

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

DESCRIPTION

The  $\mu$ PA1428A is NPN silicon epitaxial Darlington Power Transistor Array that built in Surge Absorber 4 circuits designed for driving solenoid, relay, lamp and so on.

FEATURES

- Surge Absorber built in.
- Easy mount by 0.1 inch of terminal interval.
- High  $h_{FE}$  for Darlington Transistor.

ORDERING INFORMATION

Part Number	Package	Quality Grade
$\mu$ PA1428AH	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 ( $T_a = 25\text{ }^\circ\text{C}$ )

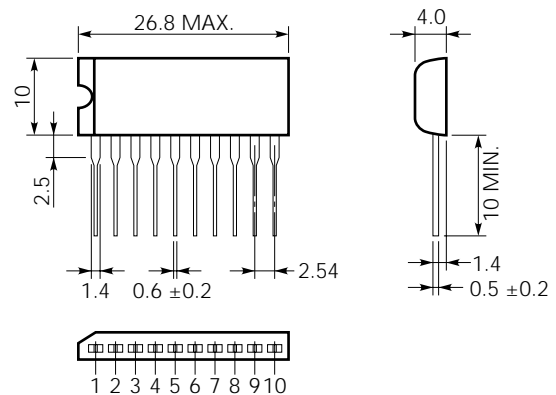
Collector to Base Voltage	$V_{CB0}$	$60 \pm 10$	V
Collector to Emitter Voltage	$V_{CE0}$	$60 \pm 10$	V
Emitter to Base Voltage	$V_{EBO}$	8	V
Surge Sustaining Energy	$E_{CEO(sus)}$	30	mJ/unit
Collector Current (DC)	$I_{C(DC)}$	$\pm 2$	A/unit
Collector Current (pulse)	$I_{C(pulse)^*}$	$\pm 3$	A/unit
Base Current (DC)	$I_{B(DC)}$	0.2	A/unit
Total Power Dissipation	$P_{T1}^{**}$	3.5	W
Total Power Dissipation	$P_{T2}^{***}$	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  $\leq 2\%$

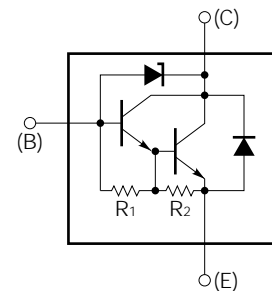
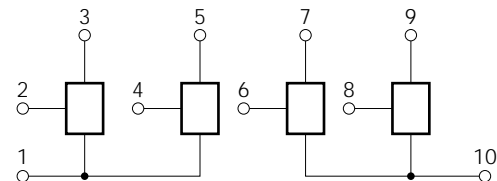
\*\* 4 Circuits,  $T_a = 25\text{ }^\circ\text{C}$

\*\*\* 4 Circuits,  $T_c = 25\text{ }^\circ\text{C}$

PACKAGE DIMENSION  
 (in millimeters)



CONNECTION DIAGRAM



PIN NO.

- 2, 4, 6, 8: Base (B)
- 3, 5, 7, 9: Collector (C)
- 1, 10: Emitter (E)
- $R_1 \approx 10\text{ k}\Omega$
- $R_2 \approx 900\ \Omega$

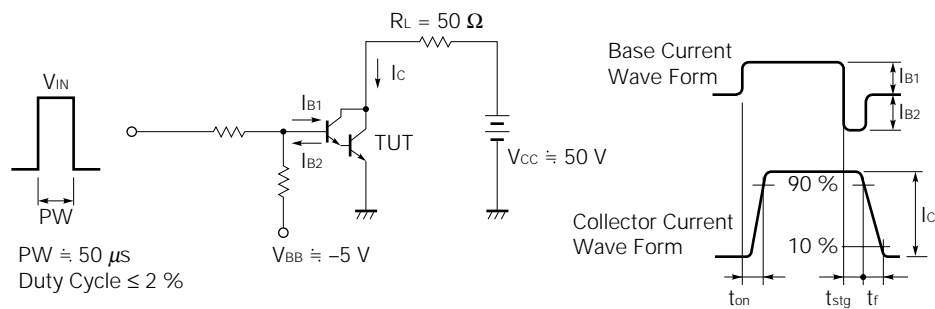
The information in this document is subject to change without notice.

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

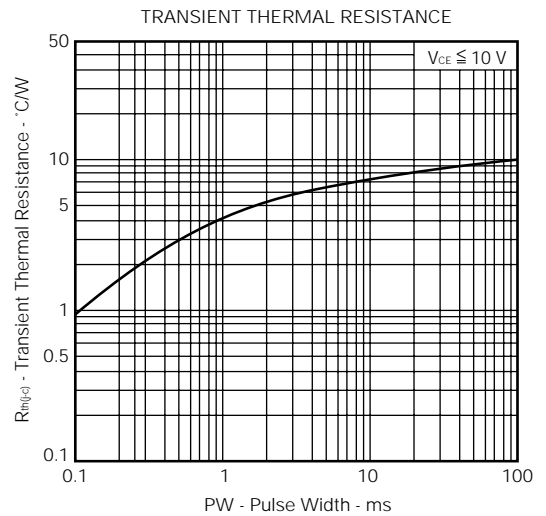
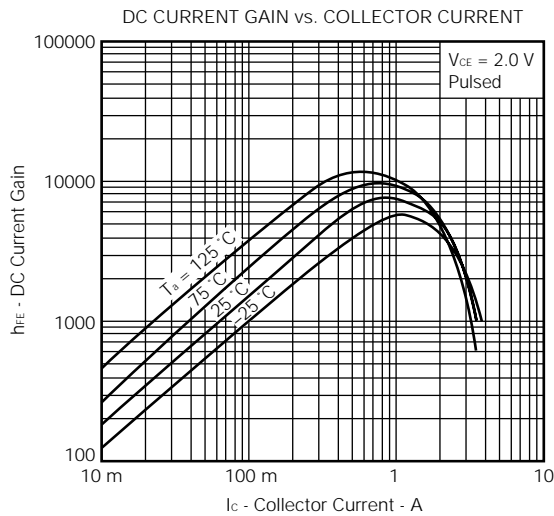
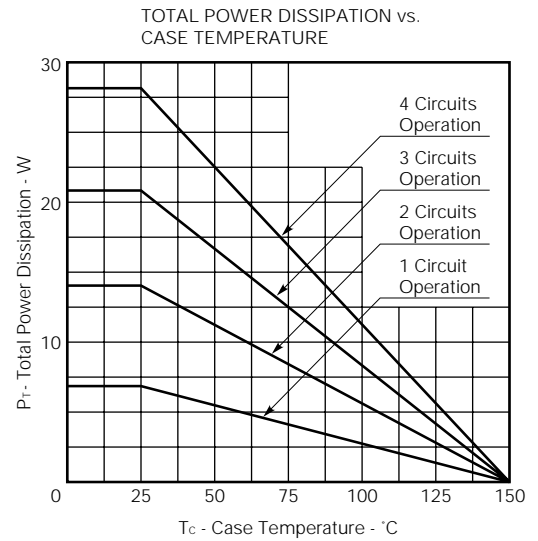
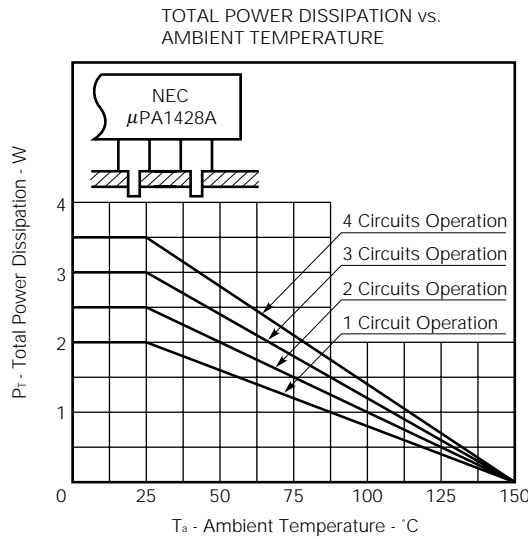
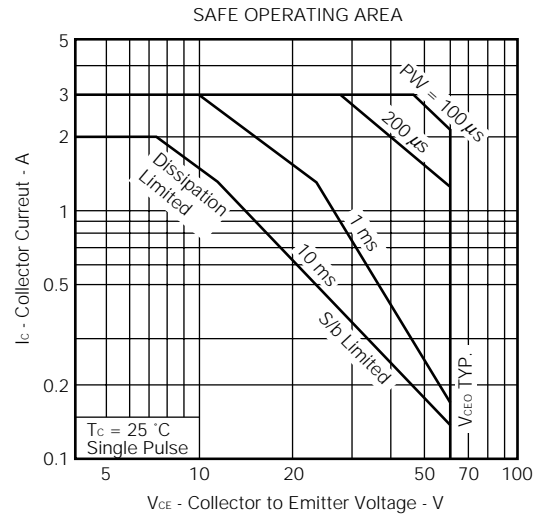
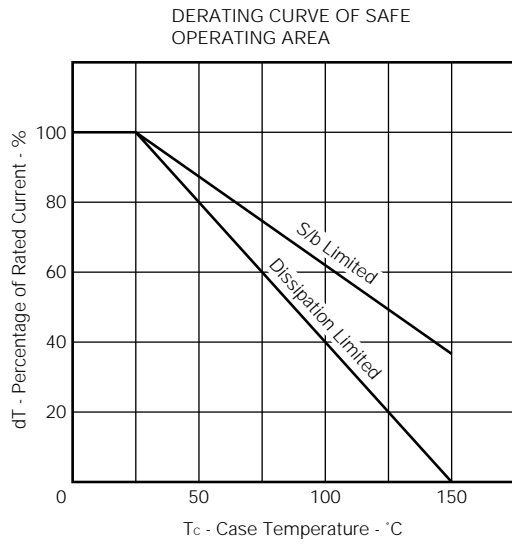
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Leakage Current	I <sub>CBO</sub>			1	μA	V <sub>CB</sub> = 40 V, I <sub>E</sub> = 0
Emitter Leakage Current	I <sub>EBO</sub>			5	mA	V <sub>EB</sub> = 5 V, I <sub>C</sub> = 0
Collector to Emitter Sustaining Voltage	V <sub>CEO(sus)</sub>	50	60	70	V	I <sub>C</sub> = 1 A, L = 1 mH
DC Current Gain	h <sub>FE1</sub> *	2000		20000	—	V <sub>CE</sub> = 2 V, I <sub>C</sub> = 1 A
DC Current Gain	h <sub>FE2</sub> *	500			—	V <sub>CE</sub> = 2 V, I <sub>C</sub> = 2 A
Collector Saturation Voltage	V <sub>CE(sat)</sub> *		1.0	1.5	V	I <sub>C</sub> = 1 A, I <sub>B</sub> = 1 mA
Base Saturation Voltage	V <sub>BE(sat)</sub> *		1.7	2	V	I <sub>C</sub> = 1 A, I <sub>B</sub> = 1 mA
Turn On Time	t <sub>on</sub>		0.4		μs	I <sub>C</sub> = 1 A
Storage Time	t <sub>stg</sub>		1.5		μs	I <sub>B1</sub> = -I <sub>B2</sub> = 2 mA
Fall Time	t <sub>f</sub>		0.4		μs	V <sub>CC</sub> ≐ 50 V, R <sub>L</sub> = 50 Ω See test circuit

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

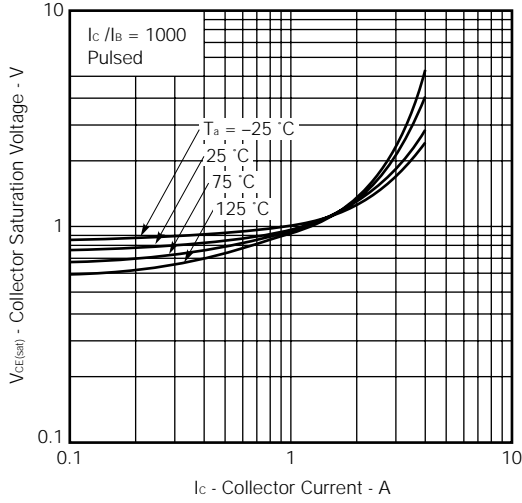
**SWITCHING TIME TEST CIRCUIT**



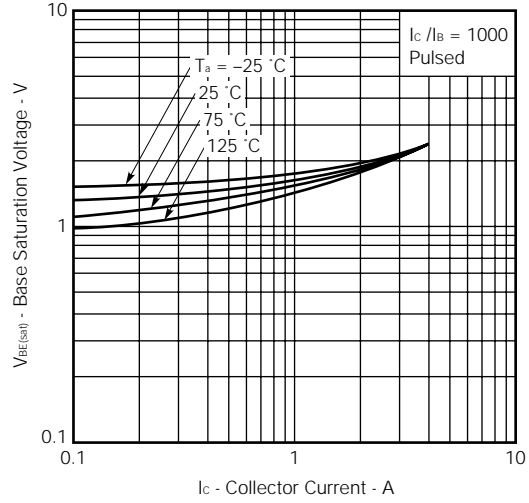
TYPICAL CHARACTERISTICS ( $T_a = 25\text{ }^\circ\text{C}$ )



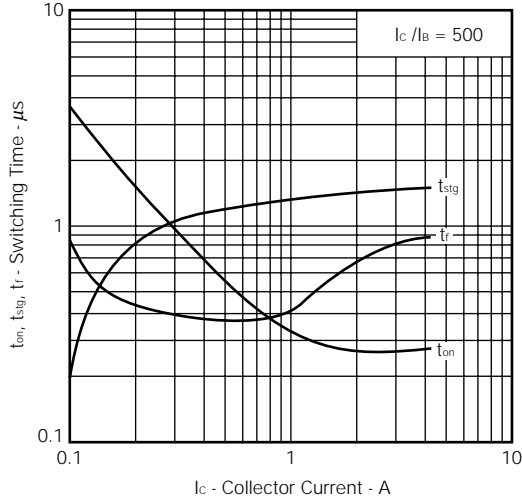
COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



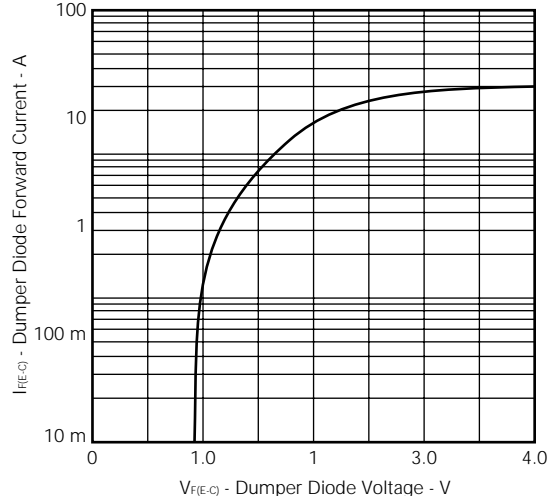
BASE SATURATION VOLTAGE vs. COLLECTOR CURRENT



SWITCHING TIME vs. COLLECTOR CURRENT



DUMPER DIODE CHARACTERISTICS



## 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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