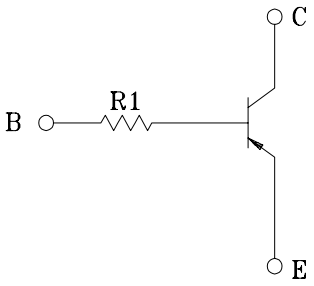
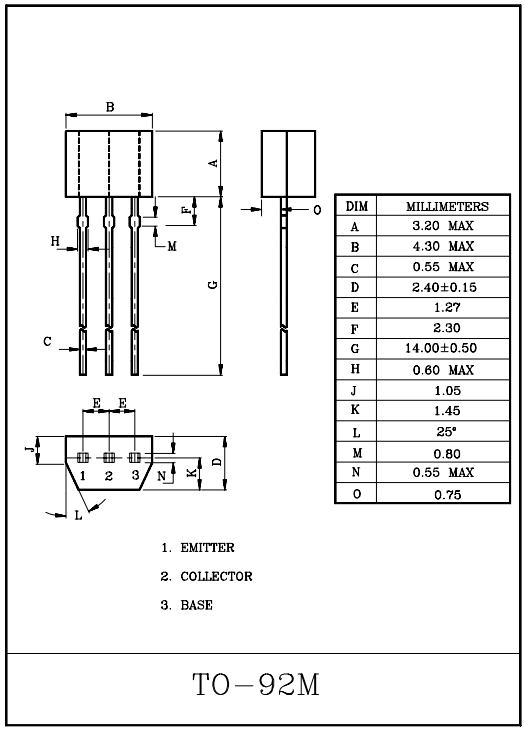
SWITCHING APPLICATION.
INTERFACE CIRCUIT AND DRIVER CIRCUIT APPLICATION.

FEATURES
- With Built-in Bias Resistors.
- Simplify Circuit Design.
- Reduce a Quantity of Parts and Manufacturing Process.

EQUIVALENT CIRCUIT





DIM	MILLIMETERS
A	3.20 MAX
B	4.30 MAX
C	0.55 MAX
D	2.40±0.15
E	1.27
F	2.30
G	14.00±0.50
H	0.60 MAX
J	1.05
K	1.45
L	25°
M	0.80
N	0.55 MAX
O	0.75

TO-92M

MAXIMUM RATINGS (Ta=25℃)

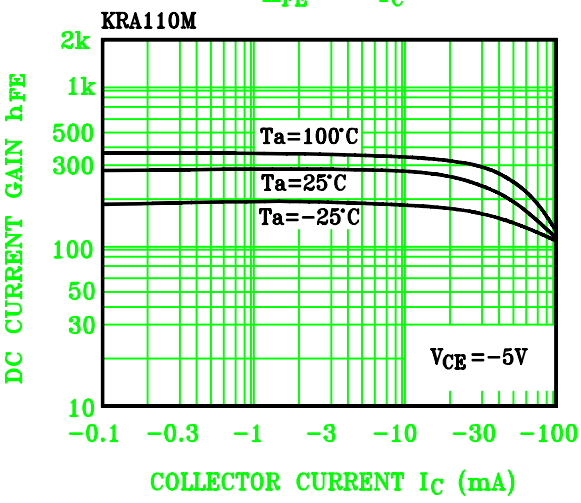
CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	V_{CBO}	-50	V
Collector-Emitter Voltage	V_{CEO}	-50	V
Emitter-Base Voltage	V_{EBO}	-5	V
Collector Current	I_C	-100	mA
Collector Power Dissipation	P_C	400	mW
Junction Temperature	T_j	150	℃
Storage Temperature Range	T_{stg}	-55~150	℃

ELECTRICAL CHARACTERISTICS (Ta=25℃)

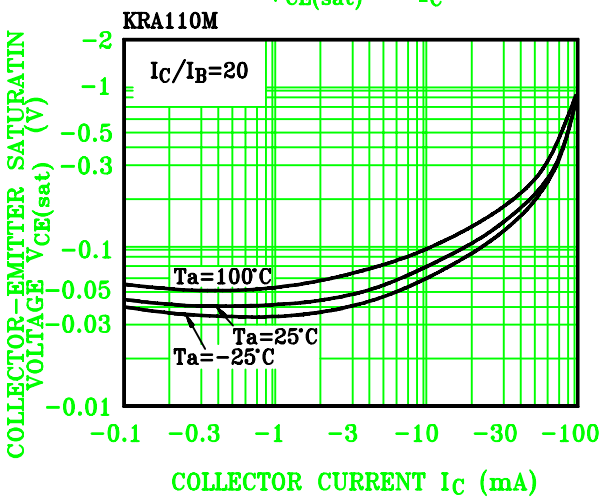
CHARACTERISTIC			SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current			I_{CBO}	V_{CB}=-50V, I_E=0	-	-	-100	nA
Emitter Cut-off Current			I_{EBO}	V_{EB}=-5V, I_C=0	-	-	-100	nA
DC Current Gain			h_{FE}	V_{CE}=-5V, I_C=-1mA	120	-	-	
Collector-Emitter Saturation Voltage			$V_{CE(sat)}$	I_C=-10mA, I_B=-0.5mA	-	-0.1	-0.3	V
Transition Frequency			f_T *	V_{CE}=-10V, I_C=-5mA	-	250	-	MHz
Input Resistor		KRA110M	R_1		-	4.7	-	kΩ
		KRA111M			-	10	-	
		KRA112M			-	100	-	
		KRA113M			-	22	-	
		KRA114M			-	47	-	
Switching Time	Rise Time	KRA110M	t_r	V_O=-5V V_{IN}=-5V R_L=1kΩ	-	0.2	-	μS
		KRA111M			-	0.065	-	
		KRA112M			-	0.4	-	
		KRA113M			-	0.1	-	
		KRA114M			-	0.15		
	Storage Time	KRA110M	t_{stg}		-	2.0	-	
		KRA111M			-	1.7	-	
		KRA112M			-	3.0	-	
		KRA113M			-	2.0	-	
		KRA114M			-	1.5	-	
	Fall Time	KRA110M	t_f		-	0.3	-	
		KRA111M			-	0.3	-	
		KRA112M			-	1.7	-	
		KRA113M			-	0.8	-	
		KRA114M			-	1.5	-	

Note; * Characteristic of Tranistor Only

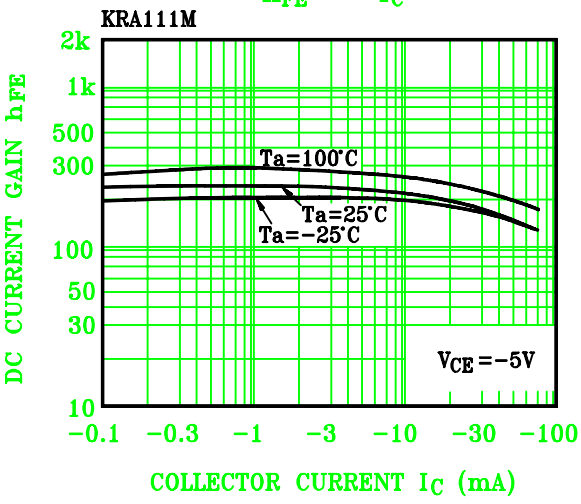
h_{FE} – I_C



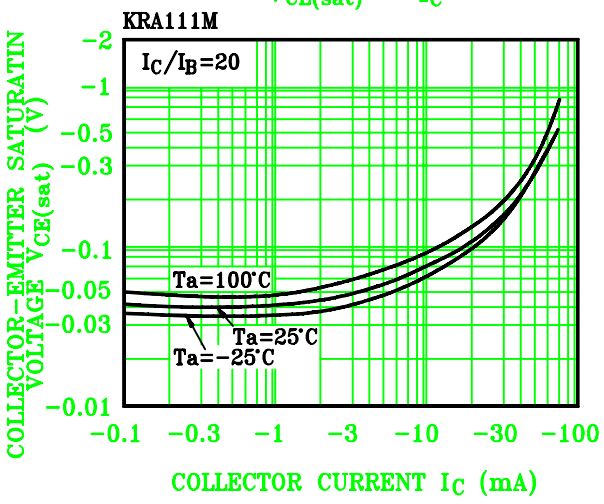
$V_{CE(sat)}$ – I_C



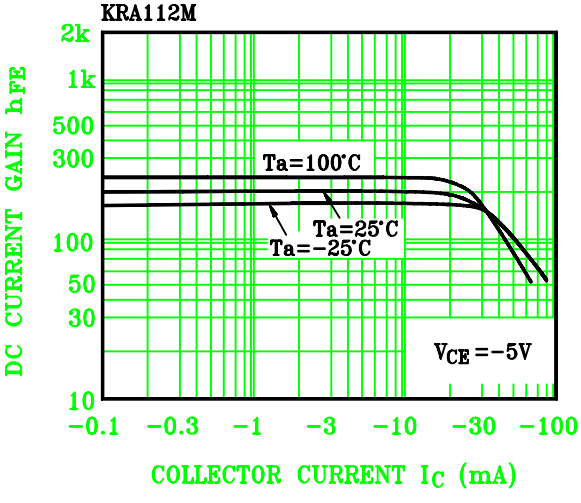
h_{FE} – I_C



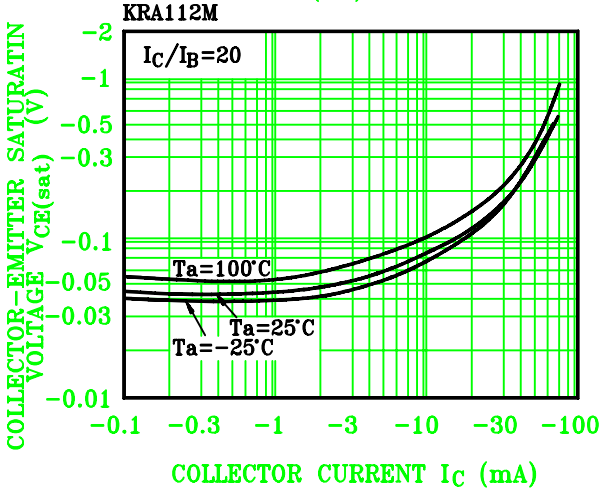
$V_{CE(sat)}$ – I_C

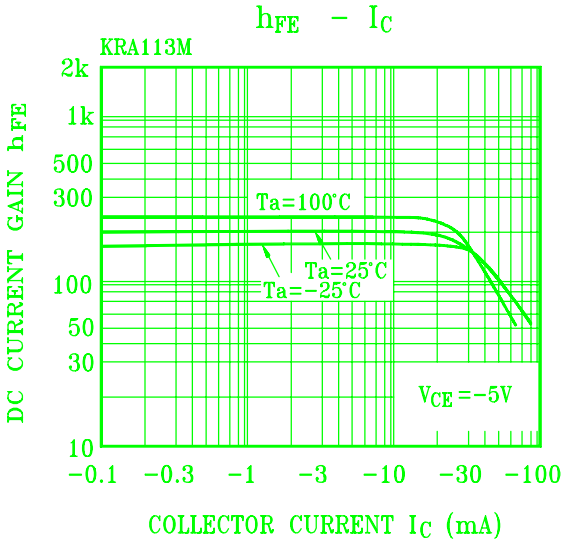


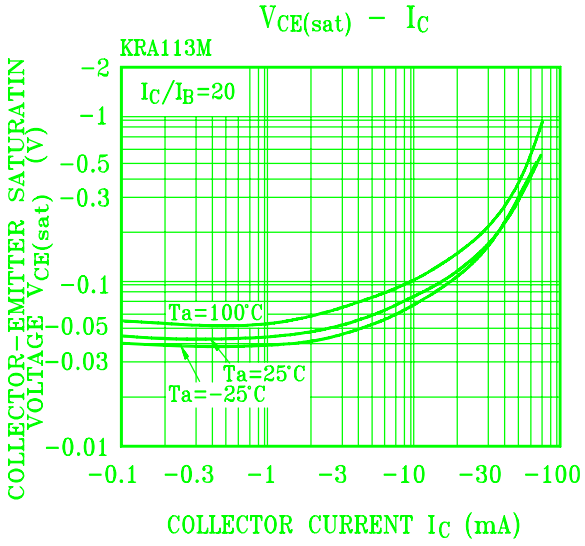
h_{FE} – I_C

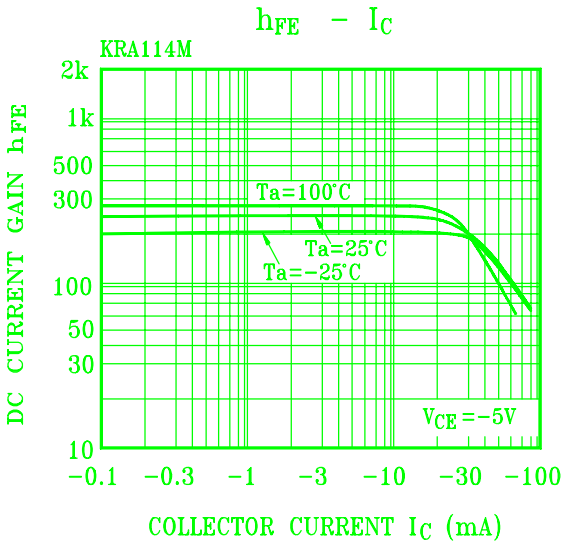


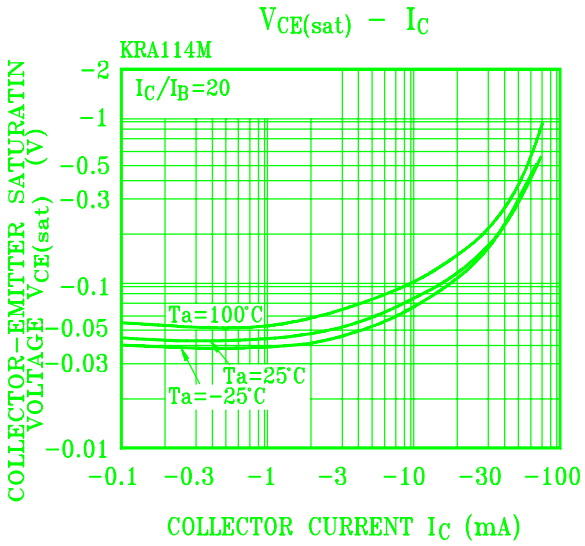
$V_{CE(sat)}$ – I_C




h_{FE} - I_C
KRA113M
DC CURRENT GAIN h_{FE}
2k
1k
500
300
100
50
30
10
Ta=100°C
Ta=25°C
Ta=-25°C
V_{CE}=-5V
-0.1 -0.3 -1 -3 -10 -30 -100
COLLECTOR CURRENT I_C (mA)


$V_{CE(sat)}$ - I_C
KRA113M
I_C/I_B=20
COLLECTOR-EMITTER SATURATION VOLTAGE $V_{CE(sat)}$ (V)
-2
-1
-0.5
-0.3
-0.1
-0.05
-0.03
-0.01
Ta=100°C
Ta=25°C
Ta=-25°C
-0.1 -0.3 -1 -3 -10 -30 -100
COLLECTOR CURRENT I_C (mA)


h_{FE} - I_C
KRA114M
DC CURRENT GAIN h_{FE}
2k
1k
500
300
100
50
30
10
Ta=100°C
Ta=25°C
Ta=-25°C
V_{CE}=-5V
-0.1 -0.3 -1 -3 -10 -30 -100
COLLECTOR CURRENT I_C (mA)


$V_{CE(sat)}$ - I_C
KRA114M
I_C/I_B=20
COLLECTOR-EMITTER SATURATION VOLTAGE $V_{CE(sat)}$ (V)
-2
-1
-0.5
-0.3
-0.1
-0.05
-0.03
-0.01
Ta=100°C
Ta=25°C
Ta=-25°C
-0.1 -0.3 -1 -3 -10 -30 -100
COLLECTOR CURRENT I_C (mA)