AN90B00/AN90B00S Series

Transistor Arrays

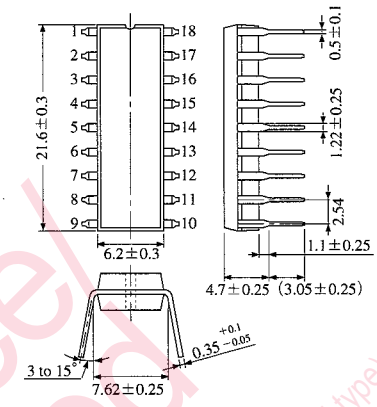
■ Overview

The transistor array, the AN90B00 and the AN90B00S series, includes the circuits with eight transistors connected in emitter-common style (seven transistors in AN90B00S series) and also the ones with five independent transistors integrated on a single chip.
The 18-DIL and PANAFLAT (SO-16D) packages are used in the AN90B00 series and the AN90B00S series respectively.

■ Features

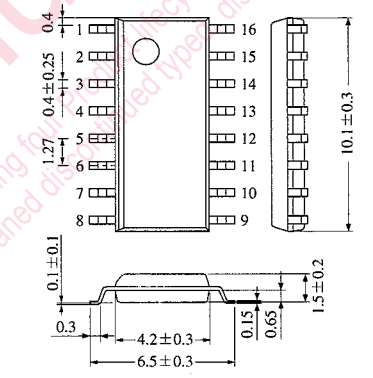
- Output current : I_O=25mA
- Breakdown voltage : V_{CEO}=24V
- Base current limiting resistor built-in.
- Output breakdown voltage protection diode built-in

AN90B00 Series Unit : mm



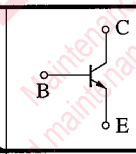
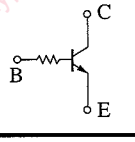
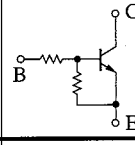
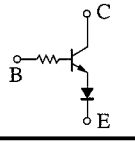
18-pin DIL Plastic Package (DIP018-P-0300E)

AN90B00S Series Unit : mm



16-pin PANAFLAT Package (SOP016-P-0225)

■ Block Diagram

Type No. \ Basic circuit				
AN90B01S	●			
AN90B10	●			
AN90B20, AN90B20S		●		
AN90B21, AN90B21S			●	
AN90B22, AN90B22S			●	
AN90B60, AN90B60S	●			
AN90B70, AN90B70S		●		
AN90B81, AN90B81S				●
AN90B82S				●

Note) A type No. ending with S stands for PANAFLAT package. (SO package)

■ Absolute Maximum Ratings (Ta=25℃)

Parameter	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	50	V
Collector-substrate voltage	V_{CIO}	50	V
Collector-emitter voltage	V_{CEO}	24	V
	V_{CER} *1	50	
Emitter-base voltage	V_{EBO} *2	5	V
Collector current	I_C	25	mA
Collector power dissipation	P_C *3	200	mW
Power dissipation	P_D	1000 *4	mW
		380 *5	
Operating ambient temperature	T_{opr}	−30 to +75	℃
Storage temperature	T_{stg}	−55 to +150 *4	℃
		−55 to +125 *5	

*1 AN90B21/21S *2 AN90B10/20/20S/21/21S/22/22S are excluded. *3 Allowable value per transistor
*4 Allowable value per 18-DIL package *5 Allowable value per SO-16D package

■ Electrical Characteristics (Ta=25℃)

● Common specification

Parameter	Symbol	Condition	min	typ	max	Unit
Collector-emitter voltage	V_{CEO}	I_C=1mA, I_B=0	24	—	—	V
Collector-base voltage	V_{CBO}	I_C=10 μA, I_E=0	50	—	—	V
Emitter-base voltage	V_{EBO}	I_E=10 μA, I_C=0	0.5	—	—	V
Collector cutoff current	I_{CEO}	V_{CE}=10V, $R_{BE}=\infty$	—	—	1	μA

● AN90B01S/10/60/60S (No base current limit resistor)

Parmeter		Symbol	Condition	min	typ	max	Unit
Collecter-emitter saturation voltage		$V_{CE(sat)1}$	I_C=1mA, I_B=0.1mA	—	0.1	0.2	V
		$V_{CE(sat)2}$	I_C=10mA, I_B=1mA	—	0.25	0.4	V
Base-emitter saturation voltage		$V_{BE(sat)}$	I_C=10mA, I_B=1mA	—	0.88	1	V
DC current amplification factor		h_{FE1}	V_{CE}=3V, I_C=1mA	50	120	—	—
		h_{FE2}	V_{CE}=3V, I_C=10mA	50	100	—	—
Output voltage	AN90B60/60S	V_O	V_I=V_C=5V, I_O=1mA	4	4.3	—	V

● AN90B20/20S/70/70S (With base current limit resistor)

Parameter		Symbol	Condition	min	typ	max	Unit
Collector-emitter saturation voltage		$V_{CE(sat)1}$	I_C=1mA, I_B=0.1mA	—	0.1	0.2	V
		$V_{CE(sat)2}$	I_C=10mA, I_B=1mA	—	0.25	0.4	V
Input voltage		V_{I1}	V_{CE}=0.2V, I_C=1mA	—	0.85	1.2	V
		V_{I2}	V_{CE}=0.4V, I_C=10mA	—	2.3	3.5	V
DC current amplification factor		h_{FE1}	V_{CE}=3V, I_C=1mA	50	120	—	—
		h_{FE2}	V_{CE}=3V, I_C=10mA	50	100	—	—
Output voltage	AN90B70/70S	V_O	V_I=V_C=5V, I_O=1mA	3.8	4.3	—	V

■ Electrical Characteristics (cont.) (T_a=25℃)

● AN90B21/21S

Parameter	Symbol	Condition	min	typ	max	Unit
Collector-emitter saturation voltage	$V_{CE(sat)1}$	I_C=1mA, I_I=0.4mA	—	0.1	0.2	V
	$V_{CE(sat)2}$	I_C=10mA, I_I=1.4mA	—	0.25	0.4	V
Input voltage	V_{I1}	V_{CE}=0.2V, I_C=1mA	—	3.1	4.1	V
	V_{I2}	V_{CE}=0.4V, I_C=10mA	—	4.2	5.8	V
Input current	I_{I1}	I_C=10mA, V_I=5V	—	0.55	1.1	mA
	I_{I2}	I_C=10mA, V_I=10V	—	1.2	2.0	mA

● AN90B22/22S

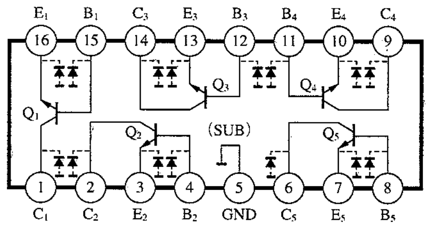
Parameter	Symbol	Condition	min	typ	max	Unit
Collector-emitter saturation voltage	$V_{CE(sat)1}$	I_C=1mA, I_I=0.3mA	—	0.1	0.2	V
	$V_{CE(sat)2}$	I_C=10mA, I_I=1.2mA	—	0.3	0.4	V
Input voltage	V_{I1}	V_{CE}=0.2V, I_C=1mA	—	1.4	2.0	V
	V_{I2}	V_{CE}=0.4V, I_C=10mA	—	1.9	3.0	V
Input current	I_{I1}	I_C=1mA, V_I=5V	—	0.9	1.1	mA
	I_{I2}	I_C=10mA, V_I=10V	—	1.9	2.3	mA

● AN90B81/81S/82S (With output breakdown protect diode)

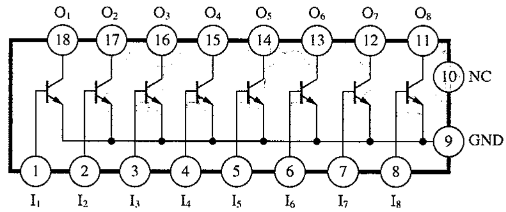
Parameter		Symbol	Condition	min	typ	max	Unit
Collector-emitter saturation voltage		$V_{CE(sat)1}$	I_C=1mA, I_B=0.1mA	—	0.85	1.1	V
		$V_{CE(sat)2}$	I_C=10mA, I_B=1mA	—	1.15	1.4	V
Input voltage	AN90B81/81S	V_{I1}	V_{CE}=1.1V, I_C=1mA	—	1.6	2.2	V
	AN90B82S	V_{I2}	V_{CE}=1.4V, I_C=10mA	—	3.0	4.5	V
DC current amplification factor		h_{FE1}	V_{CE}=3V, I_O=1mA	25	60	—	—
		h_{FE2}	V_{CE}=3V, I_O=10mA	20	50	—	—
Output voltage	AN90B81/81S AN90B82S	V_O	V_I=V_C=5V, I_O=1mA	2.9	3.3	—	V
Diode reverse voltage		V_R	I_R=10μA, I_C=0	50	—	—	V
Diode leakage current		I_R	V_{EB}=10V, I_C=0	—	—	1	μA

■ Schematic Diagram

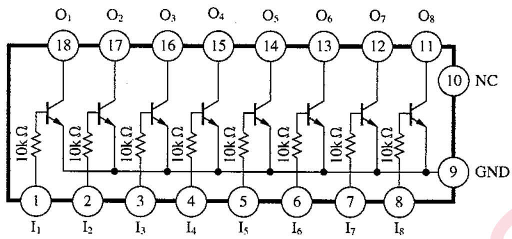
AN90B01S



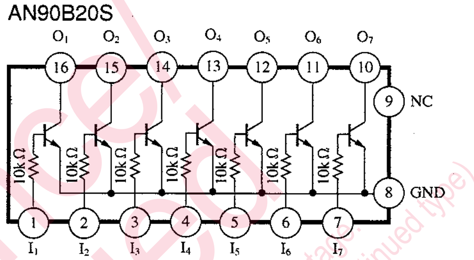
AN90B10



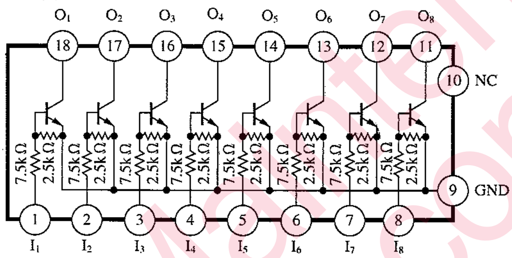
AN90B20



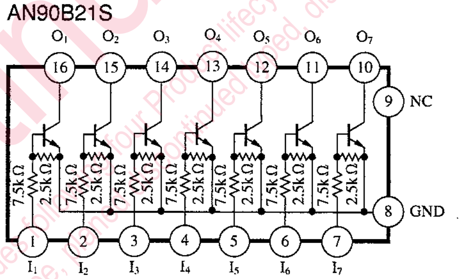
AN90B20S



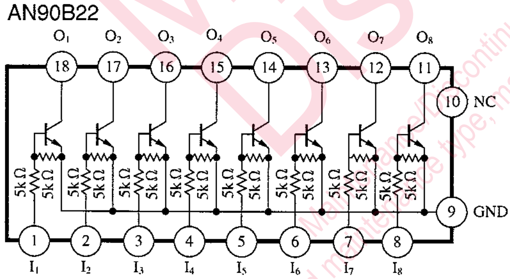
AN90B21



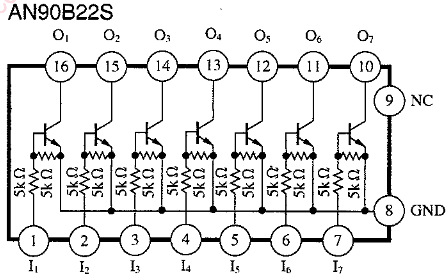
AN90B21S



AN90B22



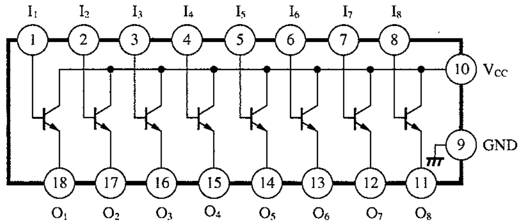
AN90B22S



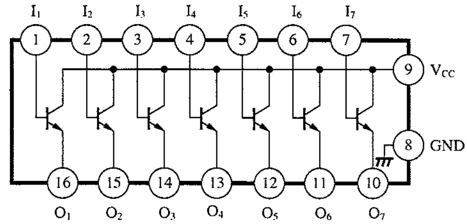
Note) I ···Input O ···Output

■ Schematic Diagram (cont.)

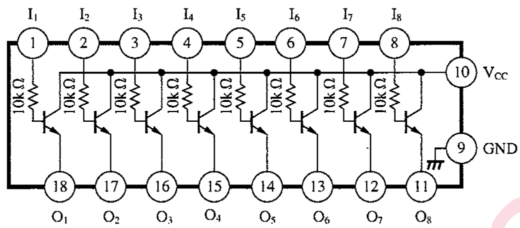
AN90B60



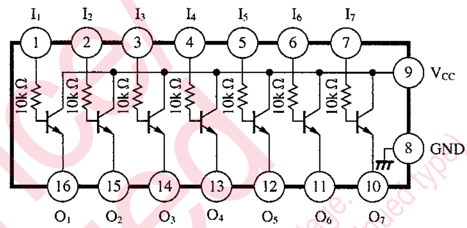
AN90B60S



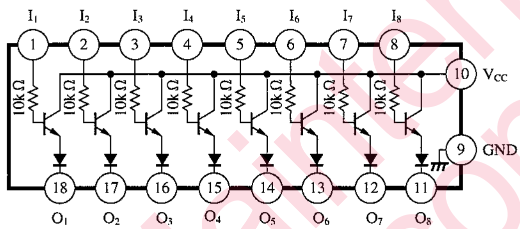
AN90B70



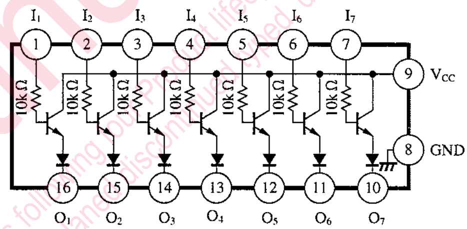
AN90B70S



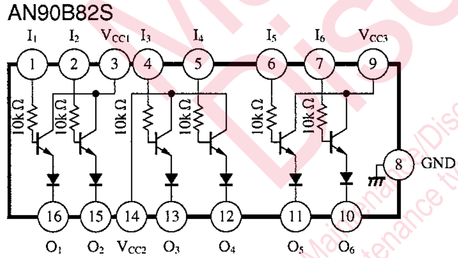
AN90B81



AN90B81S



AN90B82S

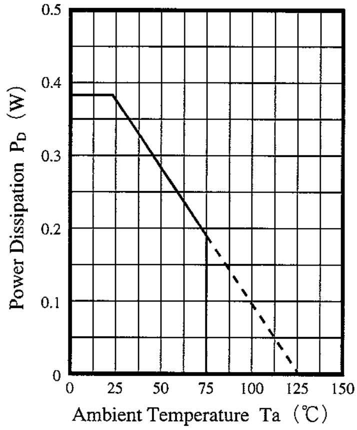


Note) I ···Input O ···Output

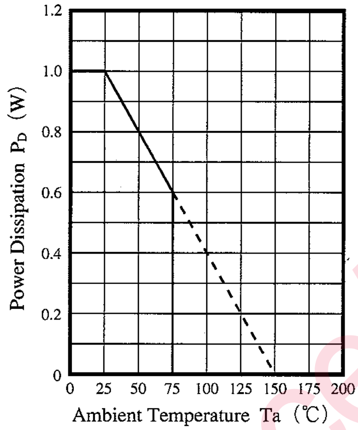
Others

■ Characteristics Curve

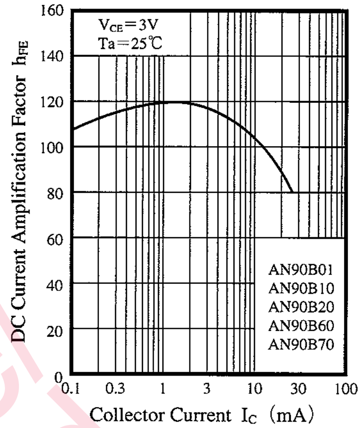
P_D — Ta (SO—16D)



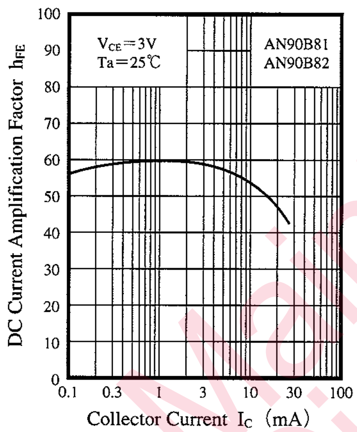
P_D — Ta (18—DIL)



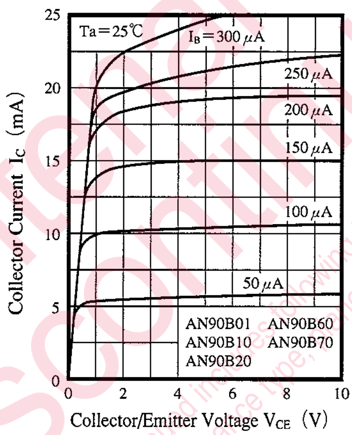
h_{FE} — I_C



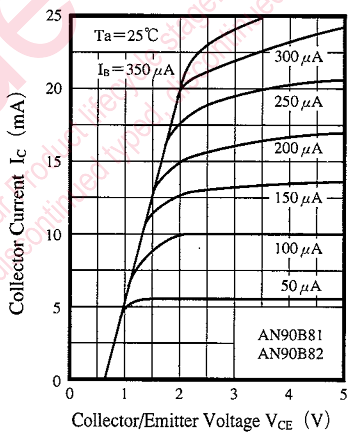
h_{FE} — I_C



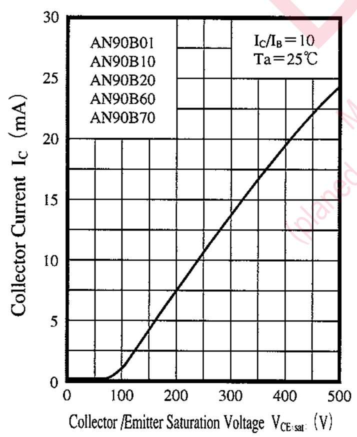
I_C — V_{CE}



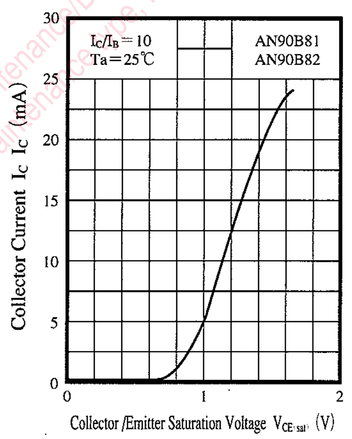
I_C — V_{CE}



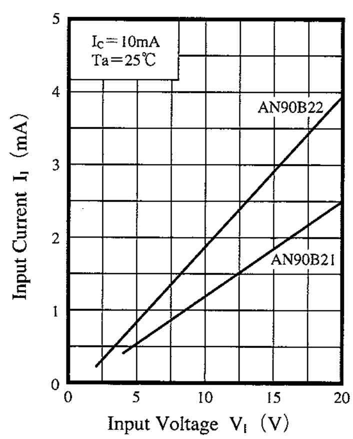
I_C — $V_{CE(sat)}$



I_C — $V_{CE(sat)}$



I_I — V_I



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