NEC
ELECTRON DEVICE

TRANSISTOR ARRAY

μPA2001C, μPA2002C, μPA2003C, μPA2004C

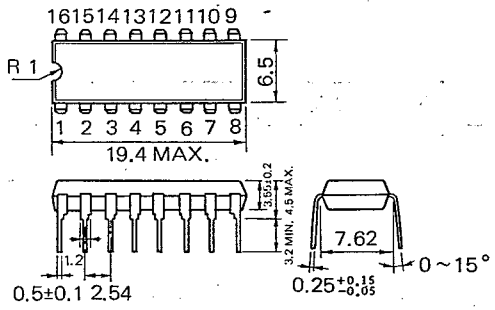
NPN SILICON EPITAXIAL DARLINGTON TRANSISTOR ARRAY

DESCRIPTION

The μPA2001C, 2002C, 2003C and 2004C are monolithic arrays of seven darlington transistors. These devices are especially suited for driving relays, solenoids, LED, lamps, and other devices with up to 0.3 A output current per unit.

PACKAGE DIMENSIONS

in millimeters

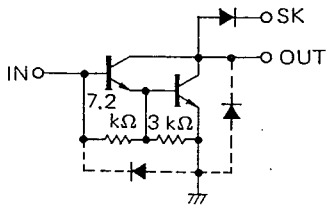


FEATURES

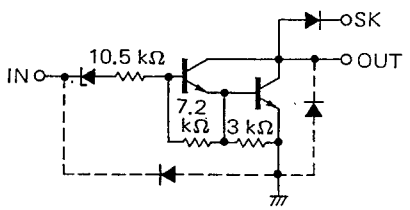
- Transient Protected Outputs
- High DC Current Gain
- High Output Drive Current
- High Output Voltage
- Package is 16 pin PLASTIC DIP.

EQUIVALENT CIRCUIT (1 Unit)

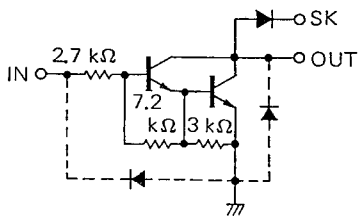
μPA2001C



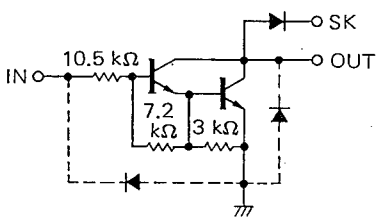
μPA2002C



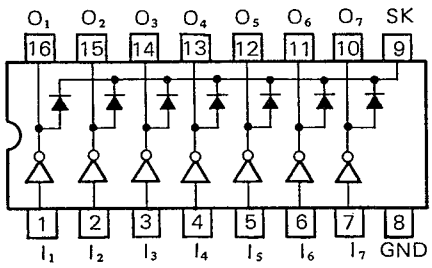
μPA2003C



μPA2004C



CONNECTION DIAGRAM (Top View)



I : Input (Base)
O : Output (Collector)
GND : (Common Emitter)
SK : Surge Killer

ABSOLUTE MAXIMUM RATINGS

Maximum Voltages and Currents (Ta = 25 °C)

Output Voltage	V_O	60	V
Input Voltage (except μPA2001C)	V_I	−0.5 to +30	V
Input Current (only μPA2001C)	I_I	25	mA/unit
Output Current	I_O	500	mA/unit
Output Current	I_O*	2.3	A/package
Reverse Voltage (Clamp Diode)	V_R	60	V
Forward Current (Clamp Diode)	I_F	500	mA/unit

Maximum Power Dissipation

Total Power Dissipation	Pd	900	mW/package
Total Power Dissipation	Pd*	2.5	W/package

Maximum Temperature

Operating Temperature	Topt	−30 to + 75	°C
Storage Temperature	Tstg	−55 to +150	°C

* PW≦20 ms, duty cycle≦10 %

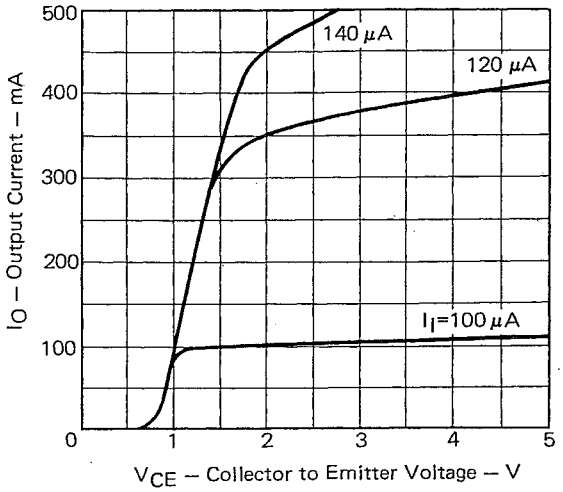
ELECTRICAL CHARACTERISTICS (Ta = 25 °C)

CHARACTERISTIC		SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Output Leakage Current		I_L			10	μA	V_{CE}=50 V
					100	μA	V_{CE}=50 V, Ta=70 °C
DC Current Gain		h_{FE}	1000	2800			V_{CE}=2.0 V, I_O=350 mA
Collector Saturation Voltage		$V_{CE(sat)}$		0.9	1.1	V	I_O=100 mA, I_I=250 μA
				1.0	1.3	V	I_O=200 mA, I_I=350 μA
				1.2	1.6	V	I_O=350 mA, I_I=500 μA
Input Voltage	μPA2002C	V_I			11	V	V_{CE}=2.0 V, I_O=100 mA
					12	V	V_{CE}=2.0 V, I_O=200 mA
					13.5	V	V_{CE}=2.0 V, I_O=350 mA
	μPA2003C				2.0	V	V_{CE}=2.0 V, I_O=100 mA
					2.4	V	V_{CE}=2.0 V, I_O=200 mA
					3.4	V	V_{CE}=2.0 V, I_O=350 mA
	μPA2004C				5.0	V	V_{CE}=2.0 V, I_O=100 mA
					6.0	V	V_{CE}=2.0 V, I_O=200 mA
					8.0	V	V_{CE}=2.0 V, I_O=350 mA
Input Current	μPA2002C	I_I			1.3	mA	V_I=17 V
	μPA2003C				1.35	mA	V_I=3.85 V
	μPA2004C				1.0	mA	V_I=5.0 V
Reverse Current (Clamp Diode)		I_R			50	μA	V_R=50 V
Forward Voltage (Clamp Diode)		V_F			2.0	V	I_F=350 mA
Terminal Capacitance		C_t		15		pF	V_I=0, f=1.0 MHz

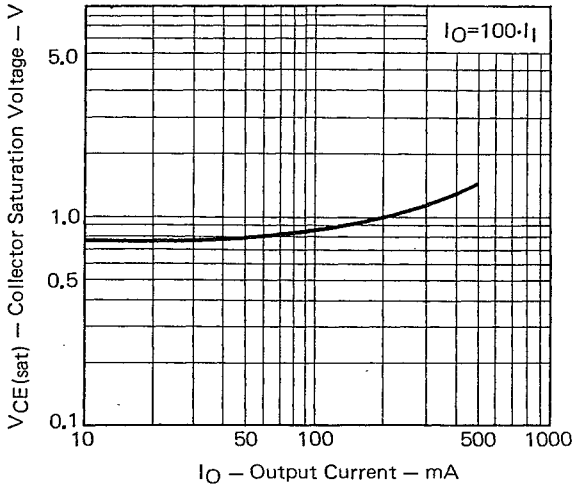
Note: Input Voltage and Current of the μPA2001C depend on external resistor.

TYPICAL CHARACTERISTICS (Ta = 25 °C)

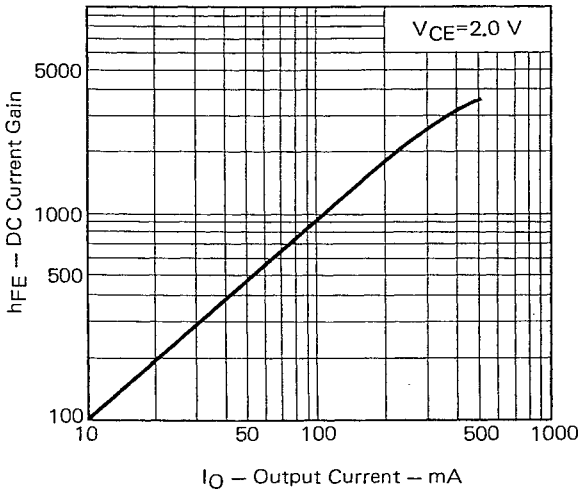
OUTPUT CURRENT vs.
COLLECTOR TO EMITTER VOLTAGE



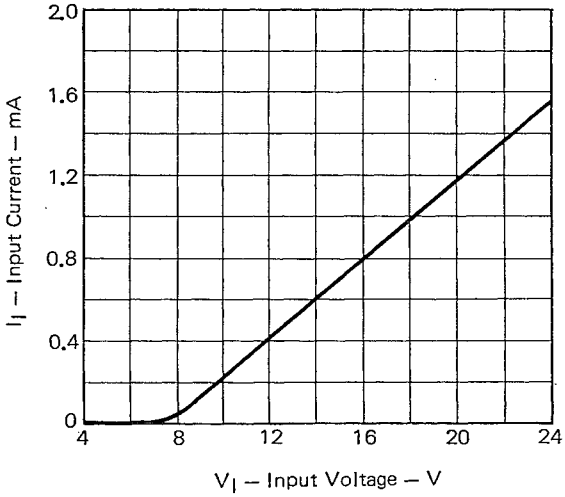
COLLECTOR SATURATION VOLTAGE vs.
COLLECTOR CURRENT



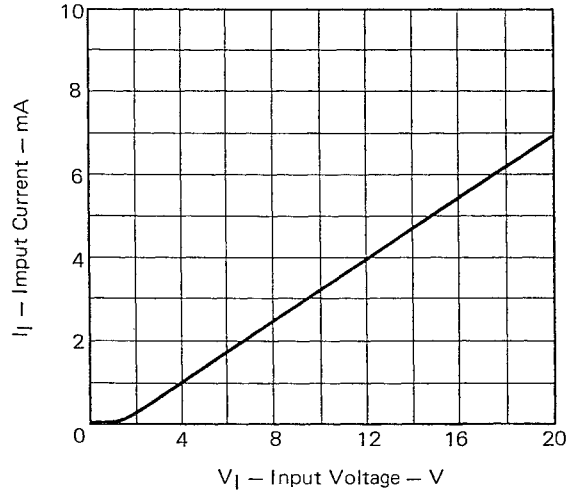
DC CURRENT GAIN vs.
OUTPUT CURRENT



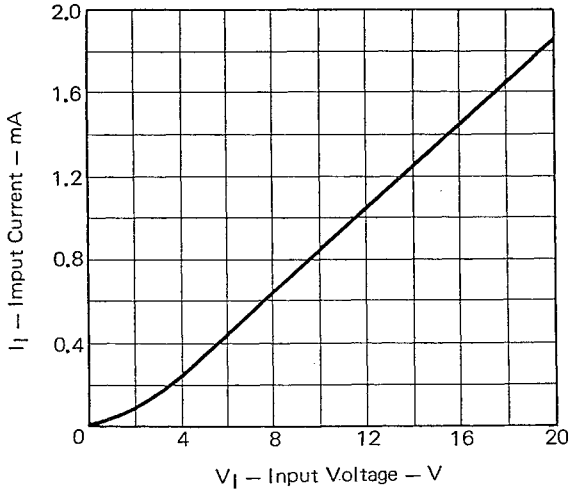
INPUT CURRENT vs.
INPUT VOLTAGE (μPA2002C)



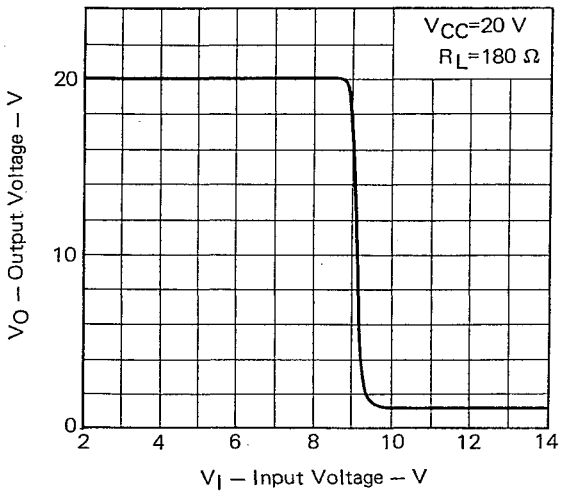
INPUT CURRENT vs.
INPUT VOLTAGE (μPA2003C)



INPUT CURRENT vs.
INPUT VOLTAGE (μPA2004C)



OUTPUT VOLTAGE vs.
INPUT VOLTAGE (μPA2002C)



OUTPUT VOLTAGE vs.
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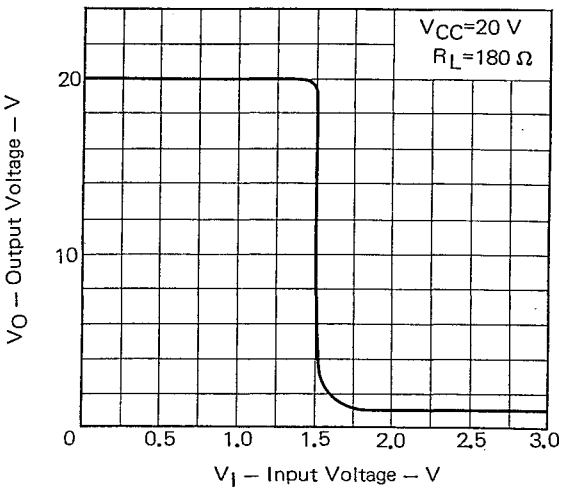
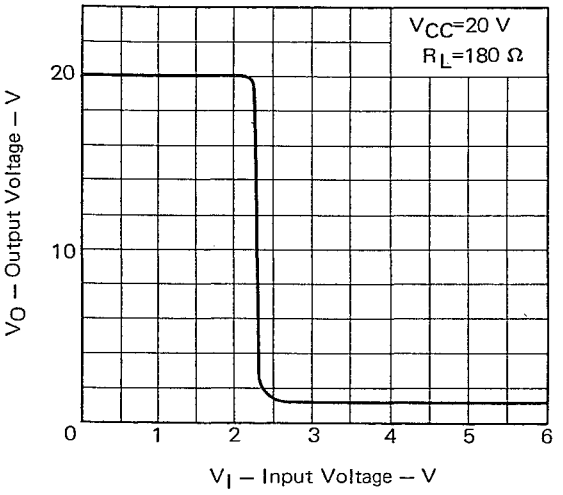
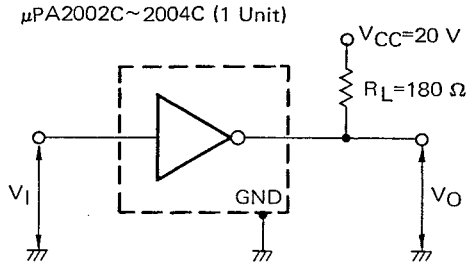


OUTPUT VOLTAGE vs.
INPUT VOLTAGE (μPA2004C)



V_O–V_I TEST CIRCUIT



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