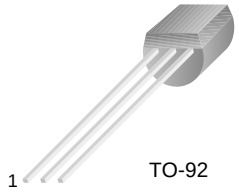
FAIRCHILD SEMICONDUCTOR®

July 2007

MPSA13

NPN Darlington Transistor

- This device is designed for applications requiring extremely high Current gain at collector Currents to 1.0A.
- Sourced from process 05.



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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	30	V
V_{CBO}	Collector-Base Voltage	30	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 to +150	°C

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 = 100μA, I_B = 0	30		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	V_{CE} = 5.0V, I_C =10mA V_{CE} = 5.0, I_C = 100mA	5,000 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} = 5.0V		2.0	V
Small Signal Characteristics					
f_T	Current Gain Bandwidth Product	I_C = 10mA, V_{CE} = 10V, f = 100MHz	125		pF

* Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%

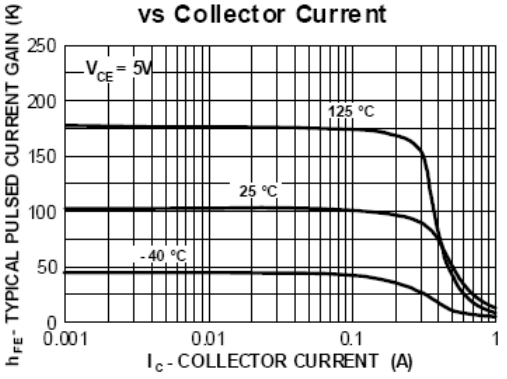
Thermal Characteristics T_a=25°C unless otherwise noted

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

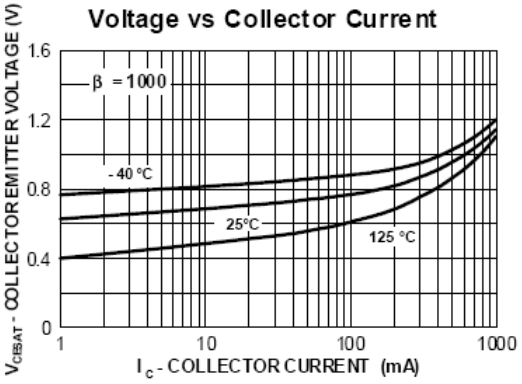
* Device mounted on FR-4PCB 1.6" × 1.6" × 0.06".

Typical Characteristics

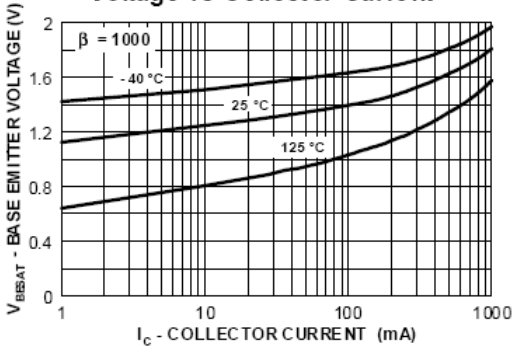
Typical Pulsed Current Gain vs Collector Current



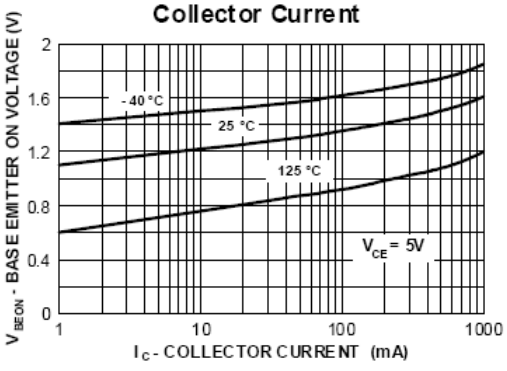
Collector-Emitter Saturation Voltage vs Collector Current



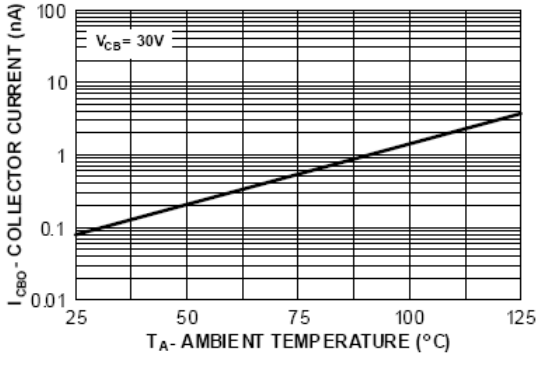
Base-Emitter Saturation Voltage vs Collector Current



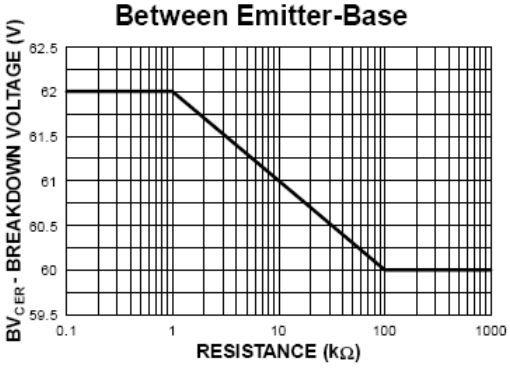
Base Emitter ON Voltage vs Collector Current



Collector-Cutoff Current vs Ambient Temperature

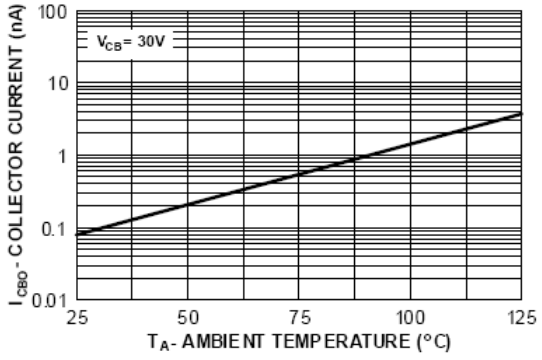


Collector-Emitter Breakdown Voltage with Resistance Between Emitter-Base

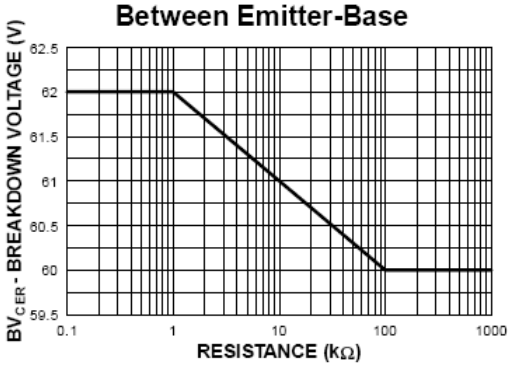


Typical Characteristics (continued)

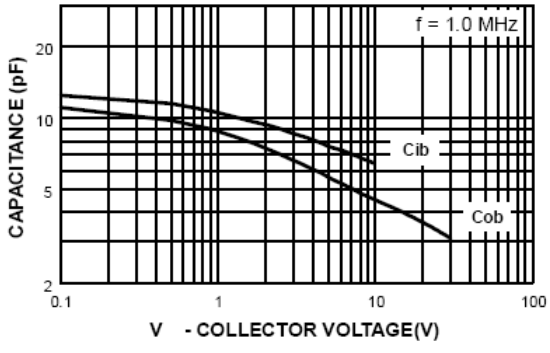
Collector-Cutoff Current
vs Ambient Temperature



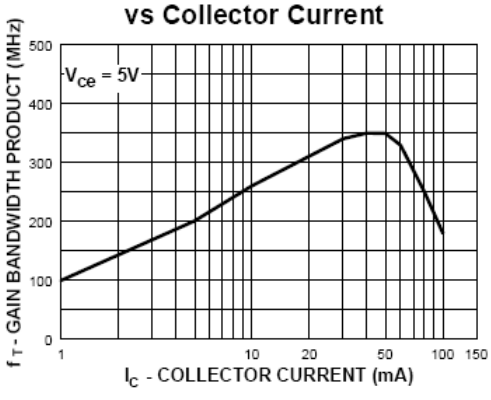
Collector-Emitter Breakdown
Voltage with Resistance
Between Emitter-Base



Input and Output Capacitance
vs Reverse Voltage

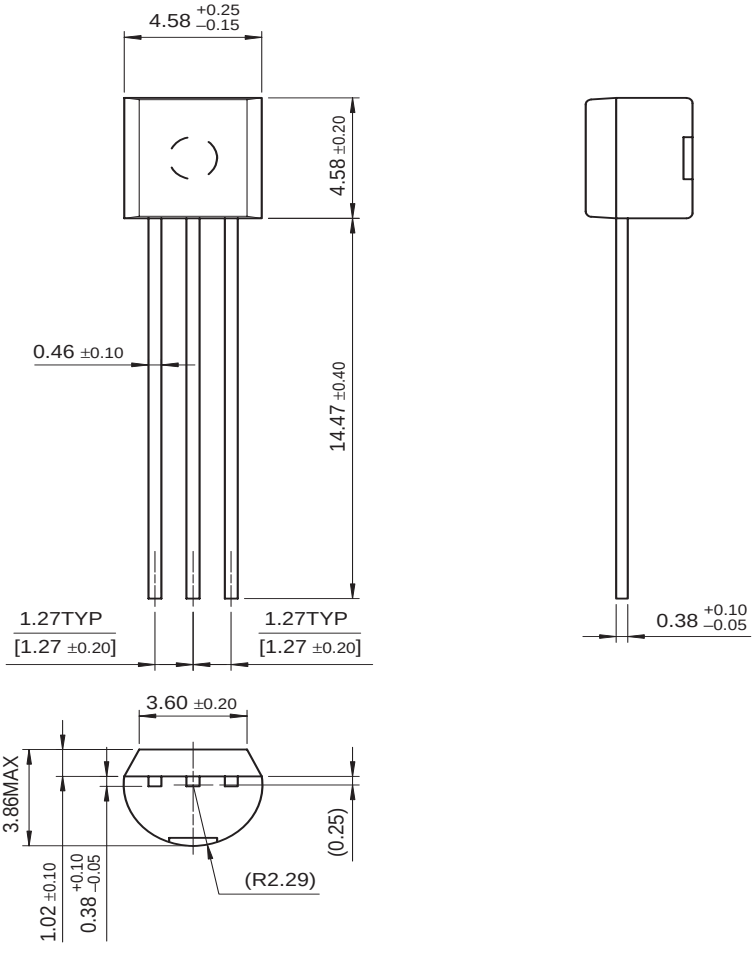


Gain Bandwidth Product
vs Collector Current



Mechanical Dimensions

TO-92



Dimensions in Millimeters

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Rev. I25