New Jersey Semi-Conductor Products, Inc.

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# MJ21195 - PNP MJ21196 - NPN

# **Silicon Power Transistors**

The MJ21195 and MJ21196 utilize Perforated Emitter technology and are specifically designed for high power audio output, disk head positioners and linear applications.

#### Features

- Total Harmonic Distortion Characterized
- High DC Current Gain  $-h_{FE} = 25 \text{ Min} @ I_C = 8 \text{ Adc}$
- Excellent Gain Linearity
- High SOA: 3 A, 80 V, 1 Sec
- Pb–Free Packages are Available\*

#### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V <sub>CEO</sub>	250	Vdc
Collector-Base Voltage	V <sub>CBO</sub>	400	Vdc
Emitter-Base Voltage	V <sub>EBO</sub>	5	Vdc
Collector-Emitter Voltage - 1.5V	V <sub>CEX</sub>	400	Vdc
Collector Current – Continuous – Peak (Note 1)	I <sub>C</sub>	16 30	Adc
Base Current - Continuous	1 <sub>B</sub>	5	Adc
Total Device Dissipation @ T <sub>C</sub> = 25°C Derate above 25°C	PD	250 1.43	W W/°C
Operating and Storage Junction Temperature Range	Τ <sub>J</sub> , T <sub>stg</sub>	-65 to +200	°C

#### THERMAL CHARACTERISTICS

Characteristics	Symbol	Max	Unit
Thermal Resistance, Junction-to-Case	R <sub>θJC</sub>	0.7	°C/W

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.

Pulse Test: Pulse Width = 5 µs, Duty Cycle ≤ 10%.



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.

## 16 AMPERES COMPLEMENTARY SILICON-POWER TRANSISTORS 250 VOLTS, 250 WATTS



(TO-3)

**Quality Semi-Conductors** 

### MJ21195 – PNP MJ21196 – NPN

### **ELECTRICAL CHARACTERISTICS** ( $T_C = 25^{\circ}C \pm 5^{\circ}C$ unless otherwise noted)

Characteristic		Symbol	Min	Typical	Max	Unit
OFF CHARACTERISTICS						
Collector-Emitter Sustaining Voltage $(I_c = 100 \text{ mAdc}, I_B = 0)$		V <sub>CEO(sus)</sub>	250	-	-	Vdc
Collector Cutoff Current ( $V_{CE}$ = 200 Vdc, I <sub>B</sub> = 0)		I <sub>CEO</sub>		-	100	μAdc
Emitter Cutoff Current (V <sub>CE</sub> = 5 Vdc, I <sub>C</sub> = 0)		IEBO	-	-	100	μAdc
Collector Cutoff Current ( $V_{CE}$ = 250 Vdc, $V_{BE(off)}$ = 1.5 Vdc)		I <sub>CEX</sub>	-	-	100	uAdc
SECOND BREAKDOWN						
Second Breakdown Collector Current with Base Forward (V <sub>CE</sub> = 50 Vdc, t = 1 s (non-repetitive) (V <sub>CE</sub> = 80 Vdc, t = 1 s (non-repetitive)	Biased	I <sub>S/b</sub>	5 2.5	-	-	Adc
ON CHARACTERISTICS		•				
DC Current Gain ( $I_C = 8 \text{ Adc}, V_{CE} = 5 \text{ Vdc}$ ) ( $I_C = 16 \text{ Adc}, V_{CE} = 5 \text{ Vdc}$ )		h <sub>FE</sub>	25 8		75	-
Base-Emitter On Voltage (I <sub>C</sub> = 8 Adc, V <sub>CE</sub> = 5 Vdc)		V <sub>BE(on)</sub>	_	-	2.2	Vdc
Collector-Emitter Saturation Voltage ( $I_C = 8 \text{ Adc}, I_B = 0.8 \text{ Adc}$ ) ( $I_C = 16 \text{ Adc}, I_B = 3.2 \text{ Adc}$ )		V <sub>CE(sat)</sub>		-	1.4 4	Vdc
DYNAMIC CHARACTERISTICS						
Total Harmonic Distortion at the Output V <sub>RMS</sub> = 28.3 V, f = 1 kHz, P <sub>LOAD</sub> = 100 W <sub>RMS</sub> h <sub>F</sub> un	E	T <sub>HD</sub>	_	0.8	_	%
(Matched pair h <sub>FE</sub> = 50 @ 5 A/5 V) h <sub>F</sub> ma	E atched		-	0.08	-	
Current Gain Bandwidth Product (I <sub>C</sub> = 1 Adc, V <sub>CE</sub> = 10 Vdc, f <sub>test</sub> = 1 MHz)		fT	4	-	_	MHz
Output Capacitance (V <sub>CB</sub> = 10 Vdc, I <sub>E</sub> = 0, f <sub>test</sub> = 1 MHz)		C <sub>ob</sub>	-	-	500	pF

2. Pulse Test: Pulse Width = 300  $\mu$ s, Duty Cycle  $\leq$ 2%



Figure 1. Typical Current Gain Bandwidth Product



