

NPN SILICON EPITAXIAL TRANSISTOR  
FOR LOW-FREQUENCY POWER AMPLIFIERS

The 2SD1581 is a single type super high  $h_{FE}$  transistor and low collector saturation voltage and low power loss. This transistor is ideal for use in high current drives such as mortars, relays, and ramps.

FEATURES

- Ultra high  $h_{FE}$   
 $h_{FE} = 800$  to  $3200$  (@  $V_{CE} = 5.0$  V,  $I_C = 500$  mA)
- Low collector saturation voltage  
 $V_{CE(sat)} = 0.18$  V TYP. (@  $I_C = 1.0$  A,  $I_B = 10$  mA)

ABSOLUTE MAXIMUM RATINGS ( $T_a = 25^\circ\text{C}$ )

Parameter	Symbol	Ratings	Unit
Collector to base voltage	$V_{CB0}$	30	V
Collector to emitter voltage	$V_{CE0}$	25	V
Emitter to base voltage	$V_{EB0}$	15	V
Collector current (DC)	$I_{C(DC)}$	2.0	A
Collector current (pulse)	$I_{C(pulse)^*}$	3.0	A
Total power dissipation	$P_T$	1.0	W
Junction temperature	$T_j$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

\*  $PW \leq 10$  ms, duty cycle  $\leq 50\%$

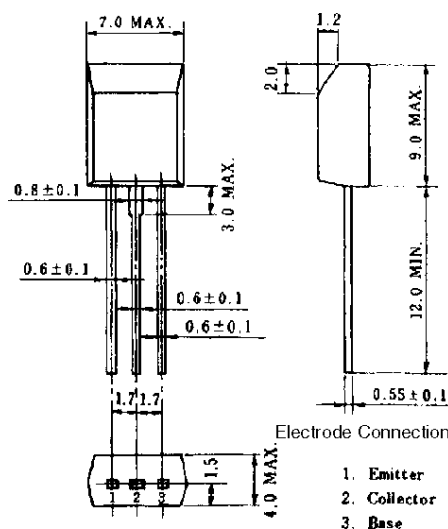
ELECTRICAL CHARACTERISTICS ( $T_a = 25^\circ\text{C}$ )

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit	
Collector cutoff current	$I_{CB0}$	$V_{CB} = 30$ V, $I_E = 0$			100	nA	
Emitter cutoff current	$I_{EB0}$	$V_{EB} = 10$ V, $I_C = 0$			100	nA	
DC current gain	$h_{FE1}$	$V_{CE} = 5.0$ V, $I_C = 500$ mA	*	800	1500	3200	-
DC current gain	$h_{FE2}$	$V_{CE} = 5.0$ V, $I_C = 2.0$ mA	*	400			-
DC base voltage	$V_{BE}$	$V_{CE} = 5.0$ V, $I_C = 300$ mA	*	600	660	700	mV
Collector saturation voltage	$V_{CE(sat)}$	$I_C = 1.0$ A, $I_B = 10$ mA	*		0.18	0.30	V
Base saturation voltage	$V_{BE(sat)}$	$I_C = 1.0$ A, $I_B = 10$ mA	*		0.83	1.2	V
Output capacitance	$C_{ob}$	$V_{CB} = 10$ V, $I_E = 0$ , $f = 1.0$ MHz		26	35		pF
Gain bandwidth product	$f_r$	$V_{CE} = 10$ V, $I_E = -500$ mA	150	350			MHz

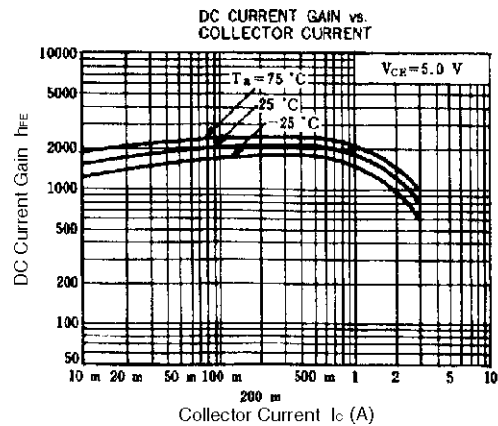
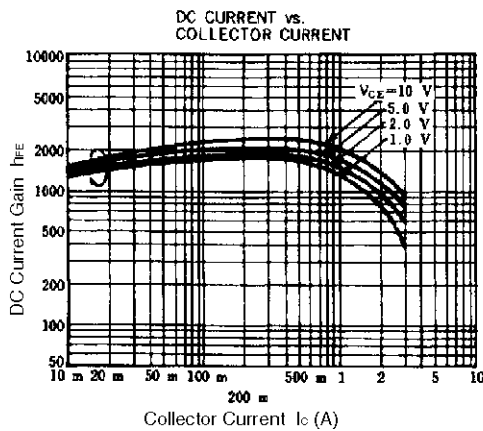
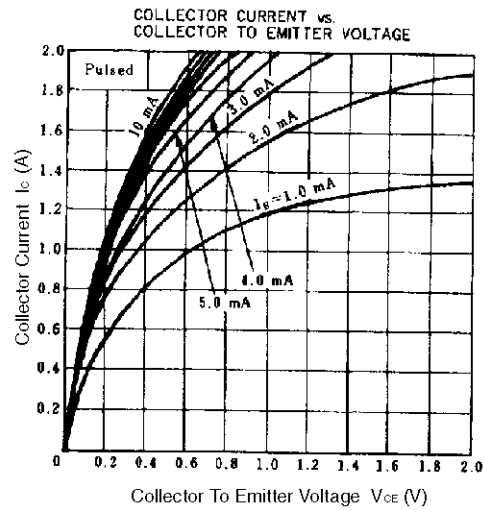
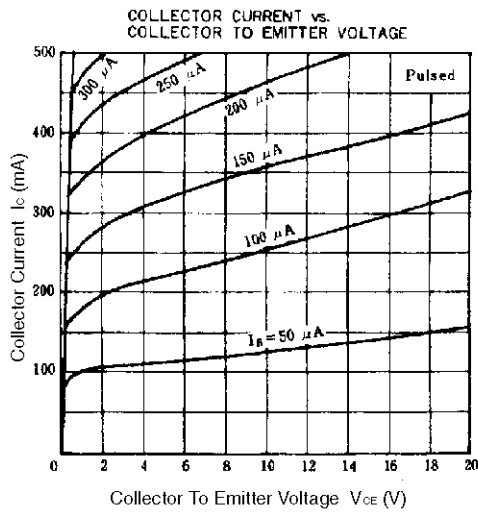
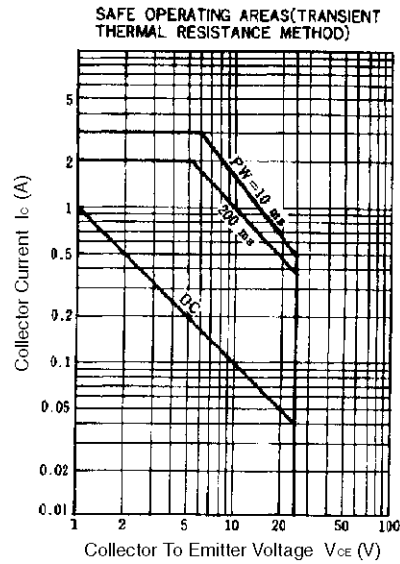
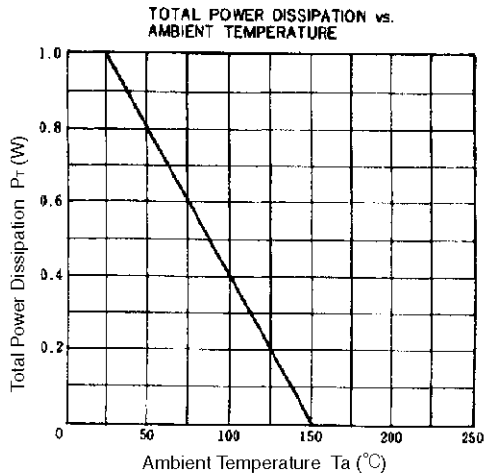
\*\* Pulse test  $PW \leq 350$   $\mu\text{s}$ , duty cycle  $\leq 2\%$  per pulsed

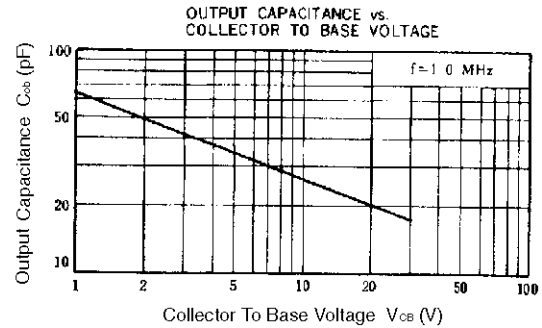
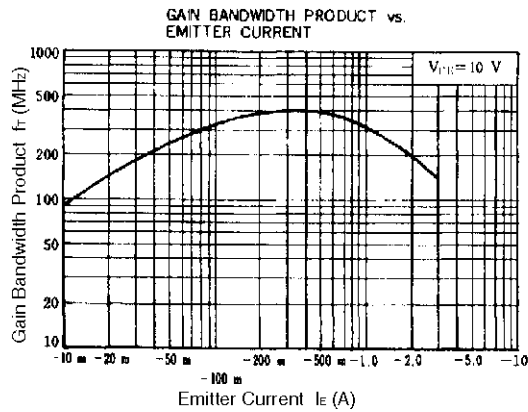
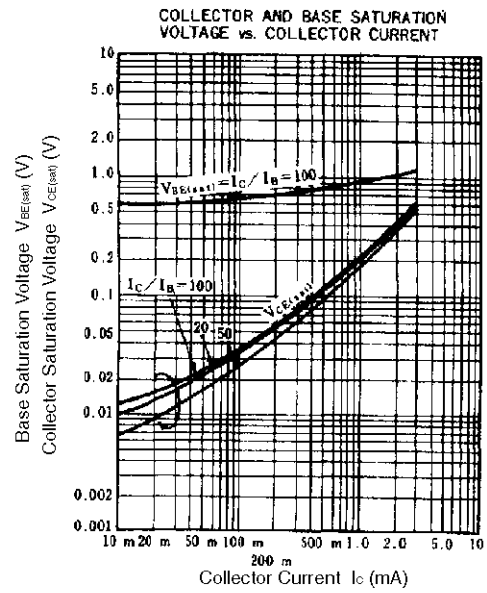
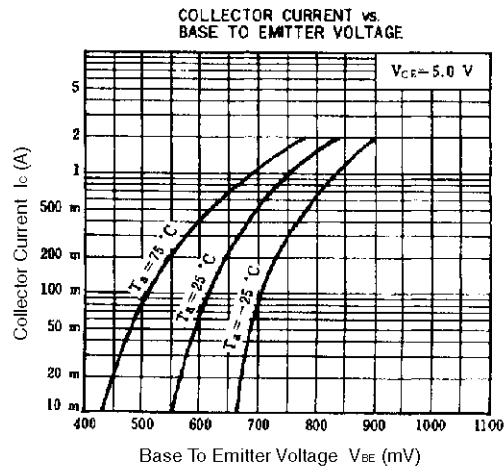
$h_{FE1}/h_{FE}$  CLASSIFICATION M : 800 to 1600 L : 1200 to 2400 K : 2000 to 3200

PACKAGE DRAWING (UNIT: mm)



TYPICAL CHARACTERISTICS (Ta = 25°C)





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