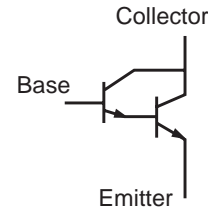
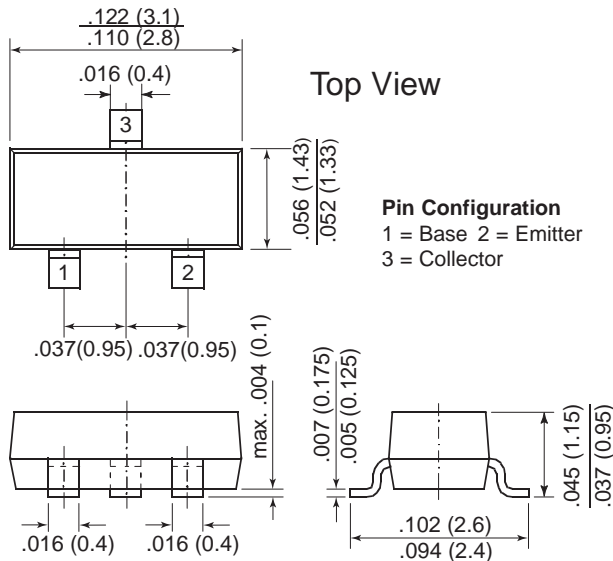




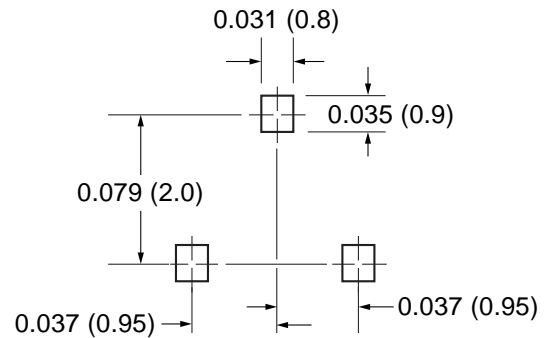
## Darlington Transistors (NPN)



TO-236AB (SOT-23)



Mounting Pad Layout



### Mechanical Data

**Case:** SOT-23 Plastic Package

**Weight:** approx. 0.008g

**Marking Code:**

1M for MMBTA13

1N for MMBTA14

**Packaging Codes/Options:**

E8/10K per 13" reel (8mm tape), 30K/box

E9/3K per 7" reel (8mm tape), 30K/box

### Features

- NPN Silicon Darlington Transistor for switching and amplifier applications.
- High collector current • High current gain
- These transistors are also available in the TO-92 case with the type designation MPSA13 & MPSA14

### Maximum Ratings and Thermal Characteristics (T<sub>C</sub> = 25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CB0</sub>	30	V
Collector-Emitter Voltage	V <sub>CES</sub>	30	V
Emitter-Base Voltage	V <sub>EB0</sub>	10	V
Collector Current	I <sub>C</sub>	300	mA
Power Dissipation at T <sub>A</sub> = 25°C <sup>(3)</sup>	P <sub>tot</sub>	225 <sup>(1)</sup> 300 <sup>(2)</sup>	mW
Thermal Resistance Junction to Ambient Air <sup>(3)</sup>	R <sub>θJA</sub>	556 <sup>(1)</sup> 417 <sup>(2)</sup>	°C/W
Maximum Junction Temperature	T <sub>j</sub>	150	°C
Storage Temperature Range	T <sub>s</sub>	-55 to +150	°C

**Notes:**

(1) On FR-5 board

(2) On alumina substrate

(3) Valid provided that leads are kept at ambient temperature

# MMBTA13 and MMBTA14

Vishay Semiconductors  
formerly General Semiconductor



## Electrical Characteristics (T<sub>C</sub> = 25°C unless otherwise noted)

Parameter	Symbol	Minimum	Maximum	Unit
Collector-Emitter Breakdown Voltage at I <sub>C</sub> = 100 μA, I <sub>B</sub> = 0	V <sub>(BR)CEO</sub>	30	–	V
Emitter Cutoff Current V <sub>EB</sub> = 10 V, I <sub>C</sub> = 0	I <sub>EBO</sub>	–	100	nA
Collector Cutoff Current V <sub>CB</sub> = 30 V, I <sub>E</sub> = 0	I <sub>CBO</sub>	–	100	nA
Collector-Emitter Saturation Voltage at I <sub>C</sub> = 100 mA, I <sub>B</sub> = 0.1 mA	V <sub>CEsat</sub>	–	1.5	V
Base-Emitter On Voltage at I <sub>C</sub> = 100 mA, V <sub>CE</sub> = 5.0V	V <sub>BE(on)</sub>	–	2.0	V
DC Current Gain at V <sub>CE</sub> = 5.0 V, I <sub>C</sub> = 10 mA	h <sub>FE</sub>	MMBTA13 5000	–	–
		MMBTA14 10000	–	–
at V <sub>CE</sub> = 5.0 V, I <sub>C</sub> = 100 mA		MMBTA13 10000	–	–
		MMBTA14 20000	–	–
Gain-Bandwidth Product at V <sub>CE</sub> = 5.0 V, I <sub>C</sub> = 10 mA, f = 100 MHz	f <sub>T</sub>	125	–	MHz