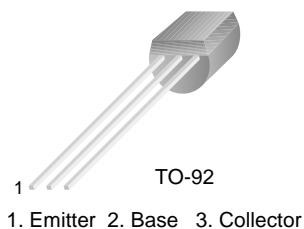


# MPSA13

## 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<sub>a</sub> = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V <sub>CES</sub>	Collector-Emitter Voltage	30	V
V <sub>CBO</sub>	Collector-Base Voltage	30	V
V <sub>EBO</sub>	Emitter-Base Voltage	10	V
I <sub>C</sub>	Collector Current - Continuous	1.2	A
T <sub>J</sub> , T <sub>STG</sub>	Operating and Storage Junction Temperature Range	-55 to +150	°C

### Electrical Characteristics T<sub>a</sub> = 25°C unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Max.	Units
<b>Off Characteristics</b>					
V <sub>(BR)CES</sub>	Collector-Emitter Breakdown Voltage	I <sub>C</sub> = 100μA, I <sub>B</sub> = 0	30		V
I <sub>CB0</sub>	Collector-Cutoff Current	V <sub>CB</sub> = 30V, I <sub>E</sub> = 0		100	nA
I <sub>EBO</sub>	Emitter-Cutoff Current	V <sub>EB</sub> = 10V, I <sub>C</sub> = 0		100	nA
<b>On Characteristics *</b>					
h <sub>FE</sub>	DC Current Gain	V <sub>CE</sub> = 5.0V, I <sub>C</sub> = 10mA V <sub>CE</sub> = 5.0, I <sub>C</sub> = 100mA	5,000 10,000		
V <sub>CE(sat)</sub>	Collector-Emitter Saturation Voltage	I <sub>C</sub> = 100mA, I <sub>B</sub> = 0.1mA		1.5	V
V <sub>BE(on)</sub>	Base-Emitter On Voltage	I <sub>C</sub> = 100mA, V <sub>CE</sub> = 5.0V		2.0	V
<b>Small Signal Characteristics</b>					
f <sub>T</sub>	Current Gain Bandwidth Product	I <sub>C</sub> = 10mA, V <sub>CE</sub> = 10V, f = 100MHz	125		pF

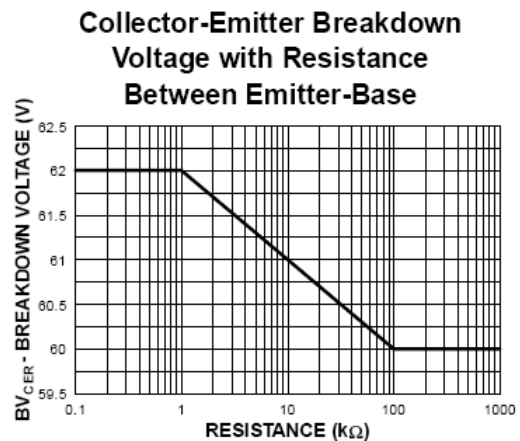
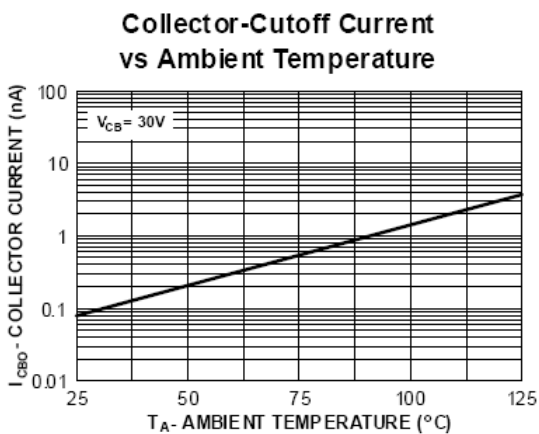
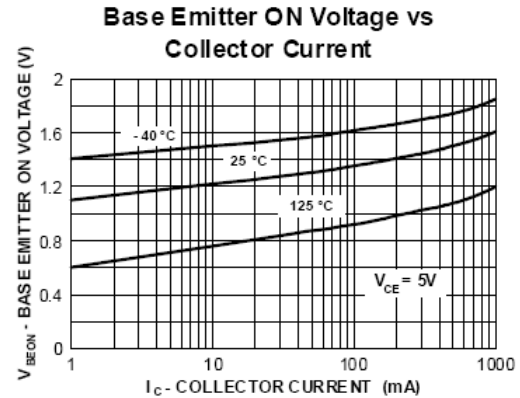
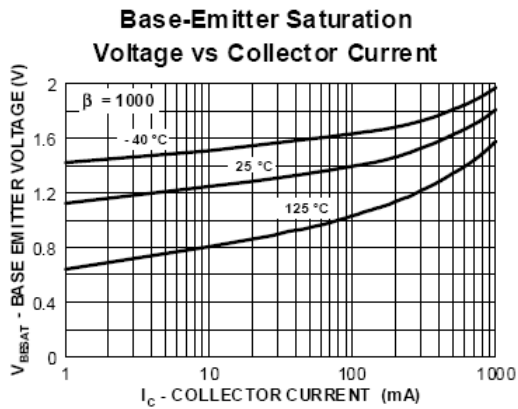
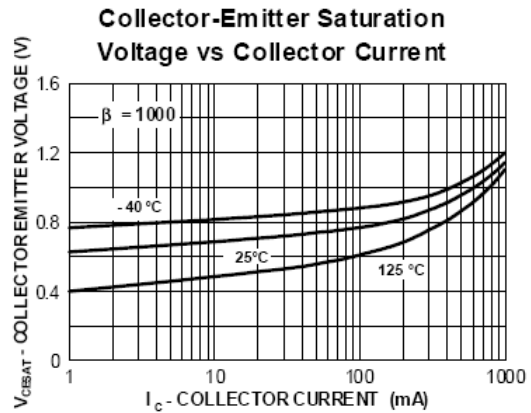
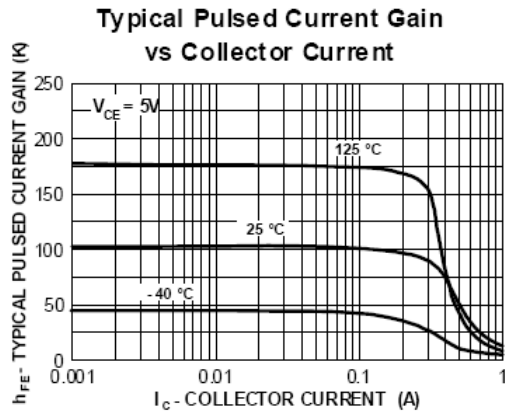
\* Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%

### 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	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	200	$^\circ\text{C}/\text{W}$

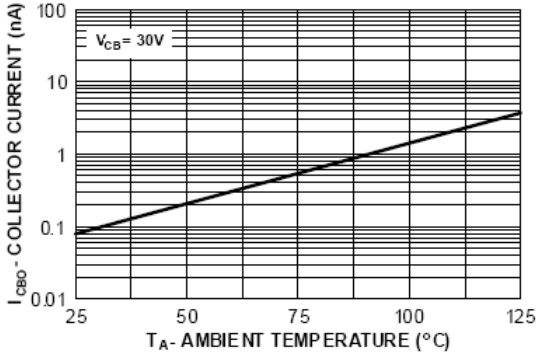
\* Device mounted on FR-4PCB  $1.6" \times 1.6" \times 0.06"$ .

### Typical Characteristics

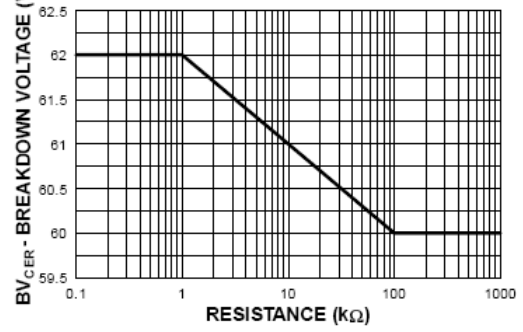


**Typical Characteristics** (continued)

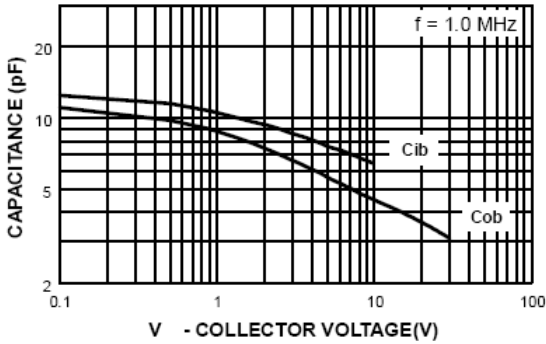
**Collector-Cutoff Current vs Ambient Temperature**



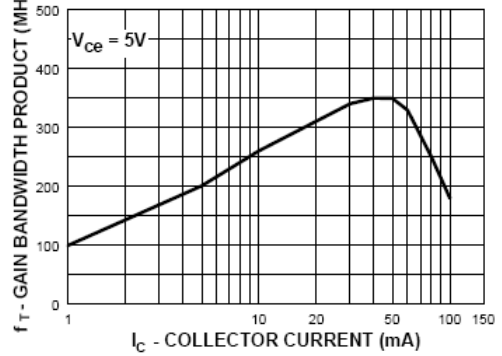
**Collector-Emitter Breakdown Voltage with Resistance Between Emitter-Base**



**Input and Output Capacitance vs Reverse Voltage**

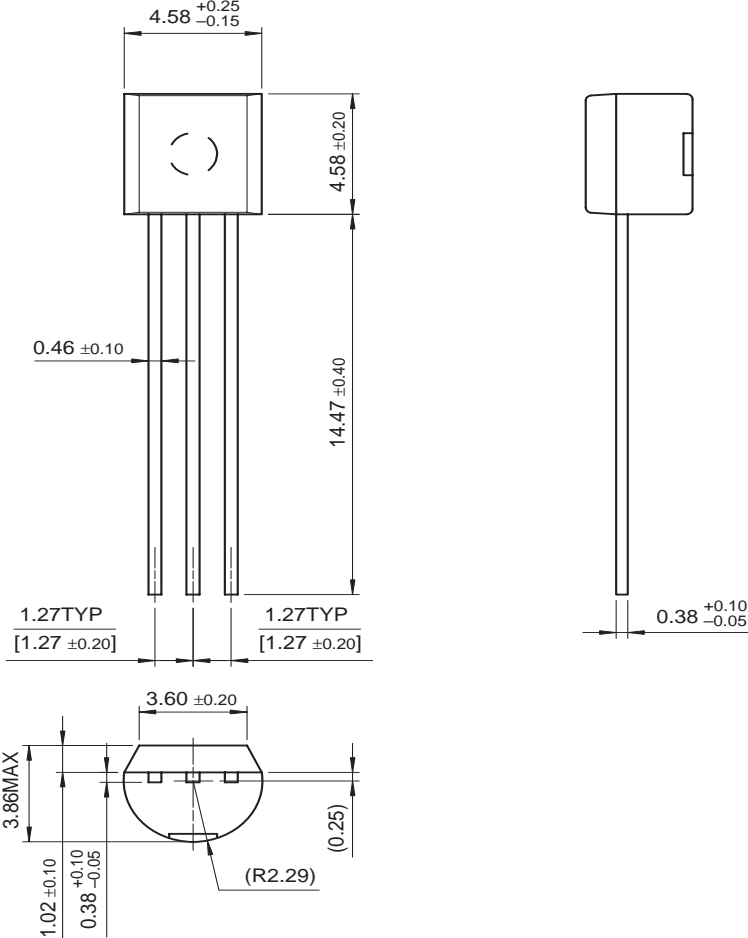


**Gain Bandwidth Product vs Collector Current**



Mechanical Dimensions

TO-92




Dimensions in Millimeters



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CTL™	MICROWIRE™	RapidConfigure™	µSerDes™
Current Transfer Logic™	Motion-SPM™	RapidConnect™	UHC®
DOME™	MSX™	ScalarPump™	UniFET™
E <sup>2</sup> CMOS™	MSXPro™	SMART START™	VCX™
EcoSPARK®	OCX™	SPM®	Wire™
EnSigna™	OCXPro™	STEALTH™	
FACT Quiet Series™	OPTOLOGIC®	SuperFET™	
FACT®	OPTOPLANAR®	SuperSOT™-3	
FAST®	PACMAN™	SuperSOT™-6	
FASTr™	PDP-SPM™	SuperSOT™-8	
FPS™	POP™	SyncFET™	
FRFET®	Power220®	TCM™	
GlobalOptoisolator™	Power247®	The Power Franchise®	
GTO™	PowerEdge™		

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