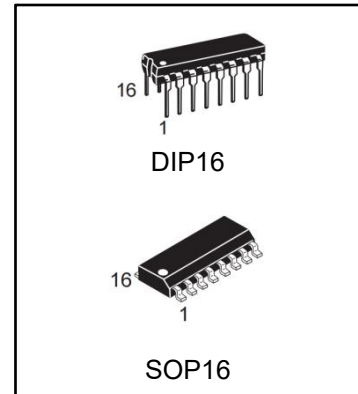


## High Voltage, High Current Darlington Transistor Arrays

### General Description

The seven NPN Darlington connected transistors in these arrays 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 500 mA permit them to drive incandescent lamps.

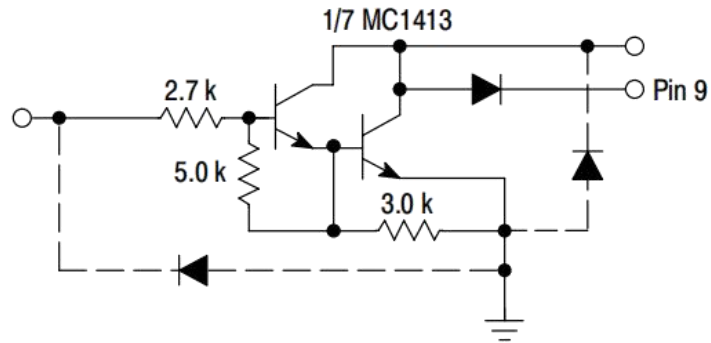
The MC1413, B with a 2.7 k $\Omega$  series input resistor is well suited for systems utilizing a 5.0 V TTL or CMOS Logic.



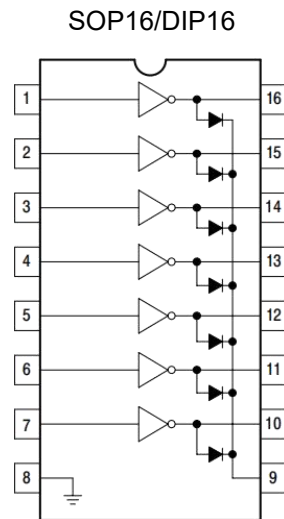
### Ordering Information

DEVICE	Package Type	MARKING	Packing	Packing Qty
MC1413N	DIP16	MC1413	TUBE	1000pcs/Box
MC1413M/TR	SOP16	MC1413	REEL	2500pcs/Reel
MC1413BN	DIP16	MC1413B	TUBE	1000pcs/Box
MC1413BM/TR	SOP16	MC1413B	REEL	2500pcs/Reel

### Representative Schematic Diagram



### Pin Connections



**Maximum Ratings** (TA = 25°C, and rating apply to any one device in the package, unless otherwise noted.)

Rating	Symbol	Value	Unit
Output Voltage	VO	50	V
Input Voltage	VI	30	V
Collector Current – Continuous	IC	500	mA
Base Current – Continuous	IB	25	mA
Operating Ambient Temperature Range MC1413 MC1413B	TA	-20 to +85 -40 to +85	°C
Storage Temperature Range	T <sub>stg</sub>	-55 to +150	°C
Junction Temperature	T <sub>J</sub>	150	°C
Thermal Resistance, Junction-to-Ambient: N Suffix M Suffix	R <sub>θJA</sub>	67 100	°C/W
Thermal Resistance, Junction-to-Case: N Suffix M Suffix	R <sub>θJC</sub>	22 20	°C/W
Electrostatic Discharge Sensitivity (ESD) Human Body Model (HBM) Machine Model (MM) Charged Device Model (CDM)	ESD	2000 400 1500	V

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

**Electrical Characteristics** (TA = 25°C, unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Output Leakage Current (VO = 50 V, TA = +85°C) (VO = 50 V, TA = +25°C)	ICEX	-	-	100 50	μA
Collector-Emitter Saturation Voltage (IC = 350 mA, IB = 500 μA) (IC = 200 mA, IB = 350 μA) (IC = 100 mA, IB = 250 μA)	VCE(sat)	-	1.1 0.95 0.85	1.6 1.3 1.1	V
Input Current – On Condition (VI = 3.85 V)	II(on)	-	0.93	1.35	mA
Input Voltage – On Condition (VCE = 2.0 V, IC = 200 mA) (VCE = 2.0 V, IC = 250 mA) (VCE = 2.0 V, IC = 300 mA)	VI(on)	-	-	2.4 2.7 3.0	V
Input Current – Off Condition (IC = 500 μA, TA = 85°C)	II(off)	50	100	-	μA
DC Current Gain (VCE = 2.0 V, IC = 350 mA)	hFE	1000	-	-	-
Input Capacitance	CI	-	15	30	pF
Turn-On Delay Time (50% EI to 50% EO)	t <sub>on</sub>	-	0.25	1.0	μs
Turn-Off Delay Time (50% EI to 50% EO)	t <sub>off</sub>	-	0.25	1.0	μs
Clamp Diode Leakage Current (VR = 50 V)	IR	-	-	50 100	μA
Clamp Diode Forward Voltage (IF = 350 mA)	VF	-	1.5	2.0	V

Typical Performance Curves TA = 25°C

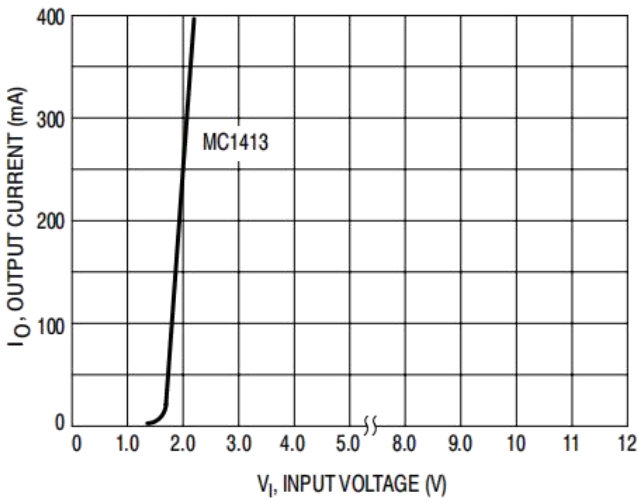


Figure 3. Output Current versus Input Voltage

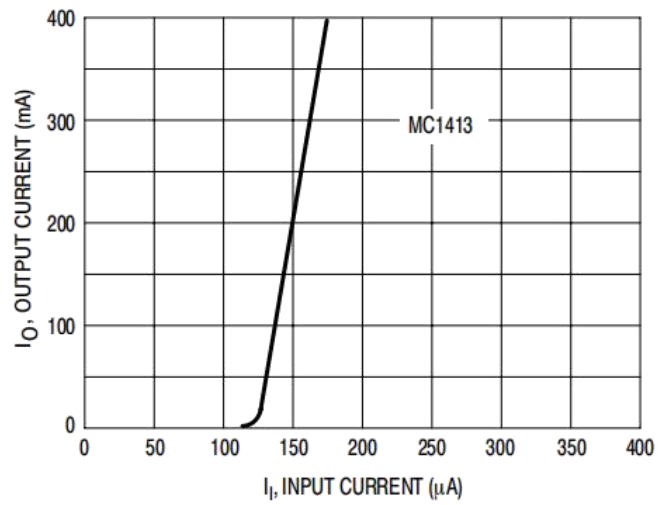


Figure 4. Output Current versus Input Current

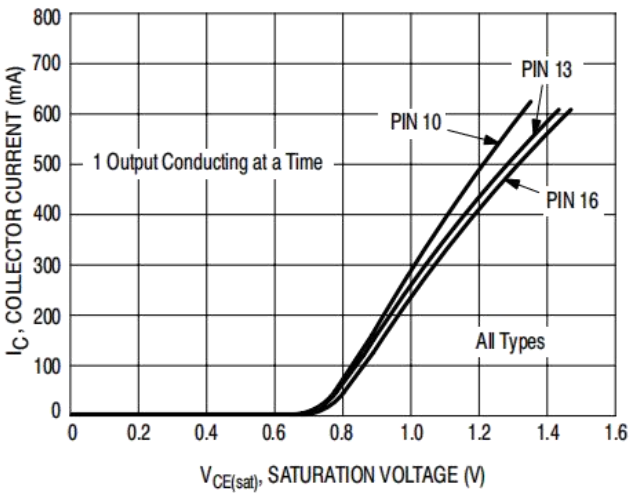


Figure 5. Typical Output Characteristics

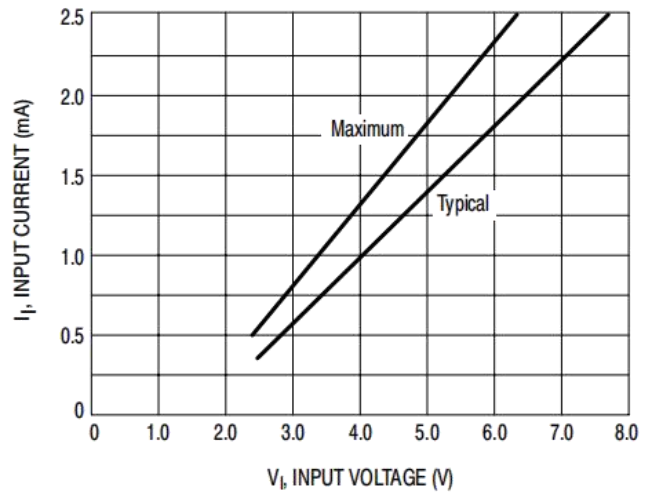


Figure 6. Input Characteristics

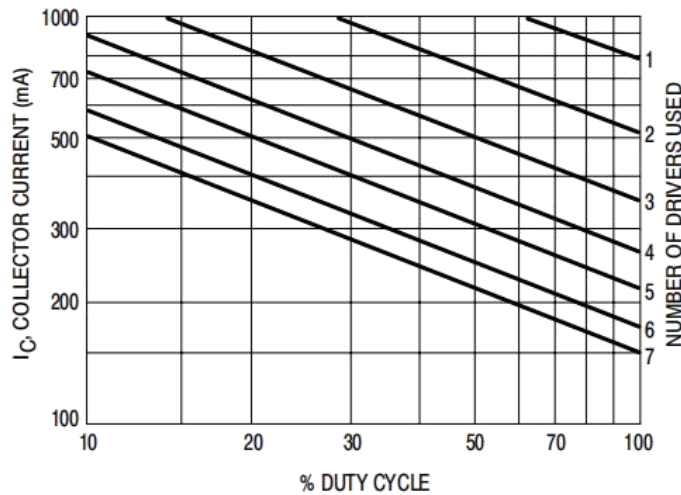
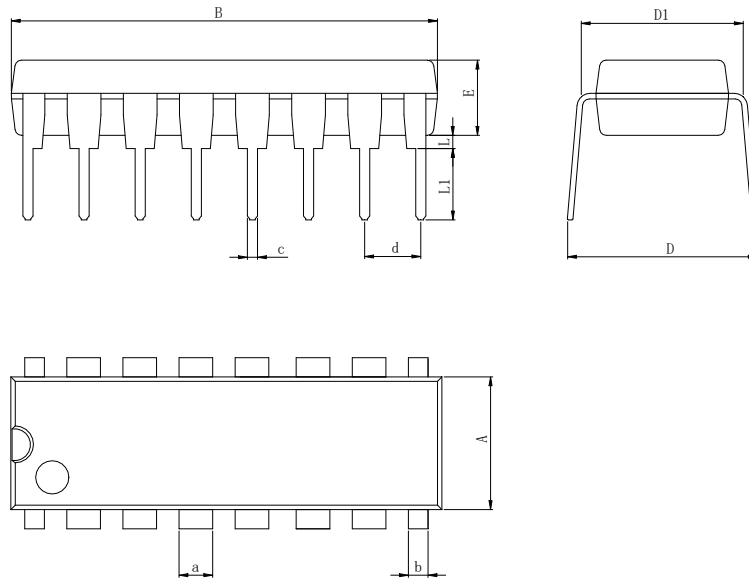


Figure 7. Maximum Collector Current versus Duty Cycle (and Number of Drivers in Use)

## Physical Dimensions

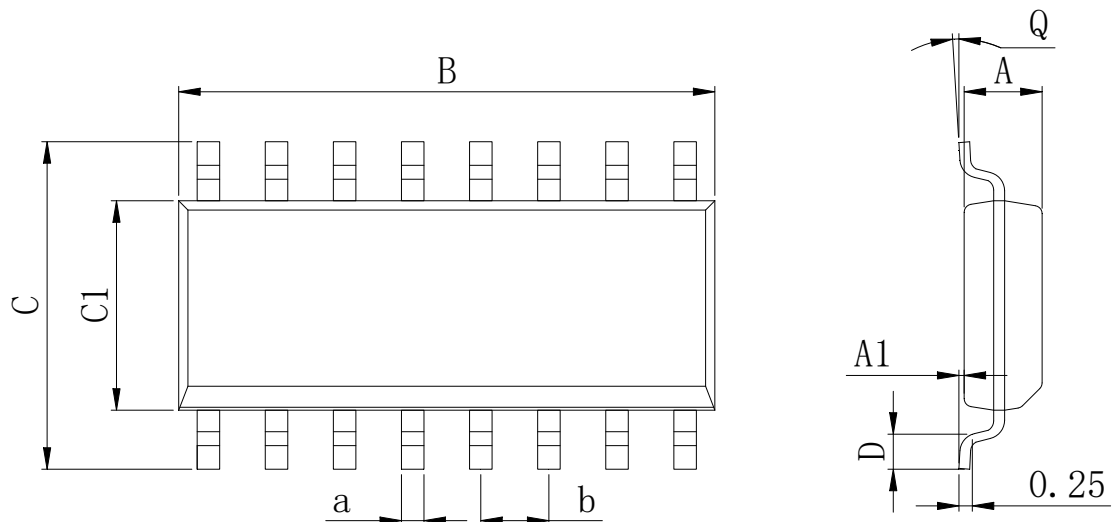
### DIP16



Dimensions In Millimeters(DIP16)

Symbol:	A	B	D	D1	E	L	L1	a	b	c	d
Min:	6.10	18.94	8.40	7.42	3.10	0.50	300	1.50	0.85	0.40	2.54 BSC
Max:	6.68	19.56	9.00	7.82	3.55	0.70	3.60	1.55	0.90	0.50	

### SOP16



Dimensions In Millimeters(SOP16)

Symbol:	A	A1	B	C	C1	D	Q	a	b
Min:	1.35	0.05	9.80	5.80	3.80	0.40	0°	0.35	1.27 BSC
Max:	1.55	0.20	10.0	6.20	4.00	0.80	8°	0.45	

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