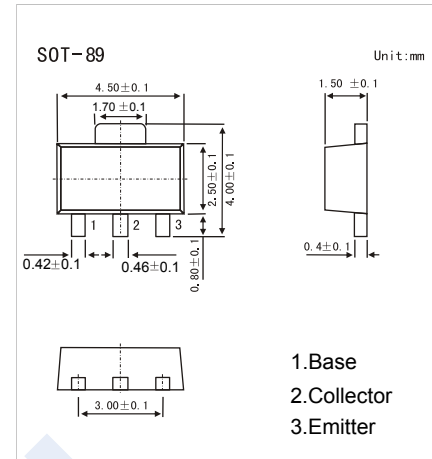


PNP Transistors

2SA1415

■ Features

- Adoption of FBET Process
- High Breakdown Voltage ($V_{CE0} = 160V$)
- Excellent Linearity of h_{FE} and Small C_{ob}
- Fast Switching Speed
- Complementary to 2SC3645



■ Absolute Maximum Ratings $T_a = 25^\circ C$

Parameter	Symbol	Rating	Unit
Collector - Base Voltage	V_{CB0}	-180	V
Collector - Emitter Voltage	V_{CE0}	-160	
Emitter - Base Voltage	V_{EB0}	-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	$^\circ C$
Storage Temperature range	T_{stg}	-55 to 150	

■ Electrical Characteristics $T_a = 25^\circ C$

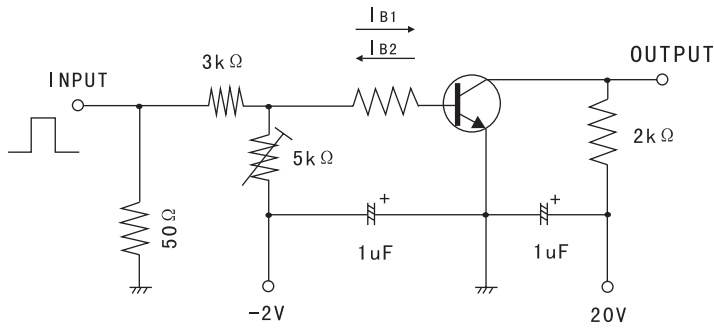
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	V_{CB0}	$I_C = -100 \mu A, I_E = 0$	-180			V
Collector-emitter breakdown voltage	V_{CE0}	$I_C = -1 mA, I_B = 0$	-160			
Emitter-base breakdown voltage	V_{EB0}	$I_E = -100 \mu A, I_C = 0$	-5			
Collector-base cut-off current	I_{CB0}	$V_{CB} = -80 V, I_E = 0$			-0.1	μA
Emitter cut-off current	I_{EB0}	$V_{EB} = -4 V, I_C = 0$			-0.1	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = -50 mA, I_B = -5 mA$		-0.14	-0.4	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C = -50 mA, I_B = -5 mA$			-1.2	
DC current gain	h_{FE}	$V_{CE} = -5 V, I_C = -10 mA$	100		400	
Turn-on time	t_{on}	See Test Circuit.		0.1		μs
Storage time	t_s			0.15		
Fall time	t_f			0.1		
Output capacitance	C_{ob}	$V_{CB} = -10 V, I_E = 0, f = 1 MHz$		4		pF
Transition frequency	f_T	$V_{CE} = -10 V, I_E = -10 mA$		150		MHz

■ Classification of h_{FE}

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

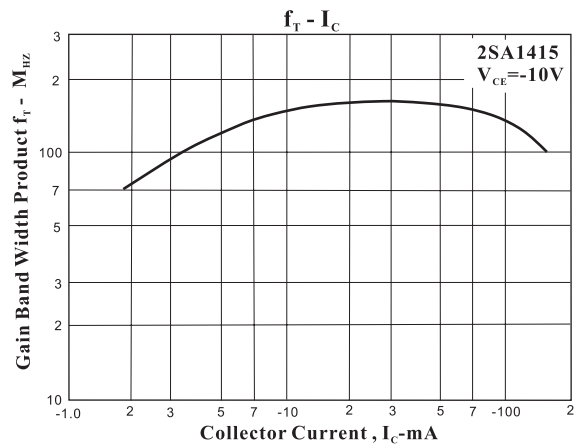
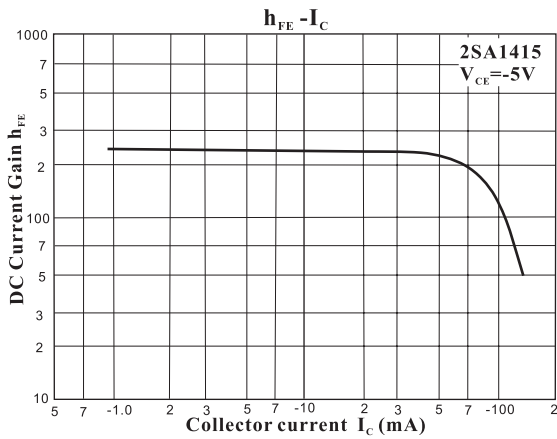
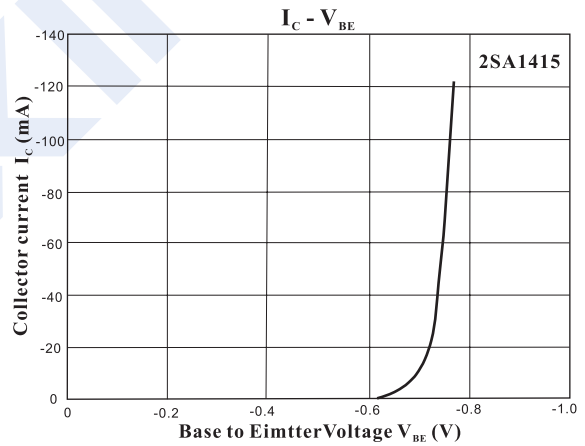
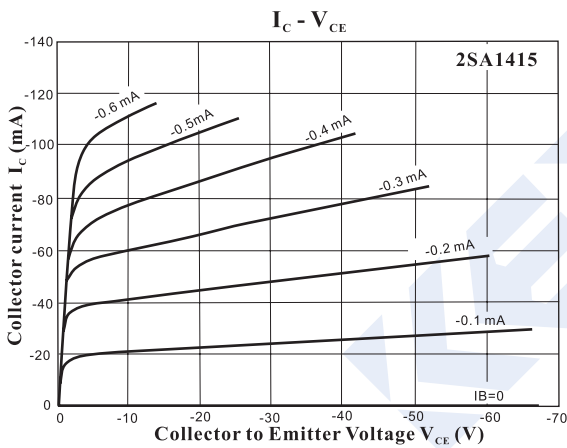
PNP Transistors 2SA1415

■ Test Circuit



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

■ Typical Characteristics



PNP Transistors

2SA1415

■ Typical Characteristics

