

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

DESCRIPTION

The  $\mu$ PA1478 is NPN silicon epitaxial Darlington Power Transistor Array that built in Surge Absorber and 4 circuits designed for driving solenoid, relay, lamp and so on.

FEATURES

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

ORDERING INFORMATION

Part Number	Package	Quality Grade
$\mu$ PA1478H	10 Pin SIP	Standard

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

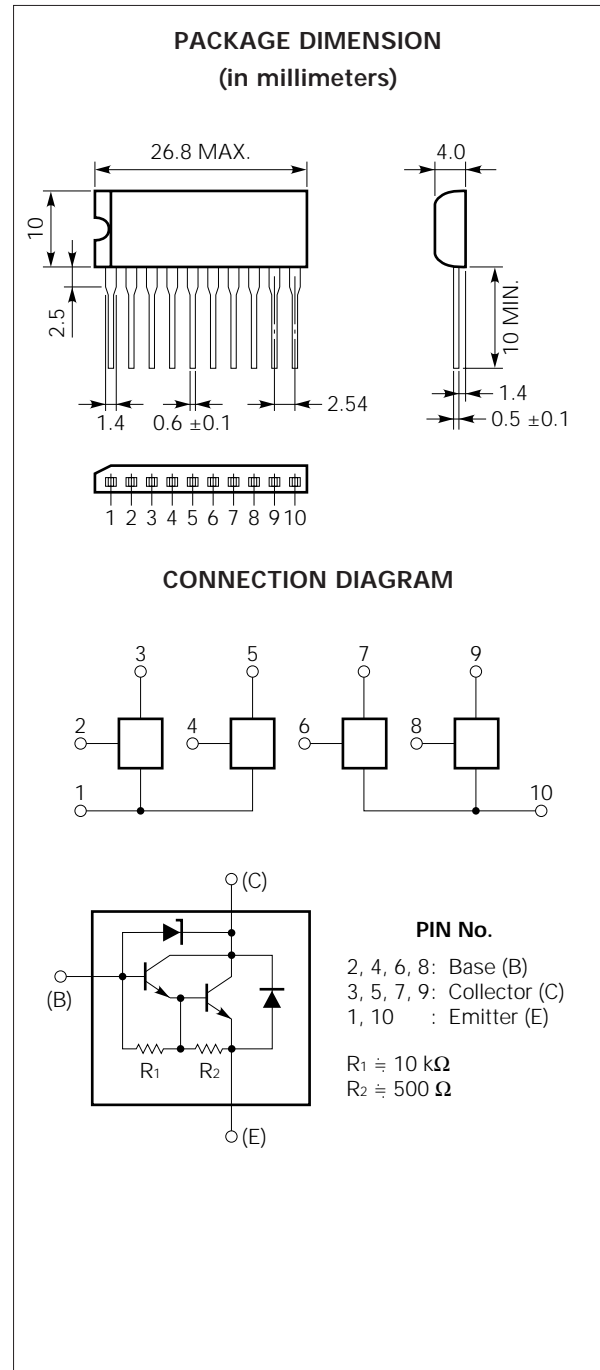
ABSOLUTE MAXIMUM RATINGS ( $T_A = 25\text{ }^\circ\text{C}$ )

Collector to Base Voltage	$V_{CBO}$	$31 \pm 4$	V
Collector to Emitter Voltage	$V_{CEO}$	$31 \pm 4$	V
Emitter to Base Voltage	$V_{EBO}$	7	V
Surge Sustaining Energy	$E_{CEO (SUS)}$	40	mJ/unit
Collector Current (DC)	$I_{C(DC)}$	$\pm 2$	A/unit
Collector Current (pulse)	$I_{C(pulse)^*}$	$\pm 4$	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	$^\circ\text{C}$

\*  $PW \leq 300\ \mu s$ , Duty Cycle  $\leq 10\%$

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

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



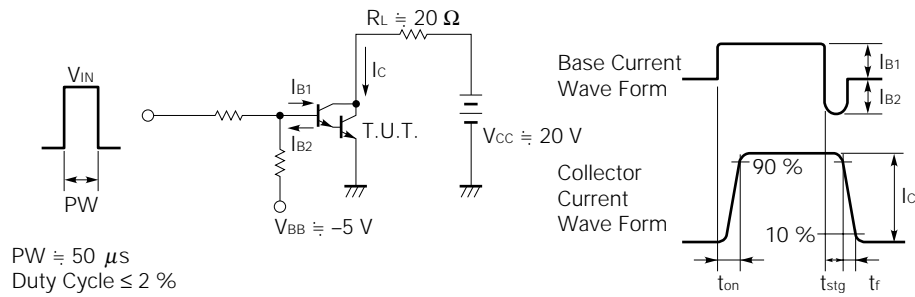
The information in this document is subject to change without notice.

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

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Leakage Current	I <sub>CBO</sub>			10	μA	V <sub>CB</sub> = 20 V, I <sub>E</sub> = 0
Emitter Leakage Current	I <sub>EBO</sub>			1	mA	V <sub>EB</sub> = 5 V, I <sub>C</sub> = 0
Collector to Emitter Sustaining Voltage	V <sub>CEO(SUS)</sub>	27	31	35	V	I <sub>C</sub> = 1 A, L = 3 mH
DC Current Gain	h <sub>FE1</sub> *	1000			—	V <sub>CE</sub> = 2 V, I <sub>C</sub> = 0.5 A
DC Current Gain	h <sub>FE2</sub> *	2000		30000	—	V <sub>CE</sub> = 2 V, I <sub>C</sub> = 1 A
Collector Saturation Voltage	V <sub>CE(sat)</sub> *			1.5	V	I <sub>C</sub> = 1 A, I <sub>B</sub> = 1 mA
Base Saturation Voltage	V <sub>BE(sat)</sub> *			2	V	I <sub>C</sub> = 1 A, I <sub>B</sub> = 1 mA
Turn On Time	t <sub>on</sub>		0.5		μs	I <sub>C</sub> = 1 A
Storage Time	t <sub>stg</sub>		3		μs	I <sub>B1</sub> = -I <sub>B2</sub> = 1 mA V <sub>CC</sub> ≅ 20 V, R <sub>L</sub> ≅ 20 Ω
Fall Time	t <sub>f</sub>		1		μs	See test circuit

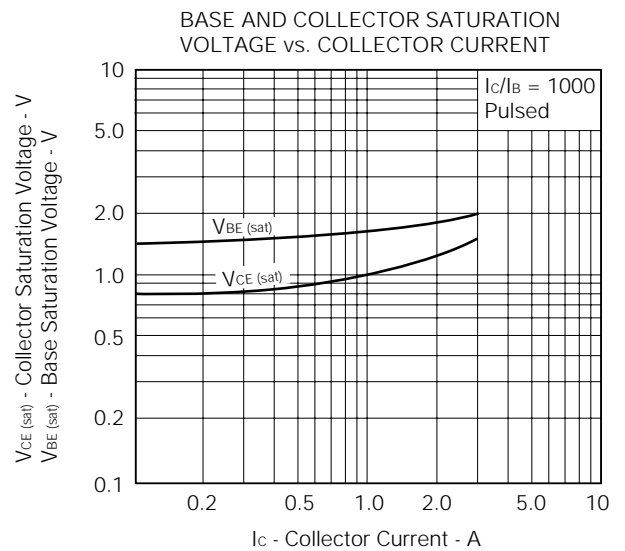
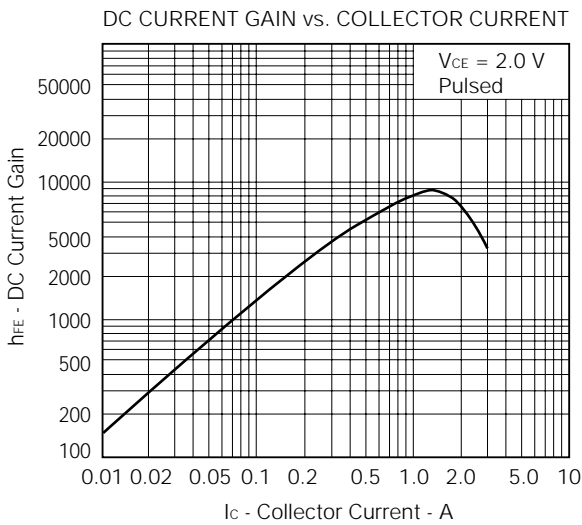
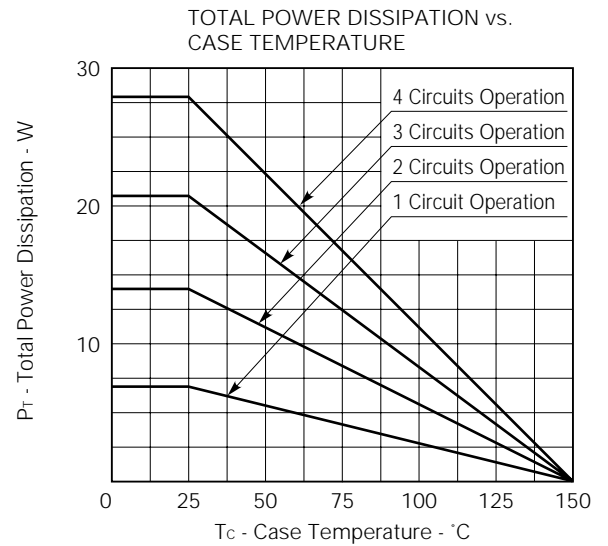
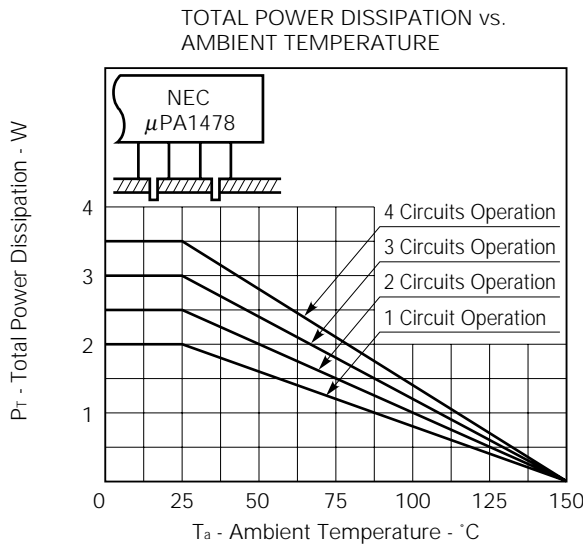
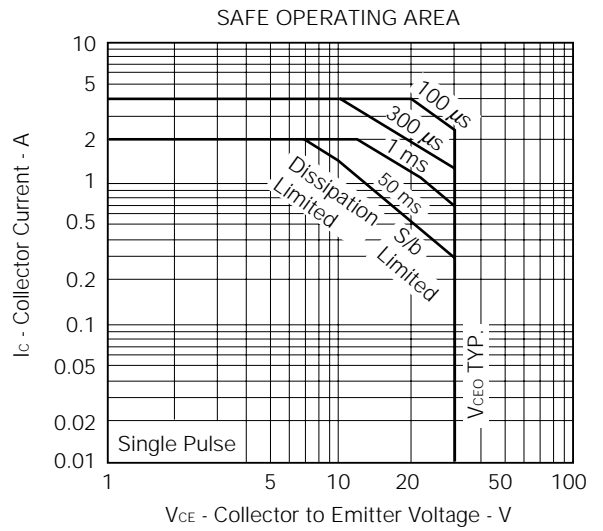
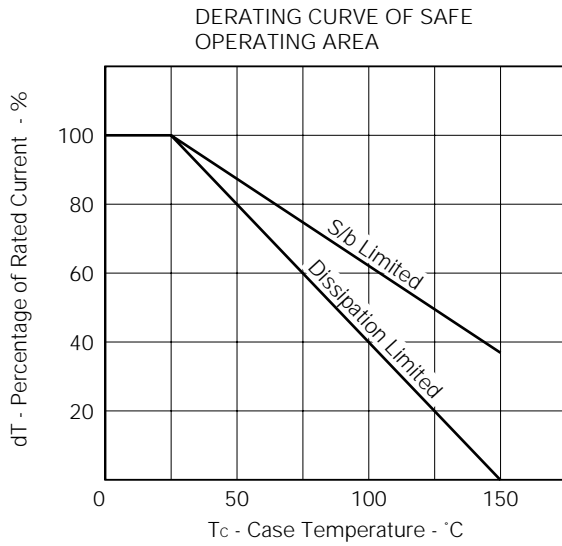
\* PW ≤ 350 μs, Duty Cycle ≤ 2 % / pulsed

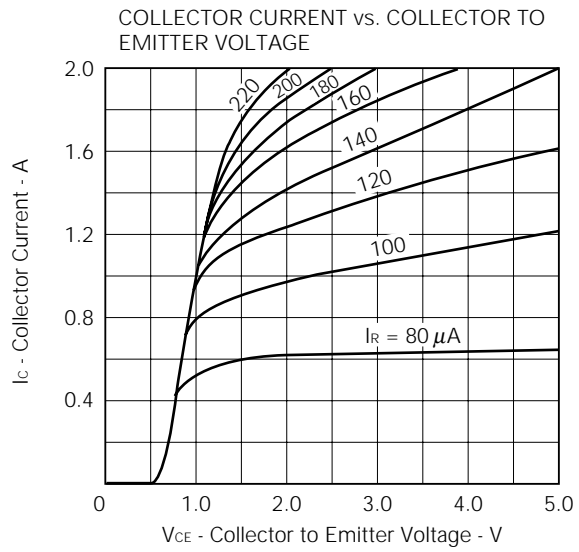
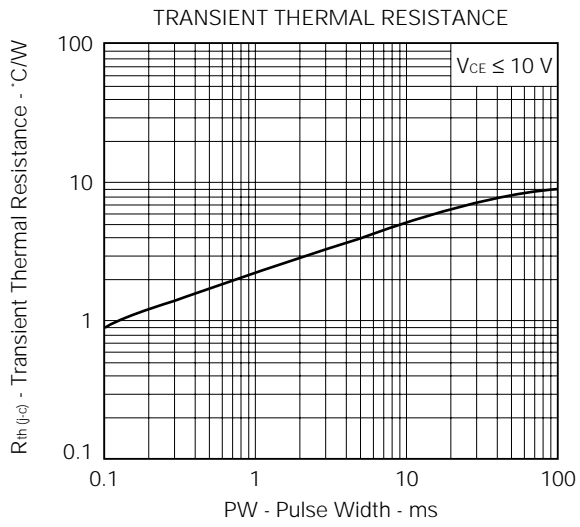
**SWITCHING TIME TEST CIRCUIT**



The application circuits and their parameters are for references only and are not intended for use in actual design-in's.

TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25 °C)





## 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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Application examples recommended by NEC Corporation

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