NEC
ELECTRON DEVICE

SILICON POWER TRANSISTORS
2SB536,2SB537/2SD381,2SD382

AUDIO FREQUENCY POWER AMPLIFIER AND LOW SPEED SWITCHING PNP/NPN SILICON EPITAXIAL TRANSISTOR

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DESCRIPTION

The 2SB536, 2SB537 and 2SD381, 2SD382 are silicon epitaxial transistors intended for a wide variety of switching and amplifier applications.

These devices are especially suitable for use in the driver stage of 60 to 100 watts complimentary-symmetrical audio amplifier applications.

The 2SB537 and 2SD382 have formed emitter and base leads for easy insertion into TO-66 sockets.

FEATURES

- High breakdown voltage
- High f_T
- Wide safe-operating area

ABSOLUTE MAXIMUM RATINGS

Maximum Voltages and Currents (Ta=25°C)		2SB536, 2SB537	2SD381, 2SD382	
Collector to Base Voltage	V_{CBO}	−130	130	V
Collector to Emitter Voltage	V_{CEO}	−120	120	V
Emitter to Base Voltage	V_{EBO}	−5.0	5.0	V
Collector Current	$I_{C(DC)}$	−1.5	1.5	A
Collector Current	$I_{C(pulse)}$*	−3.0	3.0	A
Base Current	$I_{B(DC)}$	−0.3	0.3	A
Maximum Power Dissipations				
Total Power Dissipation				
at Case Temperature	P_T(Tc=25°C)	20	20	W
at Ambient Temperature	P_T(Ta=25°C)	1.5	1.5	W
Maximum Temperatures				
Junction Temperature	T_j	150	150	°C
Storage Temperature	T_{stg}	−55 to +150	−55 to +150	°C

* PW ≤10ms, duty cycle ≤ 50%

ELECTRICAL CHARACTERISTICS (Ta = 25°C) 2SB536, 2SB537/2SD381, 2SD382

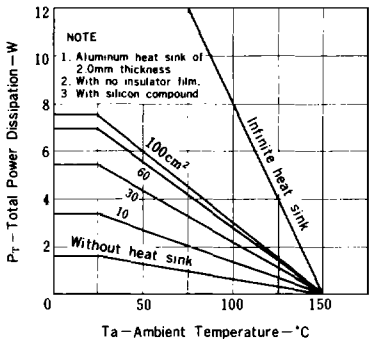
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	I_{CBO}			−1.0/1.0	μA	V_{CB} = 120V, I_B = 0
Emitter Cutoff Current	I_{EBO}			−1.0/1.0	μA	V_{EB} = 3.0V, I_C = 0
DC Current Gain	h_{FE1}	25	100/65			V_{CE} = 5.0V, I_C = 5.0mA*
DC Current Gain	h_{FE2}	40	110	250		V_{CE} = 5.0V, I_C = 0.3A*
Collector Saturation Voltage	$V_{CE(sat)}$		−1.0/0.3	−2.0/2.0	V	I_C = 1.0A, I_B = 0.1A*
Base Saturation Voltage	$V_{BE(sat)}$		−0.9/0.9	−1.5/1.5	V	I_C = 1.0A, I_B = 0.1A*
Gain Bandwidth Product	f_T		40/45		MHz	V_{CE} = 5.0V, I_C = 0.1A
Output Capacitance	C_{ob}		35/25		pF	V_{CB} = 10V, I_E = 0, f = 1.0MHz

* Pulse Test/PW≤ 350μs, duty cycle≤2%

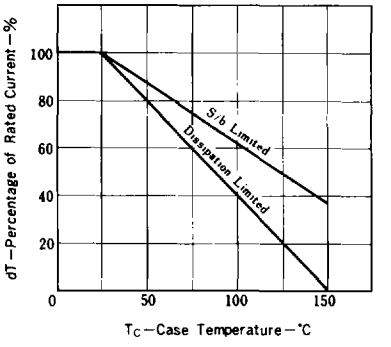
h_{FE} rank (h_{FE2})/N: 40 ~ 80, M: 60 ~ 120, L: 80 ~ 160, K: 120 ~ 250

TYPICAL CHARACTERISTICS (Ta=25°C)

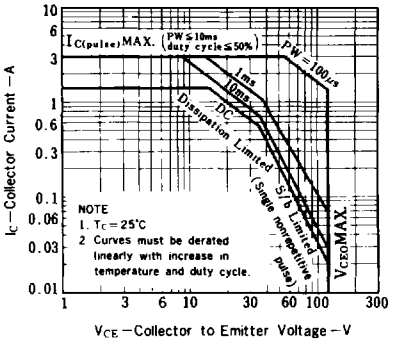
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



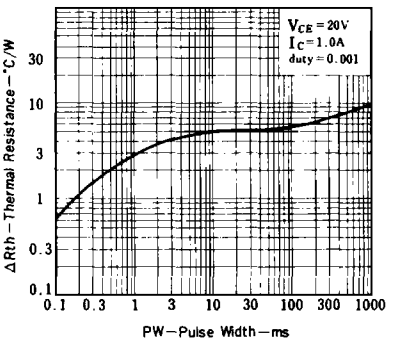
DERATING CURVES FOR ALL TYPES



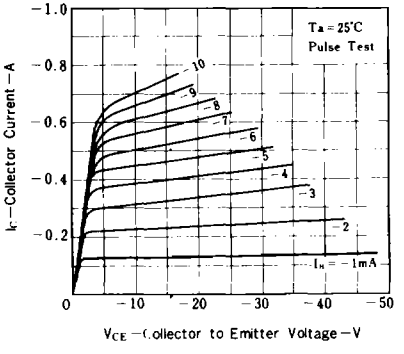
SAFE OPERATING AREAS



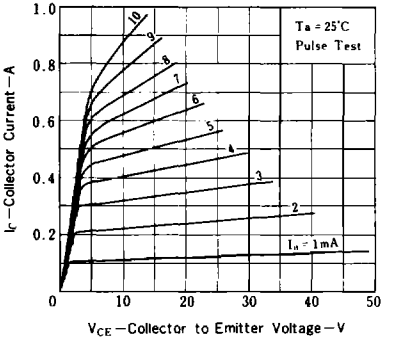
THERMAL RESISTANCE vs. PULSE WIDTH



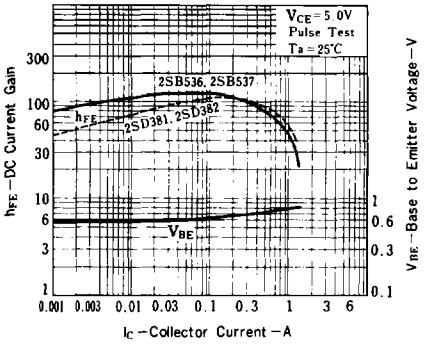
2SB536, 2SB537
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



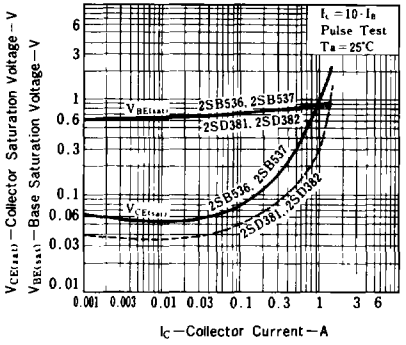
2SD381, 2SD382
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



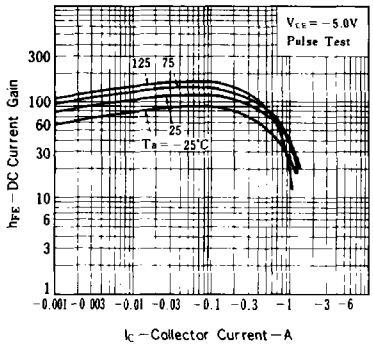
DC CURRENT GAIN, BASE TO EMITTER VOLTAGE vs. COLLECTOR CURRENT



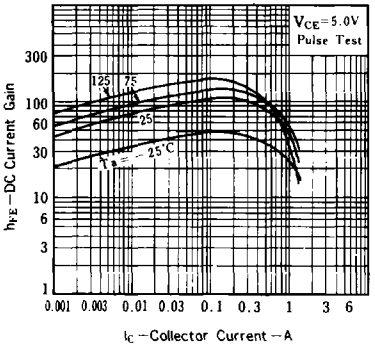
BASE AND COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



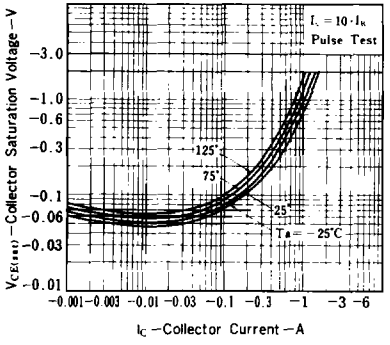
2SB536, 2SB537 DC CURRENT GAIN vs. COLLECTOR CURRENT



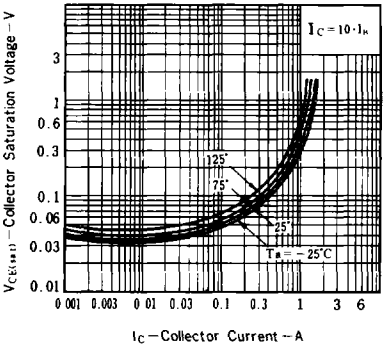
2SD381, 2SD382 DC CURRENT GAIN vs. COLLECTOR CURRENT



2SB536, 2SB537 COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



2SD381, 2SD382 COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



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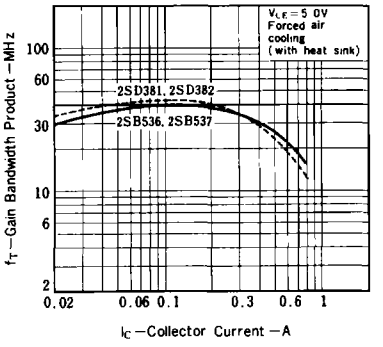
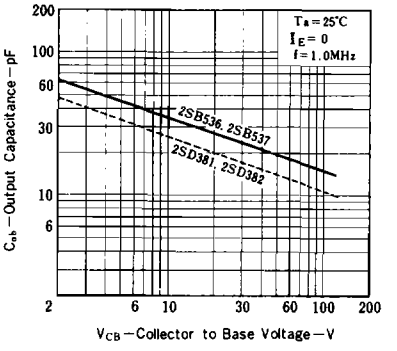
GAIN BANDWIDTH PRODUCT vs. COLLECTOR CURRENT

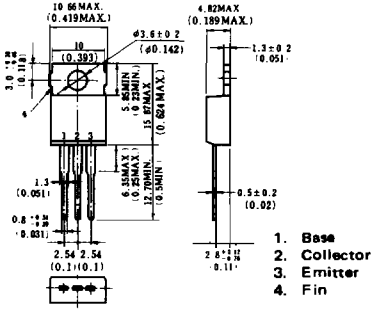


OUTPUT CAPACITANCE vs. COLLECTOR TO BASE VOLTAGE

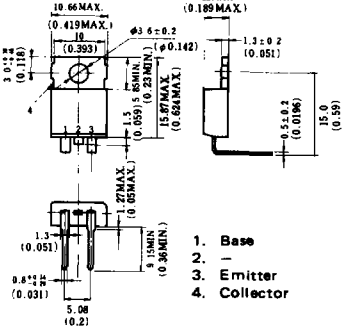


PACKAGE DIMENSIONS In millimeters (inches)

2SB536/2SD381

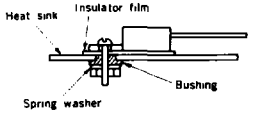


2SB537/2SD382

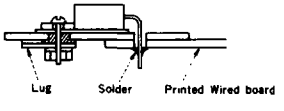


MOUNTING HARDWARES

2SB536/2SD381

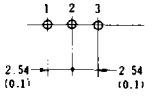


2SB537/2SD382



MOUNTING HOLES

2SB536/2SD381



2SB537/2SD382