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February 2015

MMBTA56 / PZTA56
PNP General-Purpose Amplifier

Description

This device is designed for general-purpose amplifier applications at collector currents to 300 mA. Sourced from process 73.

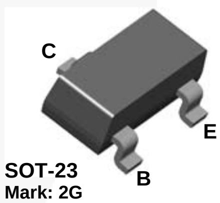

Figure 1. MMBTA56 Device Package

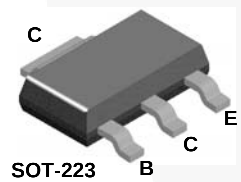

Figure 2. PZTA56 Device Package

Ordering Information

Part Number	Marking	Package	Packing Method
MMBTA56	2G	SOT-23 3L	Tape and Reel
PZTA56	A56	SOT-223 4L	Tape and Reel

Absolute Maximum Ratings[(1),(2)]

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at T_A = 25°C unless otherwise noted.

Symbol	Parameter	Value	Unit
V_{CES}	Collector-Emitter Voltage	-80	V
V_{CBO}	Collector-Base Voltage	-80	V
V_{EBO}	Emitter-Base Voltage	-4.0	V
I_C	Collector Current - Continuous	-500	mA
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	°C

Notes:
1. These ratings are based on a maximum junction temperature of 150°C.
2. These are steady-state limits. Fairchild Semiconductor should be consulted on applications involving pulsed or low-duty-cycle operations.

Thermal Characteristics

Values are at T_A = 25°C unless otherwise noted.

Symbol	Parameter	Max.		Unit
		MMBTA56(3)	PZTA56(4)	
P_D	Total Device Dissipation	350	1000	mW
	Derate Above 25°C	2.8	8.0	mW/°C
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	357	125	°C/W

Notes:

3. Device mounted on FR-4 PCB 36mm × 18mm × 1.5mm; mounting pad for the collector lead minimum 6cm^2.
4. PCB size: FR-4, 76 mm x 114 mm x 1.57 mm (3.0 inch x 4.5 inch x 0.062 inch) with minimum land pattern size.

Electrical Characteristics

Values are at T_A = 25°C unless otherwise noted.

Symbol	Parameter	Conditions	Min.	Max.	Unit
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage(5)	I_C = -1.0 mA, I_B = 0	-80		V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	I_C = -100 µA, I_E = 0	-60		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	I_E = -100 µA, I_C = 0	-4.0		V
I_{CEO}	Collector Cut-Off Current	V_{CE} = -60 V, I_B = 0		-0.1	µA
I_{CBO}	Collector Cut-Off Current	V_{CB} = -80 V, I_E = 0		-0.1	µA
h_{FE}	DC Current Gain	I_C = -10 mA, V_{CE} = -1.0 V	100		
		I_C = -100 mA, V_{CE} = -1.0 V	100		
$V_{CE}(sat)$	Collector-Emitter Saturation Voltage	I_C = -100 mA, I_B = -10 mA		-0.25	V
$V_{BE}(on)$	Base-Emitter On Voltage	I_C = -100 mA, V_{CE} = -1.0 V		-1.2	V
f_T	Current Gain - Bandwidth Product	I_C = -100 mA, V_{CE} = -1.0 V, f = 100 MHz	50		MHz

Note:

5. Pulse test: pulse width ≤ 300 µs, duty cycle ≤ 2.0%.

Typical Performance Characteristics

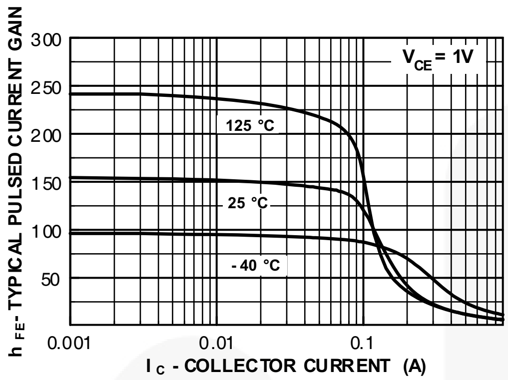

Figure 3. Typical Pulsed Current Gain vs. Collector Current

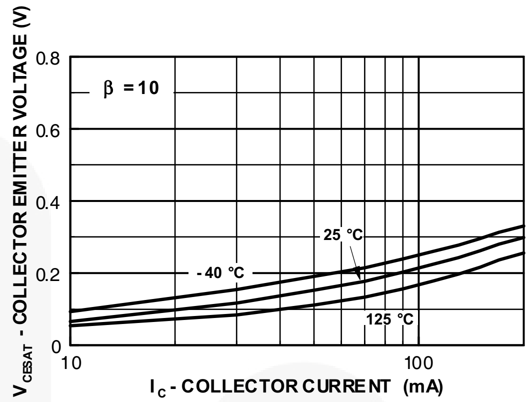

Figure 4. Collector-Emitter Saturation Voltage vs. Collector Current

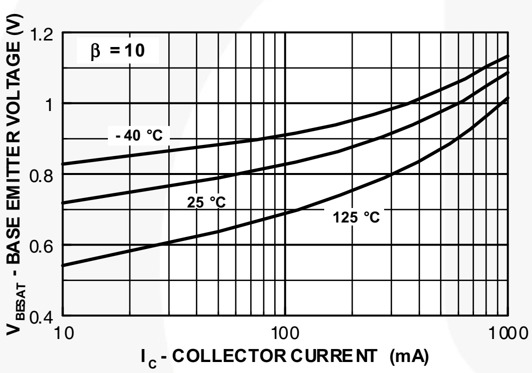

Figure 5. Base-Emitter Saturation Voltage vs. Collector Current

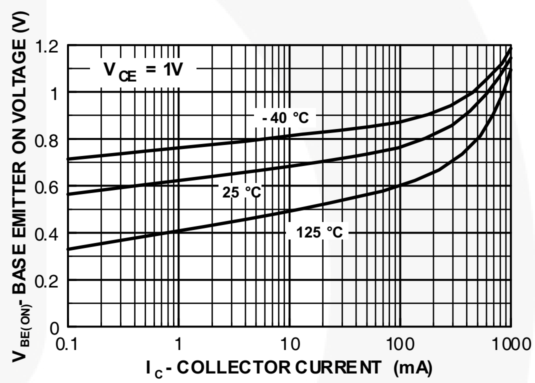

Figure 6. Base-Emitter On Voltage vs. Collector Current

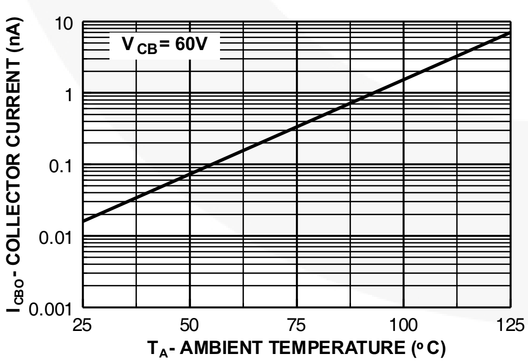

Figure 7. Collector Cut-Off Current vs. Ambient Temperature

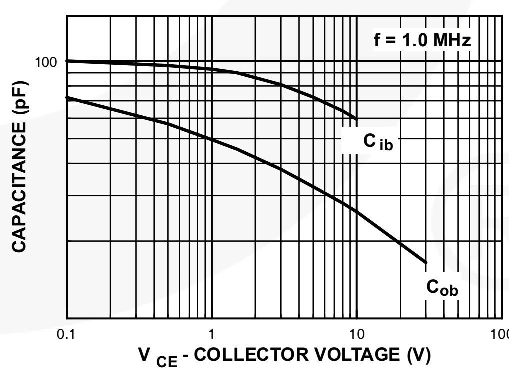

Figure 8. Input and Output Capacitance vs. Reverse Voltage

Typical Performance Characteristics (Continued)

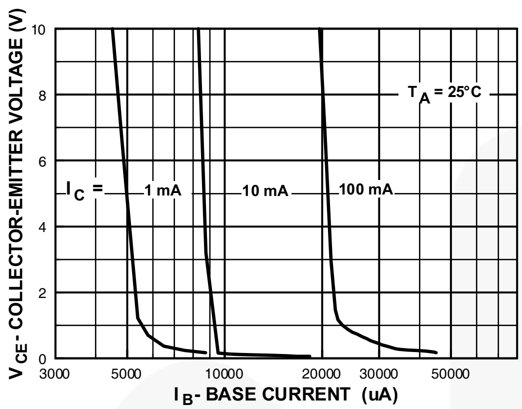

Figure 9. Collector Saturation Region

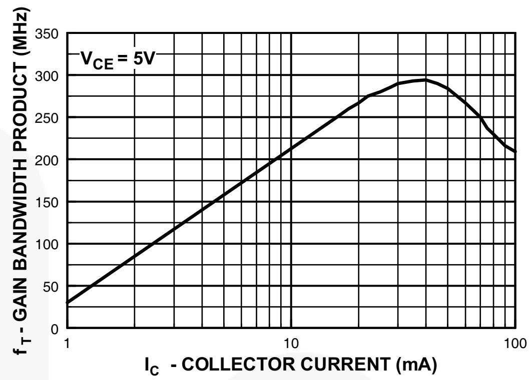

Figure 10. Gain Bandwidth Product vs. Collector Current

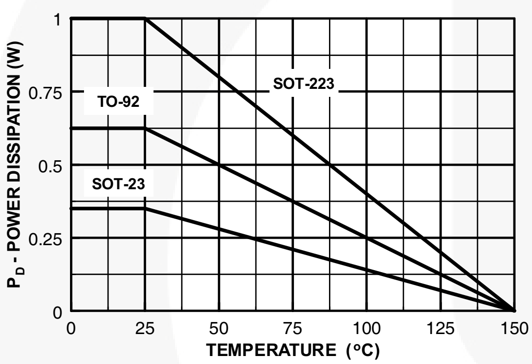

Figure 11. Power Dissipation vs. Ambient Temperature

Physical Dimensions

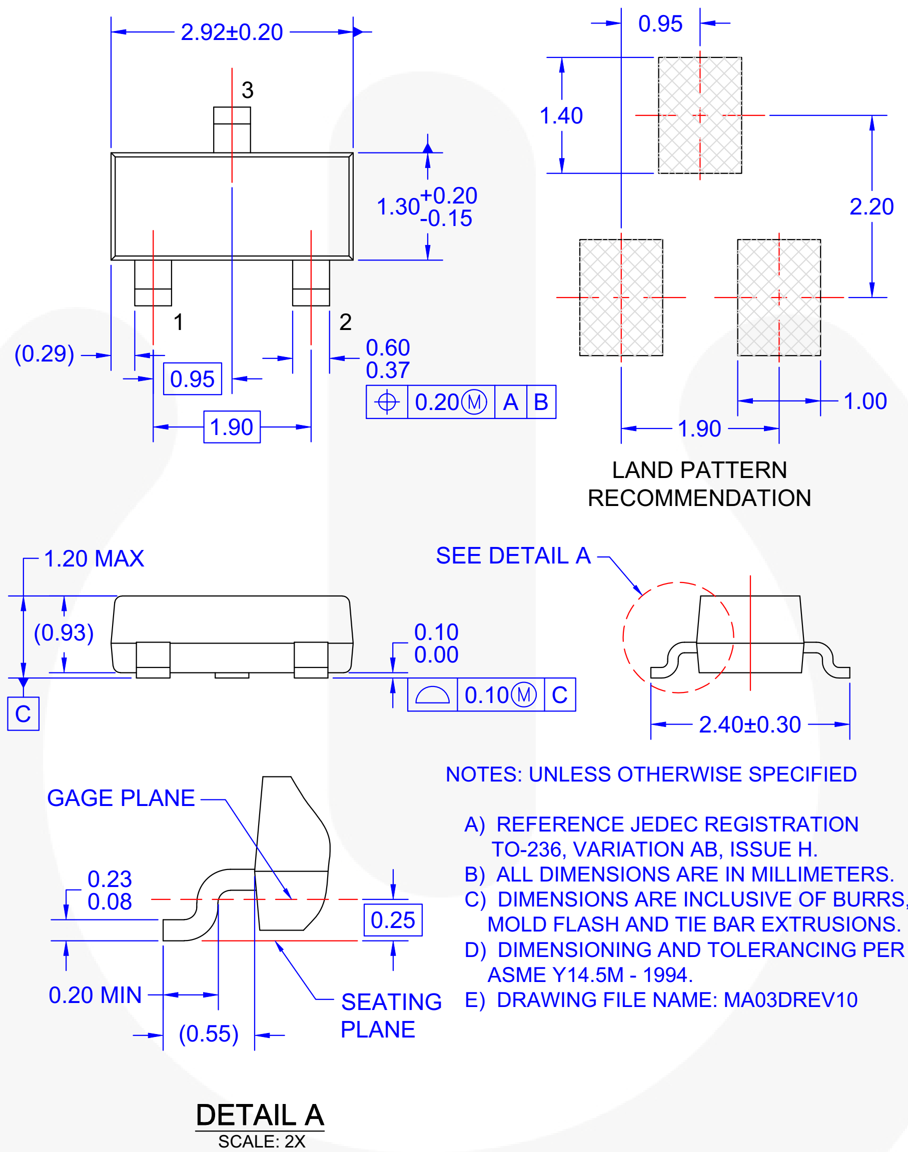

Figure 12. 3-LEAD, SOT23, JEDEC TO-236, LOW PROFILE

Physical Dimensions (Continued)

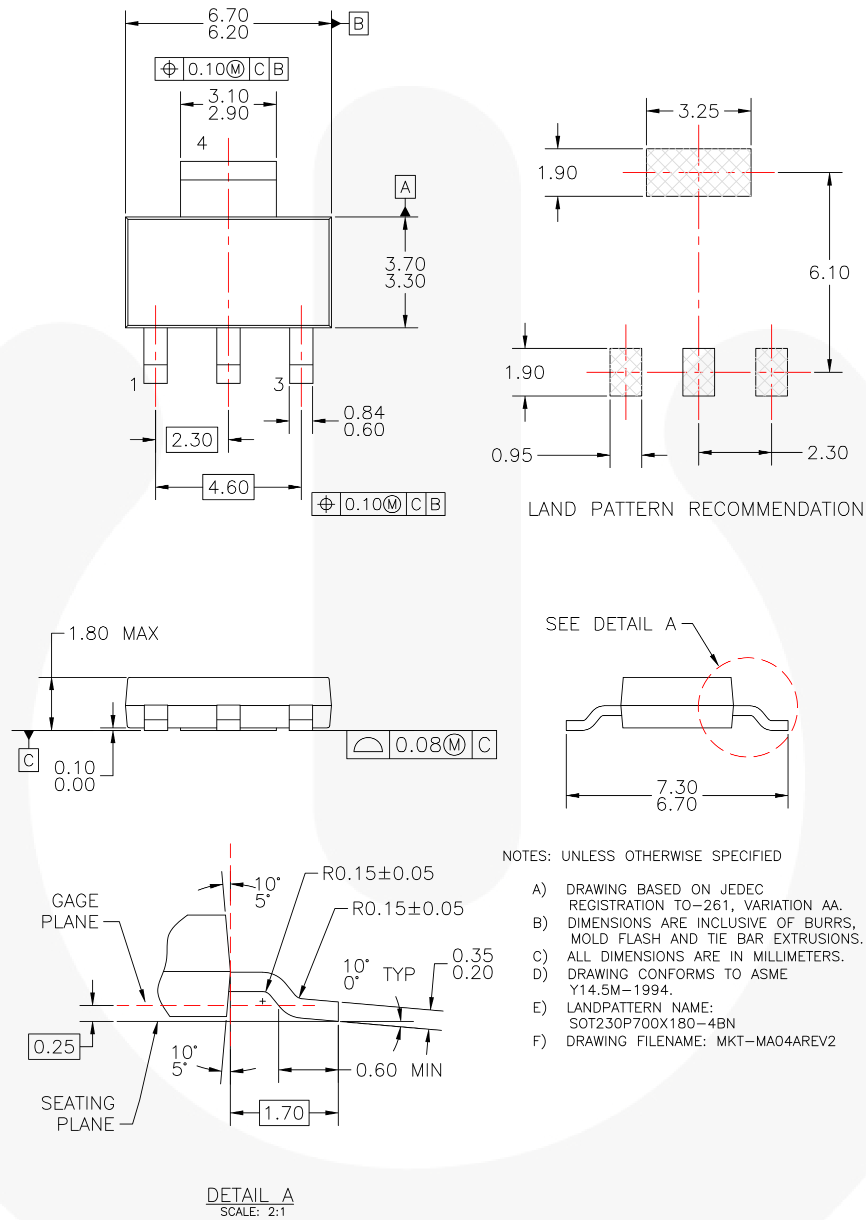

Figure 13. MOLDED PACKAGING, SOT-223, 4-LEAD

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