

Am2913

Priority Interrupt Expander

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

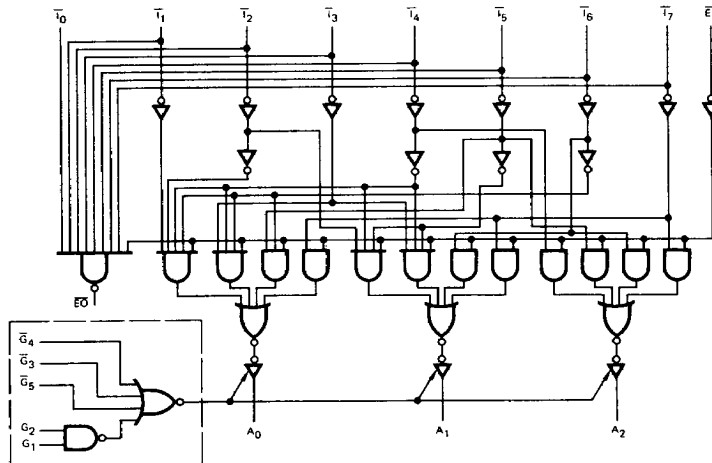
GENERAL DESCRIPTION

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 I_7 to 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 ($\bar{EO}$).

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.

BLOCK DIAGRAM



BD001700

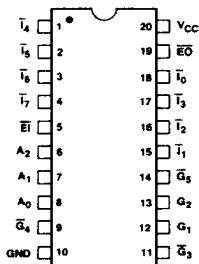
RELATED PRODUCTS

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

03596A

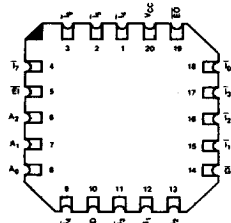
CONNECTION DIAGRAM Top View

P-20, D-20



CD002030

L-20-1

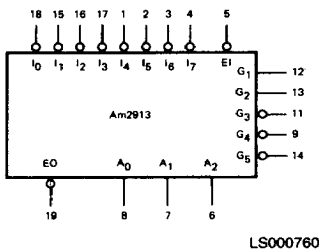


CD002020

F-20 pin configuration identical to D-20, P-20.

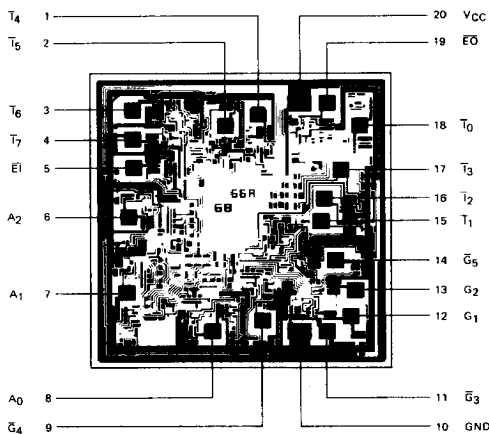
Note: Pin 1 is marked for orientation

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).

Am2913

D

C

B

Screening Option
Blank – Standard processing
B – Burn-in
Temperature (See Operating Range)
C – Commercial (0°C to +70°C)
M – Military (–55°C to +125°C)

Package

D – 20-pin CERDIP

F – 20-pin flatpak

L – 20-pin leadless chip carrier

P – 20-pin plastic DIP

X – Dice

Device type

Priority Interrupt Expander

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	E $\bar{O}$	O	Enable output provided to enable the next lower order priority chip.
12, 13	G ₁ , G ₂	O	Active high three-state output controls.
11, 9, 14	G ₃ , G ₄ , G ₅	O	Active low three-state output controls.
	I ₀₋₇	I	Active low encoder inputs.

TRUTH TABLE

Inputs									Outputs			
Ei	i ₀	i ₁	i ₂	i ₃	i ₄	i ₅	i ₆	i ₇	A ₀	A ₁	A ₂	E _O
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	X	L	H	H	H	L	H	H
L	X	X	X	L	H	H	H	H	L	L	H	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

H = HIGH Voltage Level

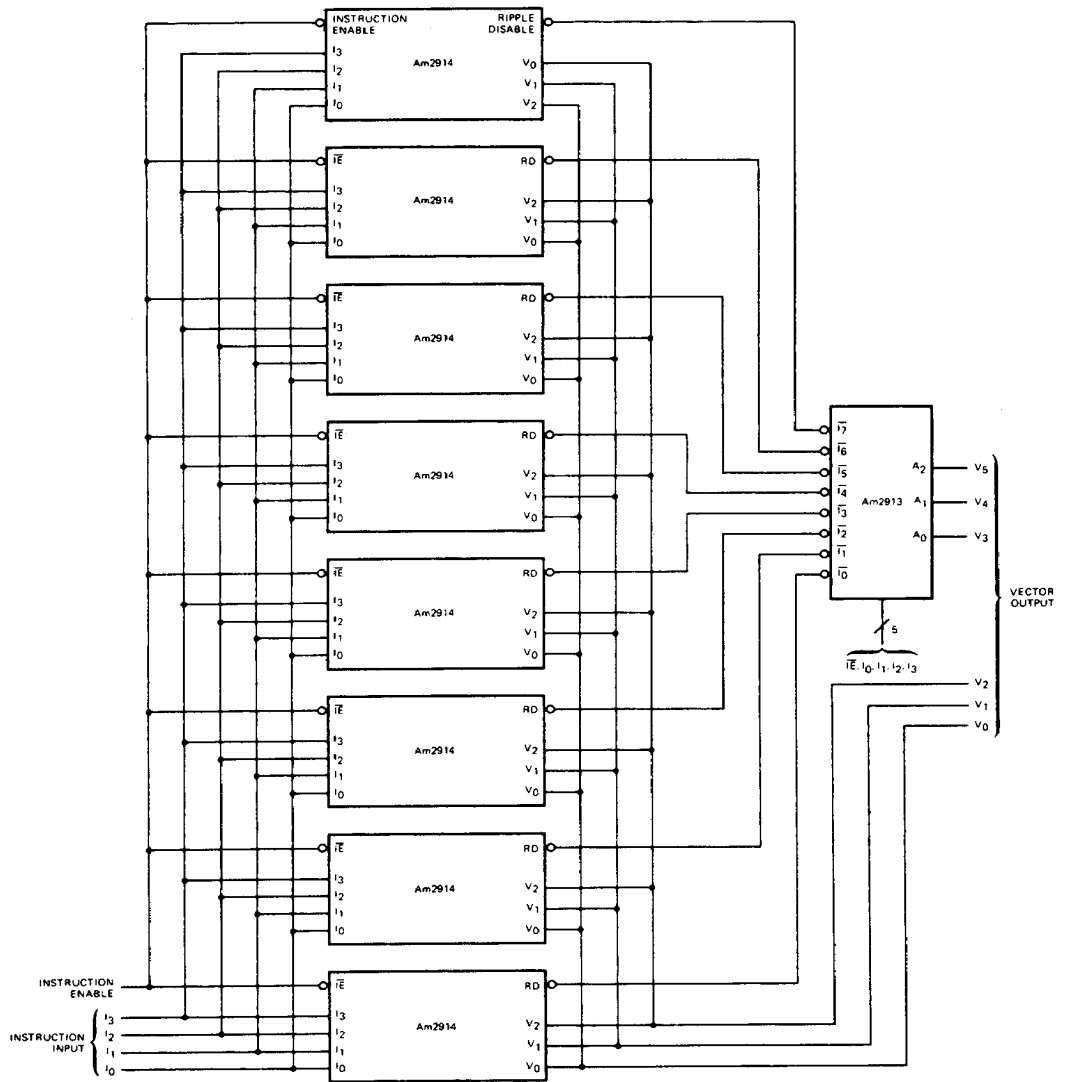
L = LOW Voltage Level

X = Don't Care

For G₁ = H, G₂ = H, G₃ = L, G₄ = L, G₅ = L

G ₁	G ₂	G ₃	G ₄	G ₅	A ₀	A ₁	A ₂
H	H	L	L	L	Enabled		
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



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

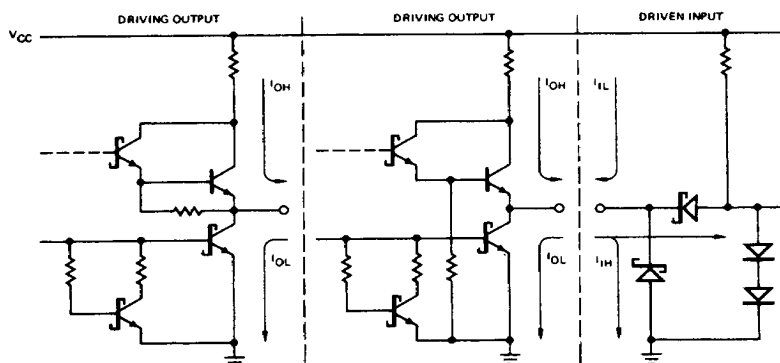
Temperature -55°C to +125°C
 Supply Voltage +4.5V to +5.5V
Operating ranges define those limits over which the functionality of the device is guaranteed.

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 _O			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 _O			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 _O			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}	$\bar{I}_i$ to A_n (Out-phase)			17	25	
t_{PLH}	$\bar{I}_i$ to A_n (Out-phase)			11	17	ns
t_{PHL}	$\bar{I}_i$ to $\bar{E}\bar{O}$			12	18	
t_{PLH}	$\bar{I}_i$ to $\bar{E}\bar{O}$			7.0	11	ns
t_{PHL}	$\bar{E}\bar{I}$ to $\bar{E}\bar{O}$			24	36	
t_{PLH}	$\bar{E}\bar{I}$ to $\bar{E}\bar{O}$			11	17	ns
t_{PHL}	$\bar{E}\bar{I}$ to A_n			23	34	
t_{PLH}	$\bar{E}\bar{I}$ to A_n			12	18	ns
t_{PHL}	$\bar{E}\bar{I}$ to A_n			14	21	
t_{ZH}	G_1 or G_2 to A_n	$C_L = 5.0\text{ pF}$ $R_L = 2.0\text{ k}\Omega$		23	40	ns
t_{ZL}	$\bar{G}_3, \bar{G}_4, \bar{G}_5$ to A_n			20	37	
t_{ZH}	$\bar{G}_3, \bar{G}_4, \bar{G}_5$ to A_n			20	30	ns
t_{ZL}	$\bar{G}_3, \bar{G}_4, \bar{G}_5$ to A_n			18	27	
t_{HZ}	G_1 or G_2 to A_n			17	27	ns
t_{LZ}	$\bar{G}_3, \bar{G}_4, \bar{G}_5$ to A_n			19	28	
t_{HZ}	$\bar{G}_3, \bar{G}_4, \bar{G}_5$ to A_n			16	24	ns
t_{LZ}	$\bar{G}_3, \bar{G}_4, \bar{G}_5$ to A_n			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}	I _i to A _n (In-phase)	C _L = 50 pF R _L = 2.0 kΩ		31		37	ns
t _{PHL}				30		34	
t _{PLH}	I _i to A _n (Out-phase)			22		27	ns
t _{PHL}				22		25	
t _{PLH}	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	C _L = 5.0 pF R _L = 2.0 kΩ		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			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