

# SILICON TRANSISTOR

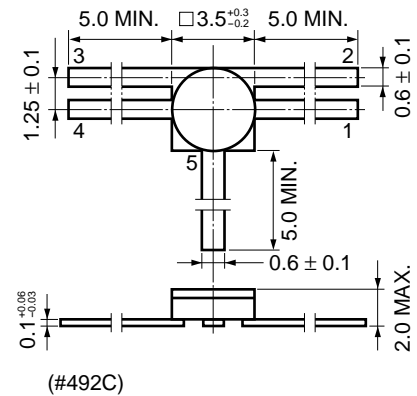
## 2SC3809

### NPN SILICON EPITAXIAL TRANSISTOR FOR MICROWAVE AMPLIFIERS AND ULTRA HIGH SPEED SWITCHINGS INDUSTRIAL USE

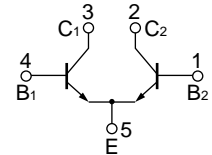
#### FEATURES

- The 2SC3809 is an NPN silicon epitaxial dual transistor having a large-gain-bandwidth product performance in a wide operating current range.
- Dual chips in one package can achieve high performance for differential amplifiers and current mode logic (CML) circuits.

#### PACKAGE DIMENSIONS (in millimeters)



#### PIN CONNECTIONS



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

PARAMETER	SYMBOL	RATINGS	UNIT
Collector to Base Voltage	$V_{CBO}$	20	V
Collector to Emitter Voltage	$V_{CEO}$	12	V
Emitter to Base Voltage	$V_{EBO}$	3	V
Collector Current	$I_C$	100/unit	mA
Total Power Dissipation	$P_T$	300/unit	mW
Thermal Resistance (junction to case)	$R_{th(j-c)}$	90/unit	$^{\circ}\text{C/W}$
Junction Temperature	$T_j$	200	$^{\circ}\text{C}$
Storage Temperature	$T_{stg}$	-65 to +200	$^{\circ}\text{C}$

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Collector to Base Breakdown Voltage	$BV_{CBO}$	$I_C = 100\text{ }\mu\text{A}$	20			V
Emitter to Base Breakdown Voltage	$BV_{EBO}$	$I_E = 100\text{ }\mu\text{A}, I_C = 0$	3			V
Collector to Emitter Breakdown Voltage	$BV_{CEO}$	$I_C = 1\text{ mA}, R_{BE} = \infty$	12			V
Collector Cut-off Current	$I_{CBO}$	$V_{CB} = 10\text{ V}, I_C = 0$			1.0	$\mu\text{A}$
Emitter Cut-off Current	$I_{EBO}$	$V_{EB} = 1\text{ V}, I_E = 0$			1.0	$\mu\text{A}$
DC Current Gain	$h_{FE}$	$V_{CE} = 10\text{ V}, I_C = 20\text{ mA}$	50		250	
$h_{FE}$ Ratio	$h_{FE1}/h_{FE2}$ <sup>Note 1</sup>	$V_{CE} = 10\text{ V}, I_C = 20\text{ mA}$	0.6		1.0	
Difference of Base to Emitter Voltage	$V_{BE(on)}$	$V_{CE} = 10\text{ V}, I_C = 20\text{ mA}$			30	mV
Gain Bandwidth Product	$f_T$ <sup>Note 2</sup>	$V_{CE} = 10\text{ V}, I_C = 20\text{ mA}$	6	7		GHz
Feedback Capacitance	$C_{re}$ <sup>Note 3</sup>	$V_{CB} = 10\text{ V}, I_E = 0, f = 1.0\text{ MHz}$		0.75	1.0	pF

**Notes 1.**  $h_{FE1}$  is the smaller  $h_{FE}$  value of the 2 transistors.

**2.** Measured using a single-type device (equivalent to the 2SC3603).

**3.** Measured with a 3-terminal bridge, terminals other than the collector and base of the device under test should be connected to the guard terminal of the bridge.

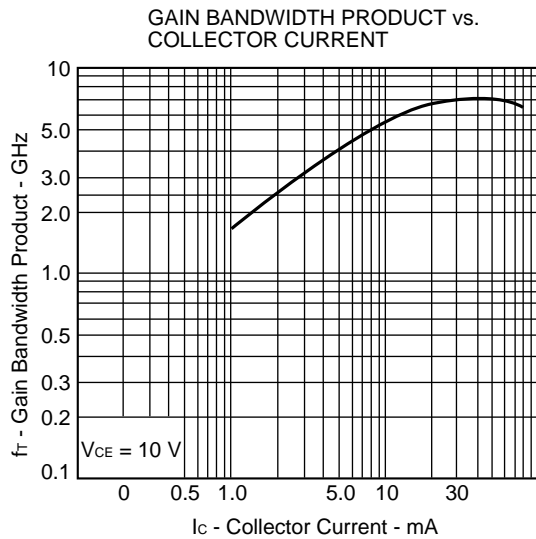
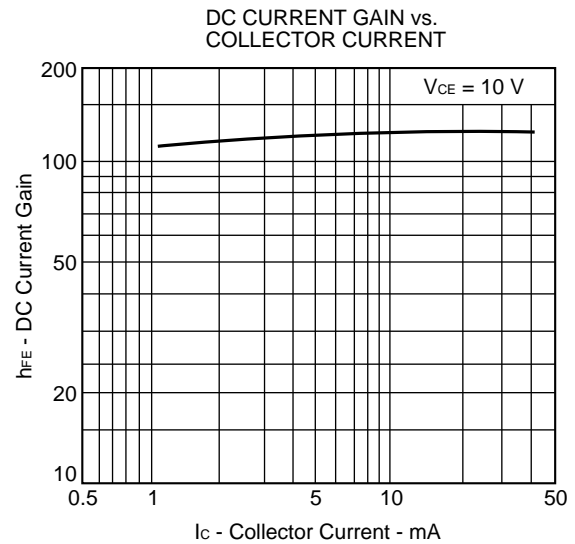
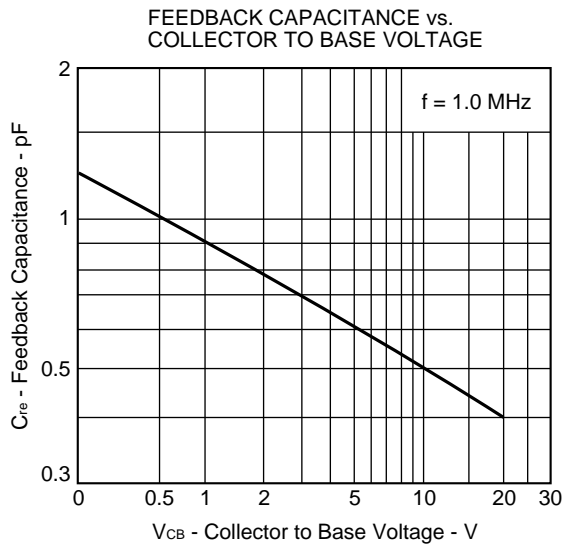
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REGARDING CLEANSING

Cleanse the flux after soldering. Particularly, cleanse the bottom surface of the transistor so that flux does not remain. If any flux remains on the bottom surface, it may absorb moisture, resulting in short circuit among pins due to metal-migration at the metalized area of the transistor. You can use **alcohol** as a solvent.

Do not apply ultra-sonic-cleaning on this product.

TYPICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ )



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Anti-radioactive design is not implemented in this product.