



**CHENMKO ENTERPRISE CO.,LTD**

**2SA1213PT**

*Lead free devices*

**SMALL FLAT  
PNP Epitaxial Transistor**

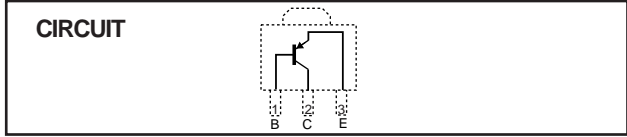
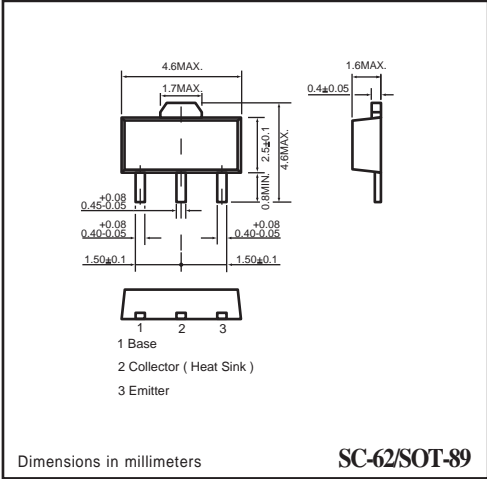
VOLTAGE 50 Volts CURRENT 2 Ampere

**APPLICATION**  
\* Power amplifier .

**FEATURE**  
\* Small flat package. (SC-62/SOT-89)  
\* Low saturation voltage  $V_{CE(sat)} = -0.5V(\text{max.})(I_c = -1A)$   
\* High speed switching time:  $t_{stg} = 1.0\mu\text{Sec}(\text{typ.})$   
\* PC= 1.0 to 2.0W (mounted on ceramic substrate).  
\* High saturation current capability.

**CONSTRUCTION**  
\* PNP Switching Transistor

**MARKING**  
\* HFE(O):NO  
\* HFE(Y):NY



**MAXIMUM RATINGS** ( At  $T_A = 25^\circ\text{C}$  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		$I_c$	-	-2	Amps
Peak Collector Current		$I_{CM}$	-	-2	Amps
Peak Base Current		$I_{BM}$	-	-0.4	Amps
Total Power Dissipation	$T_A \leq 25^\circ\text{C}$ ; Note 1	$P_{TOT}$	-	1000	mW
Storage Temperature		$T_{STG}$	-55	+150	$^\circ\text{C}$
Junction Temperature		$T_J$	-	+150	$^\circ\text{C}$
Operating Ambient Temperature		$T_{AMB}$	-55	+150	$^\circ\text{C}$

**Note**

1. Transistor mounted on ceramic substrate 50mmX50mmX0.8t.
2. Measured at Pulse Width 300 us, Duty Cycle 2%.

## RATING CHARACTERISTIC CURVES ( 2SA1213PT )

**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 $I_C=-2.0\text{A}$	$h_{FE}$	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	-	$\text{pF}$
Transition Frequency	$I_C=-0.5\text{A}; V_{CE}=-2\text{V}$ ; $f=100\text{MHz}$	$f_T$	-	120	-	$\text{MHz}$

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

PARAMETERS	CONDITION	SYMBOL	MIN.	TYPE	MAX.	UNITS
Turn-on Time	<p><math>I_{B1}=I_{B2}=0.05\text{A}</math> Duty cycle <math>\leq 1\%</math></p>	$t_{on}$	-	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 ( 2SA1213PT )

## Typical Electrical Characteristics

Figure 1.  $V_{CE} - I_c$

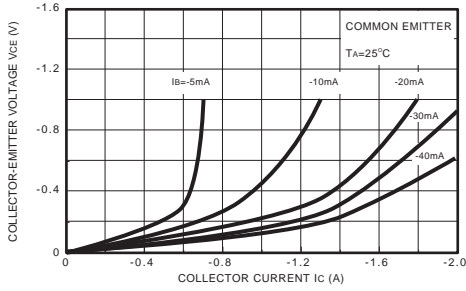


Figure 2.  $V_{CE} - I_c$

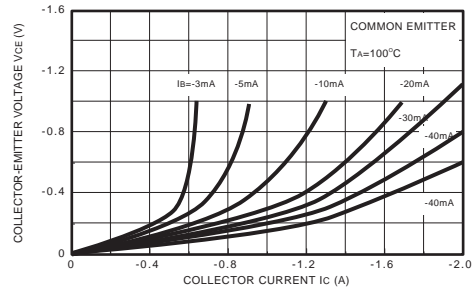


Figure 3.  $V_{CE} - I_c$

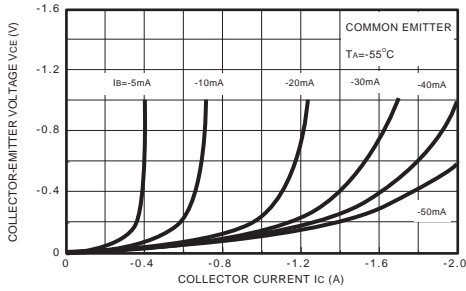


Figure 4.  $h_{FE} - I_c$

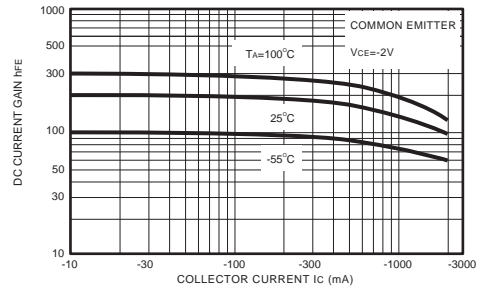


Figure 5.  $V_{CE(sat)} - I_c$

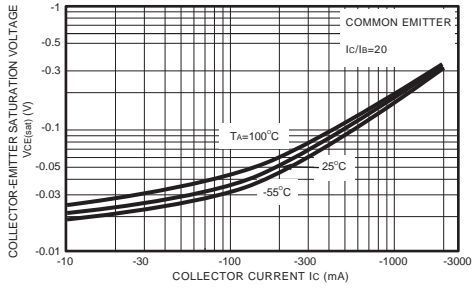
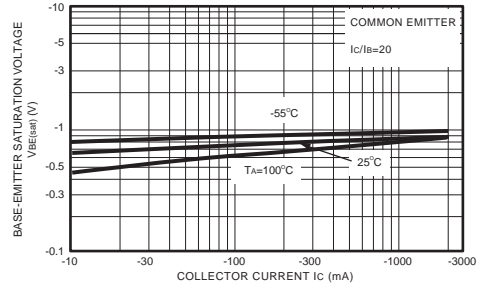


Figure 6.  $V_{BE(sat)} - I_c$



# RATING CHARACTERISTIC CURVES ( 2SA1213PT )

## Typical Electrical Characteristics

Figure 7.  $I_c - V_{BE}$

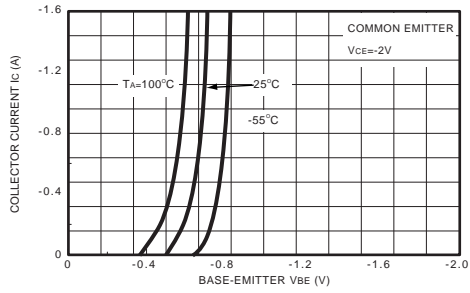


Figure 8.  $P_c - T_A$

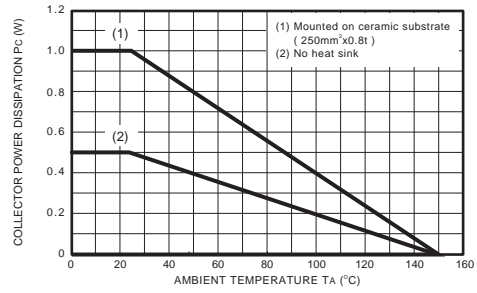


Figure 9. Safe Operation Area

