

Am2913

Priority Interrupt Expander

Am2913

DISTINCTIVE CHARACTERISTICS

- Encodes eight lines to three-line binary
- Expands use of Am2914
- Cascadable
- Similar in function to Am54LS/74LS/25LS148/2513
- Gated three-state output
- Advanced Low-Power Schottky processing

GENERAL DESCRIPTION

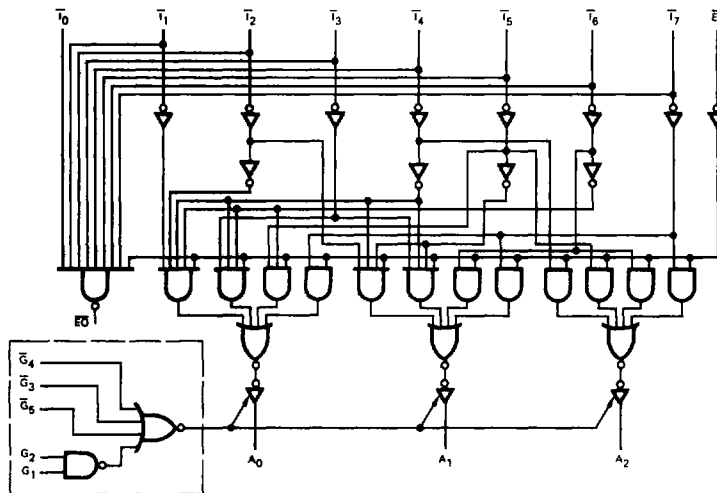
The Low-Power Schottky Priority Interrupt Expander is an extension of the Am2900 series of Bipolar Processor family and is used to expand and prioritize the output of the Am2914 Priority Interrupt circuit. Affording an increase of vectored priority interrupt in groups of eight, this unit accepts active LOW inputs and produces a three-state active HIGH output prioritized from active \bar{I}_7 to \bar{I}_0 . The

output is gated by five control signals, three active LOW and two active HIGH. Also provided is a cascade input (\bar{EI}) and Enable Output ($E\bar{O}$).

One Am2913 will accept and encode group signal lines from up to 8 Am2914's (64 levels of interrupt). Additional Am2913's may be used to encode more interrupt levels.

5

BLOCK DIAGRAM

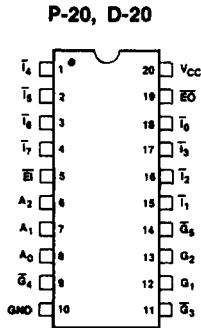


BD001700

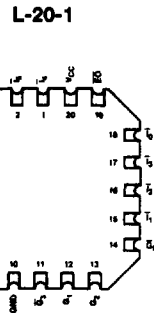
RELATED PRODUCTS

Part No.	Description
Am2914	Vectored Priority Interrupt Controller
Am25LS2513	8 to 3 Line Priority Encoder

CONNECTION DIAGRAM Top View



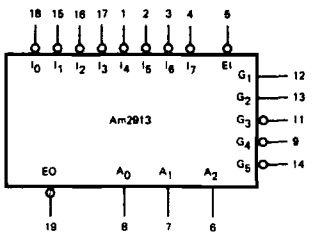
CD002030



CD002020

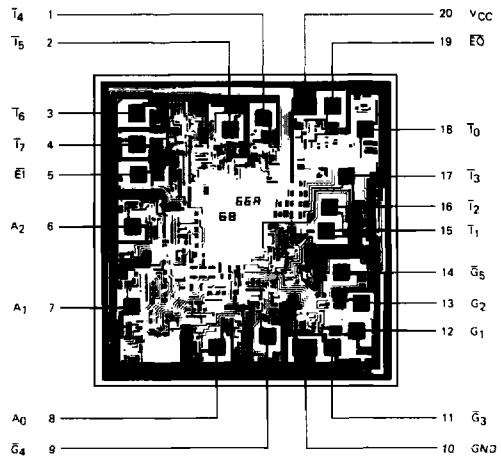
F-20 pin configuration identical to D-20, P-20.
Note: Pin 1 is marked for orientation

LOGIC SYMBOL



LS000760

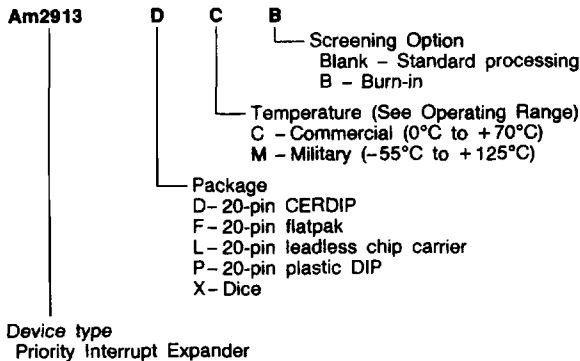
METALLIZATION AND PAD LAYOUT



DIE SIZE 0.082" x 0.085"

ORDERING INFORMATION

AMD products are available in several packages and operating ranges. The order number is formed by a combination of the following: Device number, speed option (if applicable), package type, operating range and screening option (if desired).



Valid Combinations	
Am2913	PC DC, DCB, DM, DMB FM, FMB LC, LCB, LM, LMB XC, XM

Valid Combinations
Consult the AMD sales office in your area to determine if a device is currently available in the combination you wish.

PIN DESCRIPTION

Pin No.	Name	I/O	Description
8, 7, 6	A0, A1, A2	O	Three-state, active high encoder outputs.
5	EI	I	Enable input provided to allow cascaded operation.
19	EO	O	Enable output provided to enable the next lower order priority chip.
12, 13	G1, G2	O	Active high three-state output controls.
11, 9, 14	G3, G4, G5	O	Active low three-state output controls.
	I0-7	I	Active low encoder inputs.

TRUTH TABLE

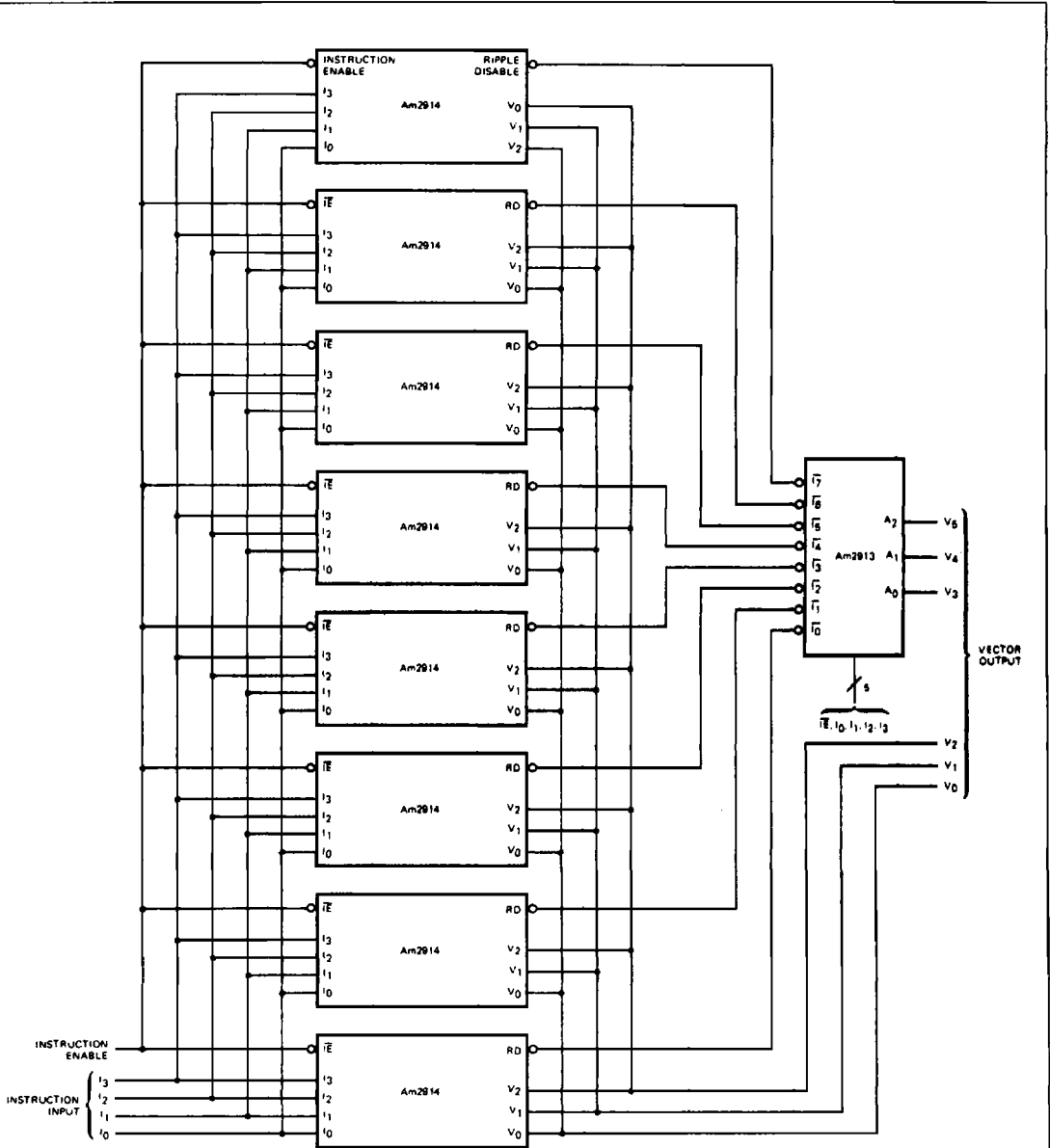
Inputs								Outputs				
EI	I0	I1	I2	I3	I4	I5	I6	I7	A0	A1	A2	EO
H	X	X	X	X	X	X	X	X	L	L	L	H
L	H	H	H	H	H	H	H	H	L	L	L	L
L	X	X	X	X	X	X	X	L	H	H	H	H
L	X	X	X	X	X	L	H	H	L	H	H	H
L	X	X	X	X	L	H	H	H	H	L	H	H
L	X	X	X	L	H	H	H	H	H	H	L	H
L	X	X	L	H	H	H	H	H	L	H	L	H
L	X	L	H	H	H	H	H	H	H	L	L	H
L	L	H	H	H	H	H	H	H	L	L	L	H

G1	G2	G3	G4	G5	A0	A1	A2	
H	H	L	L	L	Enabled	Z	Z	Z
L	X	X	X	X	Z	Z	Z	
X	L	X	X	X	Z	Z	Z	
X	X	H	X	X	Z	Z	Z	
X	X	X	H	X	Z	Z	Z	
X	X	X	X	H	Z	Z	Z	

Z = HIGH Impedance

H = HIGH Voltage Level
 L = LOW Voltage Level
 X = Don't Care
 For G1 = H, G2 = H, G3 = L, G4 = L, G5 = L

5



AF001300

Shown above is the connection of the instruction lines and vector output lines in a 64-input priority interrupt system. The Am2913 is used to encode the most significant bits associated with the vector output.

ABSOLUTE MAXIMUM RATINGS

Storage Temperature	-65°C to +150°C
(Ambient) Temperature Under Bias	-55°C to +125°C
Supply Voltage to Ground Potential Continuous	-0.5V to +7.0V
DC Voltage Applied to Outputs For High Output State	-0.5V to +V _{CC} max
DC Input Voltage	-0.5V to +7.0V
DC Output Current, Into Outputs	30mA
DC Input Current	-30mA to +5.0mA

Stresses above those listed under **ABSOLUTE MAXIMUM RATINGS** may cause permanent device failure. Functionality at or above these limits is not implied. Exposure to absolute maximum ratings for extended periods may affect device reliability.

OPERATING RANGES

Commercial (C) Devices	
Temperature	0°C to +70°C
Supply Voltage	+4.75V to +5.25V
Military (M) Devices	
Temperature	-55°C to +125°C
Supply Voltage	+4.5V to +5.5V

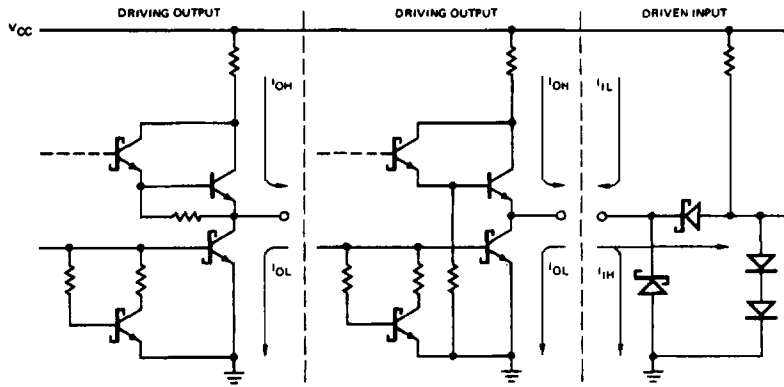
Operating ranges define those limits over which the functionality of the device is guaranteed.

DC CHARACTERISTICS over operating range unless otherwise specified

Parameters	Description	Test Conditions (Note 2)	Min	Typ (Note 1)	Max	Units	
V _{OH}	Output HIGH Voltage	V _{CC} = MIN V _{IN} = V _{IH} or V _{IL}	MIL, I _{OH} = -1.0mA	2.4	3.4	Volts	
			COM'L, I _{OH} = -2.6mA	2.4	3.2		
			E _O , I _{OH} = -440μA	MIL	2.5		3.4
				COM'L	2.7		3.4
V _{OL}	Output LOW Voltage	V _{CC} = MIN V _{IN} = V _{IH} or V _{IL}	I _{OL} = 4.0mA		0.4	Volts	
			I _{OL} = 8.0mA		0.45		
			I _{OL} = 12mA(A _n Outputs)		0.5		
V _{IH}	Input HIGH Level	Guaranteed input logical HIGH Voltage for all inputs	2.0			Volts	
V _{IL}	Input LOW Level	Guaranteed input logical LOW voltage for all inputs	MIL		0.7	Volts	
			COM'L		0.8		
V _I	Input Clamp Voltage	V _{CC} = MIN, I _{IN} = -18mA			-1.5	Volts	
I _{IL}	Input LOW Current	V _{CC} = MAX V _{IN} = 0.4V	E _I , G ₁ , G ₂ , G ₃ , G ₄ , G ₅ , I ₀		0.4	mA	
			All others		0.8		
I _{IH}	Input HIGH Current	V _{CC} = MAX V _{IN} = 2.7V	E _I , G ₁ , G ₂ , G ₃ , G ₄ , G ₅ , I ₀		20	μA	
			All others		40		
I _I	Input HIGH Current	V _{CC} = MAX V _{IN} = 7.0V	E _I , G ₁ , G ₂ , G ₃ , G ₄ , G ₅ , I ₀		0.1	mA	
			All others		0.2		
I _O	Off-State (High-Impedance) Output Current	V _{CC} = MAX	V _O = 0.4V		-20	μA	
			V _O = 2.4V		20		
I _{SC}	Output Short Circuit Current (Note 3)	V _{CC} = MAX	-15		-85	mA	
I _{CC}	Power Supply Current (Note 4)	V _{CC} = MAX		15	24	mA	

- Notes: 1. Typical limits are at V_{CC} = 5.0V, 25°C ambient and maximum loading.
 2. For conditions shown as MIN or MAX, use the appropriate value specified under Operating Ranges for the applicable device type.
 3. Not more than one output should be shorted at a time. Duration of the short circuit test should not exceed one second.
 4. All inputs and outputs open.

LOW-POWER SCHOTTKY INPUT/OUTPUT CURRENT INTERFACE CONDITIONS



IC000710

Note: Actual current flow direction shown.

SWITCHING CHARACTERISTICS ($T_A = +25^\circ\text{C}$, $V_{CC} = 5.0\text{V}$)

Parameters	Description	Test Conditions	Min	Typ	Max	Units
t_{PLH}	\bar{I}_i to A_n (In-phase)	$C_L = 15\text{ pF}$ $R_L = 2.0\text{ k}\Omega$		17	25	ns
t_{PHL}				17	25	
t_{PLH}	\bar{I}_i to A_n (Out-phase)			11	17	ns
t_{PHL}				12	18	
t_{PLH}	\bar{I}_i to $E\bar{O}$			7.0	11	ns
t_{PHL}				24	36	
t_{PLH}	$E\bar{I}$ to $E\bar{O}$			11	17	ns
t_{PHL}				23	34	
t_{PLH}	$E\bar{I}$ to A_n			12	18	ns
t_{PHL}				14	21	
t_{ZH}	G_1 or G_2 to A_n			23	40	ns
t_{ZL}				20	37	
t_{ZH}	$\bar{G}_3, \bar{G}_4, \bar{G}_5$ to A_n			20	30	ns
t_{ZL}				18	27	
t_{HZ}	G_1 or G_2 to A_n	$C_L = 5.0\text{ pF}$ $R_L = 2.0\text{ k}\Omega$		17	27	ns
t_{LZ}				19	28	
t_{HZ}	$\bar{G}_3, \bar{G}_4, \bar{G}_5$ to A_n			16	24	ns
t_{LZ}				18	27	

SWITCHING CHARACTERISTICS over operating range unless otherwise specified*

Parameters	Description	Test Conditions	COMMERCIAL		MILITARY		Units
			Am2913		Am2913		
			Min	Max	Min	Max	
t_{PLH}	\bar{I}_i to A_n (In-phase)	$C_L = 50\text{ pF}$ $R_L = 2.0\text{ k}\Omega$		31		37	ns
t_{PHL}				30		34	
t_{PLH}	\bar{I}_i to A_n (Out-phase)			22		27	ns
t_{PHL}				22		25	
t_{PLH}	\bar{I}_i to $E\bar{O}$			15		18	ns
t_{PHL}				48		60	
t_{PLH}	$E\bar{I}$ to $E\bar{O}$			19		21	ns
t_{PHL}				46		57	
t_{PLH}	$E\bar{I}$ to A_n			22		25	ns
t_{PHL}				27		32	
t_{ZH}	G_1 or G_2 to A_n			42		49	ns
t_{ZL}				43		49	
t_{ZH}	$\bar{G}_3, \bar{G}_4, \bar{G}_5$ to A_n			36		43	ns
t_{ZL}				35		43	
t_{HZ}	G_1 or G_2 to A_n	$C_L = 5.0\text{ pF}$ $R_L = 2.0\text{ k}\Omega$		34		40	ns
t_{LZ}				34		40	
t_{HZ}	$\bar{G}_3, \bar{G}_4, \bar{G}_5$ to A_n			30		35	ns
t_{LZ}				31		35	

*AC performance over the operating temperature range is guaranteed by testing defined in Group A, Subgroup 9.

Note: $i = 0$ to 7
 $n = 0$ to 2