MC1413, MC1413B, NCV1413B

High Vol age, High C rren Darling on Transis or Arra s

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 inductivej/F3377C1487sTn vtivrushTD0 8nsups, r1Fure fr TD00 mAc0.3897 Tw[1he seven N, 200(permit)Tjmfr

July, 2006 − Rev. 8
Publication Order Number:
MC1413/D

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 MC1413 MC1413B NCV1413B	T_A	 −20 to +85 −40 to +85 −40 to +125	°C
Storage Temperature Range	T_{stg}	−55 to +150	°C
Junction Temperature	T_J	150	°C
Thermal Resistance, Junction−to−Ambient Case 648, P Suffix Case 751B, D Suffix	$R_{\theta JA}$	 67 100	°C/W
Thermal Resistance, Junction−to−Case Case 648, P Suffix Case 751B, D Suffix	$R_{\theta JC}$	 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 (T_A = 25°C, unless otherwise noted)

Characteristic		Symbol	Min	Typ	Max	Unit
Output Leakage Current		I_{CEX}				μA
(V_O = 50 V, T_A = +85°C)	All Types		−	−	100	
(V_O = 50 V, T_A = +25°C)	All Types		−	−	50	
Collector−Emitter Saturation Voltage		$V_{CE(sat)}$				V
(I_C = 350 mA, I_B = 500 μA)	All Types		−	1.1	1.6	
(I_C = 200 mA, I_B = 350 μA)	All Types		−	0.95	1.3	
(I_C = 100 mA, I_B = 250 μA)	All Types		−	0.85	1.1	
Input Current − On Condition		$I_{I(on)}$				mA
(V_I = 3.85 V)	MC1413, B		−	0.93	1.35	
Input Voltage − On Condition		$V_{I(on)}$				V
(V_{CE} = 2.0 V, I_C = 200 mA)	MC1413, B		−	−	2.4	
(V_{CE} = 2.0 V, I_C = 250 mA)	MC1413, B		−	−	2.7	
(V_{CE} = 2.0 V, I_C = 300 mA)	MC1413, B		−	−	3.0	
Input Current − Off Condition (I_C = 500 μA, T_A = 85°C)	All Types	$I_{I(off)}$	50	100	−	μA
DC Current Gain (V_{CE} = 2.0 V, I_C = 350 mA)		h_{FE}	1000	−	−	−
Input Capacitance		C_I	−	15	30	pF
Turn−On Delay Time (50% E_I to 50% E_O)		t_{on}	−	0.25	1.0	μs
Turn−Off Delay Time (50% E_I to 50% E_O)		t_{off}	−	0.25	1.0	μs
Clamp Diode Leakage Current	T_A = +25°C	I_R	−	−	50	μA
(V_R = 50 V)	T_A = +85°C		−	−	100	
Clamp Diode Forward Voltage (I_F = 350 mA)		V_F	−	1.5	2.0	V

NOTE: NCV1413B T_{low} = −40°C, T_{high} = +125°C. Guaranteed by design. NCV prefix is for automotive and other applications requiring site and change control.

TYPICAL PERFORMANCE CURVES − T_A = 25°C

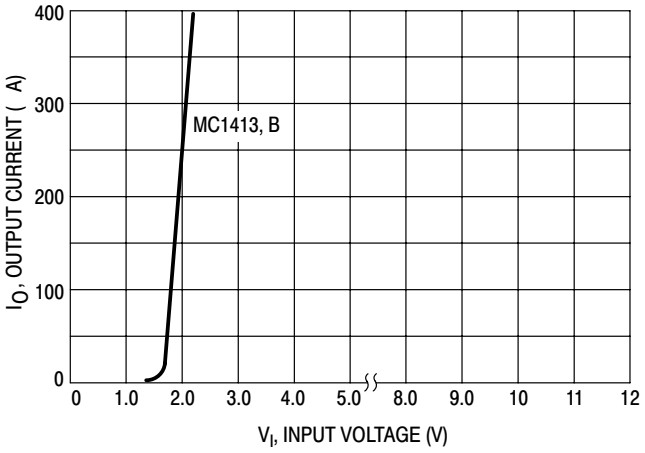


Figure 3. Output Current versus Input Voltage

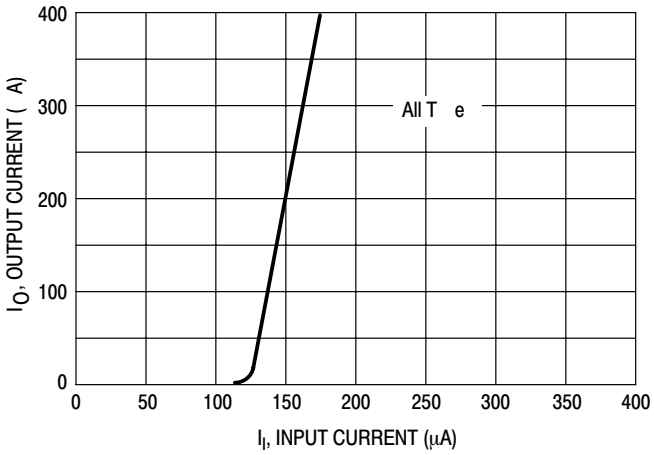


Figure 4. Output Current versus Input Current

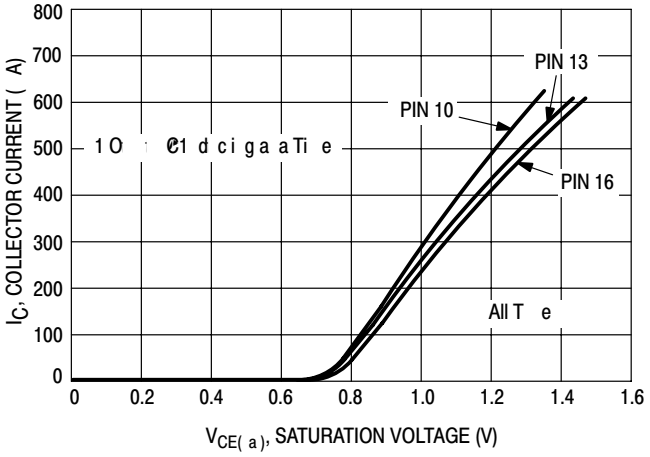


Figure 5. Typical Output Characteristics

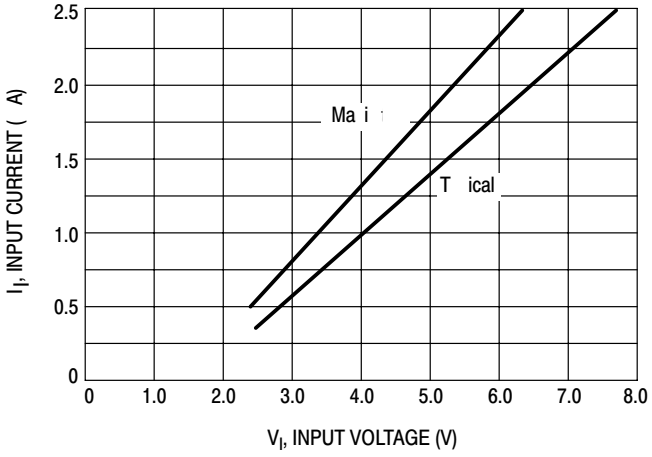


Figure 6. Input Characteristics − MC1413, B

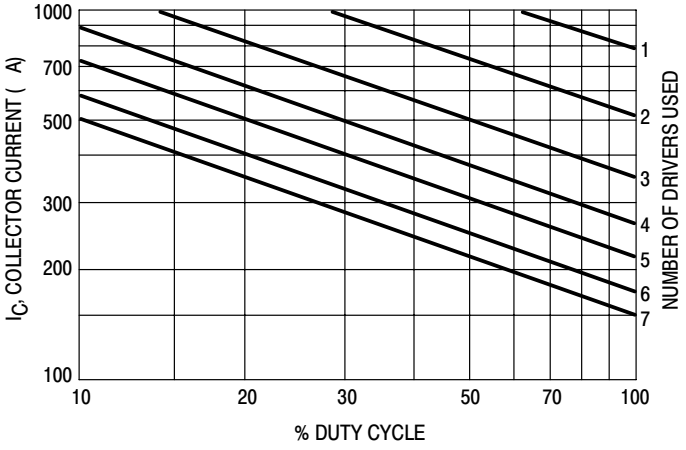
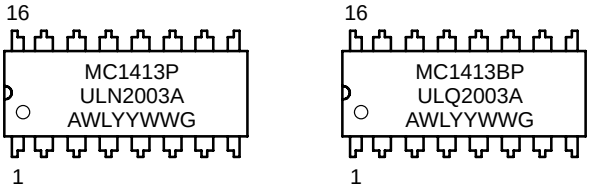
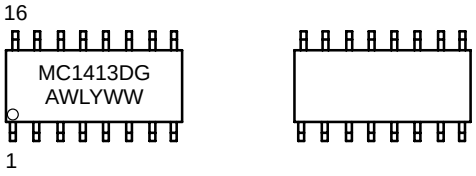


Figure 7. Maximum Collector Current versus Duty Cycle (and Number of Drivers in Use)

MARKING DIAGRAMS

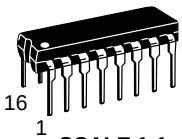
PDIP−16
P SUFFIX
CASE 648



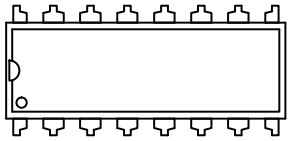


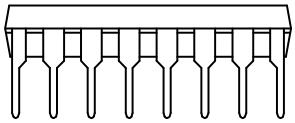
PDIP−16
CASE 648−08
ISSUE V

DATE 22 APR 2015



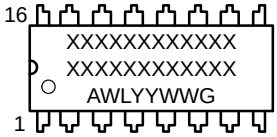
SCALE 1:1





STYLE 1:

GENERIC
MARKING DIAGRAM*



XXXXX	= Specific Device Code
A	= Assembly Location
WL	= Wafer Lot
YY	= Year
WW	= Work Week
G	= Pb−Free Package

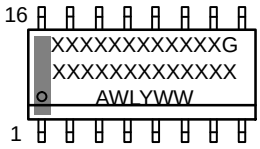
*This information is generic. Please refer to device data sheet for actual part marking. Pb−Free indicator, “G” or microdot “ ▪”, may or may not be present.

SOIC−16 9.90x3.90x1.50 1.27P
CASE 751B
ISSUE L

SOIC−16 9.90x3.90x1.50 1.27P
CASE 751B
ISSUE L

DATE 29 MAY 2024

GENERIC MARKING DIAGRAM*



XXXXX = Specific Device Code
A = Assembly Location
WL = Wafer Lot
Y = Year
WW = Work Week
G = Pb−Free Package

*This information is generic. Please refer to device data sheet for actual part marking. Pb−Free indicator, “G” or microdot “▪”, may or may not be present. Some products may not follow the Generic Marking.

S 1:
1. C C
2. BAS
3.
4. C C
5.
6. BAS
7. C C
8. C C
9. BAS
10.
11. C C
12.
13. BAS
14. C C
15.
16. C C

S 2:
1. CA
2. A
3. C C
4. CA
5. CA
6. C C
7. A
8. CA
9. CA
10. A
11. C C
12. CA
13. CA
14. C C
15. A
16. CA

S 3:
1. C C , #1
2. BAS , #1
3. , #1
4. C C , #1
5. C C , #2
6. BAS , #2
7. , #2
8. C C , #2
9. C C , #3
10. BAS , #3
11. , #3
12. C C , #3
13. C C , #4
14. BAS , #4
15. , #4
16. C C , #4

S 4:
1. C C , #1
2. C C , #1
3. C C , #2
4. C C , #2
5. C C , #3
6. C C , #3
7. C C , #4
8. C C , #4
9. BAS , #4
10. , #4
11. BAS , #3
12. , #3
13. BAS , #2
14. , #2
15. BAS , #1
16. , #1

S 5:
1. A , #1
2. A , #1
3. A , #2
4. A , #2
5. A , #3
6. A , #3
7. A , #4
8. A , #4
9. A , #4
10. S C , #4
11. A , #3
12. S C , #3
13. A , #2
14. S C , #2
15. A , #1
16. S C , #1

S 6:
1. CA
2. CA
3. CA
4. CA
5. CA
6. CA
7. CA
8. CA
9. A
10. A
11. A
12. A
13. A
14. A
15. A
16. A

S 7:
1. S C -C
2. C A ( )
3. C A ( )
4. A -C
5. C A ( )
6. C A ( )
7. C A ( )
8. S C -C
9. S C -C
10. C A ( )
11. C A ( )
12. C A ( )
13. A -C
14. C A ( )
15. C A ( )
16. S C -C

DOCUMENT NUMBER:	**98ASB42566B**	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped “CONTROLLED COPY” in red.	
DESCRIPTION:	**SOIC−16 9.90X3.90X1.50 1.27P**		**PAGE 2 OF 2**