

DM5441A/DM7441A BCD to Decimal Decoders/Drivers

General Description

The DM5441A/DM7441A is a BCD-to-decimal decoder designed to drive gas-filled NIXIE tubes. The device is also capable of driving other types of low-current lamps and relays.

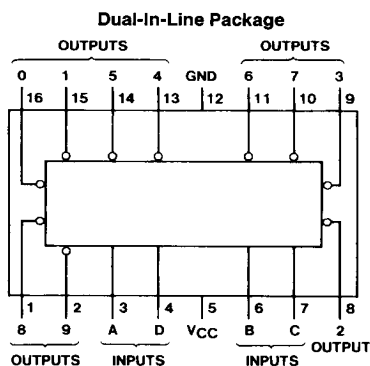
An over-range decoding feature provides that if binary numbers between 10 and 15 are applied to the input, the least significant bit (0-5) will be decoded on the output.

Input clamp diodes are also provided to clamp negative-voltage transitions in order to minimize transmission-line effects.

Features

- Drive cold-cathode, numeric indicator tubes directly
- Fully decoded inputs
- Low leakage current 1.8 μA @ 50V
- Low power dissipation 105 mW typical

Connection Diagram



Order Number DM5441AJ or DM7441AN
See NS Package Number J16A or N16A

Function Table

5441A/7441A				
Inputs				Output On*
D	C	B	A	
L	L	L	L	0
L	L	L	H	1
L	L	H	L	2
L	L	H	H	3
L	H	L	L	4
L	H	L	H	5
L	H	H	L	6
L	H	H	H	7
H	L	L	L	8
H	L	L	H	9
(Over Range)				
H	L	H	L	0
H	L	H	H	1
H	H	L	L	2
H	H	L	H	3
H	H	H	L	4
H	H	H	H	5

H = High Level, L = Low Level

*All other outputs are off

Absolute Maximum Ratings (Note)

Specifications for Military/Aerospace products are not contained in this datasheet. Refer to the associated reliability electrical test specifications document.

Supply Voltage	7V
Input Voltage	5.5V
Operating Free Air Temperature Range	
DM54	-55°C to +125°C
DM74	0°C to +70°C
Storage Temperature Range	-65°C to +150°C

Note: The "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. The device should not be operated at these limits. The parametric values defined in the "Electrical Characteristics" table are not guaranteed at the absolute maximum ratings. The "Recommended Operating Conditions" table will define the conditions for actual device operation.

Recommended Operating Conditions

Symbol	Parameter	DM5441A			DM7441A			Units
		Min	Nom	Max	Min	Nom	Max	
V _{CC}	Supply Voltage	4.5	5	5.5	4.75	5	5.25	V
V _{IH}	High Level Input Voltage	2			2			V
V _{IL}	Low Level Input Voltage			0.8			0.8	V
I _{OL}	Low Level Output Current			7			7	mA
T _A	Free Air Operating Temperature	-55		125	0		70	°C

Electrical Characteristics over recommended operating free air temperature range (unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ (Note 1)	Max	Units
V _{OH}	High Level Output Voltage	V _{CC} = Min, I _{OH} = 1 mA V _{IL} = Max, V _{IH} = Min	70			V
I _{OH}	Off-State Reverse Current	V _{CC} = Min V _O = 50V T _A = 125°C			60	μA
		T _A = 70°C			40	
		T _A = -55 to 70°C			1.8	
V _{OL}	Low Level Output Voltage	V _{CC} = Min I _{OL} = Max V _{IL} = Max V _{IH} = Min T _A = -55 to 70°C			2.5	V
		T _A = 125°C			3	
I _I	Input Current @ Max Input Voltage	V _{CC} = Max, V _I = 5.5V			1	mA
I _{IH}	High Level Input Current	V _{CC} = Max, V _I = 2.4V			40	μA
I _{IL}	Low Level Input Current	V _{CC} = Max, V _I = 0.4V			-1.6	mA
I _{CC}	Supply Current	V _{CC} = Max (Note 2)		21	36	mA

Note 1: All typicals are at V_{CC} = 5V, T_A = 25°C.

Note 2: I_{CC} is measured with all outputs open and all inputs grounded.

Logic Diagram

