

RESISTOR BUILT-IN TYPE PNP TRANSISTOR

FEATURES

- Compact package
- Resistors built-in type
- Complementary to FA4xxx

ORDERING INFORMATION

PART NUMBER	PACKAGE
FN4xxx	SC-59

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$)

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)	$I_{C(pulse)}$	-0.2	A
Total Power Dissipation	P_T	0.2	W
Junction Temperature	T_j	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

<R> Note 1.

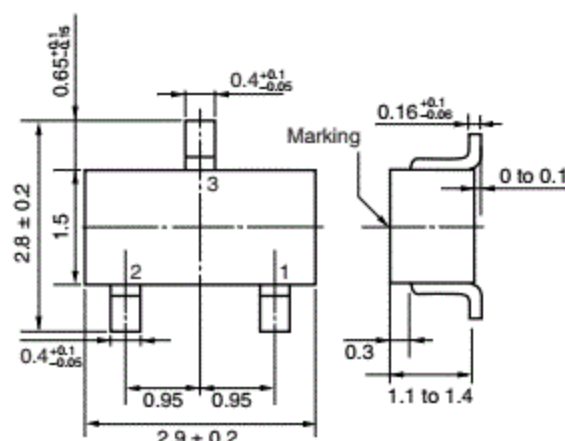
PART NUMBER	V_{EBO} (V)	MARK	R_1 (k Ω)	R_2 (k Ω)
FN4A4M	-10	NA1	10.0	10.0
FN4F4M	-10	NB1	22.0	22.0
FN4L4M	-10	NC1	47.0	47.0
FN4L3M	-10	ND1	4.7	4.7
FN4L3N	-5	NE1	4.7	10.0
FN4L3Z	-5	NF1	4.7	
FN4A3Q	-5	NG1	1.0	10.0
FN4A4P	-5	NH1	10.0	47.0
FN4F4N	-5	NJ1	22.0	47.0

Note 2. $PW \leq 10$ ms, Duty Cycle $\leq 50\%$

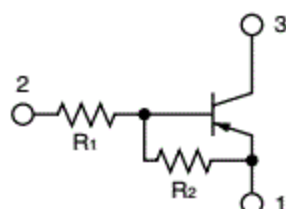
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Not all products and/or types are available in every country. Please check with an NEC Electronics sales representative for availability and additional information.

PACKAGE DRAWING (Unit: mm)



EQUIVALENT CIRCUIT



PIN CONNECTION

- 1: Emitter
2: Base
3: Collector

PART NUMBER	V_{EBO} (V)	MARK	R_1 (k Ω)	R_2 (k Ω)
FN4L4L	-15	NK1	47.0	22.0
FN4A4Z	-5	NL1	10.0	
FN4F4Z	-5	NM1	22.0	
FN4L4Z	-5	NN1	47.0	
FN4F3M	-10	NP1	2.2	2.2
FN4F3P	-5	NQ1	2.2	10.0
FN4F3R	-5	NR1	2.2	47.0
FN4A4L	-15	NS1	10.0	4.7
FN4L4K	-25	NT1	47.0	10.0

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 _I		Note3			kΩ
Emitter to Base Resistor	R _E					kΩ

Note 1.

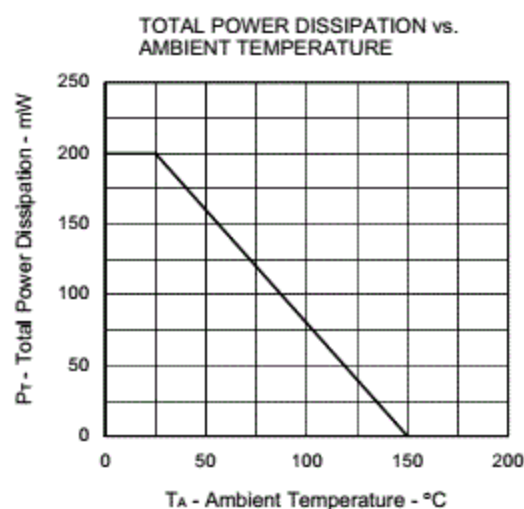
PART NUMBER	h _{FE1}			h _{FE2}			UNIT
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	
FN4A4M	35		100	80			-
FN4F4M	60		195	90			-
FN4L4M	85		340	95			-
FN4L3M	20		80	80			-
FN4L3N	35		100	80			-
FN4L3Z	135		600	100			-
FN4A3Q	35		100	80			-
FN4A4P	85		340	95			-
FN4F4N	85		340	95			-
FN4L4L	60		195	90			-
FN4A4Z	135		600	100			-
FN4F4Z	135		600	100			-
FN4L4Z	135		600	100			-
FN4F3M	8		50	50			-
FN4F3P	35		100	80			-
FN4F3R	85		340	95			-
FN4A4L	20		80	80			-
FN4L4K	35		100	80			-

Note 2.

PART NUMBER	V _{IL}			V _{IH}			UNIT
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	
FN4A4M			-0.8	-3.0			V
FN4F4M			-0.8	-4.0			V
FN4L4M			-0.8	-5.0			V
FN4L3M			-0.8	-3.0			V
FN4L3N			-0.6	-3.0			V
FN4L3Z			-0.5	-1.2			V
FN4A3Q			-0.5	-2.0			V
FN4A4P			-0.5	-3.0			V
FN4F4N			-0.6	-3.0			V
FN4L4L			-0.9	-6.0			V
FN4A4Z			-0.5	-2.0			V
FN4F4Z			-0.5	-3.0			V
FN4L4Z			-0.5	-4.0			V
FN4F3M			-0.8	-3.0			V
FN4F3P			-0.5	-2.0			V
FN4F3R			-0.5	-2.0			V
FN4A4L			-0.9	-6.0			V
FN4L4K			-2.0	-8.0			V

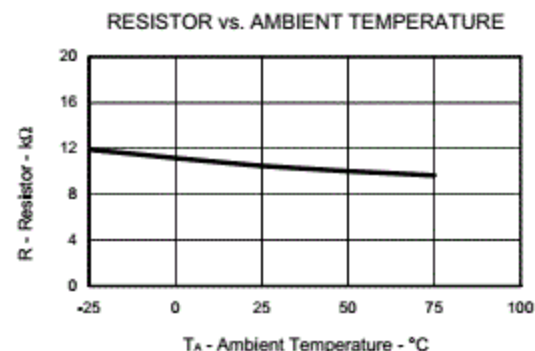
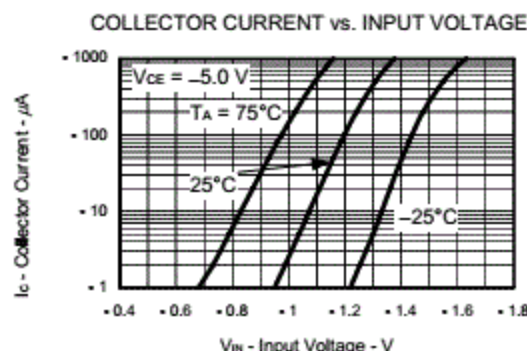
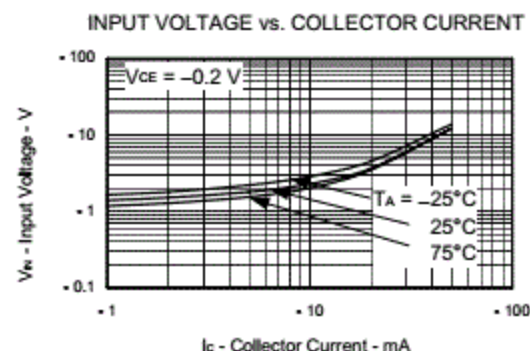
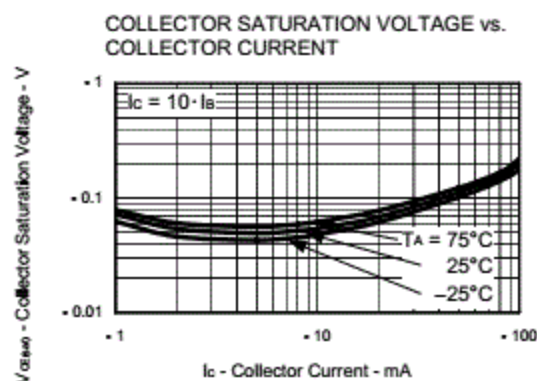
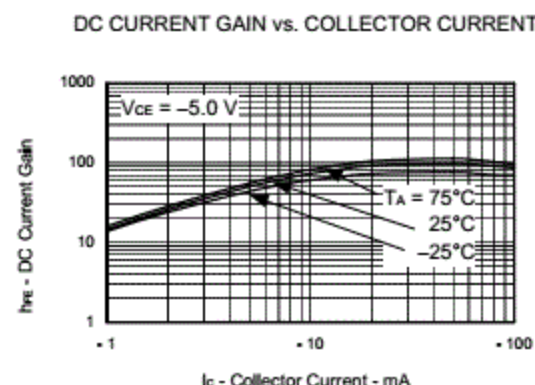
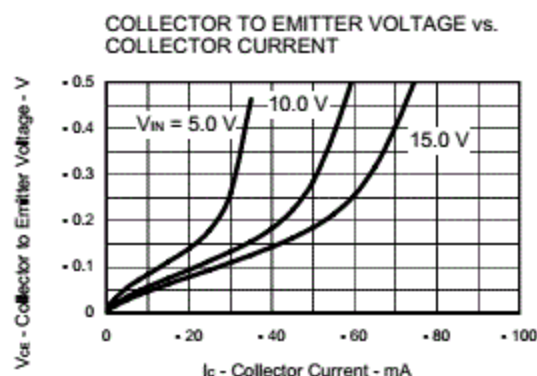
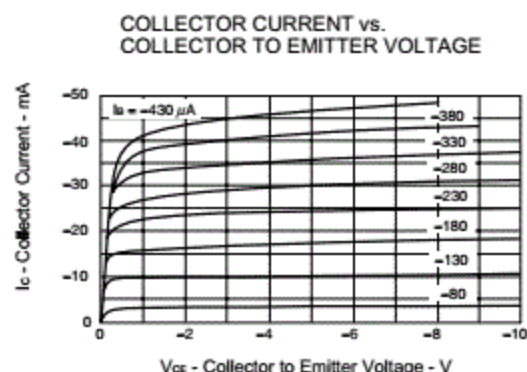
Note 3.

PART NUMBER	R ₁			R ₂			UNIT
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	
FN4A4M	7.00	10.00	13.00	7.00	10.00	13.00	kΩ
FN4F4M	15.40	22.00	28.60	15.40	22.00	28.60	kΩ
FN4L4M	32.90	47.00	61.10	32.90	47.00	61.10	kΩ
FN4L3M	3.29	4.70	6.11	3.29	4.70	6.11	kΩ
FN4L3N	3.29	4.70	6.11	7.00	10.00	13.00	kΩ
FN4L3Z	3.29	4.70	6.11				kΩ
FN4A3Q	0.70	1.00	1.30	7.00	10.00	13.00	kΩ
FN4A4P	7.00	10.00	13.00	32.90	47.00	61.10	kΩ
FN4F4N	15.40	22.00	28.60	32.90	47.00	61.10	kΩ
FN4L4L	32.90	47.00	61.10	15.40	22.00	28.60	kΩ
FN4A4Z	7.00	10.00	13.00				kΩ
FN4F4Z	15.40	22.00	28.60				kΩ
FN4L4Z	32.90	47.00	61.10				kΩ
FN4F3M	1.54	2.20	2.86	1.54	2.20	2.86	kΩ
FN4F3P	1.54	2.20	2.86	7.00	10.00	13.00	kΩ
FN4F3R	1.54	2.20	2.86	32.90	47.00	61.10	kΩ
FN4A4L	7.00	10.00	13.00	3.29	4.70	6.11	kΩ
FN4L4K	32.90	47.00	61.10	7.00	10.00	13.00	kΩ

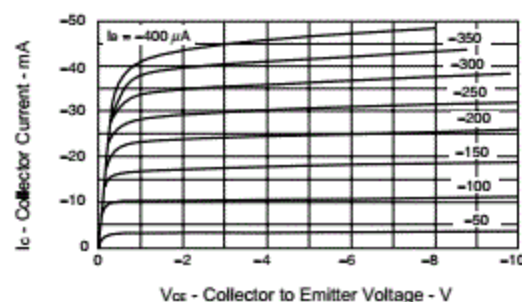
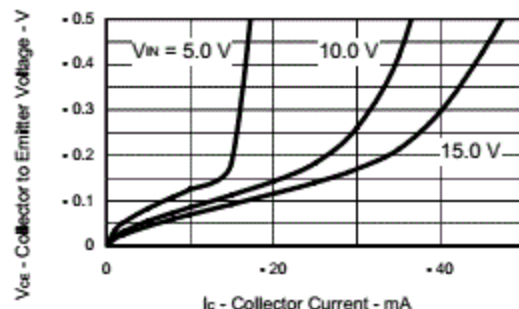


[FN4A4M]

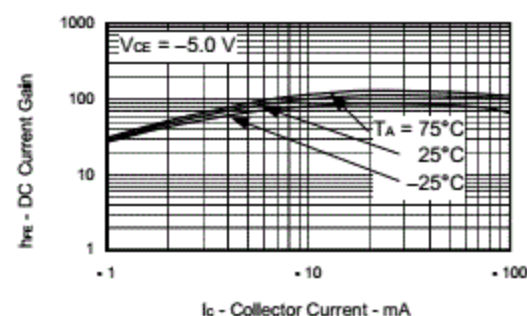
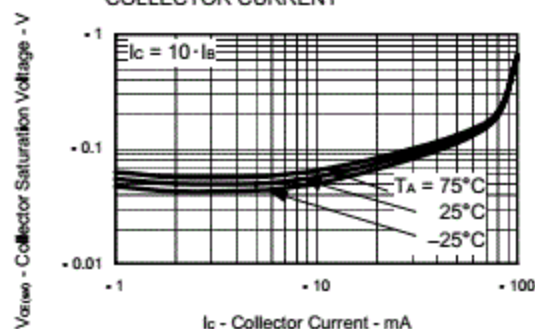
TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)



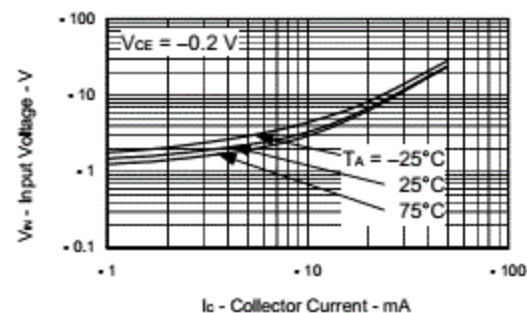
[FN4F4M]

TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)COLLECTOR CURRENT vs.
COLLECTOR TO EMITTER VOLTAGECOLLECTOR TO EMITTER VOLTAGE vs.
COLLECTOR CURRENT

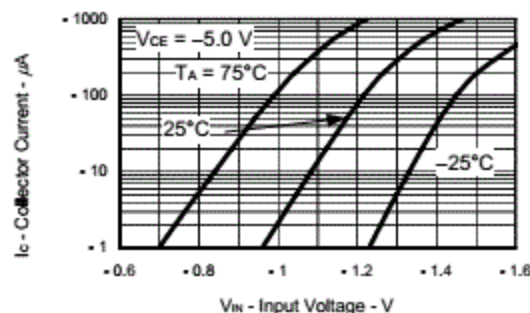
DC CURRENT GAIN vs. COLLECTOR CURRENT

COLLECTOR SATURATION VOLTAGE vs.
COLLECTOR CURRENT

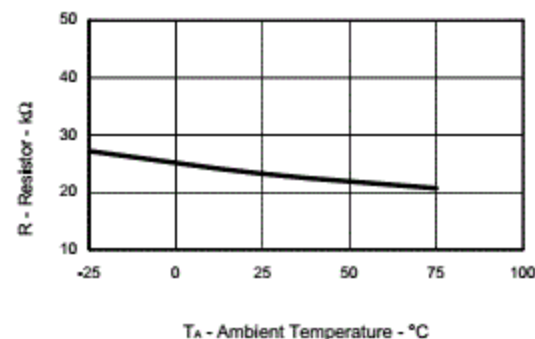
INPUT VOLTAGE vs. COLLECTOR CURRENT



COLLECTOR CURRENT vs. INPUT VOLTAGE

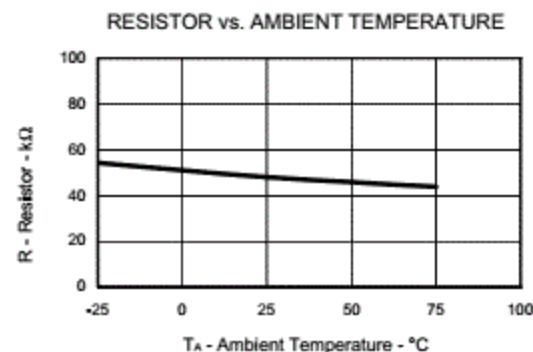
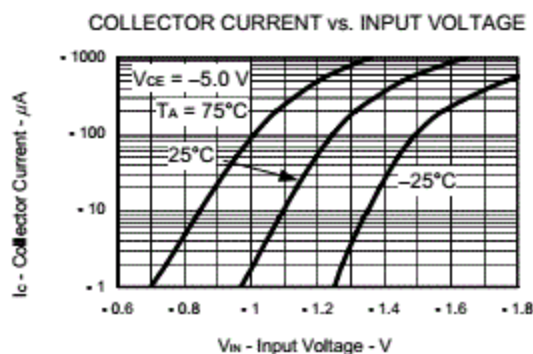
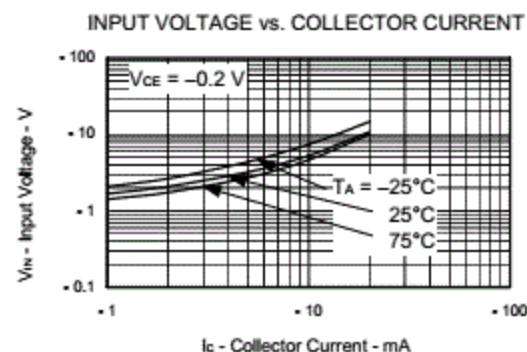
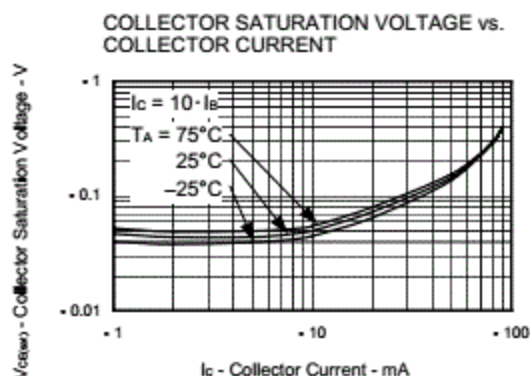
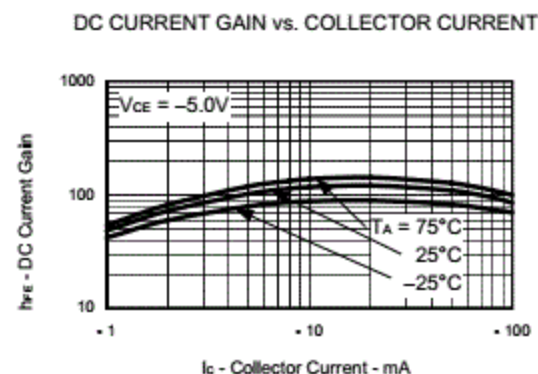
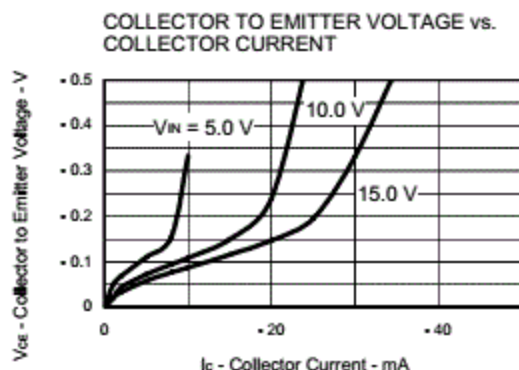
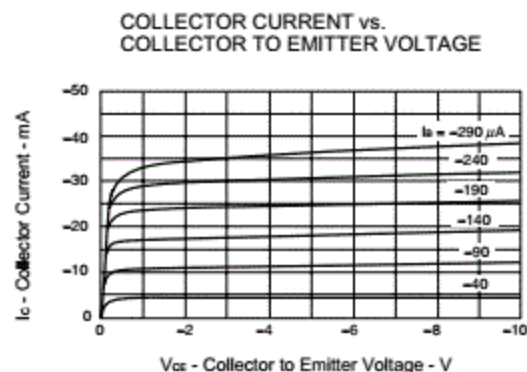


RESISTOR vs. AMBIENT TEMPERATURE



[FN4L4M]

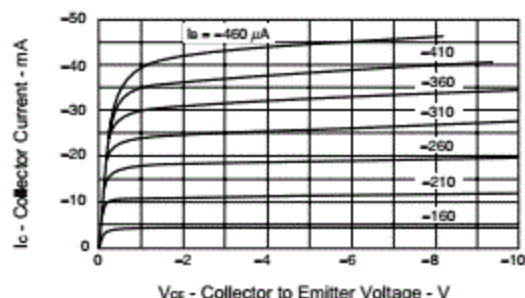
TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)



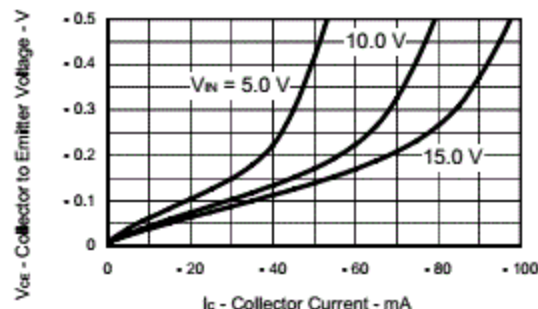
[FN4L3M]

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

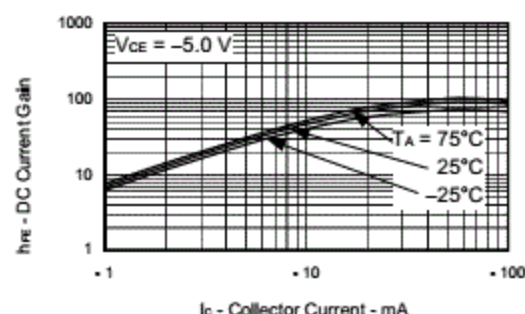
COLLECTOR CURRENT vs.
COLLECTOR TO EMITTER VOLTAGE



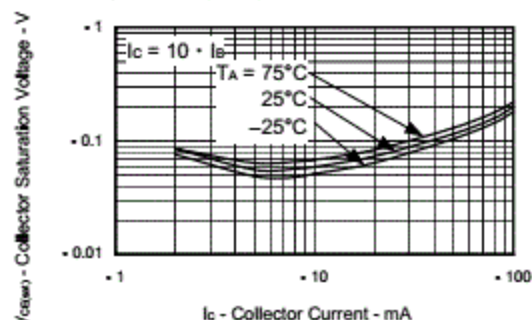
COLLECTOR TO EMITTER VOLTAGE vs.
COLLECTOR CURRENT



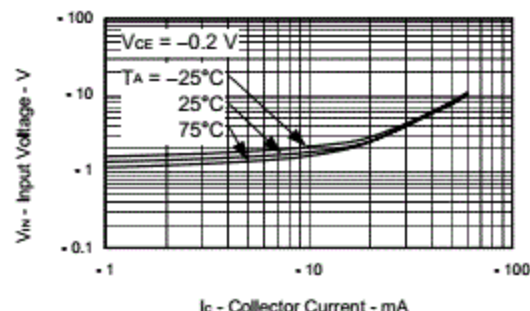
DC CURRENT GAIN vs. COLLECTOR CURRENT



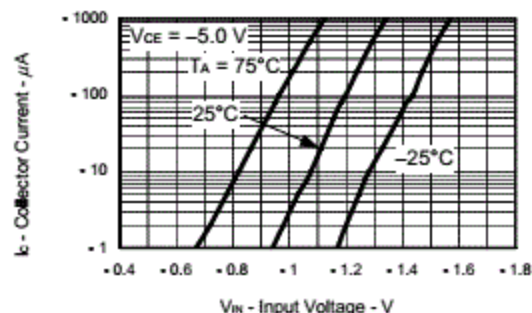
COLLECTOR SATURATION VOLTAGE vs.
COLLECTOR CURRENT



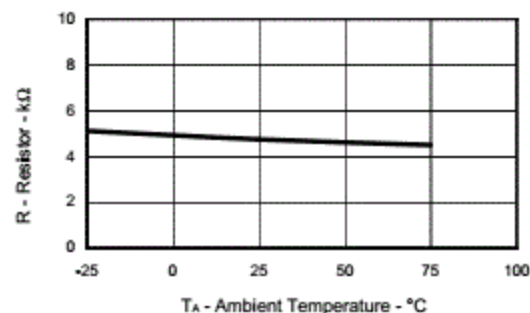
INPUT VOLTAGE vs. COLLECTOR CURRENT



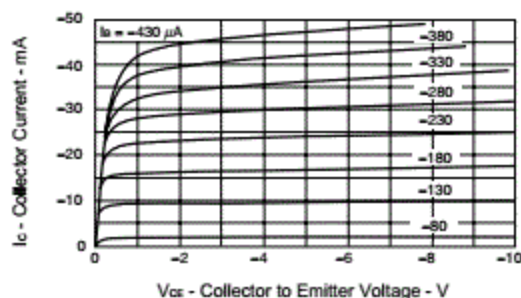
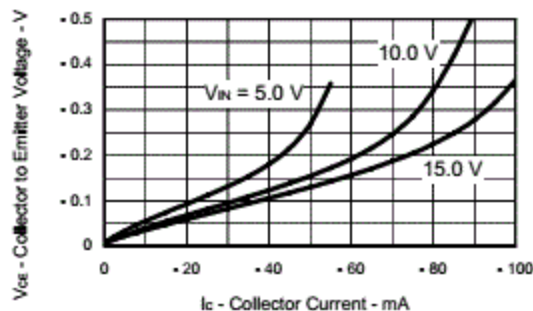
COLLECTOR CURRENT vs. INPUT VOLTAGE



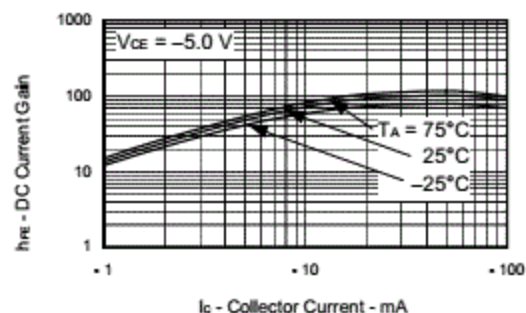
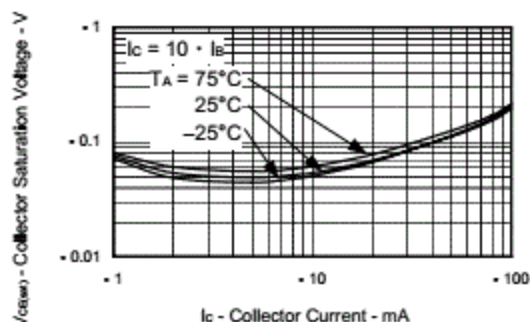
RESISTOR vs. AMBIENT TEMPERATURE



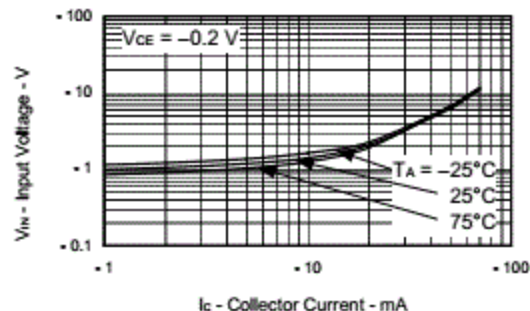
[FN4L3N]

TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)COLLECTOR CURRENT vs.
COLLECTOR TO EMITTER VOLTAGECOLLECTOR TO EMITTER VOLTAGE vs.
COLLECTOR CURRENT

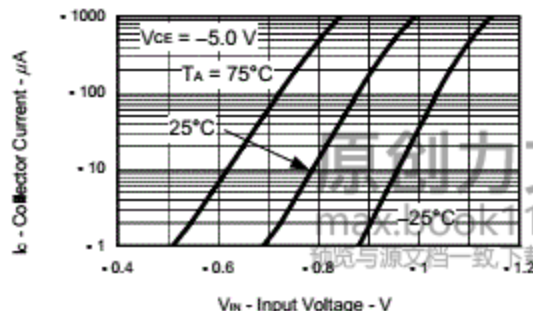
DC CURRENT GAIN vs. COLLECTOR CURRENT

COLLECTOR SATURATION VOLTAGE vs.
COLLECTOR CURRENT

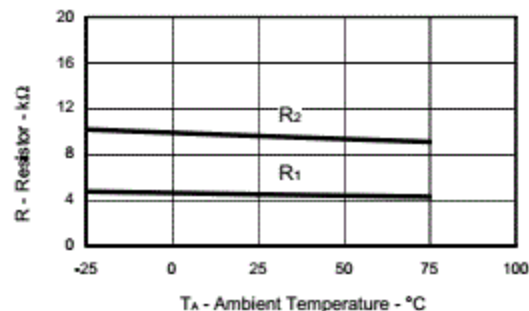
INPUT VOLTAGE vs. COLLECTOR CURRENT



COLLECTOR CURRENT vs. INPUT VOLTAGE

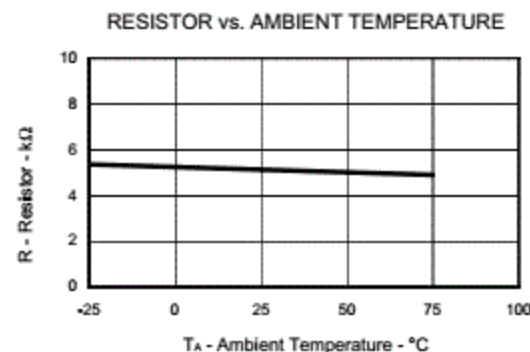
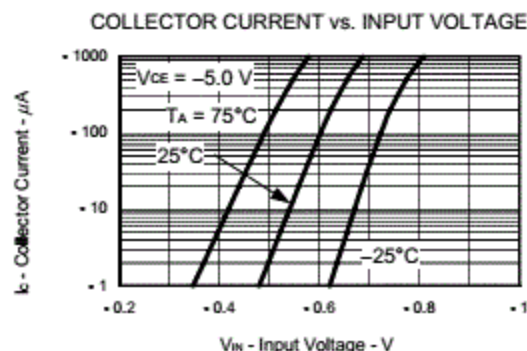
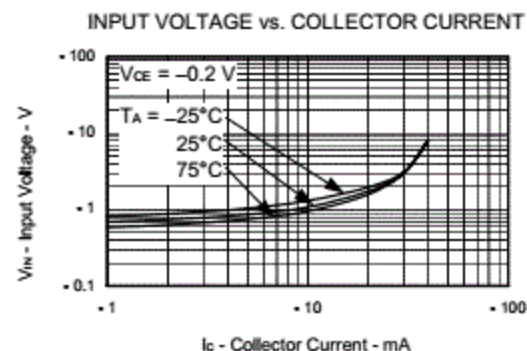
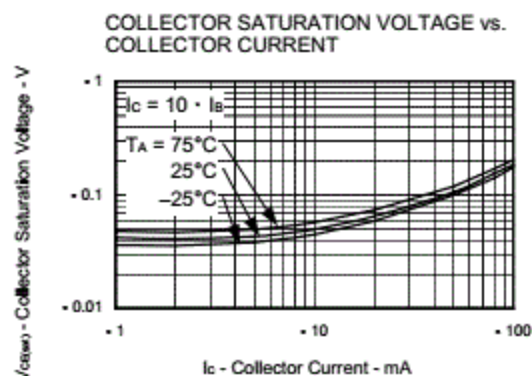
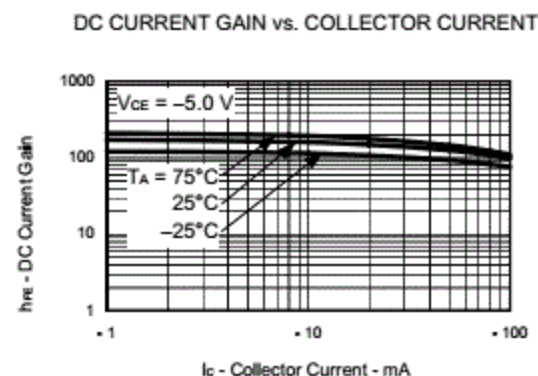
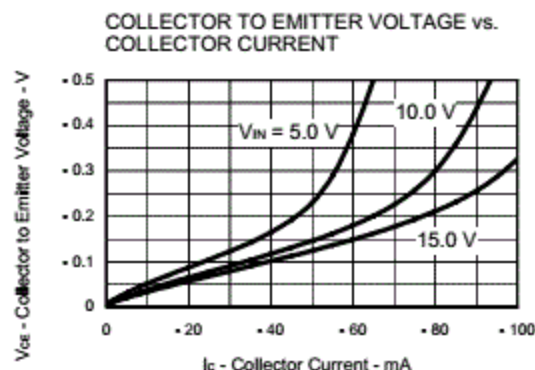
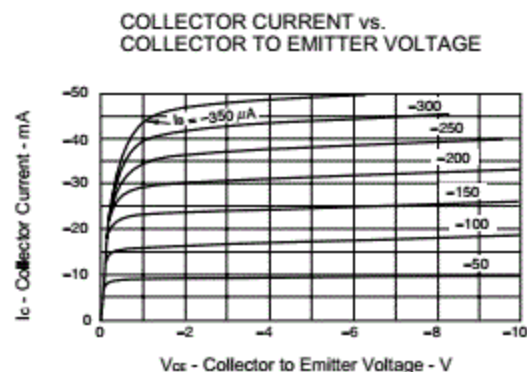


RESISTOR vs. AMBIENT TEMPERATURE



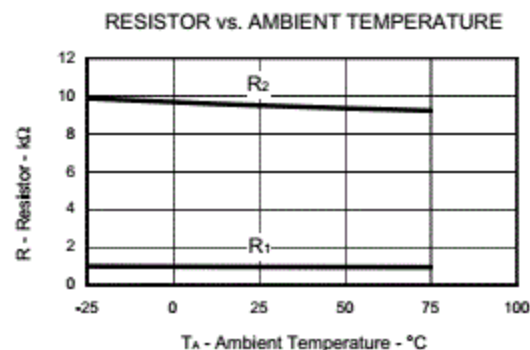
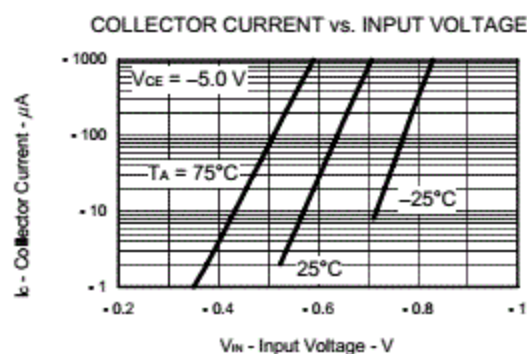
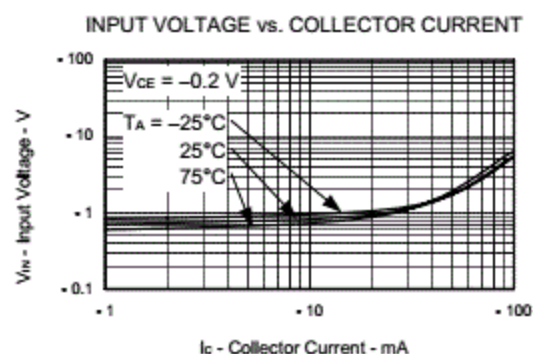
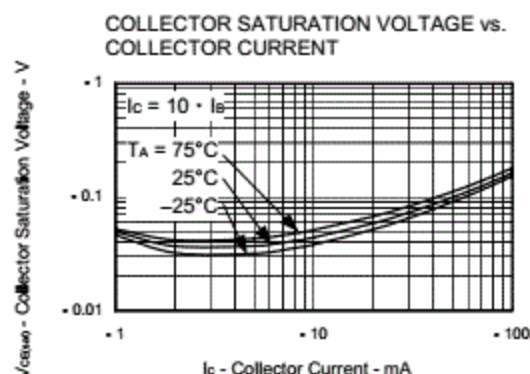
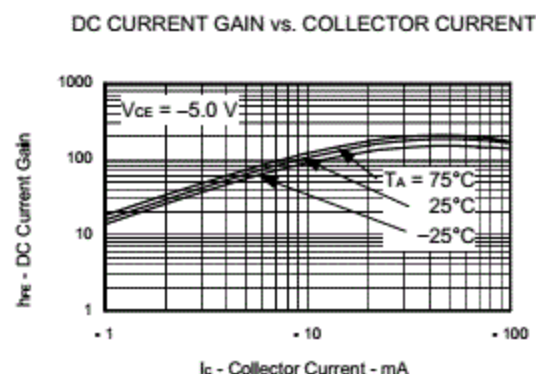
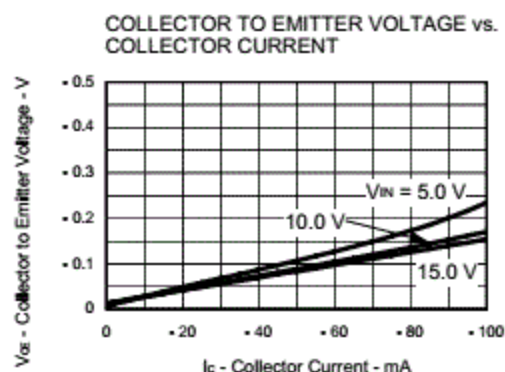
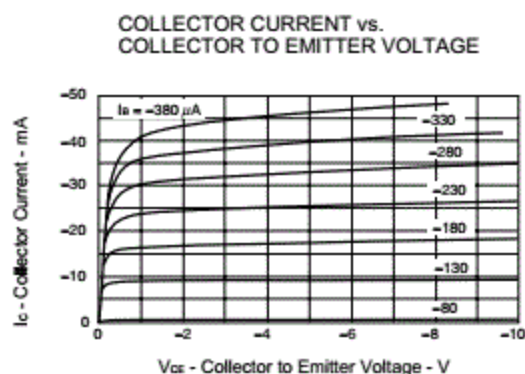
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TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)

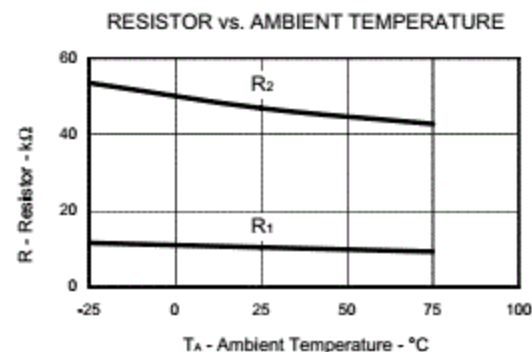
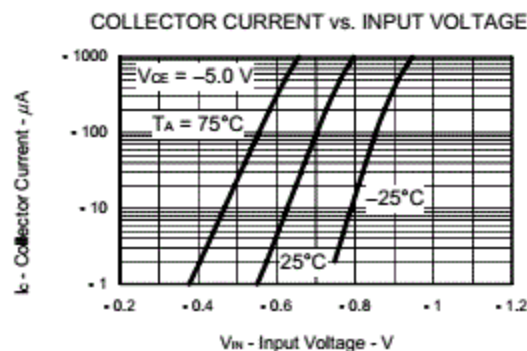
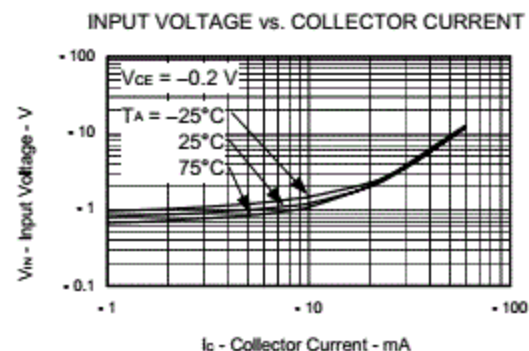
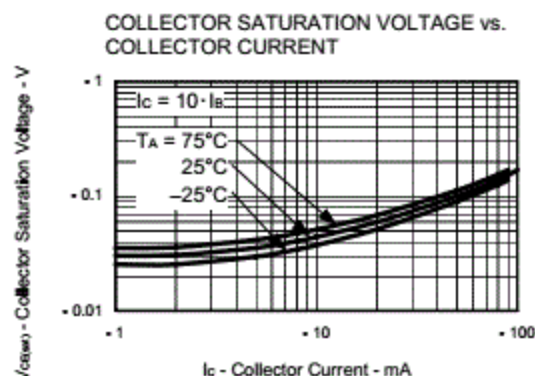
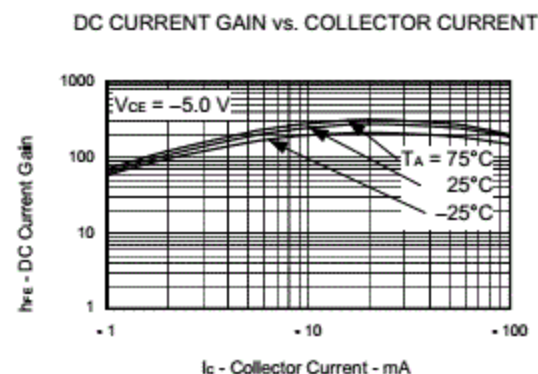
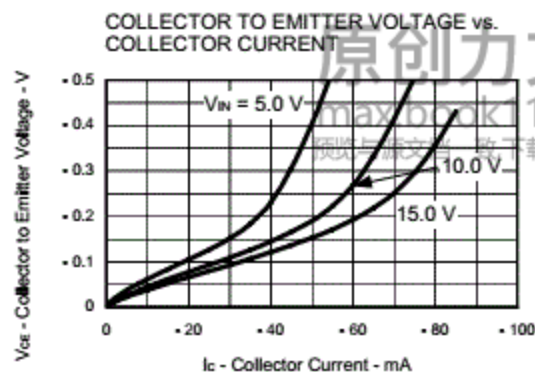
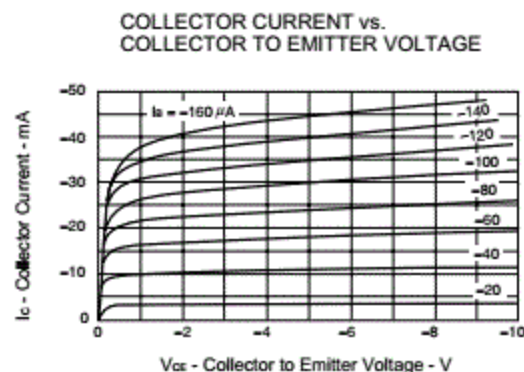


[FN4A3Q]

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



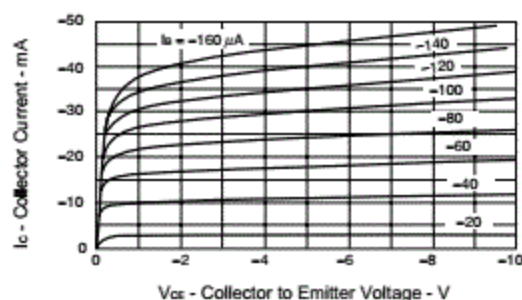
[FN4A4P]

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

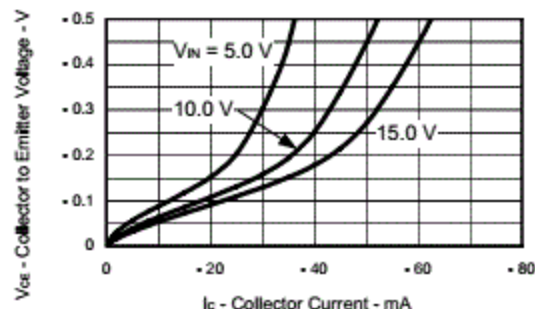
[FN4F4N]

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

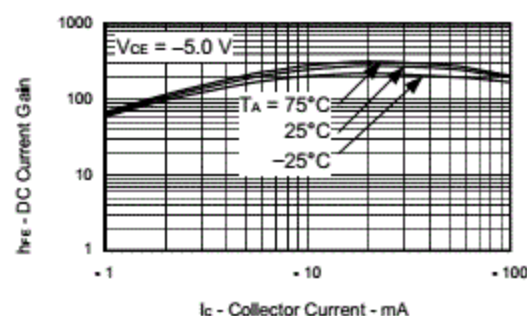
COLLECTOR CURRENT vs.
COLLECTOR TO EMITTER VOLTAGE



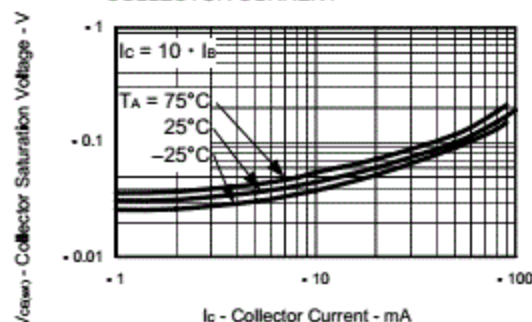
COLLECTOR TO EMITTER VOLTAGE vs.
COLLECTOR CURRENT



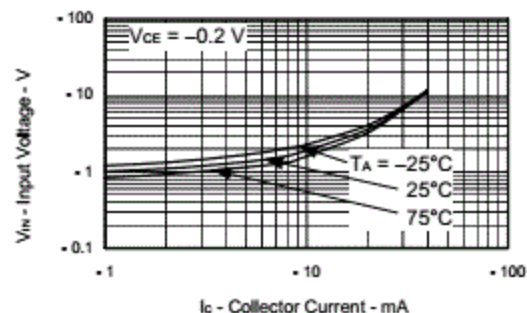
DC CURRENT GAIN vs. COLLECTOR CURRENT



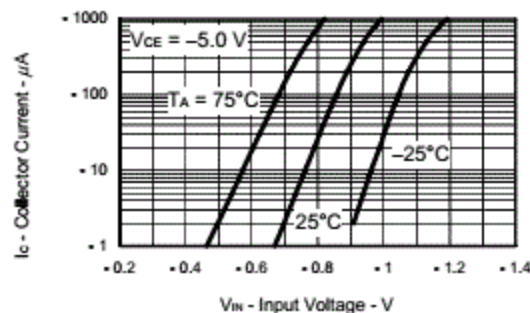
COLLECTOR SATURATION VOLTAGE vs.
COLLECTOR CURRENT



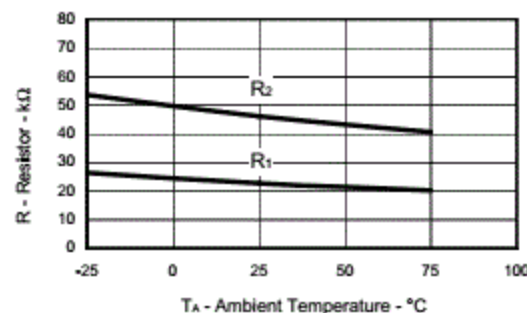
INPUT VOLTAGE vs. COLLECTOR CURRENT



COLLECTOR CURRENT vs. INPUT VOLTAGE



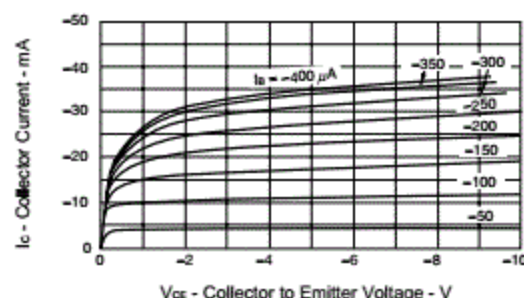
RESISTOR vs. AMBIENT TEMPERATURE



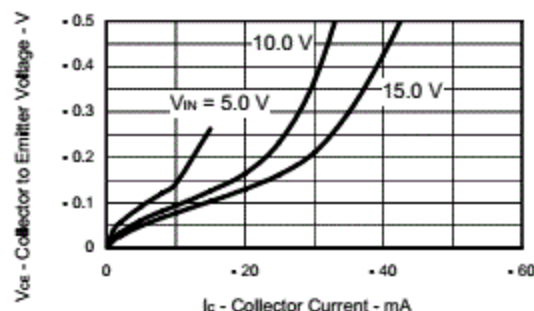
[FN4L4L]

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

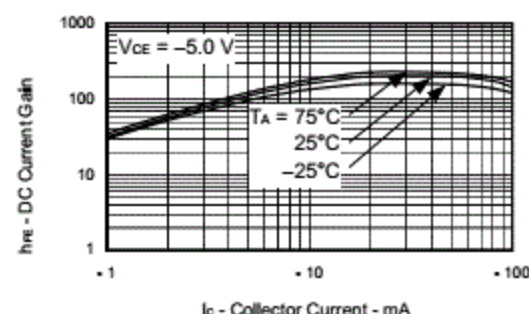
COLLECTOR CURRENT vs.
COLLECTOR TO EMITTER VOLTAGE



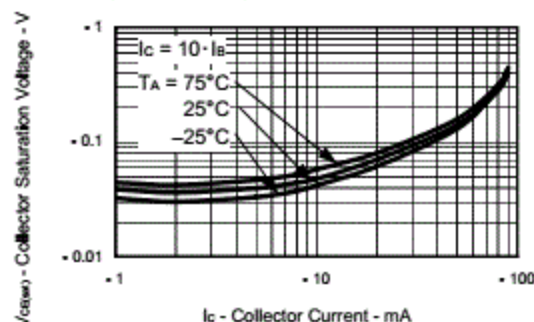
COLLECTOR TO EMITTER VOLTAGE vs.
COLLECTOR CURRENT



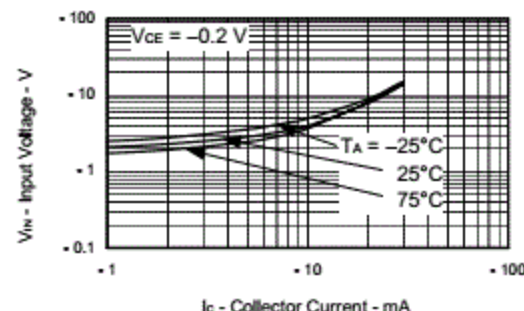
DC CURRENT GAIN vs. COLLECTOR CURRENT



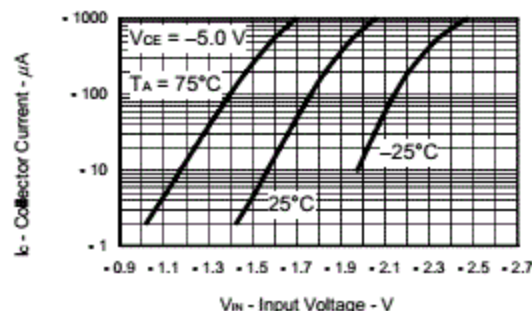
COLLECTOR SATURATION VOLTAGE vs.
COLLECTOR CURRENT



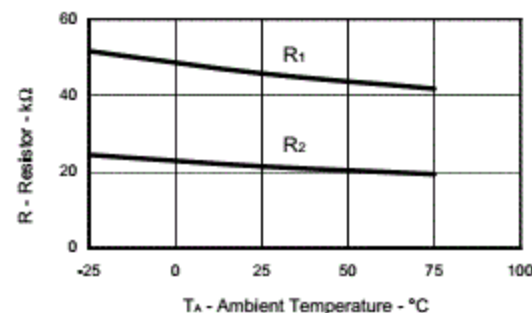
INPUT VOLTAGE vs. COLLECTOR CURRENT



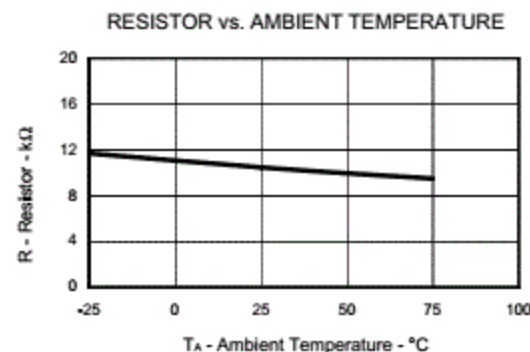
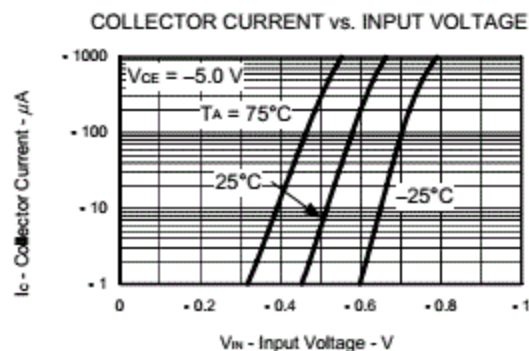
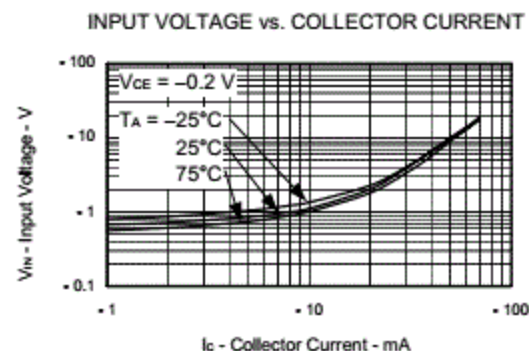
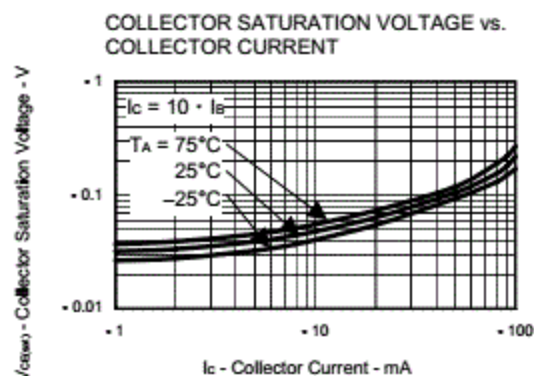
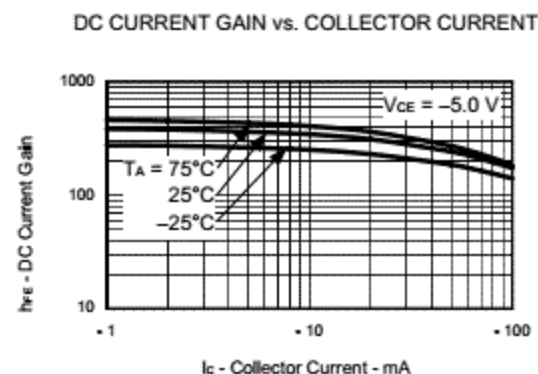
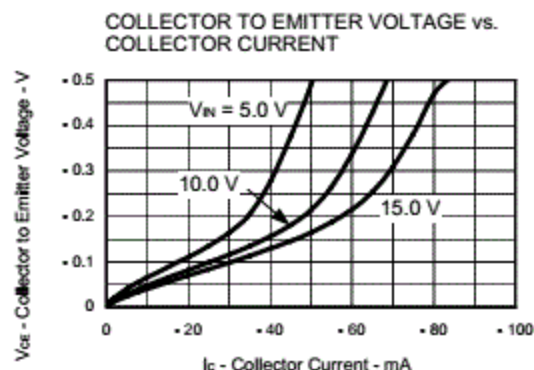
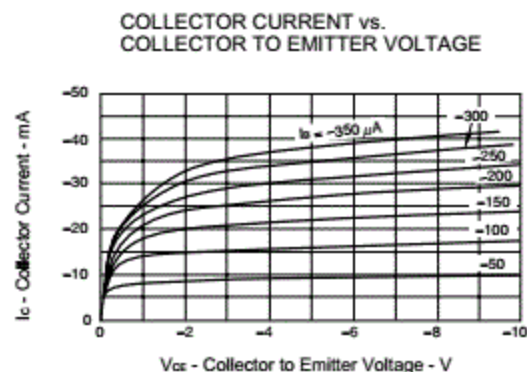
COLLECTOR CURRENT vs. INPUT VOLTAGE



RESISTOR vs. AMBIENT TEMPERATURE

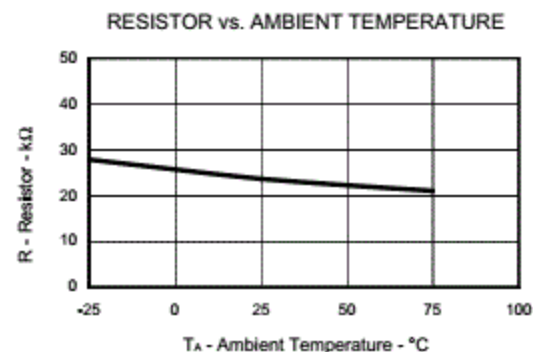
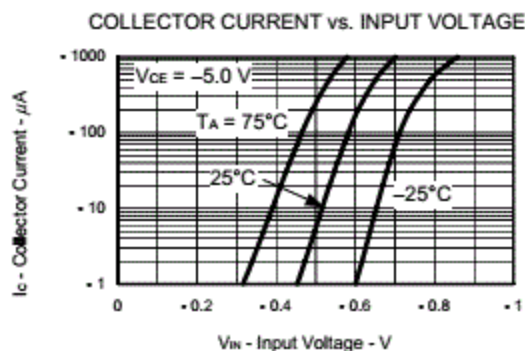
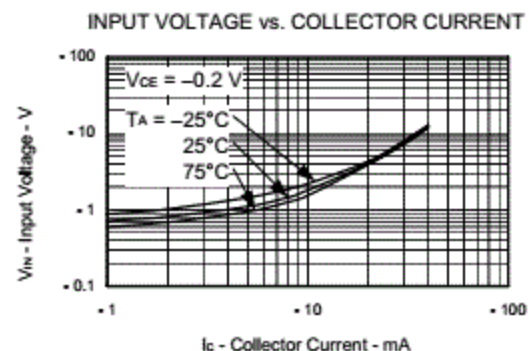
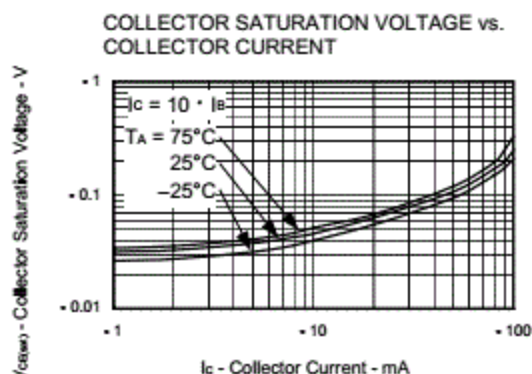
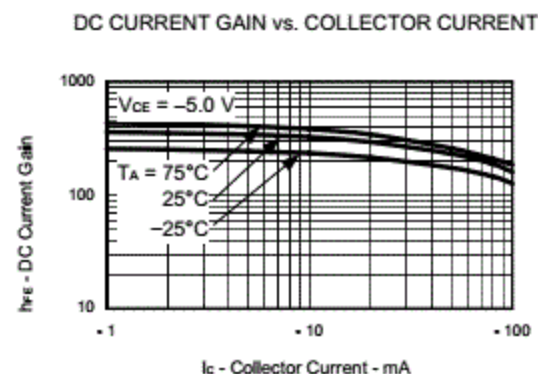
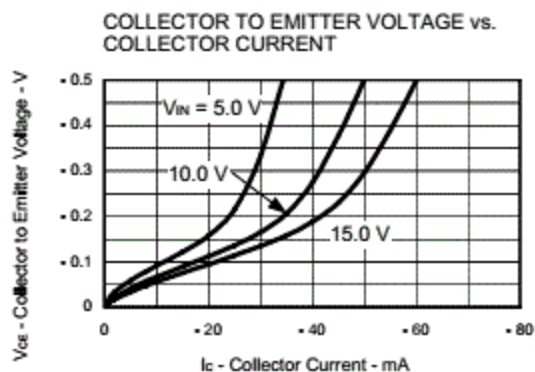
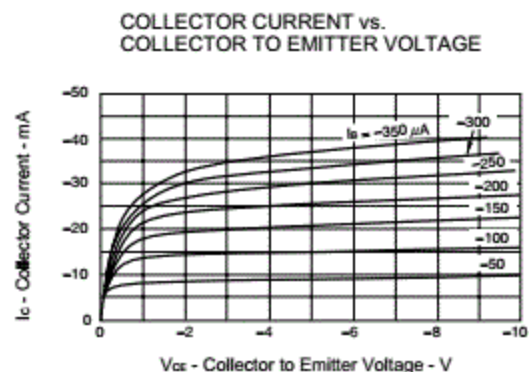


[FN4A4Z]

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

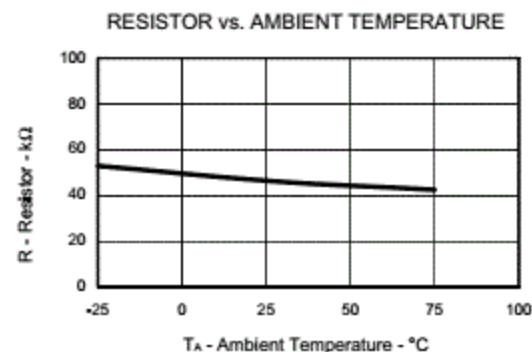
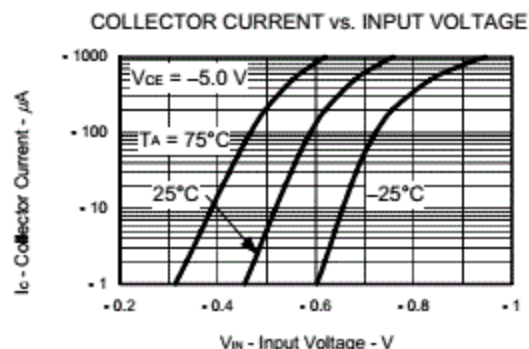
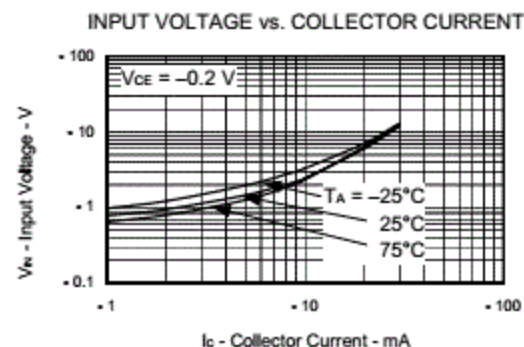
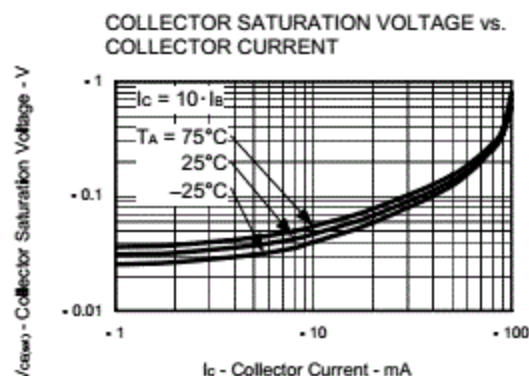
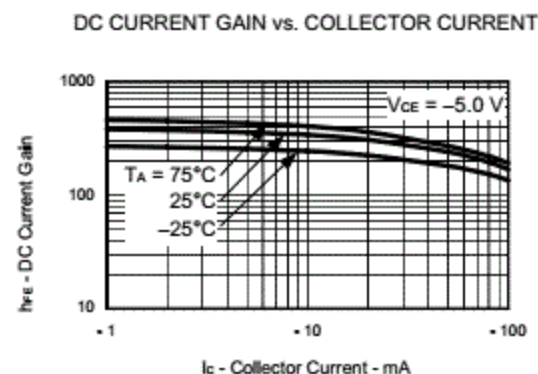
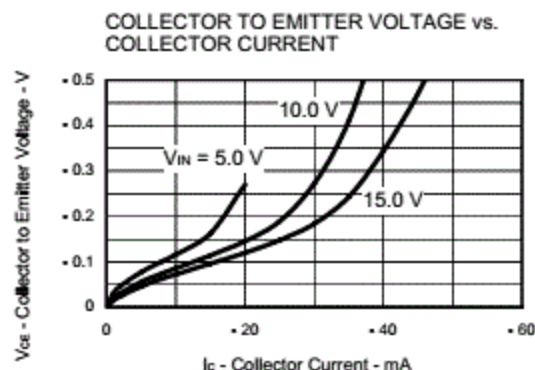
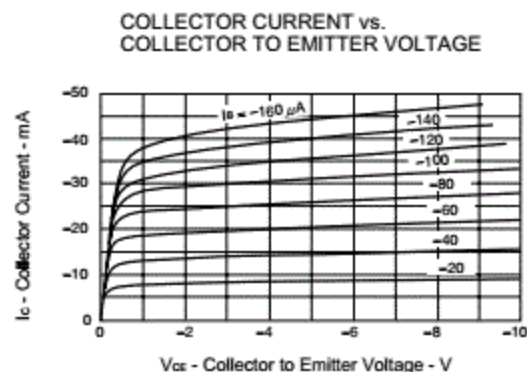
[FN4F4Z]

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

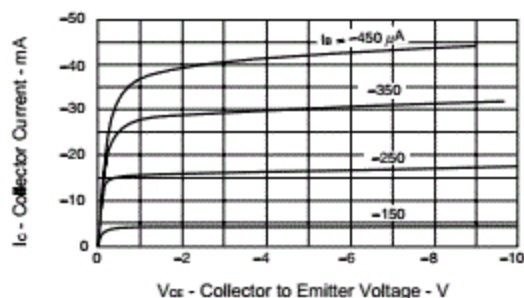
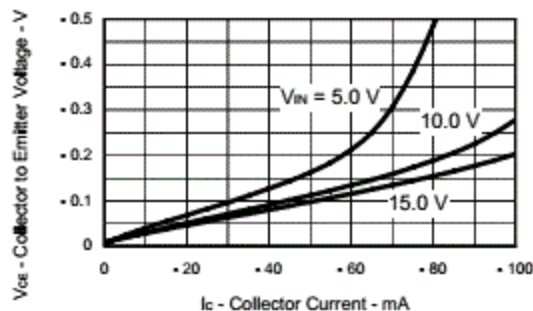


[FN4L4Z]

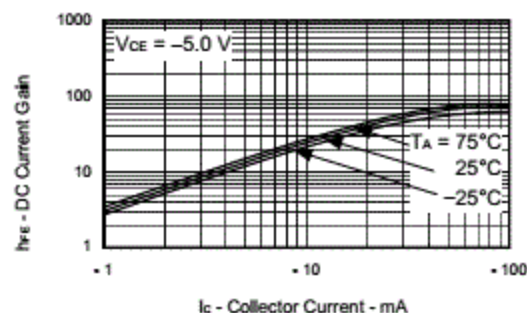
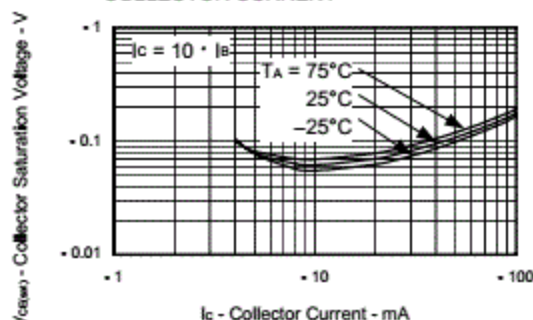
TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)



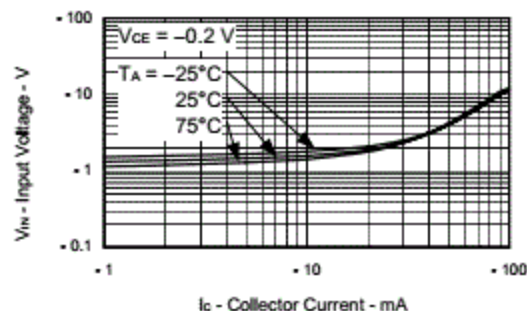
[FN4F3M]

TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)COLLECTOR CURRENT vs.
COLLECTOR TO EMITTER VOLTAGECOLLECTOR TO EMITTER VOLTAGE vs.
COLLECTOR CURRENT

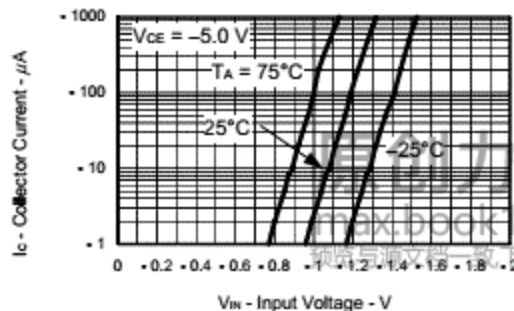
DC CURRENT GAIN vs. COLLECTOR CURRENT

COLLECTOR SATURATION VOLTAGE vs.
COLLECTOR CURRENT

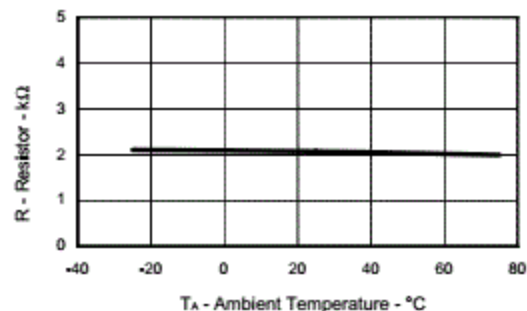
INPUT VOLTAGE vs. COLLECTOR CURRENT



COLLECTOR CURRENT vs. INPUT VOLTAGE

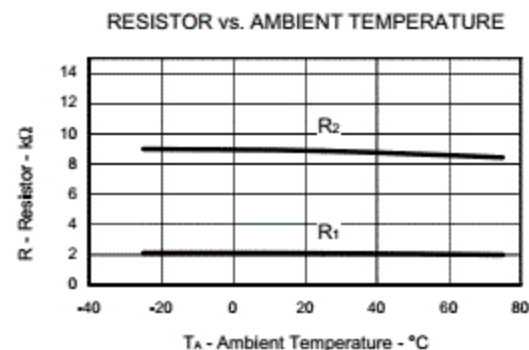
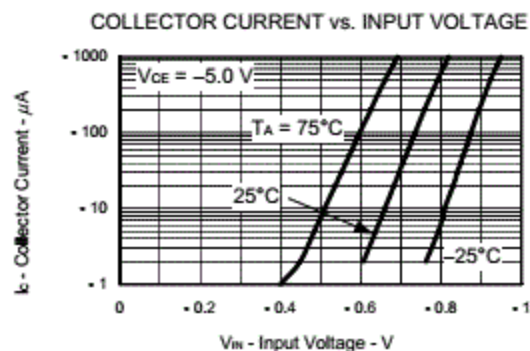
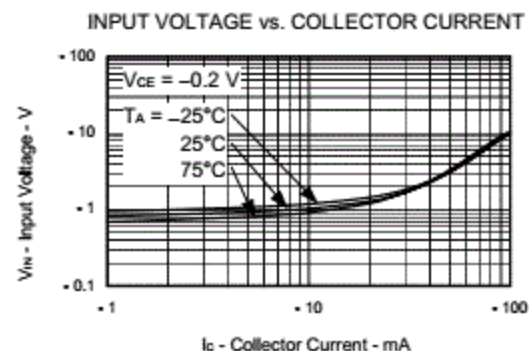
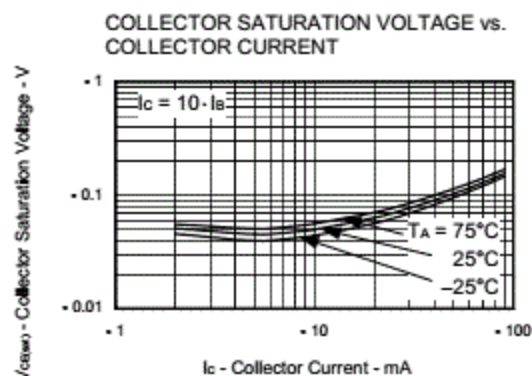
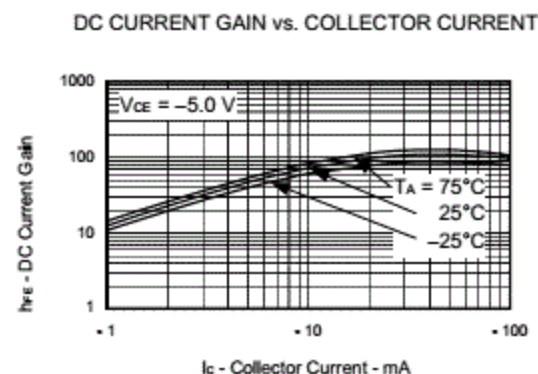
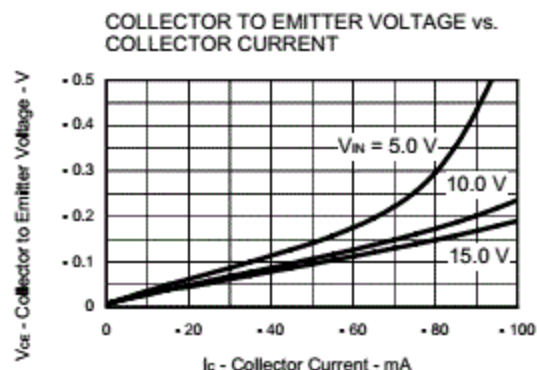
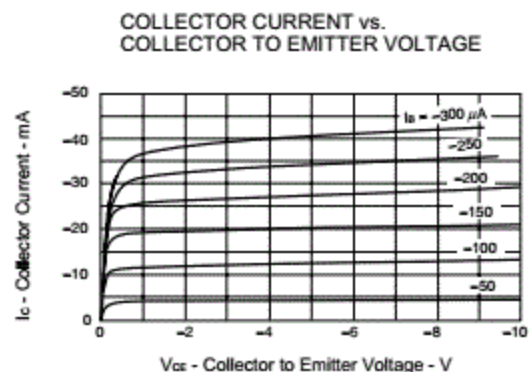


RESISTOR vs. AMBIENT TEMPERATURE



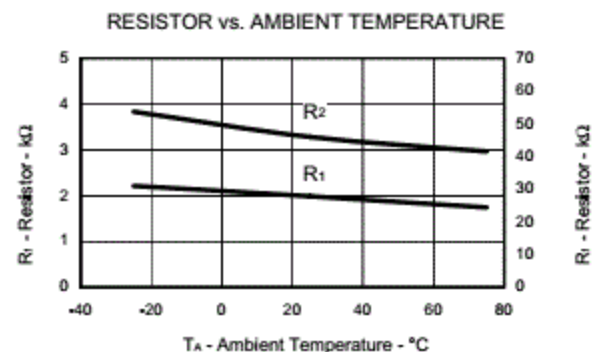
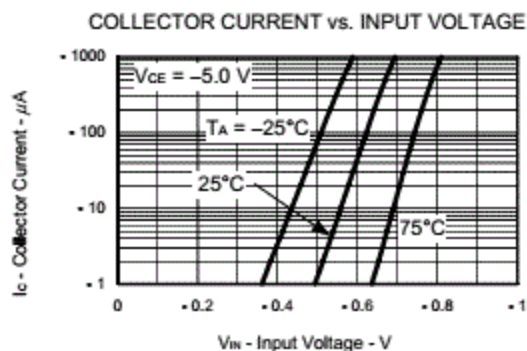
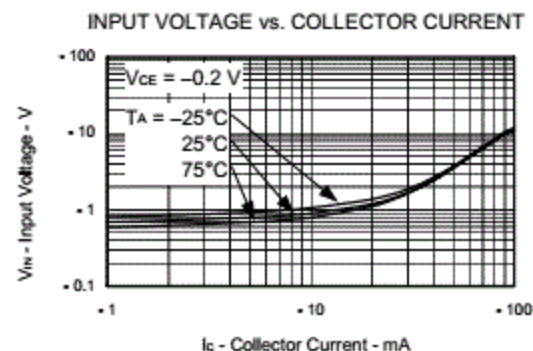
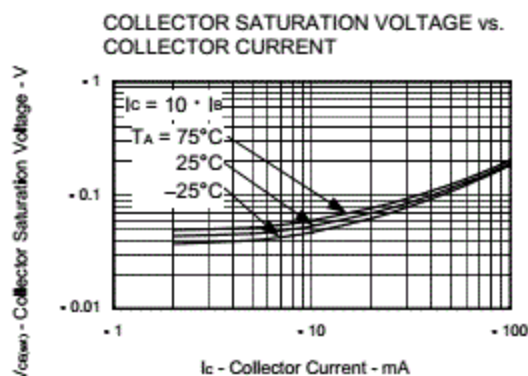
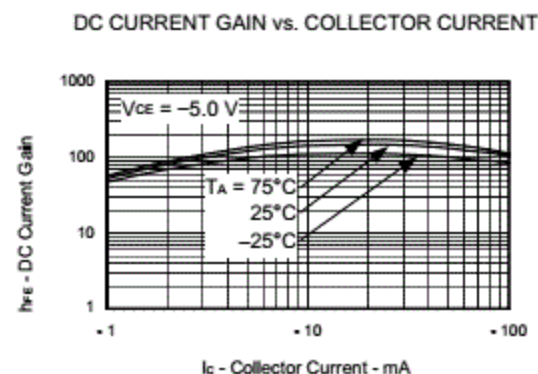
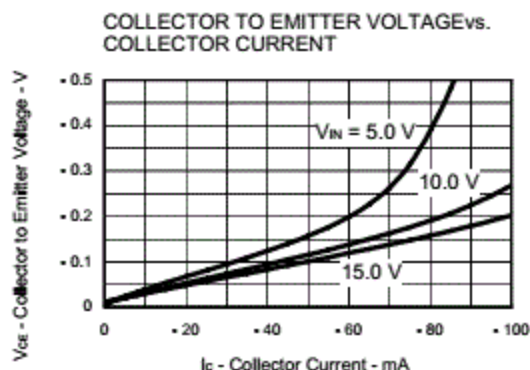
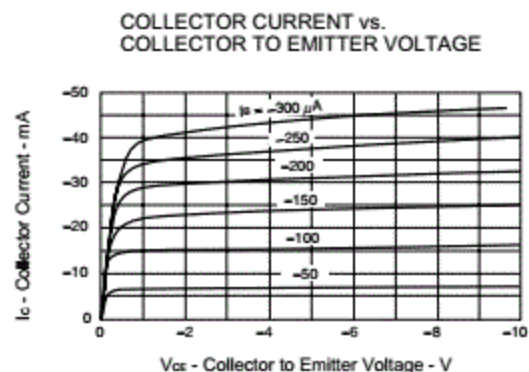
[FN4F3P]

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



[FN4F3R]

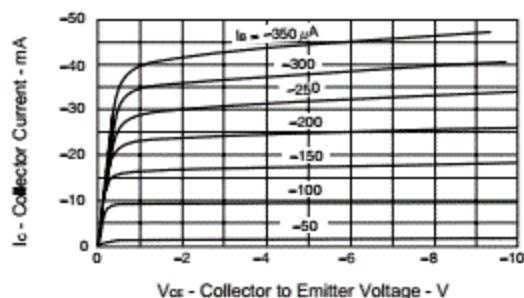
TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)



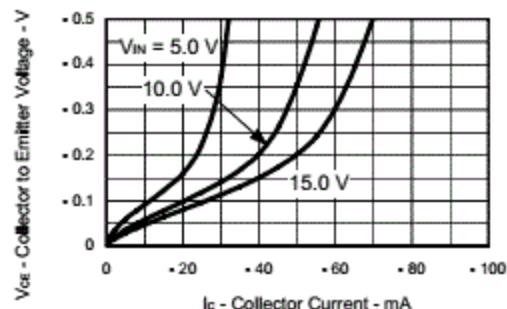
[FN4A4L]

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

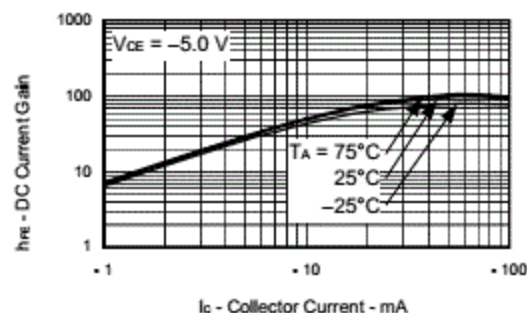
COLLECTOR CURRENT vs.
COLLECTOR TO EMITTER VOLTAGE



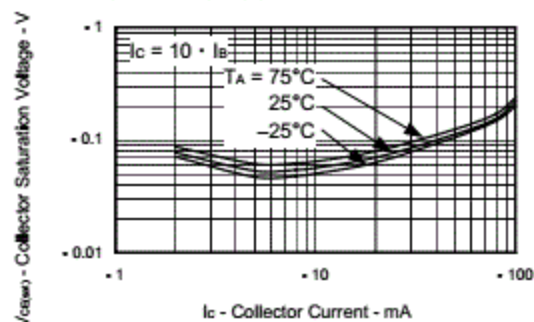
COLLECTOR TO EMITTER VOLTAGE vs.
COLLECTOR CURRENT



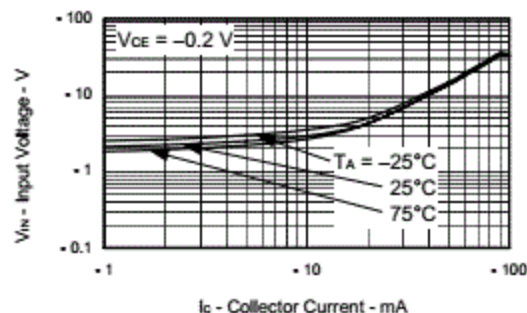
DC CURRENT GAIN vs. COLLECTOR CURRENT



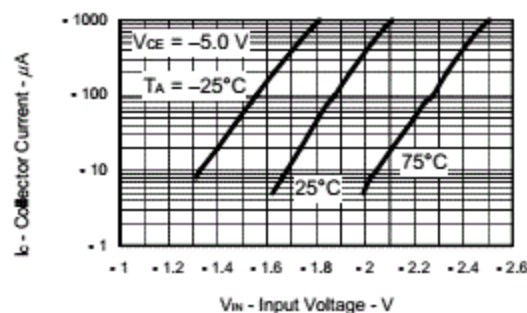
COLLECTOR SATURATION VOLTAGE vs.
COLLECTOR CURRENT



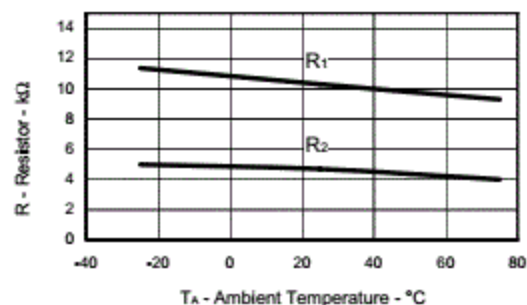
INPUT VOLTAGE vs. COLLECTOR CURRENT



COLLECTOR CURRENT vs. INPUT VOLTAGE

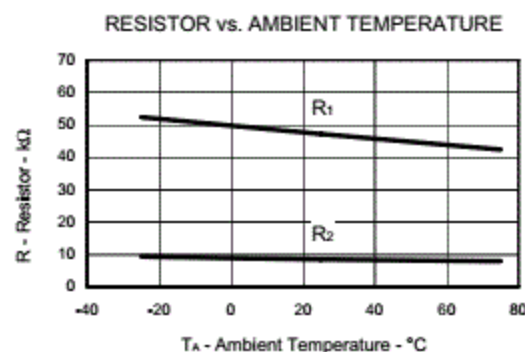
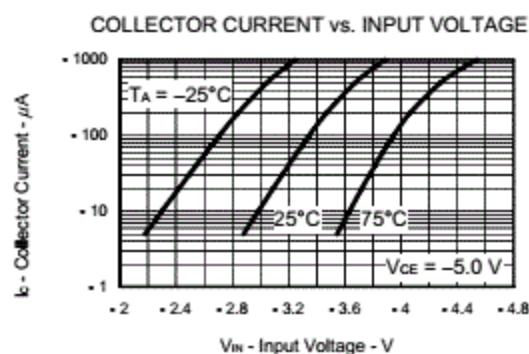
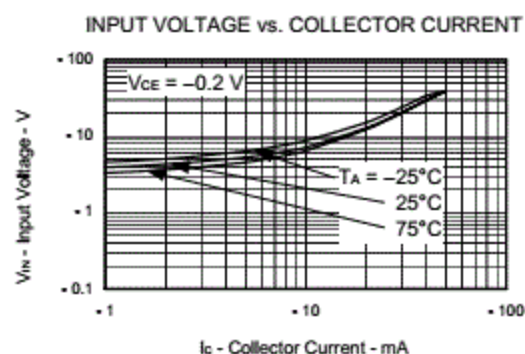
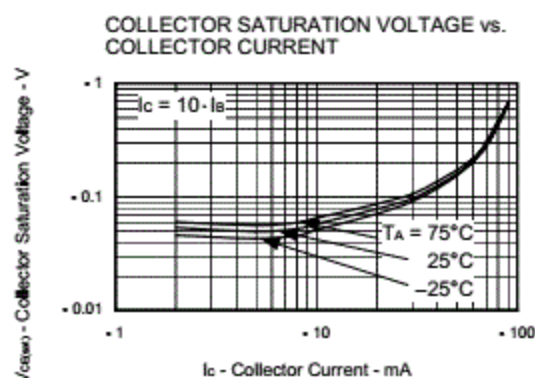
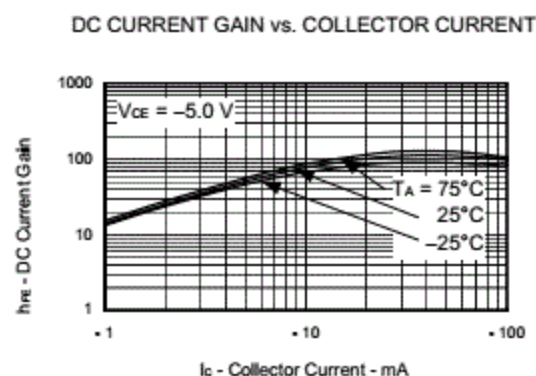
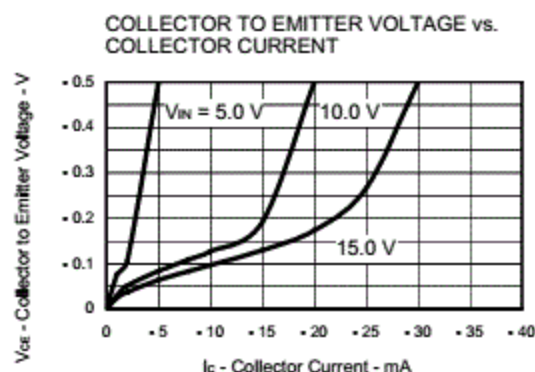
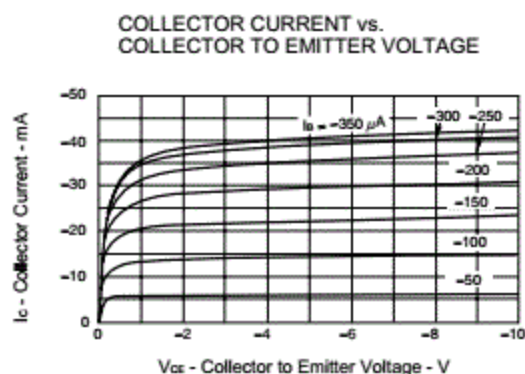


RESISTOR vs. AMBIENT TEMPERATURE



[FN4L4K]

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



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