



Card Code	Part No 37----	Cplg Network		Circuit Used as	Input Levels		In $\emptyset$ Output		Out $\emptyset$ Output		Ma. Output		musec Block Delay			
		In $\emptyset$	Out $\emptyset$		Min.	Max.	Min.	Max.	Min.	Max.	In $\emptyset$	Out $\emptyset$	Turn On	Turn Off		
DAZW	1280	Yes	Yes	+A	-O	+0.4	See driver for max. Output Levels	-5.6	-4.9	-5.6	-4.6	Min.	5.62	5.98	4	3
DAZU	1281	No	Yes	+AO	-OA	-0.4		-6.4	-6.6	-6.4	-6.6	Nom.	6.25	7.22	14	11
				+TA	-TO							Max.	6.87	8.46	23	21

### Diffused Junction Two-Way AND, Type A

The two-way N-type logic block is an AND circuit to positive logic and an OR circuit to negative logic. As an AND circuit, all inputs must be positive to obtain a positive in-phase output. As an OR circuit, any negative input produces a negative in-phase output.

The AND circuit logic block shows that the coincidence of two +N inputs produces a +P in-phase output and a -P out-of-phase output.

#### Circuit Description

This circuit utilizes two transistors (T5 and T6) in an AND configuration similar to diode circuitry (the base-emitter of each transistor is an NP diode with the P region commoned and returned to a positive, 6v, supply). The emitter output of this AND circuit drives into a ground-base amplifier T4 which is referenced to ground. Thus, T4 is forward-biased only when its emitter is above ground. Because the transistors used have a forward emitter-to-base drop of 0.2v, any -N input will pull the emitter line below ground and reverse bias T4, as shown. In this state, output B is at a -P level of -6.5v because of divider current through its coupling network, and output A is at

a +P level of -5.1v because of current flow (7.2ma) out of its coupling network through T5 and T6 to +6v.

When all inputs are positive, the emitter of T4 attempts to rise above ground, but in so doing it becomes forward-biased and clamps to its base potential. In this state all input transistors are cut off so that output A falls to a -P level and output B rises to a +P level because T4 is conducting. The peaking coils compensate for output capacitance, so that optimum square-wave response is realized. The 82 ohm base resistor is an oscillation suppressor which is necessary because of the inductive coupling networks used. The type B block is the preferred circuit for many applications because it provides a better input current source (4.53K to +30v) than the type A (909 ohms to +6v).

#### Application

For some applications, the circuit driven by this logic block requires a coupling network other than the 243 ohm and 2.43K resistors shown. In such cases cap code ZU is used (see chart). This circuit is also combined with an OR circuit to make up a trigger, and with other AND circuit blocks to obtain NOR functions.