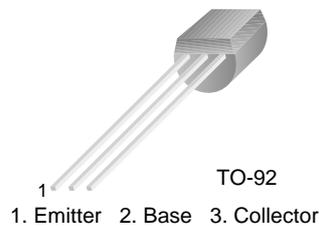**FAIRCHILD**

SEMICONDUCTOR®

March 2009

MPSA77
PNP Darlington Transistor

- This device is designed for applications requiring extremely high current gain at currents to 800mA.

- Sourced from process 61.

TO-92

1. Emitter   2. Base   3. Collector

Absolute Maximum Ratings * T_a=25°C unless otherwise noted

Symbol	Parameter		Value	Units
V_{CES}	Collector-Emitter Voltage		-60	V
V_{CBO}	Collector-Base Voltage		-60	V
V_{EBO}	Emitter-Base Voltage		-10	V
I_C	Collector Current	- Continuous	-1.2	A
T_J, T_{STG}	Operating and Storage Junction Temperature Range		-55 ~ +150	°C

* These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

NOTES:
1. These ratings are based on a maximum junction temperature of 150 degrees C.
2. These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

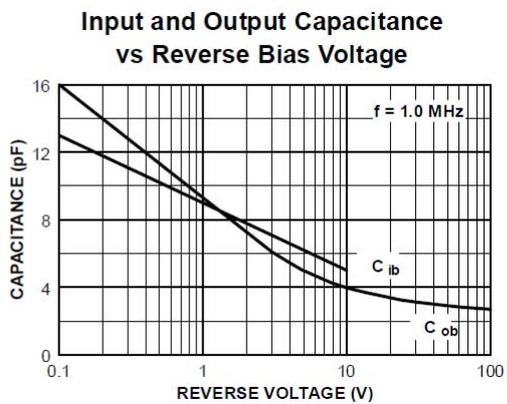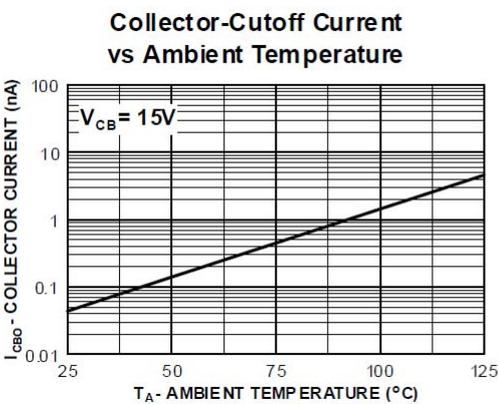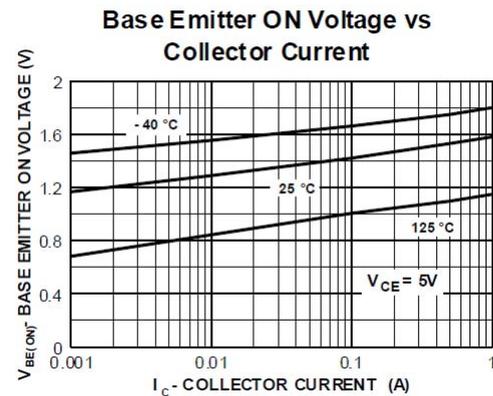## Thermal Characteristics T_a=25°C unless otherwise noted

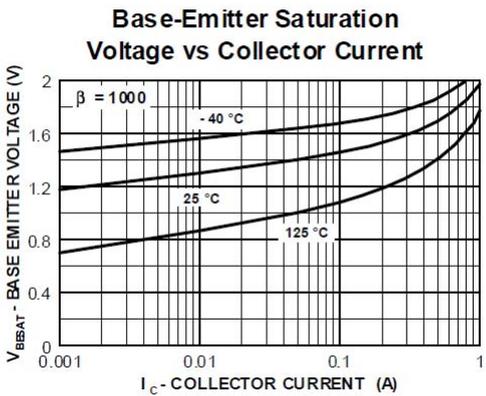| Symbol	Parameter	Max.	Units
P_D	Total Device Dissipation Derate above 25°C	625 5.0	mW mW/°C
$R_{\theta JC}$	Thermal Resistance, Junction to Case	83.3	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	200	°C/W

Electrical Characteristics T_a=25°C unless otherwise noted

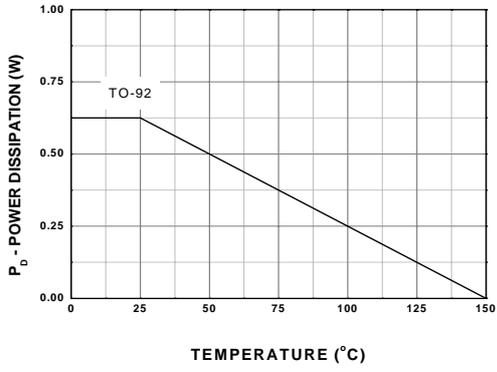| Symbol	Parameter	Test Condition	Min.	Max.	Units
Off Characteristics					
$V_{(BR)CES}$	Collector-Emitter Breakdown Voltage	$I_C = -100\mu A$, $I_B = 0$	-60		V
I_{CBO}	Collector Cutoff Current	$V_{CB} = -30V$, $I_E = 0$		-100	nA
I_{EBO}	Emitter Cutoff Current	$V_{EB} = -10V$, $I_C = 0$		-100	nA
On Characteristics *					
h_{FE}	DC Current Gain	$I_C = -10mA$, $V_{CE} = -5.0V$ $I_C = -100mA$, $V_{CE} = -5.0V$	10,000 10,000		
V_{CE}(sat)	Collector-Emitter Saturation Voltage	$I_C = -100mA$, $I_B = -0.1mA$		-1.5	V
V_{BE}(on)	Base-Emitter On Voltage	$I_C = -100mA$, $V_{CE} = -5.0mA$		-2.0	V
Small Signal Characteristics *					
f_T	Current Gain Dandwidth Product	$I_C = -10mA$, $V_{CE} = -5.0V$ $f = 100MHz$	100		MHz

* Pulse Test: Pulse Width $\leq$ 300μs, Duty Cycle $\leq$ 2.0%

Typical Performance Characteristics

Typical Pulsed Current Gain vs Collector Current

Collector-Emitter Saturation Voltage vs Collector Current

Base-Emitter Saturation Voltage vs Collector Current

Base Emitter ON Voltage vs Collector Current

Collector-Cutoff Current vs Ambient Temperature

Input and Output Capacitance vs Reverse Bias Voltage
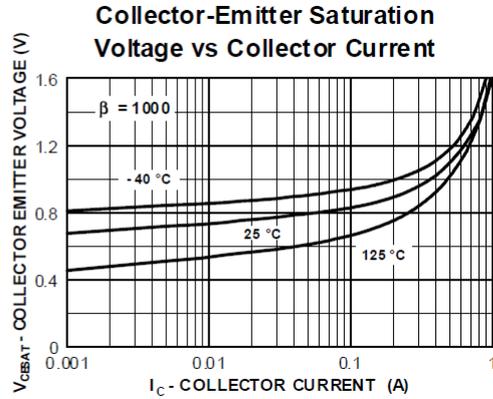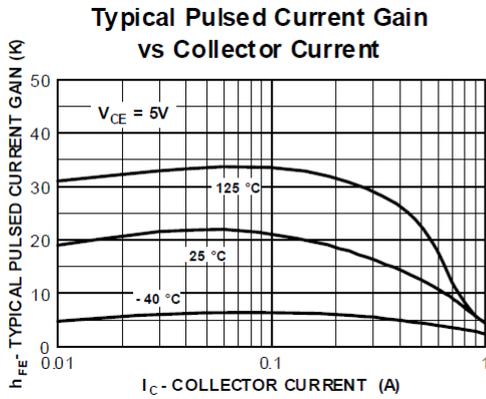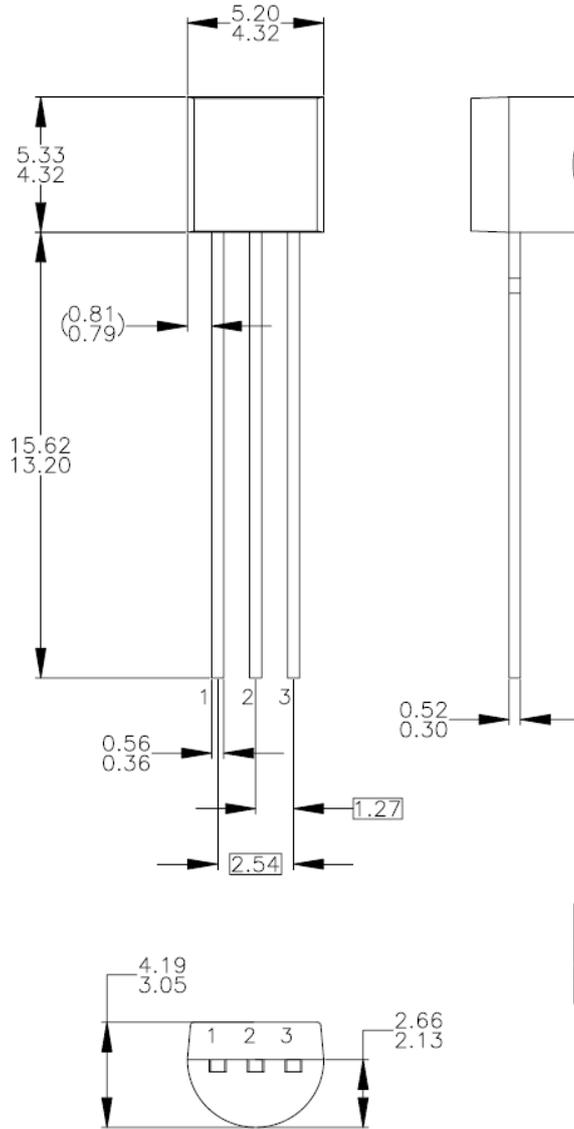
Typical Performance Characteristics (Continued)

Power Dissipation vs Ambient Temperature

Mechanical Dimensions (TO-92)

5.20
4.32

5.33
4.32

(0.81)
(0.79)

15.62
13.20

1 2 3

0.56
0.36

1.27

2.54

0.52
0.30

4.19
3.05

1 2 3

2.66
2.13

NOTES: UNLESS OTHERWISE SPECIFIED

A) DRAWING WITH REFERENCE TO JEDEC TO–92
RECOMMENDATIONS.
B) ALL DIMENSIONS ARE IN MILLIMETERS.
C) DRAWING CONFORMS TO ASME Y14.5M–1994.
D) TO–92 (92,94,96,97,98) PIN CONFIGURATION:

PIN	92			94			96			97			98		
	P	F	M	P	F	M	B	F	M	P	F	M	P	F	M
1	E	S	S	E	S	S	B	D	G	C	G	D	C	G	D
2	B	D	G	C	G	D	E	S	S	B	D	G	E	S	S
3	C	G	D	B	D	G	C	G	D	E	S	S	B	D	G

LEGEND:
P – BIPOLAR   E – EMITTER   D – DRAIN
F – JFET   B – BASE   S – SOURCE
M – DMOS   C – COLLECTOR   G – GATE

E) FOR PACKAGE 92, 94, 96, 97 AND 98:
PIN CONFIGURATION DRAIN "D" AND SOURCE "S"
ARE INTERCHANGEAGLE AT JFET "F" OPTION.
F) DRAWING FILENAME: MKT–ZA03DREV3.

Dimensions in Millimeters

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CTL™	GTO™	RapidConfigure™	TinyLogic®
Current Transfer Logic™	IntelliMAX™	ⓞ™	TINYOPTO™
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EfficentMax™	MegaBuck™	Saving our world, 1mW/W/kW at a time™	TinyPWM™
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FPS™	PowerTrench®	The Power Franchise®	XS™
F-PFS™	PowerXS™		

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Definition of Terms

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