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With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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## 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
$V_{CES}$	Collector-Emitter Voltage	30	V
$V_{CBO}$	Collector-Base Voltage	30	V
$V_{EBO}$	Emitter-Base Voltage	10	V
$I_C$	Collector Current Continuous	500	mA
$P_D$	Total Device Dissipation @ $T_A=25^\circ\text{C}$	625	mW
	Derate above 25°C	5.0	mW/°C
$P_D$	Total Device Dissipation @ $T_A=25^\circ\text{C}$	1.5	W
	Derate above 25°C	12	mW/°C
$T_J$	Junction Temperature	-55 to +150	°C
$T_{STG}$	Storage Temperature	-55 to +150	°C

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

Symbol	Parameter	Min	Max	Units
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#### OFF CHARACTERISTICS

$V_{(BR)CES}$	Collector-Emitter Breakdown Voltage ( $I_C=100\mu\text{Adc}$ , $I_B=0$ )	30		Vdc
$I_{CBO}$	Collector Cutoff Current ( $V_{CB}=30\text{Vdc}$ , $I_E=0$ )		100	nAdc
$I_{EBO}$	Emitter Cutoff Current ( $V_{EB}=10\text{Vdc}$ , $I_C=0$ )		100	nAdc

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

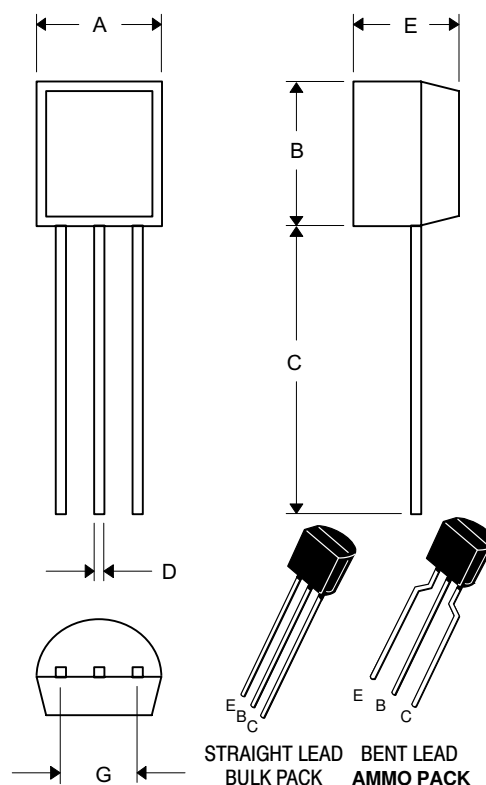
$h_{FE(1)}$	DC Current Gain ( $I_C=10\text{mAdc}$ , $V_{CE}=5.0\text{Vdc}$ )	MPSA13 MPSA14	5000 10000		
$h_{FE(2)}$	DC Current Gain ( $I_C=100\text{mAdc}$ , $V_{CE}=5.0\text{Vdc}$ )	MPSA13 MPSA14	10000 20000		
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage ( $I_C=100\text{mAdc}$ , $I_B=0.1\text{mAdc}$ )			1.5	Vdc
$V_{BE(on)}$	Base-Emitter Saturation Voltage ( $I_C=100\text{mAdc}$ , $V_{CE}=5.0\text{Vdc}$ )			2.0	Vdc

#### SMALL-SIGNAL CHARACTERISTICS

$f_T$	Current-Gain – Bandwidth Product <sup>(2)</sup> ( $I_C=10\text{mAdc}$ , $V_{CE}=5.0\text{Vdc}$ , $f=100\text{MHz}$ )	125			MHz
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1. Pulse Test: Pulse Width<300us, Duty Cycle<2.0%
2.  $f_T=|h_{fe}| \times f_{test}$

### 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.

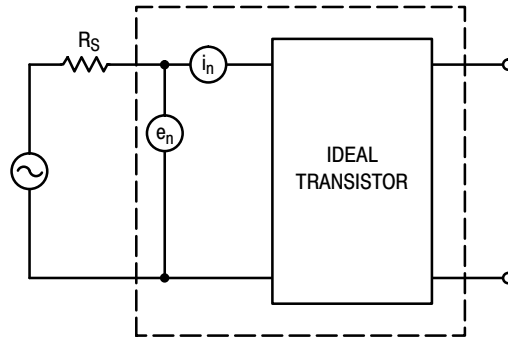


Figure 1. Transistor Noise Model

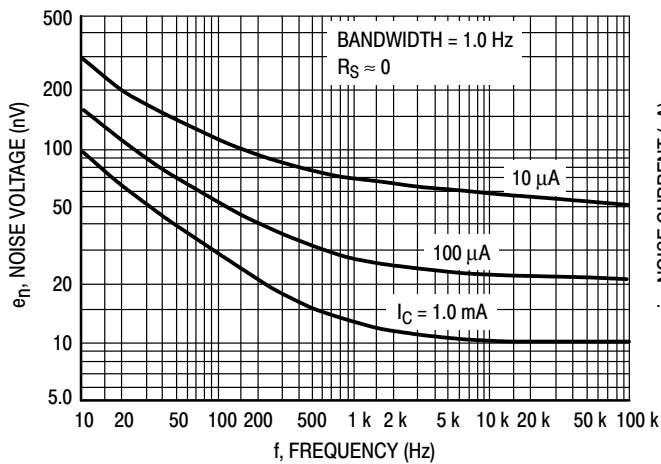


Figure 2. Noise Voltage

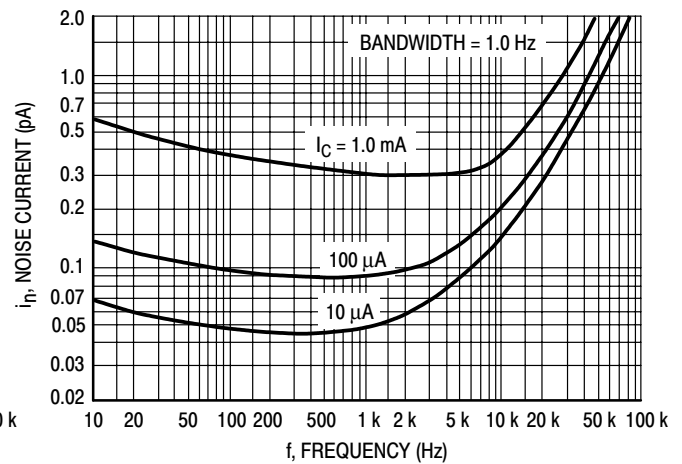


Figure 3. Noise Current

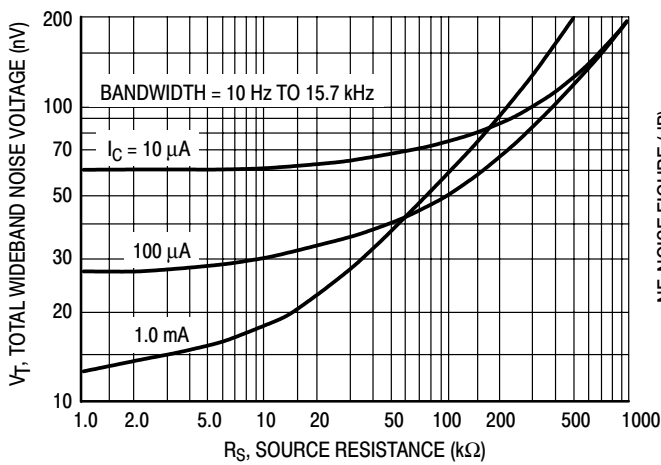


Figure 4. Total Wideband Noise Voltage

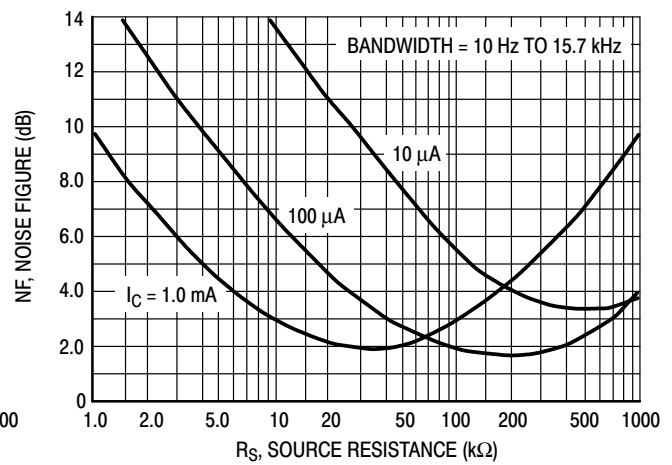


Figure 5. Wideband Noise Figure



# MPSA13 thru MPSA14

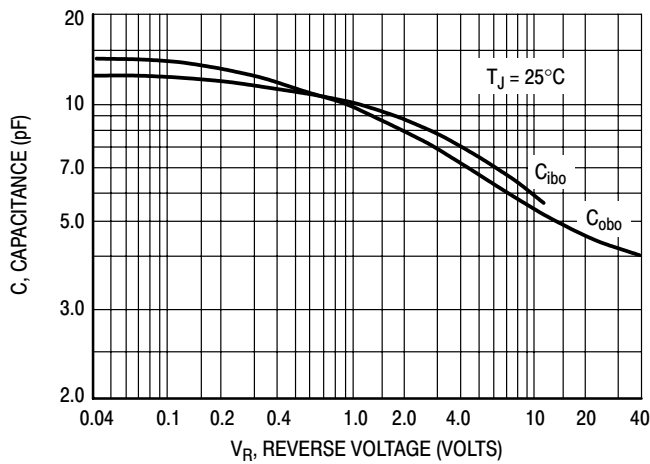


Figure 6. Capacitance

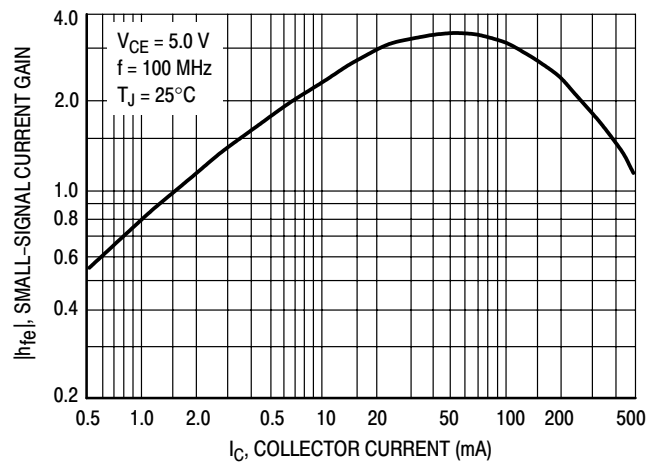


Figure 7. High Frequency Current Gain

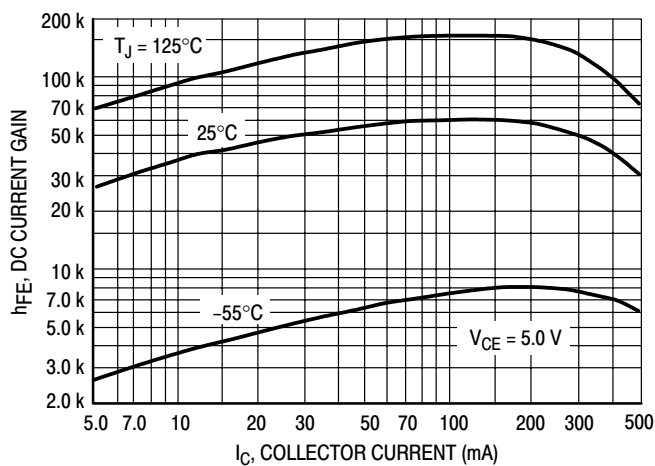


Figure 8. DC Current Gain

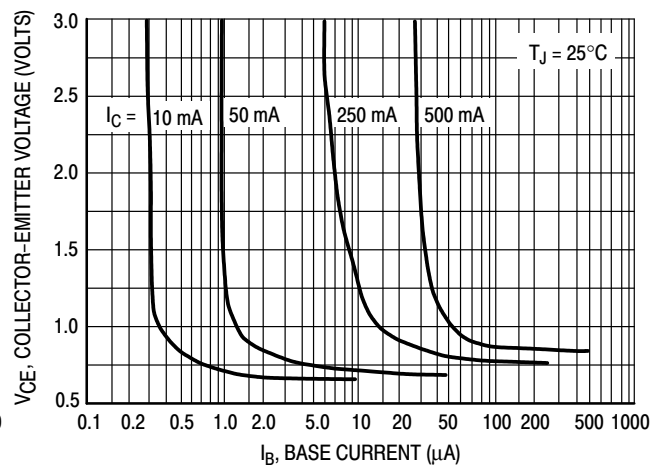


Figure 9. Collector Saturation Region

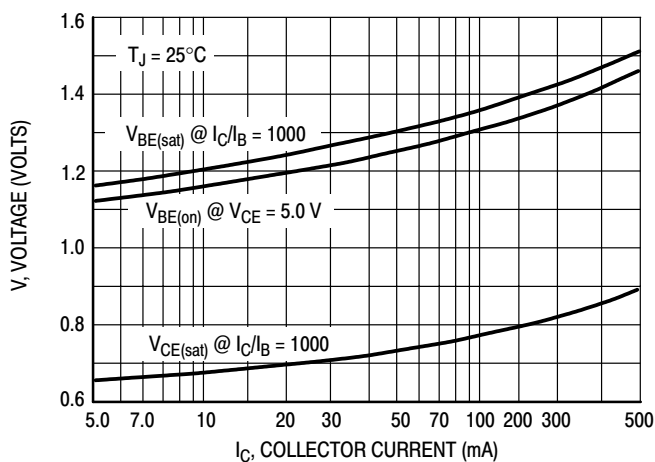


Figure 10. "On" Voltages

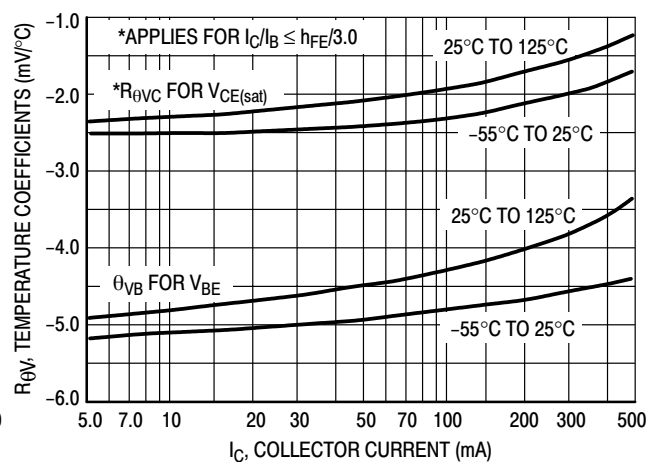


Figure 11. Temperature Coefficients

# MPSA13 thru MPSA14



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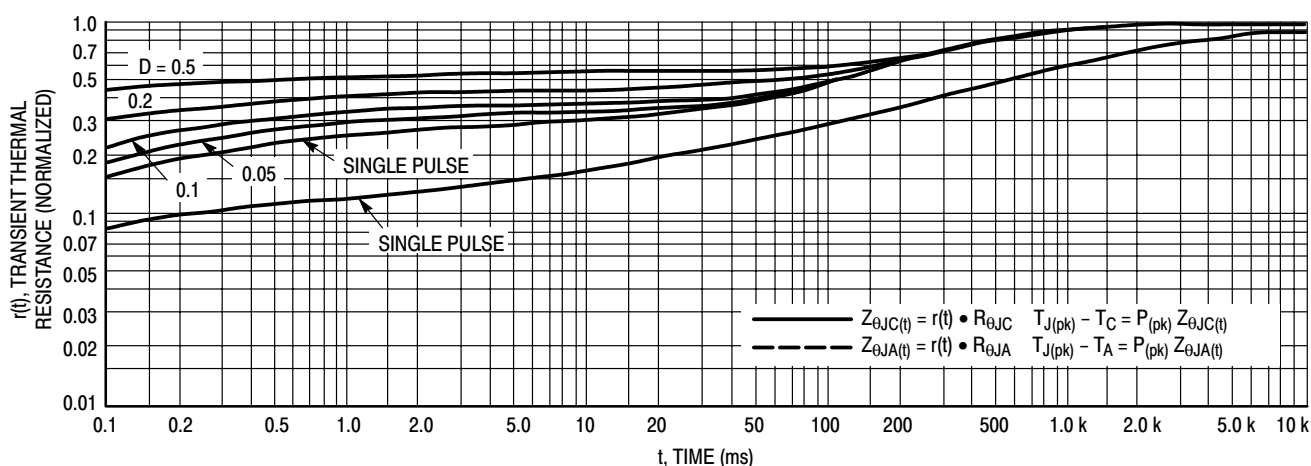


Figure 12. Thermal Response

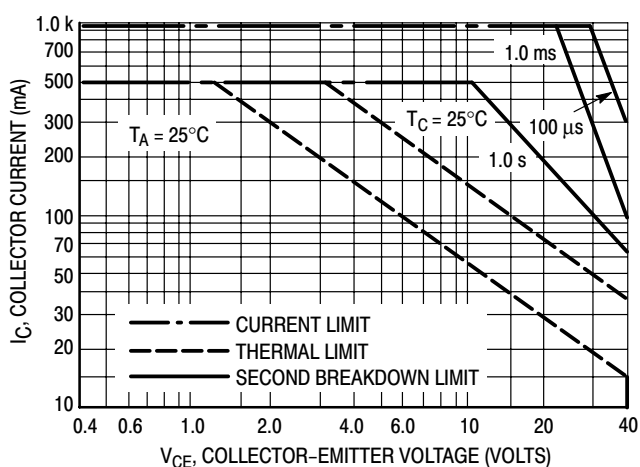
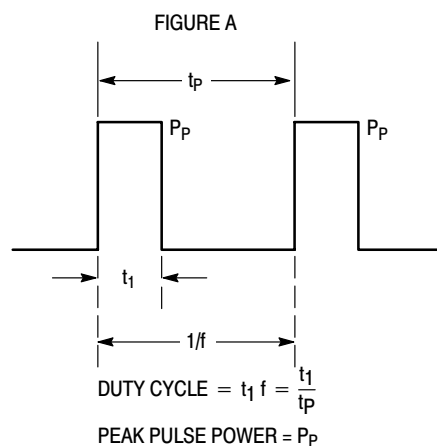


Figure 13. Active Region Safe Operating Area



Design Note: Use of Transient Thermal Resistance Data



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**Ordering Information :**

Device	Packing
Part Number-AP	Am m o 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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