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MOTOROLA

MCT1413, B

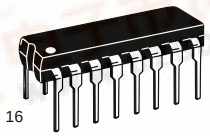
High Voltage, High Current Darlington Transistor Array

PERIPHERAL DRIVER ARRAY

SEMICONDUCTOR TECHNICAL DATA

The seven NPN Darlington connected transistors in this array are well suited for driving lamps, relays, or printer hammers in a variety of industrial and consumer applications. Their high breakdown voltage and internal suppression diodes insure freedom from problems associated with inductive loads. Peak inrush currents to 600 mA permit them to drive incandescent lamps.

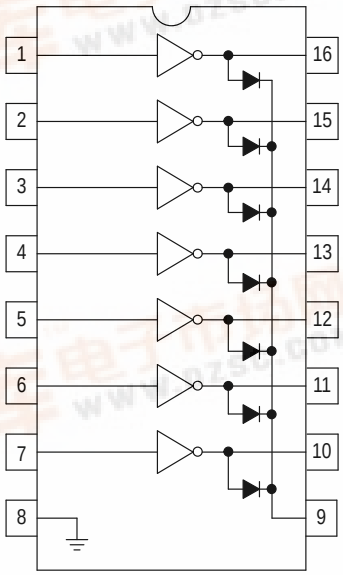
The MCT1413, B with a 2.7 kΩ series input resistor is well suited for systems utilizing a 5.0 V TTL or CMOS Logic.



P SUFFIX
PLASTIC PACKAGE
CASE 648D

This MCT–prefixed device is intended to be a possible replacement for the similar device with the MC–prefix. Because the MCT device originates from different source material, there may be subtle differences in typical parameter values or characteristic curves. Due to the diversity of potential applications, Motorola can not assure identical performance in all circuits. Motorola recommends that the customer qualify the MCT–prefixed device in each potential application.

PIN CONNECTIONS



MAXIMUM RATINGS (T_A = 25°C and rating apply to any one device in the package unless otherwise noted.)

Rating	Symbol	Value	Unit
Output Voltage	V_O	50	V
Input Voltage	V_I	30	V
Collector Current – Continuous	I_C	500	mA
Base Current – Continuous	I_B	25	mA
Operating Ambient Temperature Range MCT1413 MCT1413B	T_A	 – 20 to + 85 – 40 to + 85	°C
Storage Temperature Range	T_{stg}	– 55 to +150	°C
Junction Temperature	T_J	150	°C
Thermal Resistance – Junction–to–Ambient	θ_{JA}	67	°C/W

CAUTION: These devices do not have internal ESD protection circuitry and are rated as CLASS 1 devices per the ESD test method in Mil–Std–833D. They should be handled using standard ESD prevention methods to avoid damage to the device.

ORDERING INFORMATION

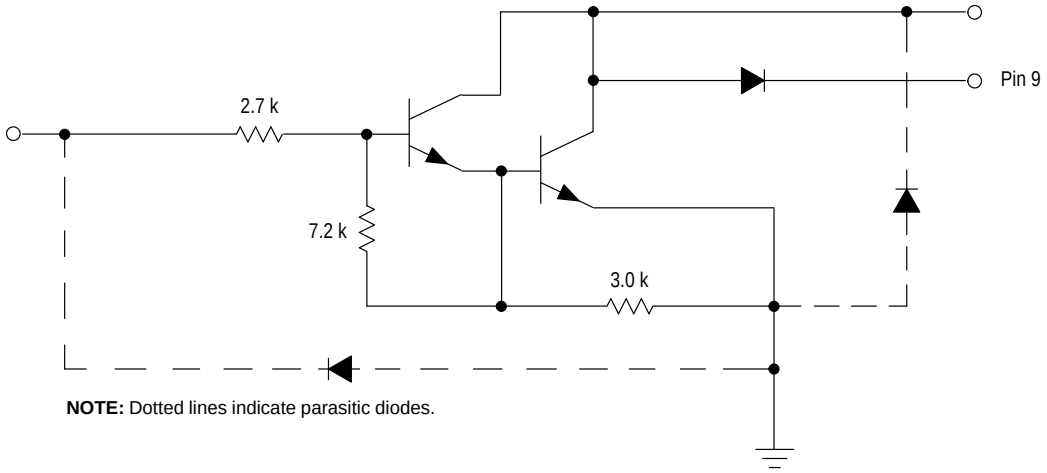
Device	Operating Temperature Range	Package
MCT1413P (ULN2003A)	T_A = – 20° to +85°C	Plastic
MCT1413BP	T_A = – 40° to +85°C	

ELECTRICAL CHARACTERISTICS (T_A = 25°C, unless otherwise noted.)

Characteristic		Symbol	Min	Typ	Max	Unit
Output Leakage Current		I_{CEX}				μA
(V_O = 50 V)	MCT1413, B		–	–	50	
(V_O = 50 V, T_A = + 85°C)	MCT1413, B		–	–	100	
(V_O = 50 V, T_A = – 40°C)	MCT1413B		–	–	100	
Collector–Emitter Saturation Voltage		$V_{CE(sat)}$				V
(I_C = 350 mA, I_B = 500 μA)	MCT1413, B		–	1.1	1.6	
(I_C = 200 mA, I_B = 350 μA)	MCT1413, B		–	0.95	1.3	
(I_C = 100 mA, I_B = 250 μA)	MCT1413, B		–	0.85	1.1	
(I_C = 350 mA, I_B = 500 μA, T_A = + 85°C, – 40°C)	MCT1413B		–	–	1.75	
(I_C = 200 mA, I_B = 350 μA, T_A = + 85°C, – 40°C)	MCT1413B		–	–	1.5	
(I_C = 100 mA, I_B = 250 μA, T_A = + 85°C, – 40°C)	MCT1413B		–	–	1.3	
Input Current – ON Condition		I_{in}				mA
(V_{in} = 3.85 V)	MCT1413, B		–	0.93	1.35	
Output Voltage – ON Condition		V_{out}				V
(V_{in} = 2.4 V, I_C = 200 mA)	MCT1413, B		–	–	2.0	
(V_{in} = 2.7 V, I_C = 250 mA)	MCT1413, B		–	–	2.0	
(V_{in} = 3.0 V, I_C = 300 mA)	MCT1413, B		–	–	2.0	
(V_{in} = 2.7 V, I_C = 250 mA, T_A = + 85°C, – 40°C)	MCT1413B		–	–	2.0	
(V_{in} = 3.0 V, I_C = 300 mA, T_A = + 85°C, – 40°C)	MCT1413B		–	–	2.0	
Output Current – OFF Condition		I_{out}				μA
(I_{in} = 50 μA, V_{out} = 5.0 V)	MCT1413, B		–	–	100	
(I_{in} = 50 μA, V_{out} = 5.0 V, T_A = + 85°C)	MCT1413, B		–	–	500	
(I_{in} = 50 μA, V_{out} = 5.0 V, T_A = – 40°C)	MCT1413B		–	–	500	
Clamp Diode Leakage Current		I_R				μA
(V_R = 50 V)	MCT1413, B		–	–	50	
(V_R = 50 V, T_A = + 85°C)	MCT1413, B		–	–	100	
(V_R = 50 V, T_A = – 40°C)	MCT1413B		–	–	100	
Clamp Diode Forward Voltage		V_F				V
(I_F = 350 mA)	MCT1413, B		–	1.5	2.0	
(I_F = 350 mA, T_A = + 85°C, – 40°C)	MCT1413B		–	–	2.0	

Figure 1. Representative Schematic Diagram

(1/7 MCT1413, B)

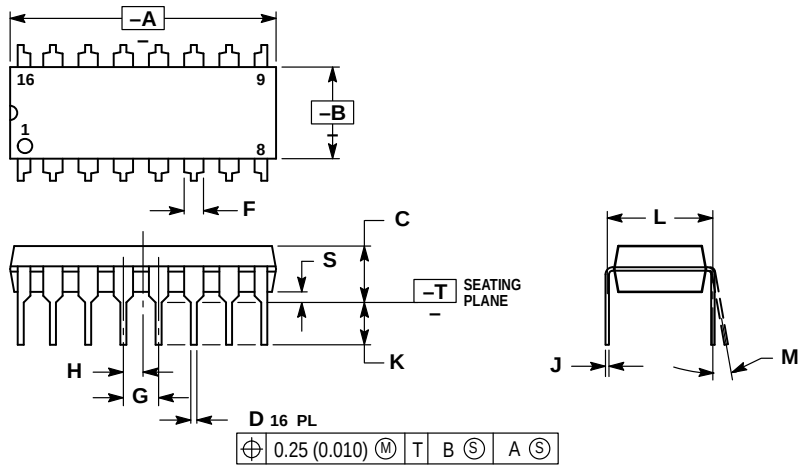


NOTE: Dotted lines indicate parasitic diodes.

This device contains 14 active transistors.

OUTLINE DIMENSIONS

P SUFFIX
PLASTIC PACKAGE
CASE 648D–02



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION L TO CENTER OF LEADS WHEN FORMED PARALLEL.
4. DIMENSIONS A AND B DO NOT INCLUDE MOLD PROTRUSION.
5. MOLD FLASH OR PROTRUSIONS SHALL NOT EXCEED 0.25 (0.010).
6. ROUNDED CORNERS OPTIONAL.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.740	0.760	18.80	19.30
B	0.245	0.260	6.23	6.60
C	0.145	0.175	3.69	4.44
D	0.015	0.021	0.39	0.53
F	0.050	0.070	1.27	1.77
G	0.100 BSC		2.54 BSC	
H	0.050 BSC		1.27 BSC	
J	0.008	0.015	0.21	0.38
K	0.120	0.140	3.05	3.55
L	0.295	0.305	7.50	7.74
M	0°	10°	0°	10°
S	0.015	0.035	0.39	0.88

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