



MOTOROLA

MCT1413, B

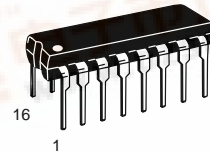
High Voltage, High Current Darlington Transistor Array

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.

PERIPHERAL DRIVER ARRAY

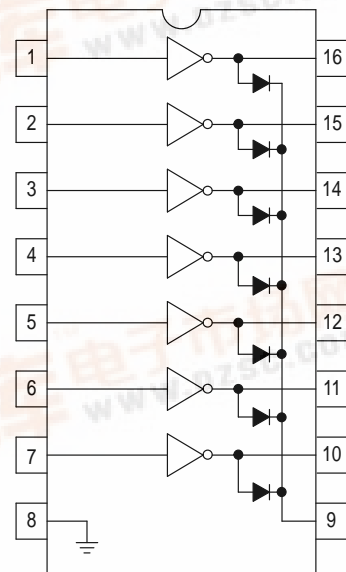
SEMICONDUCTOR TECHNICAL DATA



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 ($T_A = 25^\circ\text{C}$ 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	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	- 55 to +150	$^\circ\text{C}$
Junction Temperature	T_J	150	$^\circ\text{C}$
Thermal Resistance – Junction-to–Ambient	θ_{JA}	67	$^\circ\text{C/W}$

ORDERING INFORMATION

Device	Operating Temperature Range	Package
MCT1413P (ULN2003A)	$T_A = - 20^\circ$ to $+85^\circ\text{C}$	Plastic
MCT1413BP	$T_A = - 40^\circ$ to $+85^\circ\text{C}$	

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–883D. They should be handled using standard ESD prevention methods to avoid damage to the device.



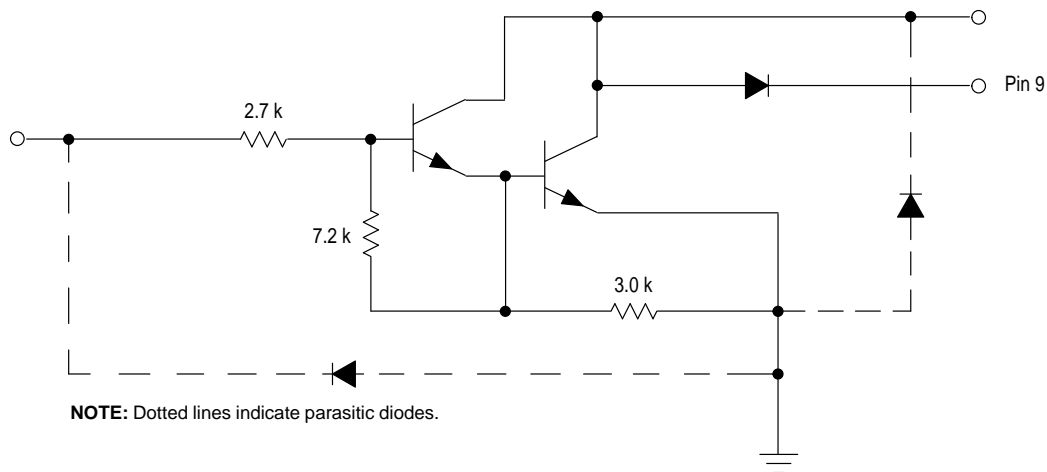
MCT1413, B

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$, unless otherwise noted.)

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

Figure 1. Representative Schematic Diagram

(1/7 MCT1413, B)



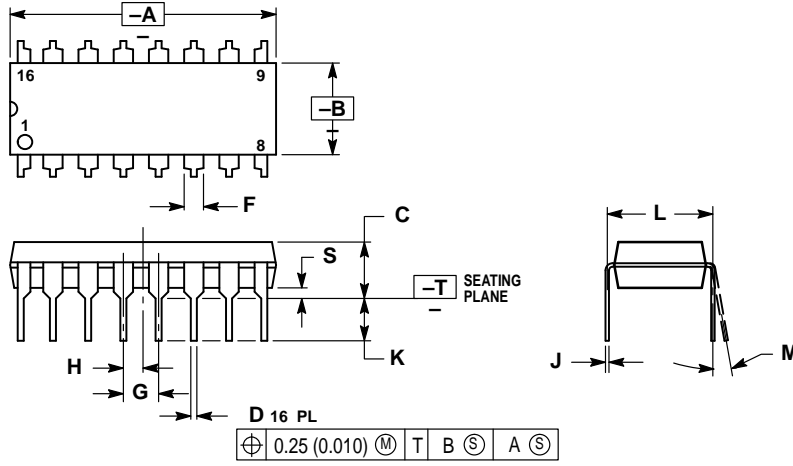
NOTE: Dotted lines indicate parasitic diodes.

This device contains 14 active transistors.

MCT1413, B

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.

DIM	INCHES		MILLIMETERS	
	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

MCT1413, B

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How to reach us:

USA / EUROPE: Motorola Literature Distribution;
P.O. Box 20912; Phoenix, Arizona 85036. 1-800-441-2447

MFAX: RMFAX0@email.sps.mot.com – TOUCHTONE (602) 244-6609
INTERNET: <http://Design-NET.com>

JAPAN: Nippon Motorola Ltd.; Tatsumi-SPD-JLDC, Toshikatsu Otsuki,
6F Seibu-Butsuryu-Center, 3-14-2 Tatsumi Koto-Ku, Tokyo 135, Japan. 03-3521-8315

HONG KONG: Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park,
51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852-26629298



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