC CURRENT GAIN vs. COLLECTOR CURRENT



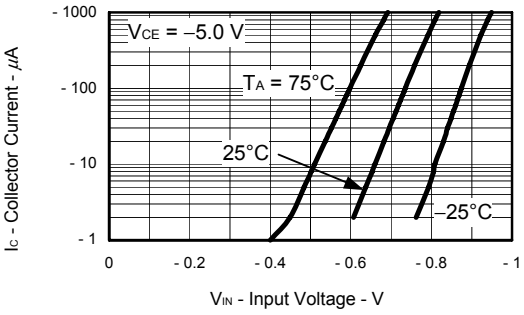
COLLECTOR SATURATION VOLTAGE vs.
COLLECTOR CURRENT



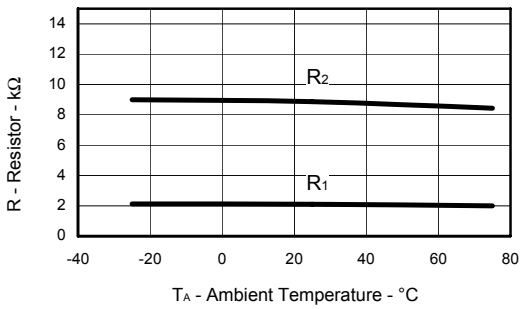
INPUT VOLTAGE vs. COLLECTOR CURRENT



COLLECTOR CURRENT vs. INPUT VOLTAGE



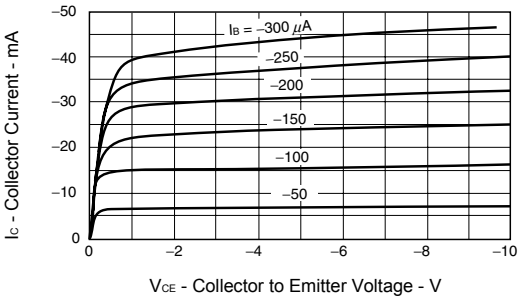
RESISTOR vs. AMBIENT TEMPERATURE



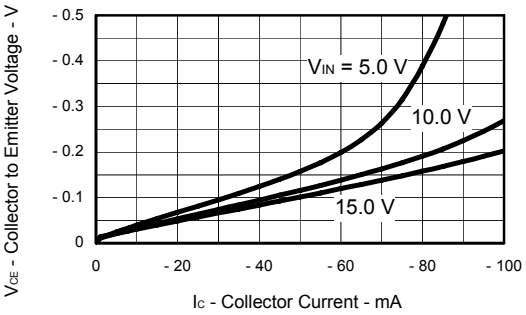
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[GN4F3R]
TYPICAL CHARACTERISTICS (T_A = 25°C)

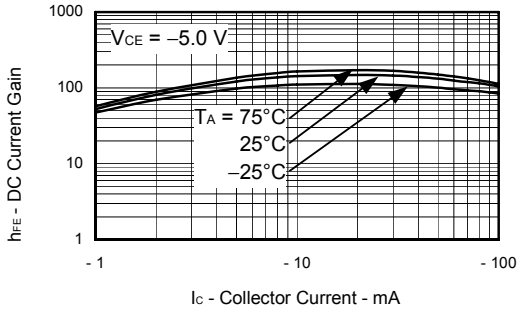
COLLECTOR CURRENT vs.
COLLECTOR TO EMITTER VOLTAGE



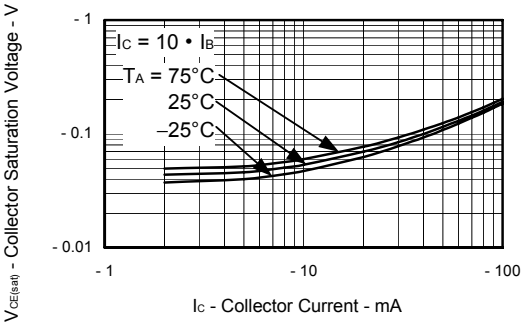
COLLECTOR TO EMITTER VOLTAGEvs.
COLLECTOR CURRENT



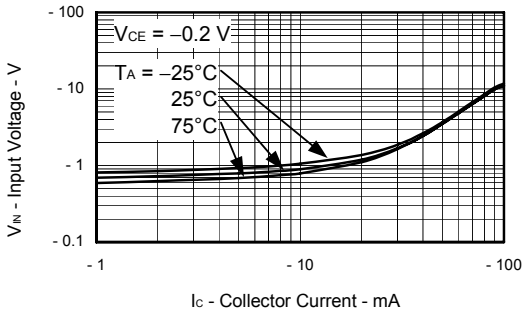
DC CURRENT GAIN vs. COLLECTOR CURRENT



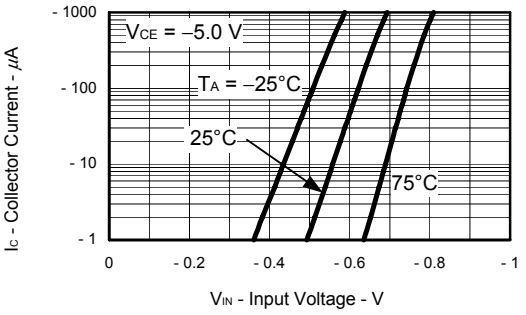
COLLECTOR SATURATION VOLTAGE vs.
COLLECTOR CURRENT



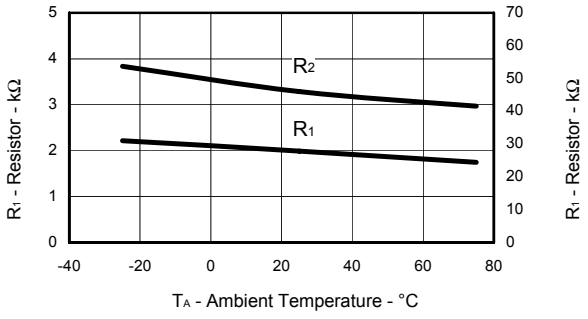
INPUT VOLTAGE vs. COLLECTOR CURRENT



COLLECTOR CURRENT vs. INPUT VOLTAGE



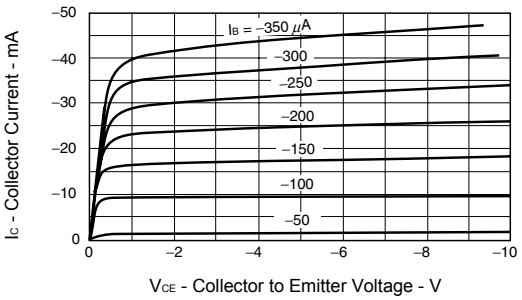
RESISTOR vs. AMBIENT TEMPERATURE



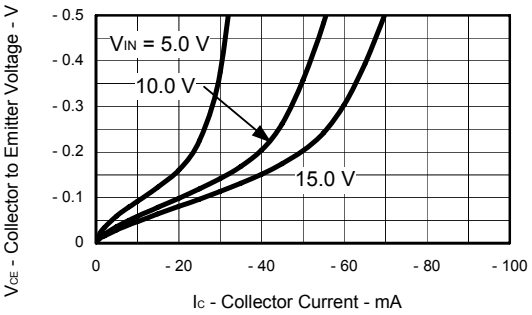
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[GN4A4L]
TYPICAL CHARACTERISTICS (T_A = 25°C)

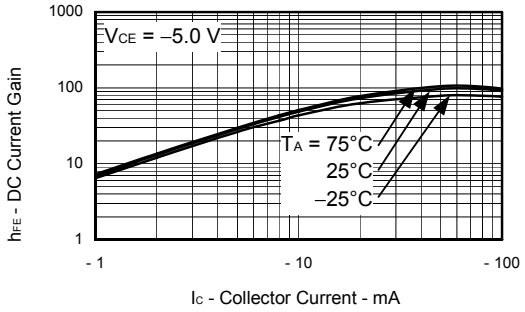
COLLECTOR CURRENT vs.
COLLECTOR TO EMITTER VOLTAGE



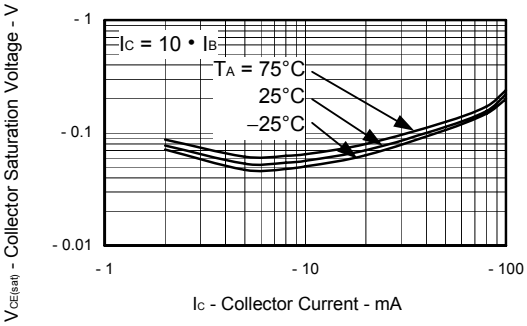
COLLECTOR TO EMITTER VOLTAGE vs.
COLLECTOR CURRENT



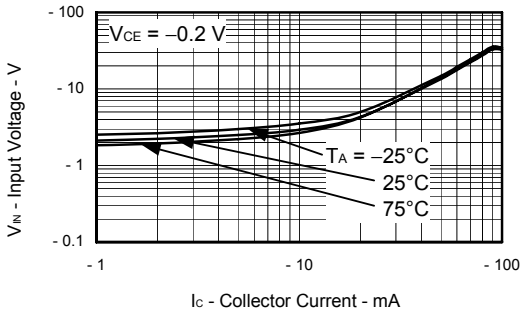
DC CURRENT GAIN vs. COLLECTOR CURRENT



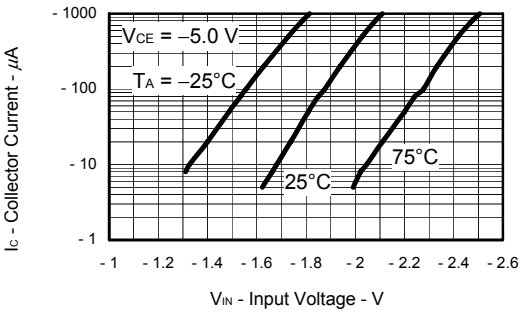
COLLECTOR SATURATION VOLTAGE vs.
COLLECTOR CURRENT



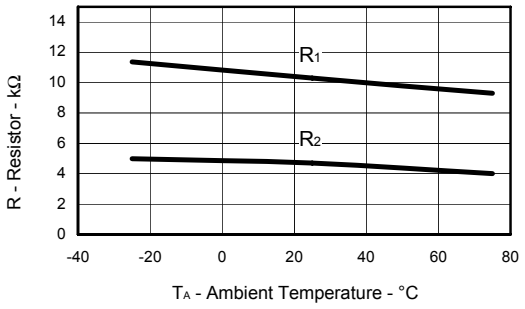
INPUT VOLTAGE vs. COLLECTOR CURRENT



COLLECTOR CURRENT vs. INPUT VOLTAGE



RESISTOR vs. AMBIENT TEMPERATURE

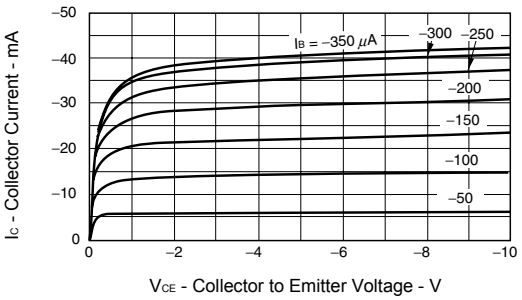


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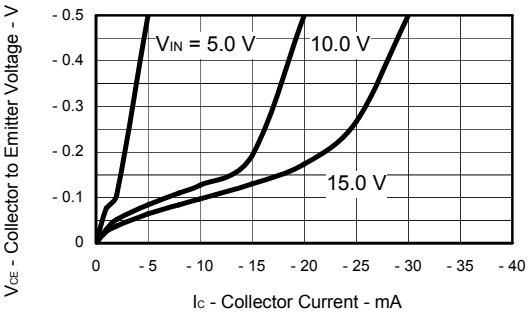
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TYPICAL CHARACTERISTICS (T_A = 25°C)

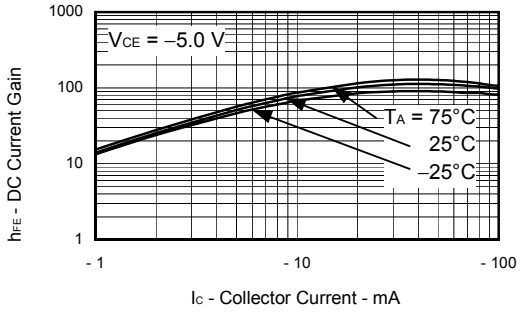
COLLECTOR CURRENT vs.
COLLECTOR TO EMITTER VOLTAGE



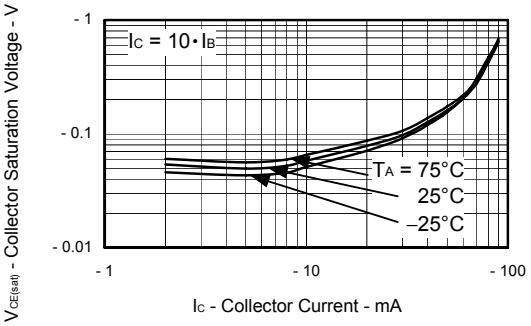
COLLECTOR TO EMITTER VOLTAGE vs.
COLLECTOR CURRENT



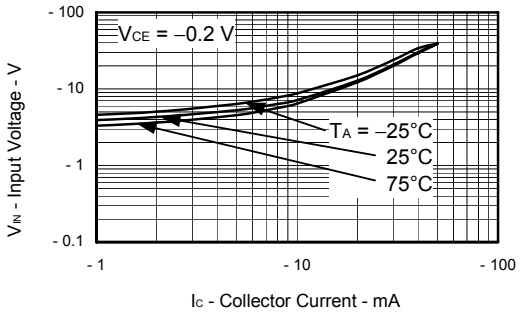
DC CURRENT GAIN vs. COLLECTOR CURRENT



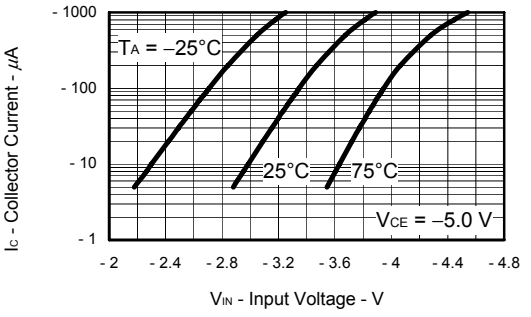
COLLECTOR SATURATION VOLTAGE vs.
COLLECTOR CURRENT



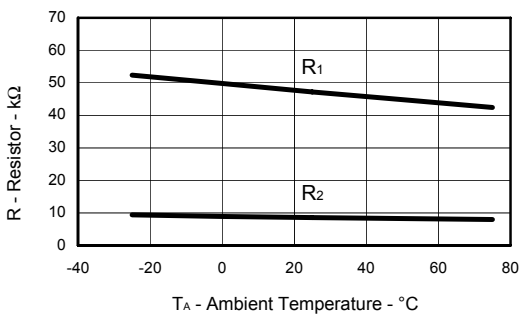
INPUT VOLTAGE vs. COLLECTOR CURRENT



COLLECTOR CURRENT vs. INPUT VOLTAGE



RESISTOR vs. AMBIENT TEMPERATURE



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  "Standard": Computers, office equipment, communications equipment, test and measurement equipment, audio and visual equipment, home electronic appliances, machine tools, personal electronic equipment and industrial robots.
  "Special": Transportation equipment (automobiles, trains, ships, etc.), traffic control systems, anti-disaster systems, anti-crime systems, safety equipment and medical equipment (not specifically designed for life support).
  "Specific": Aircraft, aerospace equipment, submersible repeaters, nuclear reactor control systems, life support systems and medical equipment for life support, etc.

The quality grade of NEC Electronics products is "Standard" unless otherwise expressly specified in NEC Electronics data sheets or data books, etc. If customers wish to use NEC Electronics products in applications not intended by NEC Electronics, they must contact an NEC Electronics sales representative in advance to determine NEC Electronics' willingness to support a given application.

(Note)
(1) "NEC Electronics" as used in this statement means NEC Electronics Corporation and also includes its majority-owned subsidiaries.
(2) "NEC Electronics products" means any product developed or manufactured by or for NEC Electronics (as defined above).

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