National Semiconductor

NA61 (NPN)
NA62 (PNP) 4.5 Amp complementary power transistors

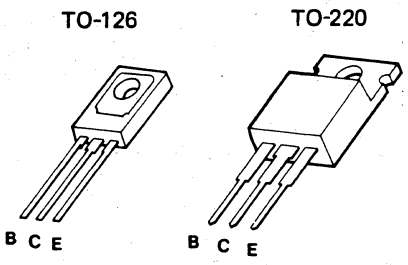
features

- 45 Volt/4.5 Amp rating
- Available in TO-126 and TO-220 packages
- Low V_{CE} (sat) and V_{BE} (sat) characteristics at I_C = 3A, I_B = 150 mA
- Guaranteed V_{CE} (sat) and V_{BE} (sat) at I_C = 4.5A, I_B = 300 mA for improved short-circuit protection design in audio amplifiers
- "Epoxy B" packaging concept for excellent reliability

applications

- 10 to 25 Watt, 4 Ohm audio power amplifiers
- High current switching circuits
- Converter/Inverter circuits
- TV receivers

1 packages and lead coding

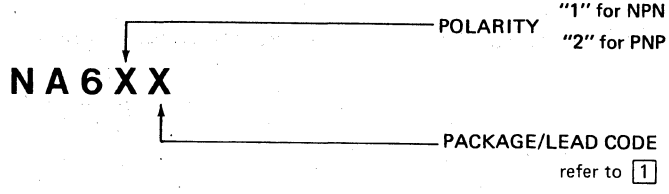


PACKAGE CODE	
TO 126	TO 220
U	W

2 maximum ratings

PARAMETER	SYMBOL	RATING	UNIT
Collector-Emitter Voltage	V_{CE}	45	V_{DC}
Collector-Base Voltage	V_{CB}	50	V_{DC}
Emitter-Base Voltage	V_{EB}	4	V_{DC}
Collector Current (continuous)	I_C (max)	4.5	A
Power Dissipation (T_A = 25°C)	P_D		
TO-126		1.8	W
TO-220		2.0	W
Power Dissipation (T_C = 25°C)	P_D		
TO-126		40	W
TO-220		40	W
Thermal Resistance			
TO-126	θ_{JA}/θ_{JC}	69.4/3.125	°C/W
TO-220	θ_{JA}/θ_{JC}	62.5/3.125	°C/W
Temperature, Junction and Storage	T_j, T_{stg}	–55 to + 150	°C

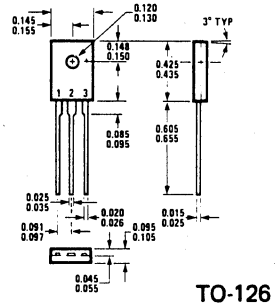
3 ordering information



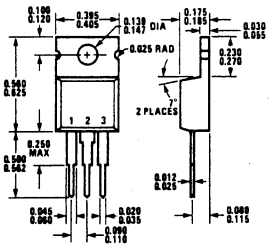
4 electrical characteristics $T_C = 25°C$

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
BV_{CER}	Collector-Emitter Sustaining Voltage	I_C = 10 mA, R = 1K	45			V
BV_{CBO}	Collector-Base Breakdown Voltage	I_C = 100μA	50			V
BV_{EBO}	Emitter-Base Breakdown Voltage	I_E = 100μA	4			V
I_{CER}	Collector-Emitter Leakage Current	V_{CE} = 35V, R = 1K			2	mA
I_{CBO}	Collector-Base Leakage Current	V_{CB} = 40V			1	mA
V_{BE} (on)	Base-Emitter Voltage	I_C = 20 mA, V_{CE} = 10V	520	600	680	mV
V_{BE} (sat)	Base-Emitter Saturation Voltage	I_C = 3A, I_B = 150 mA			1.5	V
V_{BE} (sat)	Base-Emitter Saturation Voltage	I_C = 4.5A, I_B = 300 mA			2	V
V_{CE} (sat)	Collector-Emitter Saturation Voltage	I_C = 3A, I_B = 150 mA			2	V
V_{CE} (sat)	Collector-Emitter Saturation Voltage	I_C = 4.5A, I_B = 300 mA			5	V
HFE_1	DC Current Gain	I_C = 500 mA, V_{CE} = 10V	30	100		ratio
Cob	Collector Output Capacitance	V_{CB} = 10V, f = 1 MHz				
	NPN types			40		pF
	PNP types			70		pF

5 physical dimensions



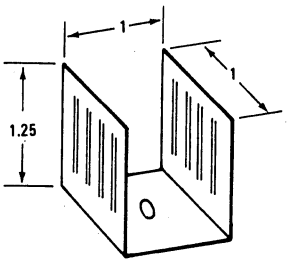
TO-126



TO-220

6 heatsink information

The TO-126 and TO-220 packages used with heatsink shown below permits about 10 Watts power dissipation and θ_{CA} = 9.4°C/W.

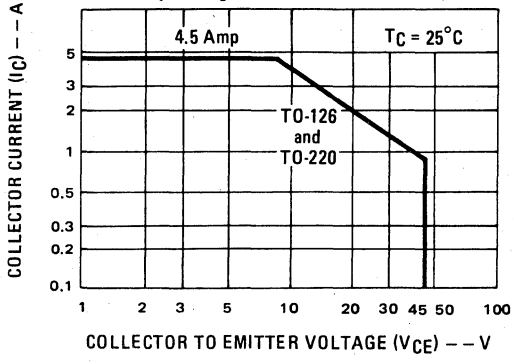


0.05 inch aluminium sheet

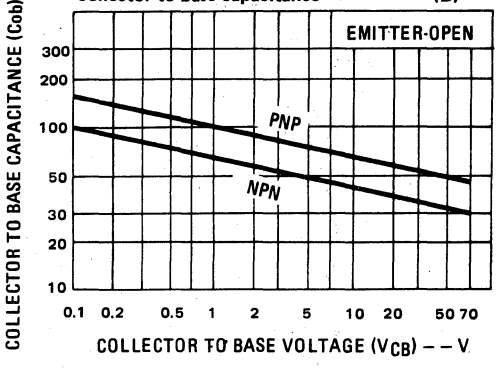
Mount transistor under heatsink and apply thermally conductive compound between contact surfaces.

7 typical performance characteristics

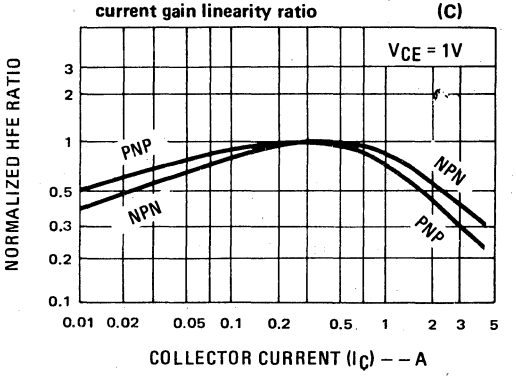
SOA
dc safe operating area (A)



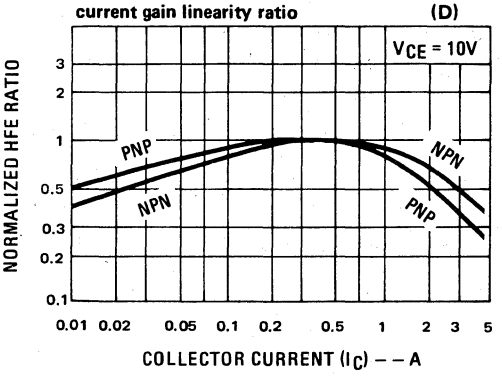
Cob
collector to base capacitance (B)



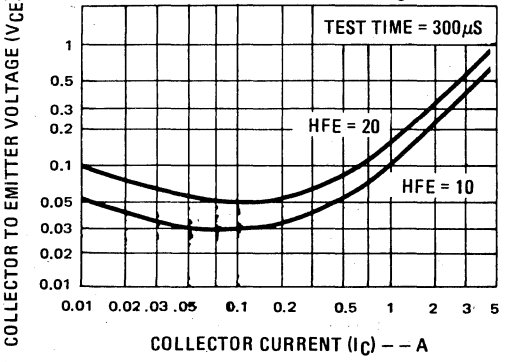
HFE1/HFE2
current gain linearity ratio (C)



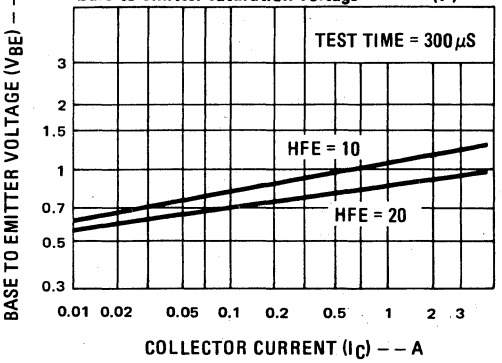
HFE1/HFE2
current gain linearity ratio (D)



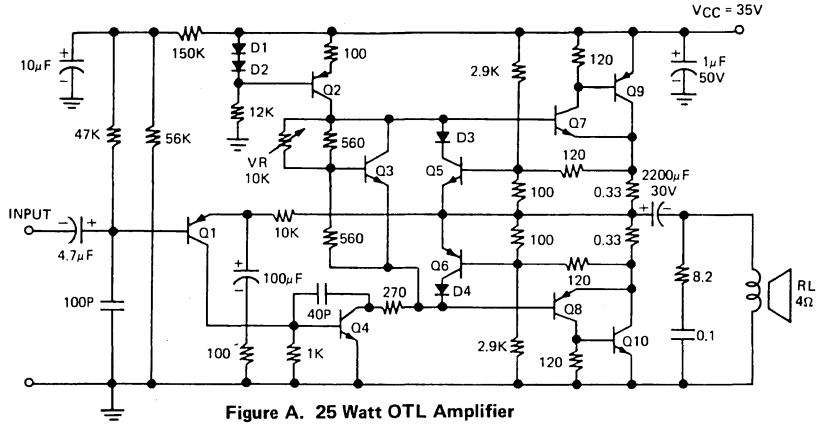
VCE(sat)
collector to emitter saturation voltage (E)



VBE(sat)
base to emitter saturation voltage (F)

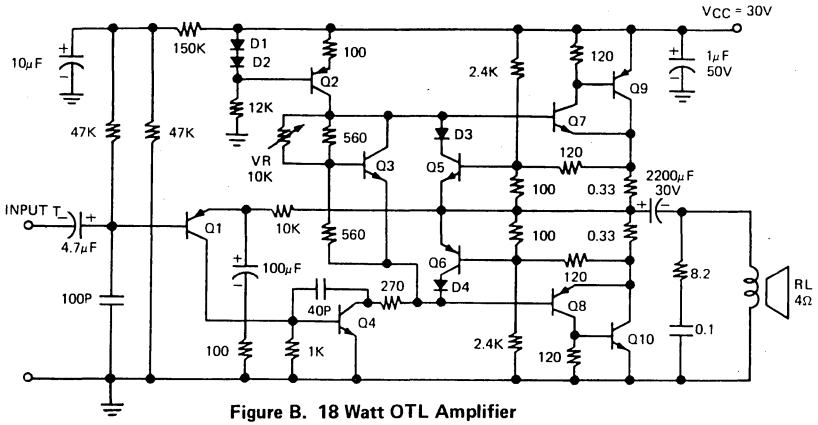


8 typical applications



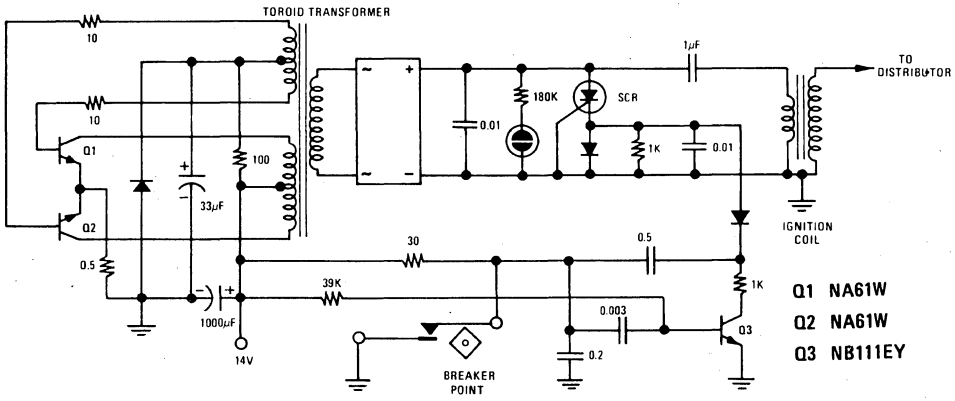
Q1 NB022EY
Q2 NB123EY
Q3 NR001E
Q4 NB113EY
Q5 NB111EY
Q6 NB121EY
Q7 NB313Y
Q8 NB323Y
Q9 NA62W
Q10 NA61W

Figure A. 25 Watt OTL Amplifier



Q1 NB022EY
Q2 NB122EY
Q3 NR001E
Q4 NB112EY
Q5 NB111EY
Q6 NB121EY
Q7 NB313Y
Q8 NB323Y
Q9 NA62W
Q10 NA61W

Figure B. 18 Watt OTL Amplifier



Q1 NA61W
Q2 NA61W
Q3 NB111EY

Figure C. Capacitor Discharge Ignition System

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