

Darlington Transistors

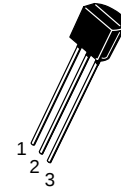
NPN Silicon

2N6426*
2N6427

*ON Semiconductor Preferred Device

MAXIMUM RATINGS

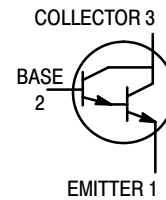
Rating	Symbol	Value	Unit
Collector–Emitter Voltage	V_{CEO}	40	Vdc
Collector–Base Voltage	V_{CBO}	40	Vdc
Emitter–Base Voltage	V_{EBO}	12	Vdc
Collector Current — Continuous	I_C	500	mAdc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	625 5.0	mW mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	1.5 12	Watts mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-55 to $+150$	$^\circ\text{C}$



CASE 29-04, STYLE 1
TO-92 (TO-226AA)

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	200	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	83.3	$^\circ\text{C}/\text{W}$



ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Collector–Emitter Breakdown Voltage ⁽¹⁾ ($I_C = 10$ mAdc, $V_{BE} = 0$)	$V_{(BR)CEO}$	40	—	—	Vdc
Collector–Base Breakdown Voltage ($I_C = 100$ μ Adc, $I_E = 0$)	$V_{(BR)CBO}$	40	—	—	Vdc
Emitter–Base Breakdown Voltage ($I_E = 10$ μ Adc, $I_C = 0$)	$V_{(BR)EBO}$	12	—	—	Vdc
Collector Cutoff Current ($V_{CE} = 25$ Vdc, $I_B = 0$)	I_{CES}	—	—	1.0	μ Adc
Collector Cutoff Current ($V_{CB} = 30$ Vdc, $I_E = 0$)	I_{CBO}	—	—	50	nAdc
Emitter Cutoff Current ($V_{EB} = 10$ Vdc, $I_C = 0$)	I_{EBO}	—	—	50	nAdc

1. Pulse Test: Pulse Width ≤ 300 μ s; Duty Cycle $\leq 2.0\%$.

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ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted) (Continued)

Characteristic	Symbol	Min	Typ	Max	Unit
ON CHARACTERISTICS					
DC Current Gain ⁽¹⁾ ($I_C = 10\text{ mAdc}$, $V_{CE} = 5.0\text{ Vdc}$)	h_{FE}	20,000	—	200,000	—
		10,000	—	100,000	
($I_C = 100\text{ mAdc}$, $V_{CE} = 5.0\text{ Vdc}$)		30,000	—	300,000	
		20,000	—	200,000	
($I_C = 500\text{ mAdc}$, $V_{CE} = 5.0\text{ Vdc}$)		20,000	—	200,000	
		14,000	—	140,000	
Collector–Emitter Saturation Voltage ($I_C = 50\text{ mAdc}$, $I_B = 0.5\text{ mAdc}$) ($I_C = 500\text{ mAdc}$, $I_B = 0.5\text{ mAdc}$)	$V_{CE(sat)}$	—	0.71 0.9	1.2 1.5	Vdc
Base–Emitter Saturation Voltage ($I_C = 500\text{ mAdc}$, $I_B = 0.5\text{ mAdc}$)	$V_{BE(sat)}$	—	1.52	2.0	Vdc
Base–Emitter On Voltage ($I_C = 50\text{ mAdc}$, $V_{CE} = 5.0\text{ Vdc}$)	$V_{BE(on)}$	—	1.24	1.75	Vdc

SMALL–SIGNAL CHARACTERISTICS

Output Capacitance ($V_{CB} = 10\text{ Vdc}$, $I_E = 0$, $f = 1.0\text{ MHz}$)	C_{obo}	—	5.4	7.0	pF
Input Capacitance ($V_{EB} = 1.0\text{ Vdc}$, $I_C = 0$, $f = 1.0\text{ MHz}$)	C_{ibo}	—	10	15	pF
Input Impedance ($I_C = 10\text{ mAdc}$, $V_{CE} = 5.0\text{ Vdc}$, $f = 1.0\text{ kHz}$)	h_{ie}	100 50	— —	2000 1000	k Ω
Small–Signal Current Gain ($I_C = 10\text{ mAdc}$, $V_{CE} = 5.0\text{ Vdc}$, $f = 1.0\text{ kHz}$)	h_{fe}	20,000 10,000	— —	— —	—
Current–Gain — High Frequency ($I_C = 10\text{ mAdc}$, $V_{CE} = 5.0\text{ Vdc}$, $f = 100\text{ MHz}$)	$ h_{fe} $	1.5 1.3	2.4 2.4	— —	—
Output Admittance ($I_C = 10\text{ mAdc}$, $V_{CE} = 5.0\text{ Vdc}$, $f = 1.0\text{ kHz}$)	h_{oe}	—	—	1000	μmhos
Noise Figure ($I_C = 1.0\text{ mAdc}$, $V_{CE} = 5.0\text{ Vdc}$, $R_S = 100\text{ k}\Omega$, $f = 1.0\text{ kHz}$)	NF	—	3.0	10	dB

1. Pulse Test: Pulse Width $\leq 300\text{ }\mu\text{s}$; Duty Cycle $\leq 2.0\%$.

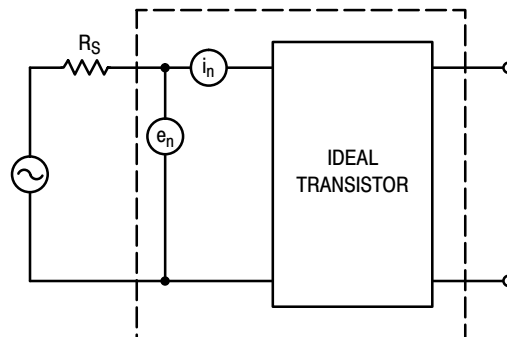


Figure 1. Transistor Noise Model

NOISE CHARACTERISTICS

($V_{CE} = 5.0$ Vdc, $T_A = 25^\circ\text{C}$)

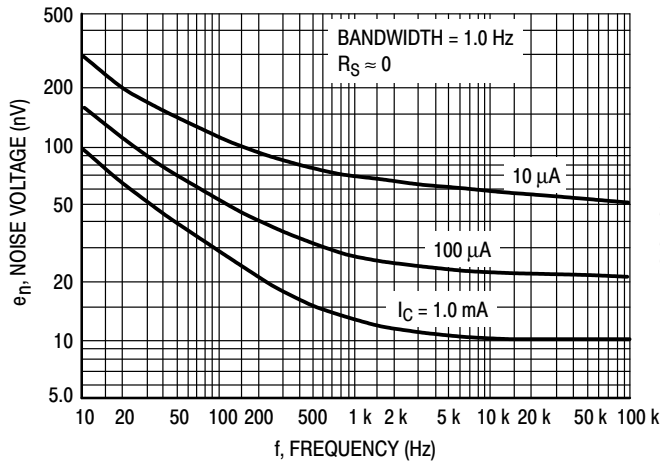


Figure 2. Noise Voltage

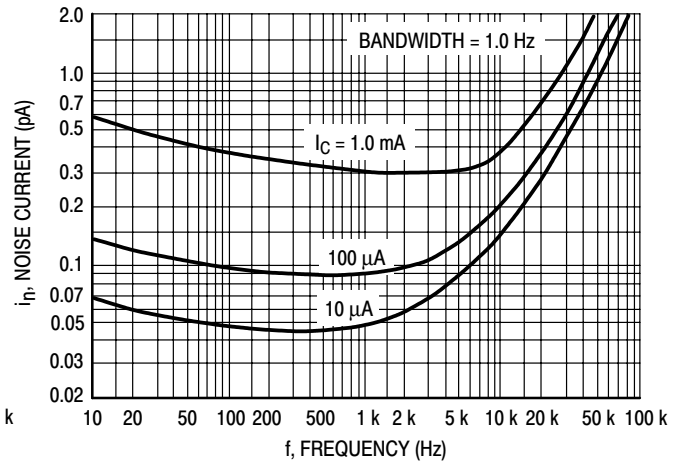


Figure 3. Noise Current

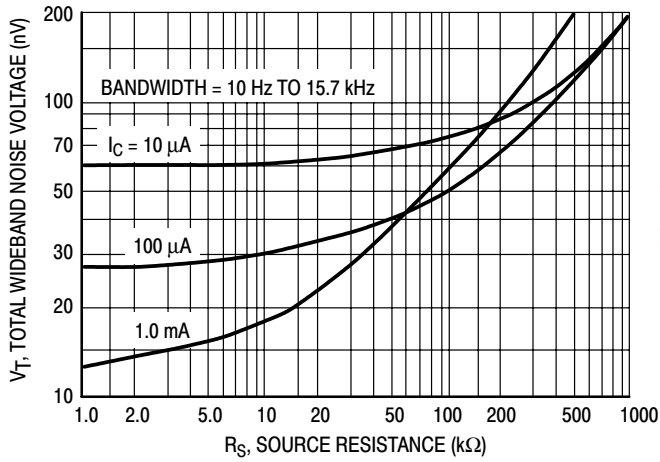


Figure 4. Total Wideband Noise Voltage

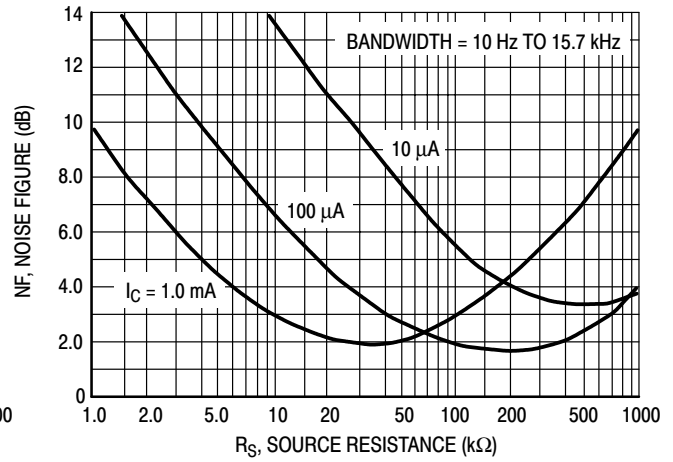


Figure 5. Wideband Noise Figure

SMALL-SIGNAL CHARACTERISTICS

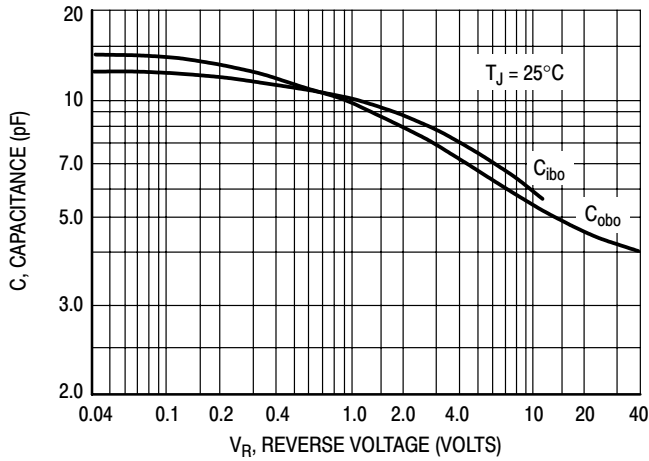


Figure 6. Capacitance

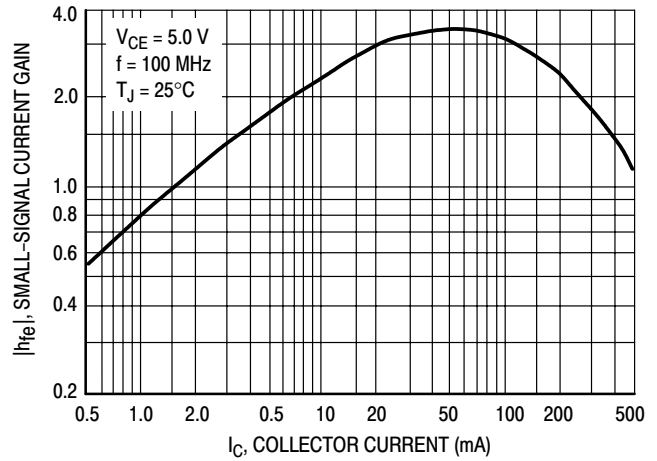


Figure 7. High Frequency Current Gain

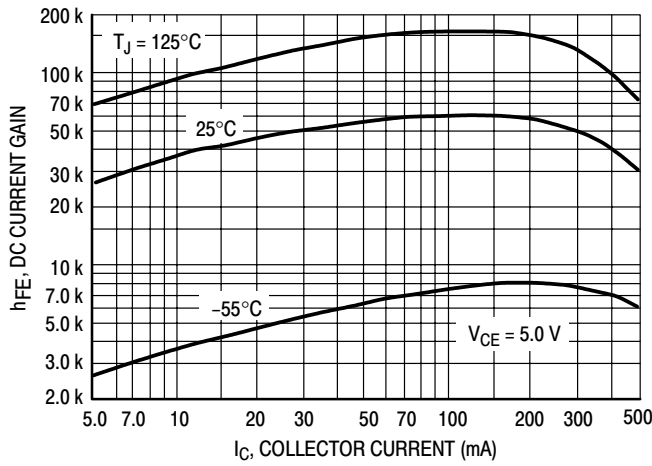


Figure 8. DC Current Gain

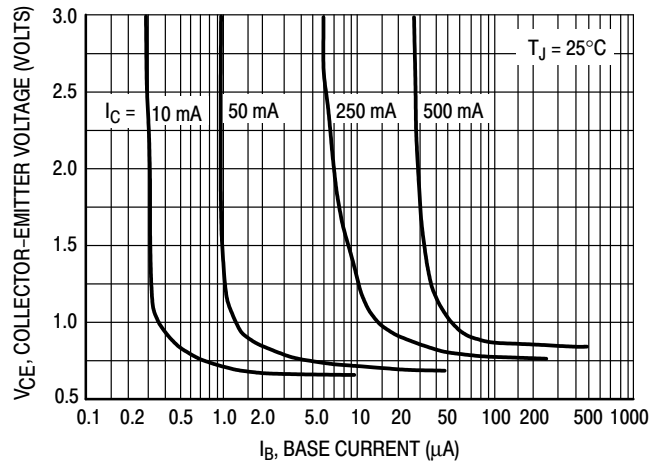


Figure 9. Collector Saturation Region

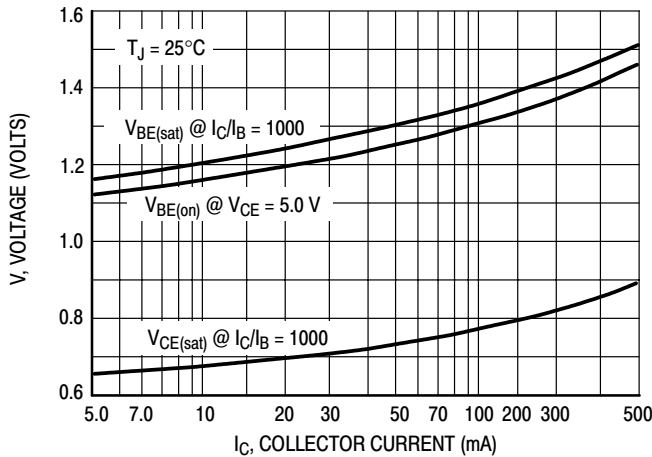


Figure 10. "On" Voltages

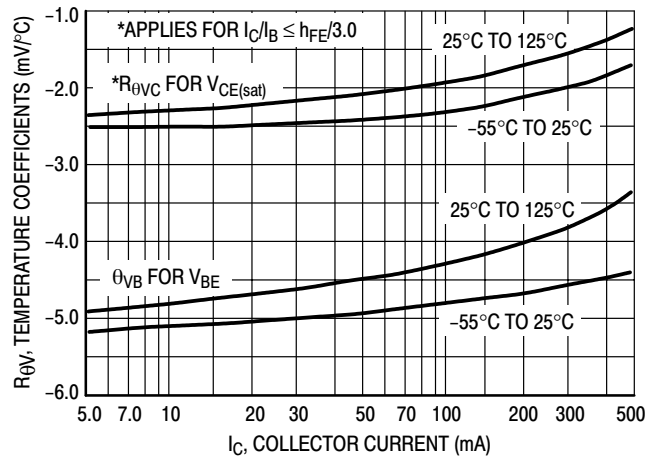


Figure 11. Temperature Coefficients

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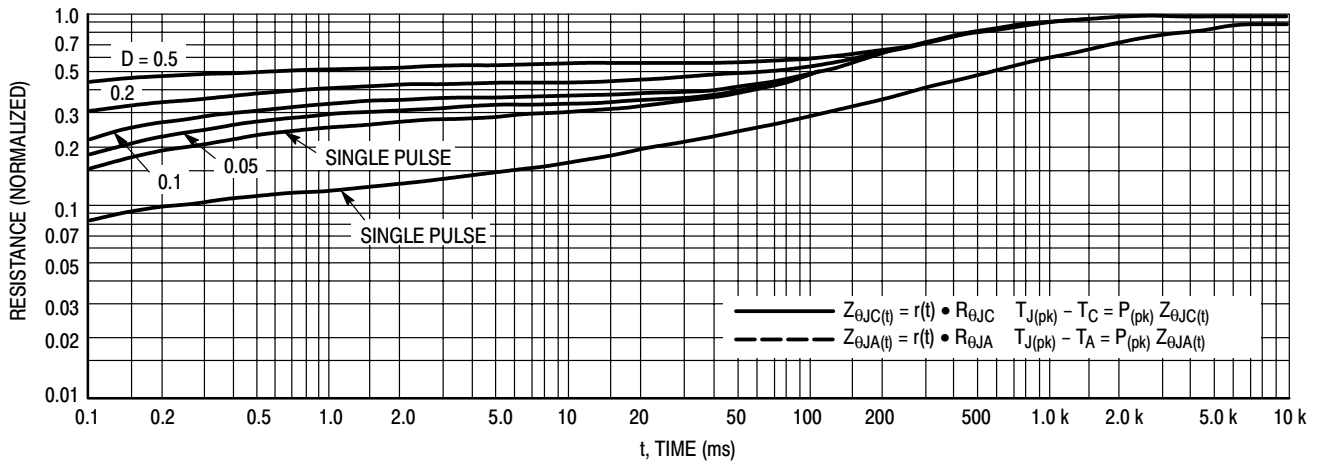


Figure 12. Thermal Response

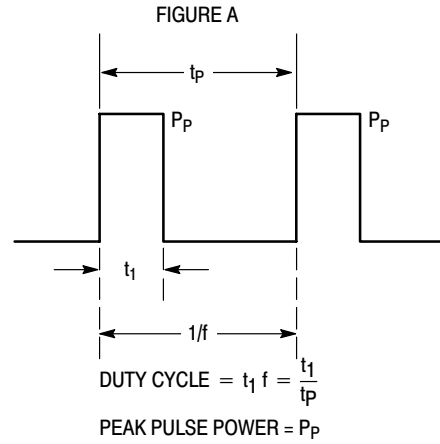
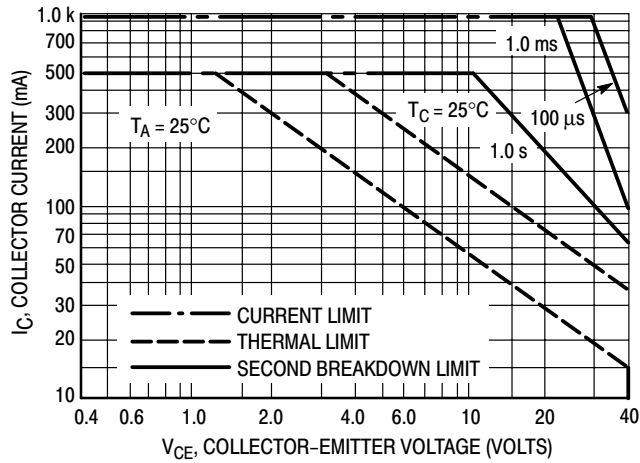
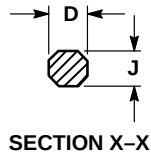
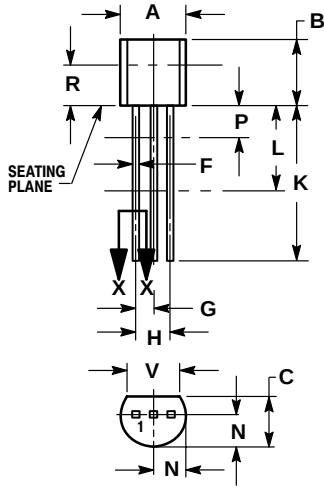


Figure 13. Active Region Safe Operating Area Design Note: Use of Transient Thermal Resistance Data

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PACKAGE DIMENSIONS

CASE 029-04
(TO-226AA)
ISSUE AD



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. DIMENSION F APPLIES BETWEEN P AND L. DIMENSION D AND J APPLY BETWEEN L AND K MINIMUM. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.175	0.205	4.45	5.20
B	0.170	0.210	4.32	5.33
C	0.125	0.165	3.18	4.19
D	0.016	0.022	0.41	0.55
F	0.016	0.019	0.41	0.48
G	0.045	0.055	1.15	1.39
H	0.095	0.105	2.42	2.66
J	0.015	0.020	0.39	0.50
K	0.500	---	12.70	---
L	0.250	---	6.35	---
N	0.080	0.105	2.04	2.66
P	---	0.100	---	2.54
R	0.115	---	2.93	---
V	0.135	---	3.43	---

STYLE 1:

- PIN 1. EMITTER
- BASE
- COLLECTOR

Notes

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