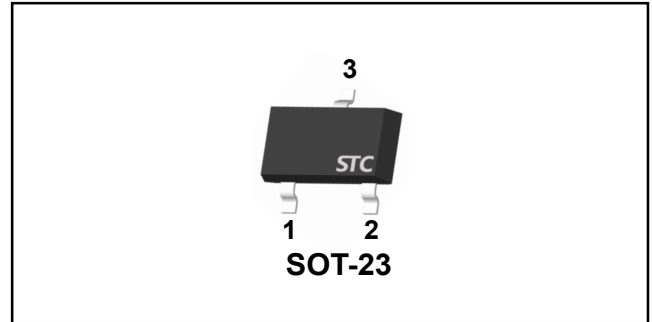


GENERAL-PURPOSE TRANSISTOR NPN Silicon

DESCRIPTION

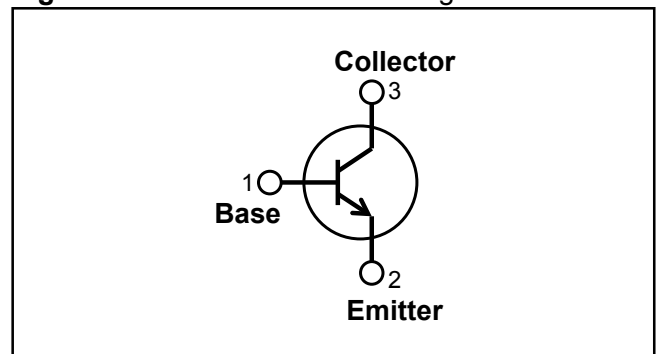
The **STComponent** S8050 is designed for a low voltage high current small signal NPN transistor. Ideal for Class B push-pull audio amplifier and general purpose applications.



FEATURES

- Collector-Emitter Voltage $V_{CE} = 25V$
- Collector Current $I_C = 800mA$
- Complementary PNP Type Available (STC S8550)

Figure 1: Internal Schematic Diagram



DEVICE SUMMARY

Ordering Code	h_{FE1} Rank ⁽¹⁾	Package Material	Package Type	Marking ⁽²⁾	Shipping
S8050-L-M	120 ~ 200	Lead Free	SOT-23	J3Y	Taping reel
S8050-H-M	200 ~ 350		SOT-23		Taping reel
S8050-J-M	300 ~ 400		SOT-23		Taping reel
S8050-L-MG	120 ~ 200	Halogen Free	SOT-23		Taping reel
S8050-H-MG	200 ~ 350		SOT-23		Taping reel
S8050-J-MG	300 ~ 400		SOT-23		Taping reel

Note 1: At $T_A = 25^{\circ}C$, $V_{CE} = 5V$, $I_C = 1mA$, pulse test: $t_P \leq 300\mu s$; duty cycle $\leq 2\%$.

Note 2: **J3Y**: Specific device code.

ABSOLUTE MAXIMUM RATINGS ⁽³⁾

$T_A = 25^\circ\text{C}$, unless otherwise noted.

PARAMETER	SYMBOL	RATINGS	UNIT
Collector-Base Voltage	V_{CBO}	40	V
Collector-Emitter Voltage	V_{CEO}	25	V
Emitter-Base Voltage	V_{EBO}	5	V
Collector Current	I_C	800	mA
Collector Power Dissipation	P_C	300	mW
Maximum Junction Temperature	T_{JMAX}	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 ~ +150	$^\circ\text{C}$

Note 3: Absolute Maximum Ratings are those values beyond which the device could be permanently damaged. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

Thermal Data ⁽⁴⁾

PARAMETER	SYMBOL	RATINGS	UNIT
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	416	$^\circ\text{C}/\text{W}$

Note 4: Device mounted on FR-4 PCB 1.6 inch × 1.6 inch × 0.06 inch.

ELECTRICAL CHARACTERISTICS
 $T_A = 25^\circ\text{C}$, unless otherwise noted.

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 100\mu\text{A}, I_E = 0$	40			V
Collector-Emitter Breakdown Voltage ⁽⁵⁾	$V_{(BR)CEO}$	$I_C = 1\text{mA}, I_B = 0$	25			V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 100\mu\text{A}, I_C = 0$	5			V
Collector Cut-Off Current	I_{CBO}	$V_{CB} = 40\text{V}, I_E = 0$			100	nA
	I_{CEO}	$V_{CE} = 20\text{V}, I_B = 0$			100	nA
Emitter Cut-Off Current	I_{EBO}	$V_{EB} = 5\text{V}, I_C = 0$			100	nA
ON CHARACTERISTICS						
DC Current Gain ⁽⁵⁾	h_{FE1}	$V_{CE} = 5\text{V}, I_C = 1\text{mA}$	120		400	
	h_{FE2}	$V_{CE} = 1\text{V}, I_C = 50\text{mA}$	120			
	h_{FE3}	$V_{CE} = 1\text{V}, I_C = 500\text{mA}$	50			
Collector-Emitter Saturation Voltage ⁽⁵⁾	$V_{CE(sat)}$	$I_C = 500\text{mA}, I_B = 50\text{mA}$			0.6	V
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 500\text{mA}, I_B = 50\text{mA}$			1.2	V
SMALL SIGNAL CHARACTERISTICS						
Transition Frequency	f_T	$V_{CE} = 6\text{V}, I_C = 20\text{mA}, f = 30\text{MHz}$	150			MHz
Output Capacitance	C_{ob}	$V_{CB} = 10\text{V}, I_E = 0, f = 1\text{MHz}$		4		pF
Input Capacitance	C_{ib}	$V_{EB} = 0.5\text{V}, I_C = 0, f = 1\text{MHz}$		40		pF

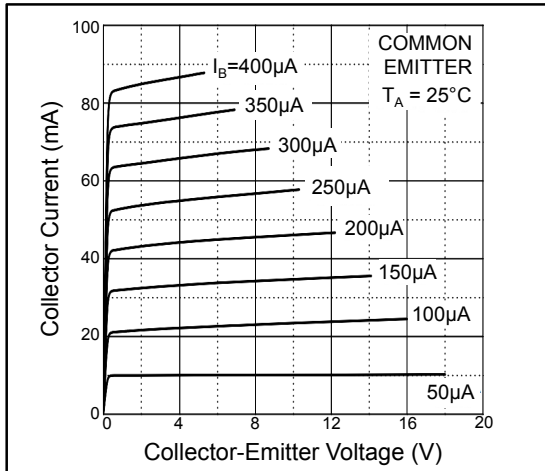
 Note 5: Pulse test: $t_p \leq 300\mu\text{s}$; duty cycle $\leq 2\%$.

CLASSIFICATION OF h_{FE1}

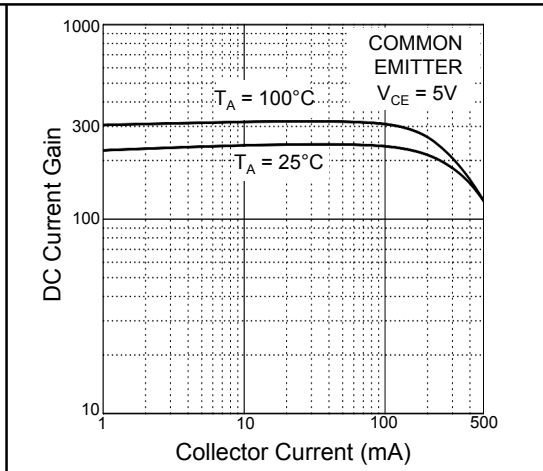
Rank	L	H	J
Range	120 ~ 200	200 ~ 350	300 ~ 400

ELECTRICAL CHARACTERISTICS CURVES

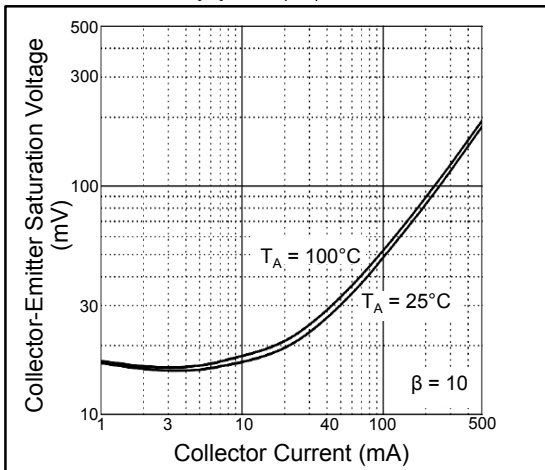
(1) Static Characteristic



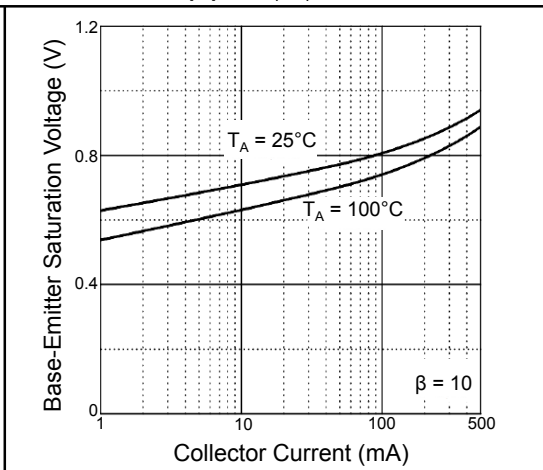
(2) DC Current Gain vs. IC



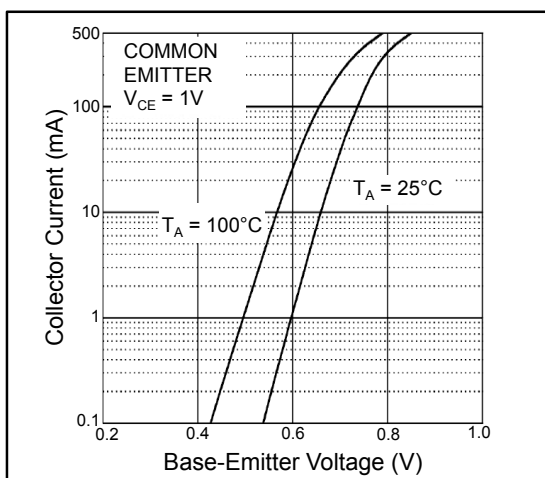
(3) VCE(sat) vs. IC



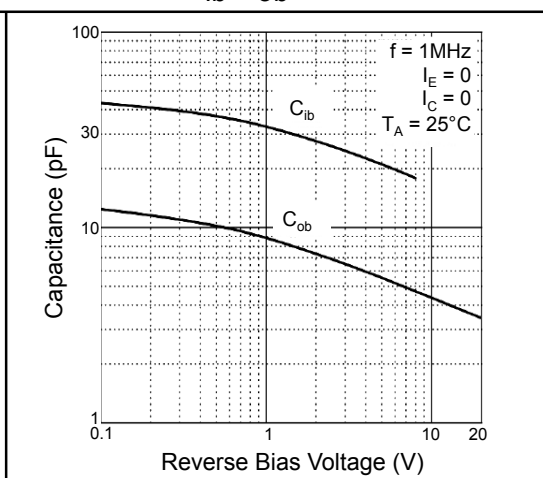
(4) VBE(sat) vs. IC



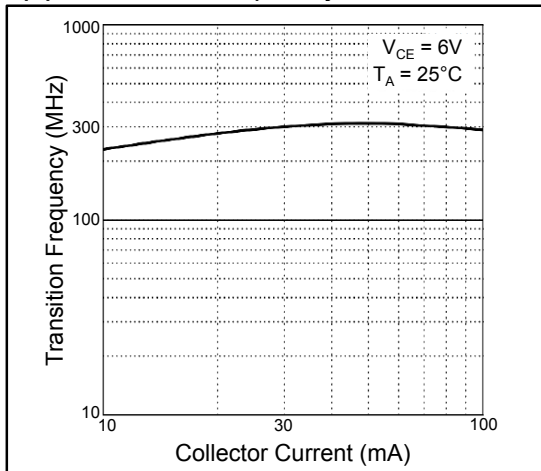
(5) IC vs. VBE



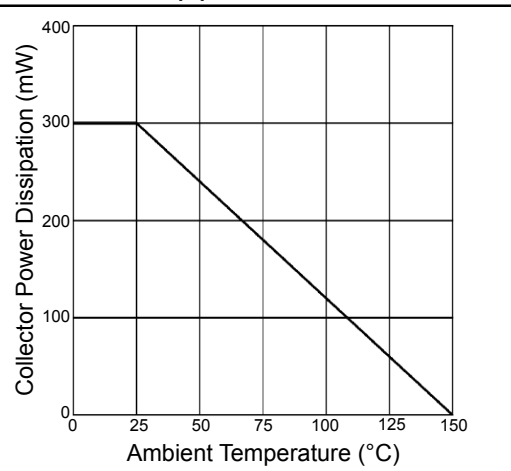
(6) Cib/Cob vs. VEB/VCB



(7) Transition Frequency Characteristic



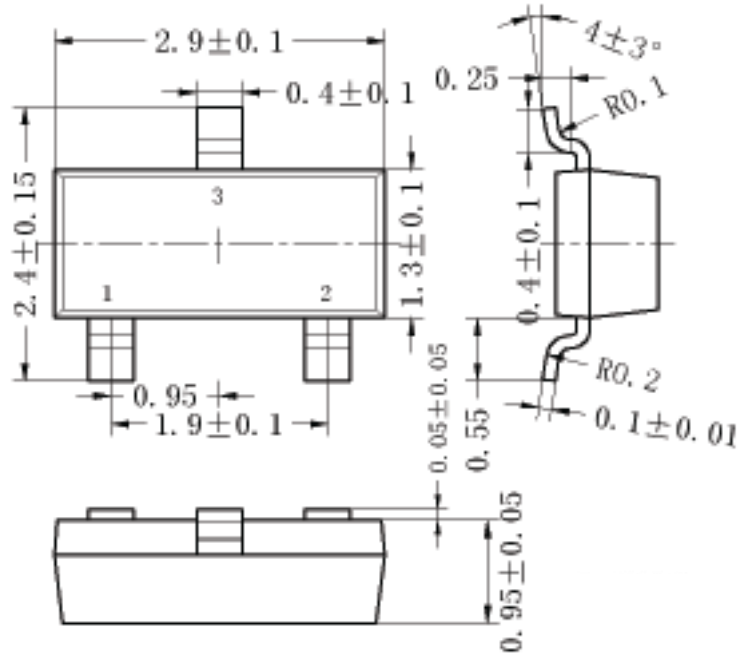
(8) P_C vs. T_A



PACKAGE DIMENSION

SOT-23

Unit: Millimeters



NOTICE

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