



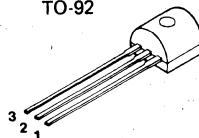
NAO1(NPN) NAO2(PNP) 800mA complementary power transistors

features

- 20 Volt/800 mA Amp rating
- Low V_{CE} (sat) and V_{BE} (sat) characteristics at
 $I_C = 500$ mA, $I_B = 50$ mA
- Guaranteed V_{BE} (on) characteristics at low
current for stable biasing
- Matched HFE groupings for complementary applications
- "Epoxy B" packaging concept for excellent reliability

1 package and lead coding

TO-92



applications

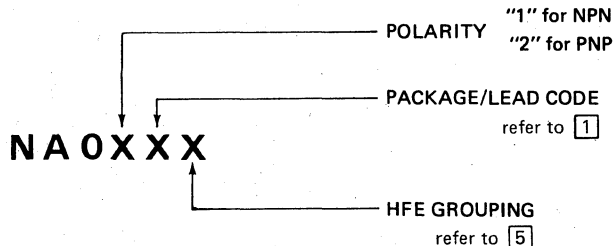
- 0.2 to 1 Watt audio power amplifiers
- Medium power switching circuits
- Converter/Inverter circuits
- Circuits for toys

PACKAGE CODE TO-92	LEAD		
	1	2	3
E	E	B	C
F	E	C	B
H	C	B	E

2 maximum ratings

PARAMETER	SYMBOL	RATING	UNIT
Collector-Emitter Voltage	V_{CEO}	20	V_{DC}
Collector-Base Voltage	V_{CB}	25	V_{DC}
Emitter-Base Voltage	V_{EB}	5.0	V_{DC}
Collector Current (continuous)	I_C (max)	800	mA
Power Dissipation ($T_A = 25^\circ\text{C}$)	P_D		
TO-92		0.6	W
Power Dissipation ($T_C = 25^\circ\text{C}$)	P_D		
TO-92		1.0	W
Thermal Resistance	θ_{JA}	208	$^\circ\text{C/W}$
TO-92	θ_{JC}	125	$^\circ\text{C/W}$
Temperature, Junction and Storage	T_j, T_{stg}	-55 to + 150	$^\circ\text{C}$

3 ordering information



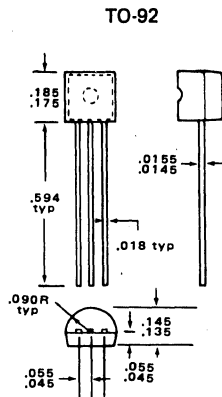
4 electrical characteristics $T_C = 25^\circ\text{C}$

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
V_{CEO}	Collector-Emitter Sustaining Voltage	$I_C = 1\text{ mA}$	20			V
V_{CBO}	Collector-Base Breakdown Voltage	$I_C = 100\mu\text{A}$	25			V
V_{EBO}	Emitter-Base Breakdown Voltage	$I_E = 10\mu\text{A}$	5			V
I_{CEO}	Collector-Emitter Leakage Current	$V_{CE} = 15\text{V}$			100	μA
I_{CBO}	Collector-Base Leakage Current	$V_{CB} = 20\text{V}$			1	μA
$V_{BE}(\text{on})$	Base-Emitter Voltage	$I_C = 10\text{ mA}, V_{CE} = 3\text{V}$	630	680	730	mV
$V_{BE}(\text{sat})$	Base-Emitter Saturation Voltage	$I_C = 500\text{ mA}, I_B = 50\text{ mA}$		0.95	1.5	V
$V_{CE}(\text{sat})$	Collector-Emitter Saturation Voltage	$I_C = 500\text{ mA}, I_B = 50\text{ mA}$		0.2	0.5	V
C_{ob}	Collector Output Capacitance NPN types PNP types	$V_{CB} = 10\text{V}, f = 1\text{ MHz}$		4.5 7.0		pF pF
f_t	Current Gain Bandwidth Product	$I_C = 100\text{ mA}, V_{CE} = 3\text{V}$	50	200		MHz

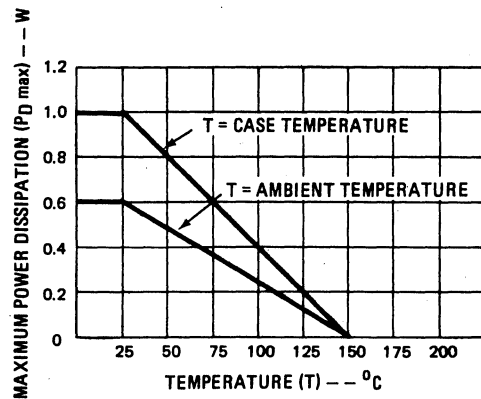
5 HFE groupings

GROUPING	PARAMETER	CONDITIONS	MIN	TYP	MAX	RATIO
G	DC Current Gain	$I_C = 100\text{ mA}, V_{CE} = 3\text{V}$	68	85	110	1:1.6
H	DC Current Gain	$I_C = 100\text{ mA}, V_{CE} = 3\text{V}$	100	127	160	1:1.6
I	DC Current Gain	$I_C = 100\text{ mA}, V_{CE} = 3\text{V}$	140	180	240	1:1.6
J	DC Current Gain	$I_C = 100\text{ mA}, V_{CE} = 3\text{V}$	200	260	350	1:1.6
X	DC Current Gain	$I_C = 100\text{ mA}, V_{CE} = 3\text{V}$	30	58	110	1:3.5
Y	DC Current Gain	$I_C = 100\text{ mA}, V_{CE} = 3\text{V}$	100	190	350	1:3.5

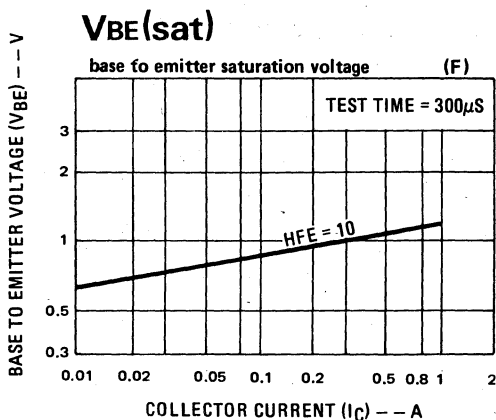
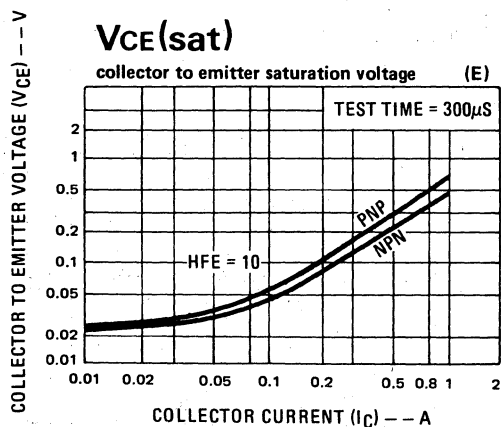
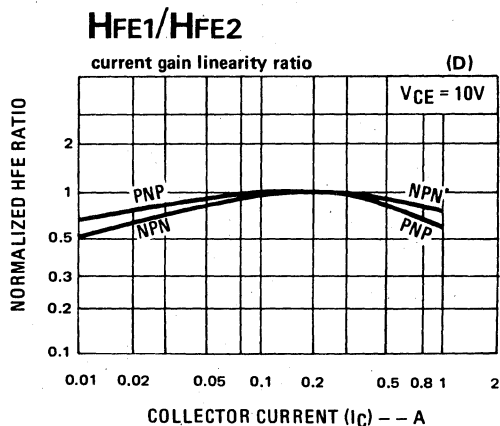
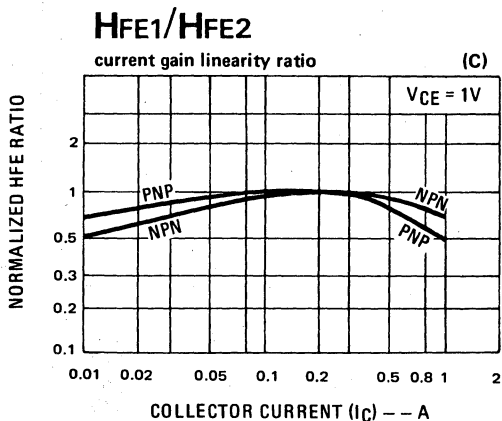
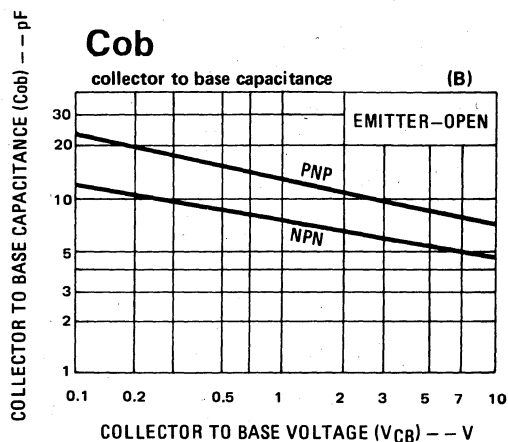
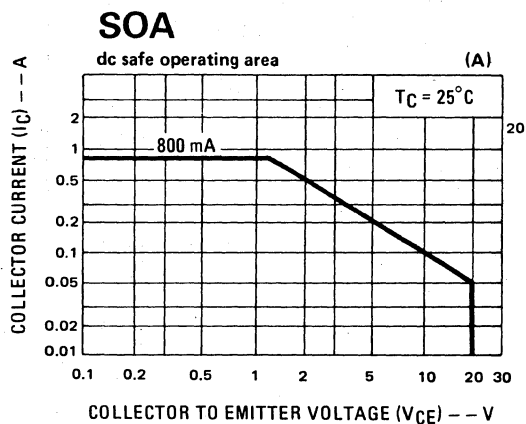
6 physical dimensions



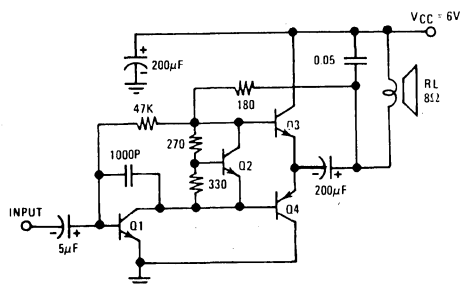
7 max power dissipation



8 typical performance characteristics

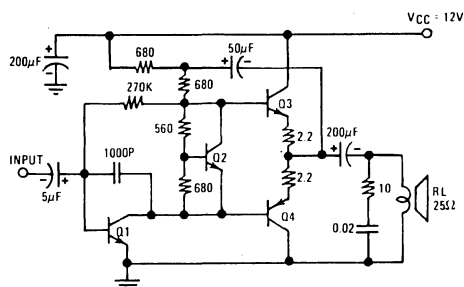


9 typical applications



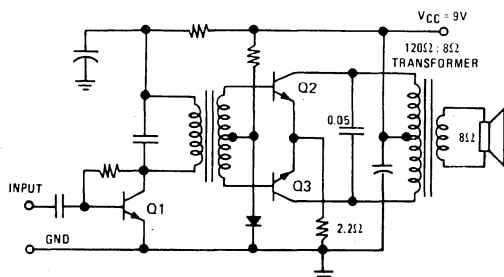
Q1 NB111EH/J Q3 NA01EG/J
Q2 NR001E Q4 NA01EG/J

Figure A. 380mW 6V/8Ω OTL Amplifier



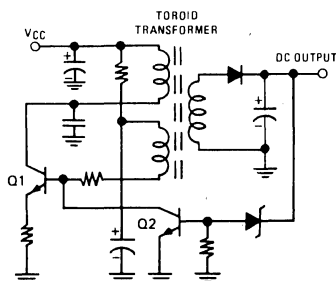
Q1 NB111EH/J Q3 NA01EG/J
Q2 NR001E Q4 NA01EG/J

Figure B. 650mW 12V/25Ω OTL Amplifier



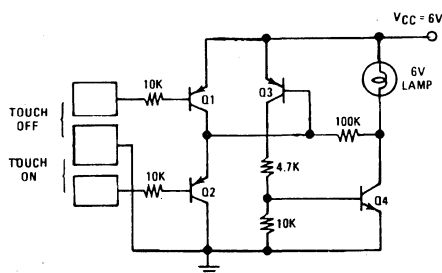
Q1 NB111EH/J Q2 NA01EG/J Q3 NA01EG/J

Figure C. 1.2W Audio Amplifier



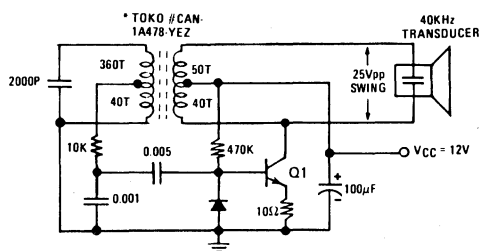
Q1 NA01EX Q2 NB111EY

Figure D. Typical Converter Circuit



Q1 NB021EY Q3 NB021EY
Q2 NB021EY Q4 NA01EX

Figure E. Touch-on/Touch-off Electronic Switch



Q1 NA01EX

Figure F. 40KHz Ultrasonic Transmitter