

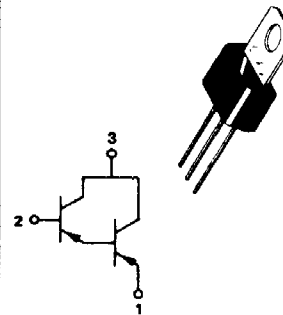
## MPS-U95 (SILICON)

### PNP SILICON DARLINGTON AMPLIFIER TRANSISTOR

... designed for amplifier and driver applications.

- High DC Current Gain –  
 $h_{FE} = 25,000$  (Min) @  $I_C = 200$  mA dc  
 $15,000$  (Min) @  $I_C = 500$  mA dc
- Collector-Emitter Breakdown Voltage –  
 $BV_{CES} = 40$  Vdc (Min) @  $I_C = 100$   $\mu$ A dc
- Low Collector-Emitter Saturation Voltage –  
 $V_{CE(sat)} = 1.5$  Vdc @  $I_C = 1.0$  A dc
- Monolithic Construction for High Reliability
- Complement to NPN MPS-U45

### PNP SILICON DARLINGTON TRANSISTOR



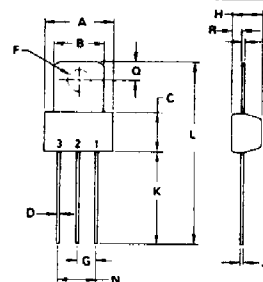
#### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	$V_{CES}$	40	Vdc
Collector-Base Voltage	$V_{CB}$	50	Vdc
Emitter-Base Voltage	$V_{EB}$	10	Vdc
Collector Current - Continuous	$I_C$	2.0	A dc
Total Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	1.0 8.0	Watt mW/ $^\circ\text{C}$
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	10 80	Watts mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-55 to +150	$^\circ\text{C}$

#### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	125	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$ (1)	12.5	$^\circ\text{C}/\text{W}$

(1)  $R_{\theta JA}$  is measured with the device soldered into a typical printed circuit board.



STYLE 1  
PIN 1: EMITTER  
2: BASE  
3: COLLECTOR

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	9.14	9.53	0.360	0.375
B	6.60	7.24	0.260	0.285
C	5.41	5.98	0.213	0.233
D	0.38	0.53	0.015	0.021
F	3.18	3.33	0.125	0.131
G	2.54 BSC 0.100 BSC			
H	3.94	4.19	0.155	0.165
J	0.36	0.41	0.014	0.016
K	12.07	12.70	0.475	0.500
L	26.02	26.63	0.985	1.005
N	5.08 BSC 0.200 BSC			
Q	2.79	2.99	0.094	0.106
R	1.14	1.40	0.045	0.055

CASE 162-02

NJ Semi-Conductors reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by NJ Semi-Conductors is believed to be both accurate and reliable at the time of going to press. However, NJ Semi-Conductors assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Conductors encourages customers to verify that datasheets are current before placing orders.

MPS-U95 (continued)

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

Characteristic	Symbol	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>					
Collector-Emitter Breakdown Voltage ( $I_C = 100 \mu\text{A}$ , $V_{BE} = 0$ )	$BV_{CES}$	40	—	—	Vdc
Collector-Base Breakdown Voltage ( $I_C = 100 \mu\text{A}$ , $I_E = 0$ )	$BV_{CBO}$	50	—	—	Vdc
Emitter-Base Breakdown Voltage ( $I_E = 10 \mu\text{A}$ , $I_C = 0$ )	$BV_{EBO}$	10	—	—	Vdc
Collector Cutoff Current ( $V_{CB} = 30 \text{ Vdc}$ , $I_E = 0$ )	$I_{CBO}$	—	—	100	nA
Emitter Cutoff Current ( $V_{EB} = 8.0 \text{ Vdc}$ , $I_C = 0$ )	$I_{EBO}$	—	—	100	nA
<b>ON CHARACTERISTICS(1)</b>					
DC Current Gain ( $I_C = 200 \text{ mA}$ , $V_{CE} = 5.0 \text{ Vdc}$ ) ( $I_C = 500 \text{ mA}$ , $V_{CE} = 5.0 \text{ Vdc}$ ) ( $I_C = 1.0 \text{ A}$ , $V_{CE} = 5.0 \text{ Vdc}$ )	$h_{FE}$	25,000 15,000 4,000	43,000 41,000 35,000	150,000 — —	—
Collector-Emitter Saturation Voltage ( $I_C = 1.0 \text{ A}$ , $I_B = 2.0 \text{ mA}$ )	$V_{CE(sat)}$	—	1.0	1.5	Vdc
Base-Emitter Saturation Voltage ( $I_C = 1.0 \text{ A}$ , $I_B = 2.0 \text{ mA}$ )	$V_{BE(sat)}$	—	1.85	2.0	Vdc
Base-Emitter On Voltage ( $I_C = 1.0 \text{ A}$ , $V_{CE} = 5.0 \text{ Vdc}$ )	$V_{BE(on)}$	—	1.7	2.0	Vdc
<b>DYNAMIC CHARACTERISTICS</b>					
Small-Signal Current Gain (1) ( $I_C = 200 \text{ mA}$ , $V_{CE} = 5.0 \text{ Vdc}$ , $f = 100 \text{ MHz}$ )	$ h_{fe} $	0.5	1.6	—	—
Collector Base Capacitance ( $V_{CB} = 10 \text{ Vdc}$ , $I_E = 0$ , $f = 1.0 \text{ MHz}$ )	$C_{cb}$	—	2.5	12	pF

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

Uniwell darlington transistors can be used in any number of low power applications, such as relay drivers, motor control and as general purpose amplifiers. As an audio amplifier these devices, when used as a complementary pair, can drive 3.5 watts into a 3.2 ohm speaker using a 14 volt supply with less than one per cent distortion. Because of the high gain the base drive requirement is as low as 1 mA in this application. They are also useful as power drivers for high current application such as voltage regulators.