



# MPSA13 MPSA14

## NPN Silicon Darlington Transistor

### Features

- Halogen free available upon request by adding suffix "-HF"
- Capable of 1.5Watts of Power Dissipation.
- Collector-current 500mA
- Collector-base Voltage 30V
- Operating and storage junction temperature range: -55°C to +150°C
- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1
- Marking:MPSA13--MPSA13,MPSA14--MPSA14.
- Lead Free Finish/RoHS Compliant ("P" Suffix designates RoHS Compliant. See ordering information)

### Maximum Ratings

Symbol	Rating	Rating	Unit
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	500	mA
P <sub>D</sub>	Total Device Dissipation @T <sub>A</sub> =25°C	625	mW
	Derate above 25°C	5.0	mW/°C
P <sub>D</sub>	Total Device Dissipation @T <sub>A</sub> =25°C	1.5	W
	Derate above 25°C	12	mW/°C
T <sub>J</sub>	Junction Temperature	-55 to +150	°C
T <sub>STG</sub>	Storage Temperature	-55 to +150	°C

### Electrical Characteristics @ 25°C Unless Otherwise Specified

Symbol	Parameter	Min	Max	Units
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#### OFF CHARACTERISTICS

V <sub>(BR)CES</sub>	Collector-Emitter Breakdown Voltage (I <sub>C</sub> =100μAdc, I <sub>B</sub> =0)	30		Vdc
I <sub>CBO</sub>	Collector Cutoff Current (V <sub>CB</sub> =30Vdc, I <sub>E</sub> =0)		100	nAdc
I <sub>EBO</sub>	Emitter Cutoff Current (V <sub>EB</sub> =10Vdc, I <sub>C</sub> =0)		100	nAdc

#### ON CHARACTERISTICS<sup>(1)</sup>

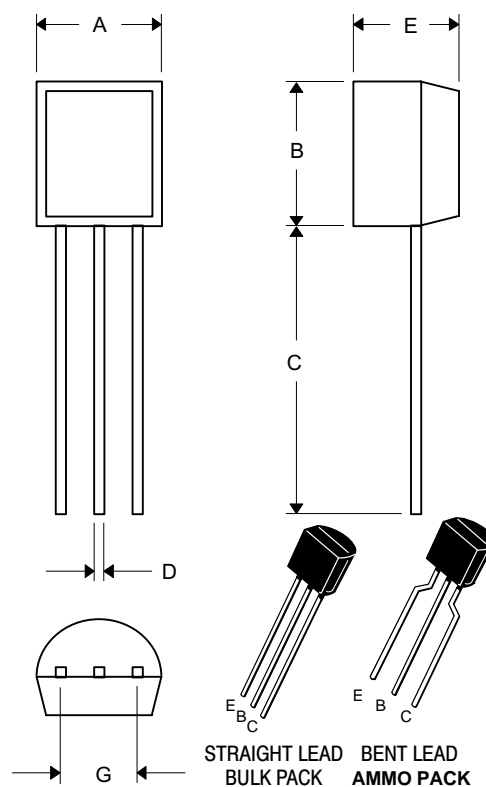
h <sub>FE(1)</sub>	DC Current Gain (I <sub>C</sub> =10mAdc, V <sub>CE</sub> =5.0Vdc)	MPSA13 MPSA14	5000 10000		
h <sub>FE(2)</sub>	DC Current Gain (I <sub>C</sub> =100mAdc, V <sub>CE</sub> =5.0Vdc)	MPSA13 MPSA14	10000 20000		
V <sub>CE(sat)</sub>	Collector-Emitter Saturation Voltage (I <sub>C</sub> =100mAdc, I <sub>B</sub> =0.1mAdc)			1.5	Vdc
V <sub>BE(on)</sub>	Base-Emitter Saturation Voltage (I <sub>C</sub> =100mAdc, V <sub>CE</sub> =5.0Vdc)			2.0	Vdc

#### SMALL-SIGNAL CHARACTERISTICS

f <sub>T</sub>	Current-Gain – Bandwidth Product <sup>(2)</sup> (I <sub>C</sub> =10mAdc, V <sub>CE</sub> =5.0Vdc, f=100MHz)	125		MHz
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1. Pulse Test: Pulse Width<300us, Duty Cycle<2.0%
2. f<sub>T</sub>=|h<sub>fe</sub>| x f<sub>test</sub>

### TO-92

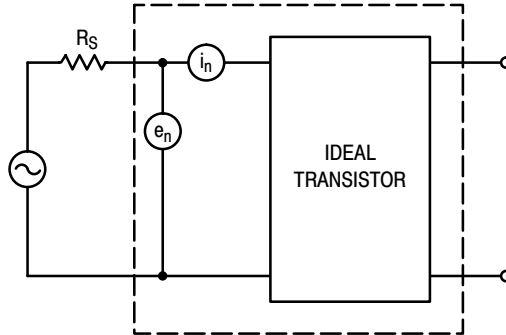


STRAIGHT LEAD BULK PACK BENT LEAD AMMO PACK

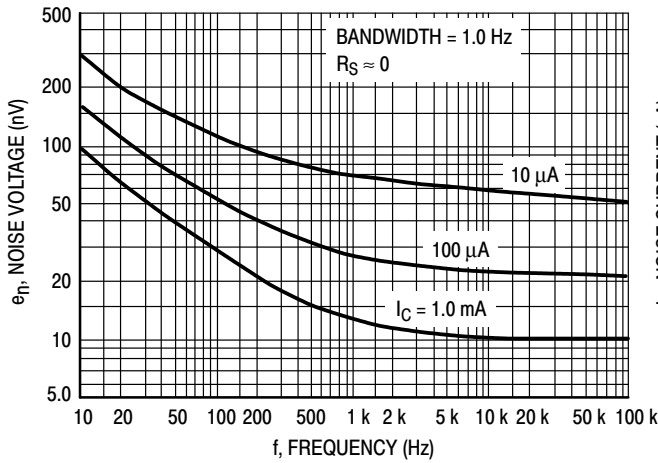
#### DIMENSIONS

DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	.175	.185	4.45	4.70	
B	.175	.185	4.45	4.70	
C	.500	---	12.70	---	
D	.016	.020	0.41	0.63	
E	.135	.145	3.43	3.68	
G	.095	.105	2.42	2.67	Straight Lead
	.173	.220	4.40	5.60	Bent Lead

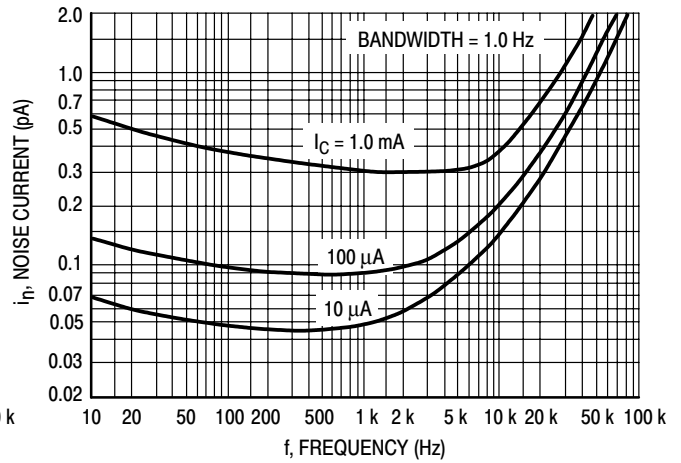
\* For ammo packing detailed specification, click here to visit our website of product packaging for details.



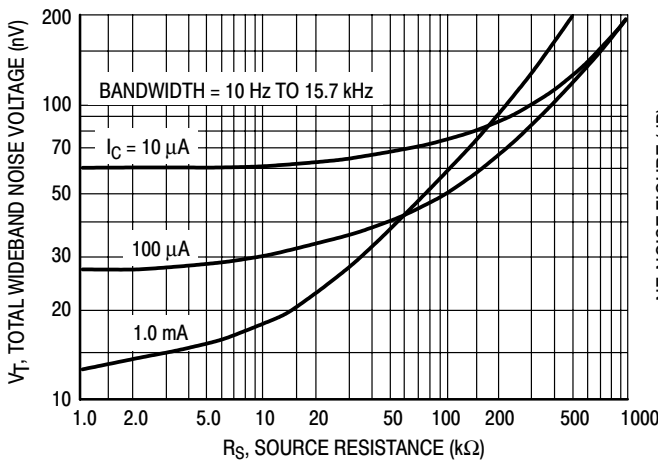
**Figure 1. Transistor Noise Model**



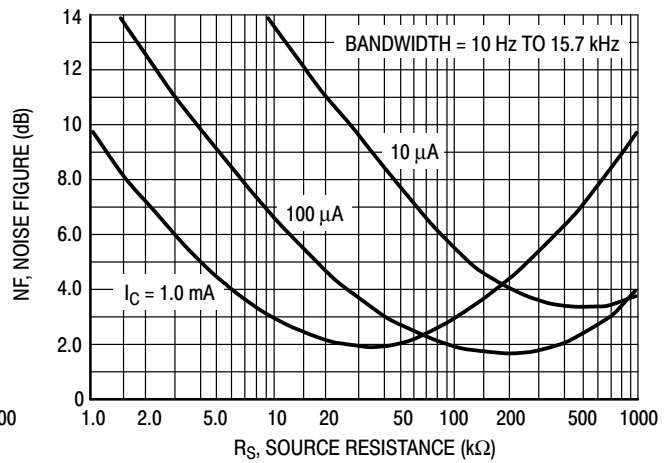
**Figure 2. Noise Voltage**



**Figure 3. Noise Current**



**Figure 4. Total Wideband Noise Voltage**



**Figure 5. Wideband Noise Figure**

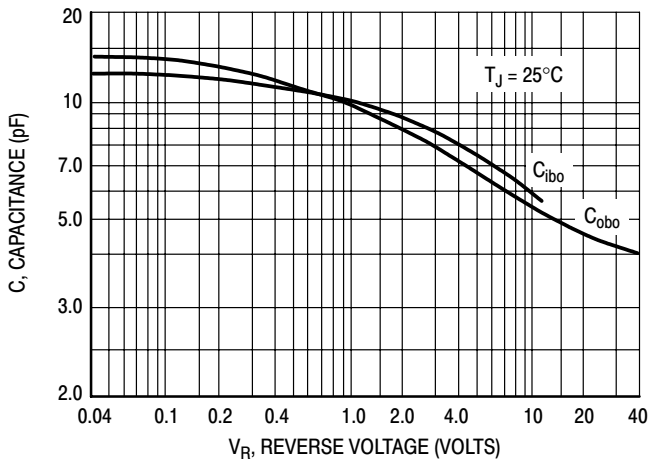


Figure 6. Capacitance

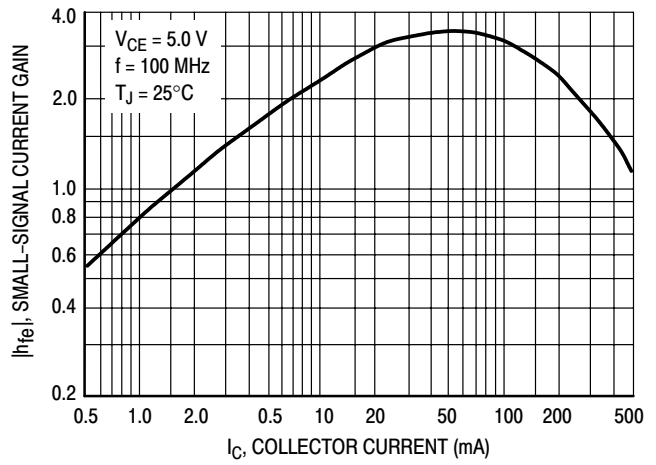


Figure 7. High Frequency Current Gain

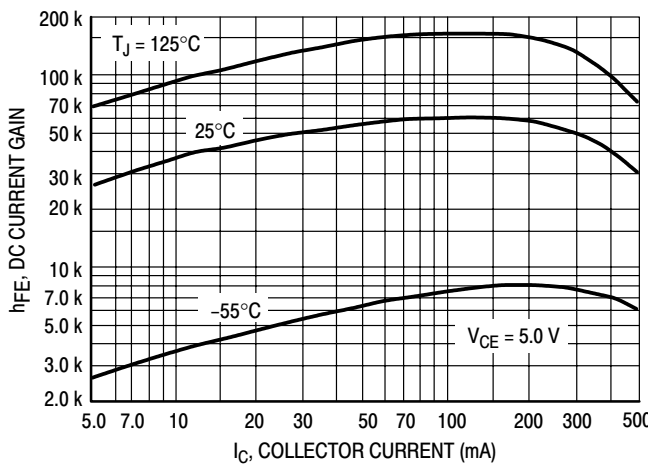


Figure 8. DC Current Gain

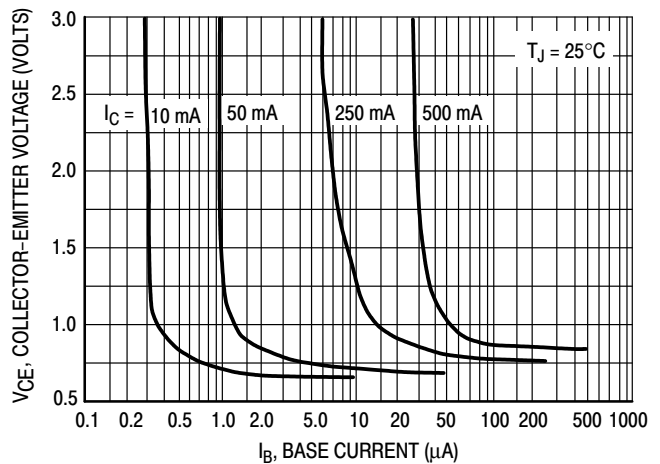


Figure 9. Collector Saturation Region

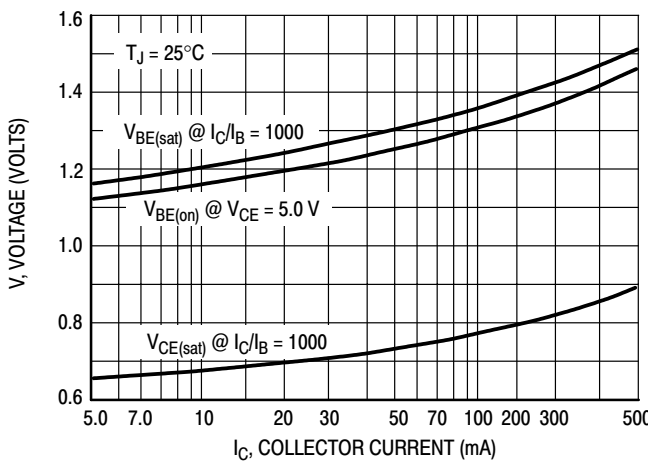


Figure 10. "On" Voltages

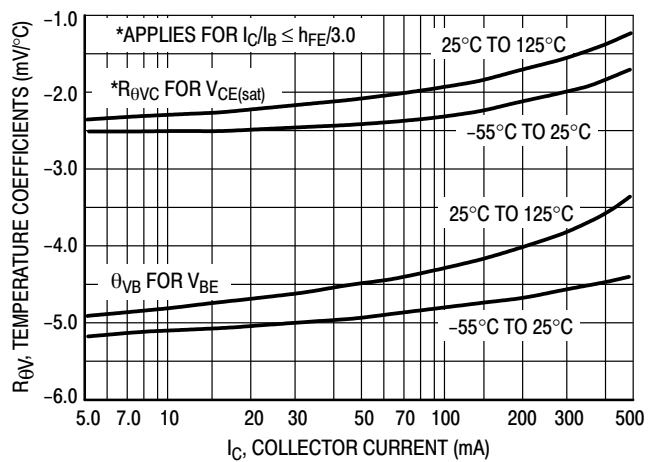


Figure 11. Temperature Coefficients

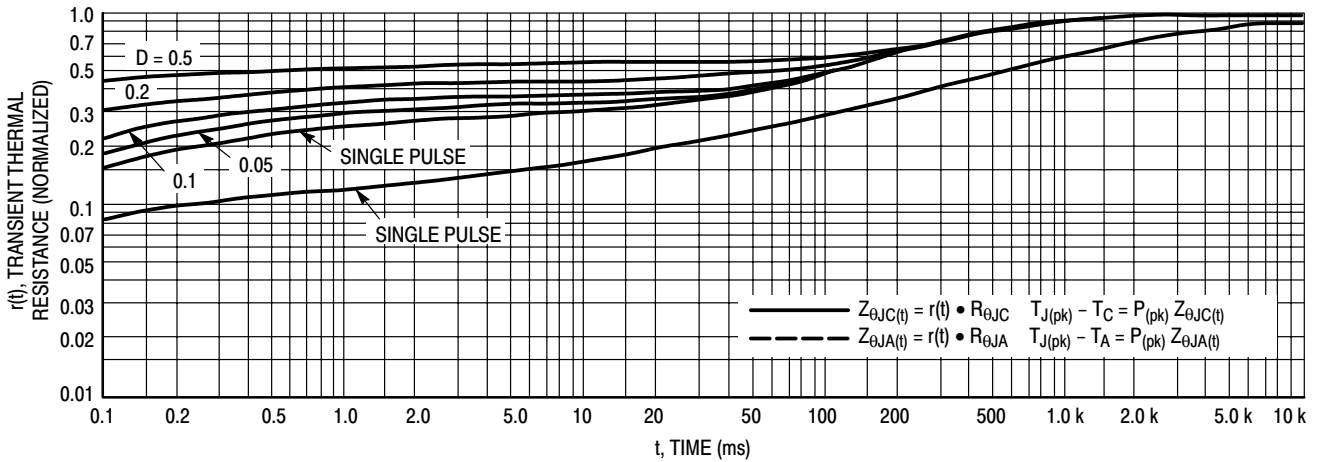


Figure 12. Thermal Response

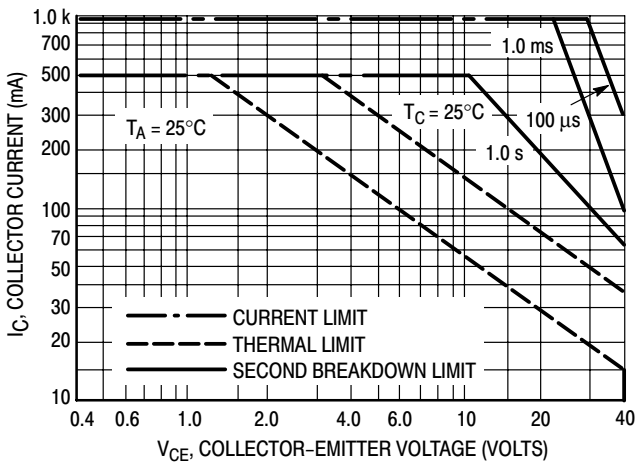
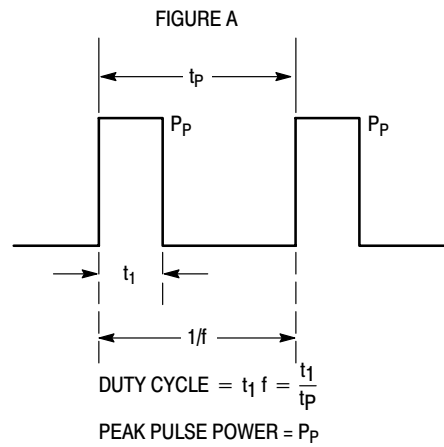


Figure 13. Active Region Safe Operating Area



Design Note: Use of Transient Thermal Resistance Data



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### Ordering Information :

Device	Packing
Part Number-AP	Ammo Packing: 20Kpcs/Carton
Part Number-BP	Bulk: 100Kpcs/Carton

Note : Adding "-HF" suffix for halogen free, eg. Part Number-AP-HF

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