

# 2N6426\*, 2N6427

Preferred Device

## Darlington Transistors

### NPN Silicon

#### Features

- Pb-Free Packages are Available\*\*
- Device Marking: Device Type, e.g., 2N6426, Date Code

#### 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 $25^\circ\text{C}$	$P_D$	625 5.0	mW mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	1.5 12	W mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-55 to +150	$^\circ\text{C}$

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

#### THERMAL CHARACTERISTICS

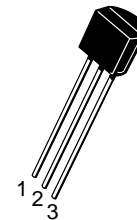
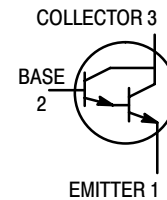
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	200	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	83.3	$^\circ\text{C}/\text{W}$

\*\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



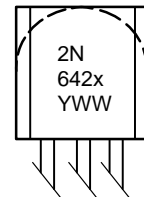
ON Semiconductor®

<http://onsemi.com>



TO-92  
CASE 29  
STYLE 1

#### MARKING DIAGRAM



642x    Specific Device Code  
Y       = Year  
WW     = Work Week

#### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 5 of this data sheet.

\*Preferred devices are recommended choices for future use and best overall value.

## 2N6426\*, 2N6427

### ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit	
<b>OFF CHARACTERISTICS</b>						
Collector–Emitter Breakdown Voltage, (Note 1) (I <sub>C</sub> = 10 mA <sub>dc</sub> , V <sub>BE</sub> = 0)	V <sub>(BR)CEO</sub>	40	–	–	V <sub>dc</sub>	
Collector–Base Breakdown Voltage (I <sub>C</sub> = 100 μA <sub>dc</sub> , I <sub>E</sub> = 0)	V <sub>(BR)CBO</sub>	40	–	–	V <sub>dc</sub>	
Emitter–Base Breakdown Voltage (I <sub>E</sub> = 10 μA <sub>dc</sub> , I <sub>C</sub> = 0)	V <sub>(BR)EBO</sub>	12	–	–	V <sub>dc</sub>	
Collector Cutoff Current (V <sub>CE</sub> = 25 V <sub>dc</sub> , I <sub>B</sub> = 0)	I <sub>CES</sub>	–	–	1.0	μA <sub>dc</sub>	
Collector Cutoff Current (V <sub>CB</sub> = 30 V <sub>dc</sub> , I <sub>E</sub> = 0)	I <sub>CBO</sub>	–	–	50	nA <sub>dc</sub>	
Emitter Cutoff Current (V <sub>EB</sub> = 10 V <sub>dc</sub> , I <sub>C</sub> = 0)	I <sub>EBO</sub>	–	–	50	nA <sub>dc</sub>	
<b>ON CHARACTERISTICS</b>						
DC Current Gain, (Note 1) (I <sub>C</sub> = 10 mA <sub>dc</sub> , V <sub>CE</sub> = 5.0 V <sub>dc</sub> )	h <sub>FE</sub>	2N6426 2N6427	20,000 10,000	– –	200,000 100,000	–
(I <sub>C</sub> = 100 mA <sub>dc</sub> , V <sub>CE</sub> = 5.0 V <sub>dc</sub> )		2N6426 2N6427	30,000 20,000	– –	300,000 200,000	
(I <sub>C</sub> = 500 mA <sub>dc</sub> , V <sub>CE</sub> = 5.0 V <sub>dc</sub> )		2N6426 2N6427	20,000 14,000	– –	200,000 140,000	
Collector–Emitter Saturation Voltage (I <sub>C</sub> = 50 mA <sub>dc</sub> , I <sub>B</sub> = 0.5 mA <sub>dc</sub> ) (I <sub>C</sub> = 500 mA <sub>dc</sub> , I <sub>B</sub> = 0.5 mA <sub>dc</sub> )	V <sub>CE(sat)</sub>	– –	0.71 0.9	1.2 1.5	V <sub>dc</sub>	
Base–Emitter Saturation Voltage (I <sub>C</sub> = 500 mA <sub>dc</sub> , I <sub>B</sub> = 0.5 mA <sub>dc</sub> )	V <sub>BE(sat)</sub>	–	1.52	2.0	V <sub>dc</sub>	
Base–Emitter On Voltage (I <sub>C</sub> = 50 mA <sub>dc</sub> , V <sub>CE</sub> = 5.0 V <sub>dc</sub> )	V <sub>BE(on)</sub>	–	1.24	1.75	V <sub>dc</sub>	
<b>SMALL–SIGNAL CHARACTERISTICS</b>						
Output Capacitance (V <sub>CB</sub> = 10 V <sub>dc</sub> , I <sub>E</sub> = 0, f = 1.0 MHz)	C <sub>obo</sub>	–	5.4	7.0	pF	
Input Capacitance (V <sub>EB</sub> = 1.0 V <sub>dc</sub> , I <sub>C</sub> = 0, f = 1.0 MHz)	C <sub>ibo</sub>	–	10	15	pF	
Input Impedance (I <sub>C</sub> = 10 mA <sub>dc</sub> , V <sub>CE</sub> = 5.0 V <sub>dc</sub> , f = 1.0 kHz)	h <sub>ie</sub>	2N6426 2N6427	100 50	– –	2000 1000	kΩ
Small–Signal Current Gain (I <sub>C</sub> = 10 mA <sub>dc</sub> , V <sub>CE</sub> = 5.0 V <sub>dc</sub> , f = 1.0 kHz)		2N6426 2N6427	20,000 10,000	– –	– –	–
Current–Gain – High Frequency (I <sub>C</sub> = 10 mA <sub>dc</sub> , V <sub>CE</sub> = 5.0 V <sub>dc</sub> , f = 100 MHz)	h <sub>fe</sub>	2N6426 2N6427	1.5 1.3	2.4 2.4	– –	–
Output Admittance (I <sub>C</sub> = 10 mA <sub>dc</sub> , V <sub>CE</sub> = 5.0 V <sub>dc</sub> , f = 1.0 kHz)		h <sub>oe</sub>	–	–	1000	μmhos
Noise Figure (I <sub>C</sub> = 1.0 mA <sub>dc</sub> , V <sub>CE</sub> = 5.0 V <sub>dc</sub> , R <sub>S</sub> = 100 kΩ, f = 1.0 kHz)	NF	–	3.0	10	dB	

1. Pulse Test: Pulse Width ≤ 300 μs; Duty Cycle ≤ 2.0%.

## 2N6426\*, 2N6427

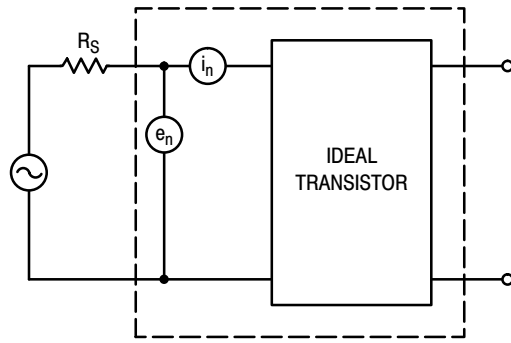


Figure 1. Transistor Noise Model

### NOISE CHARACTERISTICS

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

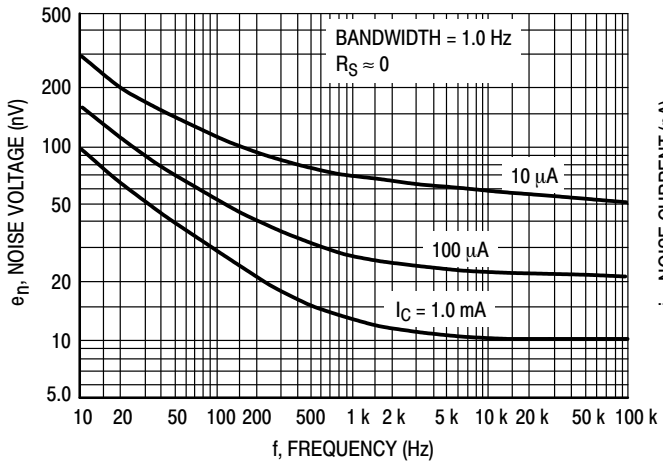


Figure 2. Noise Voltage

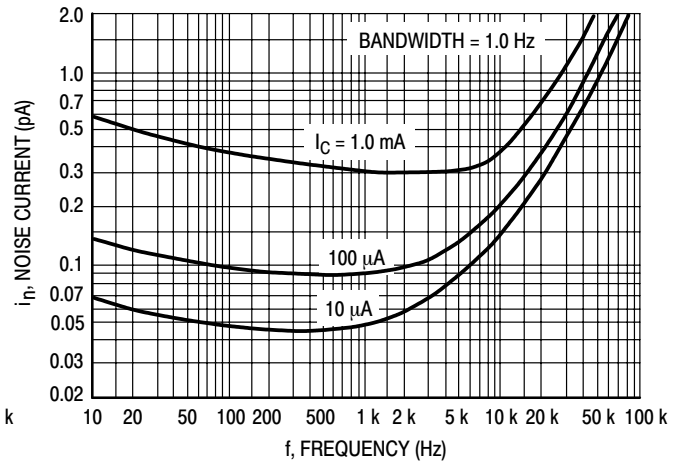


Figure 3. Noise Current

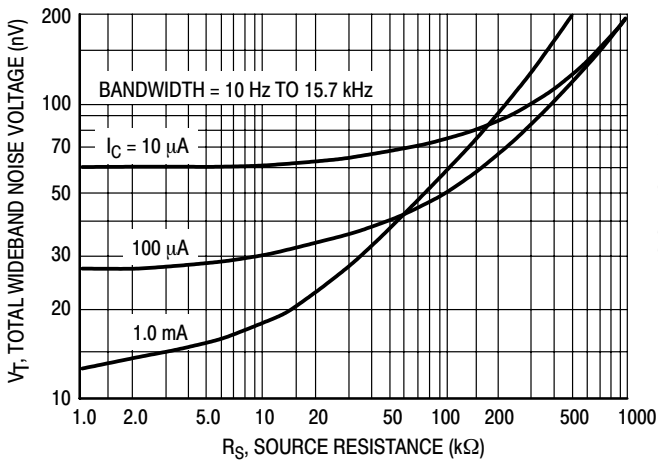


Figure 4. Total Wideband Noise Voltage

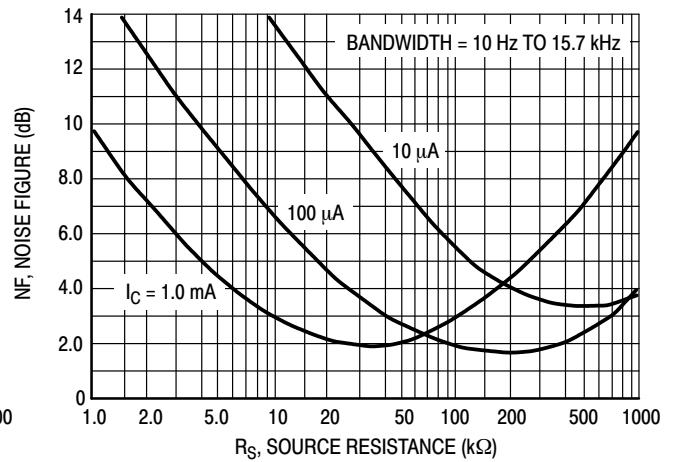


Figure 5. Wideband Noise Figure

SMALL-SIGNAL CHARACTERISTICS

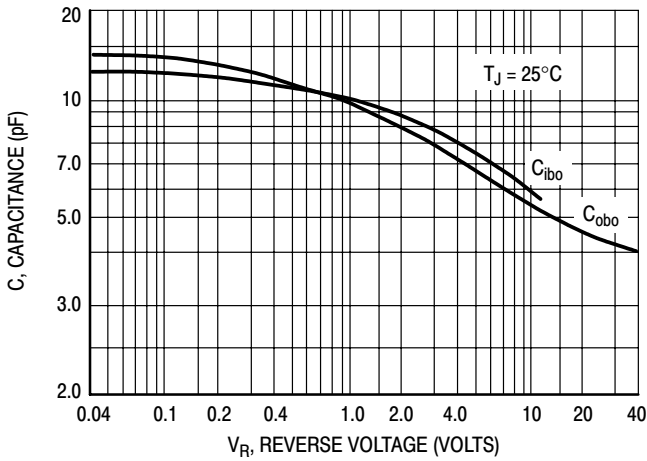


Figure 6. Capacitance

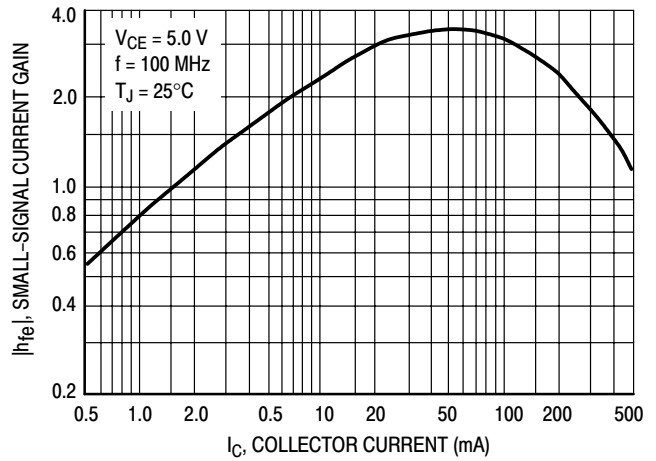


Figure 7. High Frequency Current Gain

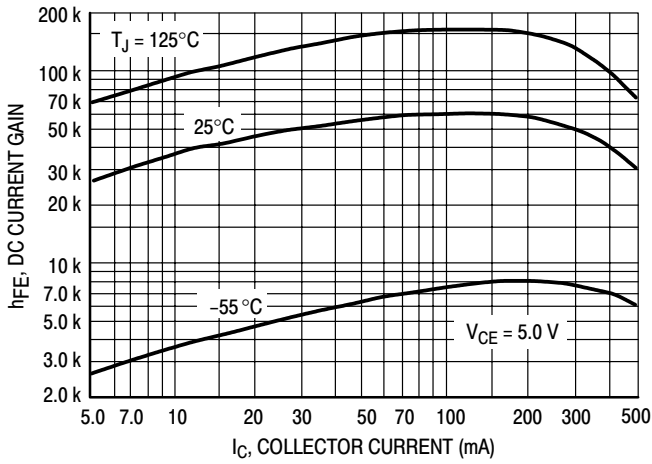


Figure 8. DC Current Gain

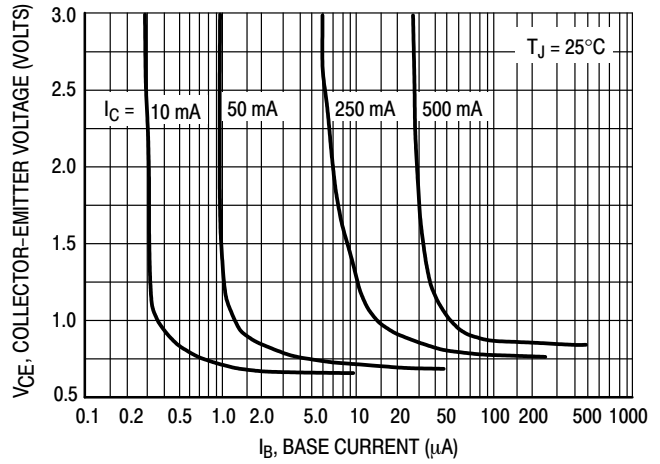


Figure 9. Collector Saturation Region

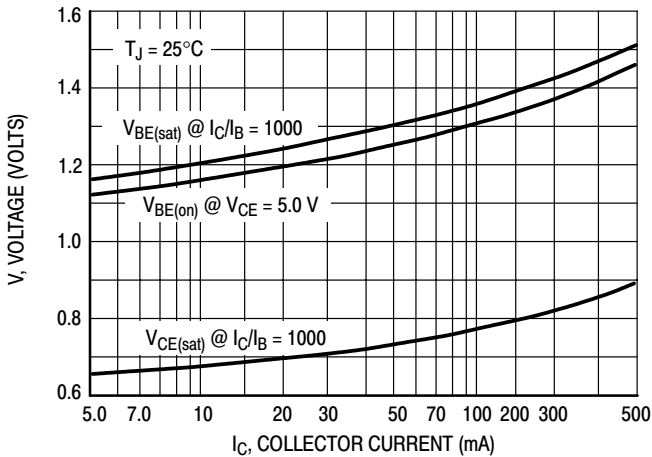


Figure 10. "On" Voltages

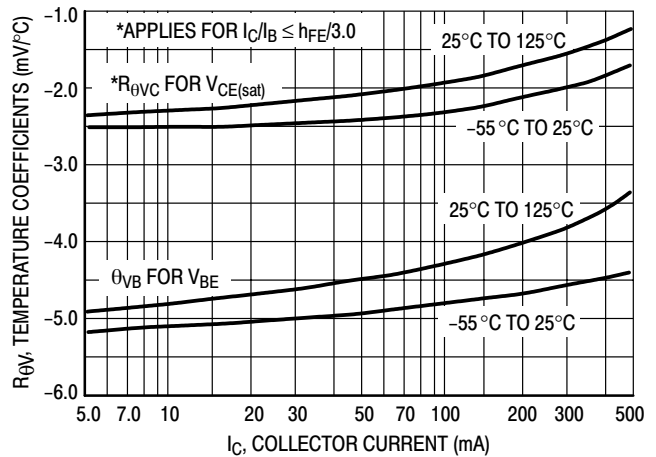
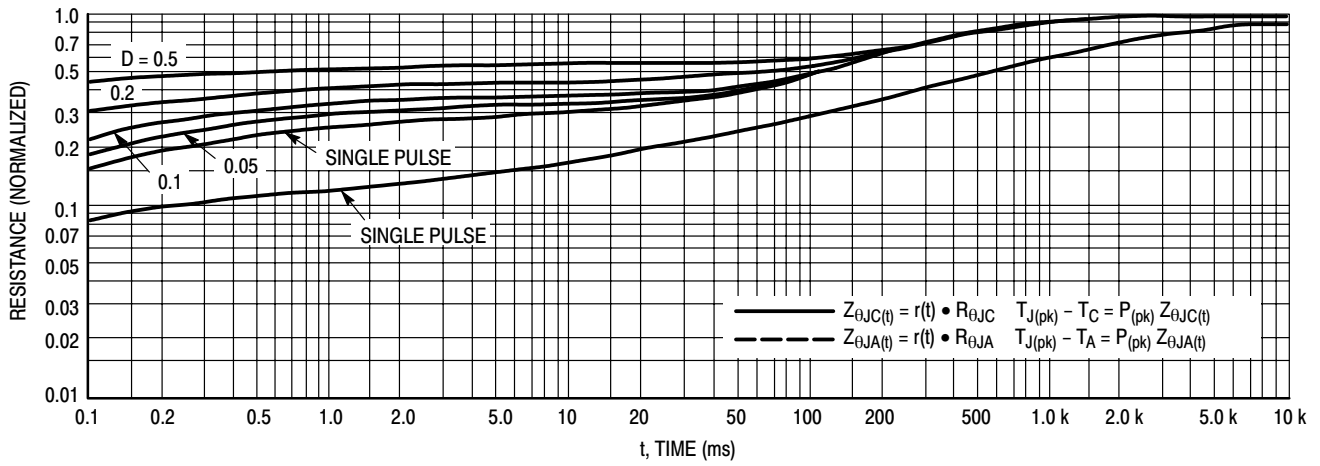
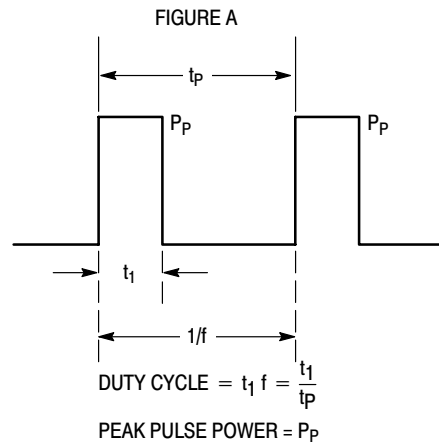
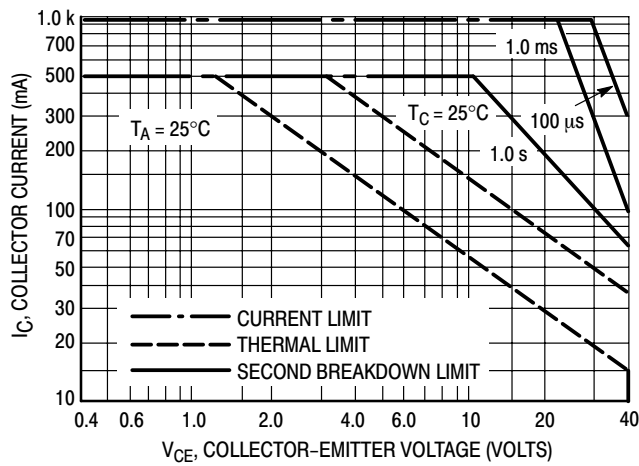


Figure 11. Temperature Coefficients

## 2N6426\*, 2N6427



**Figure 12. Thermal Response**



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

### ORDERING INFORMATION

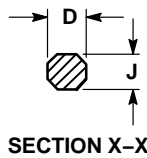
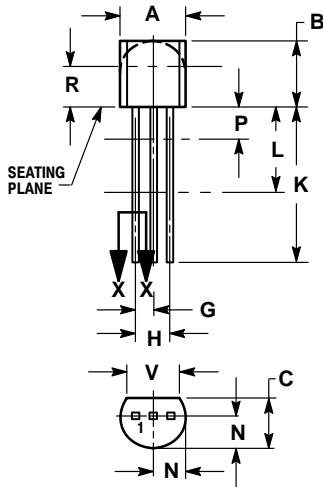
Device	Package	Shipping†
2N6426	TO-92	5,000 Units / Box
2N6426G	TO-92 (Pb-Free)	5,000 Units / Box
2N6426RLRA	TO-92	2,000 / Tape & Reel
2N6427	TO-92	5,000 Units / Box
2N6427RLRA	TO-92	2,000 / Tape & Reel
2N6427RLRAG	TO-92 (Pb-Free)	2,000 / Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

# 2N6426\*, 2N6427

## PACKAGE DIMENSIONS

TO-92  
TO-226AA  
CASE 29-11  
ISSUE AL



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. 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	0.021	0.407	0.533
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:

1. EMITTER
2. BASE
3. COLLECTOR

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