

SANYO

2SA201, 202
203

Semiconductors

GERMANIUM P-N-P ALLOY
JUNCTION TYPE

SANYO 2SA201, 2SA202 and 2SA203, which are P-N-P alloy junction germanium transistors, are suitable for the uses in the BC band.

2SA201 is used for the frequency converter, and the conversion power gain at 1MHz is 32 dB.

2SA202 and 2SA203 are used for the intermediate frequency amplifier at 455 KHz, then the power gain of the former is 34 dB and of the latter is 30.5 dB.

ABSOLUTE MAXIMUM RATINGS

Ta=25°C

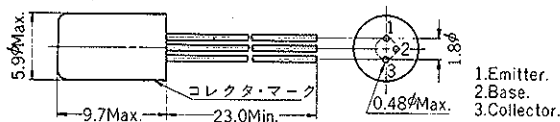
Parameter	Symbol	2SA201	2SA202	2SA203	Unit
Collector to Base Voltage	V _{CB0}	-15	-15	-15	V
Emitter to Base Voltage	V _{EB0}	-10	-10	-10	V
Collector Current	I _c	-15	-15	-15	mA
Collector Power Dissipation	P _c	100	100	100	mW
Junction Temperature	T _j	75	75	75	°C
Storage Temperature	T _{stg}	-55 ~ +85			°C

ELECTRICAL CHARACTERISTICS

Ta=25°C

Parameter	Symbol	2SA201			2SA202			2SA203			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
Collector Cutoff Current (V _{CB} =-15V, I _E =0)	I _{CB0}			-10			-10			-10	μA
Emitter Cutoff Current (V _{EB} =-2V, I _C =0)	I _{EB0}			-7			-7			-7	μA
Forward Current Transfer Ratio (V _{CE} =-6V, I _C =-1mA, f=1KHz)	h _{fe}	10	50		10	55		10	30		
Alpha Cutoff Frequency (V _{CB} =-6V, I _C =-1mA)	f _{αb}		8			12			5		MHz
Output Capacitance (V _{CB} =-6V, I _E =0, f=455KHz)	C _{Ob}		11	14.5	7.5	11	12.5	7.5	11	12.5	pF
Reverse Voltage Transfer Ratio (V _{CB} =-6V, I _C =-1mA, f=455KHz)	h _{rb}			3.2× 10 ⁻³			3.2× 10 ⁻³			3.2× 10 ⁻³	

OUTLINE DRAWING (Unit: mm)



h _{fe} Rank		
Number	Rank	V _{CE} =-6V, I _C =-1mA, f=455KHz
2SA201	A	9 ~ 13.5
	B	11 ~ 16
2SA202	A	11 ~ 16
	B	13.5 ~ 18
	C	15.5 ~ 20.5
	D	18 ~ 27.5
2SA203	A	4 ~ 9.5
	B	7 ~ 13.5

TYPICAL OPERATION CHARACTERISTICS

Self-Biased Converter

Ta = 25°C

Parameter	Symbol	2SA20	Unit
Collector Supply Voltage	Vc	5	V
Collector Current	Ic	0.5	mA
Signal Frequency	f	1	MHz
Intermediate Frequency	f _i	455	KHz
Injection Voltage	V _{inj}	100	mV
Input Resistance (Output Short)	r _i	300	Ω
Output Resistance (Input Short)	r _o	30	KΩ
Useful Conversion Power Gain	G _U	30	dB

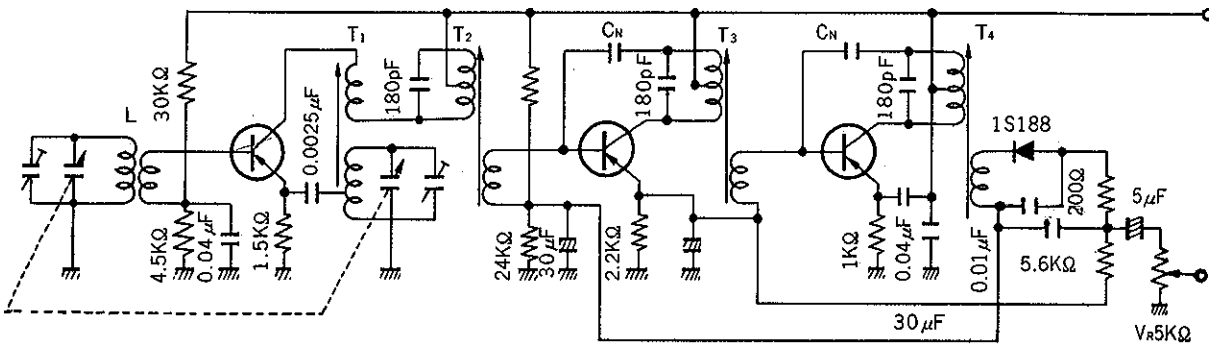
* f = 1.455 MHz

Ib Amplifier

Ta = 25°C

Parameter	Symbol	2SA20	2SA202	Unit
Collector Supply Voltage	Vc	5	5	V
Collector Current	Ic	0.5	0.5	mA
Signal Frequency	f	50	455	KHz
Input Resistance (Output Short)	r _i	200	300	KΩ
Output Resistance (Input Short)	r _o	10	10	KΩ
Useful Power Gain	G _U	30	30/5	dB

Circuit



L: Antenna coil for B.C.
 Primary inductance = 282μH
 Turns ratio = 11.2:1
 Primary unloaded Q = 110

T₁: Oscillator coil
 V.C. 3
 Emitter 2
 Earth 1
 1-3:84T, 1-2:2T, 4-5:13T
 Primary inductance = 155μH
 Unloaded Q = 100

T₂: 1st I.F.T.
 f = 455KHz
 Collector 3
 Battery 2
 CN 1
 1-2:79T, 2-3:89T, 4-5:8T
 Unloaded Q = 110
 Loaded Q = 40

T₃: 2nd I.F.T.
 f = 455KHz
 Collector 3
 Battery 2
 CN 1
 1-2:78T, 2-3:90T, 4-5:7T
 Unloaded Q = 110
 Loaded Q = 45

T₄: 3rd I.F.T.
 f = 455KHz
 Collector 3
 Battery 2
 CN 1
 1-2:94T, 2-3:76T, 4-5:27T
 Unloaded Q = 110
 Loaded Q = 40

