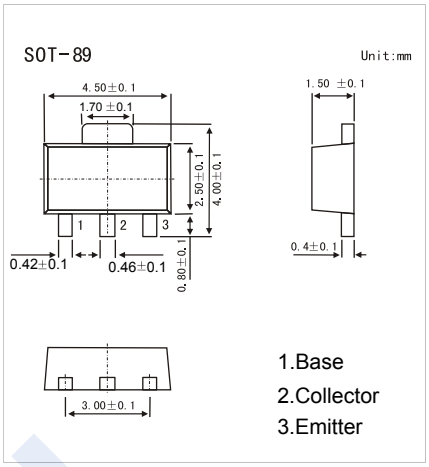
PNP Transistors

2SA1415



■ Features

- Adoption of FBET Process
- High Breakdown Voltage (V_{CEO} = 160V)
- Excellent Linearlity of h_{FE} and Small C_{ob}
- Fast Switching Speed
- Complementary to 2SC3645

■ Absolute Maximum Ratings Ta = 25℃

Parameter	Symbol	Rating	Unit
Collector - Base Voltage	V_{CBO}	-180	V
Collector - Emitter Voltage	V_{CEO}	-160	
Emitter - Base Voltage	V_{EBO}	-5	
Collector Current - Continuous	I_C	-140	mA
Collector Current - Pulsed	I_{CP}	-200	
Collector Power Dissipation	P_C	500	mW
Junction Temperature	T_J	150	℃
Storage Temperature range	T_{stg}	-55 to 150	

■ Electrical Characteristics Ta = 25℃

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector- base breakdown voltage	V_{CBO}	I_C= -100 μA, I_E=0	-180			V
Collector- emitter breakdown voltage	V_{CEO}	I_C= -1 mA, I_B=0	-160			
Emitter - base breakdown voltage	V_{EBO}	I_E= -100 μ A, I_C=0	-5			
Collector-base cut-off current	I_{CBO}	V_{CB}= -80 V , I_E=0			-0.1	uA
Emitter cut-off current	I_{EBO}	V_{EB}= -4V , I_C=0			-0.1	
Collector-emitter saturation voltage	$V_{CE(sat)}$	I_C=-50mA, I_B=- 5mA		-0.14	-0.4	V
Base - emitter saturation voltage	$V_{BE(sat)}$	I_C=-50mA, I_B=- 5mA			-1.2	
DC current gain	h_{FE}	V_{CE}= -5V, I_C= -10mA	100		400	
Turn-on time	t_{on}	See Test Circuit.		0.1		us
Storage time	t_s			0.15		
Fall time	t_f			0.1		
Output capacitance	C_{ob}	V_{CB}= -10V, I_E= 0,f =1MHz		4		pF
Transition frequency	f_T	V_{CE}= -10V, I_E= -10mA		150		MHz

■ Classification of h_{fe}

Type	2SA1415-R	2SA1415-S	2SA1415-T
Range	100-200	140-280	200-400
Marking	AAR*	AAS*	AAT*

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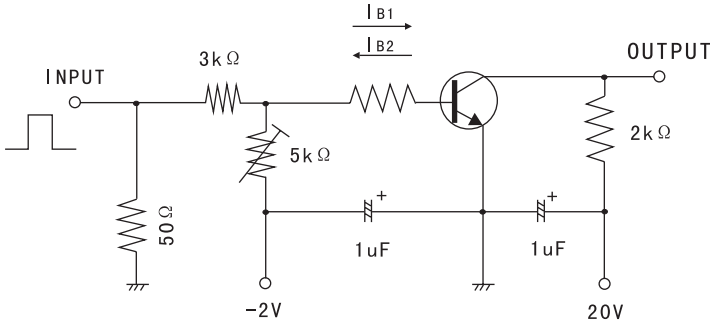
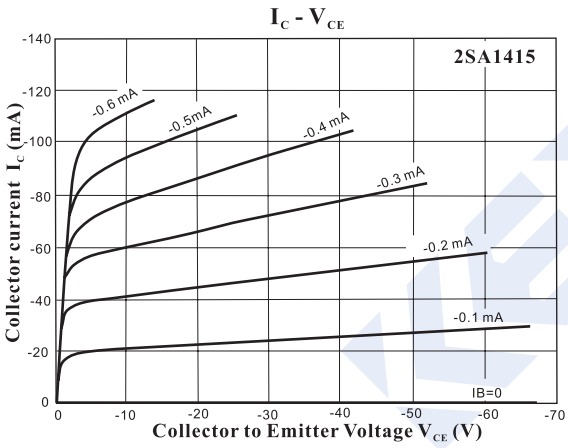
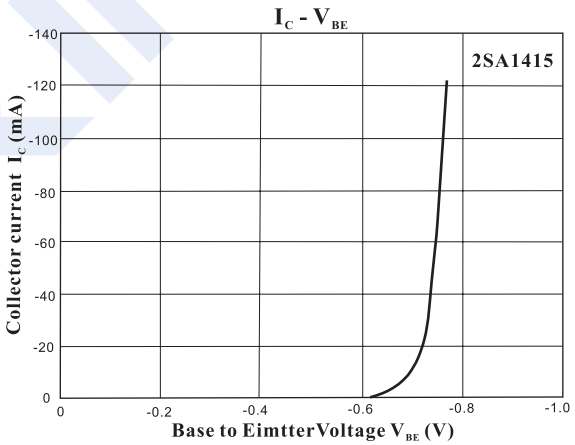
■ Test Circuit

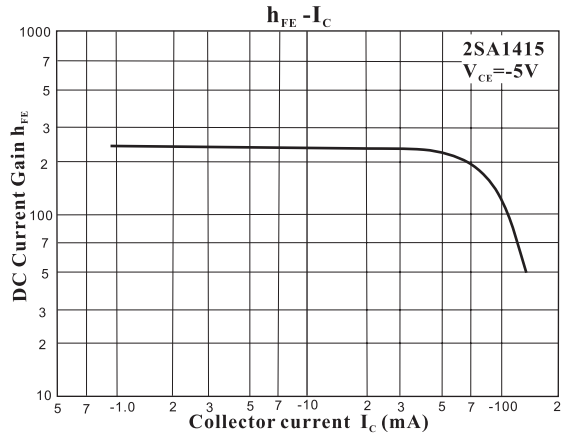


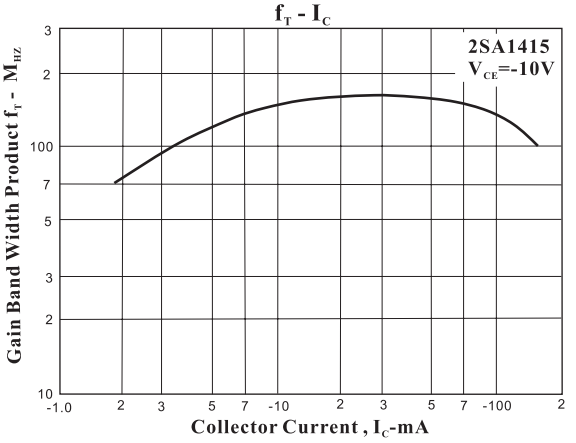
$I_C = 10I_{B1} = -10I_{B2} = 10mA$
(For PNP , the polarity is reversed.)

■ Typical Characterisitics









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■ Typical Characterisitics