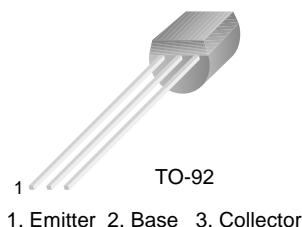


# MPSA13

## NPN Darlington Transistor

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



### Absolute Maximum Ratings

 $T_a = 25^\circ\text{C}$  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	$^\circ\text{C}$

### Electrical Characteristics

 $T_a = 25^\circ\text{C}$  unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Max.	Units
<b>Off Characteristics</b>					
$V_{(BR)CES}$	Collector-Emitter Breakdown Voltage	$I_C = 100\mu\text{A}, I_B = 0$	30		V
$I_{CBO}$	Collector-Cutoff Current	$V_{CB} = 30\text{V}, I_E = 0$		100	nA
$I_{EBO}$	Emitter-Cutoff Current	$V_{EB} = 10\text{V}, I_C = 0$		100	nA
<b>On Characteristics *</b>					
$h_{FE}$	DC Current Gain	$V_{CE} = 5.0\text{V}, I_C = 10\text{mA}$ $V_{CE} = 5.0, I_C = 100\text{mA}$	5,000 10,000		
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 100\text{mA}, I_B = 0.1\text{mA}$		1.5	V
$V_{BE(on)}$	Base-Emitter On Voltage	$I_C = 100\text{mA}, V_{CE} = 5.0\text{V}$		2.0	V
<b>Small Signal Characteristics</b>					
$f_T$	Current Gain Bandwidth Product	$I_C = 10\text{mA}, V_{CE} = 10\text{V}, f = 100\text{MHz}$	125		pF

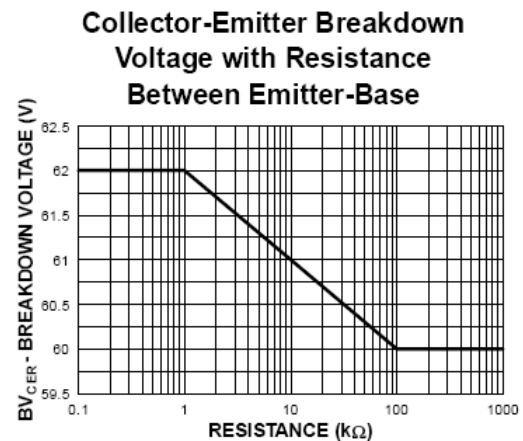
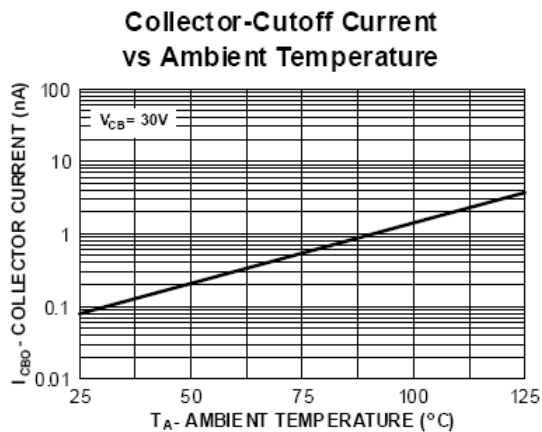
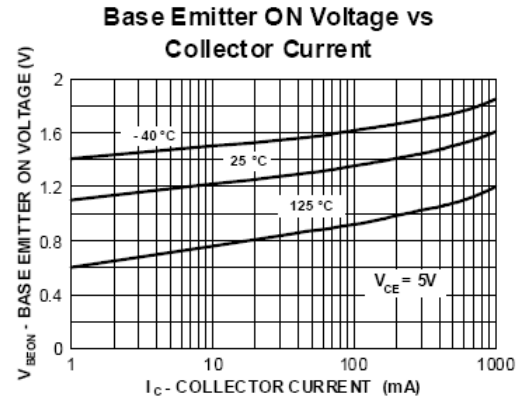
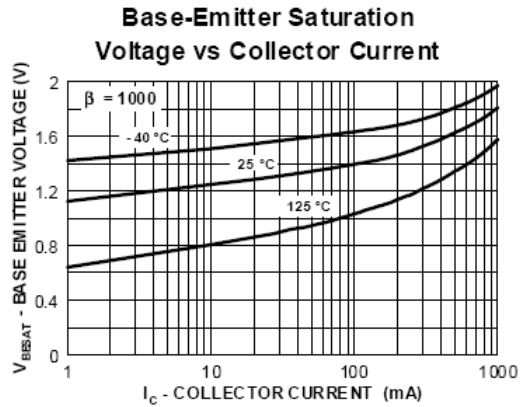
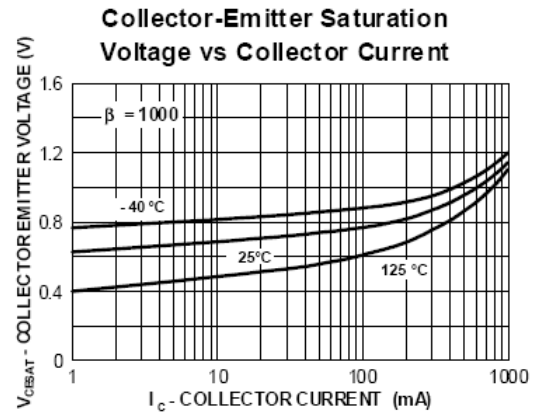
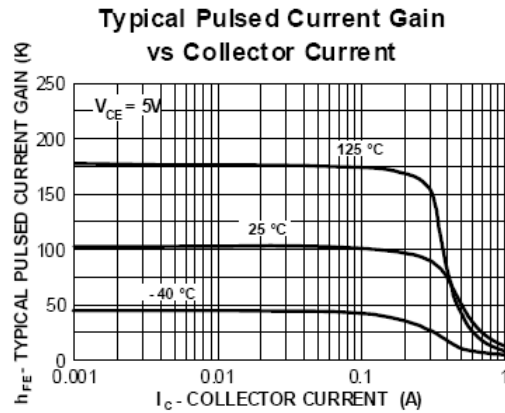
 \* Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$

# Thermal Characteristics $T_a=25^\circ\text{C}$ unless otherwise noted

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

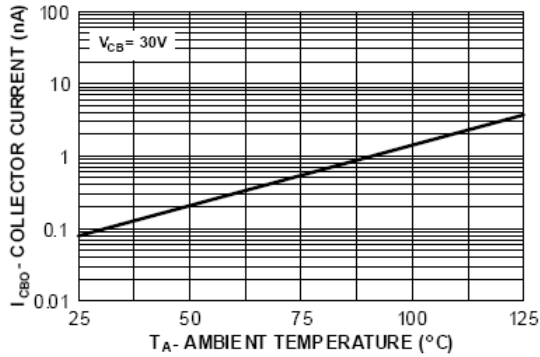
\* Device mounted on FR-4PCB  $1.6" \times 1.6" \times 0.06"$ .

## Typical Characteristics

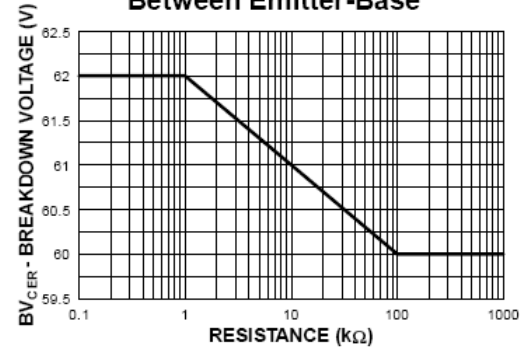


# Typical Characteristics (continued)

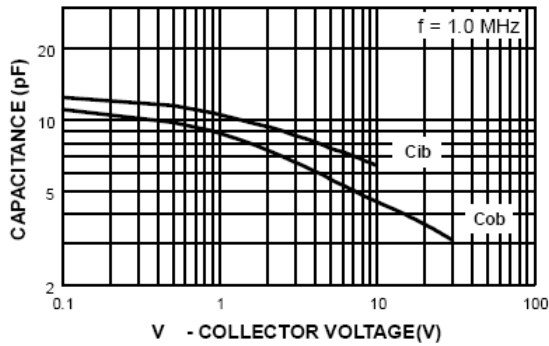
Collector-Cutoff Current  
vs Ambient Temperature



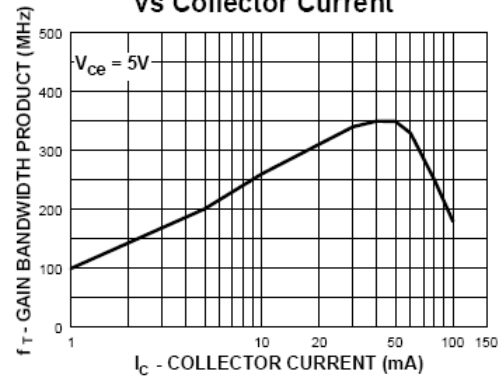
Collector-Emitter Breakdown  
Voltage with Resistance  
Between Emitter-Base



Input and Output Capacitance  
vs Reverse Voltage

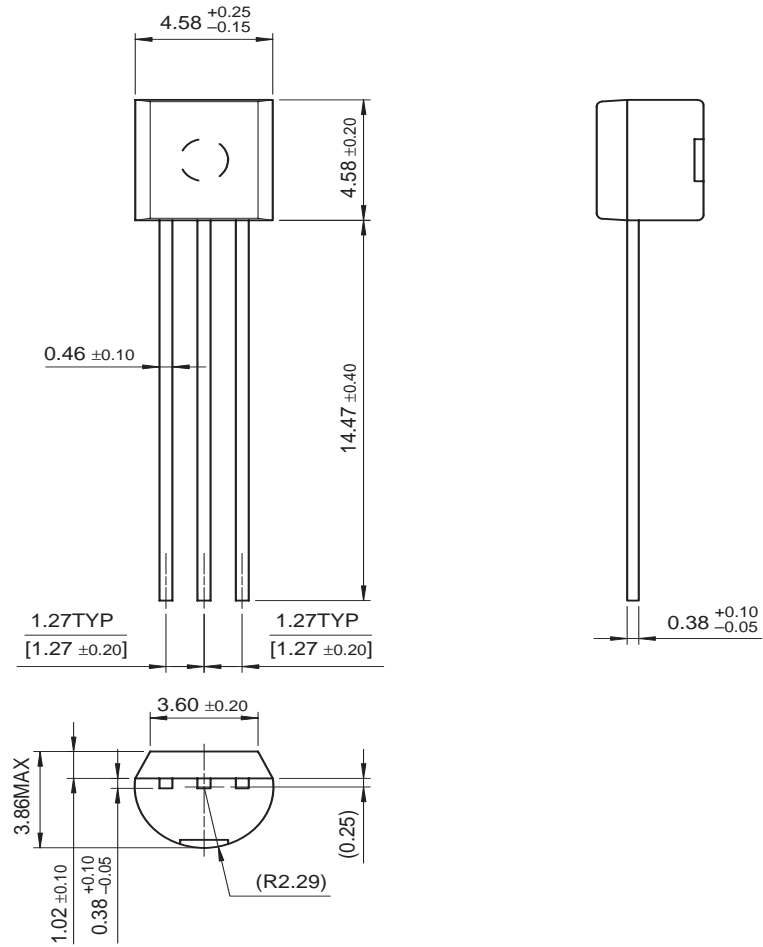


Gain Bandwidth Product  
vs Collector Current



# Mechanical Dimensions

## TO-92




Dimensions in Millimeters



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