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FAIRCHILD

February 2015

MMBTA28 / PZTA28
NPN Darlington Transistor

Description

This device is designed for applications requiring extremely high current gain at collector currents to 500 mA. Sourced from process 03.

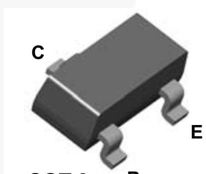

Figure 1. MMBTA28 Device Package

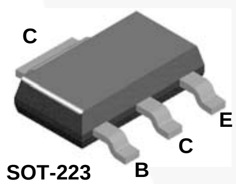

Figure 2. PZTA28 Device Package

Ordering Information

Part Number	Top Mark	Package	Packing Method
MMBTA28	3SS	SSOT 3L	Tape and Reel
PZTA28	A28	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_{CEO}	Collector-Emitter Voltage	80	V
V_{CBO}	Collector-Base Voltage	80	V
V_{EBO}	Emitter-Base Voltage	12	V
I_C	Collector Current - Continuous	800	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
		MMBTA28(3)	PZTA28(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(5)

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

Symbol	Parameter	Conditions	Min.	Max.	Unit
$V_{(BR)CES}$	Collector-Emitter Breakdown Voltage	I_C = 100 µA, V_{BE} = 0	80		V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	I_C = 100 µA, I_E = 0	80		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	I_E = 10 µA, I_C = 0	12		V
I_{CBO}	Collector Cut-Off Current	V_{CB} = 60 V, I_E = 0		100	nA
I_{CES}	Collector Cut-Off Current	V_{CE} = 60 V, V_{BE} = 0		500	nA
I_{EBO}	Emitter Cut-Off Current	V_{EB} = 10 V, I_C = 0		100	nA
h_{FE}	DC Current Gain	I_C = 10 mA, V_{CE} = 5.0 V	10000		
		I_C = 100 mA, V_{CE} = 5.0 V	10000		
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C = 10 mA, I_B = 0.01 mA		1.2	V
		I_C = 100 mA, I_B = 0.1 mA		1.5	
$V_{BE(on)}$	Base-Emitter On Voltage	I_C = 100 mA, V_{CE} = 5.0 V		2.0	V
f_T	Current Gain - Bandwidth Product	I_C = 10 mA, V_{CE} = 5.0 V, f = 100 MHz	125		MHz
C_{obo}	Output Capacitance	V_{CB} = 1.0 V, I_E = 0, f = 1.0 MHz		8.0	pF

Note:

5. Pulse test: pulse width ≤ 300 µs, duty cycle ≤ 2%.

Typical Performance Characteristics

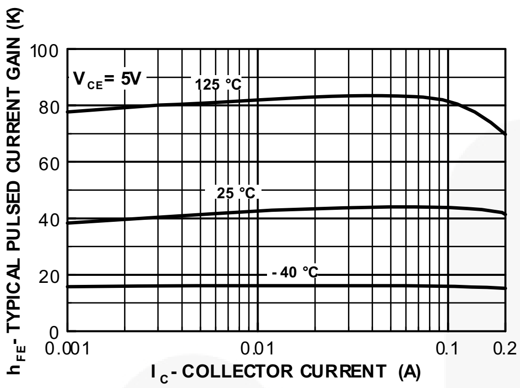

Figure 3. Typical Pulsed Current Gain vs. Collector Current

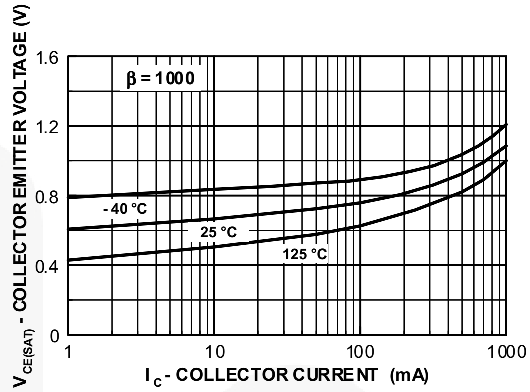

Figure 4. Collector-Emitter Saturation Voltage vs. Collector Current

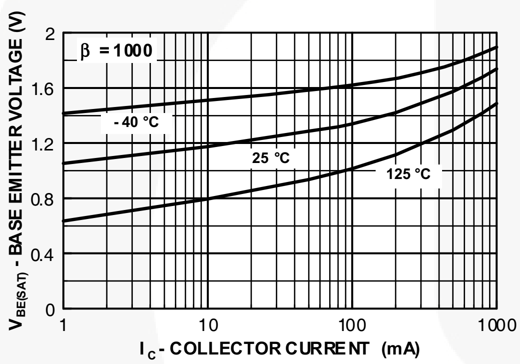

Figure 5. Base-Emitter Saturation Voltage vs. Collector Current

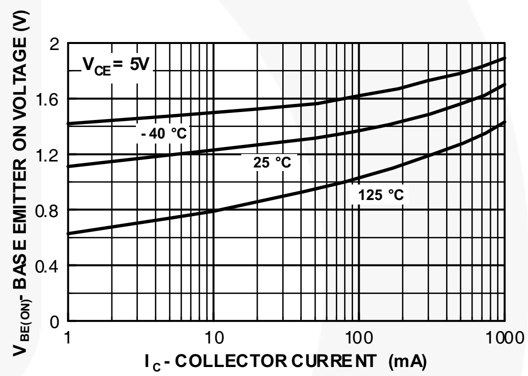

Figure 6. Base-Emitter On Voltage vs. Collector Current

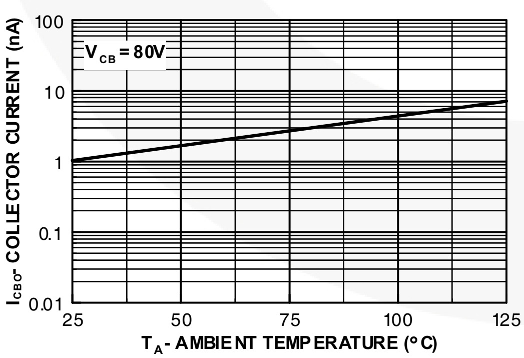

Figure 7. Collector Cut-Off Current vs. Ambient Temperature

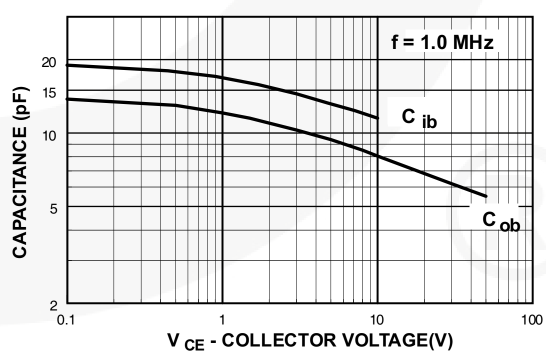

Figure 8. Input and Output Capacitance vs. Reverse Voltage

Typical Performance Characteristics (Continued)

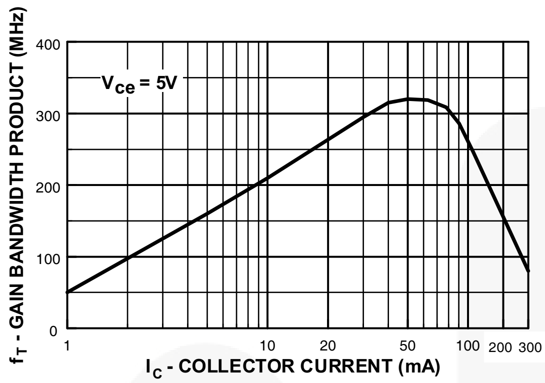

Figure 9. Gain Bandwidth Product vs. Collector Current

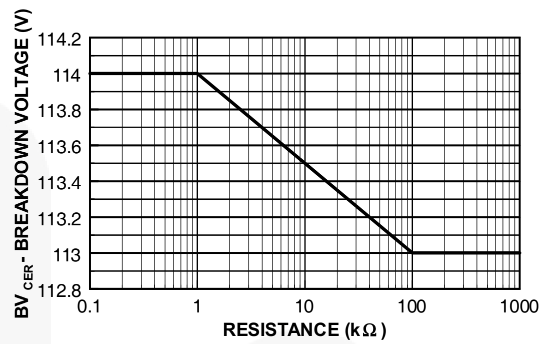

Figure 10. Collector-Emitter Breakdown Voltage with Resistance Between Emitter-Base

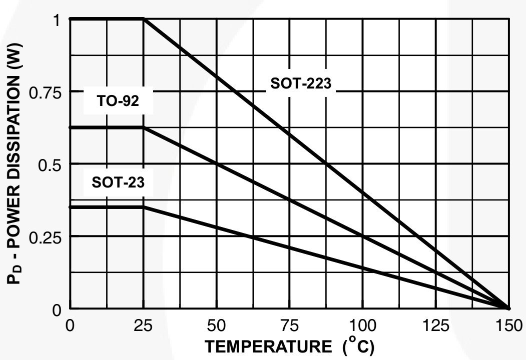

Figure 11. Power Dissipation vs. Ambient Temperature

Physical Dimensions

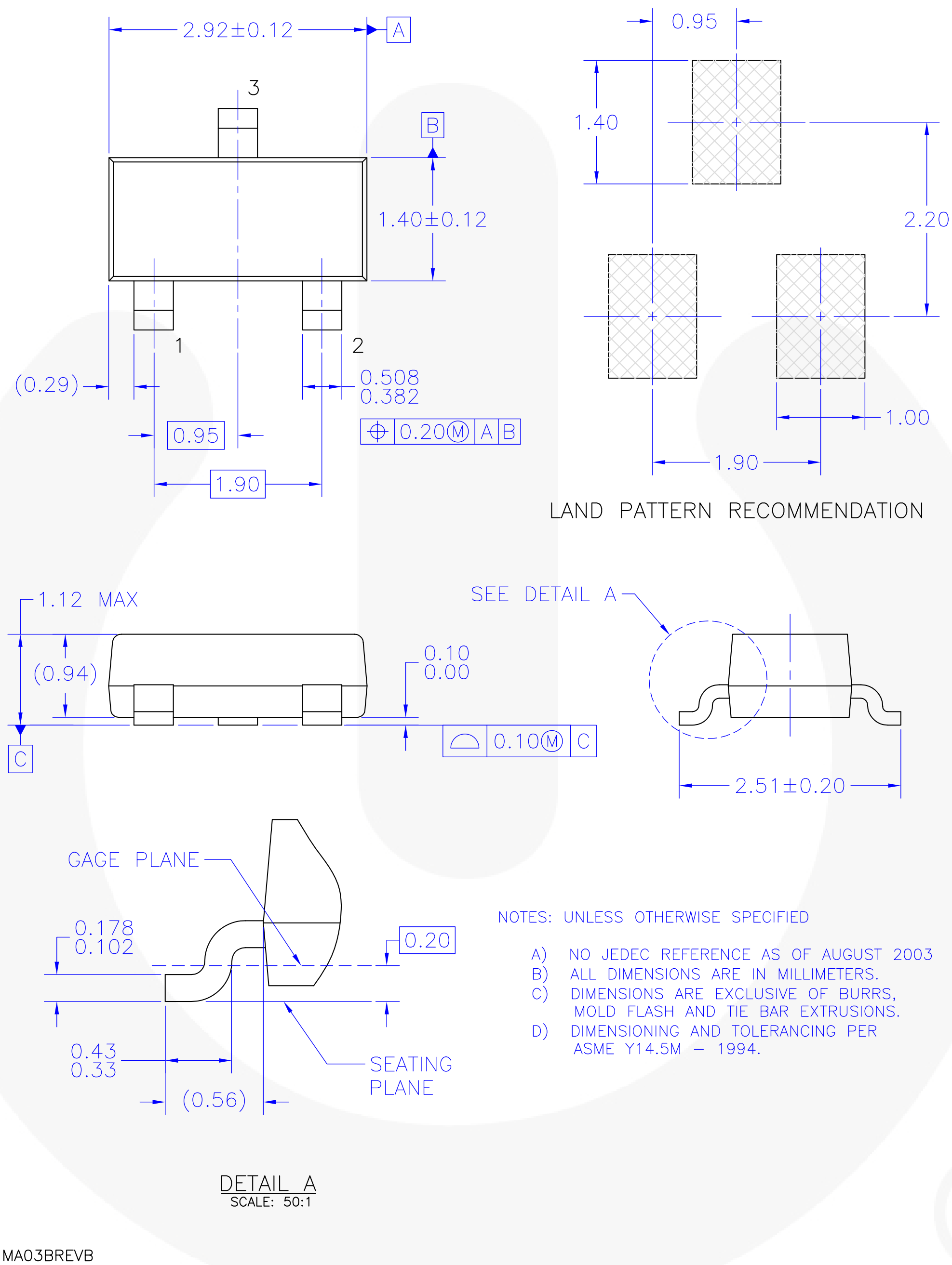

Figure 12. MOLDED PACKAGE, SUPERSOT, 3-LEAD

Physical Dimensions (Continued)

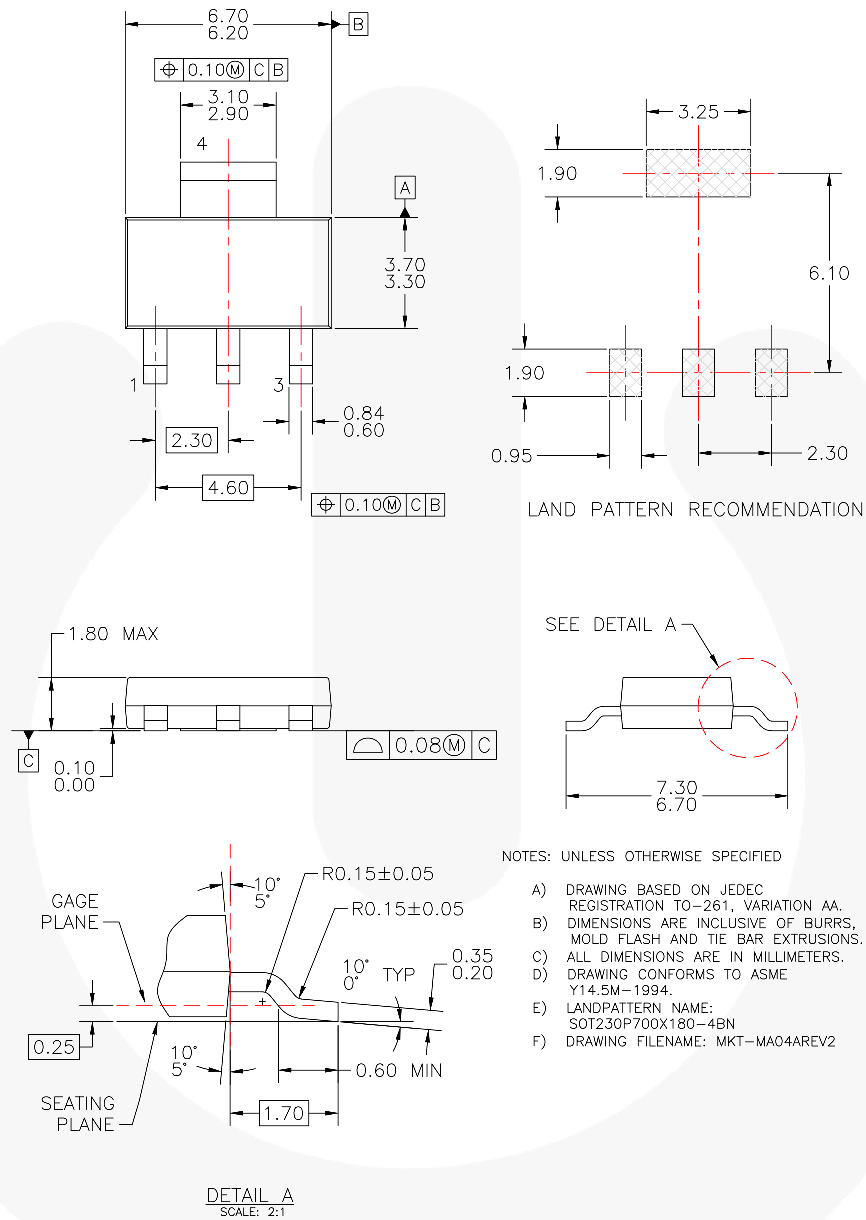

Figure 13. MOLDED PACKAGING, SOT-223, 4-LEAD

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