

NPN SILICON POWER TRANSISTOR ARRAY  
 HIGH SPEED SWITCHING USE (DARLINGTON TRANSISTOR)  
 INDUSTRIAL USE

DESCRIPTION

The  $\mu$ PA1436A is NPN silicon epitaxial Darlington Power Transistor Array that built in 4 circuits designed for driving solenoid, relay, lamp and so on.

FEATURES

- Easy mount by 0.1 inch of terminal interval.
- High  $h_{FE}$  for Darlington Transistor.
- C-E Reverse Diode built in.
- High Speed Switching.

ORDERING INFORMATION

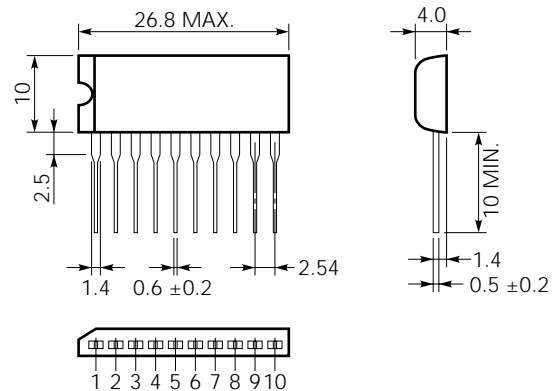
Part Number	Package	Quality Grade
$\mu$ PA1436AH	10 Pin SIP	Standard

Please refer to "Quality grade on NEC Semiconductor Device" (Document number IEI-1209) published by NEC Corporation to know the specification of quality grade on the devices and its recommended applications.

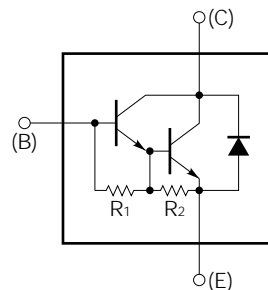
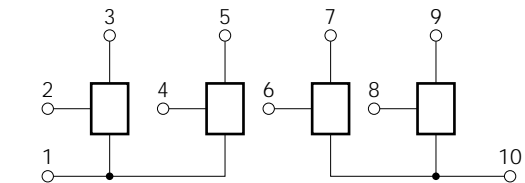
ABSOLUTE MAXIMUM RATINGS ( $T_a = 25\text{ }^\circ\text{C}$ )

Collector to Base Voltage	$V_{CBO}$	150	V
Collector to Emitter Voltage	$V_{CEO}$	100	V
Emitter to Base Voltage	$V_{EBO}$	8	V
Collector Current (DC)	$I_{C(DC)}$	$\pm 3$	A/unit
Collector Current (pulse)	$I_{C(pulse)^*}$	$\pm 5$	A/unit
Base Current (DC)	$I_{B(DC)}$	0.3	A/unit
Total Power Dissipation ( $T_a = 25\text{ }^\circ\text{C}$ )	$P_{T1}^{**}$	3.5	W
Total Power Dissipation ( $T_c = 25\text{ }^\circ\text{C}$ )	$P_{T2}^{**}$	28	W
Junction Temperature	$T_j$	150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$
* $PW \leq 350\ \mu s$ , Duty Cycle $\leq 2\%$			
** 4 Circuits			

PACKAGE DIMENSION  
(in millimeters)



CONNECTION DIAGRAM



PIN NO.

- 2, 4, 6, 8: Base (B)
- 3, 5, 7, 9: Collector (C)
- 1, 10: Emitter (E)
- $R_1 \cong 5\text{ k}\Omega$
- $R_2 \cong 1.3\text{ k}\Omega$

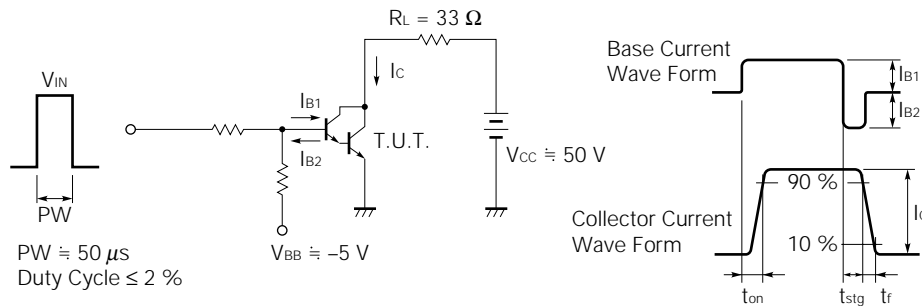
The information in this document is subject to change without notice.

ELECTRICAL CHARACTERISTICS (T<sub>a</sub> = 25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Leakage Current	I <sub>CBO</sub>			1	μA	V <sub>CB</sub> = 100 V, I <sub>E</sub> = 0
Emitter Leakage Current	I <sub>EBO</sub>			5	mA	V <sub>EB</sub> = 5 V, I <sub>C</sub> = 0
DC Current Gain	h <sub>FE1</sub> *	2000		20000	—	V <sub>CE</sub> = 2 V, I <sub>C</sub> = 1.5 A
DC Current Gain	h <sub>FE2</sub> *	1000			—	V <sub>CE</sub> = 2 V, I <sub>C</sub> = 3 A
Collector Saturation Voltage	V <sub>CE(sat)</sub> *		1	1.5	V	I <sub>C</sub> = 1.5 A, I <sub>B</sub> = 1.5 mA
Base Saturation Voltage	V <sub>BE(sat)</sub> *		1.8	2	V	I <sub>C</sub> = 1.5 A, I <sub>B</sub> = 1.5 mA
Turn On Time	t <sub>on</sub>		0.3		μs	I <sub>C</sub> = 1.5 A I <sub>B1</sub> = -I <sub>B2</sub> = 3 mA V <sub>CC</sub> ≅ 50 V, R <sub>L</sub> = 33 Ω
Storage Time	t <sub>stg</sub>		1.5		μs	
Fall Time	t <sub>f</sub>		0.4		μs	

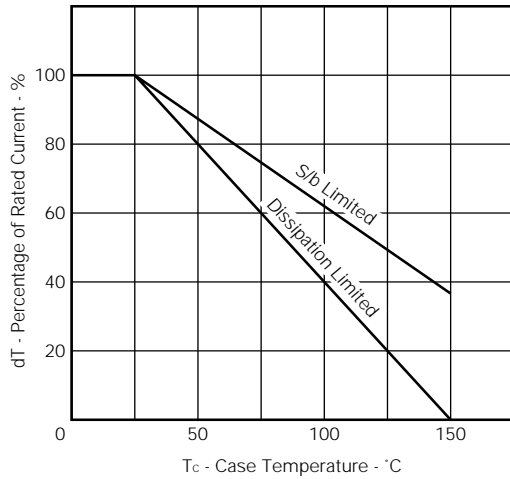
\* PW ≤ 350 μs, Duty Cycle ≤ 2 % /pulsed

SWITCHING TIME TEST CIRCUIT

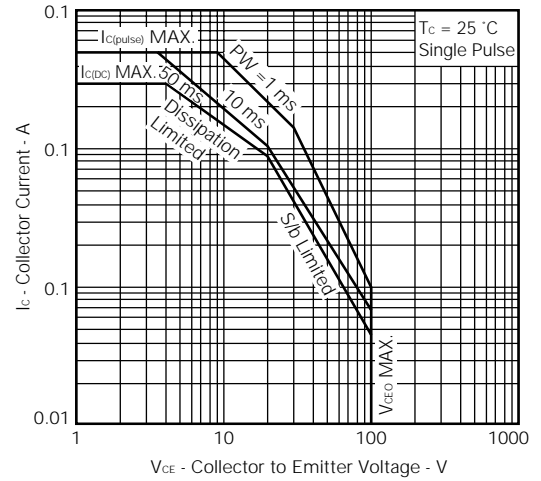


TYPICAL CHARACTERISTICS ( $T_a = 25^\circ\text{C}$ )

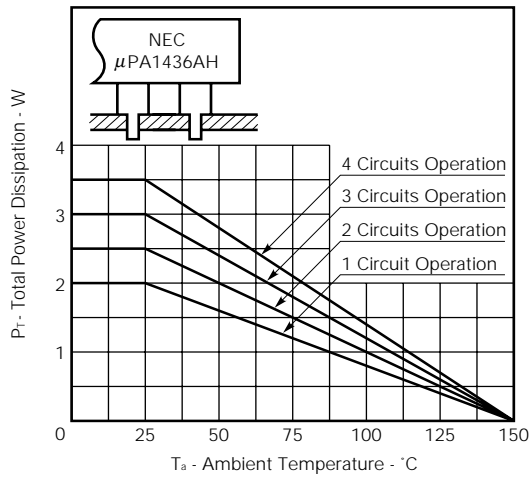
DERATING CURVE OF SAFE OPERATING AREA



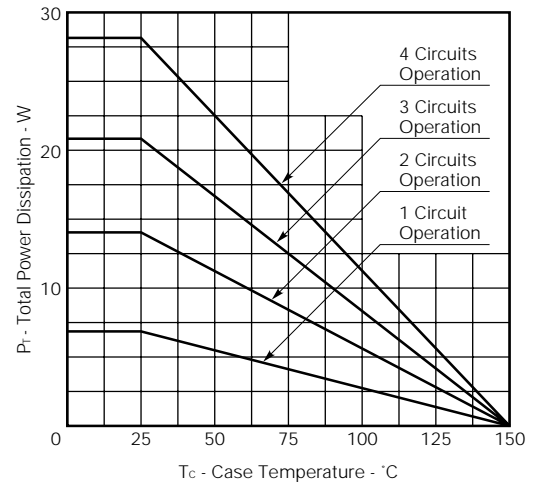
SAFE OPERATING AREA



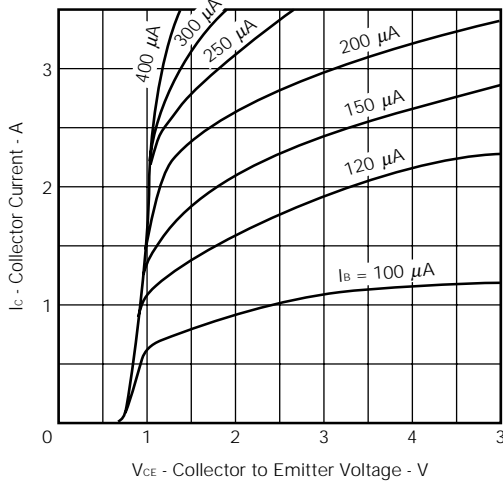
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



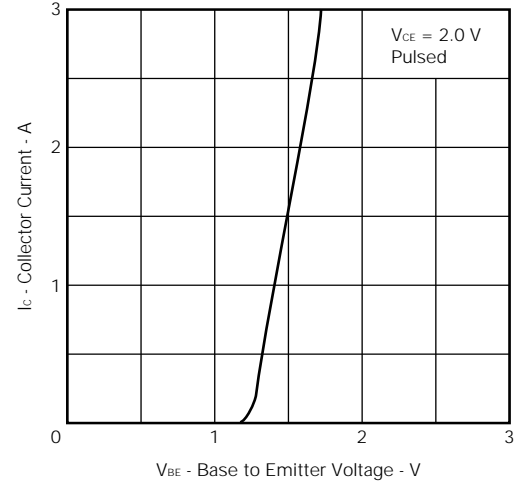
TOTAL POWER DISSIPATION vs. CASE TEMPERATURE

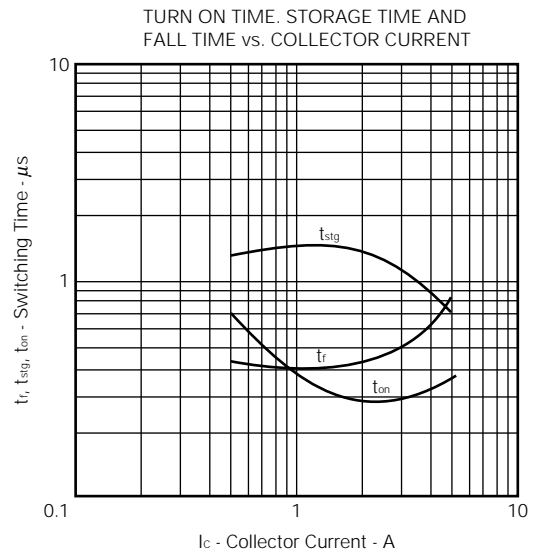
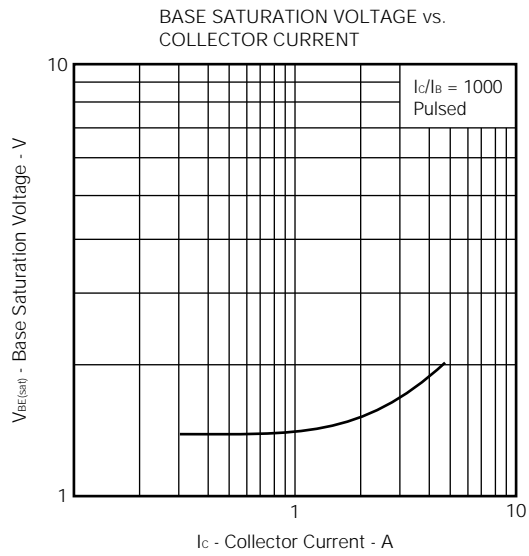
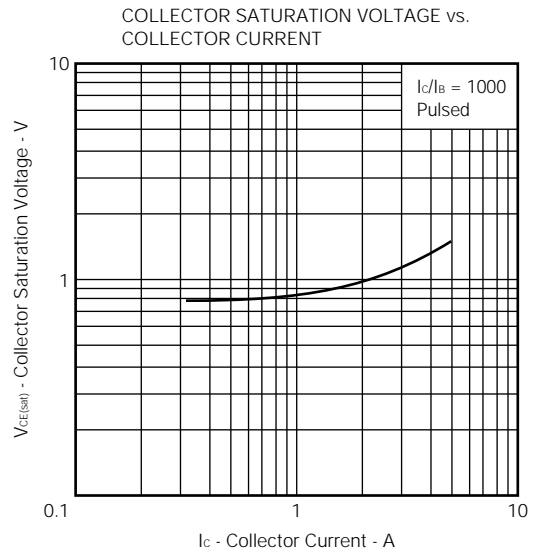
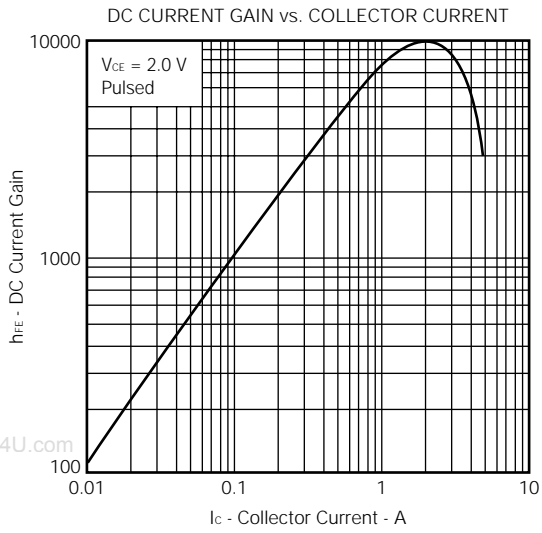


COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE





## REFERENCE

Document Name	Document No.
NEC semiconductor device reliability/quality control system.	TEI-1202
Quality grade on NEC semiconductor devices.	IEI-1209
Semiconductor device mounting technology manual.	IEI-1207
Semiconductor device package manual.	IEI-1213
Guide to quality assurance for semiconductor devices.	MEI-1202
Semiconductor selection guide.	MF-1134

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Special: Automotive and Transportation equipment, Traffic control systems, Antidisaster systems, Anticrime systems, etc.

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