

NB311, 312, 313(NPN), NB321, 322, 323(PNP)

6501130 NATL SEMICONDUCTOR, (DISCRETE)



28C 35601 D

T-29-21

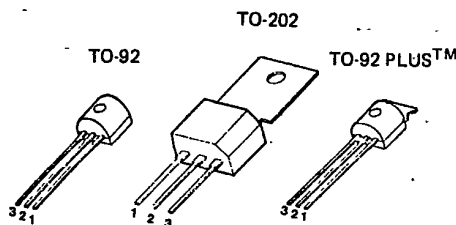
T-33-07

NB311, 312, 313 (NPN) NB321, 322, 323 (PNP) 1.5Amp complementary power drivers

features

- 35 to 65 Volt at 1.5 Amp collector ratings
- Low $V_{CE(sat)}$ and $V_{BE(sat)}$ characteristics with $I_C = 300$ mA and $I_B = 10$ mA drive
- Available in TO-92, TO-92 PLUSTM and TO-202 packages
- "Epoxy B" packaging concept for excellent reliability

1 packages and lead coding



PACKAGE CODE			LEAD		
TO-92	TO-92 PLUS	TO-202	1	2	3
E	X	K	E	B	C
F	Y	L	E	C	B
H	Z	M	B	C	E

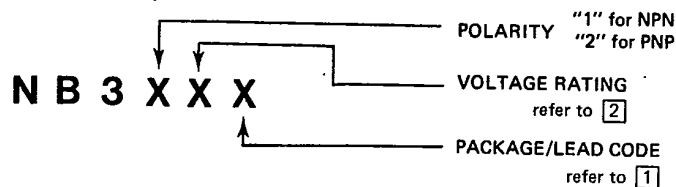
applications

- Driver stages in high-power audio amplifiers
- Medium-power switching circuits
- Converter/inverter circuits
- TV receivers

2 maximum ratings

PARAMETER	SYMBOL	NB311 NB321	NB312 NB322	NB313 NB323	UNIT
Collector-Emitter Voltage	V_{CEO}	35	50	65	V_{DC}
Collector-Base Voltage	V_{CB}	40	55	70	V_{DC}
Emitter-Base Voltage	V_{EB}	6	6	6	V_{DC}
Collector Current (continuous)	I_C	1.5	1.5	1.5	A_{DC}
Power Dissipation ($T_A = 25^\circ C$)	P_D				
TO-92		0.6	0.6	0.6	W
TO-92 PLUS		0.75	0.75	0.75	W
TO-202		1.75	1.75	1.75	W
Power Dissipation ($T_C = 25^\circ C$)	P_D				
TO-92		1.0	1.0	1.0	W
TO-92 PLUS		2.5	2.5	2.5	W
TO-202		10	10	10	W
Temperature, Junction and Storage	T_j, T_{stg}	-55 to +150	-55 to +150	-55 to +150	$^\circ C$

3 ordering information



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

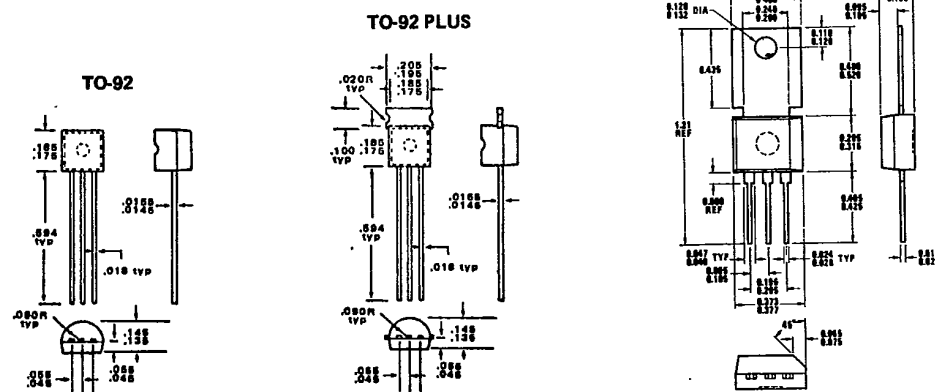
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SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
BV_{CEO}	Collector-Emitter Sustaining Voltage NB311/321 NB312/322 NB313/323	$I_C = 1\text{ mA}$	35 50 65			V V V
BV_{CBO}	Collector-Base Breakdown Voltage NB311/321 NB312/322 NB313/323	$I_C = 100\text{ }\mu\text{A}$	40 55 70			V V V
BV_{EBO}	Emitter-Base Breakdown Voltage	$I_E = 10\text{ }\mu\text{A}$	6			V
I_{CEO}	Collector-Emitter Leakage Current	$V_{CE} = 30\text{ V NB311/321}$ 45 V NB312/322 60 V NB313/323			50 50 50	μA μA μA
I_{CBO}	Collector-Base Leakage Current	$V_{CB} = 35\text{ V NB311/321}$ 50 V NB312/322 65 V NB313/323			0.5 0.5 0.5	μA μA μA
I_{EBO}	Emitter-Base Leakage Current	$V_{EB} = 5\text{ V}$			0.5	μA
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = 300\text{ mA}, I_B = 10\text{ mA}$		0.9	1	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 300\text{ mA}, I_B = 10\text{ mA}$		0.15	0.5	V
HFE_1	DC Current Gain	$I_C = 1\text{ mA}, V_{CE} = 10\text{ V}$	30			
HFE_2	DC Current Gain	$I_C = 100\text{ mA}, V_{CE} = 10\text{ V}$	50			
C_{ob}	Collector Output Capacitance NPN types PNP types	$V_{CB} = 10\text{ V}, f = 1\text{ MHz}$		10 17		pF pF
f_t	Current Gain Bandwidth Product	$I_C = 100\text{ mA}, V_{CE} = 10\text{ V}$	20			MHz

5 physical dimensions

TO-202

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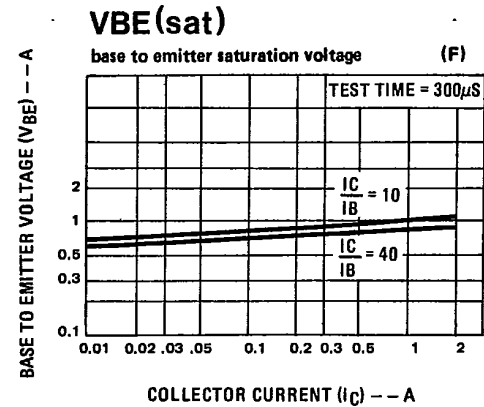
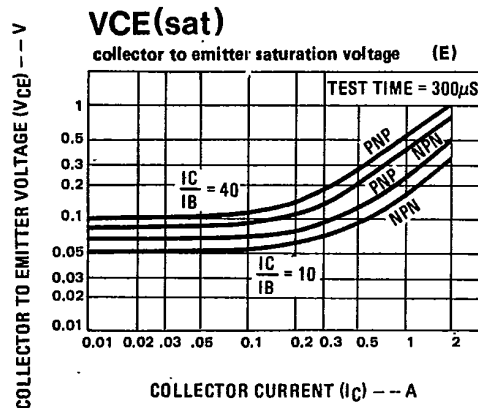
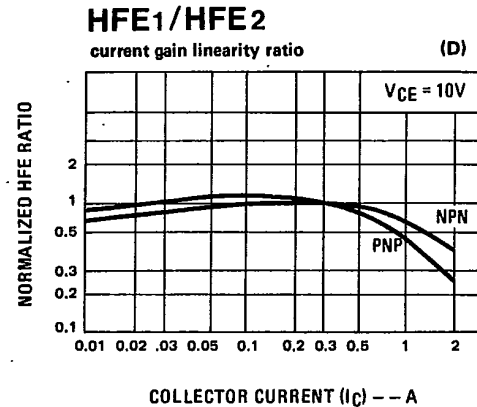
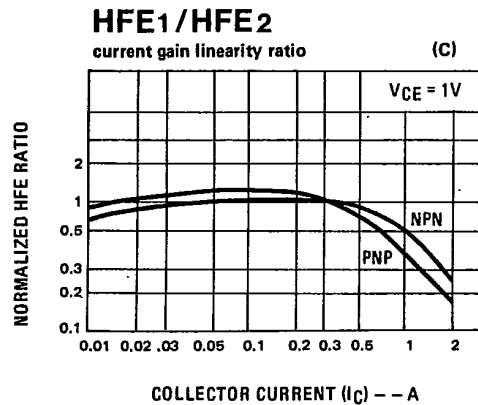
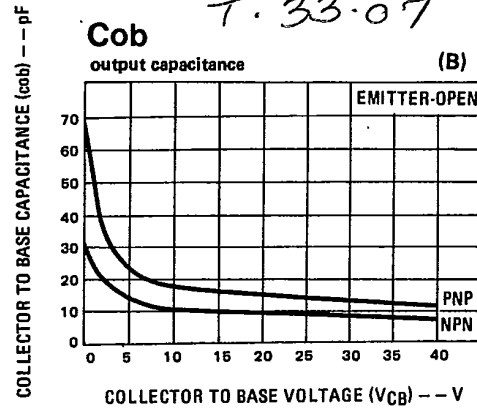
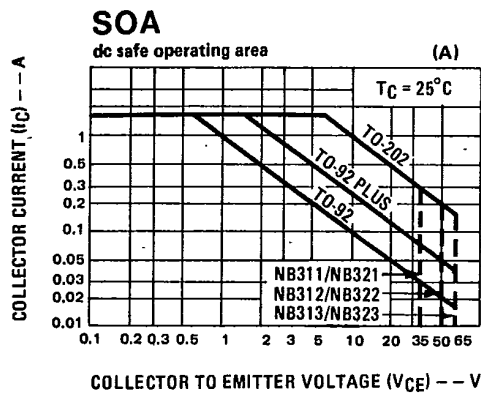


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28C 35603 D

NB311, 312, 313(NPN), NB321, 322, 323(PNP)

⑥ typical performance characteristics



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28C 35604

D

7 typical applications

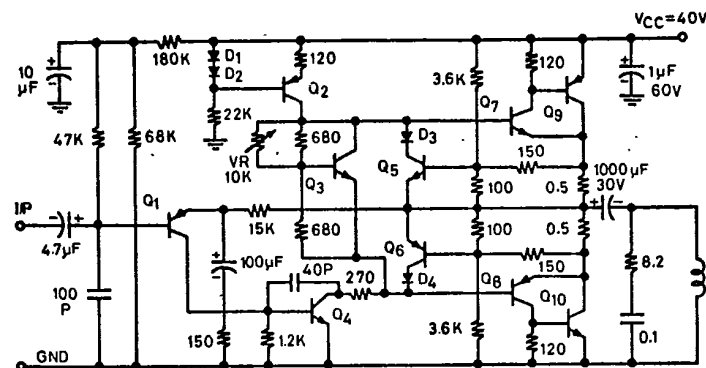
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Figure A. 25 Watt OTL Amplifier

Q1 NB022EY
Q2 NB123EY
Q3 NR001E
Q4 NB113EY
Q5 NB111EY
Q6 NB121EY
Q7 NB313Y
Q8 NB323Y
Q9 NA72W
Q10 NA71W

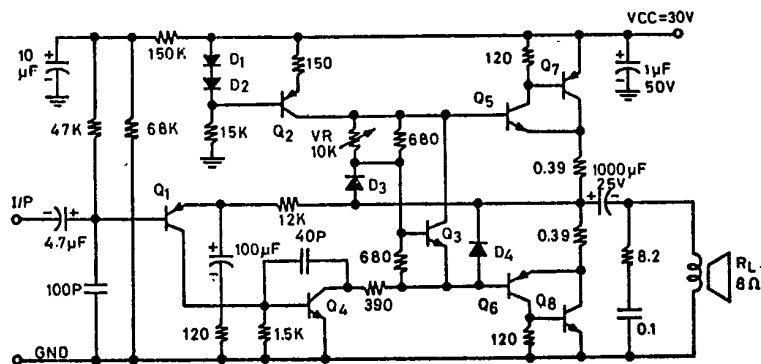


Figure B. 12 Watt OTL Amplifier

Q1 NB021EY
Q2 NB122EY
Q3 NR001E
Q4 NB112EY
Q5 NB312E
Q6 NB322E
Q7 NA62W
Q8 NA51W

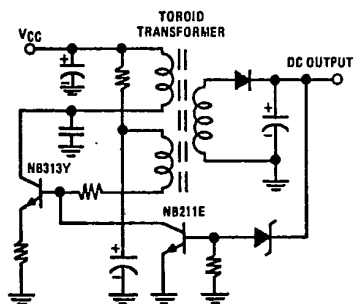


Figure C. Typical Converter Circuit

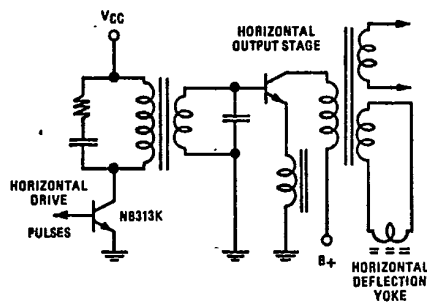


Figure D. Typical TV Horizontal Driver Application

B311, 312, 313(NPN), NB321, 322, 323(PNP)

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