



**CHENMKO ENTERPRISE CO.,LTD**

**SMALL FLAT  
PNP Epitaxial Transistor**

VOLTAGE 50 Volts CURRENT 0.5 Ampere

**2SA1020N1PT**

Lead free devices

**APPLICATION**

\* Power amplifier .

**FEATURE**

- \* Small flat package. (FBPT-923)
- \* Low saturation voltage  $V_{CE(sat)} = -0.5V$  (max.) ( $I_c = -0.5A$ )
- \* High speed switching time:  $t_{stg} = 1.0\mu s$  (typ.)
- \* High saturation current capability.

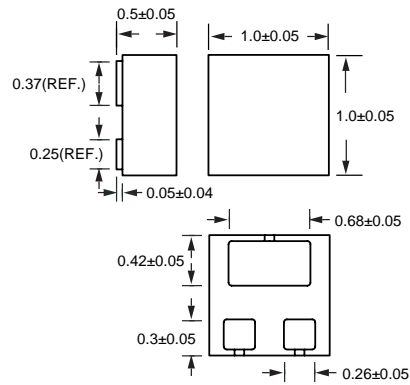
**CONSTRUCTION**

\* PNP Switching Transistor

**CIRCUIT**



**FBPT-923**



Dimensions in millimeters

**FBPT-923**

**MAXIMUM RATINGS ( At  $T_A = 25^\circ C$  unless otherwise noted )**

RATINGS	CONDITION	SYMBOL	MIN.	MAX.	UNITS
Collector - Base Voltage	Open Emitter	$V_{CB0}$	-	-50	Volts
Collector - Emitter Voltage	Open Base	$V_{CE0}$	-	-50	Volts
Emitter - Base Voltage	Open Collector	$V_{EB0}$	-	-5	Volts
Collector Current DC		$I_c$	-	-500	mAmps
Peak Collector Current		$I_{CM}$	-	-1000	mAmps
Peak Base Current		$I_{BM}$	-	-50	mAmps
Total Power Dissipation	$T_A \leq 25^\circ C$ ; Note 1	$P_{TOT}$	-	100	mW
Storage Temperature		$T_{STG}$	-55	+150	$^\circ C$
Junction Temperature		$T_J$	-	+150	$^\circ C$
Operating Ambient Temperature		$T_{AMB}$	-55	+150	$^\circ C$

**Note**

1. Transistor mounted on PCB 50mmX50mmx0.8t.
2. Measured at Pulse Width 300 us, Duty Cycle 2%.

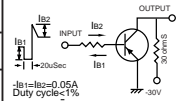
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## RATING CHARACTERISTIC CURVES ( 2SA1020N1PT )

**CHARACTERISTICS** ( At  $T_A = 25^\circ\text{C}$  unless otherwise noted )

PARAMETERS	CONDITION	SYMBOL	MIN.	TYPE	MAX.	UNITS
Collector Cut-off Current	$I_E=0; V_{CB}=-50\text{V}$	$I_{CBO}$	-	-	-0.1	$\mu\text{A}$
Emitter Cut-off Current	$I_C=0; V_{EB}=-5\text{V}$	$I_{CEO}$	-	-	-0.1	$\mu\text{A}$
DC Current Gain	$V_{CE}=-2\text{V}$ ; Note 1 $I_C=-0.5\text{A}$ ; Note 2 $I_C=-1.0\text{A}$	$h_{FE}$	70 20	- -	240 -	
Collector-Emitter Saturation Voltage	$I_C=-1\text{A}; I_B=-0.05\text{A}$	$V_{CEsat}$	-	-	-0.5	Volts
Base-Emitter Saturation Voltage	$I_C=-1\text{A}; I_B=-0.05\text{A}$	$V_{BEsat}$	-	-	-1.2	mVolts
Collector Capacitance	$I_E=I_C=0; V_{CB}=10\text{V}$ ; $f=1\text{MHz}$	$C_C$	-	40	-	pF
Transition Frequency	$I_C=-0.5\text{A}; V_{CE}=-2\text{V}$ ; $f=100\text{MHz}$	$f_T$	-	120	-	MHz

**SWITCHING TIMES** ( Between 10% and 90% levels )

PARAMETERS	CONDITION	SYMBOL	MIN.	TYPE	MAX.	UNITS
Turn-on Time		$t_{on}$	-	0.1	-	$\mu\text{Sec}$
Storage Time		$t_s$	-	1.0	-	$\mu\text{Sec}$
Fall Time		$t_f$	-	0.1	-	$\mu\text{Sec}$

**Note :**

1. Pulse test:  $t_p \leq 300\mu\text{Sec}$ ;  $\delta \leq 0.02$ .
2.  $h_{FE}(1)$  Classification O: 70 to 140, Y: 120 to 240

# RATING CHARACTERISTIC CURVES ( 2SA1020N1PT )

## Typical Electrical Characteristics

Figure 1. V<sub>CE</sub> - I<sub>C</sub>

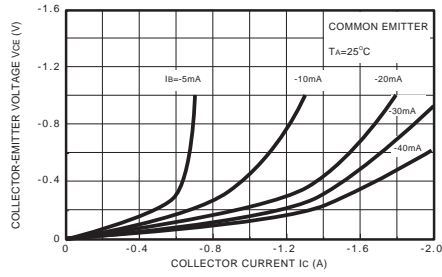


Figure 2. V<sub>CE</sub> - I<sub>C</sub>

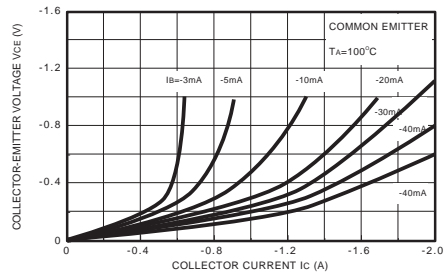


Figure 3. V<sub>CE</sub> - I<sub>C</sub>

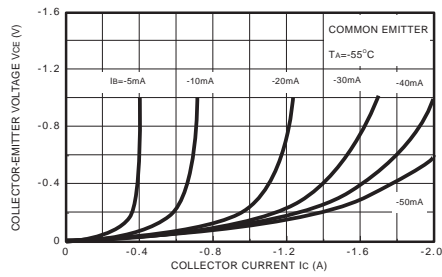


Figure 4. h<sub>FE</sub> - I<sub>C</sub>

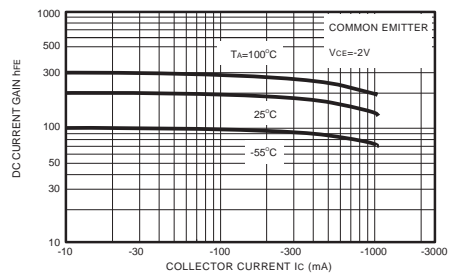


Figure 5. V<sub>CE(sat)</sub> - I<sub>C</sub>

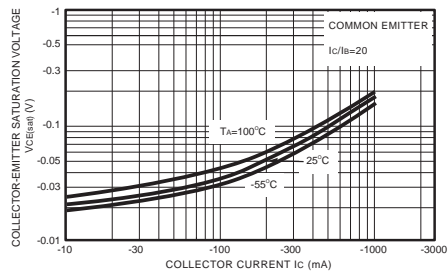
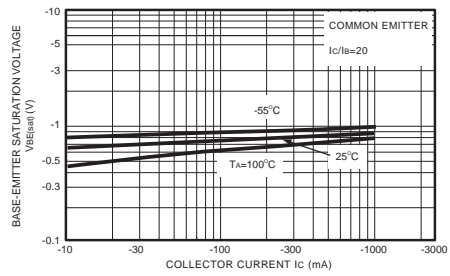


Figure 6. V<sub>BE(sat)</sub> - I<sub>C</sub>



## RATING CHARACTERISTIC CURVES ( 2SA1020N1PT )

### Typical Electrical Characteristics

Figure 7.  $I_c - V_{BE}$

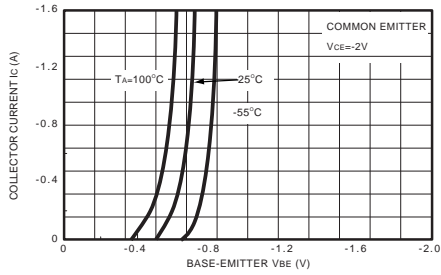


Figure 8.  $P_c - T_A$

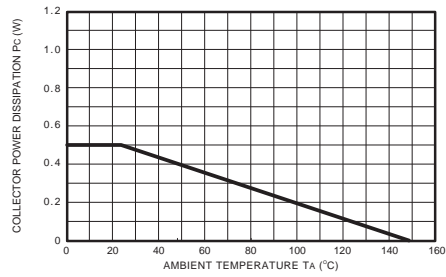


Figure 9. Safe Operation Area

