

1. DESCRIPTION

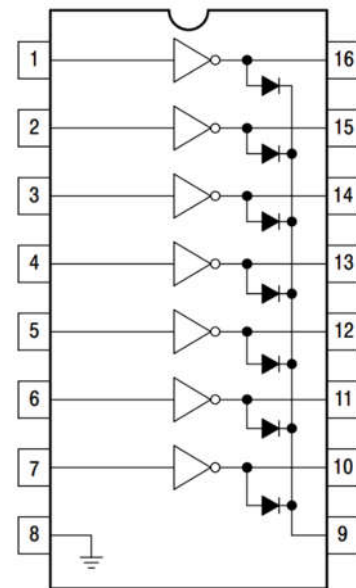
The XL/XD1413 are 7 channels NPN Darlington Transistor Array IC. Their high breakdown voltage and internal suppression diodes insure freedom from problems associated with inductive loads. Peak inrush currents to 500 mA permit them to drive incandescent lamps. So they are ideal for driving lamps, relays, or printer hammers in a variety of industrial and consumer applications etc.

2. FEATURES

- High Voltage: 50V , High Current: 500mA(Max. 1-CH)
- 5.0 V TTL or CMOS Logic input compatible
- Integrated suppression diodes for inductive
- Input pins placed opposite to output pins to simplify layout
- Package type include: SOP16、DIP16

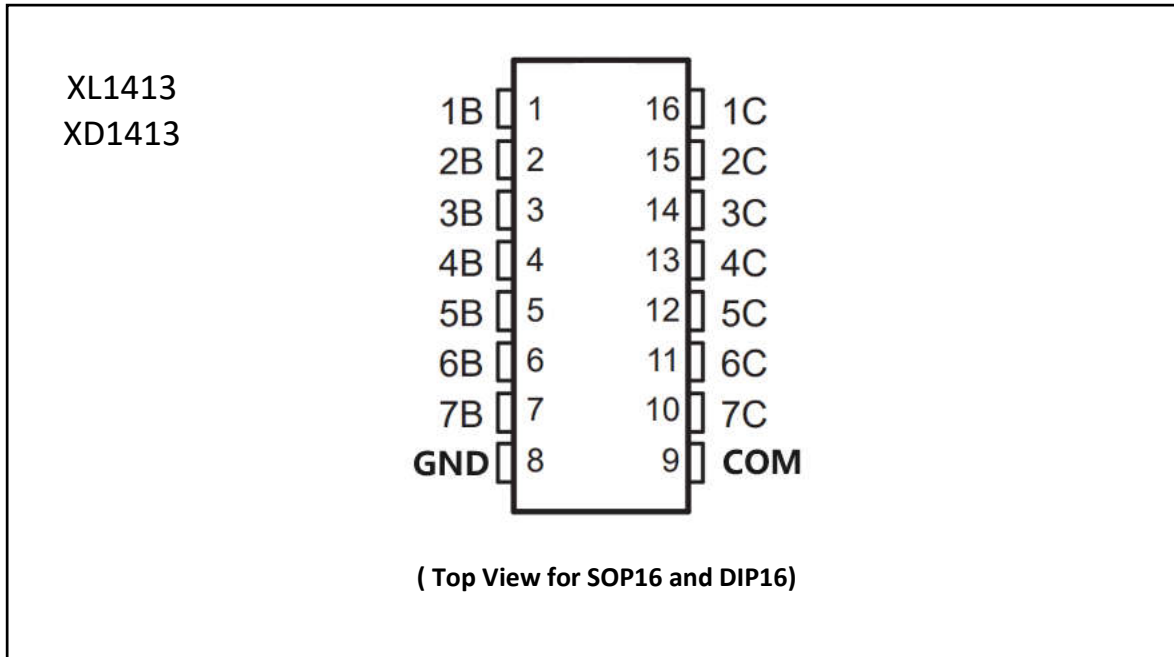
3. APPLICATIONS

- Relay and Inductive Load Driver in Various Telecom, Consumer, and Industrial Applications
- Lamp and LED Displays
- Logic Level Shifter



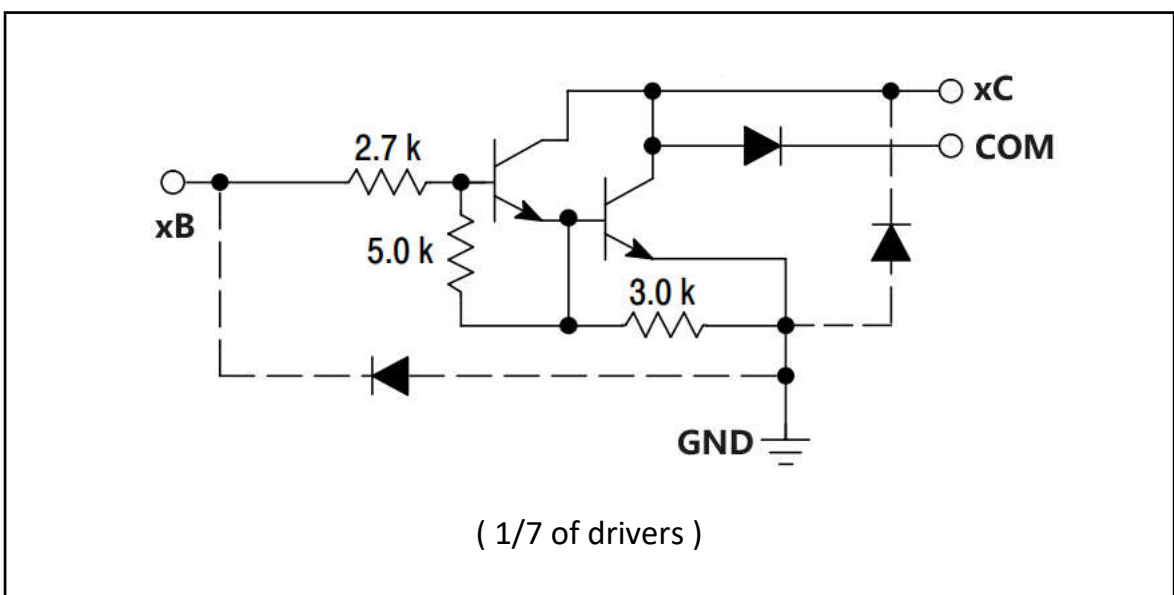
(Diagram, Top View)

4. PIN CONFIGURATIONS AND FUNCTIONS



PIN		I/O	FUNCTION DESCRIPTIONS
NAME	NO.		
1B~7B	1~7	Input	Channel 1 through 7 Darlington base input
1C~7C	16~10	Output	Channel 1 through 7 Darlington collector output
GND	8	Power	Common emitter shared by all channels (typically tied to ground)
COM	9	Power	Common cathode node for flyback diodes (required for inductive loads)

5. SCHEMATICS DIAGRAM



6. SPECIFICATIONS

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

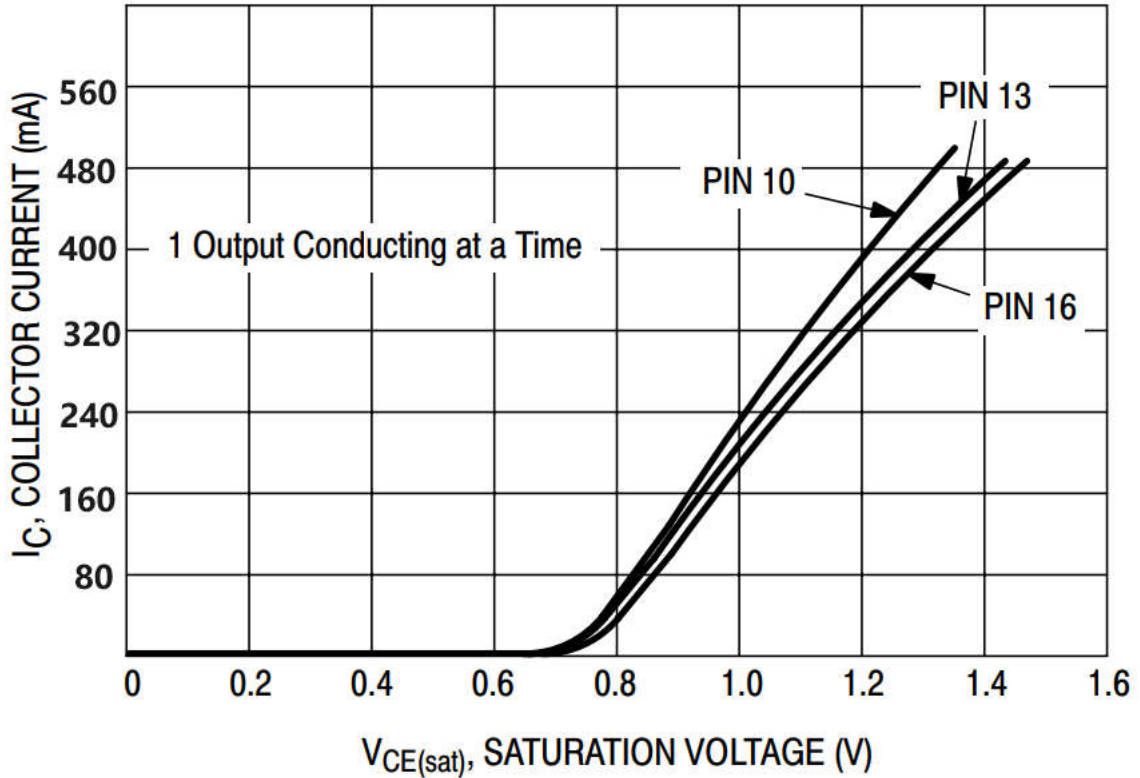
Rating	Symbol	Value	Unit
Output Voltage	V _O	50	V
Input Voltage	V _I	25	V
Collector Current – Continuous	I _C	500	mA
Base Current – Continuous	I _B	20	mA
Operating Ambient Temperature Range	T _A	-20 to +85	°C
Storage Temperature Range	T _{stg}	-40 to +150	°C
Junction Temperature	T _J	150	°C
Thermal Resistance, Junction-to-Ambient XD1413 (DIP16 Package) XL1413 (SOP16 Package)	R _{θJA}	77 120	°C/W
Thermal Resistance, Junction-to-Case XD1413 (DIP16 Package) XL1413 (SOP16 Package)	R _{θJC}	28 35	°C/W
Electrostatic Discharge Sensitivity (ESD) Human Body Model (HBM) Machine Model (MM) Charged Device Model (CDM)	ESD	1000 200 1000	V

※※※ NOTE: 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.

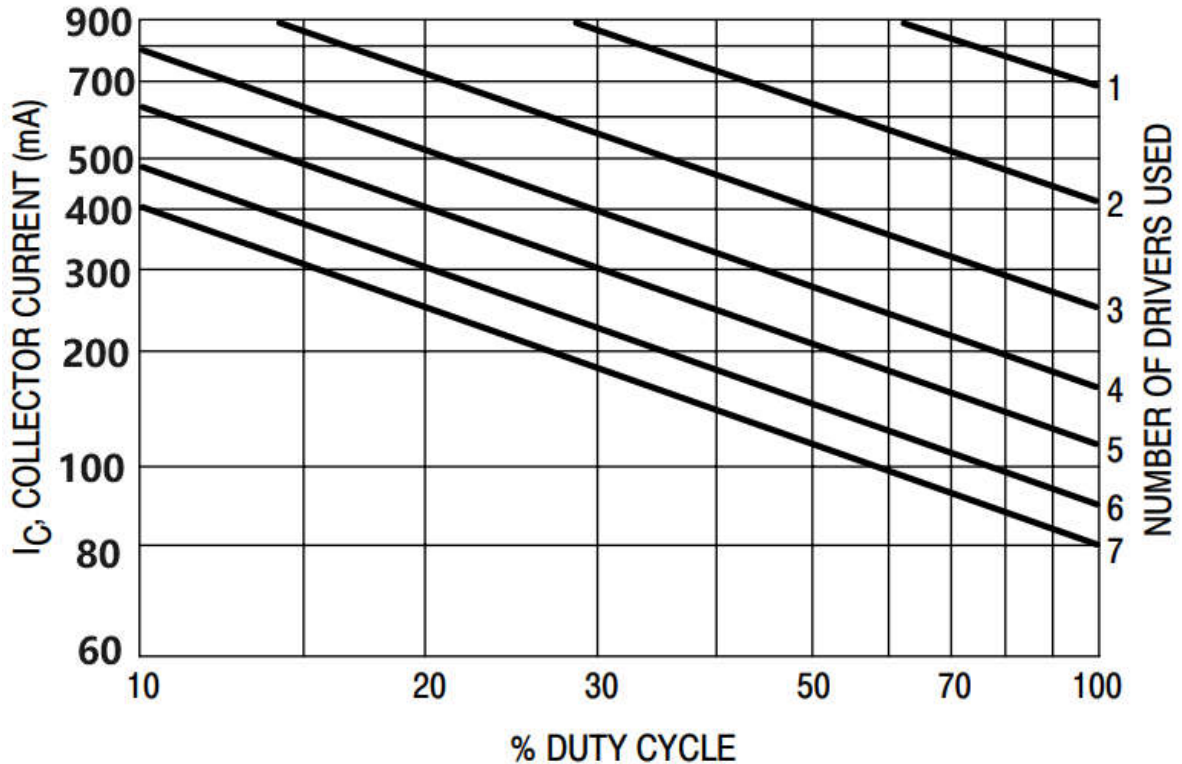
6.2. ELECTRICAL CHARACTERISTICS (TA= 25 °C, unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Output Leakage Current (V _O = 50 V, T _A = +85°) (V _O = 50 V, T _A = +25°)	I _{CEX}	- -	- -	200 100	μA
Collector-Emitter Saturation Voltage (I _C = 320 mA, I _B = 500 μA) (I _C = 240 mA, I _B = 350 μA) (I _C = 80 mA, I _B = 250 μA)	V _{CE(sat)}	- - -	1.2 1.0 0.9	1.6 1.3 1.1	V
Input Current – On Condition (V _I = 3.85 V)	I _{I(on)}	-	0.93	1.35	mA
Input Voltage – On Condition (V _{CE} = 2.0 V, I _C = 160 mA) (V _{CE} = 2.0 V, I _C = 240 mA) (V _{CE} = 2.0 V, I _C = 320 mA)	V _{I(on)}	- - -	- - -	2.4 2.7 3.0	V
Input Current – Off Condition (I _C = 500 μA, T _A = 85°C)	I _{I(off)}	50	100	-	μA
DC Current Gain (V _{CE} = 2.0 V, I _C = 320 mA)	h _{FE}	800	-	-	-
Input Capacitance	C _I	-	20	50	pF
Turn-On Delay Time (50% E _I to 50% E _O)	t _{on}	-	0.4	1.5	μs
Turn-Off Delay Time (50% E _I to 50% E _O)	t _{off}	-	0.4	1.5	μs
Clamp Diode Leakage Current, T _A = +25°C (V _R = 50 V, T _A = +85°C)	I _R	- -	- -	80 200	μA
Clamp Diode Forward (Voltage (I _F = 320 mA)	V _F	-	1.5	2.0	V

7. TYPICAL PERFORMANCE CHARACTERISTICS



(Figure 1. Typical Output Characteristics)



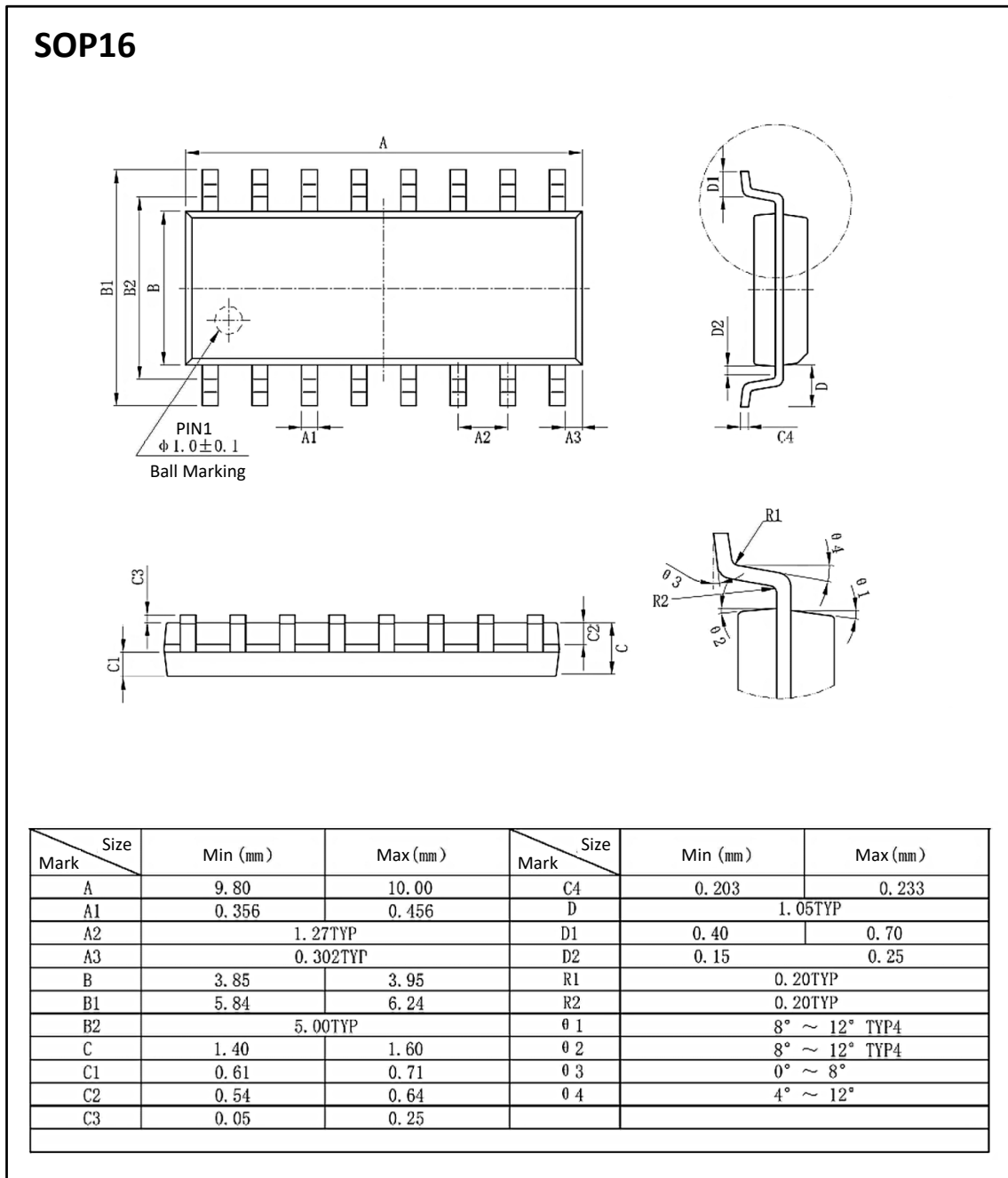
(Figure 2. Maximum Collector Current & Duty Cycle and Number of Drivers in Use)

8. ORDERING INFORMATION

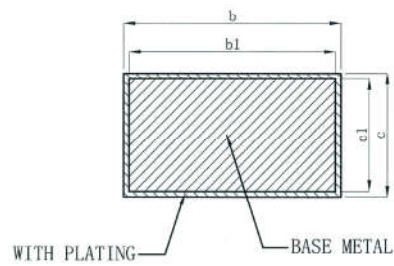
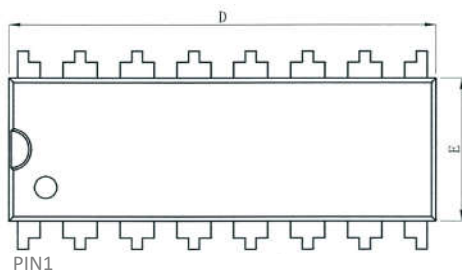
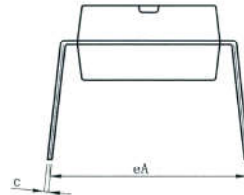
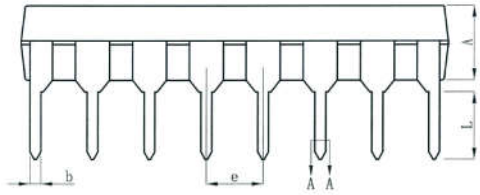
Ordering Information

Part Number	Device Marking	Package Type	Body size (mm)	Temperature (°C)	MSL	Transport Media	Package Quantity
XL1413	XL1413	SOP16	10.00 * 3.95	- 20 to 85	MSL3	T&R	2500
XD1413	XD1413	DIP16	19.05 * 6.35	- 20 to 85	MSL3	Tube 25	1000

8. DIMENSIONAL DRAWINGS



DIP16



symbol	millimeter		
	Min	Nom	Max
A	3.20	3.30	3.40
b	0.44	---	0.53
b1	0.43	0.46	0.49
c	0.25	---	0.30
c1	0.24	0.25	0.26
D	18.95	19.05	19.15
E	6.25	6.35	6.45
e	2.54BSC		
eA	8.30	8.80	9.30
L	3.00	---	---

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