



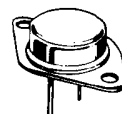
NES
NEW ENGLAND SEMICONDUCTOR

NPN
NS15003
PNP
NS15004

COMPLEMENTARY SILICON POWER TRANSISTORS

The NS15003 and NS15004 are power transistors designed for high power audio, disk head positions and other linear applications

- High Safe Operation Area (100% Tested)
200 W @ 40 V
- For Low Distortion Complementary Designs
- High DC Current Gain --
 $h_{FE} = 25$ (min) @ $I_C = 5$ Adc



TO-3

**20 AMPERE
POWER TRANSISTOR
COMPLEMENTARY SILICON**

**140 VOLTS
200 WATTS**

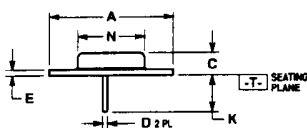
MAXIMUM RATINGS

RATINGS	SYMBOL	VALUE	UNITS
Collector-Emitter Voltage	V_{CEO}	140	Vdc
Collector-Base Voltage	V_{CBO}	140	Vdc
Emitter-Base Voltage	V_{EBO}	5.0	Vdc
Collector-Current -- Continuous	I_C	20	Adc
Base-Current -- Continuous	I_B	5.0	Adc
Emitter-Current -- Continuous	I_E	25	Adc
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	200 1.14	W W/ $^\circ\text{C}$
Operating & Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200	$^\circ\text{C}$

THERMAL CHARACTERISTICS

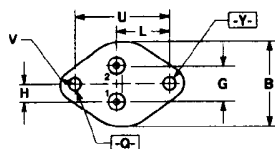
CHARACTERISTICS	SYMBOL	MAX.	UNITS
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.875	$^\circ\text{C/W}$
Maximum Lead Temperature for Soldering $\frac{1}{16}$ " from Case for < 10s.	T_L	265	$^\circ\text{C}$

MECHANICAL OUTLINE



STYLE 1:

PIN 1: BASE
PIN 2: EMITTER
CASE: COLLECTOR



DIM	MILLIMETER		INCHES	
	MIN	MAX	MIN	MAX
A	38.86 REF		1.530 REF	
B	25.15	26.67	0.990	1.050
C	6.35	8.51	0.250	0.335
D	1.45	1.60	0.057	0.063
E	1.53	1.77	0.060	0.070
G	10.92 BSC		0.430	
H	5.46 BSC		0.215 BSC	
K	11.18	12.19	0.440	0.480
L	16.89 BSC		0.665 BSC	
N	19.31	21.08	0.760	0.830
Q	3.84	4.19	0.151	0.165
U	30.15 BSC		1.187 BSC	
V	3.33	4.77	0.131	0.188

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6 Lake Street Lawrence, MA 01841
1-800-446-1158 / (978) 794-1666 / FAX: (978) 689-0803

T4-4.8-860-045 REV: --



NES

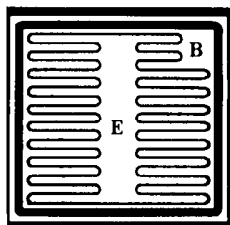
NEW ENGLAND SEMICONDUCTOR

NS15003
NS15004

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

Characteristics	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Sustaining Voltage (1) $I_C = 200\text{ mAdc}$, $I_B = 0$	$V_{CE(sus)}$	140		Vdc
Collector-Cutoff Current $V_{CE} = 140\text{ Vdc}$, $V_{BE(off)} = 1.5\text{ Vdc}$ $V_{CE} = 140\text{ Vdc}$, $V_{BE(off)} = 1.5\text{ Vdc}$, $T_C = 150^\circ\text{C}$	I_{CEX}		100 2.0	μAdc mAdc
Collector Cutoff Current $V_{CE} = 140\text{ Vdc}$, $I_B = 0$	I_{CEO}		250	μAdc
Emitter-Cutoff Current $V_{EB} = 5.0\text{ Vdc}$, $I_C = 0$	I_{EBO}		100	μAdc
SECOND BREAKDOWN				
Second Breakdown Collector Current w/ Base Forward Biased $V_{CE} = 40\text{ Vdc}$, $t = 1\text{ s}$ (non-repetitive)	$I_{S/h}$	5.0		Adc
ON CHARACTERISTICS				
DC Current Gain $I_C = 5.0\text{ Adc}$, $V_{CE} = 7.0\text{ Vdc}$	h_{FE}	25	150	
Collector-Emitter Saturation Voltage $I_C = 5.0\text{ Adc}$, $I_B = 0.5\text{ Adc}$	$V_{CE(sat)}$		1.0	Vdc
Base-Emitter On Voltage $I_C = 5.0\text{ Adc}$, $V_{CE} = 7.0\text{ Vdc}$	$V_{BE(on)}$		2.0	Vdc
DYNAMIC CHARACTERISTICS				
Current-Gain -- Bandwidth Product $I_C = 0.5\text{ Adc}$, $V_{CE} = 10\text{ Vdc}$, $f_{(test)} = 0.5\text{ MHz}$	f_T	2.0		MHz
Output Capacitance $V_{CB} = 10\text{ Vdc}$, $I_E = 0$, $f_{(test)} = 1.0\text{ MHz}$	C_{obo}		1000	p^f

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



1. Chip size..... 230 X 230 mils ± 2 mils
2. Chip thickness.... 8 - 12 mils nominal
3. Top metal..... Aluminum 25,000Å minimum, 30,000Å nominal
4. Back metal..... A. Ti/Ni/Ag 2kÅ/7kÅ/7kÅ min. 3kÅ/10kÅ/10kÅ nom.
B. Gold 1,500Å minimum, 2,500Å nominal
5. Backside..... Collector
6. Bonding pad..... B = 30 X 38 mils, E = 33 X 156 mils

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