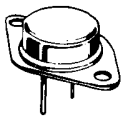
NEW ENGLAND SEMICONDUCTOR

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

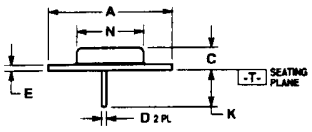
MAXIMUM RATINGS

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 @ $T_C = 25^0C$ Derate above 25^0C	P_D	200 1.14	W $W/^0C$
Operating & Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200	^0C

THERMAL CHARACTERISTICS

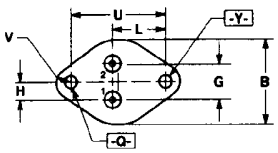
CHARACTERISTICS	SYMBOL	MAX.	UNITS
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.875	$^0C\backslash W$
Maximum Lead Temperature for Soldering $\frac{1}{16}$ " from Case for< 10s.	T_L	265	^0C

MECHANICAL OUTLINE



STYLE 1:

PIN 1: BASE
PIN 2: EMITTER
CASE: COLLECTOR



	MILLIMETER		INCHES	
DIM	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

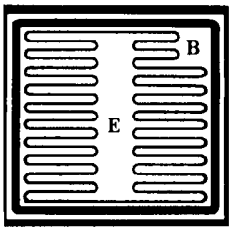
NEW ENGLAND SEMICONDUCTOR

NS15003
NS15004

ELECTRICAL CHARACTERISTICS ($T_C = 25^0C$ unless otherwise noted)

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

(1)Pulse Test: Pulse Width $\leq 300\mu s$, 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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